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**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 6

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Army • Budget Estimates FY 2020 • RDT&E Program

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RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY
APPROPRIATION LANGUAGE

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, \$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.

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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:

<i>Budget Activity</i>	<i>OSDPE / Project</i>	<i>Project Title</i>
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:

<u><i>Budget Activity</i></u>	<u><i>Old OSDPE / Project: Title</i></u>	<u><i>New OSDPE / Project</i></u>
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 Survivably	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:

<u>Budget Activity</u>	<u>OSDPE / Project</u>	<u>OSDPE Title / Project Title</u>
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.

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

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<u>Appropriation</u>	<u>FY 2018</u> <u>(Base + OCO)</u>	<u>FY 2019</u> <u>Base Enacted</u>	<u>FY 2019</u> <u>OCO Enacted</u>	<u>FY 2019</u> <u>Total Enacted</u>
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

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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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<u>Summary Recap of Budget Activities</u>	<u>FY 2018</u> <u>(Base + OCO)</u>	<u>FY 2019</u> <u>Base Enacted</u>	<u>FY 2019</u> <u>OCO Enacted</u>	<u>FY 2019</u> <u>Total Enacted</u>
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
 <u>Summary Recap of FYDP Programs</u>				
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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<u>Summary Recap of Budget Activities</u>	<u>FY 2018 (Base + OCO)</u>	<u>FY 2019 Base Enacted</u>	<u>FY 2019 OCO Enacted</u>	<u>FY 2019 Total Enacted</u>
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
<u>Summary Recap of FYDP Programs</u>				
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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	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)
<u>Summary Recap of Budget Activities</u>					
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
<u>Summary Recap of FYDP Programs</u>					
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	Se
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)	Se
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	S e c
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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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	S e c
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)	Se c
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	Se
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)	Se
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	S e c
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 Missile 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)	Se
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 Missile 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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Appropriation: 2040A Research, Development, Test & Eval, Army

Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	S e c
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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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	S e c
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)	\$ e c
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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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)	Se
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	S e c
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)	Se
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	Se
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)	Se
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: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>
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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
Total Program Element	-	31.401	47.322	14.117	-	14.117	15.229	14.823	14.139	7.350	0.000	144.381
976: <i>Army Threat Sim (ATS)</i>	-	31.401	47.322	14.117	-	14.117	15.229	14.823	14.139	7.350	0.000	144.381

A. Mission Description and Budget Item Justification

This Program Element (PE) supports the design, development, acquisition, integration and fielding of realistic mobile threat simulators and realistic threat simulation products utilized in Army/Department of Defense (DoD) training and developmental and operational tests. This PE originally funded simulators representing Soviet equipment, but scope was expanded to address emerging world threats. Army Threat Simulator and Threat Simulation products are utilized to populate test battlefields for United States (U.S.) Army Test and Evaluation Command (ATEC), to conduct developmental and operational tests, and to support Program Executive Office (PEO) required user testing in System Integration Laboratories (SILs) and hardware/simulation in-the-loop facilities. These battlefield simulators represent adversary systems (e.g. missile systems, command, control and communications systems, electronic warfare systems, etc.) in order to portray a realistic threat environment during testing of U.S. weapon systems.

Army Threat Simulator and Threat Simulation products developed or fielded under this PE support Army-wide, non-system-specific threat product requirements. Each capability is pursued in concert and coordination with existing Army/DoD and Tri-Service capabilities to eliminate duplication of effort. Simulator development is responsive to Office of the Secretary of Defense and Government Accountability Office guidance for the Army to conduct operational testing in a realistic threat environment. Actual threat equipment is acquired when appropriate (in lieu of development) and total package fielding is still required (i.e., instrumentation, operations and maintenance, manuals, new equipment training, etc.). Threat simulator development is accomplished under the auspices of the Project Manager for Instrumentation, Targets and Threat Simulators (PM ITTS) and the Director, Operational Test and Evaluation (DOT&E) Threat Simulator Investment Working Group.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	22.862	12.835	15.284	-	15.284
Current President's Budget	31.401	47.322	14.117	-	14.117
Total Adjustments	8.539	34.487	-1.167	-	-1.167
• Congressional General Reductions	-0.009	-0.013			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	9.000	34.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.452	-			
• Adjustments to Budget Years	-	-	-1.167	-	-1.167

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 976: *Army Threat Sim (ATS)*

- Congressional Add: *Congressional Add: Integrated Threat Force*
- Congressional Add: *Integrated Threat Force Cyber Threat Simulators*
- Congressional Add: *Threat Cyberspace Operations*
- Congressional Add: *Cyber Security Operations Center*

Congressional Add Subtotals for Project: 976

Congressional Add Totals for all Projects

	FY 2018	FY 2019
	9.000	-
	-	6.000
	-	10.000
	-	18.500
Congressional Add Subtotals for Project: 976	9.000	34.500
Congressional Add Totals for all Projects	9.000	34.500

Change Summary Explanation

Fiscal Year (FY) 2018 Congressional Add of \$9.000 million for Integrated Threat Force.
 FY19 Congressional Adds of \$34.500 million for: Integrated Force Cyber Threat Simulators (\$6.000 million); Threat Cyberspace Operations (\$10.000 million); and Cyber Security Operations Center (\$18.500 million).

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>				Project (Number/Name) 976 / <i>Army Threat Sim (ATS)</i>			
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
976: <i>Army Threat Sim (ATS)</i>	-	31.401	47.322	14.117	-	14.117	15.229	14.823	14.139	7.350	0.000	144.381
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In Fiscal Year 2020, management and oversight of Cyber Blue Team vulnerability assessments was moved from Project 976 to Program Element 0604759A (Major Test & Evaluation Investment), Project FF1 (Cyber Blue Team).

A. Mission Description and Budget Item Justification

This Project supports the design, development, acquisition, integration, and fielding of realistic mobile threat simulators and realistic threat simulation products utilized in Army/DOD training and developmental and operational tests. Army Threat Simulator and Threat Simulation products are utilized to populate test battlefields for United States (U.S.) Army Test and Evaluation Command (ATEC), to conduct developmental and operational tests, and to support Program Executive Office (PEO) required user testing in System Integration Laboratories and hardware/simulation in-the-loop facilities.

Army Threat Simulator and Threat Simulation products developed or fielded under this Project support Army-wide, non-system-specific threat product requirements. Each capability is pursued in concert and coordination with existing Army/DoD and Tri-Service capabilities to eliminate duplication of effort. These battlefield simulators represent systems (e.g. missile systems, command, control and communications systems, electronic warfare systems, etc.) that are used to portray a realistic threat environment during testing of U.S. weapon systems. Simulator development is responsive to Office of the Secretary of Defense and General Accounting Office guidance for the Army to conduct operational testing in a realistic threat environment. Actual threat equipment is acquired when appropriate (in lieu of development) and total package fielding is still required (i.e., instrumentation, operations and maintenance, manuals, new equipment training, etc.). Threat simulator development is accomplished under the auspices of the Project Manager for Instrumentation, Targets and Threat Simulators (PM ITTS) and the Director, Operational Test and Evaluation, Threat Simulator Investment Working Group.

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

	FY 2018	FY 2019	FY 2020
Title: Network Exploitation Test Tool (NETT).	3.289	1.450	1.849
Description: NETT is a comprehensive Threat Cyberspace Operations (TCO) tool designed for Test and Evaluation (T&E) to portray evolving hostile and malicious Threat effects within the Cyber domain. Program will continue to provide an integrated suite of open-source/open-method exploitation tools to be integrated with robust reporting and instrumentation capabilities. NETT is used by TCO teams to replicate the tactics of state and non-state Threats and is supported by a robust TCO development environment. The Cyber domain is the most rapidly changing domain in which our systems operate. NETT program will continue research of these capabilities and will use an in-depth process to clean, fix, sustain, modernize, and integrate required Threat tools, tactics, and techniques that will be needed during T&E. Focus areas include: continued Threat integration, instrumentation, distributed collaboration between multiple users, targets and attack visualization, data collection and remote agent development.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>	Project (Number/Name) 976 / <i>Army Threat Sim (ATS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p><i>FY 2019 Plans:</i> Continue EMD phase for the NETT including the integration of new tools, tactics, and techniques into the NETT to portray evolving Threat environments.</p> <p><i>FY 2020 Plans:</i> Continue EMD phase for the NETT including the integration of new tools, tactics, and techniques into NETT in order to portray the evolving threat environment.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Minor adjustment in Army requirements.</p>				
<p><i>Title:</i> Threat Systems Management Office's (TSMO) Threat Operations</p> <p><i>Description:</i> The Threat Operations program will fund the operation, maintenance, management, and sustainment capability for Threat systems used to portray a realistic threat environment during Army testing and training within the Army's Threat inventory in order to support multiple Army/DoD test events including Network Integration Evaluation / Army Warfighting Assessment (NIE / AWA) and anticipated excursion test events for numerous Systems Under Test / Programs of Record (SUT / POR).</p> <p><i>FY 2019 Plans:</i> Will continue to support multiple Army test events including NIE / AWA and anticipated excursion test events for numerous SUT / POR currently identified through FY2019.</p> <p><i>FY 2020 Plans:</i> Will continue to support multiple Army test events including NIE / AWA and anticipated excursion test events for numerous SUT / POR currently identified through FY2020.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Minor adjustment in Army requirements.</p>		3.552	1.256	1.429
<p><i>Title:</i> Threat Cyberspace Operations (TCO), formerly named Threat Computer Network Operations Team (TCNOT)</p> <p><i>Description:</i> TCO supports Army/DoD events by maintaining a team of highly qualified, trained, and certified TCO professionals who execute Cyber operations against systems under test. The TCO program was designated a "Threat CNO Team" under Army Regulation (AR) 380-53 and is accredited as a United States Cyber Command (USCYBERCOM) / National Security Agency (NSA) certified "Red Team".</p> <p><i>FY 2019 Plans:</i></p>		5.764	0.565	2.444

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>	Project (Number/Name) 976 / <i>Army Threat Sim (ATS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Funding provides for Contractor subject matter expertise within the Cyber Red Team workforce to support critical threat assessments. Beginning in FY2019, O&M funds will enable Cyber Red Team Department of the Army Civilian (DAC) subject matter expertise to execute this unique threat intelligence based mission (hence the reduction in FY2019 RDTE requirement).</p> <p>FY 2020 Plans: TCO funding provides for Contractor subject matter expertise within the Cyber Red Team workforce to support critical threat assessments.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increased contract support in FY20 for critical threat assessments.</p>				
<p>Title: Threat Cyberspace Operations (TCO) Fidelity Enhancements. formerly named Threat Computer Network Operations (CNO) Fidelity Enhancements</p> <p>Description: Establishes high-fidelity Threat malware and real-world tools, tactics, techniques, and procedures of Threat employment of TCO using commercial Information Technologies (IT) intended to engage complex U.S. operations. Threat packages range from "technological nomads" operating autonomously to state level forces using both active and passive network attack to selectively degrade or disrupt C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) and Enterprise Business Systems.</p> <p>FY 2019 Plans: Program will continue the validation of high-fidelity threat malware and real-world tools, tactics, techniques, and procedures of threat TCO employment using commercial IT technologies intended to engage complex U.S. operations. Will continue to develop state and non-state threat targeting packages that are current, accurately profiling attack trends and timelines, intent, levels of sophistication, and threat training. These threat packages represent state and non-state level forces using both active and passive network attack to selectively degrade or disrupt Army C4ISR and Enterprise Business Systems.</p> <p>FY 2020 Plans: The TCO-FI program will continue the validation of high-fidelity threat malware and real-world tools, tactics, techniques, and procedures of threat TCO employment using commercial IT technologies intended to engage complex U.S. operations. Will continue to develop state and non-state threat targeting packages that are current, accurately profiling attack trends and timelines, intent, levels of sophistication, and threat training. These threat packages represent state and non-state level forces using both active and passive network attack to selectively degrade or disrupt C4ISR and Enterprise Business Systems.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Minor adjustment in Army requirements.</p>		1.402	0.762	0.778
Title: Advanced Jammer Suite (AJS)		3.000	1.979	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>	Project (Number/Name) 976 / <i>Army Threat Sim (ATS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Description: The Advanced Jammer Suite expanded the Army's open air and alternatives for Electronic Attack (EA) in a test environment by using variations of jamming to include direct jamming, open air jamming and GPS jamming. It kept the current jamming Threat as an asset to the Army for use in testing at lower test costs while expanding the Army alternative EA in a test environment by using appropriate jamming techniques for the applied testing environment. This program provided Threat representation for the Army/DoD in the jamming domain, developing new and future jamming threats, to include satellite jamming.</p> <p>FY 2019 Plans: Threat development will include, but is not limited to, techniques such as Frequency Follower Direct Sequence Spread Spectrum (DSSS) threat jamming; Digital Radio Frequency Memory (DRFM) "spoofing," and extended Radio Frequency (RF) range into the Extremely High Frequency (EHF) range.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: End of RDTE efforts for Advanced Jammer Suite in FY19.</p>				
<p>Title: Threat Battle Command Force (TBCF), formerly named Integrated Threat Force (ITF)</p> <p>Description: The Threat Battle Command Force (TBCF) incorporates remote operations via distributed Command and Control (C2) while maintaining valid Threat TTP during Tes & Evaluation (T&E) and training events.</p> <p>FY 2019 Plans: Integrate the Advanced Jammer Suite and additional Threat systems as identified by Threat assessments. Develop parsing tools to increase situational awareness for the Threat operations commander. Increase remote operations capabilities to decrease test costs.</p> <p>FY 2020 Plans: Integrate Advanced Electronic Support Sensor Suite (AESSS) initial capabilities and additional threat systems as identified by threat assessments. Increase on the move command and control capabilities to provide threat representative on the move capabilities to the threat operations commander.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 increase for Threat Battle Command Force (TBCF) for parsing tool development to increase situational awareness for the Threat Operations Commander, increase remote operations capabilities to decrease test costs and integrate the Advanced Electronic Support Sensor Suite (AESSS) capabilities to provide remote C2 capability network of unmanned sensors.</p>		2.237	2.270	2.977
<p>Title: Next Generation Mobile Communication Network Infrastructure Test Range (Next GEN MCNITR)</p> <p>Description: Next Generation MCNITR provides a mobile, scalable closed-loop cellular communications network infrastructure implementing multiple technologies capable of providing a realistic commercial Radio Frequency (RF) signals environment</p>		0.657	1.166	2.003

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>	Project (Number/Name) 976 / <i>Army Threat Sim (ATS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>needed for testing and training of U.S. forces in urban and suburban battle space environments. The Next Generation MCNITR program acquires a capability that simulates real-world RF signals environment and that supports representative Threat force reliance of network enabled devices dependent on advanced cellular technology.</p> <p>FY 2019 Plans: Integrate commercial RF technologies to create a threat faithful communications environment based upon results of the risk reduction phase.</p> <p>FY 2020 Plans: Continue development of 4GLTE IOC through Full Operational Capability (FOC). FOC will create threat representative commercial cellular environments.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 increase will be used to develop the 4GLTE FOC (IOC) baseline interoperable with Threat Battle Command Force creating threat representative commercial cellular environments.</p>				
<p>Title: Advanced Electronic Support Sensor Suite (AESSS)</p> <p>Description: AESSS provides expansion of Army's ability to portray acoustic, seismic, radio frequency, and electro-optical / infrared (EO/IR) sensor capabilities.</p> <p>FY 2019 Plans: Conduct risk reduction phase to decompose Threat requirements into system and sub-system functional requirements.</p> <p>FY 2020 Plans: Develop threat representative unmanned sensor mesh network leveraging lessons learned on prior programs.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 requirement represents expected cost of threat representative unmanned sensor mesh network development.</p>		-	1.859	2.637
<p>Title: Management and oversight of Cyber Blue Team vulnerability assessments</p> <p>Description: In 2016 the Army Acquisition Executive (AAE) designated PM ITTS as the Office of Primary Responsibility for Acquisition Blue Teams, to provide management and execution of relevant Cyber Blue Team assessment capabilities in support of the acquisition and test communities. Cyber Blue Teams refer to the cyber team which works cooperatively with the system owner to ensure programs can defend against attackers and/or Red Teams. These Cyber Blue Team capabilities are essential to enable military operators to assess and defeat the presence of cyber security threats across Army networks. PM ITTS will also serve as the primary point of contact for cyber-related testing and vulnerabilities assessments with U.S. Cyber Command and Army Cyber. This Project executes the establishment and management of certification standards for Acquisition Blue Teams</p>		-	0.925	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>	Project (Number/Name) 976 / <i>Army Threat Sim (ATS)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
and coordination of Blue Team requirements on behalf of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA ALT).			
FY 2019 Plans: This activity will establish and manage certification standards for Cyber Blue Teams in coordination with all Project Managers on behalf of Assistant Secretary of the Army for Acquisition, Logistics, and Technology. It will be the single point of contact with United States Cyber Command (CYBERCOM) for open and closed networks, and will develop and field a central repository for vulnerability assessments.			
FY 2019 to FY 2020 Increase/Decrease Statement: Requirement is transferred to Program Element 0604759A (Major Test & Evaluation Investment) Project FF1 (Cyber Blue Team).			
Title: Advanced Networked Electronic Support Threat Sensors (NESTS) Description: In FY2018, Program began prototype design and implementation to deliver advanced threat Electronic Support (ES) platforms. The Advanced NESTS program aims to increase existing Threat ES capabilities to match U.S. Intelligence Community performance assessments of real-world Threat capabilities.	2.500	-	-
Title: FY19 SBIR/STTR Transfer Description: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)	-	0.590	-
FY 2019 Plans: Accounting for full funding amount.			
FY 2019 to FY 2020 Increase/Decrease Statement: Accounting for full funding amount.			
Accomplishments/Planned Programs Subtotals	22.401	12.822	14.117

	FY 2018	FY 2019
Congressional Add: Congressional Add: Integrated Threat Force FY 2018 Accomplishments: Congressional Add: Integrated Threat Force	9.000	-
Congressional Add: Integrated Threat Force Cyber Threat Simulators FY 2019 Plans: Integrated Threat Force Cyber Threat Simulators	-	6.000
Congressional Add: Threat Cyberspace Operations	-	10.000

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>	Project (Number/Name) 976 / <i>Army Threat Sim (ATS)</i>
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	FY 2018	FY 2019
FY 2019 Plans: Threat Cyberspace Operations		
Congressional Add: Cyber Security Operations Center	-	18.500
FY 2019 Plans: Cyber Security Operations Center		
Congressional Adds Subtotals	9.000	34.500

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>
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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
Total Program Element	-	13.467	32.120	8.327	-	8.327	9.080	8.566	12.441	9.334	Continuing	Continuing
238: <i>Aerial Targets</i>	-	9.616	29.808	6.506	-	6.506	7.554	7.963	9.838	8.206	Continuing	Continuing
459: <i>Ground Targets</i>	-	3.851	2.312	1.821	-	1.821	1.526	0.603	2.603	1.128	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element funds aerial and ground target hardware and software development, maintenance, and upgrades. The overall objective is to ensure validation of weapon system accuracy and reliability by developing aerial and ground targets essential for test and evaluation (T&E). These targets are economical and expendable, remotely controlled or stationary, and often destroyed in use. The Army is the Tri-Service lead under the Secretariat Reliance panel for providing rotary wing, mobile ground, towed, and designated targets for T&E. The Army executes development of some service-peculiar target requirements in support of quality assurance, lot acceptance, and training and continues development of service-peculiar and on-going target materiel upgrades to maintain continuity with current weapons technology and trends in modern and evolving Army weapons.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	13.902	12.135	9.344	-	9.344
Current President's Budget	13.467	32.120	8.327	-	8.327
Total Adjustments	-0.435	19.985	-1.017	-	-1.017
• Congressional General Reductions	-0.009	-0.015			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	20.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.426	-			
• Adjustments to Budget Years	-	-	-1.017	-	-1.017

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 238: *Aerial Targets*

Congressional Add: *Cyber Virtualization Center*

Congressional Add Subtotals for Project: 238

Congressional Add Totals for all Projects

	FY 2018	FY 2019
	-	20.000
Congressional Add Subtotals for Project: 238	-	20.000
Congressional Add Totals for all Projects	-	20.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>	
<u>Change Summary Explanation</u> Fiscal Year (FY) 2019 Congressional Add increase of \$20.000 million is for the Cyber Virtualization Center and will ensure cyber hardening of missile, aviation, and command/control systems at the earliest phases of development as well as throughout the acquisition lifecycle. FY20 decrease of \$1.017 million aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>				Project (Number/Name) 238 / <i>Aerial Targets</i>			
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
238: <i>Aerial Targets</i>	-	9.616	29.808	6.506	-	6.506	7.554	7.963	9.838	8.206	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aerial Targets Project supports Army readiness through development, acquisition, operation and modernization of aerial targets. Multi-spectral Aerial Targets include realistic surrogates, actual high performance threat aircraft, and virtual target computer models. Current and emerging weapons systems require test, evaluation, and training using threat representative aerial targets to assess weapons systems effectiveness in the operational environment. This program encompasses a portfolio of full-scale, miniature, and subscale fixed wing/rotary wing targets, virtual targets, ancillary devices, and associated control systems. For accurate threat portrayal that properly stresses weapons systems during test and evaluation, aerial targets must exhibit the flight characteristics, threat signatures, and other performance factors to represent or emulate relevant and validated threats. This Project funds: the long-range planning necessary to determine future target needs and development of coordinated requirements; the management of target research, development, test and evaluation, production, and modernization; execution of the validation process to ensure that aerial targets accurately represent the threat; as well as storage and repair parts. The Army is the Test Enterprise Reliance lead for Rotary Wing Targets and Towed Target development and the Tri-Service lead for procurement and enhancement of the MQM-107 fixed wing High Speed Aerial Target.

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

	FY 2018	FY 2019	FY 2020
Title: Towed Targets/Ancillary devices.	0.557	0.496	0.325
Description: Continue Engineering & Manufacturing Development (EMD) phase activities for Towed Targets/Ancillary devices.			
FY 2019 Plans: Continues EMD for Towed Targets/Ancillary devices, to include development, enhancement, maintenance, and sustainment for towed targets and ancillary devices as needed. Continued development and testing of Low Cost Towed target systems (Sphere Tow and the Glide Tow Target) emulating current threats at a very low cost to Lower Tier Project Office (LTPO), Indirect Fires Protection Capability (IFPC), United States Army Center for Countermeasures/Office of the Secretary of Defense (CCM/OSD), and classified customers. Signature modification and performance enhancement efforts for these targets is ongoing. Investigates and tests other cost-saving towed systems (Glide-Tow, Cruise Missile Tow Target, Towed Spheres, and Tow Test Bed) for Air Defense Weapons System customers.			
FY 2020 Plans: Continues EMD for Towed Targets/Ancillary devices, to include development, enhancement, maintenance, and sustainment for towed targets and ancillary devices as needed. Continued development and testing of Low Cost Towed target systems (Sphere Tow and the Glide Tow Target) emulating current threats at a very low cost to Lower Tier Project Office (LTPO), Indirect Fires Protection Capability (IFPC), United States Army Center for Countermeasures/Office of the Secretary of Defense (CCM/OSD), and classified customers. Signature modification and performance enhancement efforts for these targets is ongoing. Investigates			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>	Project (Number/Name) 238 / <i>Aerial Targets</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
and tests other cost-saving towed systems (Glide-Tow, Cruise Missile Tow Target, Towed Spheres, and Tow Test Bed) for Air Defense Weapons System customers				
FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.				
Title: Aerial Virtual Targets.		0.755	0.753	0.521
Description: Continue EMD phase activities for Aerial Virtual Targets.				
FY 2019 Plans: Will continue engineering and manufacturing for Aerial Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques; focuses on simulation target models of airplanes, helicopters, missiles, unmanned aerial vehicles, and aerial targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations; will support verification and validation of models, will provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. Simulation target models are employed to facilitate simulations for DT and OT test planning, test rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions. These models will be used by multiple DoD agencies and multiple weapon systems such as, but not limited to CCWS, Unmanned Aerial Systems, and Lower Tier Program offices.				
FY 2020 Plans: Will continue engineering and manufacturing for Aerial Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques; focuses on simulation target models of airplanes, helicopters, missiles, unmanned aerial vehicles, and aerial targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations; will support verification and validation of models, will provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. Simulation target models are employed to facilitate simulations for DT and OT test planning, test rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions. These models will be used by multiple DoD agencies and multiple weapon systems such as, but not limited to CCWS, Unmanned Aerial Systems, and Lower Tier Program offices.				
FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.				
Title: Army Ground Aerial Target Control System (AGATCS).		3.520	3.370	2.407
Description: EMD Phase activities for the AGATCS in support of a modern current technology target control system for control of both aerial and ground targets.				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>	Project (Number/Name) 238 / <i>Aerial Targets</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p><i>FY 2019 Plans:</i> AGATCS engineering and manufacturing to provide remote control of aerial (fixed wing, rotary wing, and simulated unmanned aerial systems (SUAS)), ground (heavy, medium, and light vehicles), and seaborne targets with a single control system in support of live fire testing necessary for lethality evaluation and sensor package testing for evaluation of suitability and effectiveness. Complies with DODI 8510.01 mandate / DOD Risk Management Framework on all target control systems to ensure a secure operating posture. Meets surface target testing requirements to include formation, collision avoidance, and swarming capabilities for U.S. Army test ranges. Provides Test Centers and the T&E community with a versatile seaborne and rotary wing resource for use in conducting tests to include live fire testing, observation, signal repeater and cargo transportation.</p> <p><i>FY 2020 Plans:</i> AGATCS engineering and manufacturing to provide remote control of aerial (fixed wing, rotary wing, and simulated unmanned aerial systems (SUAS)), ground (heavy, medium, and light vehicles), and seaborne targets with a single control system in support of live fire testing necessary for lethality evaluation and sensor package testing for evaluation of suitability and effectiveness. Complies with DODI 8510.01 mandate / DOD Risk Management Framework on all target control systems to ensure a secure operating posture. Meets surface target testing requirements to include formation, collision avoidance, and swarming capabilities for U.S. Army test ranges. Provides Test Centers and the T&E community with a versatile seaborne and rotary wing resource for use in conducting tests to include live fire testing, observation, signal repeater and cargo transportation.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.</p>			
<p><i>Title:</i> Unmanned Aerial System - Target (UAS-T).</p> <p><i>Description:</i> Technical updates and life cycle management activities for the UAS-T to provide Threat representative support for test and experimentation missions.</p> <p><i>FY 2019 Plans:</i> Technical and life cycle management for the UAS-T to operate and maintain a generic, tactical class unmanned aircraft system target to support a variety of test requirements by providing a generic threat representative aerial target to support test and experimentation missions. Projects to be supported include the Space and Missile Defense Command and the Joint Integration Air and Missile Defense Organization live fire testing. This activity will continue to require technical support for investigation, demonstration, and integration of a more economical target, to include technical oversight of the targets' acquisition and ground support equipment.</p> <p><i>FY 2020 Plans:</i></p>	0.361	0.370	0.260

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>	Project (Number/Name) 238 / <i>Aerial Targets</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Technical and life cycle management for the UAS-T to operate and maintain a generic, tactical class unmanned aircraft system target to support a variety of test requirements by providing a generic threat representative aerial target to support test and experimentation missions. Projects to be supported include the Space and Missile Defense Command and the Joint Integration Air and Missile Defense Organization live fire testing. This activity will continue to require technical support for investigation, demonstration, and integration of a more economical target, to include technical oversight of the targets' acquisition and ground support equipment.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.</p> <p>Title: High Speed Aerial Target (HSAT).</p> <p>Description: The U.S Army Targets Management Office provides Aerial Targets to customers for threat realism required by law in Title 10 U.S.C., Section 2366 (Live Fire Test & Evaluation) for the testing of ACAT I/II major munitions, missile programs, or product improvements of these programs. Funds the EMD phase for the replacement of the aging MQM-107 with the new BQM-167A to provide a realistic aerial target capable of simulating the performance of enemy aircraft; technical and life cycle management activities for equipment, to include engineering change proposals, technology obsolescence, and safety and system data documentation for the HSAT Target. Program requires technical support for investigation, demonstration, and integration of a more economical target. Technical oversight of the replacement targets' acquisition along with Ground Support Equipment (GSE) and other activities related to getting it operational is essential; provides a realistic aerial target capable of simulating the performance of enemy aircraft to aid in the research, development, test, and evaluation of weapons systems and aid in training operational units employing production missile systems.</p> <p>FY 2019 Plans: The U.S Army Targets Management Office provides Aerial Targets to customers for threat realism required by law in Title 10 U.S.C., Section 2366 (Live Fire Test & Evaluation) for the testing of ACT I/II major munitions, missile programs, or product improvements of these programs This line is the technical sustainment of all HSATs. This funding covers the engineering, integration, safety, cyber security, technology obsolescence, safety and system data documentation, AWR development, and flight waivers for the entire enterprise, as well as, NRE for software/firmware updates, and minor product upgrades. This includes the MQM-107, MQM-178, BQM-34, and the new BQM-167. These HSATs will continue to support T&E programs such as Patriot, Stinger, IAMD, Sentinel Radar, CMDS and classified programs for Army and Tri-Service customers.</p> <p>FY 2020 Plans: The U.S Army Targets Management Office provides Aerial Targets to customers for threat realism required by law in Title 10 U.S.C., Section 2366 (Live Fire Test & Evaluation) for the testing of ACT I/II major munitions, missile programs, or product</p>		4.423	4.251	2.993

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>	Project (Number/Name) 238 / <i>Aerial Targets</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>improvements of these programs. This line is the technical sustainment of all HSATs. This funding covers the engineering, integration, safety, cyber security, technology obsolescence, safety and system data documentation, AWR development, and flight waivers for the entire enterprise, as well as, NRE for software/firmware updates, and minor product upgrades. This includes the MQM-107, MQM-178, BQM-34, and the new BQM-167. These HSATs will continue to support T&E programs such as Patriot, Stinger, IAMD, Sentinel Radar, CMD5 and classified programs for Army and Tri-Service customers.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.</p>			
<p>Title: FY19 SBIR/STTR Transfer</p> <p>Description: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)</p> <p>FY 2019 Plans: Accounting for full funding amount.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Accounting for full funding amount.</p>	-	0.568	-
Accomplishments/Planned Programs Subtotals	9.616	9.808	6.506

	FY 2018	FY 2019
<p>Congressional Add: Cyber Virtualization Center</p> <p>FY 2019 Plans: Cyber Virtualization Center</p>	-	20.000
Congressional Adds Subtotals	-	20.000

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>	Project (Number/Name) 459 / <i>Ground Targets</i>
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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
459: <i>Ground Targets</i>	-	3.851	2.312	1.821	-	1.821	1.526	0.603	2.603	1.128	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds Army efforts to support test and evaluation (T&E) of advanced weapon systems and supports Army Modernization and Tri-Service readiness by developing ground target surrogates, acquiring foreign equipment, and developing virtual target computer models of ground vehicle targets. These products are required to adequately stress weapon systems undergoing T&E. The U.S. Army is the Tri-Service lead for providing mobile ground targets for T&E. This tasking includes long-range planning to determine future target needs and development of coordinated requirement documents; the centralized management of the ground target research, development, test and evaluation processes; execution of the validation process; acquisition of foreign equipment; and continuing maintenance, storage, and development/enhancement/update via engineering services of developed and acquired targets to ensure availability for T&E customers. This Project also manages use of current assets and operates a centralized spare parts program.

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

	FY 2018	FY 2019	FY 2020
Title: Mobile Ground Target Operations (MGTO)	2.191	0.988	1.029
Description: MGTO provides oversight of five Primary Operating Centers to include operation, storage, maintenance, repair, safety and configuration management.			
FY 2019 Plans: Will maintain a fleet of reusable ground targets emulating relevant, current, and emerging threats which provides cost effective solutions for T&E. Manage a fleet of foreign threat ground vehicles while maintaining the foreign integrity of the assets. Provides support and oversight for actual threat foreign ground vehicles and mobile ground target surrogate vehicles for use as threat targets by the T&E community for destructive and non-destructive scenarios. Efforts will support users such as Apache 64E, JAGM, Javelin, Extended Range Guided Multiple Launch Rocket System, Army Tactical Missile System, Cruise Missile Defense System, Precision Fires, Counter-Rocket Artillery and Missile (C-RAM), Close Combat Weapon Systems and other research, prototyping, and operational users.			
FY 2020 Plans: Will maintain a fleet of reusable ground targets emulating relevant, current, and emerging threats which provides cost effective solutions for T&E. The objective of the MGTO effort is to support the testing community as fully, efficiently and effectively as possible. The MGTO centrally manages a fleet of foreign threat ground vehicles while maintaining the foreign integrity of the assets. The MGTO will provide support and oversight for actual threat foreign ground vehicles and mobile ground target surrogate vehicles for use as threat targets by the T&E community for destructive and non-destructive scenarios. Efforts will support users			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>	Project (Number/Name) 459 / <i>Ground Targets</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
such as, but not limited to Apache 64E, JAGM, Javelin, ER-GMLRS, ATACMS, CMDS, Precision Fires, C-RAM, CCWS and other research, prototyping, and operational users.				
FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.				
Title: Mobile Ground Targets Hardware (MGTH)		0.855	0.682	0.398
Description: MGTH provides a mix of actual threat assets and surrogate targets to support Army T&E events.				
FY 2019 Plans: Will continue to provide ground targets to meet the functionality and signature fidelity requirements of the objective force. Will continue to initiate analysis and design efforts to address specific capability shortfalls and the ability to develop surrogates.				
FY 2020 Plans: Will provide cost effective and highly threat representative surface targets (consisting of actual foreign equipment as well as surrogates) for T&E of multiple Weapon System developers. Will continue to provide surface targets to meet the functionality and signature fidelity requirements of the objective force. Will acquire actual foreign equipment, to include insurgent vehicles, to meet known Weapon System target shortfalls. Will continue to initiate analysis and design efforts to address specific capability shortfalls and the ability to develop threat representative surrogates.				
FY 2019 to FY 2020 Increase/Decrease Statement: FY2020 decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.				
Title: Ground Virtual Targets		0.805	0.376	0.394
Description: Government System T&E to support the research and development of Ground Virtual Targets. Virtual Targets are employed by multiple DoD agencies and weapon systems to facilitate simulations for Developmental and Operational Test planning, rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions.				
FY 2019 Plans: Will support verification and validation of models, and provides archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. Simulation target models will continue to be employed to facilitate simulations for both developmental and operational testing.				
FY 2020 Plans: Will continue engineering and manufacturing for Ground Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques. Will focus on simulation target models of armored assets, air defense systems,				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / <i>Target Systems Development</i>	Project (Number/Name) 459 / <i>Ground Targets</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
small - unmanned aerial systems vehicles, maritime systems and other surface targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations. Will support verification and validation of models and provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. FY 2019 to FY 2020 Increase/Decrease Statement: FY2020 increase reflects inflation rate adjustments.				
Title: FY19 SBIR/STTR Transfer Description: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) FY 2019 Plans: Accounting for full funding amount. FY 2019 to FY 2020 Increase/Decrease Statement: Accounting for full funding amount.		-	0.266	-
Accomplishments/Planned Programs Subtotals		3.851	2.312	1.821
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				
E. Performance Metrics N/A				

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759A / <i>Major T&E Investment</i>
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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
Total Program Element	-	113.516	82.893	136.565	-	136.565	77.953	49.550	67.188	41.242	Continuing	Continuing
983: <i>Reagan Test Site (RTS) T&E Investments</i>	-	6.924	7.303	6.247	-	6.247	6.286	6.573	6.694	8.150	Continuing	Continuing
984: <i>Major Developmental Testing Instrumentation</i>	-	43.601	25.226	34.342	-	34.342	32.072	28.898	36.831	31.977	Continuing	Continuing
986: <i>Major Operational Test Instrumentation</i>	-	15.263	12.829	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
EY9: <i>Range Radar Replacement Program (RRRP)</i>	-	42.928	23.119	94.760	-	94.760	38.540	12.980	21.400	0.000	Continuing	Continuing
FA4: <i>Warrior Injury Assessment Manikin (WIAMan)</i>	-	4.800	14.416	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
FF1: <i>Cyber Blue Team</i>	-	0.000	0.000	1.216	-	1.216	1.055	1.099	2.263	1.115	0.000	6.748

Note
 Project FF1 was previously funded in 0604256A (Threat Simulator Development) Project 976 (Army Threat Sim (ATS)).

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the development and acquisition of major developmental test instrumentation for the United States (U.S.) Army Test and Evaluation Command's (ATEC) test activities: White Sands Test Center (WSTC), New Mexico; Yuma Test Center (YTC), Arizona; Aberdeen Test Center (ATC), Maryland; Electronic Proving Ground (EPG), Arizona; Redstone Test Center (RTC), Alabama; and for the Reagan Test Site (RTS) at the U.S. Army Kwajalein Atoll (USAKA), which is managed by the Space and Missile Defense Command. This PE also funds development and acquisition of Operational Test Command's (OTC) major field instrumentation and, until Fiscal Year (FY) 2020, management of the Cyber Acquisition Blue Teams (CABT) certification standards. Requirements for instrumentation and cyber certifications are identified through a long range survey of project managers, Research Development and Engineering Centers (RDECs), and Battle Laboratories developing future weapon systems and the test programs that support these systems. Army testing facilities are also surveyed to determine major testing capability shortfalls.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604759A / <i>Major T&E Investment</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	102.901	82.996	104.789	-	104.789
Current President's Budget	113.516	82.893	136.565	-	136.565
Total Adjustments	10.615	-0.103	31.776	-	31.776
• Congressional General Reductions	-0.081	-0.103			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	12.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.600	-			
• SBIR/STTR Transfer	-3.904	-			
• Adjustments to Budget Years	-	-	31.776	-	31.776

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 984: *Major Developmental Testing Instrumentation*

Congressional Add: *Congressional Add for Cyber Virtualization Research*

	FY 2018	FY 2019
	12.000	-
Congressional Add Subtotals for Project: 984	12.000	-
Congressional Add Totals for all Projects	12.000	-

Change Summary Explanation

FY18 congressional add (\$12.000 million) for cyber virtualization research.

FY20 Base funding increase (\$31.776 million) to procure seven additional Range Radar Replacement Program (RRRP) systems in Project EY9.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment				Project (Number/Name) 983 / Reagan Test Site (RTS) T&E Investments			
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
983: Reagan Test Site (RTS) T&E Investments	-	6.924	7.303	6.247	-	6.247	6.286	6.573	6.694	8.150	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds improvement and modernization (I&M) for the Ronald Reagan Ballistic Missile Defense Test Site (RTS) instrumentation systems. The Reagan Test Site with its remote location and one of kind instrumentation systems provides a strategic test environment that cannot be replicated. In order to continue its critical mission of testing missile systems that are of paramount importance to the defense of the nation, the RTS instrumentation systems must be continuously updated and upgraded to support the emerging technologies being developed by the DoD such as hypersonics and other advanced weapons systems. Without modernization these instrumentation systems face obsolescence or degraded capability and the inability to provide the critical data needed for continued materiel development. Without instrumentation on par with the technologies being utilized in emerging systems, the materiel developer will be unable to complete their test programs or pass programmatic milestones toward deployment. These funds provide modernization of the radar, telemetry, optics, range safety, communications, command/control and other equipment essential to meet test and evaluation requirements of the Services and Department of Defense (DoD) agencies. The RTS instrumentation is required to support data collection for test & evaluation assessments and operational decisions that have strategic implications for the Army, Navy, Air Force, United States Strategic Command (STRATCOM), Missile Defense Agency (MDA), Defense Advanced Research Projects Agency (DARPA), National Aeronautics and Space Administration (NASA), and other customers. RTS, located in the Republic of the Marshall Islands, is a remote, secure activity of the Major Range and Test Facility Base (MRTFB). Funding will enable RTS to continue to meet customer objectives and sustain the required instrumentation suite.

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

	FY 2018	FY 2019	FY 2020
Title: Radar Open Systems Architecture (ROSA) Refresh	0.900	-	-
Description: The ROSA Refresh plan is to incorporate subsystem technologies into the Ground-Based Radar Prototype (GBR-P), then transition those technologies to the other RTS sensors. Much of the testing and integration lessons will be learned ahead of time, providing a drop-in updated solution for legacy ROSA components at the other radars identified as having long-term sustainability issues. In this approach, the ROSA refresh effort is coupled with the GBR-P modernization leading to a cleaner and more cost-effective program.			
Title: Radar Reliability Improvement Program (RRI).	0.141	0.500	0.085
Description: The Radar Improvement and Sustainment (RIS) activity is an Improvements and Modernizations (I&M) Umbrella Program to push technology into radar systems. RIS is a group of complimentary I&M Projects that mitigate annual Operations and Maintenance (O&M) risks. Projects initiated address the following needs: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring; Fault Detection - Fault Isolation (FD/FI); Enable Remote Operation and Monitoring; and Enhanced Capabilities.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 983 / Reagan Test Site (RTS) T&E Investments

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>FY 2019 Plans: RRI Program continues as an I&M umbrella Program to push technology into the radar systems. RRI projects will address: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring; FD/FI; Enable Remote Operation and Monitoring; and Enhanced Capabilities. For FY19 the TRADEX S-band Bandwidth Enhancements study effort which will address identifying a more capable Klystron with higher power and bandwidth to address a critical SOTR risk, and also to support Hypersonic test requirements will begin. Additional efforts include a technical study to evaluate an updated architecture and technology insertion strategy to replace obsolete subsystems.</p> <p>FY 2020 Plans: RRI Program will continue as an I&M umbrella Program to push technology into the radar systems. RRI projects will address: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring FD/FI; Enable Remote Operation and Monitoring; and Enhanced Capabilities.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease aligns enduring requirements with holistic program assessment of RTS instrumentation needs.</p>			
<p>Title: Telemetry (TM) Modernization Study.</p> <p>Description: This activity will develop the technology required to modernize the telemetry systems using an innovative software defined radio approach designed to vastly improve the ability to adapt to future telemetry changes and requirements quickly with lower cost. In addition, this approach will enable centralized command and control of the telemetry equipment increasing efficiency in mission preparation and execution. The telemetry back-end processing chain is currently comprised of discrete frequency-specific hardware components that are replicated for each telemetry channel required for a test event. This activity will develop a scalable frequency-agnostic, software-based solution that runs on commodity computer servers. More complex missions (e.g., Over-the-air (OTA) operational testing of the Ballistic Missile Defense Systems (BMDS)) will continue to require more telemetry channels, but this activity will avoid much of that future cost. This effort will provide enough hardware to increase capacity of the telemetry system.</p> <p>FY 2019 Plans: Complete purchase of Roi Island modernized TM equipment. Reach Initial Operating Capability for a single telemetry site.</p> <p>FY 2020 Plans: Continuation of Verification and Acceptance (V&A) testing effort focusing on engineering test for the full-up capability and deployment of the modernized telemetry equipment to the other TM sites within RTS range (Kwaj, Illegini, & Gagan Islands).</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>	2.500	2.480	1.732

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 983 / Reagan Test Site (RTS) T&E Investments		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Telemetry (TM) Modernization Study decrease aligns enduring requirements with holistic program assessment of RTS instrumentation needs.				
<p>Title: Legacy Servo Upgrade Program.</p> <p>Description: This activity will design, upgrade, and replace the radar and optics servo systems. The custom-hardware based legacy systems will be replaced with commercially supportable commercial off the shelf (COTS) hardware. Where possible, common components will be used across all range sensors to minimize ongoing maintenance costs.</p> <p>FY 2019 Plans: Assess condition of remaining antenna servo systems and determine highest priority servo replacement need and initiate engineering design activities for the next phase of the program.</p> <p>FY 2020 Plans: Continue assessment of remaining antenna servo systems and determine next highest priority servo replacement need and initiate engineering design activities for the next phase of the program.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Legacy Servo Upgrade Program increase due to inflation.</p>		-	1.183	1.500
<p>Title: Multi-Statics for Radars and Telemetry - Prototype</p> <p>Description: This development will enable all the existing Kiernan Reentry Measurements System (KREMS) radars to be used as illuminators and the RTS telemetry systems to be used as receivers in a multi-static array that will increase the sensitivity of the systems, reduce the need for high power operation in the systems, and in conjunction with the software radio radar project and the solid state transmitter project will allow the radars to be operated at a lower O&M cost.</p> <p>FY 2019 Plans: Continue development of multi-statics for KREMS Radars. Conduct initial proof of concept tests.</p> <p>FY 2020 Plans: Continue the phase two effort designing and implementing a small prototype receive array on site at RTS as a proof of concept for a future target system consisting of larger array and transmitter modernizations.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Multi-Statics for Radars and Telemetry - Prototype increase due to inflation changes</p>		0.283	0.781	0.800
<p>Title: Ground Based Discrimination Radar</p>		3.100	1.600	0.780

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 983 / Reagan Test Site (RTS) T&E Investments

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: The Ground Based Discrimination Radar activity will provide the RTS with an instrumentation-quality, X-band phased array radar to more robustly support customer mission requirements and provide a relatively cost-effective phased array technology test-bed capability. To control costs, the existing GBR-P, provided by the Missile Defense Agency and initially developed as the prototype fire control radar, will be upgraded.</p> <p>FY 2019 Plans: Continue GBR upgrade external systems and infrastructure work. Begin integration of one super-sub-array. Planned initial connection to the RTS classified mission network.</p> <p>FY 2020 Plans: Continue GBR upgrade external systems and infrastructure work.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Ground Based Discrimination Radar decrease aligns enduring requirements with holistic program assessment of RTS instrumentation needs.</p>			
<p>Title: RTS Cyber Threat Assessment and Mitigation</p> <p>Description: Prototype and integrate a sidelobe canceller (to protect against electronic attack and radar jamming) for ALTAIR Ultra High Frequency (UHF) radar that has compatibility with other KREMs.</p> <p>FY 2019 Plans: System design review planned. Begin system development phase with yard antenna placement and integration.</p> <p>FY 2020 Plans: Continue system development phase with yard antenna placement and integration.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase in expected requirement for RTS Cyber Threat Assessment and Mitigation based on holistic program assessment of RTS instrumentation needs.</p>	-	0.491	0.800
<p>Title: RTS Range Enhancements for Hypersonic Vehicle Testing</p> <p>Description: The Range Enhancements for Hypersonic Vehicle Testing program will develop and deploy advanced technologies and a number of infrastructure upgrades specific to hypersonic vehicle testing. These technologies and infrastructure improvements include advanced non-ballistic tracking enhancements, improved data collection, additional waveform support, sensor surrogate capabilities and integration of adjunct sensors to support situational awareness and future tracking enhancements.</p>	-	-	0.550

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 983 / Reagan Test Site (RTS) T&E Investments

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>FY 2020 Plans: In FY20, the program will begin maturing and deploying enhanced tracking algorithms to the RTS sensor suite.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Hypersonic Vehicle Testing is an emerging effort for FY20 that will focus on improving/enhancing tracking algorithms within the RTS sensor suite.</p>			
<p>Title: FY19 SBIR/STTR Transfer</p> <p>Description: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)</p> <p>FY 2019 Plans: Accounting for full funding amount.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Accounting for full funding amount.</p>	-	0.268	-
Accomplishments/Planned Programs Subtotals	6.924	7.303	6.247

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment				Project (Number/Name) 984 / Major Developmental Testing Instrumentation			
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
984: Major Developmental Testing Instrumentation	-	43.601	25.226	34.342	-	34.342	32.072	28.898	36.831	31.977	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project develops and acquires major test instrumentation to perform developmental testing of weapon systems at U. S. Army Test and Evaluation Command's (ATEC) activities which include: Yuma Test Center (YTC), AZ; Aberdeen Test Center (ATC), MD; Electronic Proving Ground (EPG), AZ; White Sands Test Center (WSTC), NM; Redstone Test Center (RTC), AL.

Projects are designated as a major test program based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (greater than \$1.5 Million per year or \$7.5 Million for the total Project) and applicability to other mission areas or services. These Projects are technically demanding, state-of-the-art, unique instrumentation assets or suites to meet the technology shortfalls, and generally result from development programs managed by a professional project management team. FY20 funds will be used for modernization of outdated instrumentation in support of developmental testing for Army, Department of Defense programs.

Electromagnetic Environmental Effects (E3) Electromagnetic Radiation Effects (EMRE) Systems Modernization will upgrade equipment at the White Sands Missile Range (WSMR) EMRE site where E3 testing is performed to evaluate survivability and vulnerability of military systems. This Project will upgrade and replace signal transmitters, refurbish an anechoic test chamber, replace data acquisition equipment and install a new turntable to support test items. Nuclear Effects Test Capabilities Modernization acquires and upgrades Special Test Equipment for nuclear facilities located at WSMR. These acquisitions and upgrades include the Pulse Current Injection Simulator, Prompt Gamma Simulator, Gamma Range Facility, Linear Electron Accelerator (LINAC), Semi-Conductor Test Lab, Electromagnetic Pulse and the Solar Furnace. Common Range Integrated Instrumentation System (CRIIS) Objective Program provides precision location instrumentation which will significantly increase the Test and Evaluation (T&E) ranges' capability to meet the test instrumentation needs of the tri-service range users. Test Network Modernization (TNM) will upgrade existing test data networks to ensure infrastructures are capable of providing reliable and secure transport of data and communications for ATEC test activities. Applied Environments Modernization (AEM) program will upgrade antiquated Environmental labs for climatic and dynamic testing with new cascade refrigeration units, climatic chambers, vibration test systems, x-ray cameras, a real-time radiography system and full spectrum solar lights. Future Wireless Network program (FWN) will procure and integrate wireless network technologies across ATEC test activities which will provide near real-time data collection support for Developmental Test and Operational Test events. Robotics/Unmanned Aerial Systems (UAS) Instrumentation Suite will develop and procure instrumentation for testing controlled and autonomous ground and aerial robotic systems. System of Systems Cooperative Engagement Test Infrastructure (SCETI) will provide for the development of systems to conduct systems-level Manned-Unmanned Teaming (MUM-T) testing for both aircraft and ground systems in a distributed environment.

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

	FY 2018	FY 2019	FY 2020
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Electromagnetic Environmental Effects (E3) Systems Modernization (EMRE) project.	0.741	0.114	6.600

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 984 / Major Developmental Testing Instrumentation

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: EMD phase contract activities for the EMRE project. This effort will upgrade 27 instrumentation test facilities at WSMR.</p> <p>FY 2019 Plans: complete the EMD phase for E3 Systems contract activity.</p> <p>FY 2020 Plans: Will complete acquisition of key components and finish project in FY20. Additional key components include Electromagnetic Interface equipment and Pulsed Ultra Magnetron Discharge equipment needed for electromagnetic instrumentation testing at WSMR.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 testing requirements drove the need for additional Electromagnetic Interference equipment.</p>			
<p>Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Nuclear Effects Test Capability Modernization.</p> <p>Description: EMD phase contract activity for the Nuclear Effects Test Capability Modernization.</p> <p>FY 2019 Plans: Continue the EMD phase contract activity for the Nuclear Effects Test Capability Modernization. Funds acquisition and upgrades of Special Test Equipment for Prompt Gamma Simulator facility.</p> <p>FY 2020 Plans: Will complete the EMD phase and field the Nuclear Effects Test Capabilities Modernization Prompt Gamma Simulator.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increased requirement in order to complete additional upgrades for equipment at facilities.</p>	7.657	5.246	8.775
<p>Title: Engineering and Manufacturing Development (EMD) phase contract activity of the Test Network Modernization Program.</p> <p>Description: EMD phase contract activity for the Test Network Modernization. This program will provide a modern test infrastructure capable of reliable, secure transport of test data and test communications for all ATEC developmental test ranges.</p> <p>FY 2019 Plans: Continue the engineering and manufacturing for the Test Network Modernization. This program will provide a modern test infrastructure capable of reliable, secure transport of test data and test communications for all ATEC developmental test ranges. Funds continue the procurement and install of end of life network hardware for five Test Centers (Aberdeen, Electronic Proving Grounds, Redstone, White Sands, and Yuma), replacing obsolete hardware that no longer meets Authority to Operate (ATO)</p>	11.841	12.085	12.881

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 984 / Major Developmental Testing Instrumentation		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>requirements. Funds will continue standardization of Network Monitoring System across five Test Centers (Aberdeen, Electronic Proving Grounds, Redstone, White Sands, and Yuma) to allow operators the ability to monitor and track network traffic and trouble shoot network failure points.</p> <p>FY 2020 Plans: Will continue the engineering and manufacturing for the Test Network Modernization. This program will provide a modern test infrastructure capable of reliable, secure transport of test data and test communications for all ATEC developmental test ranges. Funds continue the procurement and install of end of life network hardware for five Test Centers (Aberdeen, Electronic Proving Grounds, Redstone, White Sands, and Yuma), replacing obsolete hardware that no longer meets Authority to Operate (ATO) requirements. Funds will continue standardization of Network Monitoring System across five Test Centers (Aberdeen, Electronic Proving Grounds, Redstone, White Sands, and Yuma) to allow operators the ability to monitor and track network traffic and troubleshoot network failure points.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 funding increase for design testing.</p>				
<p>Title: Engineering and Manufacturing Development (EMD) for the Applied Environments Modernization program.</p> <p>Description: EMD phase contract activity for the Applied Environments Modernization program</p> <p>FY 2019 Plans: Continue the EMD phase for the Applied Environments Modernization program. Funds will continue to provide upgrades to antiquated Environmental labs for climatic and dynamic testing with new cascade refrigeration units, climatic chambers, vibration test systems, x-ray cameras, a real-time radiography system and full spectrum solar lights.</p> <p>FY 2020 Plans: Will continue the EMD phase for the Applied Environments Modernization program. Funds will continue to provide upgrades to antiquated Environmental labs for climatic and dynamic testing with new cascade refrigeration units, climatic chambers, vibration test systems, x-ray cameras, a real-time radiography system and full spectrum solar lights.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funds realigned to higher Army test priorities based on detailed, holistic assessment of developmental testing needs.</p>		4.565	3.785	1.036
<p>Title: Engineering and Manufacturing Development (EMD) phase contract activity for System of Systems Controlled Environment Test Infrastructure (SCETI)</p> <p>Description: EMD phase for System of Systems Cooperative Engagement Test Infrastructure (SCETI).</p> <p>FY 2019 Plans:</p>		3.292	2.862	3.312

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 984 / Major Developmental Testing Instrumentation		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Continue EMD phase contract activity for the SCETI program. This program will deliver the modular airborne sensor capability to test avionic sensors in degraded visual environments such as rain, dust, and snow for helicopters. FY 2020 Plans: Will continue EMD phase contract activity for the SCETI program. In FY20, this program will complete Emulation Flight Capability installation and acceptance testing; and the design and acceptance testing of Atmospheric Measurement equipment. FY 2019 to FY 2020 Increase/Decrease Statement: FY20 funding increase for design testing.				
Title: Engineering and Manufacturing Development (EMD) phase contract activity for Robotics/UAS Instrumentation Suite Description: EMD phase of Robotics/Unmanned Autonomous System (UAS) Instrumentation Suite for testing controlled and autonomous ground and aerial robotic systems. FY 2020 Plans: Continue market research and acquisition strategy refinement. FY 2019 to FY 2020 Increase/Decrease Statement: Project continuing in FY20 after skip year..		1.121	-	1.738
Title: Engineering and Manufacturing Development (EMD) phase contract activity of the Common Range Integrated Instrumentation System (CRIIS) Objective Program. Description: EMD phase contract activities of the CRIIS Objective Program. This is a replacement system for the Advanced Range Data System (ARDS). This system will meet the critical need for measuring the precision location of units under test within the Time-Space domain. It provides a significant increase to the Test & Evaluation ranges' capability to meet the test instrumentation needs of the tri-service range users. The improvements are the data link, TSPI accuracy, miniaturization, standard interfaces, and system encryption of high dynamic instrumentation tracking pods. CRIIS instrumentation upgrades will be delivered to WSMR.		2.384	-	-
Title: FY19 SBIR/STTR Transfer FY 2019 Plans: Accounting for full funding amount. FY 2019 to FY 2020 Increase/Decrease Statement: Accounting for full funding amount.		-	1.134	-
Accomplishments/Planned Programs Subtotals		31.601	25.226	34.342

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 984 / Major Developmental Testing Instrumentation

	FY 2018	FY 2019
Congressional Add: Congressional Add for Cyber Virtualization Research	12.000	-
FY 2018 Accomplishments: Congressional Add for Cyber Virtualization Research		
Congressional Adds Subtotals	12.000	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment				Project (Number/Name) 986 / Major Operational Test Instrumentation			
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
986: Major Operational Test Instrumentation	-	15.263	12.829	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the development, acquisition, and integration of major operational test instrumentation for the U.S. Army Test and Evaluation Command's Operational Test Command and supporting test activities at test and training ranges. Requirements for instrumentation are identified through a long range survey of project managers, Research Development and Engineering Centers (RDECs), and Battle Laboratories developing future weapon systems and the test programs that support these systems. Project focus is to address Director Operational Test and Evaluation (DOT&E)-identified Army test realism shortfalls.

Projects are designated as a major test program based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (greater than \$1.5 million per year or \$7.5 million for the total project) and applicability to other mission areas or services. These projects are technically demanding, state-of-the-art, unique instrumentation assets or suites to meet the technology shortfalls, and generally result from development programs managed by a professional project management team.

The DOT&E annual report to Congress identified shortfalls in the Army's abilities to create realistic operational environments. The Integrated Live-Virtual-Constructive (LVC) Test Environment (ILTE) project will address multiple shortfalls identified by DOT&E. ILTE is a portfolio of related development efforts that will deliver a system of systems to provide a Real-Time Casualty Assessment (RTCA) and instrumentation suite that delivers a high fidelity, realistic, real-time capability to measure hardware and personnel performance in modern combat environments. ILTE will enable testing under tactical conditions for small and large-scale operations while integrating network operations and effects in support of the Army Equipment Modernization Plan. ILTE also allows the U.S. Army to test all Current-to-Future weapon systems in a realistic operational environment. ILTE will transition Research, Development, Test and Evaluation (RDTE) developed performance enhancements and technology upgrades to the operational test command, control, and communications, communications network, weapons system interfaces, vehicle and dismounted-troop kits and peripherals, Global Positioning System (GPS), encryption components, and integrate operational realistic digital battlefield data collection and analysis tools. These tools will collect, store and analyze data from the digital battlefield. Improvements will enable the ILTE system of systems to measure and record accrued damage, levels of exposure, effects of countermeasures, evasive action, and instrument threat vehicles. This capability is required by the operational test community to integrate digital battlefield data collection and analysis tools into the Network Integration Evaluations (NIEs), M1A2 Abrams, M2A4 Bradley, Stryker, Armored Multi-Purpose Vehicle (AMPV), Apache AH-64E, Gray Eagle and other operational tests.

Fiscal Year (FY) 2019 funds remaining for obligation in FY20 will be used to complete Block 1 of the Follow-On Operational Test and Evaluation (FOT&E) in support of PM Apache, Joint Light Tactical Vehicle (JLTV) and Rifleman Radio. In FY20 operational test instrumentation funding is strategically realigned to Army modernization in support of the National Defense Strategy.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 986 / Major Operational Test Instrumentation		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Title: Integrated Live-Virtual-Constructive (LVC) Test Environment (ILTE) - formerly "Real-Time Casualty Assessment (RTCA)"</p> <p>Description: Complete Block 1 of the Engineering, Manufacturing, and Development (EMD) Phase and acquisition of ILTE capabilities required to conduct Operational Tests.</p> <p>FY 2019 Plans: ILTE completing Block I. Project will provide capabilities in direct support of Operational Test of the AH-64E, JLTV, and AMPV. Will continue to fund the development of hardware, software, interfaces, and new capabilities to ensure RTCA / ILTE requirements for upcoming operational tests are satisfied. Will fund integration of improved representation of unmanned aerial system in operational test environments. Will continue to develop capability to provide a realistic operational test environment. Funds will continue to be allocated for RTCA instrumentation and simulation systems to be used to support Force-on-Force Operational Tests which support a more comprehensive operational test infrastructure. New development efforts will include integration of classified and unclassified simulations into a common environment. Continued development efforts include: integration with new tactical systems under test; integration with Live, Virtual, and Constructive simulation environments; RTCA capabilities for active protection systems and countermeasures; RTCA capabilities for communications/sensor kills and degradations; development, integration, and testing of mission command effects and degradations; communications upgrade; new communications sub-systems; new encryption and RTCA capabilities for electronic warfare and countermeasures.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding levels are designed to align program requirements with Army Modernization Priorities in support of the National Defense Strategy.</p>		15.263	12.149	-
<p>Title: FY SBIR/STTR Transfer</p> <p>Description: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)</p> <p>FY 2019 Plans: Accounting for full funding amount.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Accounting for full funding amount.</p>		-	0.680	-
Accomplishments/Planned Programs Subtotals		15.263	12.829	-
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 986 / Major Operational Test Instrumentation

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment				Project (Number/Name) EY9 / Range Radar Replacement Program (RRRP)			
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
EY9: Range Radar Replacement Program (RRRP)	-	42.928	23.119	94.760	-	94.760	38.540	12.980	21.400	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In order to effect strategic overmatch on current and future battlefields, it is essential that the United States (U.S.) Army provide advanced radar system instrumentation for developmental testing. Since existing range radar instrumentation is aged beyond useful life and cannot adequately support emerging test requirements in areas such as hypersonics, the Range Radar Replacement Program (RRRP) develops modern instrumentation radars to replace obsolete tracking and surveillance radars at U.S. Army Test and Evaluation Command's Developmental Test Command (DTC) activities, which include: Aberdeen Test Center (ATC), MD; Redstone Test Center (RTC), AL; White Sands Test Center (WSTC), NM; and Yuma Test Center (YTC), AZ. The acquisition of modern instrumentation radar systems will provide the Army with critical testing data essential for the development of next generation technology and advanced system capabilities. The RRRP provides the test centers with improved radar resolution, sensitivity, accuracy, clutter suppression, and reliability. The planned solution to meet program requirements consists of four primary items: Long Range Single Object Tracking Radars (SOTR), Long Range Multiple Object Tracking Radars (MOTR), Medium Range Radars (MRR), and Short Range Radars (SRR). The resulting systems will not only reduce operation and sustainment costs for the ranges, but improve data collection, thus enhancing development of Army systems being tested at these ranges. The current fleet of instrumentation radars located at ATC, RTC, WSTC, and YTC has become antiquated to the extent that they are not able to support the test needs of the test centers.

This Project will procure commercial off-the-shelf (COTS) and/or modified commercial off-the-shelf (MOTS) radars for both the MRR and SRR solutions, and a combination of recapitalization and COTS/MOTS replacement for the FPS-16 Long Range Radars (LRR). Also, the program will conduct Engineering and Manufacturing Development (EMD) for upgrading three MPS-39 Long Range MOTRs.

The Fiscal Year (FY) 2020 request of \$94.760 million continues procurement of MRRs and LRRs and provides acceptance testing of Medium, Long, and MPS-39 MOTR radars. The significant increase in requested program funding from FY 2019 to FY 2020 procures seven additional radars, accelerating the program by one year. This strategic acceleration aligns RRRP with developmental testing requirements emerging from Army Modernization efforts in support of the National Defense Strategy.

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

	FY 2018	FY 2019	FY 2020
Title: Engineering and Manufacturing Development (EMD) Phase Contract Activity	42.928	22.272	94.760
Description: EMD phase contract activities for RRRP are designed to provide advanced radar instrumentation suites that meet emerging requirements for developmental testing.			
FY 2019 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) EY9 / Range Radar Replacement Program (RRRP)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Procure COTS SRRs and deliver recapitalized FPS-16 LRRs and COTS MRRs to YTC and WSTC. Will support and conduct factory acceptance and site acceptance testing with vendors and ATEC ranges. Will continue EMD for the MPS-39 Long Range MOTRs.</p> <p>FY 2020 Plans: Will continue procurement of MRRs and LRRs. Will continue EMD and initial acceptance testing of MPR-39 MOTR and LRRs. Will continue delivery and acceptance testing of MRRs with vendors and ATEC ranges. This effort's funding will be executed by the RRRP program. FY20 funding procures seven additional radars and accelerates the program by one year. This acceleration is designed to align program requirements with Army Modernization Priorities in support of the National Defense Strategy.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase in funding from FY 2019 to FY 2020 procures seven additional radars and accelerates the program by one year. This acceleration is designed to align program requirements with Army Modernization Priorities in support of the National Defense Strategy.</p>			
<p>Title: FY19 SBIR/STTR Transfer</p> <p>Description: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)</p> <p>FY 2019 Plans: Accounting for full funding amount.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Accounting for full funding amount.</p>	-	0.847	-
Accomplishments/Planned Programs Subtotals	42.928	23.119	94.760

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment				Project (Number/Name) FA4 / Warrior Injury Assessment Manikin (WIAMan)			
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
FA4: <i>Warrior Injury Assessment Manikin (WIAMan)</i>	-	4.800	14.416	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD) Project will develop and produce Warrior-representative ATDs that incorporate realistic, biomechanically-validated injury features and assessment tools to better characterize dynamic events and injury risks measured in Live Fire Test & Evaluation (LFT&E) and vehicle development efforts. This capability is comprised of an ATD system built for the Title 10 LFT&E environment and associated biomechanics data and analysis tools. The current manikins do not represent the modern Warrior and were not designed for the vertical acceleration environment associated with underbody blast (UBB) events. Consequently, current LFT&E crew survivability assessment devices are limited in their ability to predict the types and severity of injuries seen in these events. Due to this technology gap, military ground vehicles are being fielded without fully defined levels of injury risk and crew survivability for Under Body Blast (UBB) events. The device produced by this Project will be used to satisfy a critical need for scientifically valid capability for analyzing the risk of injury caused by UBB.

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

	FY 2018	FY 2019	FY 2020
<p>Title: Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD)</p> <p>Description: The Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD) project will provide the Army Test and Evaluation Command and Army Research Laboratory with a Warrior-representative blast test manikin and data acquisition system to assess the risk of injury during underbody blast testing of military ground vehicles.</p> <p>FY 2019 Plans: FY19 funding continues to cover costs associated with testing, engineering, procurement, and delivery of the first ten (10) ATDs, calibration and certification equipment, and verification and validation testing.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: WIAMan has funding in FY19 to deliver ten devices. Funding in FY20 aligns program requirements with Army modernization priorities in support of the National Defense Strategy.</p>	4.800	13.665	-
<p>Title: FY19 SBIR/STTR Transfer</p> <p>Description: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)</p> <p>FY 2019 Plans:</p>	-	0.751	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) FA4 / Warrior Injury Assessment Manikin (WIAMan)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Accounting for full funding amount.				
FY 2019 to FY 2020 Increase/Decrease Statement:				
Accounting for full funding amount.				
Accomplishments/Planned Programs Subtotals		4.800	14.416	-
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
Biomechanical research supporting WIAMan is funded by the Defense Health Agency (DHA), Program Element PE 0603115DHA/Medical Technology Development Project 431A / Underbody Blast Testing (Army).				
D. Acquisition Strategy				
Technology transfer from Research and Development Command (RDECOM). Contract for the Anthropomorphic Test Devices (ATDs) with industry leveraging the technology data package provided by RDECOM.				
E. Performance Metrics				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment				Project (Number/Name) FF1 / Cyber Blue Team			
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
FF1: <i>Cyber Blue Team</i>	-	0.000	0.000	1.216	-	1.216	1.055	1.099	2.263	1.115	0.000	6.748
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This effort was previously funded in PE 0604256A (Threat Simulator Development) / Project 976 (Army Threat Sim (ATS)).

A. Mission Description and Budget Item Justification

In 2016 the Army Acquisition Executive (AAE) designated the Program Manager for Instrumentation, Target and Threat Simulators (PM ITTS) as the Office of Primary Responsibility for Acquisition Blue Teams, to provide management and execution of relevant Cyber Blue Team assessment capabilities in support of the acquisition and test communities. Cyber Blue Teams refer to the cyber team which works cooperatively with the system owner to ensure programs can defend against attackers and/or Red Teams. These Cyber Blue Team capabilities are essential to enable military operators to assess and defeat the presence of cyber security threats across Army networks. PM ITTS will also serve as the primary point of contact for cyber-related testing and vulnerabilities assessments with U.S. Cyber Command and Army Cyber. This Project executes the establishment and management of certification standards for Acquisition Blue Teams and coordination of Blue Team requirements on behalf of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA ALT).

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

	FY 2018	FY 2019	FY 2020
Title: Cyber Blue Teams	-	-	1.216
Description: Management and oversight of Cyber Blue Team vulnerability assessments.			
FY 2020 Plans: FY20 funding will develop a central repository for vulnerability assessments. Will continue to manage certification standards for Cyber Blue Teams in coordination with all Project Managers on behalf of Assistant Secretary of the Army for Acquisition, Logistics, and Technology. The Cyber Blue Teams standards office will be the single point of contact with United States Cyber Command (CYBERCOM) for open and closed networks.			
FY 2019 to FY 2020 Increase/Decrease Statement: Prior year FY 2019 funds were programmed in PE 0604256A at \$0.925 million. FY 2020 increase for development of central repository.			
Accomplishments/Planned Programs Subtotals	-	-	1.216

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

N/A

Remarks

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) FF1 / Cyber Blue Team
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D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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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 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0605103A / Rand Arroyo Center
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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
Total Program Element	-	19.336	19.796	13.113	-	13.113	13.494	14.106	14.526	14.953	0.000	109.324
732: Arroyo Center Spt	-	19.336	19.796	13.113	-	13.113	13.494	14.106	14.526	14.953	0.000	109.324

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the RAND Arroyo Center, the Department of the Army's Federally Funded Research and Development Center (FFRDC) for studies and analysis. The Arroyo Center draws researchers from RAND's staff of nearly 700 professionals trained in a broad range of disciplines. Most staff members work in RAND's principal locations: Santa Monica, California; Arlington, Virginia; and Pittsburgh, Pennsylvania. The RAND Arroyo Center provides for continuing analytical research across a broad spectrum of issues and concerns, grouped in four major research areas: Strategy, Doctrine, and Resources; Military Logistics; Manpower and Training; and Force Development and Technology. The RAND Arroyo Center research agenda is primarily focused on mid/long-term concerns. Results and analytical findings directly affect senior leadership deliberations on major issues. Arroyo Center research is sponsored by the Chief of Staff, Vice Chief, and Deputy Chiefs of Staff of the Army; the Army Assistant Secretaries; and Army major commands. The Arroyo Center receives Army guidance through the Arroyo Center Policy Committee (ACPC), which is co-chaired by the Vice Chief of Staff of the Army and the Assistant Secretary of the Army (Acquisition, Logistics and Technology). The ACPC reviews, monitors, and approves the annual Arroyo Center research plan. Each research project is sponsored by a General Officer (or Senior Executive Service (SES) equivalent) who is continually involved in research evaluation and feedback. RAND Arroyo provides the Army with a unique multidisciplinary capability for independent analysis.

B. Program Change Summary (\$ in Millions)

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	20.140	19.821	19.913	-	19.913
Current President's Budget	19.336	19.796	13.113	-	13.113
Total Adjustments	-0.804	-0.025	-6.800	-	-6.800
• Congressional General Reductions	-0.016	-0.025			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.788	-			
• Adjustments to Budget Years	-	-	-6.800	-	-6.800

Change Summary Explanation

Fiscal Year (FY) 2020 decrease of \$6.800 Million aligns program requirements with Army modernization priorities in support of the National Defense Strategy.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605103A / <i>Rand Arroyo Center</i>				Project (Number/Name) 732 / <i>Arroyo Center Spt</i>			
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
732: <i>Arroyo Center Spt</i>	-	19.336	19.796	13.113	-	13.113	13.494	14.106	14.526	14.953	0.000	109.324
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the RAND Arroyo Center, the Department of the Army's Federally Funded Research and Development Center (FFRDC) for studies and analysis. The Arroyo Center draws researchers from RAND's staff of nearly 700 professionals trained in a broad range of disciplines. Most staff members work in RAND's principal locations: Santa Monica, California; Arlington, Virginia; and Pittsburgh, Pennsylvania. The RAND Arroyo Center provides for continuing analytical research across a broad spectrum of issues and concerns, grouped in four major research areas: Strategy, Doctrine, and Resources; Military Logistics; Manpower and Training; and Force Development and Technology. The RAND Arroyo Center research agenda is primarily focused on mid/long-term concerns. Results and analytical findings directly affect senior leadership deliberations on major issues. Arroyo Center research is sponsored by the Chief of Staff, Vice Chief, and Deputy Chiefs of Staff of the Army; the Army Assistant Secretaries; and Army major commands. The Arroyo Center receives Army guidance through the Arroyo Center Policy Committee (ACPC), which is co-chaired by the Vice Chief of Staff of the Army and the Assistant Secretary of the Army (Acquisition, Logistics and Technology). The ACPC reviews, monitors, and approves the annual Arroyo Center research plan. Each research project is sponsored by a General Officer (or Senior Executive Service (SES) equivalent) who is continually involved in research evaluation and feedback. RAND Arroyo provides the Army with a unique multidisciplinary capability for independent analysis.

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

	FY 2018	FY 2019	FY 2020
Title: Research addressing manpower and training Description: Addresses key issues for the Army, including recruiting and personnel fill requirements; reserve component readiness; leader development; training (major combat operations and stability operations skills); distance learning, simulation training development and application; training support systems; retention (active command/reserve command); officer career fields, selection, assignment sequencing; and medical forces and operations.	4.890	-	-
Title: Research addressing force development and technology Description: Addresses key issues for the Army, including systems and technology analysis; networks and Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR); modeling and simulation; force and organizational development; acquisition policies; and assessment of tactics, techniques, and procedures.	4.780	-	-
Title: Research addressing Army logistics Description: Addresses key issues for the Army, including supply chain management; fleet management and modernization; logistics force development; and infrastructure management.	4.243	-	-
Title: Research addressing strategies, doctrine, and resources	4.187	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605103A / <i>Rand Arroyo Center</i>	Project (Number/Name) 732 / <i>Arroyo Center Spt</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Description: Addresses key issues for the Army, including the evolving operating environment; capabilities to face new challenges; partner capabilities; capabilities for stability operations; improvement of resource management; learning from past and present operations; and supporting Army wargames and analysis.</p> <p>Title: Research addressing military health</p>		1.236	-	-
<p>Description: Addresses key issues for the Army, including the impact of deployment on soldiers and families; quality of Army health care; medical manpower requirements; medical readiness of soldiers and programs; and implications of advances in medical technology.</p> <p>Title: Research addressing personnel, training, and health</p>		-	4.341	2.872
<p>Description: Addresses key issues for the Army including: total workforce management; recruiting and retention; leader development; training, readiness and effectiveness; Soldier and family wellness and support.</p> <p>FY 2019 Plans: The Planned Study program covers key issues for the Army including: total workforce management; recruiting and retention; leader development; training readiness and effectiveness; Soldier and family wellness and support. Each research project is sponsored by a General Officer (or Senior Executive Service (SES) equivalent) who validates the need for the project and directly participates in research evaluation and iterative feedback. Project results are briefed to Army senior leaders to ensure recommendations are available for immediate consideration.</p> <p>FY 2020 Plans: The Planned Study program will cover key issues for the Army including: total workforce management; recruiting and retention; leader development; training readiness and effectiveness; Soldier and family wellness and support. Each research project will be sponsored by a General Officer (or Senior Executive Service (SES) equivalent) who validates the need for the project and directly participates in research evaluation and iterative feedback. Project results will be briefed to Army senior leaders to ensure recommendations are available for immediate consideration.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease aligns with Army's projected need for RAND Studies and Analyses in Fiscal Year (FY) 2020.</p>				
<p>Title: Research addressing forces and logistics</p> <p>Description: Addresses key issues for the Army, including systems and technology analysis; networks and Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR); acquisition policy; force and organizational development; assessment of tactics, techniques, and procedures; supply chain management; fleet maintenance, management and modernization; and tactical, operational, and strategic logistic support</p>		-	5.700	4.267

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605103A / <i>Rand Arroyo Center</i>	Project (Number/Name) 732 / <i>Arroyo Center Spt</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p><i>FY 2019 Plans:</i> The Planned Study Program in forces and logistics will include key issues for the Army such as systems and technology analysis; networks and C4ISR; acquisition policy; force and organizational development; assessment of tactics, techniques, and procedures; supply chain management; fleet maintenance, management and modernization; and tactical, operational, and strategic logistic support.</p> <p><i>FY 2020 Plans:</i> The Planned Study Program in forces and logistics will include key issues for the Army such as systems and technology analysis; networks and C4ISR; acquisition policy; force and organizational development; assessment of tactics, techniques, and procedures; supply chain management; fleet maintenance, management and modernization; and tactical, operational, and strategic logistic support.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Decrease aligns with Army's projected need for RAND Studies and Analyses in FY20.</p>			
<p><i>Title:</i> Research addressing strategy, doctrine, and resources</p> <p><i>Description:</i> Addresses key issues for the Army including: current and potential threats to national interests and U.S. forces; operating environments and their implications for the Army; doctrine and operational concepts for addressing threats; operating and generating force size, scope, and mix to meet demand; building partner capabilities; learning from past and present operations; strategic risk analysis and resource policy; and Army wargames and related analyses.</p> <p><i>FY 2019 Plans:</i> The Planned Study Program in strategy, doctrine, and resources includes: current and potential threats to national interests and U.S. forces; operating environments and their implications for the Army; doctrine and operational concepts for addressing threats; operating and generating force size, scope, and mix to meet demand; building partner capabilities; learning from past and present operations; strategic risk analysis and resource policy; and Army wargames and related analyses. As with other study areas, each research project is sponsored by a General Officer (or Senior Executive Service (SES) equivalent) who validates the project need and scope and directly participates in research evaluation and iterative feedback. Project results are briefed to Army senior leaders to ensure recommendations are available for immediate consideration.</p> <p><i>FY 2020 Plans:</i> The Planned Study Program in strategy, doctrine, and resources will include current and potential threats to national interests and U.S. forces; operating environments and their implications for the Army; doctrine and operational concepts for addressing threats; operating and generating force size, scope, and mix to meet demand; building partner capabilities; learning from past and present operations; strategic risk analysis and resource policy; and Army wargames and related analyses.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i></p>	-	9.030	5.974

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605103A / <i>Rand Arroyo Center</i>	Project (Number/Name) 732 / <i>Arroyo Center Spt</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Decrease aligns with Army's projected need for RAND Studies and Analyses in FY20.			
Title: FY19 SBIR/STTR Adjustment	-	0.725	-
FY 2019 Plans: FY19 SBIR/STTR Adjustment			
FY 2019 to FY 2020 Increase/Decrease Statement: FY19 SBIR/STTR Adjustment			
Accomplishments/Planned Programs Subtotals	19.336	19.796	13.113

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605301A / <i>Army Kwajalein Atoll</i>
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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
Total Program Element	-	234.010	246.275	238.691	-	238.691	234.760	235.612	240.836	243.649	0.000	1,673.833
DW7: <i>Army Kwajalein Atoll Facilities Sustainment</i>	-	32.501	44.611	45.255	-	45.255	47.195	49.283	51.397	53.551	0.000	323.793
DW8: <i>Army Kwajalein Atoll Installation Services</i>	-	129.731	124.812	124.738	-	124.738	126.810	127.695	129.846	129.905	0.000	893.537
DW9: <i>Army Kwajalein Atoll Restoration And Modernization</i>	-	61.311	66.189	57.887	-	57.887	49.359	47.040	47.968	48.448	0.000	378.202
DX2: <i>Army Kwajalein Test Ranges and Mission Support</i>	-	10.467	10.663	10.811	-	10.811	11.396	11.594	11.625	11.745	0.000	78.301

A. Mission Description and Budget Item Justification

This Program Element (PE) is unique in the Research, Development, Test & Evaluation (RDTE) portfolio due to the comprehensive scope of RDTE funding at United States (U.S.) Army Garrison Kwajalein Atoll, directly supporting eleven leased islands with radars, telemetry, and optics in support of continuous New Foreign Launch surveillance, space surveillance, space object identification, offensive and defensive strategic ballistic and interceptor missile testing. In addition, responsibilities include provision of the totality of the logistics and municipal services required to maintain a strategically vital mission support infrastructure in a remote Pacific island chain 2,300 miles southwest of Hawaii. Kwajalein's flexible electromagnetic frequency spectrum, equatorial locale, deep water, and unmatched instrumentation make the nation's space and missile operations possible. In addition, the Ronald Reagan Ballistic Missile Defense Test Site (RTS) on Kwajalein is the Department of Defense's (DoD) only land-impact missile testing site, providing an increasingly vital Test & Evaluation (T&E) capability.

The U.S. Army Kwajalein Atoll / Ronald Reagan Ballistic Missile Defense Test Site (USAKA/RTS), located in the Republic of the Marshall Islands, is a remote, secure activity of the Major Range and Test Facility Base (MRTFB). USAKA/RTS supports test and evaluation of major Army and DoD missile and space acquisition programs and provides New Foreign Launch surveillance and space operations (surveillance and object identification) in support of U.S. Strategic Command (USSTRATCOM), the U.S. Air Force, and National Aeronautics and Space Administration (NASA) scientific and space programs. USAG-KA provides Base Operations (BOS), Infrastructure and Services (Projects DW7, DW8, and DW9) support to the USAKA/RTS mission and other resident Programs (i.e. Army missile defense, Air Force & Navy Intercontinental Ballistic Missile (ICBM) developmental and operational tests; Army, Air Force, Navy and Defense Advanced Research Projects Agency (DARPA) hypersonic developmental tests; Air Force Space Fence, Missile Defense Agency (MDA) operational /demonstration/ validation tests; USSTRATCOM space situational awareness requirements (including contributions to the U.S. Space Surveillance Network); and space experiments). Base Operations Services at Kwajalein Atoll are conducted predominantly through a contracted workforce with governmental oversight. These PE-funded contracts provide: installation/base operations and maintenance for all facilities, logistics, and security; power generation fuel supporting the installation and radars; transportation; and mission essential bandwidth via a fiber optic cable system.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605301A / <i>Army Kwajalein Atoll</i>
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The Network Enterprise Technology Command (NETCOM) utilizes Project DX2 to provide civilian pay, manpower service contracts, supporting Information Technology (IT), equipment, and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Information Technology Services Management at Army Kwajalein Test Ranges. This Project provides C4IM services in accordance with the Department of Army Pamphlet (DA PAM) PAM 25-1-1 and the Army C4IM Services List.

B. Program Change Summary (\$ in Millions)	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>
Previous President's Budget	246.663	246.574	243.535	-	243.535
Current President's Budget	234.010	246.275	238.691	-	238.691
Total Adjustments	-12.653	-0.299	-4.844	-	-4.844
• Congressional General Reductions	-0.196	-0.299			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.000	-			
• SBIR/STTR Transfer	-9.457	-			
• Adjustments to Budget Years	-	-	-4.844	-	-4.844

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll				Project (Number/Name) DW7 / Army Kwajalein Atoll Facilities Sustainment			
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
DW7: Army Kwajalein Atoll Facilities Sustainment	-	32.501	44.611	45.255	-	45.255	47.195	49.283	51.397	53.551	0.000	323.793
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides resources for preventive maintenance and repair necessary to sustain 1,477 facilities on Kwajalein, Roi-Namur, and nine other leased islands, totaling 2.6 million square feet. Funds are focused toward keeping facilities in good working order in accordance with industry standards. This includes emergency response and service calls, minor repair and major repair or replacement resulting from Kwajalein's particularly harsh climate, including strong winds, saltwater corrosion, and sustained torrential rainfall. Funds also provide manpower necessary to achieve, evaluate, and sustain compliance with appropriate Federal, State, and local environmental laws, Executive Orders, Department of Defense (DoD) Directives, regulations, and overseas country-specific Final Governing Standards.

Fiscal Year (FY) 2020 funds continue an aggressive preventive maintenance plan and provide for minor and major Real Property repairs identified during prior year inspections.

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

	FY 2018	FY 2019	FY 2020
<p>Title: Army Family Housing (AFH) Maintenance</p> <p>Description: Provided the operations to support a Family Housing (FH) inventory consisting of 372 units, Billeting consisting of 147 transient rooms, and Unaccompanied Personnel Housing dormitory inventory consisting of 692 units.</p> <p>FY 2019 Plans: Continue to perform change of occupancy maintenance which includes deep cleaning, small interior repairs and interior painting to make the housing habitable and ready for occupancy. Perform spalling repairs on aged housing masonry. Repair interior ceilings of the ?stick construction? homes to prevent further deterioration and prevent mold.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Resources were moved to the Army Family Housing appropriation per legal guidance. As a result, there are no FY20 requirements.</p>	2.413	2.462	-
<p>Title: Real Property Maintenance</p> <p>Description: This effort provides the preventive maintenance and repair necessary to sustain Kwajalein facilities and utilities in order to prevent further deterioration. Funds facilities and utilities at minimum acceptable levels to mitigate risk of catastrophic failures. Includes regularly scheduled adjustments and inspections, preventive maintenance tasks, and emergency response and service calls for minor repairs. Also includes costs of major repairs or replacement of facility components that are expected to</p>	29.973	40.396	45.138

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW7 / Army Kwajalein Atoll Facilities Sustainment		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>occur periodically throughout the expected service life. This work includes: regular roof replacement; refinishing wall surfaces; repairing and replacing electrical, plumbing, and cooling systems; replacing tile and carpeting; and similar types of work. Sustainment, however, is not intended to keep facilities adequately functioning beyond their expected service lives.</p> <p>FY 2019 Plans: Continuing to service 1,477 facilities on Kwajalein, Roi-Namur, and the nine other leased islands, totaling 2.6 Million square feet. Continuing an aggressive maintenance plan based on the significant corrosive environment; prepare maintenance plans and schedules for recurring or preventive maintenance; perform periodic pre-maintenance inspections; perform preventive and corrective maintenance; report the need for major repair, replacement, or rehabilitation; prepare records of maintenance actions performed and deficiencies discovered; and perform post-maintenance inspections.</p> <p>FY 2020 Plans: Will continue to service 1,477 facilities on Kwajalein, Roi-Namur, and the nine other leased islands, totaling 2.6 Million square feet. Will continue an aggressive maintenance plan based on the significant corrosive environment; prepare maintenance plans and schedules for recurring or preventive maintenance; perform periodic pre-maintenance inspections; perform preventive and corrective maintenance; report the need for major repair, replacement, or rehabilitation; prepare records of maintenance actions performed and deficiencies discovered; and perform post-maintenance inspections.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to higher projected costs of baseline services.</p>				
<p>Title: Environmental Quality</p> <p>Description: This effort provides manpower necessary to achieve, evaluate, and sustain compliance with appropriate Federal, State, and local environmental laws, Executive Orders, DoD Directives, regulations, and overseas country-specific Final Governing Standards, in order to protect human health and safety and reduce total cost to the Army through environmental compliance, conservation, and pollution prevention. Enables installations to comply with legal environmental mandates and critical stewardship responsibilities that impact management and modernization of installations, while sustaining natural and cultural resources in a manner that provides continued access and long-term use of training lands to support the Army's installation missions..</p> <p>FY 2019 Plans: Continuing oversight and management of environmental workload.</p> <p>FY 2020 Plans:</p>		0.115	0.122	0.117

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW7 / Army Kwajalein Atoll Facilities Sustainment

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Will continue oversight and management of environmental workload.			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Pay Rate Adjustments			
<i>Title:</i> FY19 SBIR/STTR adjustment	-	1.631	-
<i>FY 2019 Plans:</i> FY19 SBIR/STTR adjustment			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY19 SBIR/STTR adjustment			
Accomplishments/Planned Programs Subtotals	32.501	44.611	45.255

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll				Project (Number/Name) DW8 / Army Kwajalein Atoll Installation Services			
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
DW8: Army Kwajalein Atoll Installation Services	-	129.731	124.812	124.738	-	124.738	126.810	127.695	129.846	129.905	0.000	893.537
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project resources Base Operations / Installation Services Support for United States (U.S.) Army Kwajalein (USAKA) Garrison located in the Republic of the Marshall Islands, a remote, secure activity designated as a Major Range and Test Facility Base (MRTFB). Base Operations / Installation Services Support resourcing is a critical enabler to ensure continuity of operations supporting Test and Evaluation and Space Operations of the Ronald Reagan Ballistic Missile Test Site in its role as an MRTFB Activity. Kwajalein is a government-managed / contractor-operated (GOCO) site and is primarily dependent upon its associated support contracts for the daily operations and maintenance of Base Operations / Installation Services Support. Installation Services Support consists of: Utility Services; logistical (fuel/transportation) operations support requirements; Medical/Dental Services; Education (K-12) Services; Food/Grocery Services; Contracted Security Guards; and Aviation/Marine support.

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

	FY 2018	FY 2019	FY 2020
<p>Title: Army Family Housing (AFH) Operations</p> <p>Description: Description: Funds all costs associated with the operations of a residence to include management, services, furnishing and utilities.</p> <p>FY 2019 Plans: Continue to fund costs associated with the operations of FH inventory, consisting of 372 units, and is comprised of three different types: Housing units constructed of concrete masonry and poured concrete circa 1955 and 1994; units constructed of wood, metal studs and aluminum siding circa 1988, and modular housing- prefabricated, commonly referred to as domes. The Billeting Section consists of 147 transient rooms. Transient housing facilities are located on Kwajalein and Roi-Namur and consist of permanent buildings constructed of concrete masonry. The UPH inventory consists of 692 units comprised of permanent buildings constructed of concrete masonry and poured concrete. UPH units are located on both Kwajalein and Rooi-Namur.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Resources moved to Army Family Housing appropriation per legal guidance. No FY20+ requirements in RDTE.</p>	6.834	6.971	-
<p>Title: Army Airfields (AAF) and Heliports (AHP)</p> <p>Description: Provides Resources Operations and Maintenance for Army Airfield and Aviation Fleet. Provides manpower, equipment acquisition, sustainment and maintenance in support of airfield operations, airfield management, aircraft services, air traffic services (ATS), air transport, airspace management and control, and air traffic control equipment maintenance. Includes airfield specific equipment, safety requirements, Hazardous Materials (HAZMAT) support, and airfield obstruction surveys. AAF/</p>	2.723	7.687	7.641

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW8 / Army Kwajalein Atoll Installation Services		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>AHP functions support Department of Defense (DoD) priorities for Army and joint force capabilities and inter-agency, intra-agency and multinational operations to meet current and future full spectrum requirements. Funds AAF/AHP functions at the necessary state of readiness to support missions across eleven islands (two fixed wing/six rotator wing) in addition to international aircraft traffic and reduces risk of major accidents/incidents.</p> <p>FY 2019 Plans: Provide services for all mission essential DoD, commercial, and transient aircraft. Operate two Airfields and eight outer islands helipads. Operate and maintain one Air Traffic Control (ATC) tower with class D airspace, two separate airfield operations and integrated STARS radar for aircraft separation and de-confliction. Support all intra-atoll cargo and personnel movements with two fixed wing and four rotary wing aircraft. Support transient international flights.</p> <p>FY 2020 Plans: Provide services for all mission essential DoD, commercial, and transient aircraft. Operate two Airfields and eight outer islands helipads. Operate and maintain one Air Traffic Control (ATC) tower with class D airspace, two separate airfield operations and integrated STARS radar for aircraft separation and de-confliction. Support all intra-atoll cargo and personnel movements with two fixed wing and four rotary wing aircraft. Support transient international flights.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.</p>				
<p>Title: Army Community Services (ACS)</p> <p>Description: Provides programs that prevent family violence/fatalities through family advocacy programs and counseling; provide specialized assistance to provide prevention, education and family sustainment for military and civilian personnel and their families; and also provide critical financial, employment and relocation education and training to Soldiers, civilians, and their Families.</p> <p>FY 2019 Plans: Continue to provide necessary/routine Army Community Services to the Installation.</p> <p>FY 2020 Plans: Continue to provide necessary/routine Army Community Services to the Installation.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.</p>		0.267	0.274	0.273
<p>Title: Child and Youth Services (CYS)</p>		2.350	0.422	0.417

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: Provides child care, youth, and school services (CYSS) programs for children and youth. Provides child and youth spaces required to meet Army's child care and youth participation demand goals. Resources the following programs: 1) Child Development Centers; 2) Family Child Care; 3) School Age Care; 4) Youth Programs; 5) Youth Sports & Fitness; 6) School Support Services. Resources staffing levels necessary to minimize risk of child abuse, and the oversight to achieve and maintain DoD Certification (State licensing equivalent) and National Accreditation per statutory requirement and DoD policy.</p> <p>FY 2019 Plans: Continue to provide resources to operate CYS programs on Kwajalein to include a Child Development Center, School Age Services programs, Supplemental Programs and Services, and Youth programs and services. Establish and maintain developmentally and age-appropriate staff-child/youth interactions, activities, activity schedules and plans, supplies and equipment, furnishings, and environment (both indoors and outdoors) that lead to the social, physical, cognitive, and emotional growth of children up to 18 years. Ensure that youth programs include, at a minimum, seasonal sports programs, 4-H Club programs, Boys and Girls Club of America programs, instructional programs, recreational programs, programs that promote leadership and citizenship, intervention services, and teen programs.</p> <p>FY 2020 Plans: Continue to provide resources to operate CYS programs on Kwajalein to include a Child Development Center, School Age Services programs, Supplemental Programs and Services, and Youth programs and services. Establish and maintain developmentally and age-appropriate staff-child/youth interactions, activities, activity schedules and plans, supplies and equipment, furnishings, and environment (both indoors and outdoors) that lead to the social, physical, cognitive, and emotional growth of children up to 18 years. Ensure that youth programs include, at a minimum, seasonal sports programs, 4-H Club programs, Boys and Girls Club of America programs, instructional programs, recreational programs, programs that promote leadership and citizenship, intervention services, and teen programs.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.</p>			
<p>Title: Engineering Services</p> <p>Description: Provides (1) Facility Management and Administration and (2) Installation Engineering Services. Facility Management includes public works management costs, contract management, material procurement, facility data management; to include, Geographic Information System (GIS) and Sustainment Management Systems (SMS) suite implementation/inspections, furnishings management costs, and real property and real estate management. Installation Engineering Services includes facility engineer service contracts, annual inspection of facilities, master planning, overhead of planning and design, and overhead of construction management and non-Sustainment and Restoration Modernization (SRM) service calls. Excludes: vehicle</p>	3.604	4.312	4.286

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
maintenance, in-house shop and contracted personnel who routinely perform facility sustainment activities; and design engineers or project managers or construction inspectors who manage and oversee facility sustainment and construction projects.				
FY 2019 Plans: Continue to provide necessary/routine engineering services to the Installation.				
FY 2020 Plans: Continue to provide necessary/routine engineering services to the Installation.				
FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.				
Title: Soldier Recreation and Community Support		8.525	0.241	0.240
Description: Provides the development and delivery of Soldier Programs, Community Recreation, and Direct Common Family and Morale, Welfare and Recreation (FMWR) Support Services that sustain the Total Army, in accordance with (IAW) the Army Campaign Plan and the Chief of Staff of the Army (CSA)'s Strategic Priorities. Programs funded include sports, fitness and aquatics, recreation centers, libraries, outdoor recreation, skill development, bowling (16 lanes or less); Direct Common FMWR Support Services (essential command and control and risk management programs for property, funds and personnel); and as designated by Congress, Category C FMWR activities at remote and isolated sites. These programs resource readiness and resiliency and build upon physical, emotional, social and psychological coping skills; funds opportunities for Soldiers, civilians and Families to foster self-reliance, morale and a sense of belonging by offering positive discretionary time choices, mitigating aberrant behaviors through individual skill development and team participation.				
FY 2019 Plans: Continue to provided resources necessary to sustain Soldier Recreation and Community Support for a community population of 1400 and meet the needs of USAKA/RTS residents, tenants, satellite activities, range users, and other authorized organizations/ personnel on Kwajalein Island, Roi-Namur Island, Meck Island, and on other USAKA/RTS outer islands.				
FY 2020 Plans: Continue to provided resources necessary to sustain Soldier Recreation and Community Support for a community population of 1400 and meet the needs of USAKA/RTS residents, tenants, satellite activities, range users, and other authorized organizations/ personnel on Kwajalein Island, Roi-Namur Island, Meck Island, and on other USAKA/RTS outer islands.				
FY 2019 to FY 2020 Increase/Decrease Statement: Adjustment to programmed pay rate.				
Title: Fire and Emergency Services (FES)		7.677	4.717	4.832

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: Provides for fire and emergency services for the installation, including preparation for and response and mitigation of aircraft and structural firefighting and rescue, technical rescue, Hazardous Materials and Weapons of mass destruction/Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) responses, and out of control wildfire mitigation in an all-hazard response environment.</p> <p>FY 2019 Plans: Continue to provide fire and Emergency Services which are performed in association with the Base Support/Logistics contractor. Provide fire protection services for all USAG-KA and RTS assets, to include facilities, structural, aircraft, shipboard and small watercraft, and wild land fires. Services provide protection for the fire hazards associated with operations and community at USAG-KA and RTS. Provide Fire Protection on Kwajalein and Roi-Namur 24 hours Provided Fire Protection and Emergency Services on Meck during duty hours, mission periods, and hazardous operations. Provide ambulance service on Kwajalein, Meck, and Roi-Namur Islands. Provide fire safety education and activities for the schools and child development center and for adult residents of USAG-KA. Train personnel normally assigned to work on the remote islands of Illeginni, Ennylabegan, Gagan, and Legan in first aid, Cardiopulmonary Resuscitation (CPR), and operation of fire extinguishers and fire alarm and suppression equipment peculiar to the island. Provide rescue and emergency medical personnel available for immediate dispatch to aircraft or vessel crash site, entry into the ocean or lagoon, and be provisioned for immediate rescue and emergency medical assistance.</p> <p>FY 2020 Plans: Continue to provide fire and Emergency Services which are performed in association with the Base Support/Logistics contractor. Provide fire protection services for all USAG-KA and RTS assets, to include facilities, structural, aircraft, shipboard and small watercraft, and wild land fires. Services provide protection for the fire hazards associated with operations and community at USAG-KA and RTS. Provide Fire Protection on Kwajalein and Roi-Namur 24 hours Provided Fire Protection and Emergency Services on Meck during duty hours, mission periods, and hazardous operations. Provide ambulance service on Kwajalein, Meck, and Roi-Namur Islands. Provide fire safety education and activities for the schools and child development center and for adult residents of USAG-KA. Train personnel normally assigned to work on the remote islands of Illeginni, Ennylabegan, Gagan, and Legan in first aid, Cardiopulmonary Resuscitation (CPR), and operation of fire extinguishers and fire alarm and suppression equipment peculiar to the island. Provide rescue and emergency medical personnel available for immediate dispatch to aircraft or vessel crash site, entry into the ocean or lagoon, and be provisioned for immediate rescue and emergency medical assistance.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.</p>			
<p>Title: Financial Management (FM) Activities</p> <p>Description: Provides Directorate of Resource Management (DRM) and DRM base support for Army tenants resident on or receiving support from the Army installation. Functions of the DRM include program, budget, manpower, documentation,</p>	0.772	0.787	0.594

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Memorandum of Understanding (MOU)/Memorandum of Agreement (MOA)/Support Agreement management, finance and accounting.</p> <p>FY 2019 Plans: Continue to provide program/budget support and budget execution, financial advisory service and accounting liaison services. Support Audit Readiness through Statement of Budgetary Resource samples. Continue to establish Inter-service Support Agreements (ISSA). Provide management analysis on manpower requirements and organizational structure analysis. Provide Contracting Officer Representative oversight for the Program Management functions for the base-support contract.</p> <p>FY 2020 Plans: Continue to provide program/budget support and budget execution, financial advisory service and accounting liaison services. Support Audit Readiness through Statement of Budgetary Resource samples. Continue to establish Inter-service Support Agreements (ISSA). Provide management analysis on manpower requirements and organizational structure analysis. Provide Contracting Officer Representative oversight for the Program Management functions for the base-support contract.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease reflects net zero change to DW8 line to better align requirements with execution</p>				
<p>Title: Food Services</p> <p>Description: Provides for the operation of dining facilities including contract employees, food service supplies, and equipment life-cycle replacement.</p> <p>FY 2019 Plans: Continue to provide services for DoD, contractor, host nation, interagency and intra-agency organizations with multiple facilities on three different islands to include 3 cafeterias, bakery, grocery store, dry/cold warehousing, AAFES retail stores, AAFES food court, and catering services and private organizations. Monitor and approve food purchases and preparation. Conduct food service inspections.</p> <p>FY 2020 Plans: Continue to provide services for DoD, contractor, host nation, interagency and intra-agency organizations with multiple facilities on three different islands to include 3 cafeterias, bakery, grocery store, dry/cold warehousing, AAFES retail stores, AAFES food court, and catering services and private organizations. Monitor and approve food purchases and preparation. Conduct food service inspections.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>		4.385	8.653	8.865

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Cost change accommodates expected inflation.				
<p>Title: Unaccompanied Housing</p> <p>Description: Provides for Government-owned Unaccompanied Housing including appropriated funded Army lodging, lifecycle replacement furnishings, and other associated costs. Includes Manpower purchase, control, moving, management and handling of lifecycle replacement and repair for all unaccompanied housing furnishings. Includes all costs of authorized replacement furnishings in existing inventory.</p> <p>FY 2019 Plans: Continue to provide contractor management, oversight, M&R, and control of all USAG-KA Housing/ Billeting Facilities Utilize best commercial residential business practices to ensure basic quality of life standards are achieved and are in compliance with life and safety standards. Provide Master Key control services. Provide and implement a sound furnishings and appliances program that addresses acquisition, replacement, M&R, and refurbishing. Provide Hospitality Kits consisting of the minimum essential items to operate a household until permanent party personnel's HHG arrive and from HHG shipment until departure. Provide COOM on all facilities prior to reassignment to in-coming resident.</p> <p>FY 2020 Plans: Continue to provide contractor management, oversight, M&R, and control of all USAG-KA Housing/ Billeting Facilities Utilize best commercial residential business practices to ensure basic quality of life standards are achieved and are in compliance with life and safety standards. Provide Master Key control services. Provide and implement a sound furnishings and appliances program that addresses acquisition, replacement, M&R, and refurbishing. Provide Hospitality Kits consisting of the minimum essential items to operate a household until permanent party personnel's HHG arrive and from HHG shipment until departure. Provide COOM on all facilities prior to reassignment to in-coming resident.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodated expected inflation.</p>		1.543	1.581	1.601
<p>Title: Law Enforcement</p> <p>Description: Provides Law Enforcement (LE) activities/services for the protection of people and property, enforcement of laws, and maintenance of order. This effort covers, but is not limited to: all personnel and operating costs associated with LE operations, salaries, overtime, benefits, material and supplies, equipment, vehicles, training and management for LE response forces (Department of the Army Civilian Police (DACP) and military police (MP)). Funds the conduct of motor vehicle traffic supervision, and liaison with civilian LE agencies. Funds LE work load derived from historical responses to calls for service (i.e. Crimes against Persons, Drug Crimes, Traffic Crimes, Absent Without Leave (AWOL), Sex Crimes, and Crimes against Property, Environmental</p>		1.917	1.710	1.537

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Violations, Fraud Crimes, Alarm Response and Public Service Calls), investigation of non-felony level offenses, preparation and distribution of MP reports and related documents, and collection and analyses of crime statistics.			
<i>FY 2019 Plans:</i> Continue to provide LE activities/services for the protection of people and property, enforcement of laws, and maintenance of order. Will cover, but not limited to, all personnel and operating costs associated with LE operations, salaries, overtime, benefits, material and supplies, equipment, vehicles, training and management for LE response forces.			
<i>FY 2020 Plans:</i> Continue to provide LE activities/services for the protection of people and property, enforcement of laws, and maintenance of order. Will cover, but not limited to, all personnel and operating costs associated with LE operations, salaries, overtime, benefits, material and supplies, equipment, vehicles, training and management for LE response forces.			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Decrease reflects net zero change to DW8 line to better align requirements with execution			
<i>Title:</i> Materiel Maintenance	11.129	2.822	15.761
<i>Description:</i> Provide for automotive, Marine vessel, Construction, General Equipment, and Armament Maintenance. Also provides Field and Sustainment level maintenance services to Army activities in accordance with AR 750-1; provides maintenance technical assistance to supported units and activities, and provides material maintenance on base operations support equipment.			
<i>FY 2019 Plans:</i> Continue to provide resources for the maintenance of all 6 aircraft, 17 marine vessels, heavy equipment, non-tactical and tactical equipment, construction equipment; base operations equipment and marine navigational aides. Provide government estimates for repair/ replacement of damaged, lost or lifecycle replacement equipment. Provide resources for OCCM for marine vessels.			
<i>FY 2020 Plans:</i> Continue to provide resources for the maintenance of all 6 aircraft, 17 marine vessels, heavy equipment, non-tactical and tactical equipment, construction equipment; base operations equipment and marine navigational aides. Provide government estimates for repair/ replacement of damaged, lost or lifecycle replacement equipment. Provide resources for On-Condition Cyclic Maintenance (OCCM) for marine vessels.			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Increase reflects a significant increase that covers scheduled On-Condition Cyclic Maintenance (OCCM) for marine vessels.			
<i>Title:</i> Municipal Services	5.949	1.842	1.865

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Description: Provides for municipal services including grounds maintenance, custodial, pest management, solid waste or refuse handling operations, pavement clearance through the removal of snow/ice/sand and street sweeping, and homeless shelter support.</p> <p>FY 2019 Plans: Provide necessary/routine municipal services to the Installation.</p> <p>FY 2020 Plans: Will provide necessary/routine municipal services to the Installation.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.</p>				
<p>Title: Installation Command and Management</p> <p>Description: Provides for a K-12 school system, medical/dental services, and Base Support Contract overhead fees. Additionally, supports offices of the Commander, Staff Judge Advocate (SJA), Chaplain, Public Affairs (PA), and Safety Office. Supports civilian pay and benefits, training, duty travel, Permanent Change of Station (PCS) costs, equipment, and contractual services for installation command and management activities. Kwajalein Medical/Dental services provide family practice and emergency services at Kwajalein (2-5 days for MEDEVAC support to Honolulu), a secondary clinic on Roi-Namur, and a dental clinic. Support includes but is not limited to medical lab and imaging services, pharmacy services, basic dental services, and all medical functions including inspections of medical facilities.</p> <p>FY 2019 Plans: Provide Installation Command and Management across 11 islands/defense sites to a population of over 100 Active Duty Military and Department of the Army civilians & 1100 contractors and their family members. Plan, organize, staff, direct, and control all aspects of installation and command management.</p> <p>FY 2020 Plans: Provide Installation Command and Management across 11 islands/defense sites to a population of over 100 Active Duty Military and Department of the Army civilians & 1100 contractors and their family members. Plan, organize, staff, direct, and control all aspects of installation and command management.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease reflects a shift to Materiel Maintenance to better align functional activity descriptions with expected program execution.</p>		2.289	28.426	23.842
<p>Title: Personnel Services Delivery</p>		-	0.121	0.117

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: Provides a human resource specialist responsible for providing all aspects of human resource management, administrative, and counsel to the Garrison Staff.</p> <p>FY 2019 Plans: Provide human resource support to the Garrison Staff.</p> <p>FY 2020 Plans: Continue to provide human resource support to the Garrison Staff.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates programmed pay rates.</p>			
<p>Title: Physical Security Matters</p> <p>Description: Provides resources for physical security programs and equipment to support Army installations and facilities requirements. Procures, installs, maintains and/or leases physical security equipment to include, but not limited to barriers; blast mitigation devices; communication systems; explosive detection devices; intrusion detection systems and devices; sensors; site improvements; management/planning; and security forces and technicians. Funds contract security guards including military working dog management and equipping the installation with explosive and drug detection dog capabilities.</p> <p>FY 2019 Plans: Continue to provide the necessary physical security procedures and materials to ensure USAG-KA maintains all proper security measures.</p> <p>FY 2020 Plans: Continue to provide the necessary physical security procedures and materials to ensure USAG-KA maintains all proper security measures.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.</p>	5.293	5.423	5.500
<p>Title: Army Security Programs</p> <p>Description: Funds Army Command security activities supporting: Information Security, Personnel Security, Industrial Security, Communications Security (COMSEC) Policy, Security Education, Training and Awareness (SETA), Special Access Program (SAP) Security, Sensitive Compartmented Information (SCI) Security, Foreign Disclosure, and Technology Protection.</p> <p>FY 2019 Plans:</p>	0.115	0.121	0.119

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Continue to provide the necessary security procedures and materials to ensure USAGKA maintains all proper security measures to ensure successful missions continue on USAGKA. FY 2020 Plans: Continue to provide the necessary security procedures and materials to ensure USAGKA maintains all proper security measures to ensure successful missions continue on USAGKA. FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates programmed pay rates.				
Title: Supply Logistics Description: Provides supply operations which support: ammunition supply point services, bulk petroleum operations, marine and aviation assets, Army tenants, operation of a central receiving point and/or Installation Supply Support Activity (SSA) for goods delivered to the installation, management of non-deployable installation property, and receipt, storage, issue, reutilization and tracking of hazardous materials. FY 2019 Plans: Continue to provided resources for property accountability of all GFE/CAP, reutilization items, Military Standard Requisitioning and Use Procedures ordering and delivery to multiple outer islands. Dispose of obsolete items in accordance with Army equipment disposition procedures. FY 2020 Plans: Continue to provided resources for property accountability of all GFE/CAP, reutilization items, Military Standard Requisitioning and Use Procedures ordering and delivery to multiple outer islands. Dispose of obsolete items in accordance with Army equipment disposition procedures. FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodated expected inflation.		2.912	3.059	3.134
Title: Transportation Services Description: Provides the operation of installation transportation offices, transportation motor pools, and cost of rolling stock; also includes movement of privately-owned household goods of military personnel (and civilian personnel in overseas areas) in connection with assignment, reassignment, or termination of government-furnished family housing. FY 2019 Plans: Continue to provide resources for the operation of all transportation services to include 6 aircraft, 17 marine vessels, and over 200 pieces of rolling stock. Operate a centralized motor pool. Fund operations for movement of all international and intra atoll air		23.577	21.493	23.925

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>and surface cargo to include mission critical equipment and supplies, household goods, HAZMAT, United States Postal Service (USPS) mail, medical, and food items. Safely ferry over 48,000 mission critical employees per month within the atoll on various USAGKA marine assets.</p> <p>FY 2020 Plans: Continue to provide resources for the operation of all transportation services to include 6 aircraft, 17 marine vessels, and over 200 pieces of rolling stock. Operate a centralized motor pool. Fund operations for movement of all international and intra atoll air and surface cargo to include mission critical equipment and supplies, household goods, HAZMAT, United States Postal Service (USPS) mail, medical, and food items. Safely ferry over 48,000 mission critical employees per month within the atoll on various USAGKA marine assets.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates inflation and net-zero realignment from other functions to better align requirements with execution.</p>			
<p>Title: Utilities</p> <p>Description: Provides utility services - production and distribution of utilities including expenses for electricity, steam, hot water, fuels and other utilities, and operation of electrical, air conditioning, refrigeration, water distribution, and wastewater collection and treatment plants and systems.</p> <p>FY 2019 Plans: Continue to provide resources including fuel to operate and maintain seven Power generation and distribution systems on Kwajalein; nine on Roi, five on Meck, and eleven total on the outer islands of Carlos, Gagan, Illeginni, and Legan, distributing over 7.5 Million kilowatt hours / month. Operate, maintain, and repair all prime power plants, distribution systems, and ancillary equipment and related systems, including fixed and portable auxiliary generators. Provide reliable power during mission windows. Develop and implement a maintenance plan which includes operator maintenance, predictive maintenance, Program Management (PM), cyclical, and recurring maintenance, as well as periodic equipment and systems overhauls for all power production systems. Provide appropriate staff to operate power plants 24 hours a day. Operate and maintain potable and non-potable water production & distribution systems. Operate and maintain wastewater treatment plant water systems and storage including equipment. Distribute water to a population of approximately 1400 people consuming over 5.3 million gallons of water per month. Operate all wastewater treatment plants and equipment, collection and distribution systems, and all ancillary equipment and other related systems, including septic tanks. Develop, implement, and manage a waste management program including collection, incineration, landfill, compost, and recycling facilities. Provide preventative, cyclical and recurring, and unscheduled maintenance and repair of the Incinerator and all ancillary equipment and systems.</p> <p>FY 2020 Plans:</p>	34.707	17.474	17.902

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Continue to provide resources including fuel to operate and maintain seven Power generation and distribution systems on Kwajalein; nine on Roi, five on Meck, and eleven total on the outer islands of Carlos, Gagan, Illeginni, and Legan, distributing over 7.5 Million kilowatt hours / month. Operate, maintain, and repair all prime power plants, distribution systems, and ancillary equipment and related systems, including fixed and portable auxiliary generators. Provide reliable power during mission windows. Develop and implement a maintenance plan which includes operator maintenance, predictive maintenance, Program Management (PM), cyclical, and recurring maintenance, as well as periodic equipment and systems overhauls for all power production systems. Provide appropriate staff to operate power plants 24 hours a day. Operate and maintain potable and non-potable water production & distribution systems. Operate and maintain wastewater treatment plant water systems and storage including equipment. Distribute water to a population of approximately 1400 people consuming over 5.3 million gallons of water per month. Operate all wastewater treatment plants and equipment, collection and distribution systems, and all ancillary equipment and other related systems, including septic tanks. Develop, implement, and manage a waste management program including collection, incineration, landfill, compost, and recycling facilities. Provide preventative, cyclical and recurring, and unscheduled maintenance and repair of the Incinerator and all ancillary equipment and systems.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.</p>			
<p>Title: Environmental Quality</p> <p>Description: Provides manpower and funding necessary to achieve, evaluate, and sustain compliance with appropriate Compact of Free Association, national, and USAKA Environmental Standards, Executive Orders, DoD Directives, regulations, and overseas country-specific. Final Governing Standards, in order to protect human health and safety and reduce total cost to the Army through environmental compliance, conservation, and pollution prevention. Enables installations to comply with legal environmental mandates and critical stewardship responsibilities that impact management and modernization of installations, while sustaining natural and cultural resources in a manner that provides continued access and long-term use of training lands to support the Army's installation missions. Also includes costs associated with Range Military Construction (MILCON) to address one-time mitigation actions.</p> <p>FY 2019 Plans: Provide necessary/routine environmental quality services to the Installation.</p> <p>FY 2020 Plans: Will provide necessary/routine environmental quality services to the Installation.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>	3.114	2.049	2.077

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Cost change accommodated expected inflation.				
Title: Anti-Terrorism (AT)		0.049	0.205	0.210
<p>Description: Funds the Army Antiterrorism program, a defensive program to protect against Terrorism. Supports the following: Antiterrorism installation and mission requirements: Combatant Commands (COCOM) Antiterrorism requirements (Army as Executive Agent (EA)), Antiterrorism Program Management, Antiterrorism Training and Awareness efforts (Area of Responsibility (AOR) specific, Level I Antiterrorism Awareness Training, Level II Antiterrorism Officers Training, Level III Pre-command training, and Level IV Antiterrorism Executive Seminar), protection of High Risk Personnel (HRP) to include support requirements (equipment), execution of Antiterrorism Assessments (Terrorism Vulnerability Assessments, Special Event Assessments, Pre-deployment Vulnerability Assessments, and Comprehensive Antiterrorism Reviews) designed to identify and fix protection vulnerabilities that will protect personnel and facilities from terrorist acts, intelligence support to Army Antiterrorism, conduct annual Antiterrorism Exercises designed to execute Antiterrorism plans, and the implementation of the Random Antiterrorism Measures Program (RAMP) and the Force Protection Condition (FPCON) system.</p> <p>FY 2019 Plans: Provide antiterrorism programs. Provide personnel with the necessary training and identify high risk individuals when appropriate. Continue to identify and update vulnerabilities to our facilities and put protective measures in place to reduce risks to mission.</p> <p>FY 2020 Plans: Will provide antiterrorism programs. Will provide personnel with the necessary training and identify high risk individuals when appropriate. Will continue to identify and update vulnerabilities to our facilities and put protective measures in place to reduce risks to mission.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Cost change accommodates expected inflation.</p>				
Title: FY19 SBIR/STTR adjustment		-	4.422	-
<p>FY 2019 Plans: FY19 SBIR/STTR adjustment</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY19 SBIR/STTR adjustment</p>				
Accomplishments/Planned Programs Subtotals		129.731	124.812	124.738
C. Other Program Funding Summary (\$ in Millions)				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW8 / Army Kwajalein Atoll Installation Services

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

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll				Project (Number/Name) DW9 / Army Kwajalein Atoll Restoration And 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
DW9: Army Kwajalein Atoll Restoration And Modernization	-	61.311	66.189	57.887	-	57.887	49.359	47.040	47.968	48.448	0.000	378.202
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the restoration and modernization of United States (U.S.) Army Kwajalein Atoll (USAKA) degraded infrastructure (Real Property/facilities) to working condition and upgrades facilities to meet current standards. Restoration consists of repair and replacement work to fix facilities degraded due to the effects of aging and previously deferred sustainment. Modernization supports upgrade of facilities to meet current codes, accommodate new functions, and/or replace building components that exceed the overall service life of the facilities.

Fiscal Year (FY) 2020 funds will continue to provide resources in support of a Headquarters, Department of the Army (HQDA)-approved 15-year investment plan. Funds focus on Phase II of the Bucholz Army Airfield runway repair. Efforts will include repairing 1000 feet on both ends of the runway down to subgrade, resurfacing the center section of runway, and repairing aged and deteriorating airfield pavements to include airfield lighting and back up generator.

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

	FY 2018	FY 2019	FY 2020
Title: Recapitalization Deficit R&M	61.311	63.763	57.887
Description: Provides facility restoration for facilities not specifically aligned to specified Facility Investment Strategy focus areas. Funds facilities quality improvement required to achieve elimination of Q4/Q3 Installation Status Report (ISR) rated facilities. In addition to major renovation costs, facility costs include project tails in accordance with AR 420-1 for: National Environmental Policy Act (NEPA) compliance.			
FY 2019 Plans: Continuing to provide (2nd year) resources against the HQDA-approved 15-year investment plan, focusing on Phase II of the Bucholz Army Airfield runway. Efforts include repairing 1000 feet on both ends of the runway down to subgrade, resurfacing center section of runway, and repairing aged and deteriorating airfield pavements to include airfield lighting and back up generator.			
FY 2020 Plans: Will continue to provide (3rd year) resources against the HQDA-approved 15-year investment plan, focusing on completion of Phase II of the Bucholz Army Airfield runway, including repair of 1000 feet on both ends of the runway down to subgrade, resurfacing center section of runway, and repairing aged and deteriorating airfield pavements to include airfield lighting and back up generator.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW9 / Army Kwajalein Atoll Restoration And Modernization

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Funding levels are designed to align program requirements to Army Modernization priorities in support of the National Defense Strategy.			
Title: FY19 SBIR/STTR adjustment	-	2.426	-
FY 2019 Plans: FY19 SBIR/STTR adjustment			
FY 2019 to FY 2020 Increase/Decrease Statement: FY19 SBIR/STTR adjustment			
Accomplishments/Planned Programs Subtotals	61.311	66.189	57.887

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll				Project (Number/Name) DX2 / Army Kwajalein Test Ranges and Mission Support			
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
DX2: Army Kwajalein Test Ranges and Mission Support	-	10.467	10.663	10.811	-	10.811	11.396	11.594	11.625	11.745	0.000	78.301
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds Network Enterprise Technology Command (NETCOM) installation management-related Command, Control, Communications, Computers, and Information Management (C4IM) services at Army Kwajalein Test Ranges. NETCOM utilizes this Project to provide civilian pay, manpower service contracts, supporting Information technology (IT) equipment, and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Information Technology Services Management at Army Kwajalein Test Ranges. Project provides C4IM services in accordance with the Department of Army Pamphlet (DA PAM) PAM 25-1-1 and the Army C4IM Services List. Provides Base Communications Support (Service 701), Visual Information (Service 702), Information Assurance (Service 703), and Automation (Service 700). Includes the delivery of services consisting of secure and non-secure fixed voice communications, wireless voice, data and video connectivity services, and studio video conferencing services. Provides infrastructure support, including the design, installation, and maintenance of special circuits/systems in support of life safety/security systems and monitoring/control systems. Provides Collaboration and Messaging Services including services and tools for workforce to communicate and share information. Provides Application and Web-hosting including operation and management services required to support web and application hosting. Provides Desktop Management Support including management and support for end-user hardware and software services and tools. Includes Service Desk Support, Continuity of Operations, and Disaster Recovery support.

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

	FY 2018	FY 2019	FY 2020
Title: Network Enterprise Technology Command (NETCOM) C4IM	10.467	10.282	10.811
Description: Provides Army civilian pay, manpower service contracts, supporting IT equipment, and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Information Technology Services Management.			
FY 2019 Plans: Provide Department of Army civilian pay, manpower service contracts, supporting IT equipment, and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Information Technology Services Management. Provide Command, C4IM services in accordance with the DA PAM 25-1-1 and the Army C4IM Services List. Provide Base Communications Support (Service 701), Visual Information (Service 702), Information Assurance (Service 703), and Automation (Service 700). Delivery services consisting of secure and non-secure fixed voice communications, wireless voice, data and video connectivity services, and studio video conferencing services. Provide infrastructure support, including the design, installation, and maintenance of special circuits/systems in support of life safety/security systems and monitoring/control systems. Provide Collaboration and Messaging Services including services and tools for workforce to communicate and share information. Provide Application and Web-hosting including operation and management services required to support web and application hosting.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DX2 / Army Kwajalein Test Ranges and Mission Support

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Provide Desktop Management Support including management and support for end-user hardware and software services and tools, to include Service Desk Support, Continuity of Operations, and Disaster Recovery support.</p> <p>FY 2020 Plans: Provide Department of Army civilian pay, manpower service contracts, supporting IT equipment, and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Information Technology Services Management. Provide Command, C4IM services in accordance with the DA PAM 25-1-1 and the Army C4IM Services List. Provide Base Communications Support (Service 701), Visual Information (Service 702), Information Assurance (Service 703), and Automation (Service 700). Delivery services consisting of secure and non-secure fixed voice communications, wireless voice, data and video connectivity services, and studio video conferencing services. Provide infrastructure support, including the design, installation, and maintenance of special circuits/systems in support of life safety/security systems and monitoring/control systems. Provide Collaboration and Messaging Services including services and tools for workforce to communicate and share information. Provide Application and Web-hosting including operation and management services required to support web and application hosting. Provide Desktop Management Support including management and support for end-user hardware and software services and tools, to include Service Desk Support, Continuity of Operations, and Disaster Recovery support.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Economic adjustments for expected inflation rate.</p>			
<p>Title: FY19 SBIR/STTR adjustment</p> <p>FY 2019 Plans: FY19 SBIR/STTR adjustment</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY19 SBIR/STTR adjustment</p>	-	0.381	-
Accomplishments/Planned Programs Subtotals	10.467	10.663	10.811

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

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / <i>Army Kwajalein Atoll</i>	Project (Number/Name) DX2 / <i>Army Kwajalein Test Ranges and Mission Support</i>

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

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>
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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
Total Program Element	-	28.701	30.394	42.922	-	42.922	43.136	43.781	47.394	49.000	0.000	285.328
312: <i>Army/Joint Experimentation</i>	-	6.815	6.526	7.725	-	7.725	7.887	8.051	8.218	8.494	0.000	53.716
317: <i>Current Force Capability Gaps</i>	-	20.063	22.216	35.046	-	35.046	35.095	35.575	39.019	40.282	0.000	227.296
33B: <i>Soldier-Centered Analyses For Future Force</i>	-	1.823	1.652	0.151	-	0.151	0.154	0.155	0.157	0.224	0.000	4.316

A. Mission Description and Budget Item Justification

The Army Concepts Experimentation Program supports current and future concepts and capabilities involving Soldiers and Leaders within live, virtual, and constructive environments by exploring concepts, capability requirements and solutions across Doctrine, Organization, Training, Materiel, Leadership and Education, personnel, and Facilities (DOTMLPF) domains. The purpose of Concepts Experimentation is to clarify and mitigate risk for current and future forces. Experiments and projects inform Army futures concepts and assess high-risk conceptual assumptions in order to focus required capabilities and represent user requirements in the future Army. Army experiments use the combined resources of Army Battle Laboratories, operational units, research labs, materiel developers, industry and academia to collaborate in the development, refinement, and assessment of future force concepts. Simulated Experiments (SIMEX) will integrate and assess Army Concepts and Force Design phases with Army-level issues across the breadth of a campaign that highlights validation and integration of Force 2025 outcomes.

This Program Element (PE) enhances Joint Capabilities Integration and Development System (JCIDS) development in support of Program Executive Offices (PEOs) and Program Managers (PMs) for acquisition milestone decisions. This PE provides for Accelerated Capability Development (ACD) to address current critical operational needs, enabling development and deployment/employment of accelerated capabilities (both materiel and non-materiel) to the current force. Early Synthetic Prototyping enables a wargaming and experimentation capability that engages soldiers across the Army through early-fidelity game environments to gain their insights and recommendations in the development of future doctrine, organization, and materiel solutions. This PE provides funding for Army Warfighter Assessments (AWA) that physically integrate, assess and evaluate networked capability sets and other adaptive capabilities to accelerate the systems acquisition process of providing DOTMLPF recommendations to the Army. This PE also provides support to the Army Warfighting Challenges (AWFC) used by the Army to frame learning and collaboration.

The Soldier-Centered Analysis For Future Force Project (33B) will provide early application of human performance and human figure modeling tools in the development of Soldier-focused requirements to shape technology for Future Force development. These efforts include design analyses, constructive simulations, and Soldier-in-the loop assessments to ensure that manpower requirements and workload and skill demands are considered, avoiding information and physical task overloads and taking optimum advantage of aptitudes, individual and collective training, and numbers of Soldiers for an affordable Future Force.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	29.820	30.430	61.024	-	61.024
Current President's Budget	28.701	30.394	42.922	-	42.922
Total Adjustments	-1.119	-0.036	-18.102	-	-18.102
• Congressional General Reductions	-0.023	-0.036			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.096	-			
• Adjustments to Budget Years	-	-	-18.102	-	-18.102

Change Summary Explanation

FY 2020 funding request was reduced by \$18.102 million to account for the availability of prior year execution balances along with planned elimination of some Army Concepts Experimentation events.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>				Project (Number/Name) 312 / <i>Army/Joint Experimentation</i>			
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
312: <i>Army/Joint Experimentation</i>	-	6.815	6.526	7.725	-	7.725	7.887	8.051	8.218	8.494	0.000	53.716
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Army and Joint Experimentation supports current and future concepts and capabilities involving Soldiers and Leaders within live, virtual, and constructive environments by exploring concepts, capability requirements, and solutions across Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) domains. The purpose of these efforts is to learn and mitigate risk for current and future forces. Experiments inform Army future concepts and assess high-risk conceptual assumptions in order to focus required capabilities and represent user requirements in the future Army. Army experiments use the combined resources of Army Battle Laboratories, operating force units, research laboratories, materiel developers, industry, and academia to collaborate in the development, refinement, and assessment of future force concepts. These experiments refine and validate concepts for current and future forces to inform capability developments and requirements determination. Since Fiscal Year (FY) 2015, this Project has supported the Army's Simulation-Based Experiments (SIMEXp) to integrate and assess near-, mid-, and far-term future force concepts, force designs, and capabilities. In support of the Army Vision and Army Strategy, experimentation focuses on the latest Multi-Domain Operations Concept and operational and organizational concepts for the Army of 2028 and beyond. To refine the Multi-Domain Operations Concepts, Army experimentation expands linkages to multi-Service and Joint experiments.

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

	FY 2018	FY 2019	FY 2020
Title: Experimentation - High-Fidelity Live-Virtual-Constructive Experiments	6.815	6.287	7.725
Description: Experiments address concept and capability developments including integration of capabilities for all Brigade Combat Team (BCT) types; development of future DOTMLPF requirements and solutions; and acceleration and integration of capabilities for current force BCTs and above brigade.			
FY 2019 Plans: Experiments will address concept and capability developments including integration of capabilities for all BCT types; development of future DOTMLPF requirements and solutions; and acceleration and integration of capabilities for current force BCTs and above brigade.			
FY 2020 Plans: Will conduct experiments to address concept and capability developments including integration of capabilities for all Brigade Combat Team (BCT) types. Will develop future DOTMLPF requirements and solutions and accelerate / integrate capabilities for current force BCTs and above brigade.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>	Project (Number/Name) 312 / <i>Army/Joint Experimentation</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY20 funding aligns program requirements with Army modernization priorities in support of the National Defense Strategy.			
Title: FY19 SBIR/STTR adjustment	-	0.239	-
FY 2019 Plans: FY19 SBIR/STTR adjustment			
FY 2019 to FY 2020 Increase/Decrease Statement: FY19 SBIR/STTR adjustment			
Accomplishments/Planned Programs Subtotals	6.815	6.526	7.725

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>				Project (Number/Name) 317 / <i>Current Force Capability Gaps</i>			
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
317: <i>Current Force Capability Gaps</i>	-	20.063	22.216	35.046	-	35.046	35.095	35.575	39.019	40.282	0.000	227.296
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project enables Army Capability Development and Integration Programs to support the Joint Capabilities Integration and Development System (JCIDS). These efforts involve integrating Program Executive Offices (PEOs) and Program Managers (PMs) to ensure coordinated and integrated acquisition Milestone decisions in a timely manner. Funding in this Project ensures that the Army Futures Command (AFC) / Future Concepts Center (FCC) acts independently and serves as the voice of the warfighter, complementing the materiel developer in providing total capability management that integrates all doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) considerations. These resource requirements provide AFC and FCC resources to execute as lead for Accelerated Capability Development (ACD) and central coordination for Headquarters, Department of the Army (HQDA). These requirements support critical research, development, test and evaluation for Early Synthetic Prototyping and enable war-gaming and experimentation that engages soldiers across the Army to gain insights and recommendations in the development of future doctrine, organization, and materiel solutions. FCC integrates accelerated capabilities development activities between Army proponent force modernization managers as well as Joint / Sister Service coordination. AFC/FCC conducts Joint Warfighter Assessments to physically integrate, assess and evaluate adaptive capability sets to accelerate the systems acquisition process that provides DOTMLPF recommendations to the Army.

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

	FY 2018	FY 2019	FY 2020
Title: Joint Warfighting Assessments	2.085	2.118	3.337
FY 2019 Plans: Support Joint Expeditionary Maneuver and Entry Operations, Set the Theater, Special Operations Forces/Coalition Forces Interoperability, Air-Ground Reconnaissance and Security, Joint/Multinational Operations, Sea Basing/Joint Logistics Over the Shore (JLOTS), Mobile Command Posts (Expeditionary), Man Unmanned Teaming, (Ground/Air) (MUM-T), Accelerated Capabilities Developments, Early Synthetic Prototyping and Architecture Army Warfighting Assessments (AWA).			
FY 2020 Plans: Support Joint Expeditionary Maneuver and Entry Operations, Set the Theater, Special Operations Forces/Coalition Forces Interoperability, Air-Ground Reconnaissance and Security, Joint Multinational Operations, Sea Basing/Joint Logistics Over the Shore (JLOTS), Mobile Command Posts (Expeditionary), Man Unmanned Teaming, (Ground/Air) (MUM-T), Accelerated Capabilities Developments, Early Synthetic Prototyping and Architecture Joint Warfighting Assessments (JWA).			
FY 2019 to FY 2020 Increase/Decrease Statement: Increase corresponds to emphasize early Concepts Experimentation in Army Modernization Priorities.			
Title: Accelerated Capabilites Development	1.520	1.544	2.432

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>	Project (Number/Name) 317 / <i>Current Force Capability Gaps</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p><i>FY 2019 Plans:</i> Provide for TRADOC to serve as the lead Accelerated Capability Development to address current critical operational needs in enabling development and deployment/employment of accelerated capabilities (both materiel and non-materiel) to the current force. Serve as TRADOC central coordinating organization for Headquarters Department of the Army HQDA staff support requirements related to accelerated capabilities developments. Integrate ACD activities to ensure unity and priority of effort and synchronization and optimization of resources. Integrate accelerated capabilities development activities between proponent force modernization domains to include Joint/Service coordination.</p> <p><i>FY 2020 Plans:</i> Provide for AFC / Army Capabilities Integration Center (ARCIC) to serve as the lead Accelerated Capability Development to address current critical operational needs in enabling development and deployment of accelerated capabilities (both materiel and non-materiel) to the current force. Serve as AFC/ARCIC central coordinating organization for Headquarters Department of the Army HQDA staff support requirements related to accelerated capabilities developments. Integrate ACD activities to ensure unity and priority of effort and synchronization and optimization of resources. Integrate accelerated capabilities development activities between proponent force modernization.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Increase corresponds to emphasize early Concepts Experimentation in Army Modernization Priorities.</p>			
<p><i>Title:</i> CDID/TCM JCIDS Requirements Documentation</p> <p><i>Description:</i> In Fiscal Year 2014 the TRADOC Capability Development Integration Directorate (CDID) Capability Manager began finalizing a transfer of JCIDS Requirements Documentation Mission responsibility from the Assistant Secretary of the Army for Acquisition, Logistics, and Technology. This activity provides essential Joint Capabilities Integration and Development System Requirements Documentation.</p> <p><i>FY 2019 Plans:</i> Ensure TRADOC acts independently as the voice of the warfighter, the user, in complement with the materiel developer in providing total capability management including integration of all DOTMLPF consideration for warfighting functional areas.</p> <p><i>FY 2020 Plans:</i> Funding ensures AFC/ARCIC acts independently as the voice of the warfighter, the user, in complement with the materiel developer in providing total capability management including integration of all DOTMLPF considerations for warfighting functional areas.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i></p>	14.446	15.696	26.056

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>	Project (Number/Name) 317 / <i>Current Force Capability Gaps</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Increase corresponds to emphasize early Concepts Experimentation in Army Modernization Priorities.				
Title: ArCADIE New Requirements		2.012	2.044	3.221
Description: Army Capability-based Architecture Development and Integration Environment (ArCADIE) is the Army's authoritative source for architecture data and supports the community of practice requirement. ArCADIE provides a robust collaborative and common enterprise environment for architecture-related efforts in support of critical institutional processes throughout the TRADOC Centers of Excellence and Army/Joint/DOD partners. Offers a single, federated web-based environment for the development and discovery of integrated architectures across warfighting functions, and organizations throughout the Army Enterprise.				
FY 2019 Plans: Enable ARCIC to maintain ArCADIE and develop, verify, and validate operational architecture for 8 major BCT formations. Provide storage, accessibility, production, and certification of authoritative architecture data and supporting systems in accordance with DoD and DA information Assurance and management standards.				
FY 2020 Plans: Enable ARCIC to maintain ArCADIE and develop, verify, and validate operational architecture for 8 major BCT formations. Provide storage, accessibility, production, and certification of authoritative architecture data and supporting systems in accordance with DoD and DA information Assurance and management standards.				
FY 2019 to FY 2020 Increase/Decrease Statement: Increase corresponds to emphasize early Concepts Experimentation in Army Modernization Priorities.				
Title: FY19 SBIR/STTR adjustment		-	0.814	-
FY 2019 Plans: FY19 SBIR/STTR adjustment				
FY 2019 to FY 2020 Increase/Decrease Statement: FY19 SBIR/STTR adjustment				
Accomplishments/Planned Programs Subtotals		20.063	22.216	35.046
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>	Project (Number/Name) 317 / <i>Current Force Capability Gaps</i>
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>				Project (Number/Name) 33B / <i>Soldier-Centered Analyses For Future Force</i>			
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
33B: <i>Soldier-Centered Analyses For Future Force</i>	-	1.823	1.652	0.151	-	0.151	0.154	0.155	0.157	0.224	0.000	4.316
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project will provide early application of human performance and human figure modeling tools in the development of Soldier-focused requirements to shape technology for Future Force development. Efforts include design analyses, constructive simulations, and Soldier-in-the-loop assessments to ensure that manpower requirements and workload and skill demands are considered, avoiding information and physical task overloads and taking optimum advantage of aptitudes, individual and collective training, and numbers of Soldiers for an affordable Future Force.

The cited work is consistent with the Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP).

Work in this Project is performed by the Army Research Laboratory (ARL).

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

	FY 2018	FY 2019	FY 2020
Title: Manpower and Personnel Integration (MANPRINT)	1.823	1.652	0.151
<p>Description: Provide dedicated modeling and analysis cell for early and accurate MANPRINT estimates to Army Materiel Command (AMC), Research, Development, and Engineering Command (RDECOM) and its Research, Development, and Engineering Centers (RDECs), Training and Doctrine Command (TRADOC) Centers, Schools and Centers of Excellence (CoEs), Army Test and Evaluation Command (ATEC) and other service laboratories.</p> <p>FY 2019 Plans: Develop cognitive workload models to assess next-generation combat vehicle (NGCV) crewman ability to control multiple unmanned assets in a combined Manned-Unmanned Teaming (MuM-T) environment to allow crewman to think and act decisively to shoot, move and communicate more effectively. Collect dynamic motion data for NGCV crewman and format motion data for input into computer-assisted design (CAD) models to determine if proper crew offset exists in the design to minimize risk of injury. Incorporate scanned human body shape geometry into current 3D human figure boundary manikin models for improved analysis capability to shape technology for NGCV.</p> <p>FY 2020 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / <i>Concepts Experimentation Program</i>	Project (Number/Name) 33B / <i>Soldier-Centered Analyses For Future Force</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Will expand the digital library by developing 3D models of Soldier clothing and equipment items to perform early human figure modeling assessments of NGCV platform designs and enhancements.			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY 2020 decrease aligns program requirements with Army modernization priorities in support of the National Defense Strategy.			
Accomplishments/Planned Programs Subtotals	1.823	1.652	0.151

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0605502A / <i>Small Business Innovative Research</i>							
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	-	284.080	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	284.080
861: <i>SMALL BUS TECH - AMC</i>	-	35.025	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.025
M40: <i>SMALL BUSINESS-AMC</i>	-	249.055	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	249.055

Note

The Small Business Innovation Research (or SBIR) program is a United States Government program, coordinated by the Small Business Administration, in which 3.2% of the total extramural research budgets of all federal agencies with extramural research budgets in excess of \$100 million are reserved for contracts or grants to small businesses. A similar program, the Small Business Technology Transfer Program (STTR), uses a similar approach to the SBIR program to expand public/private sector partnerships between small businesses and nonprofit U.S. research institutions, and is funded at present at .45% of the relevant agencies' extramural research budgets.

There is no Fiscal Year 2019 or Fiscal Year 2020 budget programming for Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR). Funds for SBIR / STTR are redistributed in the year of execution from across the Army Research, Development, Test & Evaluation portfolio.

A. Mission Description and Budget Item Justification

The Small Business Innovation Research (SBIR) program is a United States Government program, coordinated by the Small Business Administration, in which 3.2% of the total extramural research budgets of all federal agencies with extramural research budgets in excess of \$100 million are reserved for contracts or grants to small businesses. A similar program, the Small Business Technology Transfer Program (STTR), uses a similar approach to the SBIR program to expand public/private sector partnerships between small businesses and nonprofit U.S. research institutions, and is currently funded at .45% of the relevant agencies' extramural research budgets.

This Program Element is used exclusively to account for SBIR / STTR program funding in the year of execution.

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	284.080	0.000	0.000	-	0.000
Total Adjustments	284.080	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	284.080	-	-	-	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605502A / <i>Small Business Innovative Research</i>	

Change Summary Explanation

Fiscal Year 2018 and Fiscal Year 2019 adjustments represent internal Army reprogrammings to support Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR). Funds for SBIR / STTR are redistributed in the year of execution from across the Army Research, Development, Test & Evaluation portfolio.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605502A / <i>Small Business Innovative Research</i>				Project (Number/Name) 861 / <i>SMALL BUS TECH - AMC</i>			
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
861: <i>SMALL BUS TECH - AMC</i>	-	35.025	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	35.025
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Small Business Innovation Research (SBIR) program is a United States Government program, coordinated by the Small Business Administration, in which 3.2% of the total extramural research budgets of all federal agencies with extramural research budgets in excess of \$100 million are reserved for contracts or grants to small businesses. A similar program, the Small Business Technology Transfer Program (STTR), uses a similar approach to the SBIR program to expand public/private sector partnerships between small businesses and nonprofit U.S. research institutions, and is funded at present at .45% of the relevant agencies' extramural research budgets.

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605502A / <i>Small Business Innovative Research</i>	Project (Number/Name) M40 / <i>SMALL BUSINESS-AMC</i>
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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
M40: <i>SMALL BUSINESS-AMC</i>	-	249.055	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	249.055
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Small Business Innovation Research (or SBIR) program is a United States Government program, coordinated by the Small Business Administration, in which 3.2% of the total extramural research budgets of all federal agencies with extramural research budgets in excess of \$100 million are reserved for contracts or grants to small businesses. A similar program, the Small Business Technology Transfer Program (STTR), uses a similar approach to the SBIR program to expand public/private sector partnerships between small businesses and nonprofit U.S. research institutions, and is funded at present at .45% of the relevant agencies' extramural research budgets.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0605601A / <i>Army Test Ranges and Facilities</i>							
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	-	313.589	315.634	334.468	-	334.468	341.811	349.697	349.433	357.528	0.000	2,362.160
F30: <i>Army Test Ranges & Facilities</i>	-	313.589	315.634	334.468	-	334.468	341.811	349.697	349.433	357.528	0.000	2,362.160

A. Mission Description and Budget Item Justification

This Program Element (PE) provides the institutional funding required to operate test activities in accordance with Public Law 107-314 (National Defense Authorization Act for Fiscal Year 2003) Section 232 ("Objective for institutional funding of test and evaluation facilities") in support of Department of Defense (DoD) Program Executive Officers, Program and Product Managers, Research, Development, and Engineering Centers and to the Army Futures Command. Resources provided by this PE operate six elements of the DoD Major Range and Test Facility Base (MRTFB): White Sands Test Center (WSTC) - White Sands Missile Range, New Mexico; Aberdeen Test Center (ATC) - Aberdeen Proving Ground, Maryland; Electronic Proving Ground (EPG) - Fort Huachuca, Arizona; Yuma Test Center (YTC) - Yuma Proving Ground, Arizona; Cold Regions Test Center (CRTC) - Fort Greely, Alaska; and Tropic Regions Test Centers (TRTC) at various locations. This PE also funds the Army's test capability at Redstone Test Center (RTC) - Redstone Arsenal, Alabama.

This PE finances the overhead (institutional) test operating costs not billable to DoD test customers per Department of Defense Instruction (DODI) 3200.18 and Department of Defense Financial Management Regulation (DODFMR) 7000.14-R, which include: recurring test infrastructure/capability sustainment requirements; replacement of test equipment; test operating procedures; and test revitalization/upgrade projects to maintain \$5.5 Billion of testing capabilities; and improvements to the safety, environmental protection, and efficiency of test operations. The test capabilities at these ranges have been uniquely established, are in place to support test and evaluation (T&E) requirements of funded weapons programs, and are required to assure technical performance, adherence to safety requirements, reliability, logistics supportability, Title 10 Live Fire Test and Evaluation, transportability, environmental effects, cyber, electromagnetic effects, and quality of materiel in development and in production.

This PE sustains the T&E capability required to support Army as well as Joint Service or Other Service systems, materiel, and technologies. Types of systems scheduled for testing include, but are not limited to: Aircraft, Air Delivery, Unmanned Aerial Systems, Counter Unmanned Aerial Systems, Unmanned Ground Vehicles, Air and Missile Defense Systems, Engineering Equipment, Direct fire, Indirect fire, Nonlethal weapons, Ammunition, Automotive Systems, Intelligence Surveillance and Reconnaissance, Ground Soldier Systems, Missiles, Rockets, Mission Command Network, Tactical Command, Control, and Communications, and Robotics/Unmanned Autonomous Systems.

Specific systems supported in Fiscal Year (FY) 2019 with continued support in FY 2020 include: Joint Light Tactical Vehicle (JLTV), Stryker (30mm, ICV), Joint Assault Bridge, Armored Multi-Purpose Vehicle (AMPV), Mobile Protective Firepower, Warfighter Information Network Tactical (WIN-T), AN/ TPQ53 Radar, Distributed Common Ground Sensor - Army (DCGS-A), Patriot Advanced Capability-3 (PAC-3), Joint Air-to-Ground Missile, Army Integrated Air and Missile Defense (AIAMD), M109A7 Family of Vehicles, XM25 Counter Defilade Target Engagement (CDTE), Gray Eagle Extended Range Handheld, Manpack and Small Form Fit (HMS) Man Pack Radio, Soldier Protective System, Precision Guidance Kit (PGK), Marine Corp Amphibious Combat Vehicle, Extended Range Cannon Artillery (ERCA), Autonomous Ground Resupply Safety Test (AGR), Improved-Forward Looking Infrared (I-FLIR), Precision Strike Munition (PrSM), Bradley Fighting Vehicle, Next Generation Squad Weapon

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605601A / <i>Army Test Ranges and Facilities</i>
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Automatic Rifle, Robotic Combat Vehicle, Next Generation Combat Vehicle (NGCV), Army Tactical Missile System (ATACMS), Maneuver Short Range Air Defense (M-SHORAD).

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	307.588	305.759	313.316	-	313.316
Current President's Budget	313.589	315.634	334.468	-	334.468
Total Adjustments	6.001	9.875	21.152	-	21.152
• Congressional General Reductions	-0.082	-0.125			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	10.000	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.917	-			
• Adjustments to Budget Years	-	-	21.152	-	21.152

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: F30: *Army Test Ranges & Facilities*

Congressional Add: *Cybersecurity Vulnerability and Assessment Test Environment (CVATE)*

Congressional Add Subtotals for Project: F30

Congressional Add Totals for all Projects

	FY 2018	FY 2019
	10.000	10.000
	10.000	10.000
	10.000	10.000

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities				Project (Number/Name) F30 / Army Test Ranges & Facilities			
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
F30: Army Test Ranges & Facilities	-	313.589	315.634	334.468	-	334.468	341.811	349.697	349.433	357.528	0.000	2,362.160
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides the institutional funding required to operate test activities in accordance with Public Law 107-314 (National Defense Authorization Act for Fiscal Year 2003) Section 232 ("Objective for institutional funding of test and evaluation facilities") in support of Department of Defense (DoD) Program Executive Officers, Program and Product Managers, Research, Development, and Engineering Centers and to the Army Futures Command. Resources provided by this Project operate six elements of the DoD Major Range and Test Facility Base (MRTFB): White Sands Test Center (WSTC) - White Sands Missile Range, New Mexico; Aberdeen Test Center (ATC) - Aberdeen Proving Ground, Maryland; Electronic Proving Ground (EPG) - Fort Huachuca, Arizona; Yuma Test Center (YTC) - Yuma Proving Ground, Arizona; Cold Regions Test Center (CRTC) - Fort Greely, Alaska; and Tropic Regions Test Centers (TRTC) at various locations. This Project also funds the Army's test capability at Redstone Test Center (RTC) - Redstone Arsenal, Alabama.

This Project finances the overhead (institutional) test operating costs not billable to DoD test customers per Department of Defense Instruction (DODI) 3200.18 and Department of Defense Financial Management Regulation (DODFMR) 7000.14-R, which include: recurring test infrastructure/capability sustainment requirements; replacement of test equipment; test operating procedures; test revitalization/upgrade projects to maintain \$5.5 Billion of testing capabilities; and improvements to the safety, environmental protection, and efficiency of test operations. The test capabilities at these ranges have been uniquely established, are in place to support test and evaluation (T&E) requirements of funded weapons programs, and are required to assure technical performance, adherence to safety requirements, reliability, logistics supportability, Title 10 Live Fire Test and Evaluation, transportability, environmental effects, cyber, electromagnetic effects, and quality of materiel in development and in production.

This Project sustains the T&E capability required to support Army as well as Joint Service or Other Service systems, materiel, and technologies. Types of systems scheduled for testing include, but are not limited to: Aircraft, Air Delivery, Unmanned Aerial Systems, Counter Unmanned Aerial Systems, Unmanned Ground Vehicles, Air and Missile Defense Systems, Engineering Equipment, Direct fire, Indirect fire, Nonlethal weapons, Ammunition, Automotive Systems, Intelligence Surveillance and Reconnaissance, Ground Soldier Systems, Missiles, Rockets, Mission Command Network, Tactical Command, Control, and Communications, and Robotics/Unmanned Autonomous Systems.

Specific systems supported in Fiscal Year (FY) 2019 with continued support in FY 2020 include: Joint Light Tactical Vehicle (JLTV), Stryker (30mm, ICV), Joint Assault Bridge, Armored Multi-Purpose Vehicle (AMPV), Mobile Protective Firepower, Warfighter Information Network Tactical (WIN-T), AN/ TPQ53 Radar, Distributed Common Ground Sensor - Army (DCGS-A), Patriot Advanced Capability-3 (PAC-3), Joint Air-to-Ground Missile, Army Integrated Air and Missile Defense (AIAMD), M109A7 Family of Vehicles, XM25 Counter Defilade Target Engagement (CDTE), Gray Eagle Extended Range Handheld, Manpack and Small Form Fit (HMS) Man Pack Radio, Soldier Protective System, Precision Guidance Kit (PGK), Marine Corp Amphibious Combat Vehicle, Extended Range Cannon Artillery (ERCA), Autonomous Ground Resupply Safety Test (AGR), Improved-Forward Looking Infrared (I-FLIR), Precision Strike Munition (PrSM), Bradley Fighting Vehicle, Next Generation Squad Weapon

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities		
Automatic Rifle, Robotic Combat Vehicle, Next Generation Combat Vehicle (NGCV), Army Tactical Missile System (ATACMS), Maneuver Short Range Air Defense (M-SHORAD).				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Title: Mission Support		77.679	58.486	86.271
Description: Funds support: test equipment upgrades and maintenance; test facility maintenance; calibration requirements; handling and disposal of hazardous materials, transportation, postage, administrative supplies; tools; software; spare parts; test support vehicle maintenance; mission unique installation costs; temporary duty/training of civilian and contractor personnel; certifications; printing and reproduction; communications; land leases; and range road maintenance. Funding supports indirect costs for MRTFB Activities (ATC, EPG, WSTC, YTC (including CRTC & TRTC)) in accordance with DODI 3200.18 and DODFMR 7000.14-R.				
FY 2019 Plans: Funds will continue to support test equipment upgrades and maintenance; test facility maintenance; calibration requirements; handling and disposal of hazardous materials, transportation, postage, administrative supplies; tools; software; spare parts; test support vehicle maintenance; mission unique installation costs; temporary duty/training of civilian and contractor personnel; certifications; printing and reproduction; communications; land leases; and range road maintenance. Funding supports indirect costs for MRTFB Activities (ATC, EPG, WSTC, YTC (including CRTC & TRTC)) in accordance with DODI 3200.18 and DODFMR 7000.14-R.				
FY 2020 Plans: Funds will continue to support test equipment upgrades and maintenance; test facility maintenance; calibration requirements; handling and disposal of hazardous materials, transportation, postage, administrative supplies; tools; software; spare parts; test support vehicle maintenance; mission unique installation costs; temporary duty/training of civilian and contractor personnel; certifications; printing and reproduction; communications; land leases; and range road maintenance. Funding supports indirect costs for MRTFB Activities (ATC, EPG, WSTC, YTC (including CRTC & TRTC)) in accordance with DODI 3200.18 and DODFMR 7000.14-R.				
FY 2019 to FY 2020 Increase/Decrease Statement: Increase in funding will support sustainment of the test capabilities.				
Title: T&E Civilian Pay		139.659	144.279	149.297
Description: This funding supports the overhead costs of the civilian labor for Program Budget Guidance (PBG) authorizations. The balance is customer funded. The test customer pays all direct costs that are directly attributable to the use of a test facility or resource for testing of a particular program. Funding is essential to maintain core T&E skills as part of the Government civilian workforce.				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>FY 2019 Plans: Funds will continue to support the overhead costs of the civilian labor for PBG authorizations. The balance will be customer funded. The test customer will pay all direct costs directly attributable to the use of a test facility or resource for testing of a particular program. Funding will be essential to maintain core T&E skills as part of the Government civilian workforce.</p> <p>FY 2020 Plans: Funds will continue to support the overhead costs of the civilian labor for PBG authorizations. The balance will be customer funded. The test customer will pay all direct costs directly attributable to the use of a test facility or resource for testing of a particular program. Funding will be essential to maintain core T&E skills as part of the Government civilian workforce.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to inflation for civilian pay; the majority of the workforce is in the Acquisition Demonstration Program.</p>				
<p>Title: Contractor Support</p> <p>Description: This funding supports contractor labor costs not billable to customers. Contract labor is essential to augment core civilian T&E personnel with additional capabilities and/or capacity. Functions performed include range operations, automotive test support, radar maintenance, warehousing support, project management, maintenance of support fleet aircraft, recurring/general maintenance to test facilities and data acquisition support.</p> <p>FY 2019 Plans: Funds will continue to support contractor labor costs not billable to the customer. Contract labor will be essential to augment core civilian T&E personnel. Functions performed will include range operations, automotive test support, radar maintenance, warehousing support, project management, maintenance of support fleet aircraft, recurring/general maintenance to test facilities and data acquisition support.</p> <p>FY 2020 Plans: Funds will continue to support contractor labor costs not billable to the customer. Contract labor will be essential to augment core civilian T&E personnel. Functions performed will include range operations, automotive test support, radar maintenance, warehousing support, project management, maintenance of support fleet aircraft, recurring/general maintenance to test facilities and data acquisition support.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease due to the adjustments in contractor workforce.</p>		50.116	60.294	53.914
<p>Title: Revitalization/Upgrade</p>		5.000	5.000	5.000

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: Funds support the revitalization/upgrade of critical test infrastructure and capabilities. MRTFB elements are required to use institutional funding to sustain, upgrade or create capabilities that support multiple customers. Funding will be focused on improving test and evaluation capabilities for the highest priority Army programs.</p> <p>FY 2019 Plans: Funds will continue to support the revitalization/upgrade of critical test infrastructure and capabilities. MRTFB elements will be required to use institutional funding to sustain or upgrade capabilities that support multiple customers. Funding will be focused on improving test and evaluation capabilities for the highest priority Army programs.</p> <p>FY 2020 Plans: Funds will continue to support the revitalization/upgrade of critical test infrastructure and capabilities. MRTFB elements will be required to use institutional funding to sustain or upgrade capabilities that support multiple customers. Funding will be focused on improving test and evaluation capabilities for the highest priority Army programs.</p>			
<p>Title: Physical Security Guards and Equipment</p> <p>Description: This funding supports physical security guards mandated by regulation to guard Army Test and Evaluation Command's (ATEC's) Fast Burst Nuclear Reactor (FBR) at White Sands Missile Range (WSMR) in accordance with (IAW) Army Regulation (AR) 190-54 and Chemical Biological (CB) facilities located at Dugway Proving Ground (DPG) IAW AR 190-50 and AR 190-17. These surety facilities maintain nuclear, biological, and chemical (NBC) materials and agents in order to test the effects and effectiveness of defensive or protective equipment and measures. The physical security equipment consists of concrete barriers, security fencing around test sites, cameras, gate controllers, access and intrusion detection systems, alarms, and maintenance contracts for equipment. This equipment is necessary to secure arms rooms, ammunition storage facilities, The Fast Burst Nuclear Reactor and chemical biological surety sites. Physical security equipment is critical to maintain current security requirements as outlined in AR 190-17, AR 190-59, AR 190-51, and AR 190-13.</p> <p>FY 2019 Plans: Funds will support the physical security guards and equipment for the Fast Burst Nuclear Reactor at WSMR and Chemical Biological facilities at DPG.</p> <p>FY 2020 Plans: Funds will support the physical security guards and equipment for the Fast Burst Nuclear Reactor at WSMR and Chemical Biological facilities at DPG.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>	12.733	12.492	12.726

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Increase due to inflation for civilian pay and routine program adjustments.				
<p>Title: UH-60 Aircraft</p> <p>Description: This funding supports the Aviation Restructure Initiative endorsed by the SECDEF. Funding supports aircraft maintenance, aircrew labor, mandatory training, and aircraft flying hours. In accordance with DODI 3200.18 and DODFMR 7000.14-R, these costs are not billable to the test customers. UH-60 helicopters are used to provide essential logistical, sensor platform and aerial photo/video documentation support for developmental testing.</p> <p>FY 2019 Plans: Funds will support UH-60 helicopter maintenance, aircrew labor, mandatory training and aircraft flying hours.</p> <p>FY 2020 Plans: Funds will support UH-60 helicopter maintenance, aircrew labor, mandatory training and aircraft flying hours.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Change is due to program requirement adjustments.</p>		5.631	5.740	5.855
<p>Title: Network Enterprise Center</p> <p>Description: This funding supports the Network Enterprise Center (NEC) operations for WSTC and YTC. Funding supports manpower and contracts, support equipment and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Communication, Network, and Information Technology Services Management.</p> <p>FY 2019 Plans: Funds will support all labor, support equipment, and training required for the Network Enterprise Center.</p> <p>FY 2020 Plans: Funds will support all labor, support equipment, and training required for the Network Enterprise Center operations at WSTC and YTC.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>		11.152	12.936	12.587
<p>Title: Cybersecurity Service Provider (CSSP)</p> <p>Description: This requirement supports compliance with Department of Defense Directive (DoDD) 8530.1 and Department of Defense Instruction (DoDI), which directed that all component information systems and computer networks be assigned to a certified CSSP and that all information systems and computer networks must enter into a service agreement with a CSSP. United States (U.S.) Army Cyber Command (ARCYBER) Operations Order (OPORD) 2014-224 directed all Commands/Direct Reporting</p>		1.619	1.800	1.818

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Units (DRU) to take immediate measures to ensure Army assets connected to Defense Research and Engineering Network (DREN) and Secure Defense Research and Engineering Network (SDREN) enclaves are aligned with the U.S. Army Research Laboratory as their CSSP to ensure cyber defense oversight and information security continuous monitoring going forward.</p> <p>FY 2019 Plans: Funds will support cyber defense oversight and continuous monitoring of information security.</p> <p>FY 2020 Plans: Funds will support cyber defense oversight and continuous monitoring of information security.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Minor change due to inflation adjustments.</p>				
<p>Title: Military Construction Mission Unique Equipment</p> <p>Description: In 2017, the Army programmed ATEC?s top six Military Construction (MILCON) projects, in response to Congressional interest in the lack of investment and sustainment of Major Range and Test Facility Bases (MRTFBs) and the associated risk to the development of future technology. This unanticipated event has resulted in an emergent requirement for the necessary Mission Unique Equipment (MUE) associated with each project. MUE includes items that are movable and not affixed as an integral part of the facility, but are required to perform the mission of the facility.</p> <p>FY 2020 Plans: Funds will support two MUE projects. The Electronic Proving Ground (EPG) Ground Transport Equipment Building Complex will support vehicle and equipment maintenance and provide platforms for the testing, analysis, and storage of C4I systems and Signal Intelligence, and Electronic Combat (EC)/Electronic Warfare (EW) equipment. The White Sands Test Center (WSTC) Information Systems Facility (ISF) will serve as the main hub to inter-connect internal and external White Sands Missile Range (WSMR) data and voice networks used by all test programs, range operations, and other DOD organizations.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funds are allocated only in FY2020.</p>		-	-	7.000
<p>Title: FY 2019 SBIR / STTR Transfer</p> <p>Description: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 Plans: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>		-	4.607	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 SBIR / STTR Transfer			
Accomplishments/Planned Programs Subtotals	303.589	305.634	334.468

	FY 2018	FY 2019
Congressional Add: Cybersecurity Vulnerability and Assessment Test Environment (CVATE)	10.000	10.000
FY 2018 Accomplishments: Cybersecurity Vulnerability and Assessment Test Environment (CVATE)		
FY 2019 Plans: Cybersecurity Vulnerability and Assessment Test Environment (CVATE)		
Congressional Adds Subtotals	10.000	10.000

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605602A / <i>Army Technical Test Instrumentation and Targets</i>
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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
Total Program Element	-	57.395	84.805	46.974	-	46.974	48.132	49.559	50.338	51.547	0.000	388.750
628: <i>Developmental Test Technology & Sustainment</i>	-	42.712	68.072	33.215	-	33.215	33.894	34.851	35.261	36.064	0.000	284.069
62C: <i>Modeling and Simulation Instrumentation</i>	-	14.683	16.733	13.759	-	13.759	14.238	14.708	15.077	15.483	0.000	104.681

A. Mission Description and Budget Item Justification

This Program Element (PE) provides critical front-end investments for development of: new test methodologies; test standards; advanced test technology concepts for long range requirements; future test capabilities; advanced development of Modeling and Simulation and Instrumentation (MS&I) prototypes; and the full development of test instrumentation for the United States Army Test and Evaluation Command (ATEC), which includes the Operational Test Command (OTC) at Ft Hood, Texas; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; White Sands Test Center (WSTC) at White Sands Missile Range (WSMR), New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; Yuma Test Center (YTC) at Yuma Proving Grounds (YPG), Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska and the Tropics Regions Test Center (TRTC), at various locations); and Redstone Test Center (RTC), Redstone Arsenal, Alabama. OTC consists of three forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air Defense Artillery Test Directorate, Fort Bliss, Texas; and the Fires Test Directorate, Fort Sill, Oklahoma) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Ft Hood, Texas. These activities support the development and fielding cycle of all Army acquisition programs including rapid fielding initiatives. Sustainment funding maintains existing testing capabilities at all locations by replacing unreliable, uneconomical, and irreparable instrumentation, as well as incremental upgrades of hardware and software for MS&I systems to assure adequate test data collection capabilities. This data supports acquisition milestone decisions for all commodity areas throughout the Army including programs such as the Joint Light Tactical Vehicle (JLTV), Advanced Multi-Purpose Vehicle (AMPV), Network Integration Evaluation (NIE), Patriot Advance Capability Phase 3 (PAC-3), Warfighter Information Network - Tactical (WIN-T), Stryker, Bradley, Abrams, Guided Multiple Launch Rocket System (GMLRS), Joint Tactical Radio System (JTRS), and the Distributed Common Ground System - Army (DCGS-A).

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605602A / <i>Army Technical Test Instrumentation and Targets</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	49.242	62.379	50.257	-	50.257
Current President's Budget	57.395	84.805	46.974	-	46.974
Total Adjustments	8.153	22.426	-3.283	-	-3.283
• Congressional General Reductions	-0.037	-0.074			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	10.000	22.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.810	-			
• Adjustments to Budget Years	-	-	-3.283	-	-3.283

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 628: *Developmental Test Technology & Sustainment*

Congressional Add: *Developmental Test Technology & Sustainment*

	FY 2018	FY 2019
	10.000	22.500
Congressional Add Subtotals for Project: 628	10.000	22.500
Congressional Add Totals for all Projects	10.000	22.500

Change Summary Explanation

Fiscal Year (FY) 2018 congressional add (\$10.000 million) for Cybersecurity of space and missile defense assets.

FY19 congressional add (\$22.500 million) for Cybersecurity of space and missile defense assets.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605602A / Army Technical Test Instrumentation and Targets				Project (Number/Name) 628 / Developmental Test Technology & Sustainment			
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
628: Developmental Test Technology & Sustainment	-	42.712	68.072	33.215	-	33.215	33.894	34.851	35.261	36.064	0.000	284.069
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides critical front-end investments for development of new test methodologies, test standards, advanced test technology concepts for long range requirements, future test capabilities, and advanced instrumentation prototypes for subordinate commands of the Army Test and Evaluation Command (ATEC). These capabilities are required to support developmental testing requirements of high priority Army systems supporting Army modernization efforts. Where practical, efficiencies will be gained through the common use of developmental instrumentation in operational testing. A key element is sustaining aging instrumentation which maintains existing capabilities at test facilities by replacing unreliable, uneconomical and irreparable instrumentation, as well as lifecycle replacement and incremental upgrades of instrumentation and software, reducing their average age to assure adequate testing capabilities. This Project develops and sustains developmental test instrumentation and capabilities that provide the data necessary to support acquisition milestone decisions for all commodity areas throughout the Army. Significant examples include new instrumentation for the testing of Command, Control, Communication and Computer (C4) systems, upgrades to existing radars to extend their economic life, common data collection and analysis tools, non-intrusive instrumentation to test Unmanned Ground Vehicles and sensors, high speed - high definition digital imaging systems to capture missile flight events, and automation software to improve data collection of reliability, availability, and maintainability (RAM) testing.

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

	FY 2018	FY 2019	FY 2020
Title: Developmental Test Technology Investment	32.712	43.998	33.215
Description: Develops, acquires, and sustains critical test technology and instrumentation. Provides the necessary test instrumentation, computer and communications systems, data collection, analysis and reporting equipment, and other special test capabilities to successfully develop and test Army weapons and equipment. Provides the necessary live, virtual and constructive environment, hardware-in-the-loop capabilities, and modeling and simulation (M&S) needed for testing Army materiel solutions. Acquires instrumentation to measure performance of C4 systems; reliability, availability, and maintainability (RAM) data collection on tracked and wheeled vehicles; ballistic transducers for measuring chamber pressures during ammunition and barrel tests; supports development of common data collection instrumentation and data management systems used in testing across all test commodity areas and lifecycles; continues replacement and upgrade of range control instrumentation, radar, optics and telemetry used in missile testing; acquires data recorders, signal conditioning equipment, data processing equipment and other instrumentation for various aircraft tests; upgrades natural environments test instrumentation used for testing weapon systems, vehicles, munitions and support equipment in extreme hot desert environments as well as extreme cold conditions; continues upgrade of survivability/vulnerability test capabilities in support of live fire testing; upgrades and replaces mobile range communications equipment and digital end devices; and improves test efficiency through the use of smart devices as data collectors.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605602A / <i>Army Technical Test Instrumentation and Targets</i>	Project (Number/Name) 628 / <i>Developmental Test Technology & Sustainment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p><i>FY 2019 Plans:</i> Test centers continue to provide, acquire and upgrade instrumentation for C4; RAM; ballistics, missile, aviation and environmental testing across all test commodity areas and enhance/expand the use of common data collectors, smart devices, and enterprise data management tools. This includes the continuation and completion of previous fiscal year initiatives in addition to the execution of new initiatives to modernize test infrastructure. The Redstone Test Center (RTC) will complete a critical storage backup system modernization program that will permit RTC to store the substantial developmental test data. The Aberdeen Test Center (ATC) will continue its vehicle Crew Survivability Instrumentation and small arms instrumentation developments. The Electronic Proving Ground (EPG) will continue the development of Phoenix Architecture for data collection systems to store, analyze, and fully characterize the increased volume of data from high throughput network systems. The White Sands Test Center (WSTC) and the Yuma Test Center (YTC) will develop Counter-Unmanned Aerial System (cUAS) testing capabilities. WSTC will modernize test support equipment for Long Range Precision Fires and Air and Missile Defense and will continue its Flight Termination Systems Modernization program. YTC will continue service life extension programs for close-in and fly-out radars.</p> <p><i>FY 2020 Plans:</i> Test centers will continue to provide, acquire, and upgrade instrumentation for C4, RAM, ballistics, missile, aviation and environmental testing across all test commodity areas and enhance/expand the use of common data collectors, smart devices, and enterprise data management tools. Examples include ATC Crew Survivability Instrumentation during Live Fire Test and Evaluation (LFT&E); EPG Phoenix Architecture project for future data demand; RTC Aircraft Survivability Equipment (ASE) Data Processing and Analysis; WSMR Aerial Cable Lifecycle Replacement project to replace critical components reaching the end of their useful lives; and YTC cUAS test capability for anticipated cUAS technology systems which can detect, track, identify and collect data on hostile UAS systems.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Funding adjustments align program requirements with Army modernization priorities in support of the National Defense Strategy.</p> <p><i>Title:</i> FY 2019 SBIR / STTR Transfer <i>Description:</i> FY 2019 SBIR / STTR Transfer</p> <p><i>FY 2019 Plans:</i> FY 2019 SBIR / STTR Transfer</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY 2019 SBIR / STTR Transfer</p>			
Accomplishments/Planned Programs Subtotals	32.712	45.572	33.215

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605602A / <i>Army Technical Test Instrumentation and Targets</i>	Project (Number/Name) 628 / <i>Developmental Test Technology & Sustainment</i>
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	FY 2018	FY 2019
Congressional Add: Developmental Test Technology & Sustainment	10.000	22.500
FY 2018 Accomplishments: Developmental Test Technology & Sustainment		
FY 2019 Plans: Developmental Test Technology & Sustainment		
Congressional Adds Subtotals	10.000	22.500

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605602A / Army Technical Test Instrumentation and Targets				Project (Number/Name) 62C / Modeling and Simulation Instrumentation			
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
62C: Modeling and Simulation Instrumentation	-	14.683	16.733	13.759	-	13.759	14.238	14.708	15.077	15.483	0.000	104.681
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The United States (U.S.) Army Test and Evaluation Command (ATEC) plans, conducts and reports on operational tests, assessments and experiments in order to provide essential information for the acquisition and fielding of War Fighting Systems. Operational Test (OT) Modeling Simulation and Instrumentation (MS&I) collects required data from systems under test and the systems which they integrate with to support effectiveness, survivability, and suitability analyses. These systems also provide real-time position location and status tracking to support test control. The Army's Operations Tempo (OPTEMPO) has reduced the number of tactical units and vehicles available to support OT, making enhancement of live forces through simulation essential for testing in realistic, operational environments by simulating tactical engagements, additional units, message traffic, effects, and terrain. ATEC OT MS&I funding is used to adapt capabilities from other organizations (including within ATEC), purchase commercial off-the-shelf systems, and develop and sustain OT-unique simulation and instrumentation systems. As required, the Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) Project Manager for Instrumentation, Targets and Threat Simulators (PM ITTS) provides development and integration of major simulation and instrumentation systems such as Integrated Live, Virtual, and Constructive (LVC) Test Environment (ILTE). The MS&I (Sustainment and Minor Development) program funds the expertise and the adaptation, purchases, minor development and sustainment requirements that support systems undergoing OT. Costs unique to specific systems under test may require Program Manager (PM) funding.

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

	FY 2018	FY 2019	FY 2020
Title: Modeling, Simulation and Instrumentation	14.683	16.119	13.759
Description: Develops and enhances ATEC's simulation/stimulation of Mission Command; Fire Support; Air Defense; Command, Control, Communications, and Computers Intelligence, Surveillance and Reconnaissance (C4ISR); and Network systems. Improves and sustains Real-Time Casualty Assessment (RTCA) (including ILTE capabilities). Also develops, enhances, and sustains Performance Instrumentation Systems, Time Space Positioning Information (TSPI), Telemetry Systems, and Imaging Systems together with their associated data management enabling capabilities.			
FY 2019 Plans: Continue to sustain ATEC's Fire Support, Air and Missile Defense, C4ISR, and Network OT tools. Will improve OTC's RTCA secure network and tactical engagement simulation system capabilities to support future Army Integrated Air and Missile Defense (AIAMD), Joint Tactical Radio System (JTRS), Leaders Radio, Mid-Tier Networking Vehicular Radio (MNVR), Joint Enterprise Network Manager (JENM), and Shadow (RQ-7BVN) Tactical Unmanned Aerial System (TUAS) Operational Tests (OTs). Will support the Abrams and Bradley PIP, AN/TPQ-53, Distributed Common Ground System - Army (DCGS-A), and Joint Warning and Reporting Network (JWARN) OTs. Will sustain Performance Instrumentation Systems, TSPI, and Telemetry and Imaging Systems			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605602A / Army Technical Test Instrumentation and Targets	Project (Number/Name) 62C / Modeling and Simulation Instrumentation		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>and associated data management (e.g. collection, reduction, analysis, and visualization) enabling capabilities. Will execute life cycle replacement of legacy MS&I systems which have reached end of useful life. Will sustain and upgrade MS&I systems used for operational tests.</p> <p>FY 2020 Plans: Will continue to sustain ATEC's Fire Support, Air and Missile Defense, C4ISR, and Network OT tools. Will improve OTC's RTCA secure network and tactical engagement simulation system capabilities to support future Bradley, Global Position System III, Indirect Fire Protection Capability (IFPC), Patriot PDB-8, and Integrated Air and Missile Defense (IAMD) OTs. Will support the AIAMD, DCGS-A, Manpack, Joint Enterprise Network Manager (JENM), Leaders Radio, and Shadow (RQ-7BVN) TUAS OTs. Will sustain Performance Instrumentation Systems, TSPI, and Telemetry and Imaging Systems and associated data management (e.g. collection, reduction, analysis, and visualization) enabling capabilities. Will execute life cycle replacement of legacy MS&I systems which have reached end of useful life. Will sustain and upgrade MS&I systems used for operational tests.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 funding was adjusted to align program requirements with Army modernization priorities in support of the National Defense Strategy.</p>				
<p>Title: FY 2019 SBIR / STTR Transfer</p> <p>Description: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 Plans: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SBIR / STTR Transfer</p>		-	0.614	-
Accomplishments/Planned Programs Subtotals		14.683	16.733	13.759
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				
E. Performance Metrics				
N/A				

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0605604A / <i>Survivability/Lethality Analysis</i>							
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	-	41.296	40.480	35.075	-	35.075	35.881	36.719	35.600	36.174	0.000	261.225
675: <i>Army Survivability Analysis & Evaluation Supp</i>	-	41.296	40.480	35.075	-	35.075	35.881	36.719	35.600	36.174	0.000	261.225

A. Mission Description and Budget Item Justification

This Program Element (PE) funds objective vulnerability assessment products necessary for the inherently-governmental Army Test & Evaluation Command/Army Evaluation Center (ATEC/ AEC) mission, for the Research and Development communities as well as the Analytical communities. Products result from investigating, analyzing, assessing, experimenting and reporting on the survivability of Soldiers, and on the survivability, lethality and vulnerability (SLV) of the highest-priority Army and threat systems. Products are leveraged within the Army Futures Command and the Program Manager / Program Executive Office (PM/PEO) community to exercise constructive design influence over materiel development and to provide credible engineering-level underpinning and input to the Army Analytical Community. While the Army is at war, analytical results funded by this PE are also directly leveraged for urgent materiel releases and support to current operations.

This PE provides quantitative lethality and survivability analyses and data for fielded and developmental systems as the Army pursues its modernization priorities and ensures readiness through the fielding of lethal and survivable systems for multi-domain operations. PE funds engineering level SLV analysis in the areas of Long Range Precision Fires systems, Next Generation Combat Vehicles, Future Vertical Lift, Network/C3I, Air & Missile Defense, Soldier Lethality, and other highest Army priority efforts in the threat competencies of ballistics, electronic warfare, and cyber.

Vulnerability assessments funded by this PE are conducted across the spectrum of multi-domain battlefield threats to include: guns, missiles, mines and other methods of inflicting physical damage; jammers, countermeasures, and other electronic warfare techniques; cyber threats from insiders to external nation states; and directed energy weapons. Many different kinds of technical capabilities are used to generate these analyses, including specialized equipment, modeling & simulation, and experimental facilities. This PE ensures these capabilities can represent a credible live, virtual, or constructive hostile environment required for vulnerability assessment, thus enabling evaluators, developers, users, and decision makers to make informed SLV judgments for both Soldiers and materiel. These technical survivability and lethality details: enable properly informed decisions concerning acquisition and production; maximize Army overmatch in systems and tactics; inform investment priorities; and mitigate system weaknesses prior to actual combat.

Technical data and analysis results funded by this PE are efficiently leveraged for many different Army uses, reducing total cost to the Army by eliminating the need for duplicative capabilities funded by individual system developers. Central funding of this mission assures accurate and consistent treatment of survivability and lethality across all classes of systems, across all formal system Evaluations, and across the Army's analytical community as it conducts analyses of alternatives and other studies. Army Research, Development, and Engineering Command (RDECOM) and ATEC/AEC integrate the SLV work program into Army's formal Evaluation process to ensure ATEC can comply with its legally-mandated responsibility to assess system survivability along with effectiveness and suitability.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605604A / <i>Survivability/Lethality Analysis</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	41.843	40.496	41.075	-	41.075
Current President's Budget	41.296	40.480	35.075	-	35.075
Total Adjustments	-0.547	-0.016	-6.000	-	-6.000
• Congressional General Reductions	-0.011	-0.016			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.536	-			
• Adjustments to Budget Years	-	-	-6.000	-	-6.000

Change Summary Explanation

FY 2020 decrease of \$6.000 Million aligns program requirements with Army modernization priorities in support of the National Defense Strategy.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605604A / <i>Survivability/Lethality Analysis</i>				Project (Number/Name) 675 / <i>Army Survivability Analysis & Evaluation Supp</i>			
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
675: <i>Army Survivability Analysis & Evaluation Supp</i>	-	41.296	40.480	35.075	-	35.075	35.881	36.719	35.600	36.174	0.000	261.225
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds objective vulnerability assessment products necessary for the inherently-governmental Army Test & Evaluation Command/Army Evaluation Center (ATEC/ AEC) mission, for the Research and Development communities as well as the Analytical communities. Products result from investigating, analyzing, assessing, experimenting and reporting on the survivability of Soldiers, and on the survivability, lethality and vulnerability (SLV) of the highest-priority Army and threat systems. Products are leveraged within the Army Futures Command and the Program Manager / Program Executive Office (PM/PEO) community to exercise constructive design influence over materiel development and to provide credible engineering-level underpinning and input to the Army Analytical Community. While the Army is at war, analytical results funded by this Project are also directly leveraged for urgent materiel releases and support to current operations.

This Project provides quantitative lethality and survivability analyses and data for fielded and developmental systems as the Army pursues its modernization priorities and ensures readiness through the fielding of lethal and survivable systems for multi-domain operations. This Project funds engineering level SLV analysis in the areas of Long Range Precision Fires systems, Next Generation Combat Vehicles, Future Vertical Lift, Network/C3I, Air & Missile Defense, Soldier Lethality, and other highest Army priority efforts in the threat competencies of ballistics, electronic warfare, and cyber.

Vulnerability assessments funded by this Project are conducted across the spectrum of multi-domain battlefield threats to include: guns, missiles, mines and other methods of inflicting physical damage; jammers, countermeasures, and other electronic warfare techniques; cyber threats from insiders to external nation states; and directed energy weapons. Many different kinds of technical capabilities are used to generate these analyses, including specialized equipment, modeling & simulation, and experimental facilities. This Project ensures these capabilities can represent a credible live, virtual, or constructive hostile environment required for vulnerability assessment, thus enabling evaluators, developers, users, and decision makers to make informed SLV judgments for both Soldiers and materiel. These technical survivability and lethality details: enable properly informed decisions concerning acquisition and production; maximize Army overmatch in systems and tactics; inform investment priorities; and mitigate system weaknesses prior to actual combat.

Technical data and analysis results funded by this Project are efficiently leveraged for many different Army uses, reducing total cost to the Army by eliminating the need for duplicative capabilities funded by individual system developers. Central funding of this mission assures accurate and consistent treatment of survivability and lethality across all classes of systems, across all formal system Evaluations, and across the Army's analytical community as it conducts analyses of alternatives and other studies. Army Research, Development, and Engineering Command (RDECOM) and ATEC/AEC integrate the SLV work program into Army's formal Evaluation process to ensure ATEC can comply with its legally-mandated responsibility to assess system survivability along with effectiveness and suitability.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Title: Survivability, Lethality, Vulnerability Analyses (SLVA) for Ground, Aviation, Munitions, and Soldier Systems	19.216	18.621	16.135

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605604A / <i>Survivability/Lethality Analysis</i>	Project (Number/Name) 675 / <i>Army Survivability Analysis & Evaluation Supp</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Description: This activity provides integrated multi-domain SLV for CSA and other highest priority Ground, Aviation, Munitions, and Soldier Systems.</p> <p>FY 2019 Plans: Conduct ballistic and other needed SLVA on AEC's highest priority platform and weapon systems, supporting LFT&E pre-shot predictions, damage assessments, post-shot analysis, and crew survivability analysis and provide technical data for system evaluation reports. Provide vulnerability reduction recommendations to PMs for those systems supported. For systems analyzed, provide data to AMSAA for support of Army Analyses of Alternatives and other Army studies; incorporate collected data into the DOT&E live-fire report to Congress as well as the System Evaluation Reports prepared by ATEC.</p> <p>FY 2020 Plans: Will conduct SLVA on Long Range Precision Fires, Next Generation Combat Vehicle, Future Vertical Lift, and Soldier lethality systems, and on AEC and RDECOM's highest priority platform and weapon systems. For systems supported will work with materiel developers to constructively influence system design and will provide relevant data to Army analytical community to for supporting Analyses of Alternatives and other Army studies.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease aligns program requirements with Army modernization priorities.</p>				
<p>Title: Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) System Survivability Assessments</p> <p>Description: This effort produces assessments of the survivability of C4ISR systems in EW and cyber threat environments and conducts Electronic Attack (EA) and cyber analyses that reveal critical vulnerabilities in C4ISR systems. It also defines, demonstrates, and recommends mitigation options to proponents and evaluators of C4ISR. A cyber vulnerability database is maintained for the benefit of the community.</p> <p>FY 2019 Plans: Analyze EP and cybersecurity for systems under test and systems under investigation in future NIEs and other high priority tests and for additional highest priority technologies and developmental systems as specified by ATEC so as to reduce costs of downstream development by identifying and fixing vulnerabilities earlier and to assure that formal Army evaluations at Milestone decision points are fully informed on EP and cyber issues. Mature and update cyber-attack M&S tools so as to more accurately assess the operational impact of such attacks on small unit mission accomplishment.</p> <p>FY 2020 Plans:</p>		20.488	19.664	17.537

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605604A / <i>Survivability/Lethality Analysis</i>	Project (Number/Name) 675 / <i>Army Survivability Analysis & Evaluation Supp</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Will conduct cyber and EW SLVA on network components as specified by the Network C3I CFT and AEC and on RDECOM's highest priority Network/C3 and other systems. For systems supported will work with materiel developers to constructively influence system design and will provide relevant data to Army analytical community to support Analyses of Alternatives and other Army studies. Cyber support includes resiliency assessments of systems and Soldiers together and verification of fixes to identified vulnerabilities.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease aligns program requirements with Army modernization priorities.</p>				
<p>Title: Survivability, Lethality, Vulnerability (SLV) Analyses for Developmental Air and Missile Defense Systems</p> <p>Description: Conduct integrated SLV analyses for developmental air and missile defense systems, pre-planned product improvements of current systems, and recently fielded systems.</p> <p>FY 2019 Plans: Design, develop, and employ advanced electronic attack countermeasures to assess priority AMD systems and system of systems. Develop and provide advanced EA and cybersecurity test support for highest priority operational and developmental test events. Provide additional EA/EP and cyber analysis for other AMD systems as prioritized by ATEC.</p> <p>FY 2020 Plans: Will conduct high-priority SLVA on AMD systems and components as specified by AEC and RDECOM. For systems supported will work with materiel developers to constructively influence system design and will provide relevant data to Army analytical community to support Analyses of Alternatives and other Army studies.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease aligns program requirements with Army modernization priorities.</p>		1.592	1.601	1.403
<p>Title: FY2019 SBIR/STTR Transfer</p> <p>Description: FY2019 SBIR/STTR</p> <p>FY 2019 Plans: FY2019 SBIR/STTR</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Adjusted to reflect FY2019 SBIR/STTR Transfer</p>		-	0.594	-
Accomplishments/Planned Programs Subtotals		41.296	40.480	35.075

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605604A / <i>Survivability/Lethality Analysis</i>	Project (Number/Name) 675 / <i>Army Survivability Analysis & Evaluation Supp</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605606A / <i>Aircraft Certification</i>
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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
Total Program Element	-	4.612	3.936	3.461	-	3.461	2.738	2.728	2.717	2.704	Continuing	Continuing
092: <i>Aircraft Certification</i>	-	4.612	3.936	3.461	-	3.461	2.738	2.728	2.717	2.704	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Airworthiness Certification Program Element (PE) ensures safe flight operation of Army aircraft and aviation systems by means of technical design approval and qualification of systems to appropriate airworthiness standards. This PE provides independent airworthiness qualification for all assigned developmental and in-production Army aircraft, both manned and unmanned, as required by Army Regulation (AR) 70-62 ("Airworthiness of Aircraft Systems"), and is essential for ensuring the safe operation of Army aircraft. This PE performs engineering functions (design, analysis, testing, demonstrations, and system specification compliance) essential for certifying the airworthiness of assigned Army aircraft, to include performing safety-of-flight investigations/assessments, evaluating system risks, developing Airworthiness Impact Statements, developing Airworthiness Releases, and evaluating Safety of Flight Messages and Aviation Safety Action Messages for new and upgraded aircraft systems. This PE also provides: management/execution of the Army's Aeronautical Design Standards (ADS) program; management/execution of airworthiness approval for new systems and materiel changes for all assigned Army aircraft systems; airworthiness engineering support for major development/modification and future systems/subsystems requirements of the Program Executive Officer for Aviation (PEO AVN) and U.S. Army Special Operations Command's Technology Applications Program Office (TAPO); and management of test and evaluation processes in support of the airworthiness qualification process.

The Airworthiness Certification PE also performs general research and development in support of aircraft qualification and overarching airworthiness projects that involve multiple aircraft models. Ongoing programs requiring airworthiness qualification include the following PEO Aviation and TAPO Future Force systems: Longbow Apache E-model; Chinook F-model; Blackhawk M-model; Special Operations MH-47G and MH-60M; Light Utility Helicopter; Gray Eagle unmanned aircraft system (UAS); Enhanced Multi-sensor Airborne Reconnaissance and Sensor System (EMARSS); and modified Shadow UAS. Additionally, the Airworthiness Certification PE supports the application of other critical aviation subsystems onto Army aircraft, including the following Aircraft Survivability Equipment: Advanced Threat Infrared Countermeasures (ATIRCM), Common Missile Warning System (CMWS), Aviation Mission Equipment (e.g. advanced multiband avionics and Tactical Radio Systems and digital data links), Common Sensor (electro-optical multi-spectrum visual sensor), and Blue Force Tracker.

Finally, this PE also provides: airworthiness certification for military-use civil derivative aircraft technical qualification through the Federal Aviation Administration's Military Certification Office; development of airworthiness procedures, specifications, critical standards, and other design and qualification documents; participation in senior leadership mandated airworthiness tri-service activities (e.g. National Airworthiness Council, Joint Aeronautical Commanders Group) and international airworthiness related activities mandated by treaty (e.g. Flight Into Non-segregated Airspace (FINAS)); and limited early airworthiness involvement in Technology Transition projects (e.g. Joint Multi Role (JMR) Technology Demonstrator and Future Vertical Lift aircraft) and other Office of the Secretary of Defense (OSD) initiatives.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605606A / <i>Aircraft Certification</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	4.804	3.941	3.461	-	3.461
Current President's Budget	4.612	3.936	3.461	-	3.461
Total Adjustments	-0.192	-0.005	0.000	-	0.000
• Congressional General Reductions	-0.004	-0.005			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.188	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification				Project (Number/Name) 092 / Aircraft Certification			
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
092: Aircraft Certification	-	4.612	3.936	3.461	-	3.461	2.738	2.728	2.717	2.704	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Airworthiness Certification Project assures safe flight operation of Army aircraft and aviation systems by means of technical design approval and qualification of systems to appropriate airworthiness standards. This Project supports independent airworthiness qualification for all assigned developmental and in-production Army aircraft, both manned and unmanned, as required by Army Regulation (AR) 70-62 ("Airworthiness of Aircraft Systems"), and is essential for assuring the safe operation of Army aircraft. This Project performs engineering functions (design, analysis, testing, demonstrations, and system specification compliance) essential for certifying the airworthiness of assigned Army aircraft. This Project also supports: management/execution of the Army's Aeronautical Design Standards (ADS) program; management/execution of airworthiness approval for new systems and materiel changes for all assigned Army aircraft systems; airworthiness engineering support for major development/modification and future systems/ subsystems requirements of the Program Executive Officer for Aviation (PEO AVN) and U.S. Army Special Operations Command's Technology Applications Program Office (TAPO); and management of test and evaluation processes in support of the airworthiness qualification process.

The Airworthiness Certification Project also performs general research and development in support of aircraft qualification and overarching airworthiness projects that involve multiple aircraft models, and supports the application of other critical aviation subsystems onto Army aircraft.

This Project also supports: airworthiness certification for military-use civil derivative aircraft technical qualification through the Federal Aviation Administration's Military Certification Office; development of airworthiness procedures, specifications, critical standards, and other design and qualification documents; participation in senior leadership mandated airworthiness tri-service activities (e.g., National Airworthiness Council) and international airworthiness related activities mandated by treaty (e.g. Flight Into Non-segregated Airspace (FINAS)); and early airworthiness involvement in Technology Transition projects such as the Future Attack Reconnaissance Aircraft, Future Long Range Assault Aircraft, Advanced Unmanned Aircraft Systems, Modular Open System Architecture, and other Office of the Secretary of Defense (OSD) initiatives.

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

	FY 2018	FY 2019	FY 2020
Title: Certification Assessments and Studies Force Modernization Aircraft	0.051	0.042	0.037
Description: Perform assessments and studies in support of Force Modernization Aircraft Systems			
FY 2019 Plans: Conduct technical and airworthiness qualification assessments and studies to demonstrate airworthiness and system performance for Army force modernization aircraft systems or multi-system programs (e.g. AH-64E, UH-60M, MH-47G, MH-60M, etc).			
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification	Project (Number/Name) 092 / Aircraft Certification		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Will conduct technical and airworthiness qualification assessments and studies to demonstrate airworthiness and system performance for Army force modernization aircraft systems or multi-system programs (e.g. AH-64E, UH-60M, MH-47G, MH-60M, etc).</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to adjustments in costing assumptions.</p>				
<p>Title: Certification Requirements and Studies for Future Aircraft</p> <p>Description: Perform studies to support airworthiness certification requirements for Future Aircraft Systems</p> <p>FY 2019 Plans: Conduct studies of Airworthiness Certification requirements for future aircraft systems and other technology transition programs (e.g. Joint Multi-Role Technology Demonstrator Aircraft, Future Vertical Lift Aircraft, Improved Turbine Engine Program)</p> <p>FY 2020 Plans: Will conduct studies of Airworthiness Certification requirements for future aircraft systems and other technology transition programs (e.g. Joint Multi-Role Technology Demonstrator Aircraft, Future Vertical Lift Aircraft, Improved Turbine Engine Program)</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to adjustments in costing assumptions.</p>		0.617	0.512	0.445
<p>Title: Design Standards</p> <p>Description: Support the development, implementation and maintenance to support Army Aeronautical Design Standards, airworthiness procedures and tools, and overarching Airworthiness qualification documentation.</p> <p>FY 2019 Plans: Develop, implement, and maintain Army Aeronautical Design Standards, airworthiness procedures and tools, and overarching airworthiness qualification documentation.</p> <p>FY 2020 Plans: Will develop, implement, and maintain Army Aeronautical Design Standards, airworthiness procedures and tools, and overarching airworthiness qualification documentation.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to adjustments in costing assumptions.</p>		2.475	2.023	1.918
<p>Title: Certification Assessments of Technology Upgrades</p> <p>Description: Perform certification assessments of technology upgrades.</p>		0.051	0.042	0.037

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification	Project (Number/Name) 092 / Aircraft Certification		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>FY 2019 Plans: Conduct technical and airworthiness certification assessments of technology upgrades to Army force modernization aircraft systems or programs (e.g. Advanced Threat Infrared Countermeasures integration, Common Missile Warning System integration, Common Sensor integration).</p> <p>FY 2020 Plans: Will conduct technical and airworthiness certification assessments of technology upgrades to Army force modernization aircraft systems or programs (e.g. Advanced Threat Infrared Countermeasures integration, Common Missile Warning System integration, Common Sensor integration).</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to adjustments in costing assumptions.</p>				
<p>Title: Commercial Derivative Aircraft</p> <p>Description: Technical and airworthiness qualification for Commercial Derivative Aircraft.</p> <p>FY 2019 Plans: Provide technical and airworthiness qualification for Commercial Derivative Aircraft through the Federal Aviation Administration.</p> <p>FY 2020 Plans: Will provide technical and airworthiness qualification for Commercial Derivative Aircraft through the Federal Aviation Administration.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to adjustments in costing assumptions.</p>		0.446	0.370	0.322
<p>Title: Technology Advancement</p> <p>Description: Support efforts to establish and maintain aircraft safety for a fleet of aircraft.</p> <p>FY 2019 Plans: Lead and participate in national and international airworthiness certification committees, conferences and working groups responsible for establishing and maintaining aircraft safety for a fleet of aircraft (e.g. National Airworthiness Council, Joint Aeronautical Commanders Group, Joint Propulsion Coordinating Committee, NATO Airworthiness working groups, ASIC Airworthiness Working Groups, and Global Air Traffic Management working groups.)</p> <p>FY 2020 Plans: Will lead and participate in national and international airworthiness certification committees, conferences and working groups responsible for establishing and maintaining aircraft safety for a fleet of aircraft (e.g. National Airworthiness Council, Joint</p>		0.972	0.807	0.702

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification	Project (Number/Name) 092 / Aircraft Certification
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Aeronautical Commanders Group, Joint Propulsion Coordinating Committee, NATO Airworthiness working groups, ASIC Airworthiness Working Groups, and Global Air Traffic Management working groups.)			
FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to adjustments in costing assumptions.			
Title: FY2019 SBIR/STTR Transfer	-	0.140	-
Description: FY2019 SBIR/STTR Transfer			
FY 2019 Plans: FY2019 SBIR/STTR			
FY 2019 to FY 2020 Increase/Decrease Statement: Adjustment made for FY2019 SBIR/STTR transfer			
Accomplishments/Planned Programs Subtotals	4.612	3.936	3.461

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0605702A / <i>Meteorological Support to RDT&E Activities</i>							
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	-	7.070	9.759	6.233	-	6.233	6.420	6.650	6.713	7.162	0.000	50.007
128: <i>Meteorological Support To RDT&E Activities</i>	-	7.070	9.759	6.233	-	6.233	6.420	6.650	6.713	7.162	0.000	50.007

A. Mission Description and Budget Item Justification

This Program Element (PE) provides meteorological support to research, development, test, and evaluation (RDTE) activities and provides standard and specialized weather forecasts and data to satisfy Army/Department of Defense (DoD) RDTE test requirements for modern weaponry. Types of support include: (1) unique atmospheric analysis and sampling to include atmospheric transmittance, extinction, optical scintillation, infrared temperature, aerosol/smoke cloud dispersion characteristics, and ballistic meteorological measurements; (2) test event forecasting to include prediction of sound propagation for ballistic firing tests, specialized prediction of light levels and target-to-background measurements, and predictions for electro-optical testing and ballistic artillery/mortar firing; and (3) advisory and warning products such as go/no-go test recommendations for ballistic and atmospheric probe missiles, smoke/obscurant tests, hazard predictions for chemical agent munitions disposal, monitoring dispersion of simulant clouds for chemical/biological detector tests, simulated nuclear blasts, and weather warnings for test range safety. This PE provides technical weather support to Army and Joint Program Executive Officers (PEOs), Project Managers (PMs), and the Army test ranges and sites at: White Sands Test Center (WSTC), White Sands Missile Range, New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; West Desert Test Center (WDTC), Dugway Proving Ground, Utah; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; Redstone Test Center (RTC), Redstone Arsenal, Alabama; Yuma Test Center (YTC), Yuma Proving Ground, Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska); Operational Test Command (OTC), Fort Hood, Texas and Fort Bragg, North Carolina. This PE develops methodologies and acquires instrumentation and systems that allow meteorological teams to support current and future Army/DoD RDTE requirements. It finances indirect meteorological support operating costs not billable to customers along with replacement/upgrade of meteorological instrumentation and support systems. Direct costs for meteorological support services are not funded by this PE, but are borne by the customer (i.e., materiel/weapons developers and project/product managers) in accordance with DoD Directive 7000.14R (Department of Defense Financial Management Regulations). This PE enables more effective test scheduling and execution, and is essential to the accomplishment of the Army's developmental and operational test mission in that precise weather modeling and measurements directly influence test item performance and quantify test item weather dependencies and vulnerabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605702A / <i>Meteorological Support to RDT&E Activities</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	7.238	9.767	8.286	-	8.286
Current President's Budget	7.070	9.759	6.233	-	6.233
Total Adjustments	-0.168	-0.008	-2.053	-	-2.053
• Congressional General Reductions	-0.003	-0.008			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.165	-			
• Adjustments to Budget Years	-	-	-2.053	-	-2.053

Change Summary Explanation

Fiscal Year (FY) 2020 reductions of \$2.000 Million align program requirements to Army modernization priorities in support of the National Defense Strategy.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605702A / <i>Meteorological Support to RDT&E Activities</i>				Project (Number/Name) 128 / <i>Meteorological Support To RDT&E Activities</i>			
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
128: <i>Meteorological Support To RDT&E Activities</i>	-	7.070	9.759	6.233	-	6.233	6.420	6.650	6.713	7.162	0.000	50.007
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides meteorological support to research, development, test, and evaluation (RDTE) activities and provides standard and specialized weather forecasts and data to satisfy Army/Department of Defense (DoD) RDTE test requirements for modern weaponry. Types of support include: (1) unique atmospheric analysis and sampling to include atmospheric transmittance, extinction, optical scintillation, infrared temperature, aerosol/smoke cloud dispersion characteristics, and ballistic meteorological measurements; (2) test event forecasting to include prediction of sound propagation for ballistic firing tests, specialized prediction of light levels and target-to-background measurements, and predictions for electro-optical testing and ballistic artillery/mortar firing; and (3) advisory and warning products such as go/no-go test recommendations for ballistic and atmospheric probe missiles, smoke/obscurant tests, hazard predictions for chemical agent munitions disposal, monitoring dispersion of simulant clouds for chemical/biological detector tests, simulated nuclear blasts, and weather warnings for test range safety. This Project provides technical weather support to Army and Joint Program Executive Officers (PEOs), Project Managers (PMs), and the Army test ranges and sites at: White Sands Test Center (WSTC), White Sands Missile Range, New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; West Desert Test Center (WDTC), Dugway Proving Ground, Utah; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; Redstone Test Center (RTC), Redstone Arsenal, Alabama; Yuma Test Center (YTC), Yuma Proving Ground, Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska); Operational Test Command (OTC), Fort Hood, Texas and Fort Bragg, North Carolina. This Project develops methodologies and acquires instrumentation and systems that allow meteorological teams to support current and future Army/DoD RDTE requirements. It finances indirect meteorological support operating costs not billable to customers along with replacement/upgrade of meteorological instrumentation and support systems. Direct costs for meteorological support services are not funded by this Project, but are borne by the customer (i.e., materiel/ weapons developers and project/product managers) in accordance with DoD Directive 7000.14R (Department of Defense Financial Management Regulations). This Project enables more effective test scheduling and execution, and is essential to the accomplishment of the Army's developmental and operational test mission in that precise weather modeling and measurements directly influence test item performance and quantify test item weather dependencies and vulnerabilities.

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

	FY 2018	FY 2019	FY 2020
Title: Civilian Pay and Support Costs	2.391	2.155	2.155
Description: Funding related to Civilian Pay and associated indirect costs for meteorological support.			
FY 2019 Plans:			
Provides indirect costs (personnel salaries) for generating weather forecasts, severe weather warnings and advisories; staff meteorological services; and atmospheric measurements in support of Army/DoD tests and projects at eight Army test sites and alternate test sites as required. Will provide program management for meteorological support to the Army research, development, test and evaluation community and technical review/assistance to ranges and meteorological support teams. Will provide			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605702A / <i>Meteorological Support to RDT&E Activities</i>	Project (Number/Name) 128 / <i>Meteorological Support To RDT&E Activities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>technical meteorological support to the Army RDTE community including collaboration between Army meteorologists and the NCAR toward improvements to the 4DWX System and associated system administration.</p> <p>FY 2020 Plans: Will provide indirect costs (personnel salaries) for generating weather forecasts, severe weather warnings and advisories; staff meteorological services; and atmospheric measurements in support of Army/DoD tests and projects at eight Army test sites and alternate test sites as required. Will provide program management for meteorological support to the Army research, development, test and evaluation community and technical review/assistance to ranges and meteorological support teams. Will provide technical meteorological support to the Army RDTE community including collaboration between Army meteorologists and the National Center for Atmospheric Research (NCAR) toward improvements to the 4DWX System and associated system administration.</p>				
<p>Title: Four Dimensional Weather System (4DWX) and Instrumentation</p> <p>Description: Provides funding for meteorological instrumentation and technology to support RDTE activities at Army test sites. Includes funding for sustainment and enhancement of the 4DWX system, an advanced meteorological support system that provides high-resolution weather forecasts and analyses. The 4DWX analyses and forecasts the 3-dimensional structure of the atmosphere over time (4th dimension) and is used in test planning, conduct, and forensic analyses.</p> <p>FY 2019 Plans: Continue 4DWX system sustainment and modernization to improve forecast accuracy in support of Army RDTE mission requirements, including development of a full-grid climatology using 4DWX final-analysis data, and further development of probabilistic modeling; improved data assimilation procedures, and configuration of 4DWX to optimize test range-specific accuracy. Instrumentation funding will be used to continue a multi-year effort to replace/upgrade obsolete instrumentation, including upper-air sounding systems, surface atmospheric meteorological system, and radar wind profilers at several test centers.</p> <p>FY 2020 Plans: Will continue 4DWX system sustainment and modernization to improve forecast accuracy in support of Army RDTE mission requirements, including development of a full-grid climatology using 4DWX final-analysis data, and further development of probabilistic modeling; improved data assimilation procedures, and configuration of 4DWX to optimize test range-specific accuracy. Instrumentation funding will be used to continue a multi-year effort to replace/upgrade obsolete instrumentation, including upper-air sounding systems, surface atmospheric meteorological system, and radar wind profilers at several test centers.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>		4.679	7.340	4.078

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605702A / <i>Meteorological Support to RDT&E Activities</i>	Project (Number/Name) 128 / <i>Meteorological Support To RDT&E Activities</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Program funding aligns 4DWX and Instrumentation requirements with Army modernization priorities.			
Title: FY 2019 SBIR / STTR Transfer	-	0.264	-
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	7.070	9.759	6.233

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605706A / <i>Materiel Systems Analysis</i>
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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
Total Program Element	-	21.694	21.223	21.342	-	21.342	21.631	21.681	21.673	22.790	0.000	152.034
541: <i>Materiel Sys Analysis</i>	-	21.694	21.223	21.342	-	21.342	21.631	21.681	21.673	22.790	0.000	152.034

A. Mission Description and Budget Item Justification

This Program Element (PE) funds Headquarters, Department of the Army (HQDA) civilians at the United States (U.S.) Army Materiel Systems Analysis Activity (AMSAA) to conduct responsive and effective materiel systems analysis to support modernization solutions for the U.S. Army Future Force. AMSAA conducts systems and engineering analyses to support Army decisions in technology, materiel acquisition, and the design, development, fielding, and sustainment of Army weapon/materiel systems. As part of this mission, AMSAA develops and certifies system level performance data used in Army studies, and develops item-level performance methodology and Models and Simulations (M&S) for the current and future operational environment and emerging threats.

AMSAA exercises HQDA responsibility for developing, maintaining, improving, verifying, validating, and accrediting item-level performance data and M&S for combat effects and logistics. This includes the development and maintenance of common data formats. In support of its materiel systems analysis mission, AMSAA analyzes the performance and combat effectiveness of conceptual, developmental, and fielded systems. Unique models and methodologies have been developed to predict critical performance variables, such as weapon accuracy, target acquisition, rate of fire, probability of inflicting catastrophic damage, personnel and vehicle survivability, mobility, system reliability and several additional capability areas. AMSAA generates performance and effectiveness measures and ensures their standard use across major Army and Joint studies. AMSAA conducts and supports various systems analysis efforts across the entire materiel system life cycle, such as: Analysis of Alternatives (AoAs); analytical support to Cross-Functional Teams (CFTs); system cost/performance tradeoffs and early technology tradeoffs to inform system and acquisition program risk assessments; weapons/systems mix analyses; business case analyses; cost benefit analyses; requirements analyses; technology insertion studies; reliability growth studies; Physics of Failure (PoF) analyses; Schedule and Technical Risk evaluations, and analytical support for Test and Evaluation. These analyses are used by leadership within HQDA (both Army Staff and Assistant Secretaries in the HQDA Secretariat), Army Materiel Command, Army Research, Development and Engineering Command (RDECOM), Training and Doctrine Command, Army Test and Evaluation Command, Program Executive Officers/Project Managers, Army Futures Command (AFC) and the Office of Secretary of Defense (OSD)/Department of Defense (DoD). AMSAA's inclusion as one of the central members of the Future Modernization Analysis Center of the Army Futures Command illustrates the critical contributions the organization has and continues to make in supporting Acquisition Modernization decisions.

AMSAA analyses and data are used by these organizations in making acquisition, procurement, and logistics decisions in order to provide quality equipment and procedures to the Soldier, along with enhancing and sustaining readiness for the Current and Future Force. AMSAA's M&S capabilities support the development, linkage, and accreditation of live, virtual, and constructive simulations, and provide unique tools that support systems analysis of individual systems and the combined-arms environment. AMSAA maintains over 75 models and simulations, both internally developed to address specific analytical requirements. This M&S infrastructure provides a hierarchical modeling framework that is unique to AMSAA and allows for a comprehensive performance and effectiveness prediction capability that can be utilized to make trade-off and investment decisions prior to extensive and expensive hardware testing of proposed systems/technologies for the readiness of the Current and Future Force.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605706A / <i>Materiel Systems Analysis</i>
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AMSAA exercises HQDA responsibility for Army reliability methodology development. In this role, as the Army's Executive Agent for reliability and maintainability (R&M) standardization improvement, AMSAA develops and implements R&M reform initiatives that support acquisition decisions and life cycle management. AMSAA develops and applies engineering approaches that assess the reliability of Army materiel and provides recommendations on ways to improve reliability, thereby reducing logistics footprints and life cycle costs, and extending failure-free periods for deployed equipment. AMSAA's electronic and mechanical PoF program pioneered the Army's involvement in utilizing computer-aided engineering tools in the analysis of root-cause failure mechanisms at the component level during the system design process. AMSAA's reliability engineering and PoF tools/analyses have been used extensively to support the design improvement of developmental and fielded systems used in Current Operations, resulting in improved reliability, reduced Operating and Support costs, and reduced logistics expenditures and footprints. AMSAA, in conjunction with the Army Evaluation Center (AEC), form the Center for Reliability Growth, which develops critical tools, methodologies, policies, formal guidance, and educational materials needed to help acquisition programs achieve their required reliability during the acquisition process. The reliability improvements achieved for major weapon systems translates into billions of dollars in operating and support cost savings over the life cycle.

AMSAA's unique analytical capabilities are supporting AEC/Army Test and Evaluation Command (ATEC) to assess and determine the essential analytical requirements to enhance Army evaluations and reduce extensive testing. AMSAA's support in this area improves evaluation products and results in better materiel solutions to the Warfighter. AMSAA assists in systems evaluations which support various Acquisition Category (ACAT) materiel system decisions, and provides quick response analyses in support of rapid initiatives for Current Operations.

As the Army's center for materiel systems analysis, AMSAA provides the technical capability to support Army and DoD decision makers throughout the entire acquisition process in responding to analytical requirements across the full spectrum of materiel. AMSAA's unique in-house, consistent, integrated analytical capability is a critical asset that provides Army leadership with timely, independent, unbiased, reliable, and high quality analysis to support complex decisions required for Current Operations and the development of the Future Force. AMSAA's integrated set of skills and tools are focused on its core mission to develop and deliver Analytical Solutions to enable Readiness.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	21.890	21.226	21.524	-	21.524
Current President's Budget	21.694	21.223	21.342	-	21.342
Total Adjustments	-0.196	-0.003	-0.182	-	-0.182
• Congressional General Reductions	-0.004	-0.003			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.192	-			
• Adjustments to Budget Years	-	-	-0.182	-	-0.182

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605706A / <i>Materiel Systems Analysis</i>				Project (Number/Name) 541 / <i>Materiel Sys Analysis</i>			
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
541: <i>Materiel Sys Analysis</i>	-	21.694	21.223	21.342	-	21.342	21.631	21.681	21.673	22.790	0.000	152.034
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds Headquarters, Department of the Army (HQDA) civilians at the United States (U.S.) Army Materiel Systems Analysis Activity (AMSAA) to conduct responsive and effective materiel systems analysis to support modernization solutions for the U.S. Army Future Force. AMSAA conducts systems and engineering analyses to support Army decisions in technology, materiel acquisition, and the design, development, fielding, and sustainment of Army weapon/materiel systems. As part of this mission, AMSAA develops and certifies system level performance data used in Army studies, and develops item-level performance methodology and Models and Simulations (M&S) for the current and future operational environment and emerging threats.

AMSAA exercises HQDA responsibility for developing, maintaining, improving, verifying, validating, and accrediting item-level performance data and M&S for combat effects and logistics. This includes the development and maintenance of common data formats. In support of its materiel systems analysis mission, AMSAA analyzes the performance and combat effectiveness of conceptual, developmental, and fielded systems. Unique models and methodologies have been developed to predict critical performance variables, such as weapon accuracy, target acquisition, rate of fire, probability of inflicting catastrophic damage, personnel and vehicle survivability, mobility, system reliability and several additional capability areas. AMSAA generates performance and effectiveness measures and ensures their standard use across major Army and Joint studies. AMSAA conducts and supports various systems analysis efforts across the entire materiel system life cycle, such as: Analysis of Alternatives (AoAs); analytical support to Cross-Functional Teams (CFTs); system cost/performance tradeoffs and early technology tradeoffs to inform system and acquisition program risk assessments; weapons/systems mix analyses; business case analyses; cost benefit analyses; requirements analyses; technology insertion studies; reliability growth studies; Physics of Failure (PoF) analyses; Schedule and Technical Risk evaluations, and analytical support for Test and Evaluation. These analyses are used by leadership within HQDA (both Army Staff and Assistant Secretaries in the HQDA Secretariat), Army Materiel Command, Army Research, Development and Engineering Command (RDECOM), Training and Doctrine Command, Army Test and Evaluation Command (ATEC), Program Executive Officers/ Project Managers, Army Futures Command (AFC) and the Office of Secretary of Defense (OSD)/Department of Defense (DoD). AMSAA's inclusion as one of the central members of the Future Modernization Analysis Center of the Army Futures Command illustrates the critical contributions the organization has and continues to make in supporting Acquisition Modernization decisions.

AMSAA analyses and data are used by these organizations in making acquisition, procurement, and logistics decisions in order to provide quality equipment and procedures to the Soldier, along with enhancing and sustaining readiness for the Current and Future Force. AMSAA's M&S capabilities support the development, linkage, and accreditation of live, virtual, and constructive simulations, and provide unique tools that support systems analysis of individual systems and the combined-arms environment. AMSAA maintains over 75 models and simulations, both internally developed to address specific analytical requirements. This M&S infrastructure provides a hierarchical modeling framework that is unique to AMSAA and allows for a comprehensive performance and effectiveness prediction capability that can be utilized to make trade-off and investment decisions prior to extensive and expensive hardware testing of proposed systems/technologies for the readiness of the Current and Future Force.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605706A / <i>Materiel Systems Analysis</i>	Project (Number/Name) 541 / <i>Materiel Sys Analysis</i>
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AMSAA exercises HQDA responsibility for Army reliability methodology development. In this role, as the Army's Executive Agent for reliability and maintainability (R&M) standardization improvement, AMSAA develops and implements R&M reform initiatives that support acquisition decisions and life cycle management. AMSAA develops and applies engineering approaches that assess the reliability of Army materiel and provides recommendations on ways to improve reliability, thereby reducing logistics footprints and life cycle costs, and extending failure-free periods for deployed equipment. AMSAA's electronic and mechanical PoF program pioneered the Army's involvement in utilizing computer-aided engineering tools in the analysis of root-cause failure mechanisms at the component level during the system design process. AMSAA's reliability engineering and PoF tools/analyses have been used extensively to support the design improvement of developmental and fielded systems used in Current Operations, resulting in improved reliability, reduced Operating and Support costs, and reduced logistics expenditures and footprints. AMSAA, in conjunction with the Army Evaluation Center (AEC), form the Center for Reliability Growth, which develops critical tools, methodologies, policies, formal guidance, and educational materials needed to help acquisition programs achieve their required reliability during the acquisition process. The reliability improvements achieved for major weapon systems translates into billions of dollars in operating and support cost savings over the life cycle.

AMSAA's unique analytical capabilities are supporting AEC/ATEC to assess and determine the essential analytical requirements to enhance Army evaluations and reduce extensive testing. AMSAA's support in this area improves evaluation products and results in better materiel solutions to the Warfighter. AMSAA assists in systems evaluations which support various Acquisition Category (ACAT) materiel system decisions, and provides quick response analyses in support of rapid initiatives for Current Operations.

As the Army's center for materiel systems analysis, AMSAA provides the technical capability to support Army and DoD decision makers throughout the entire acquisition process in responding to analytical requirements across the full spectrum of materiel. AMSAA's unique in-house, consistent, integrated analytical capability is a critical asset that provides Army leadership with timely, independent, unbiased, reliable, and high quality analysis to support complex decisions required for Current Operations and the development of the Future Force. AMSAA's integrated set of skills and tools are focused on its core mission to develop and deliver Analytical Solutions to enable Readiness.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Title: Materiel Systems Analysis</p> <p>Description: Beginning in FY19, AMSAA will be one of the central members of the Futures and Modernization Analysis Center (FMAC)/Army Futures Command (AFC). These funds will be used by the AMSAA to conduct various materiel systems analysis efforts in support of senior Army decision makers during fiscal years 2019 through 2025. AMSAA will continue to conduct analyses, materiel systems performance data generation and certification, methodology development, Modeling and Simulation (M&S) development, and verification, validation, and accreditation. The accomplishments include performance and combat effectiveness analyses of materiel systems and technology base programs for the Department of Army Secretariat/Staff, the Army Materiel Command, the Research, Development and Engineering Command, Program Executive Officers/Program Managers, the Training and Doctrine Command, the Army Service Component Commands, the Army Test and Evaluation Command, Army Futures Command and the OSD. These analyses form the basis for AMSAA to successfully conduct Analysis of Alternatives (AoA?s), system cost/performance tradeoffs, early technology trade-offs, weapons/systems mix analyses, system Technical and Schedule risk assessments, business case analyses, cost benefit analyses, requirements analyses, technology insertion studies, reliability growth studies, Physics of Failure (PoF) analyses; provide extensive analytical support to the Cross Functional</p>	21.694	21.043	21.342

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605706A / <i>Materiel Systems Analysis</i>	Project (Number/Name) 541 / <i>Materiel Sys Analysis</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020
<p>Teams; and analytical support for Test and Evaluation. As a member of the FMAC/AFC, AMSAA will support the SECARMY and CSA priorities and marks a fundamental change in the Army's approach to modernization and how it delivers future capabilities required to achieve overmatch against future near-peer adversaries. AMSAA/FMAC will continue to provide the analytical support throughout the acquisition life-cycle to senior leadership and increased experimentation to further enhance effective and efficient Modernization to ensure all warfighting formations have the concepts and capabilities required to defeat adversaries.</p> <p>FY 2019 Plans: AMSAA will continue to provide critical analyses and data to support key Army acquisition milestone decisions and reviews. AMSAA will continue to support Army conceptual and developmental Acquisition Category ((ACAT) 1, ACAT 2, ACAT 3, and ACAT 4) programs, including but not limited to: Family of Unmanned Aircraft Systems, Cyberspace Situational Understanding, Enhanced Heavy Equipment Transport System, Big Data Initiatives, and Cyber Electromagnetic Activities (CEMA)/Electronic Warfare (EW). AMSAA will further develop and enhance Cyber, Air & Missile Defense, and life cycle cost analytic capabilities to ensure more robust analysis of potential capabilities to properly equip the Current and Future Force. Additionally, AMSAA will ensure modeling and simulation readiness by properly updating and sustaining key analytic tools and models. AMSAA will continue to support a variety of trade-space efforts and analyses in support of the Army Secretariat and Staff. This will include directly participating in and providing analytical products for Army Requirements Oversight Councils (AROCs) and Army Systems Acquisition Review Councils (ASARCs) to assist senior leaders in key acquisition strategy and life cycle decisions for a variety of materiel systems/programs. AMSAA will also provide analytical support to modify Test and Evaluation (T&E) planning efforts, reduce testing through the use of modeling and simulation, and provide software analysis and reliability capabilities to support T&E. AMSAA will conduct follow-on studies for major Army programs undergoing engineering change proposals and continue to provide essential certified weapons system performance data for all major Army studies. AMSAAs technical work program relating to Analysis of Alternatives (AoAs) (providing analytic input and certified data, as well as leading specified AoAs), Business Case Analyses, and Cost Benefit Analyses and Risk Assessments will continue at a high level (similar to fiscal year (FY) 2017 and FY2018). AMSAA will continue efforts in support of the Army Center for Reliability Growth (CRG). Moreover, AMSAA will continue to develop and enhance its comprehensive set of system performance data and essential verified and validated item/system level methodologies, tools, and models and simulations to conduct materiel system performance analysis. This will insure accurate and up-to-date analytical products are provided across the full spectrum of Army capability/commodity areas. Overall, AMSAA's analysis capabilities and products will enable Senior Leaders to properly shape and influence acquisition policy, procedures, and materiel solutions and increase readiness for our Current and Future Force.</p> <p>FY 2020 Plans: AMSAA will continue to provide critical analyses and data to support key Army acquisition milestone decisions and reviews. AMSAA will continue to provide critical analytical support to the Army Cross Functional Teams (CFT), and to support Army conceptual and developmental all Acquisition Category programs including but not limited to: Family of Unmanned Aircraft Systems, Cyberspace Situational Understanding, Future Vertical Lift, Optionally Manned Fighting Vehicle, Future M1</p>			

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605706A / <i>Materiel Systems Analysis</i>	Project (Number/Name) 541 / <i>Materiel Sys Analysis</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
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<p>Replacement, Big Data Initiatives, and Cyber Electromagnetic Activities/Electronic Warfare. AMSAA will further develop and enhance Cyber, Air and Missile Defense, and life cycle cost analytic capabilities to ensure more robust analysis of potential capabilities to properly equip the Current and Future Force. Additionally, AMSAA will ensure modeling and simulation readiness by properly updating and sustaining key analytic tools and models. AMSAA will continue to support a variety of trade-space efforts and analyses in support of the Army Secretariat and Staff. AMSAA will also provide analytical support to modify Test and Evaluation (T&E) planning efforts, reduce testing through the use of modeling and simulation, and provide software analysis and reliability capabilities to support T&E. AMSAA will conduct follow-on studies for major Army programs undergoing engineering change proposals and continue to provide essential certified weapons system performance data for all major Army studies. AMSAA's technical work program relating to Analysis of Alternatives (AoA's) (providing analytic input and certified data, as well as leading specified AoA's), providing direct analytical support to the CFT's, Business Case Analyses, and Cost Benefit Analyses and Risk Assessments will continue at a high level (similar to fiscal year (FY) 2018 and FY2019). AMSAA will continue efforts in support of the Army Center for Reliability Growth, as well as efforts on current operations related tasks, analyses, and model enhancements. Moreover, AMSAA will continue to develop and enhance its comprehensive set of system performance data and essential verified and validated item/system level methodologies, tools, and models and simulations to conduct materiel system performance analysis. This will insure accurate and up-to-date analytical products are provided across the full spectrum of Army capability/ commodity areas. Overall, AMSAA's analysis capabilities and products will enable Senior Leaders to properly shape and influence acquisition policy, procedures, and materiel solutions and increase readiness for our Current and Future Force. AMSAA's inclusion as one of the central members of the Futures and Modernization Analysis Center (FMAC)/Army Futures Command (AFC) illustrates the critical contributions the organization has and continues to make in supporting Acquisition Modernization decisions.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding changes due to economic adjustments.</p>			
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<p>Title: FY2019 SBIR/STTR Transfer</p> <p>Description: FY2019 SBIR/STTR Transfer</p> <p>FY 2019 Plans: FY2019 SBIR/STTR Transfer</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY2019 SBIR/STTR Transfer</p>	-	0.180	-
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Accomplishments/Planned Programs Subtotals	21.694	21.223	21.342
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C. Other Program Funding Summary (\$ in Millions) N/A			
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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605706A / <i>Materiel Systems Analysis</i>	Project (Number/Name) 541 / <i>Materiel Sys Analysis</i>
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C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605709A / <i>Exploitation of Foreign Items</i>
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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
Total Program Element	-	12.684	13.026	11.168	-	11.168	11.441	11.793	12.080	12.358	0.000	84.550
C28: <i>Acq/Exploit Threat Items (MIP)</i>	-	12.684	13.026	11.168	-	11.168	11.441	11.793	12.080	12.358	0.000	84.550

A. Mission Description and Budget Item Justification

This Program Element (PE) provides for the acquisition, exploitation, and inventory of foreign ground materiel with potential advanced technology threats to United States (U.S.) systems, as well as emerging and destructive threats such as cyber vulnerabilities, biometric systems, and evolving improvised explosive devices. The primary aim of the PE is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties associated with these threats. The PE also answers scientific and technical intelligence requirements, provides materiel for realistic testing and training, and aids in the development of countermeasures to threat systems, materiel, and technologies. Operations have increased the amount of captured threat materiel that require immediate exploitation to develop countermeasures and force protection measures for U.S. forces. Acquisition and exploitation are executed according to Army Foreign Materiel Program (FMP) Plan prioritization and with the approval of the Army Deputy Chief of Staff for Intelligence (G2).

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	12.684	13.026	13.246	-	13.246
Current President's Budget	12.684	13.026	11.168	-	11.168
Total Adjustments	0.000	0.000	-2.078	-	-2.078
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-2.078	-	-2.078

Change Summary Explanation

Fiscal Year (FY) 2020 program reduction of \$2.078 Million aligns program requirements with Army modernization priorities in support of the National Defense Strategy.

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605709A / <i>Exploitation of Foreign Items</i>	Project (Number/Name) C28 / <i>Acq/Exploit Threat Items (MIP)</i>
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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
C28: <i>Acq/Exploit Threat Items (MIP)</i>	-	12.684	13.026	11.168	-	11.168	11.441	11.793	12.080	12.358	0.000	84.550
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) provides for the acquisition, exploitation, and inventory of foreign ground materiel with potential advanced technology threats to United States (U.S.) systems, as well as emerging and destructive threats. The primary aim of the Project is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties associated with these threats. The Project also answers scientific and technical intelligence requirements, provides materiel for realistic testing and training, and aids in the development of countermeasures to threat systems, materiel, and technologies. Operations have increased the amount of captured threat materiel that require immediate exploitation to develop countermeasures and force protection measures for U.S. forces. Acquisition and exploitation are executed according to Army Foreign Materiel Program (FMP) Plan prioritization and with the approval of the G2.

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

	FY 2018	FY 2019	FY 2020
Title: Army Foreign Materiel Program (FMP) Acquisition	4.186	4.298	3.685
Description: This effort provides for the acquisition of foreign ground materiel with potential advanced technology threats to U.S. systems, as well as emerging and destructive threats. The primary aim of the effort is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties associated with these threats. The effort also answers scientific and technical intelligence requirements, provides materiel for realistic testing and training, and aids in the development of countermeasures to threat systems, materiel, and technologies. Operations have increased the amount of captured threat materiel that require immediate exploitation to develop countermeasures and force protection measures for US forces. Acquisition and exploitation are executed according to Army FMP Plan prioritization and with the approval of the G2.			
FY 2019 Plans: Conduct Foreign Materiel Acquisition of threat related foreign ground materiel systems and state-of-the-art technologies of military significance.			
FY 2020 Plans: Will conduct Foreign Materiel Acquisition of threat related foreign ground materiel systems and state of the art technologies of military significance.			
FY 2019 to FY 2020 Increase/Decrease Statement: Funding levels were designed to align program requirements with Army modernization priorities in support of the National Defense Strategy.			
Title: Army Foreign Materiel Program (FMP) Exploitation	8.498	8.728	7.483

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605709A / <i>Exploitation of Foreign Items</i>	Project (Number/Name) C28 / <i>Acq/Exploit Threat Items (MIP)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: This effort provides for the exploitation and inventory of foreign ground materiel with potential advanced technology threats to U.S. systems, as well as emerging and destructive threats such as cyber vulnerabilities, biometric systems, and evolving improvised explosive devices. The primary aim of the effort is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties associated with these threats. The effort also answers scientific and technical intelligence requirements, provides materiel for realistic testing and training, and aids in the development of countermeasures to threat systems, materiel, and technologies. Operations have increased the amount of captured threat materiel that require immediate exploitation to develop countermeasures and force protection measures for US forces. Acquisition and exploitation are executed according to Army FMP Plan prioritization and with the approval of the G2.</p> <p>FY 2019 Plans: Conduct Foreign Materiel Acquisition of threat related foreign ground materiel systems and state-of-the-art technologies of military significance.</p> <p>FY 2020 Plans: Will conduct Foreign Materiel Acquisition of threat related foreign ground materiel systems and state of the art technologies of military significance.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding levels were designed to align program requirements with Army modernization priorities in support of the National Defense Strategy.</p>			
Accomplishments/Planned Programs Subtotals	12.684	13.026	11.168

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0605712A / Support of Operational Testing
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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
Total Program Element	-	50.723	52.705	52.723	-	52.723	53.898	55.076	55.152	56.345	0.000	376.622
001: ATEC Joint Tests And Follow-On Test & Eval	-	0.442	0.285	0.292	-	0.292	0.296	0.302	0.305	0.311	0.000	2.233
V02: ATEC Activities	-	50.281	52.420	52.431	-	52.431	53.602	54.774	54.847	56.034	0.000	374.389

A. Mission Description and Budget Item Justification

This Program Element (PE) provides resources to the Army Test and Evaluation Command (ATEC) to operate the Army Joint Test Element (JTE) and the Army's Operational Test Command (OTC). JTE examines Joint Service, Combatant Command (COCOM) and Department of Defense (DoD) agencies' mission gaps, tactics and doctrine, resulting in the development of Tactics, Techniques and Procedures (TTP), Concept of Operations (CONOPS) and assessment documents. Products are developed through operational non-materiel solutions to urgent, specific, Joint Warfighter problems. OTC conducts independent operational tests that provide significant data to Army decision-makers on key Army systems and concepts. This PE finances recurring costs for OTC that are essential for conducting realistic and continuous testing in the critical areas of equipment, doctrine, force design and training. These recurring costs include civilian pay, requirements for test support contracts, temporary duty, training, supplies and equipment.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	51.040	52.718	53.472	-	53.472
Current President's Budget	50.723	52.705	52.723	-	52.723
Total Adjustments	-0.317	-0.013	-0.749	-	-0.749
• Congressional General Reductions	-0.006	-0.013			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.311	-			
• Adjustments to Budget Years	-	-	-0.749	-	-0.749

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605712A / Support of Operational Testing				Project (Number/Name) 001 / ATEC Joint Tests And Follow-On Test & Eval			
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
001: ATEC Joint Tests And Follow-On Test & Eval	-	0.442	0.285	0.292	-	0.292	0.296	0.302	0.305	0.311	0.000	2.233
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for the Army Joint Test Element (JTE) which examines Joint Service, Combatant Command (COCOM) and Department of Defense (DoD) agencies' mission gaps, tactics and doctrine, resulting in the development of Tactics, Techniques and Procedures (TTP), Concept of Operations (CONOPS) and assessment documents. Products are developed through operational non-materiel solutions to urgent, specific, Joint Warfighter problems. The JTE coordinates and develops nominations for Quick Reaction Tests (QRTs) and Joint Feasibility Studies (JFS); serves as the Operational Test Agency (OTA) for Army-led QRTs; and coordinates resources to support Joint Feasibility Studies and chartered Joint Tests (JT) under the Joint Test Unit (JTU) assigned to the Army test and Evaluation Command (ATEC) as the joint OTA. Mission support for JTE includes supporting two Joint Tests under the Joint Test program, and assigned special projects. ATEC provides military resource support to Nellis Air Force Base, Suffolk VA, United States Pacific Command (USPACOM) J81 (Hawaii), and Marine Corps Warfighter Laboratory (Quantico, VA) with Officer and Non-Commissioned Officer (NCO) support. JTE supports Joint Tests until these Office of the Secretary of Defense (OSD) chartered projects are completed and transitioned to the respective Sponsoring COCOM.

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

	FY 2018	FY 2019	FY 2020
Title: Army Joint Test Element (JTE) Management Support	0.442	0.285	0.292
Description: Funds the civilian salaries and related non-labor requirements that support the JTE.			
FY 2019 Plans: Funds civilian labor and non-labor requirements such as supplies and travel in support of JTE initiatives, program support from remote JT stations and COCOM engagements.			
FY 2020 Plans: Will fund civilian labor and non-labor requirements such as supplies and travel in support of JTE initiatives, program support from remote JT stations, and COCOM engagements.			
FY 2019 to FY 2020 Increase/Decrease Statement: Inflation			
Accomplishments/Planned Programs Subtotals	0.442	0.285	0.292

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

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605712A / Support of Operational Testing	Project (Number/Name) 001 / ATEC Joint Tests And Follow-On Test & Eval

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

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605712A / Support of Operational Testing	Project (Number/Name) V02 / ATEC Activities
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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
V02: ATEC Activities	-	50.281	52.420	52.431	-	52.431	53.602	54.774	54.847	56.034	0.000	374.389
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding to United States (U.S.) Army Test & Evaluation Command (ATEC) to operate the Operational Test Command (OTC). OTC conducts independent operational tests required by public law (Title 10 USC 2399) that provide significant data to Army decision makers on key Army systems and concepts. This Project finances recurring costs for OTC that are essential for conducting realistic and continuous testing in the critical areas of equipment, doctrine, force design and training. These recurring costs include civilian pay, requirements for test support contracts, temporary duty, training, supplies and equipment.

OTC consists of four forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air and Missile Defense Test Directorate, Fort Bliss, Texas; Fires Support Test Directorate, Fort Sill, Oklahoma; and the Intelligence Electronic Warfare Test Directorate, Fort Huachuca, Arizona) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Fort Hood, Texas. These activities support the development and fielding cycle of all Army acquisition programs including rapid fielding initiatives. The primary mission of these test directorates is to perform detailed planning, execution, and reporting of Initial Operational Test and Evaluation (IOTE), Limited User Test (LUT), and Force Development Test and Experimentation (FDTE).

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

	FY 2018	FY 2019	FY 2020
<p>Title: Operational Test Command (OTC) Activities</p> <p>Description: OTC operational costs including: civilian pay, support contracts, temporary duty, training, supplies and equipment for subordinate elements of the Operational Test Command.</p> <p>FY 2019 Plans: Support operational costs to include civilian pay, support contracts, temporary duty, training, supplies and equipment for the Operational Test Command.</p> <p>FY 2020 Plans: Support operational costs to include civilian pay, support contracts, temporary duty, training, supplies and equipment for the Operational Test Command.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>	50.281	51.854	52.431
<p>Title: FY 2019 SBIR / STTR Transfer</p> <p>Description: FY 2019 SBIR / STTR Transfer</p>	-	0.566	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605712A / <i>Support of Operational Testing</i>	Project (Number/Name) V02 / <i>ATEC Activities</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<i>FY 2019 Plans:</i> FY 2019 SBIR / STTR Transfer			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY 2019 SBIR / STTR Transfer			
Accomplishments/Planned Programs Subtotals	50.281	52.420	52.431

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605716A / <i>Army Evaluation Center</i>
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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
Total Program Element	-	56.003	57.039	60.815	-	60.815	62.482	64.789	61.004	64.540	0.000	426.672
302: <i>Army Evaluation Center</i>	-	56.003	57.039	60.815	-	60.815	62.482	64.789	61.004	64.540	0.000	426.672

A. Mission Description and Budget Item Justification

This Program Element (PE) provides the resources to operate the Army Evaluation Center (AEC), the United States (U.S.) Army's independent evaluator of Technical Requirements and Critical Operational Issues and Criteria for all Cross Functional Teams (CFTs) and other programs. AEC is the lead agent to plan, direct and evaluate all required program testing. AEC is the focal point in test strategy development, system safety verification, and data analyses from early developmental consumer tests through operational tests. AEC provides critical independent assessments on the effectiveness, suitability, and survivability to include cyber and electronic warfare; safety of materiel solutions; and viability of emerging technologies and engineering change proposals in order to support major acquisition/fielding decisions including but not limited to acquisition milestones, materiel changes, and materiel releases.

AEC is responsible for all assigned developmental and independent operational evaluation of Army materiel, information and acquisition systems, an inherently governmental mission. AEC assists the Chief of Staff of the Army decision making process by supporting Army Requirements Oversight Council (AROC) processes as well as supporting the Army Futures Command through the Cross Functional Team (CFT) concept. AEC evaluates operational effectiveness by determining if the system provides intended benefits to the Force. AEC determines impacts to readiness through Human Systems Integration (HSI), Unit Systems Integration (USI), and Army Systems Integration (ASI), DOTMLPF-P impacts, integrated suitability reviews (ISR) and operational suitability reviews (OSR) in partnership with the Deputy Assistant Secretary of the Army for Acquisition Policy and Logistics (DASA APL). AEC evaluates ballistics survivability and lethality missions, adversarial assessments/threat computer network operations, cooperative vulnerability and penetration assessments (CVPA), and electronic warfare (EW) (attack, support) countermeasures in support of the National Defense Authorization Act (NDAA) 2016 Section 1647, Establishment of Cybersecurity and Electromagnetic Affects (CEMA). AEC manages, plans, and executes Information Assurance (IA) operational assessments during annual Combatant Command and Army Service exercises in support of the congressionally mandated Office of the Secretary of Defense Director, Operational Test and Evaluation (OSD DOT&E) assessment, and performs the operational test agency (OTA) duties for the Ballistic Missile Defense System.

This PE funds direct civilian labor and minimum non-labor requirements to include: Temporary Duty (TDY), personnel training, career development, supplies and equipment, hardware, software, and other external Other Government Agency (OGA) support as well as methodology development required to evaluate emerging technologies and instrumentation requirements.

AEC consists of seven directorates (Aviation-Fires Evaluation Directorate, Ballistic Missile Defense (BMD) Evaluation Directorate (funded by the Missile Defense Agency (MDA)), Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Evaluation Directorate, Integrated Suitability & Methodology Directorate, Mounted Systems Evaluation Directorate, Soldier & Support System Evaluation Directorate and Survivability Evaluation Directorate) and a lean headquarters element as AEC receives staff services from the Army Test and Evaluation Command Headquarters (ATEC HQ). The AEC primary competencies are: identify what decision makers need to know; plan and direct test and evaluation strategies; evaluate operational effectiveness, suitability, survivability and safety; and provide senior leadership unbiased advice on Army programs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605716A / <i>Army Evaluation Center</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	56.246	57.049	58.152	-	58.152
Current President's Budget	56.003	57.039	60.815	-	60.815
Total Adjustments	-0.243	-0.010	2.663	-	2.663
• Congressional General Reductions	-0.005	-0.010			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.238	-			
• Adjustments to Budget Years	-	-	2.663	-	2.663

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605716A / Army Evaluation Center				Project (Number/Name) 302 / Army Evaluation 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
302: Army Evaluation Center	-	56.003	57.039	60.815	-	60.815	62.482	64.789	61.004	64.540	0.000	426.672
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides the resources to operate the Army Evaluation Center (AEC), the Army's independent evaluator of Technical Requirements and Critical Operational Issues and Criteria for all Cross Functional Teams (CFTs) and other programs. AEC is the lead agent to plan, direct and evaluate all required program testing. AEC is the focal point in test strategy development, system safety verification, and data analyses from early developmental consumer tests through operational tests. AEC provides critical independent assessments on the effectiveness, suitability, and survivability to include cyber and electronic warfare; safety of materiel solutions; and viability of emerging technologies and engineering change proposals in order to support major acquisition/fielding decisions including but not limited to acquisition milestones, materiel changes, and materiel releases.

AEC is responsible for all assigned developmental and independent operational evaluation of Army materiel, information and acquisition systems, an inherently governmental mission. AEC assists the Chief of Staff of the Army decision making process by supporting Army Requirements Oversight Council (AROC) processes as well as supporting the Army Futures Command through the Cross Functional Team (CFT) concept. AEC evaluates operational effectiveness by determining if the system provides intended benefits to the Force. AEC determines impacts to readiness through Human Systems Integration (HSI), Unit Systems Integration (USI), and Army Systems Integration (ASI), DOTMLPF-P impacts, integrated suitability reviews (ISR) and operational suitability reviews (OSR) in partnership with the Deputy Assistant Secretary of the Army for Acquisition Policy and Logistics (DASA APL). AEC evaluates ballistics survivability and lethality missions, adversarial assessments/threat computer network operations, cooperative vulnerability and penetration assessments (CVPA), and electronic warfare (EW) (attack, support) countermeasures in support of the National Defense Authorization Act (NDAA) 2016 Section 1647, Establishment of Cybersecurity and Electromagnetic Affects (CEMA). AEC manages, plans, and executes Information Assurance (IA) operational assessments during annual Combatant Command and Army Service exercises in support of the congressionally mandated Office of the Secretary of Defense Director, Operational Test and Evaluation (OSD DOT&E) assessment, and performs the operational test agency (OTA) duties for the Ballistic Missile Defense System.

This Project funds direct civilian labor and minimum non-labor requirements to include: Temporary Duty (TDY), personnel training, career development, supplies and equipment, hardware, software, and other external Other Government Agency (OGA) support as well as methodology development required to evaluate emerging technologies and instrumentation requirements.

AEC consists of seven directorates (Aviation-Fires Evaluation Directorate, Ballistic Missile Defense (BMD) Evaluation Directorate (funded by the Missile Defense Agency (MDA)), Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Evaluation Directorate, Integrated Suitability & Methodology Directorate, Mounted Systems Evaluation Directorate, Soldier & Support System Evaluation Directorate and Survivability Evaluation Directorate) and a lean headquarters element as AEC receives staff services from the Army Test and Evaluation Command Headquarters (ATEC HQ). The AEC primary competencies are: identify what decision makers need to know; plan and direct test and evaluation strategies; evaluate operational effectiveness, suitability, survivability and safety; and provide senior leadership unbiased advice on Army programs.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605716A / Army Evaluation Center	Project (Number/Name) 302 / Army Evaluation Center		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Title: Army Evaluation Center (AEC)</p> <p>Description: AEC provides integrated technical and operational evaluations and continuous evaluation of assigned weapon systems and major automated information systems for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive and force development. AEC will develop the evaluation strategy, design technical and operational tests, and evaluate the test results to address the combat effectiveness, suitability, and survivability factors pertinent to the decision process for hundreds of systems/programs across the Army, other Services and Agencies. AEC will prepare integrated System Evaluation Plans and conduct integrated technical and operational evaluations for all assigned systems, assisting the Chief of Staff of the Army decision making process by supporting the Army Requirements Oversight Council (AROC) processes as well as provide support to the Army Futures Command through the Cross Functional Team (CFT) concept. In support of Overseas Contingency Operations (OCO) and other real-world events, AEC continues to provide Capability & Limitation Reports and safety verification documents.</p> <p>FY 2019 Plans: Cover operational costs for AEC including civilian pay and non-labor costs (approximately 94% of AEC's total budget is civilian labor). Assist TRADOC in developing operational relevant, total system focused critical operational issues and criteria that can be evaluated. Develop and apply new techniques in data mining, data visualization and presentation of large data sets. Research and develop evaluation metrics for new and emerging technologies such as signature management and human cognition.</p> <p>FY 2020 Plans: Cover operational costs for AEC including civilian pay and non-labor costs (approximately 94% of AEC's total budget is civilian labor). Assist TRADOC in developing operational relevant, total system focused critical operational issues and criteria that can be evaluated. Develop and apply new techniques in data mining, data visualization and presentation of large data sets. Continue research and develop evaluation metrics for new and emerging technologies such as signature management and human cognition.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase funds civilian personnel to provide support for capabilities development process as well as Cross Functional Team (CFT) efforts to support the Army modernization strategy.</p>		56.003	56.532	60.815
<p>Title: FY 2019 SBIR / STTR Transfer</p> <p>Description: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 Plans: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>		-	0.507	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605716A / <i>Army Evaluation Center</i>	Project (Number/Name) 302 / <i>Army Evaluation Center</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 SBIR / STTR Transfer			
Accomplishments/Planned Programs Subtotals	56.003	57.039	60.815

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0605718A / <i>Army Modeling & Sim X-Cmd Collaboration & Integ</i>							
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	-	1.756	2.798	2.527	-	2.527	2.574	2.667	2.720	2.775	0.000	17.817
S03: <i>Analysis M&S Tools and Services</i>	-	1.756	2.798	2.527	-	2.527	2.574	2.667	2.720	2.775	0.000	17.817

A. Mission Description and Budget Item Justification

This Program Element (PE) promotes the Army's Modeling and Simulation (M&S) strategy, defined by five guiding priorities: (1) formulate Army M&S policies; (2) develop and employ management processes for models, simulations and data; (3) develop M&S standards, architectures, networks and environments; (4) develop/employ new M&S tools and simulation technology; (5) develop an M&S workforce. Specifically, this PE focuses on priorities 3 and 4.

M&S Standards, Architectures, Networks and Environments: The consistent use of standards, architectures, networks and environments advances the goal of interoperability. The Army coordinates with Joint, Interagency, Intergovernmental, and Multinational (JIIM) partners along with industry and academia to develop/employ standards that promote collaboration and facilitate the sharing of tools, data and information. The Army oversees procedures and processes for the appropriate use of standards to foster common formats and increase M&S and data reuse. The Army ensures these standards, architectures, networks and environments are readily accessible and can be reliably applied by users.

M&S Tools and Simulation Technology: The Army must have credible M&S tools and data to support the full range of Army organizational missions and functional responsibilities. M&S results that are timely and credible enhance decision making. The Army must develop and accredit reliable M&S tools so that decision makers and senior leaders benefit from the results and thus support the continued development, integration and use of such tools. To ensure credibility and reliability of results, M&S managers, developers and users must make the capabilities, constraints, limitations and assumptions of their M&S tools readily accessible. PE 0605718A provides for the development and employment of tools in the form of models, simulations and data that support the full range of Army interests and deliver timely information to enhance effective decision making. Moreover, these tools can be documented, verified, validated and accredited for their intended purpose in order to provide timely, credible results.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605718A / <i>Army Modeling & Sim X-Cmd Collaboration & Integ</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	1.829	2.801	2.527	-	2.527
Current President's Budget	1.756	2.798	2.527	-	2.527
Total Adjustments	-0.073	-0.003	0.000	-	0.000
• Congressional General Reductions	-0.001	-0.003			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.072	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605718A / Army Modeling & Sim X- Cmd Collaboration & Integ				Project (Number/Name) S03 / Analysis M&S Tools and Services			
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
S03: Analysis M&S Tools and Services	-	1.756	2.798	2.527	-	2.527	2.574	2.667	2.720	2.775	0.000	17.817
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project has two functions:

Function 1 (Priority 3 of the "Army Modeling and Simulation (M&S) Strategy") -- Develop M&S standards, architectures, networks and environments that promote sharing, interoperability, access, and reliable application of tools, formats, data and information among/for users.

Function 2 (priority 4 of the "Army M&S Strategy") -- Develop and improve tools and technology in the form of models, simulations and data that support the full range of Army interests and deliver timely information to enhance effective decision making. These tools can be documented, verified, validated and accredited for their intended purpose.

Resources under Project S03 support the five M&S communities (Acquisition, Analysis, Experimentation, Test & Evaluation, Training) at the enterprise level through enabling efforts. These efforts include the following: (a) design models, simulations, data and tools that are resident within one organization but reusable and trusted by M&S users and specialists across the Army M&S enterprise; (b) leverage industry and academia; (c) promote interoperability within M&S and between M&S and operational capabilities.

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

	FY 2018	FY 2019	FY 2020
Title: Develop M&S standards, architectures, networks and environments	0.580	0.840	0.842
Description: Develop M&S standards, architectures, networks and environments that promote sharing, interoperability, access, and reliable application of tools, formats, data and information among/for users.			
FY 2019 Plans: Fiscal Year (FY) 2019 funds will be distributed among activities that promote the third priority of the Army M&S Strategy: develop M&S standards, architectures, networks and environments. Specific FY 20019 plans include: a.) development and access to cyber/electronic warfare simulated environments, b.) development of an enhanced fires training and testing environment, c.) development of an Operational Environment (OE) signal architecture, d.) enhancement and access to a network modeling architecture that bridges multiple modeling and simulation environments. FY2019 M&S standards, architectures, networks and environment plans were developed to maximize reuse across the five Army M&S-enabled communities.			
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605718A / Army Modeling & Sim X- Cmd Collaboration & Integ	Project (Number/Name) S03 / Analysis M&S Tools and Services		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Fiscal Year (FY) 2020 funds will be distributed among activities that promote the third priority of the Army M&S Strategy: develop M&S standards, architectures, networks and environments. Specific FY 2020 plans include: a.) development and access to cyber/electronic warfare simulated environments, b.) development of an enhanced fires training and testing environment, c.) development of an Operational Environment (OE) signal architecture, d.) enhancement and access to a network modeling architecture that bridges multiple modeling and simulation environments. FY2020 M&S standards, architectures, networks and environment plans will be developed to maximize reuse across the five Army M&S-enabled communities.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease in requirements.</p>				
<p>Title: Develop M&S tools and technology</p> <p>Description: Develop and improve tools and technology in the form of models, simulations and data that support the full range of Army interests and deliver timely information to enhance effective decision making. These tools can be documented, verified and validated for their intended purpose.</p> <p>FY 2019 Plans: Fiscal Year (FY) 2019 funds will be distributed among activities that promote the fourth priority of the Army M&S Strategy: develop M&S tools and technology. Specific FY 2019 plans include: a.) development of an Army Fires Community Army Effectiveness Model (AEM); b.) development of network modeling scenarios and models for the test/evaluation and analysis network communities; c.) update and enhance intelligence models for existing simulations and Mission Command Information Systems (MCIS). FY 2019 M&S tools and technology plans were developed to maximize reuse across the five Army M&S-enabled communities.</p> <p>FY 2020 Plans: Fiscal Year (FY) 2020 funds will be distributed among activities that promote the fourth priority of the Army M&S Strategy: develop M&S tools and technology. Specific FY 2019 plans include: a.) development of an Army Fires Community Army Effectiveness Model (AEM); b.) development of network modeling scenarios and models for the test/evaluation and analysis network communities; c.) update and enhance intelligence models for existing simulations and Mission Command Information Systems (MCIS). FY 2019 M&S tools and technology plans will be developed to maximize reuse across the five Army M&S-enabled communities.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease in requirements.</p>		1.176	1.868	1.685
<p>Title: FY19 SBIR/STTR adjustment</p> <p>FY 2019 Plans:</p>		-	0.090	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605718A / Army Modeling & Sim X- Cmd Collaboration & Integ	Project (Number/Name) S03 / Analysis M&S Tools and Services

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY19 SBIR/STTR adjustment			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY19 SBIR/STTR adjustment			
Accomplishments/Planned Programs Subtotals	1.756	2.798	2.527

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>
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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
Total Program Element	-	54.383	60.921	58.175	-	58.175	57.559	58.911	61.814	63.874	0.000	415.637
EU9: <i>Army Science Board</i>	-	3.020	3.157	2.250	-	2.250	2.250	2.250	2.250	2.250	0.000	17.427
M02: <i>Med Cmd Spt (Non-AMHA)</i>	-	25.998	26.457	24.052	-	24.052	24.022	24.603	25.059	25.534	0.000	175.725
M15: <i>ARI Mgmt/ADM Act</i>	-	1.437	1.513	1.550	-	1.550	1.585	1.629	1.661	1.679	0.000	11.054
M16: <i>Standardization Groups</i>	-	3.351	3.793	4.297	-	4.297	4.339	4.433	4.475	4.521	0.000	29.209
M42: <i>ARDEC Cmd/Ctr Support</i>	-	4.067	7.318	7.419	-	7.419	7.277	7.477	7.466	7.863	0.000	48.887
M44: <i>CECOM Cmd/Ctr Spt</i>	-	2.388	4.574	3.819	-	3.819	3.906	3.986	4.805	5.016	0.000	28.494
M46: <i>AMCOM Cmd/Ctr Spt</i>	-	0.225	0.228	3.596	-	3.596	3.435	3.536	3.920	4.097	0.000	19.037
M47: <i>TACOM Cmd/Ctr Spt</i>	-	3.300	3.294	3.629	-	3.629	3.707	3.808	3.857	4.088	0.000	25.683
M55: <i>Edgewood Chemical Biological Center</i>	-	6.491	6.035	3.027	-	3.027	2.583	2.643	3.724	4.139	0.000	28.642
M58: <i>SECOM CMD/CTR Spt</i>	-	2.454	2.429	2.350	-	2.350	2.234	2.280	2.318	2.367	0.000	16.432
M76: <i>Armament Group Support</i>	-	1.652	2.123	2.186	-	2.186	2.221	2.266	2.279	2.320	0.000	15.047

A. Mission Description and Budget Item Justification

This Program Element (PE) supports the non-Army Management Headquarters Activity (non-AMHA) Research, Development, Test, and Evaluation (RDTE) functions incident to the local operation and management of United States (U.S.) Army Research, Development and Engineering Command (RDECOM) Research Development and Engineering Centers, not identifiable with specific research and development projects. This PE also supports the management and operation of multiple, globally-located RDECOM International Technology Centers (ITCs). The ITCs play an integral role in the U.S. Army efforts for international cooperative research, development and interoperability, and fulfill international memoranda of understanding requirements.

Programwide activities also include: Army Science Board studies; non-AMHA Medical Command support at the U.S. Army Medical Research and Materiel Command (USAMRMC); non-AMHA management and administrative functions at the U.S. Army Research Institute (ARI); and travel and administrative support to the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	55.060	60.942	62.163	-	62.163
Current President's Budget	54.383	60.921	58.175	-	58.175
Total Adjustments	-0.677	-0.021	-3.988	-	-3.988
• Congressional General Reductions	-0.013	-0.021			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.664	-			
• Adjustments to Budget Years	-	-	-3.988	-	-3.988

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) EU9 / <i>Army Science Board</i>			
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
EU9: <i>Army Science Board</i>	-	3.020	3.157	2.250	-	2.250	2.250	2.250	2.250	2.250	0.000	17.427
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Science Board (ASB) is a federal advisory committee, organized under the Federal Advisory Committee Act (FACA) and the Government in the Sunshine Act, which provides the Secretary of the Army and Secretary of Defense with independent and transparent advice and recommendations on matters relating to scientific, technical, manufacturing, acquisition, logistics, and business management functions. The ASB dates to November 1951 when the Secretary of the Army, Honorable Frank Pace Jr., appointed twelve outstanding scientists and industrialists to a scientific advisory panel to assist him and the Army's leadership in creating an effective, economical, and progressive fighting force using existing technology and industrial resources. Three years later, this panel was expanded and officially designated the Army Scientific Advisory Panel (ASAP), with its first formal meeting held on November 16, 1954. In 1977, with the passage of FACA, the ASB was created to replace the ASAP.

The ASB provides the Army with a resource of world-class scientists, engineers, technologists and operational experts as well as business, policy and managerial specialists from the private sector, academia, non-DoD government agencies and former senior military officers. Its members volunteer their expertise and time to address those critical national security challenges for which the Army's leadership seeks independent and unbiased technical advice. The ASB focuses on issues of importance to large segments of the Army, and its products are delivered in a candid and timely manner.

The Board is composed of 20 voting and 20 non-voting members, each serving three-year terms, and consultants who serve one-year terms. Membership is carefully monitored to ensure that diverse disciplines and points of view are represented. The Secretary of the Army appoints the Chair and Vice Chair from the ASB membership. The ASB Chair also serves as a non-voting observer to the Defense Science Board. ASB membership is augmented by a small number of consultants who are appointed to provide specialized expertise for ASB studies.

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

	FY 2018	FY 2019	FY 2020
Title: Army Science Board (ASB)	3.020	3.056	2.250
Description: The ASB Charter sets the estimated number of Board meetings at four per year. Board members serve without compensation, with the exception of reimbursement for official Board-related travel and per diem. Funds are therefore required to facilitate Board activities and related subcommittee activities. The ASB Charter states that annual requirements will typically entail a personnel cost of seven Full-Time Equivalents.			
Currently, the Secretary of the Army has approved four permanent subcommittees to the Board:			
1) The Army Science Board Basic Science and Disruptive Technologies Subcommittee is composed of not more than 15 members and addresses issues relating to the Army's basic research and disruptive technologies, including Soldier performance			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) EU9 / <i>Army Science Board</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>enhancement, cognition improvement, and training; autonomous systems and human-machine teaming; Chemical, Biological, Radiological, Nuclear and high-yield Explosives (CBRNE); and counter Weapons of Mass Destruction.</p> <p>2) The Army Science Board Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Subcommittee is composed of not more than 15 members and addresses issues relating to the Army's C4ISR core competency, including the tactical edge C3, situational awareness overmatch, and electronic warfare.</p> <p>3) The Army Science Board Systems Engineering, Integration, and Sustainment Subcommittee is composed of not more than 15 members and addresses relating to the Army's core competency in systems engineering and integration; advanced prototyping and experimentation in operational environments; and sustainment, including engineered resilient systems, agile logistics and health management. These competencies are essential to the performance of the entire acquisition community.</p> <p>4) the Army Science Board Weapon Systems Subcommittee is composed of not more than 15 members and addresses issues relating to the Army's weapon systems core competency in: Rotorcraft Design Synthesis & Performance Assessment (DS&PA) and airworthiness/safety; ground combat vehicle DS&PA, Soldier interaction, and system integration; lethality, including impact physics, energetics, warhead DS&PA, effects modeling and simulation; survivability and protection, including armor and balanced approach for detection/hit/kill avoidance; and air and missile defense DS&PA, precision fires, seekers, and precision guidance.</p> <p>FY 2019 Plans: Conduct four to six studies on behalf of the Secretary of the Army; likely in areas of Basic Science and Disruptive Technology; Weapons Systems; C4ISR; and Systems Engineering, Integrations, and Sustainment or other concerns related to the future of the force.</p> <p>Plans for the ASB Winter Plenary for Fiscal Year 2019 list Lawrence Livermore National Laboratory in Livermore, California as the Plenary location.</p> <p>FY 2020 Plans: Conduct four to six studies on behalf of the Secretary of the Army; likely in areas of Basic Science and Disruptive Technology; Weapons Systems; C4ISR; and Systems Engineering, Integrations, and Sustainment or other concerns related to the future of the force.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding change in support of the Army's modernization efforts.</p>				
Title: FY2019 SBIR/STTR Transfer		-	0.101	-
Description: FY2019 SBIR/STTR Transfer				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) EU9 / <i>Army Science Board</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<i>FY 2019 Plans:</i> FY2019 SBIR/STTR Transfer			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY2019 SBIR/STTR Transfer			
Accomplishments/Planned Programs Subtotals	3.020	3.157	2.250

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M02 / <i>Med Cmd Spt (Non-AMHA)</i>			
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
M02: <i>Med Cmd Spt (Non-AMHA)</i>	-	25.998	26.457	24.052	-	24.052	24.022	24.603	25.059	25.534	0.000	175.725
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for authorized civilian workforce performing medical research, development, acquisition management and oversight that support the medical Research, Development, Test, and Evaluation (RDTE) programs at the United States (U.S.) Army Medical Research and Materiel Command (USAMRMC), Fort Detrick, Maryland to: (1) perform planning, programming, and budgeting; (2) manage resources; and (3) ensure compliance with U.S. Food and Drug Administration (FDA) and other regulatory and safety requirements. It also provides for continued operations of contracting and acquisition management functions performed by the U.S. Army Medical Research Acquisition Activity (USAMRAA) in support of the USAMRMC Medical RDTE Program.

Additionally, this Project provides funding for the special immunization program (SIP). The SIP program provides FDA licensed vaccines and investigational new drug (IND) vaccines under informed consent to laboratory workers at the U.S. Army Medical Research Institute of Infectious Diseases, and to other military, government, or contractor personnel who may be at risk of exposure to highly hazardous pathogenic microorganisms or toxins.

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

	FY 2018	FY 2019	FY 2020
Title: Civilian Authorized Salaries and other operational requirements	25.998	26.223	24.052
Description: Funding is provided to the U.S. Army Medical Research and Materiel Command (USAMRMC) for Medical Research Development Acquisition (RDA) Management and Oversight to include the payroll of civilians as well as nominal operating expense. Expertise helps establish and maintain the capabilities that Army medicine needs to sustain life, limb, and eyesight for our warfighters. Civilian labor performs centralized management of Medical RDA (many areas required by law and/or regulation) including animal & human research protections, health and safety compliance, environmental management, and U.S. Food and Drug Administration regulatory compliance, legal support (including intellectual property protection), quality assurance, contracting services, personnel management, and planning, programming, and budgeting, and execution management. Funding also supports the Army's portion of the Special Immunization Program that protects individuals engaged in infectious disease research if exposed to pathogens or toxins.			
FY 2019 Plans: Fund authorized civilian salaries and associated expenses (supplies, equipment, travel, etc) at USAMRMC and USAMRAA. Also, provide regulatory, clinical monitoring and data support for the SIP. This program will provide non licensed vaccines under FDA oversight to personnel at risk of exposure to selected infectious diseases.			
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M02 / <i>Med Cmd Spt (Non-AMHA)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Will fund authorized civilian salaries and associated expenses (supplies, equipment, travel, etc) at USAMRMC and USAMRAA. Also, will provide regulatory, clinical monitoring and data support for the Special Immunization Program. This program will provide non licensed vaccines under FDA oversight to personnel at risk of exposure to selected infectious diseases. FY 2019 to FY 2020 Increase/Decrease Statement: Funding levels are designed to align program requirements with Army modernization priorities in support of the National Defense Strategy.			
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	-	0.234	-
Accomplishments/Planned Programs Subtotals	25.998	26.457	24.052

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M15 / <i>ARI Mgmt/ADM Act</i>			
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
M15: <i>ARI Mgmt/ADM Act</i>	-	1.437	1.513	1.550	-	1.550	1.585	1.629	1.661	1.679	0.000	11.054
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The United States (U.S.) Army Research Institute for the Behavioral and Social Sciences (ARI) is the only Science and Technology (S&T) laboratory that conducts research to enhance the Soldier lifecycle (e.g., selection, assignment, training, leader development) and human relations (e.g. culture of dignity, respect, and inclusion). This Project supports the non-AMHA (Army Management Headquarters Activity) management and administrative functions to enable ARI to accomplish its research mission and includes activities such as budget execution, procurement oversight, Research Development Test & Evaluation (RDTE) program planning and evaluation, management control, security/safety, logistics, information technology, and personnel/manpower execution and oversight. ARI's behavioral and social science research provides effective non-materiel solutions to help the Army adjust to changes in force size and structure, a variety of mission demands and contexts, challenges in human relations, and budgetary constraints.

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

	FY 2018	FY 2019	FY 2020
<p>Title: ARI Management/Administrative Actions</p> <p>Description: This effort supports the non-AMHA management and administrative functions to enable ARI to accomplish its research mission and includes activities such as personnel/manpower execution and oversight.</p> <p>FY 2019 Plans: Provide operation of management, administrative, personnel, budget, and support functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Laboratory conducting the Army's personnel, training, leader development, and organizational performance R&D program.</p> <p>FY 2020 Plans: Will provide operation of management, administrative, personnel, budget, and support functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Laboratory conducting the Army's personnel, training, leader development, and organizational performance R&D program.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to inflation.</p>	1.437	1.465	1.550
<p>Title: FY2019 SBIR/STTR Transfer</p> <p>Description: FY2019 SBIR/STTR Transfer</p> <p>FY 2019 Plans:</p>	-	0.048	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M15 / <i>ARI Mgmt/ADM Act</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY2019 SBIR/STTR Transfer			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY2019 SBIR/STTR Transfer			
Accomplishments/Planned Programs Subtotals	1.437	1.513	1.550

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M16 / <i>Standardization Groups</i>			
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
M16: <i>Standardization Groups</i>	-	3.351	3.793	4.297	-	4.297	4.339	4.433	4.475	4.521	0.000	29.209
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports nine International Technology Centers (formerly known as Standardization Groups) in North America, South America, Asia, and Europe for personnel, travel and overhead costs, leases on buildings, and mandatory permanent change of station.

The mission of the International Technology Centers is to support the United States (U.S.) Army Rationalization, Standardization and Interoperability (RSI) mission around the globe as specified in Army Regulation (AR) 34-1 "Multinational Force Interoperability" and AR 70-41 "International Cooperative Research, Development and Acquisition (ICRDA)". ITCs represent the U.S. Army in their geographic areas of responsibility (AOR) with foreign ministries of defense on ICRDA programs. ITCs also facilitate U.S. Army interaction in their geographic AOR with foreign non-governmental entities, such as foreign private industry and academia.

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

	FY 2018	FY 2019	FY 2020
<p>Title: International Technology Centers Management</p> <p>Description: This activity funds the U.S. Army Rationalization, Standardization, and Interoperability mission conducted by the nine International Technology Centers around the globe. These funds support the infrastructure, personnel and travel requirements to support the mission.</p> <p>FY 2019 Plans: Represent the U.S. Army's interests in engagements with foreign ministries of defense on International Cooperative Research, Development and Acquisition (RDA) programs. Facilitate U.S. Army interaction with foreign non-government entities, such as foreign private industry and academia.</p> <p>FY 2020 Plans: Will represent the U.S. Army's interests in engagements with foreign ministries of defense on International Cooperative Research, Development and Acquisition (RDA) programs. Will facilitate U.S. Army interaction with foreign non-government entities, such as foreign private industry and academia.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to economic adjustment.</p>	3.351	3.728	4.297
<p>Title: FY2019 SBIR/STTR Transfer</p> <p>Description: FY2019 SBIR/STTR Transfer</p> <p>FY 2019 Plans:</p>	-	0.065	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M16 / <i>Standardization Groups</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY2019 SBIR/STTR Transfer			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i>			
FY2019 SBIR/STTR Transfer			
Accomplishments/Planned Programs Subtotals	3.351	3.793	4.297

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M42 / ARDEC Cmd/Ctr Support			
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
M42: ARDEC Cmd/Ctr Support	-	4.067	7.318	7.419	-	7.419	7.277	7.477	7.466	7.863	0.000	48.887
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the Non-AMHA (Army Management Headquarters Activity) functions incident to the local operation and management of the United States (U.S.) Army Armament Research, Development and Engineering Center (ARDEC), Picatinny Arsenal, NJ, not identifiable with specific research and development Projects financed under other Program Elements.

Funds only select, critical, overarching functions that enable the ARDEC to accomplish its research, development and engineering mission, to include ARDEC Headquarters staff, safety, physical security, anti-terrorism, operations security (OPSEC), information security and intelligence services.

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

	FY 2018	FY 2019	FY 2020
Title: Management Support	4.067	7.318	7.419
Description: ARDEC management / administrative efforts.			
FY 2019 Plans: Provide management and administrative functions at a level consistent with mission requirements and support needs at ARDEC.			
FY 2020 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at ARDEC.			
FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to economic adjustments.			
Accomplishments/Planned Programs Subtotals	4.067	7.318	7.419

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

N/A

Remarks

D. Acquisition Strategy

N/A

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

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 6	PE 0605801A / <i>Programwide Activities</i>	M42 / <i>ARDEC Cmd/Ctr Support</i>

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M44 / <i>CECOM Cmd/Ctr Spt</i>			
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
M44: <i>CECOM Cmd/Ctr Spt</i>	-	2.388	4.574	3.819	-	3.819	3.906	3.986	4.805	5.016	0.000	28.494
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Supports the Non-AMHA (Non-Army Management Headquarters Activity) functions incident to the local operation and management of the U.S. Army Communications-Electronics Research, Development and Engineering Center (CERDEC), Aberdeen Proving Ground, MD, not identifiable with specific research and development projects financed under other program elements.

Funds only select, critical, overarching functions that enable CERDEC to accomplish its research, development and engineering mission, to include CERDEC Headquarters staff, resource management, human resources, safety, security, protocol, public affairs, information management, facility management and audit readiness.

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

	FY 2018	FY 2019	FY 2020
Title: Management Support	2.388	4.522	3.819
Description: CERDEC management and administrative efforts.			
FY 2019 Plans: Provide management and administrative functions at a level consistent with mission requirements and support needs at CERDEC.			
FY 2020 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at CERDEC.			
FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to economic adjustment.			
Title: FY2019 SBIR/STTR Transfer	-	0.052	-
Description: FY2019 SBIR/STTR Transfer			
FY 2019 Plans: FY2019 SBIR/STTR Transfer			
FY 2019 to FY 2020 Increase/Decrease Statement: FY2019 SBIR/STTR Transfer			
Accomplishments/Planned Programs Subtotals	2.388	4.574	3.819

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M44 / <i>CECOM Cmd/Ctr Spt</i>
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C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M46 / <i>AMCOM Cmd/Ctr Spt</i>			
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
M46: <i>AMCOM Cmd/Ctr Spt</i>	-	0.225	0.228	3.596	-	3.596	3.435	3.536	3.920	4.097	0.000	19.037
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in Fiscal Year (FY) 2017, portions of Project M46 (Anti-Tamper effort) were realigned to Program Element (PE) 0602705A (Electronics and Electronic Devices) / Project H94 (Elec & Electronic Dev) and PE 0605024A (Anti-Tamper Technology Support) / Project FB1 (Anti-Tamper Technology Support).

A. Mission Description and Budget Item Justification

This Project supports Non-AMHA (Army Management Headquarters Activity) functions incident to the local operation and management of the U.S. Army Aviation and Missile Research, Development and Engineering Center (AMRDEC), Redstone Arsenal, AL. Such functions are not identifiable with specific research and development Projects financed under other Program Elements.

Minimally funds select, critical, overarching functions in support of AMRDEC accomplishing its research, development and engineering mission.

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

	FY 2018	FY 2019	FY 2020
Title: Management Support	0.225	0.228	3.596
Description: AMRDEC management and administrative efforts.			
FY 2019 Plans: Provide management and administrative functions at a level consistent with mission requirements and support needs at AMRDEC.			
FY 2020 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at AMRDEC.			
FY 2019 to FY 2020 Increase/Decrease Statement: FY20 increase realigned from other RDECOM non-AMHA projects within this Program Element. Not a mission change.			
Accomplishments/Planned Programs Subtotals	0.225	0.228	3.596

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

N/A

Remarks

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M46 / <i>AMCOM Cmd/Ctr Spt</i>
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D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M47 / <i>TACOM Cmd/Ctr Spt</i>			
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
M47: <i>TACOM Cmd/Ctr Spt</i>	-	3.300	3.294	3.629	-	3.629	3.707	3.808	3.857	4.088	0.000	25.683
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the Non-AMHA (Army Management Headquarters Activity) functions incident to the local operation and management of the United States (U.S.) Army Tank and Automotive Research, Development and Engineering Center (TARDEC), Warren, MI, not identifiable with specific research and development Projects financed under other Program Elements.

Funds only select, critical, overarching management functions that enable TARDEC to accomplish its research, development and engineering mission.

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

	FY 2018	FY 2019	FY 2020
Title: Management Support	3.300	3.294	3.629
Description: TARDEC management and administrative efforts.			
FY 2019 Plans: Provide management and administrative functions at a level consistent with mission requirements and support needs at TARDEC.			
FY 2020 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at TARDEC.			
FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to economic adjustment.			
Accomplishments/Planned Programs Subtotals	3.300	3.294	3.629

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M55 / <i>Edgewood Chemical Biological Center</i>			
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
M55: <i>Edgewood Chemical Biological Center</i>	-	6.491	6.035	3.027	-	3.027	2.583	2.643	3.724	4.139	0.000	28.642
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the Non-AMHA (Army Management Headquarters Activity) functions incident to the local operation and management of the United States (U.S.) Army Edgewood Chemical Biological Center (ECBC), Aberdeen Proving Ground, MD, not identifiable with specific research and development Projects financed under other Program Elements.

Funds only select, critical, overarching functions that enable ECBC to accomplish its mission to include the ECBC Headquarter staff, resource management, safety, and surety programs. In addition, this program includes the management and oversight of Army chemical surety operations as directed by DoD Instruction 5210.65, "Minimum Security Standards for Safeguarding Chemical Agents".

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

	FY 2018	FY 2019	FY 2020
Title: Management Support	6.491	5.893	3.027
Description: ECBC management and administrative efforts.			
FY 2019 Plans: Provide continued management and administrative functions at a level consistent with mission requirements and support needs at ECBC.			
FY 2020 Plans: Will provide continued management and administrative functions at a level consistent with mission requirements and support needs at ECBC.			
FY 2019 to FY 2020 Increase/Decrease Statement: FY20 decrease realigned to other RDECOM non-AMHA efforts within this Program Element. Not a mission change.			
Title: FY2019 SBIR/STTR Transfer	-	0.142	-
Description: FY2019 SBIR/STTR Transfer			
FY 2019 Plans: FY2019 SBIR/STTR Transfer			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M55 / <i>Edgewood Chemical Biological Center</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY2019 SBIR/STTR Transfer			
Accomplishments/Planned Programs Subtotals	6.491	6.035	3.027

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M58 / <i>SECOM CMD/CTR Spt</i>			
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
M58: <i>SECOM CMD/CTR Spt</i>	-	2.454	2.429	2.350	-	2.350	2.234	2.280	2.318	2.367	0.000	16.432
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the Non-AMHA (Army Management Headquarters Activity) functions incident to the local operation and management of the United States (U.S.) Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA, not identifiable with specific research and development Projects financed under other Program Elements.

Funds only select, critical, overarching functions that enable NSRDEC to accomplish its research, development and engineering mission, to include: Manpower/ Personnel, Intelligence/Security, Operations, Logistics, Training, Resource Management and Headquarter administrative staff.

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

	FY 2018	FY 2019	FY 2020
Title: Management Support	2.454	2.429	2.350
Description: NSRDEC management and administrative functions.			
FY 2019 Plans: Provide continued management and administrative functions at a level consistent with mission requirements and support needs at NSRDEC.			
FY 2020 Plans: Will provide continued management and administrative functions at a level consistent with mission requirements and support needs at NSRDEC.			
FY 2019 to FY 2020 Increase/Decrease Statement: Funding change due to adjustment of economic assumptions, e.g. inflation rate.			
Accomplishments/Planned Programs Subtotals	2.454	2.429	2.350

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

N/A

Remarks

D. Acquisition Strategy

N/A

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M58 / <i>SECOM CMD/CTR Spt</i>
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E. Performance Metrics
N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>				Project (Number/Name) M76 / <i>Armament Group Support</i>			
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
M76: <i>Armament Group Support</i>	-	1.652	2.123	2.186	-	2.186	2.221	2.266	2.279	2.320	0.000	15.047
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The goal of this Project is to expand worldwide allied standardization and interoperability through cooperative R&D and technology sharing per Secretary of Defense guidance and especially in support of the United States (U.S.) Army. This Project partially funds the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate in international forums, such as the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding. This Project also includes the United States' share of costs of the NATO Civil Budget, Chapter IX, which funds the NATO Industrial Advisory Group (NIAG) and the Special Fund for Cooperative Planning (U.S. Army is Executive Agent for this NATO bill). This Project also partially funds the Five Power Senior National Representatives, Army (SNR (A)), the Technical Cooperative Program, Bilateral SNR(A)s, and Army armaments working groups with many nations.

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

	FY 2018	FY 2019	FY 2020
Title: Army Scientific Support NATO Army Armaments Group (NAAG)	0.199	0.307	0.313
Description: Funds supported Army subject matter experts to attend scientific and technological exchange, meetings, demonstrations, and/or simulations having military application and mutual benefits to the U.S. and its Allies.			
FY 2019 Plans: Funds will support NAAG Army Subject Matter Experts' attendance at scientific and technological exchange, meetings, demonstrations, and/or simulations having military application and mutual benefits to the United States and its Allies. FY19 funding will continue to fund different working/capability groups.			
FY 2020 Plans: FY20 Base funded Requirements of \$313K will support Army Subject Matter Experts (SMEs) to attend scientific and technological exchange, meetings demonstrations, and/or simulations having military application and mutual benefits to the United States and its Allies. FY 20 will fund 8 different working/capability groups that will meet twice a year.			
FY 2019 to FY 2020 Increase/Decrease Statement: The increase is to cover the 2% inflations and additional support to NATO Army Armaments Group meetings for 8 Working Groups.			
Title: Executive Agent	1.453	1.755	1.873
Description: Funds the U.S. share of the Mandatory NATO Civil Budget, Chapter IX (Defense Support Programs). U.S. Army is Executive Agent for this Mandatory NATO bill.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M76 / <i>Armament Group Support</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p><i>FY 2019 Plans:</i> Will fund the United States' share of the NATO Civil Budget, Chapter IX (Defense Support Programs). U.S. Army is Executive Agent for this NATO bill.</p> <p><i>FY 2020 Plans:</i> FY20 Base funded Requirements of \$1,873K will fund the United States share of the NATO Civil Budget, Chapter IX (Defense Support Program). U.S. Army is the Executive Agent for this mandatory NATO Bill.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The increase is to cover the Euro exchange rate and the increase of the share of the NATO Bill.</p>			
<p><i>Title:</i> FY2019 SBIR/STTR Transfer</p> <p><i>Description:</i> FY2019 SBIR/STTR Transfer</p> <p><i>FY 2019 Plans:</i> FY2019 SBIR/STTR Transfer</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY2019 SBIR/STTR Transfer</p>	-	0.061	-
Accomplishments/Planned Programs Subtotals	1.652	2.123	2.186

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>
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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
Total Program Element	-	39.613	29.024	25.060	-	25.060	25.698	26.413	27.006	27.514	0.000	200.328
<i>720: Tech Info Func Actv</i>	-	5.652	4.775	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.427
<i>727: Tech Info Activities</i>	-	11.074	9.121	10.556	-	10.556	10.972	11.595	12.018	12.313	0.000	77.649
<i>730: Pers & Trng Analys Act</i>	-	2.161	1.345	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.506
<i>731: Army High Performance Computing Centers</i>	-	4.499	4.594	1.995	-	1.995	2.039	2.102	2.139	2.135	0.000	19.503
<i>733: Acquisition Tech Act</i>	-	3.348	3.525	9.278	-	9.278	9.402	9.345	9.470	9.509	0.000	53.877
<i>C16: FAST</i>	-	1.609	1.629	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.238
<i>C18: BAST</i>	-	1.019	0.894	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.913
<i>DW3: Army Geospatial Enterprise Implementation</i>	-	10.251	3.141	3.231	-	3.231	3.285	3.371	3.379	3.557	0.000	30.215

A. Mission Description and Budget Item Justification

This Program Element (PE) supports upgrading the accuracy, timeliness, availability, and accessibility of scientific, technical, and management information at all levels of the Army Research and Development (R&D) community. Management of this information is critical to achieve the goals established by the Army's Senior Leadership. Use of accurate and timely technical information is essential to successfully meeting the milestones required on the path to the future force, allowing Army Science and Technology (S&T) leadership to refine investment strategy and quickly react to emerging opportunities and issues. This PE includes initiatives to improve information derivation, storage, access, display, validation, transmission, distribution, and interpretation, along with initiatives to develop and enhance a single business model for Army S&T knowledge management information technology and to provide for Independent Review Team analysis of technology maturity as part of the Technology Area Readiness Assessment as required by Department of Defense (DoD) Instruction 5000.2 dated May 12, 2003 (Projects 720 and 727). This PE also addresses the need to increase the competitiveness and availability of scientific, engineering, and technical skills in the DoD and National workforce through outreach programs aimed at middle school through college students and teachers. Project 730 provides funding for assessments in attitudes and opinions, longitudinal trends in Soldier and leader perceptions, and emerging issues that provide senior Army leaders with information on Soldiers' perceptions to inform personnel policy and program decision-making concerning manpower, personnel, and training issues. Project 731 provides funding for support for Army high performance computing centers. Project 733 provides funding for improvements to the Army's acquisition process, while Project C16 supports combatant commanders and major Army commands by providing science advisors to address scientific and technical issues and by providing engineering teams to solve field Army technical problems. Project DW3 supports Army Geospatial Enterprise (AGE) Implementation with systems engineering, architecture, and test and certification of Army Acquisition Systems. Finally, this PE funds studies by the Board on Army Science and Technology (BAST) (Project C18). Coordination of this PE with the other Services is achieved through inter-service working groups.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>
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Work in this PE is performed by the Research, Development, and Engineering Command (RDECOM), Aberdeen Proving Ground, MD; the Army Research Institute for the Behavioral and Social Sciences (ARI), Ft. Belvoir, VA; the Army Corps of Engineers' Engineer Research and Development Center (ERDC), Vicksburg, MS; Medical Research and Materiel Command (MRMC), Ft. Detrick, MD; Space and Missile Defense Command (SMDC), Huntsville, AL; the Army Geospatial Center (AGC) in Alexandria, VA; Tank Automotive Research, Development, and Engineering Center (TARDEC), Warren, MI; and the Information Management Office, Arlington, VA.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	33.934	29.050	37.778	-	37.778
Current President's Budget	39.613	29.024	25.060	-	25.060
Total Adjustments	5.679	-0.026	-12.718	-	-12.718
• Congressional General Reductions	-0.021	-0.026			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	7.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.262	-			
• SBIR/STTR Transfer	-1.038	-			
• Adjustments to Budget Years	-	-	-12.718	-	-12.718

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: DW3: *Army Geospatial Enterprise Implementation*

Congressional Add: *Congressional Add*

	FY 2018	FY 2019
	7.000	-
Congressional Add Subtotals for Project: DW3	7.000	-
Congressional Add Totals for all Projects	7.000	-

Change Summary Explanation

Fiscal Year (FY) 2018 funding includes a congressional add of \$3.0 million for Army Geospatial Mission Command and a \$4.0 million Program Increase. FY20 decrease of \$12.718 million is designed to align program requirements with Army Modernization priorities in support of the National Defense Strategy.

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 720 / <i>Tech Info Func Actv</i>
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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
<i>720: Tech Info Func Actv</i>	-	5.652	4.775	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.427
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for technology transfer activities to support acquisition, storage, and utilization of technical information for both military and domestic applications. Effective exploitation of science and technology (S&T) information is critical to achieving the goals established by senior Army leadership. Activities include: Army support for Federal Laboratory Consortium (FLC) as required by Public Law; the Army Science Board; the Army Science Conference; S&T database management efforts; and administration of the Army's Small Business Innovation Research (SBIR) and Small Business Technology Transfer Program (STTR) in accordance with the Small Business Innovation Development Act of 1982, the Small Business Research and Development Enhancement Act of 1992 and subsequent reauthorizing legislation. Technology transfer activities make technical information available to both the public and private sectors to reduce duplication in Research and Development programs and to increase competitiveness in the United States (U.S.) business community. Database management efforts support development of decision aids, databases, and automation support for the management and execution of the Army Research, Development, Test and Evaluation (RDTE) appropriation. In addition, this Project provides funding for patent legal expenses and fees for all U.S. Army Research, Development, and Engineering Command (RDECOM) subordinate commands and laboratories, as required by the Omnibus Budget Reconciliation Act.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work is performed by RDECOM, Aberdeen Proving Ground, MD and the US Army Research Laboratory (ARL), Adelphi, MD.

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

	FY 2018	FY 2019	FY 2020
Title: Provide Army Funding Support for Federal Laboratory Consortium as Required by Public Law 104-113	0.260	0.252	-
Description: Public Law 104-113 requires the Army to provide funding for the federal laboratory consortium which is a network of federal agencies that provide a platform where technologies can be strengthened and promoted to return dividends to our economy. Beginning in Fiscal Year 2020, funding for the Federal Laboratory Consortium has been realigned to Project 727.			
FY 2019 Plans: Provide Army funding support for Federal Laboratory Consortium as required by Public Law 104-113.			
FY 2019 to FY 2020 Increase/Decrease Statement: Beginning in Fiscal Year 2020, funding for the Federal Laboratory Consortium has been realigned to Project 727.			
Title: Administrative Support for the Army's SBIR and STTR Programs	1.263	1.234	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 720 / <i>Tech Info Func Actv</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: Army SBIR and Army STTR programs. In 1982, Congress, through the Small Business Innovation Development Act (P.L. 97-219) established the SBIR program to foster the involvement of US based small businesses in federal research and development (R&D). The SBIR program is designed to increase the participation of small, high-technology firms in the federal R&D endeavor and give driven businesses the opportunity to provide innovative R&D solutions in response to critical Army needs. The STTR program expands the public/private sector partnership to include the joint venture opportunities for small business and the nation's premier nonprofit research institutions. The most important role of the STTR program is to foster the innovation necessary to meet the nation's scientific and technological challenges in the 21st century. The SBIR/STTR support services include program and technical advisory support services on a broad level. The Army SBIR/STTR Program Management Office mission requires synergized, integrated business solutions that concentrates on small business technological advances, and eliminates redundancy in a codified and consistent method that reduces confusion and ambiguity for the thousands of small businesses that participate in the SBIR and STTR programs.</p> <p>FY 2019 Plans: Provide the Army SBIR/STTR Program Offices with the resources necessary to execute Congressionally-mandated programs. The Army SBIR/STTR Program Offices will procure program management and technical services required to support the programs. The support services will include a broad range of program and technical assistance services such as programming; database support; drafting of letters, reports, newsletters, briefings, presentation materials and correspondence; analyses; documentation for record keeping and reporting; helpdesk; and web portal development and support. The services will assist the Program Offices in planning, coordinating, implementing, and orchestrating SBIR/STTR functions to include current and new approaches, processes and procedures as required by United States Code, Title 15, Section 638, Fiscal Year 2012 National Defense Authorization Act, Public Laws 112-81, and in Public Laws 97-219, 99-443, 102-564 and 106-554.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding aligns program requirements to Army Modernization Priorities in support of the National Defense Strategy.</p>			
<p>Title: Provide Funding for Patent Fees and Patent Legal Expenses for U.S. Army Materiel Command (AMC) Commands and Laboratories</p> <p>Description: The Army Research Laboratory turns high-value Army S&T investments into patented technologies in an effort to convert research into jobs and innovations for the Warfighter. The funded efforts are used for patent fees and legal expenses required for the patent application process.</p> <p>FY 2019 Plans: Provide funding for patent fees and patent legal expenses for AMC commands and laboratories.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>	1.069	0.941	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 720 / <i>Tech Info Func Actv</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Funding aligns program requirements to Army Modernization Priorities in support of the National Defense Strategy.				
Title: Provide Funding for S&T Strategic Planning and Support		0.332	0.267	-
Description: S&T strategic planning and support is a critical component to the overall Army mission as it reaffirms Army leadership guidance, reinforces commitment to basic research, and leverages a landscape of game-changing technologies that can provide future innovations and capabilities to the Warfighter.				
FY 2019 Plans: Provide funding for S&T Strategic Planning and Support.				
FY 2019 to FY 2020 Increase/Decrease Statement: Funding aligns program requirements to Army Modernization Priorities in support of the National Defense Strategy.				
Title: Administer S&T Database Computer Engineering Support Contract and Support RDECOM Databases S&T Management Support		2.728	1.922	-
Description: The S&T database computer engineering support contract provides management support of RDECOM's databases as well as supports the development of the Army Research Laboratory S&T information activities to include campaign plans envisioned to lead to enhanced land power capabilities.				
FY 2019 Plans: Administer S&T database computer engineering support contract and support RDECOM databases S&T management support.				
FY 2019 to FY 2020 Increase/Decrease Statement: Funding aligns program requirements to Army Modernization Priorities in support of the National Defense Strategy.				
Title: FY 2019 SBIR / STTR Transfer		-	0.159	-
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		5.652	4.775	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 720 / <i>Tech Info Func Actv</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>				Project (Number/Name) 727 / <i>Tech Info Activities</i>			
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
<i>727: Tech Info Activities</i>	-	11.074	9.121	10.556	-	10.556	10.972	11.595	12.018	12.313	0.000	77.649
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the development of decision aids, databases, and automation support for the management and execution of the Army Research, Development, Test, & Evaluation (RDTE) Appropriation. It includes the hardware, software, and contractor support required to develop and implement a set of management decision aids, databases, and hardware/software tools to support technical and budgetary decisions at the Office of the Secretary of Defense (OSD) and Department of the Army (DA). Most of the efforts in this project are on-going activities to support Army Research, Development, and Acquisition programs. Effective exploitation of Science and Technology (S&T) information is critical to achieving the goals established by Senior Army Leadership for the future force. Funding in this program supports Independent Review Team analysis of technology maturity as part of Technology Readiness Assessments as required by Department of Defense Instruction (DoDI) 5000.2.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the Office of the Assistant Secretary of the Army, Acquisition, Logistics and Technology, The Pentagon, Washington, DC.

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

	FY 2018	FY 2019	FY 2020
Title: Conduct and support S&T program portfolio assessments and analysis.	1.770	1.170	2.256
<p>Description: Supports identification, development and demonstration of technology options that inform and enable effective and affordable capabilities for the Soldier Providing Soldiers with the technology to win. Support Air, Ground Maneuver and Lethality Portfolio Directors, responding to scientific, technical and programmatic challenges. Support Independent Review Team analysis of technology maturity as part of Technology Readiness Assessments as required by DoDI 5000.2. Serve as Office of the Deputy Assistant Secretary of the Army, Research and Technology (DASA(R&T)) central point of contact for Systems Red Teaming and Technology Vulnerability Assessments.</p> <p>FY 2019 Plans: Track, manage and provide programmatic support for applied research and advanced technology development efforts in vulnerability assessments; act as the S&T SMEs and provide Portfolio leads what is forecasted for science and technology ? outputs? aligned with Programs of Record; provide ODASA (R&T) summary briefing in the SPAR; ensure tight alignment and coupling to existing PoRs and identifying where misalignment between Portfolio technology projections/timelines and/or emerging technology options are not yet reflected at the PoR level. Identify technology for effective and affordable capabilities in the S&T</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 727 / <i>Tech Info Activities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>portfolios: Basic Research, Innovation Enablers, Medical, Soldier/Squad, Command, Communications and Command, Control, Communications, Computers and Intelligence (C3I), Air, Lethality and Ground Maneuver.</p> <p>FY 2020 Plans: Will track, manage and provide programmatic support for applied research and advanced technology development efforts in vulnerability assessments; will act as the S&T SMEs to provide Portfolio leads what is forecasted for science and technology ? outputs? to align with Programs of Record; provide ODASA (R&T) summary briefing in the SPAR; will ensure tight alignment and coupling to existing PoRs and will identify where misalignment between Portfolio technology projections/timelines and/or emerging technology options are not yet reflected at the PoR level. Will identify technology for effective and affordable capabilities in the S&T portfolios: Basic Research; Innovation Enablers; Medical; Soldier/Squad; Command, Control, Communications, Computers and Intelligence (C3I); Air; Lethality; and Ground Maneuver.</p> <p>Will conduct studies of merging topics based on Army S&T strategy and senior leader initiatives through the Board on Army Science and Technology (BAST) and the National Academies.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding realigned within the Project due to the financial restructure; meets Modernization Priority intent.</p>				
<p>Title: Support Army S&T strategic planning, analysis, and prioritization.</p> <p>Description: Coordinates efforts with and across the Army S&T portfolios; manage proposal nomination and selection process; track and provide oversight of ongoing efforts; recommend resolutions/prioritization in the event of conflicting requirements and/or resource constraints; support the full spectrum of Planning, Programming and Budget Execution (PPBE) as it relates to the Army S&T Program. Provide senior level technical and analytical support for the Joint Capability Technology Demonstration (JCTD) program and Technology Maturation Initiative (TMI) by assisting with investment analysis, strategies and oversight. Provide financial management recommendations and insights with regards to JCTDs, TMI, Manufacturing Technology (ManTech) and DMIs. A variety of scientific and technical taxonomies applied at the task level allow responsive reporting on S&T programs to Congressional, OSD and Army leadership. Beginning in Fiscal Year 2020, funding for the Federal Laboratory Consortium has been realigned to this line of effort from Project 720.</p> <p>FY 2019 Plans: Develop strategic analyses to look across the S&T portfolios and provide recommendations to the Director of Integration for S&T efficiencies and collaborative opportunities; support ODASA(R&T) lead for future force; continue to coordinate efforts with and across the Army S&T portfolios; support the PDM process, tasks and guidance for Equipping PEG; develop prioritized decrement</p>		7.304	5.376	4.600

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 727 / <i>Tech Info Activities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>lists and recommend alternatives for a balanced portfolio; and support the plan and execution for the ASTAG, the ASTWG and the WTC.</p> <p>FY 2020 Plans: Will develop strategic analyses to look across the S&T portfolios and will provide recommendations to the Director of Integration for S&T efficiencies and collaborative opportunities; will support ODASA(R&T) lead for future force; will continue to coordinate efforts with and across the Army S&T portfolios; will support the PDM process, tasks and guidance for Equipping PEG; will develop prioritized decrement lists and recommend alternatives for a balanced portfolio; and will support the plan and execution of the S&T Oversight Committees. Beginning in Fiscal Year 2020, funding for the Federal Laboratory Consortium has been realigned to this line of effort from Project 720.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding realigned within the Project due to the financial restructure; meets Modernization Priority intent.</p>				
<p>Title: Provide funding and support for Army Acquisition Program Technology Readiness Assessments for Program Milestone Decisions.</p> <p>Description: Coordination and alignment with Programs of Record. Demonstrate technical feasibility at system and subsystem level. As path for technology spirals to acquisition, ensure a rapid insertion of new technology.</p> <p>FY 2019 Plans: Support the S&T investment strategy for the entire Army; provide options for the future across to sustain overmatch against adversaries and create opportunities to meet new challenges and fight in new ways; continue Independent Review Team (IPT) analysis of technology maturity as part of Technology Readiness Assessments as required by DoDI 5000.2; and act as the central point of contact for Systems Red Teaming and Technology Vulnerability Assessments.</p> <p>FY 2020 Plans: Will support the S&T investment strategy for the entire Army; will provide options for the future across to sustain overmatch against adversaries and to create opportunities to meet new challenges and fight in new ways; will continue Independent Review Team (IRT) analysis of technology maturity as part of Technology Readiness Assessments as required by DoDI 5000.2; and will act as the central point of contact for Systems Red Teaming and Technology Vulnerability Assessments.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding realigned within the Project due to the financial restructure; meets Modernization Priority intent.</p>		1.800	1.268	1.000
<p>Title: Provide Army support to Assistant Secretary of Defense for Research and Engineering Executive Staff for Department of Defense (DoD) wide Science and Technology oversight.</p>		0.200	0.973	0.200

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 727 / <i>Tech Info Activities</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Description: Supports Army engagement in DoD/Under Secretary of Defense for Research and Engineering and cross agency Science Technology Engineering and Mathematics (STEM) actions. Provide subject matter expert support for educational and diversity outreach activities.</p> <p>FY 2019 Plans: Participate in Defense Advanced Research Projects Agency (DARPA) engagements and awareness of DARPA Programs with links to Army S&T; support Army S&T Engagements with DARPA Program Managers and Leadership; and support execution of ongoing programs, events and functional responsibilities, effectively communicating with all Army stakeholders and partners including other services, OSD, industry and academia.</p> <p>FY 2020 Plans: Will participate in Defense Advanced Research Projects Agency (DARPA) engagements and awareness of DARPA Programs with links to Army S&T; will support Army S&T Engagements with DARPA Program Managers and Leadership; and will support execution of ongoing programs, events and functional responsibilities, effectively communicating with all Army stakeholders and partners including other services, OSD, industry and academia.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: In FY19 this effort included support to mission functions in Science, Technology, Engineering, & Mathematics (STEM) outreach and Army Educational Outreach Programs (AEOP). These support activities were transitioned to Budget Activity 1 to better integrate with Basic Research efforts in those areas.</p>				
<p>Title: Conduct and support technology wargaming</p> <p>Description: Crowd-sources future capabilities from the Army S&T enterprise, academia, and non-traditional DoD thinkers. Provides context and analysis on emerging national and international S&T trends in annual Emerging Trends report. Develops predictive technologies to identify disruptive technologies earlier. Analyzes international efforts in army S&T priorities and create a report to help inform decisions involving research partnerships.</p> <p>FY 2020 Plans: Will crowd-source future capabilities from the Army S&T enterprise, academia, and non-traditional DoD thinkers. Will refine crowd-sourced efforts, adding Subject-Matter Expert review to create a functional decomposition of potential capabilities and analysis of potential technologies using bibliographic-based data analytics (universities, personnel, countries performing the research). Will assign probabilities and perform Monte Carlo Simulation to create a here-to-there narrative for how basic science advances can produce an Army capability through a Technology Sequence Analysis (TSA). Will implement a predictive technology tool, making it available to the S&T user base. Will update international S&T report yearly, adding emerging S&T areas and dropping those that</p>		-	-	2.500

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 727 / <i>Tech Info Activities</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
are no longer army S&T priorities. Will continue to update and provide context and analysis on emerging national and international S&T trends in annual Emerging Trends Report.			
FY 2019 to FY 2020 Increase/Decrease Statement: Funding realigned within the Project due to the financial restructure; meets Modernization Priority intent.			
Title: FY 2019 SBIR / STTR Transfer Description: FY 2019 SBIR / STTR Transfer	-	0.334	-
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	11.074	9.121	10.556

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>				Project (Number/Name) 730 / <i>Pers & Trng Analys Act</i>			
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
730: <i>Pers & Trng Analys Act</i>	-	2.161	1.345	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.506
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the Army's behavioral and social science research in attitudes and opinions assessment, longitudinal trends in Soldier and leader perceptions, and emerging issues. The research provides a unique capability to address a number of issues that directly or indirectly affect Soldier and unit performance and readiness, such as identifying the impact of personnel policies on Soldier outcomes and identifying emerging and potential personnel challenges. Requirements for this research is solicited on a recurring basis from the Secretary of the Army (SA), Chief of Staff of the Army (CSA), Army Deputy Chief of Staff (DCS) G-1, and the Assistant Secretary of the Army for Manpower and Reserve Affairs (ASA (M&RA)).

Work in this Project is managed by the United States Army Research Institute for the Behavioral and Social Sciences (ARI), Ft. Belvoir, VA.

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

	FY 2018	FY 2019	FY 2020
Title: PERS & TRNG ANALYS ACT	2.161	1.317	-
Description: This effort conducts attitude and opinion research to identify longitudinal trends and emerging issues to inform senior Army leader decision making and shape ARI's long-range S&T program.			
FY 2019 Plans: Conduct research on critical issues identified by the SA, CSA, DCS G-1, and ASA (M&RA).			
FY 2019 to FY 2020 Increase/Decrease Statement: Program funding aligns program requirements with Army Modernization Priorities in support of the National Defense Strategy.			
Title: FY 2019 SBIR / STTR Transfer	-	0.028	-
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	2.161	1.345	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 730 / <i>Pers & Trng Analys Act</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>				Project (Number/Name) 731 / <i>Army High Performance Computing Centers</i>			
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
731: <i>Army High Performance Computing Centers</i>	-	4.499	4.594	1.995	-	1.995	2.039	2.102	2.139	2.135	0.000	19.503
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for the high performance computing (HPC) research environment, research, education, infrastructure sustainment, and outreach support associated with Army High Performance Computing Centers at the United States (U.S.) Army Research Laboratory (ARL) and the U.S Army Tank and Automotive Research, Development, and Engineering Center (TARDEC). The Army High Performance Computing Centers provide high fidelity modeling, simulation, and analysis of materials, systems, and operational constructs. The Centers work with researchers at Army laboratories and research, development, and engineering centers to explore new HPC computing environments, algorithms in the computational sciences to address critical technology issues in computational research areas.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work is performed by ARL, Aberdeen Proving Ground, MD and TARDEC, Warren, MI.

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

	FY 2018	FY 2019	FY 2020
Title: Sustain the High Performance Computing Environment and Infrastructure in Support of the US Army Research Laboratory (ARL)	4.499	4.543	1.995
Description: The HPC center provides levels of computational capacity to Army's tactical operational realms and provide innovative HPC capabilities to increase the effectiveness of Army Soldiers around the world. Algorithm design and software engineering approaches are investigated to effectively partition and use binary processing cores to reduce time to solution for Army-relevant problems. Factors such as performance, portability, and power will be considered in conjunction with developing new models to quantify computing capabilities in hybrid systems to facilitate algorithm signature mapping to available resources.			
FY 2019 Plans: Sustain HPC environment and infrastructure for advanced heterogeneous computing architecture including data sciences computing architectures, special access systems infrastructure, programmable HPC Networking infrastructure, and ARL computational sciences Open Campus systems. Sustain software so that the software can take advantage of advanced computing architectures, HPC networking, and visualization that are mission critical for Army S&E and T&E applications.			
FY 2020 Plans: Will support HPC environment and infrastructure by developing new methods for large-scale data processing needs and physics-based simulation applications. Sustain and port new software and legacy software to ensure compatibility with emerging			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 731 / <i>Army High Performance Computing Centers</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>computing systems, HPC networking, and visualization for mission critical applications. Sustain classified and above secret computing environments, providing application support for these special needs. Expand and support ARL Open Campus computational processing and simulation needs.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Planned restructure within civilian staff.</p> <p>Title: FY 2019 SBIR / STTR Transfer</p> <p>Description: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 Plans: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SBIR / STTR Transfer</p>		-	0.051	-
Accomplishments/Planned Programs Subtotals		4.499	4.594	1.995
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				
E. Performance Metrics				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>				Project (Number/Name) 733 / <i>Acquisition Tech Act</i>			
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
733: <i>Acquisition Tech Act</i>	-	3.348	3.525	9.278	-	9.278	9.402	9.345	9.470	9.509	0.000	53.877
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds improvements to the Army's acquisition process by applying decision support and expert information systems, and by supporting analysis and evaluation of alternative acquisition strategies using techniques such as value-added analysis and analysis-of-alternatives. This Project provides the environment for the analysis and evaluation of new information technologies, concepts, and applications for integrated management activities and supports dynamic Army acquisition technology requirements. This Project also supports critical analyses for Army leadership in support of Army Modernization. These analyses are used by leadership in making acquisition, procurement, and logistics decisions in order to provide quality equipment and procedures to the Soldiers.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the Army Acquisition Support Center, Ft. Belvoir, VA.

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

	FY 2018	FY 2019	FY 2020
Title: ACQUISITION TECH ACT	3.348	3.412	9.278
Description: This effort will distribute and beta test application programs and user interface utilities for executive level information systems that offer Standard Query Language services to Army Acquisition Corps corporate and global databases. This effort will also analyze acquisition program financial programming and budgeting requirements and continue development of a Weapon Systems Handbook, long-range planning and policy analysis, resource allocation analysis, cost tracking, and analysis. Robust plans will then be transitioned to the Materiel Developer (Program Executive Office (PEO) Enterprise Information Systems) for implementation at scale.			
FY 2019 Plans: Distribute and beta test application programs and user interface utilities for executive level information systems that offer Standard Query Language services to Army Acquisition Corps corporate and global databases. Analyze acquisition program financial programming and budgeting requirements. Continue development of long-range planning and policy analysis, resource allocation analysis, cost tracking, and analysis.			
FY 2020 Plans: Will establish and implement an Integrated Program Management Environment framework that enables centralized, role-based access to trusted and authoritative data from disparate Acquisition Domain data sources that can be leveraged for analytical and			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 733 / <i>Acquisition Tech Act</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
decision making. Will use this framework to scale and deploy the program management resource tools across a set of PEOs within the Army Acquisition community. FY 2019 to FY 2020 Increase/Decrease Statement: Transition of requirements to Material Developer (Program Executive Office Enterprise Information Systems) for implementation and deployment of program management resource tools across PEOs.				
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		-	0.113	-
Accomplishments/Planned Programs Subtotals		3.348	3.525	9.278
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				
E. Performance Metrics				
N/A				

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) C16 / FAST
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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
C16: FAST	-	1.609	1.629	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.238
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This Project provides support for the Field Assistance in Science and Technology (FAST) program. The FAST program provides Science Advisors, recruited from Army Materiel Command (AMC) headquarters and all Major Subordinate Commands (MSC) to serve combatant commands and major commands worldwide. FAST tours of duty provide significant professional growth opportunities for the Army's scientists and engineers and enable them to focus AMC resources on rapidly identifying and solving field technical problems that enable the improvement of readiness, safety, training, and reduce operations and support (O&S) costs. The FAST activity is supported by Quick Reaction Coordinators within the engineering centers. The FAST program recoups many times its cost in O&S savings. FAST also provides emerging technology demonstration opportunities to the engineering centers an Annual Program Review to facilitate sharing of lessons learned between science advisors at combatant commands, assists Combatant Commanders (COCOMS) with their annual Science and Technology Conferences. FAST also maintains close coordination with the Navy Science Advisor Program (Naval Fleet Forces Technology Integration Office). FAST supports warfighters in contingency operations with embedded Science and Technology Assistance Teams (STATs) as well as Science and Technology Acquisition Corps Advisors (STACAs).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this project is performed by: AMC, Redstone Arsenal, AL; and Research, Development and Engineering Command (RDECOM), Aberdeen Proving Ground, MD.

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

	FY 2018	FY 2019	FY 2020
Title: Respond to combatant commanders worldwide with technological solutions.	1.609	1.602	-
Description: This activity: responds to combatant commanders worldwide with technological solutions to urgent materiel problems they identify; deploys science advisors with U.S. Task Forces in support of combatant commanders; executes annual Program Review; provides additional support needed to participate in combatant commander exercises; responds to corresponding Warfighter requests for information (RFIs), providing project support to offset capability gaps identified by the Warfighter.			
FY 2019 Plans: Respond to combatant commanders worldwide with technological solutions to urgent materiel problems they identify; deploy science advisors with U.S. Task Forces in support of combatant commanders; execute annual Program Review; provide			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) C16 / <i>FAST</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
additional support needed to participate in combatant commander exercises; respond to corresponding Warfighter RFI's; and provide project support to offset capability gaps identified by the Warfighter.			
FY 2019 to FY 2020 Increase/Decrease Statement: Program funding reconciles program requirements with Army Modernization Priorities in support of the National Defense Strategy.			
Title: FY 2019 SBIR / STTR Transfer Description: FY 2019 SBIR / STTR Transfer	-	0.027	-
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	1.609	1.629	-

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) C18 / BAST
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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
C18: BAST	-	1.019	0.894	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.913
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the Board on Army Science and Technology (BAST). The BAST functions under the auspices of the National Research Council (NRC) and provides an external, independent, and objective source of advice to the Army. The BAST serves as a convening authority for the discussion of science and technology issues of importance to the Army and oversees independent Army-related studies conducted by the National Academies. Working in close coordination with the Army, the BAST helps define problems, brings together experts to study these problems, and provides recommendations. Committees are assembled in accordance with established NRC procedures and BAST studies often take 12 months or more to conclude.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.

Work in this Project is executed extramurally by the U.S. Army Research Laboratory, Army Research Office (ARO), Research Triangle Park, NC.

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

	FY 2018	FY 2019	FY 2020
<p>Title: Provide Studies and Conduct Periodic Meetings to Help Identify, Assess, and Recommend Emerging Opportunities in Science and Technology (S&T) Fields Applicable to the United States (U.S.) Army.</p> <p>Description: To acquire a greater understanding of emerging technology opportunities that support a plethora of Army-relevant capability gaps, technologies are continuously assessed both nationally and internationally. In addition, periodic meetings are conducted to discuss and recommend strategic research areas critical to advancing the Warfighter's capabilities.</p> <p>FY 2019 Plans: Study emerging topics based on Army S&T strategy and senior leader initiatives and plan to initiate a new National Academies study.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding aligns program requirements with Army Modernization Priorities in support of the National Defense Strategy.</p>	1.019	0.865	-
<p>Title: FY 2019 SBIR / STTR Transfer</p> <p>Description: FY 2019 SBIR / STTR Transfer</p> <p>FY 2019 Plans:</p>	-	0.029	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) C18 / BAST		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
FY 2019 SBIR / STTR Transfer				
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY 2019 SBIR / STTR Transfer				
Accomplishments/Planned Programs Subtotals		1.019	0.894	-
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				
E. Performance Metrics N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>				Project (Number/Name) DW3 / <i>Army Geospatial Enterprise Implementation</i>			
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
DW3: <i>Army Geospatial Enterprise Implementation</i>	-	10.251	3.141	3.231	-	3.231	3.285	3.371	3.379	3.557	0.000	30.215
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project: provides geospatial domain expertise to Mission Command (MC) in implementing the Army Geospatial Enterprise (AGE) across all MC Systems to ensure interoperability across the Army; ensures Army systems can consume geospatial data from National-Geospatial Intelligence Agency (NGA) and with National System for Geospatial-Intelligence (NSG) partners as required by Department of Defense Instruction (DoDI) 5000.56; standardizes geospatial data between echelons and ensures Standard, Sharable Geospatial Foundation (a Mission Command Essential Capability) across Mission Command; and sustains core mission of operations. Project also provides an interoperable geospatial baseline system of systems in theater, which is a near-term requirement that cannot be deferred. Geospatial is a Mission Command Essential Capability and a critical enabler for the Common Operating Environment (COE) and the warfighter.

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

	FY 2018	FY 2019	FY 2020
Title: Geospatial Acquisition Support Office	3.251	3.095	3.231
<p>Description: This effort supports the systems engineering, architecture, and test and certification of Army Acquisition Systems to support Program Executive Office (PEO)/Program Manager (PM) Computing Environment (CE) geospatial requirements to ensure that system's acquisition processes address geospatial concepts, technology and standards early in their development processes and provide an interoperable geospatial baseline system of systems in theater, which is a near-term requirement that cannot be deferred.</p> <p>FY 2019 Plans: Extend the AGE implementation within the Command Post Computing Environment (CE), Mounted and Mobile Hand-Held CE's; develop alternatives for providing Standard, Shareable Geospatial Foundation (a Mission Command Essential Capability) to Mission Command Systems in a disconnected, Intermittent or Limited environment; develop and recommending standards to distribute SSGF from National to Tactical; develop "to be" AGE roadmap for Mission Command ensuring interoperability between Mission Command systems, the NSG, and our JIIM partners; and providee geospatial domain expertise for Cross-Cutting Capabilities for the Common Operating Environment.</p> <p>FY 2020 Plans: Will continue to extend the AGE implementation within the Command Post Computing Environment, Mounted and Mobile Hand-Held CE's; continue to develop alternatives for providing Standard, Sharable Geospatial Foundation (a Mission Command Essential Capability) to Mission Command Systems in a disconnected, Intermittent or Limited environment; develop and recommend standards to distribute SSGF from National to Tactical; initiate implementation AGE roadmap for Mission Command</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) DW3 / <i>Army Geospatial Enterprise Implementation</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
ensuring interoperability between Mission Command systems, the NSG, and our UAP partners; and provide geospatial domain expertise for Army modernization and enabling technologies of the Common Operating Environment.				
FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to inflation.				
Title: FY 2019 SBIR / STTR Transfer		-	0.046	-
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		3.251	3.141	3.231
		FY 2018	FY 2019	
Congressional Add: Congressional Add		7.000	-	
FY 2018 Accomplishments: Congressional Add				
Congressional Adds Subtotals		7.000	-	
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				
E. Performance Metrics				
N/A				

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>
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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
Total Program Element	-	65.709	72.279	44.458	-	44.458	42.064	43.488	43.488	49.532	0.000	361.018
296: <i>Close Combat Technology*</i>	-	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	5.087	0.000	5.087
297: <i>Mun Survivability & Log</i>	-	15.985	31.637	15.595	-	15.595	16.362	17.062	17.040	17.247	0.000	130.928
857: <i>DoD Explosives Safety Standards</i>	-	1.889	1.840	1.858	-	1.858	1.892	1.930	2.023	1.984	0.000	13.416
858: <i>Army Explosives Safety Management Program</i>	-	1.042	0.991	1.011	-	1.011	1.030	1.047	1.079	1.076	0.000	7.276
859: <i>Life Cycle Pilot Process</i>	-	29.345	20.434	5.600	-	5.600	5.700	5.800	5.900	5.900	0.000	78.679
F21: <i>NATO Ammo Evaluation</i>	-	0.566	0.741	0.750	-	0.750	0.750	0.750	0.750	0.750	0.000	5.057
F24: <i>Conventional Munitions Demil</i>	-	16.882	16.636	19.644	-	19.644	16.330	16.899	16.696	17.488	0.000	120.575

*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 (PE) supports continuing technology investigations by providing a coordinated Tri-Service mechanism for the collection and free exchange of technical data on the performance and effectiveness of all non-nuclear conventional munitions and weapons systems in a realistic operational environment.

Project 296 - This Project will support research, development and testing to identify, characterize and resolve reliability, safety, storage and manufacturing issues that impact production availability and field use of demolitions, grenades, shoulder launched munitions, mines and mine clearing charges and pyrotechnics, including training realism. Project will result in the development and demonstration of new, safe, reliable and environmentally acceptable munitions.

Project 297 - Munitions Survivability & Logistics: This Project supports the future force by making Army units more survivable through the investigation, testing and demonstration of munitions logistics system improvements that prevent or minimize catastrophic explosive events and accelerate ammunition resupply. Key thrusts are munitions storage area survivability, Insensitive Munitions (IM) technology integration and compliance, ammunition management and asset visibility, weapon system rearm, munitions configured load enablers and advanced packaging and distribution system enhancements. Within each thrust, a broad array of solutions will be identified, tested, and evaluated against developed system measures of effectiveness. Optimum, cost effective and efficient solutions that enable the rapid projection of lethal and survivable forces will be demonstrated. The early stages of force deployment are especially critical. Theater ammunition storage areas are vulnerable and present the enemy with lucrative targets. These areas and distribution nodes contain the only available munitions stocks in theater. Loss of these munition stocks could cripple the force, jeopardize the mission, and result in high loss of life. This Project mitigates vulnerabilities and ensures a survivable fighting force.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	
<p>Project 857 - DoD Explosives Safety Standards: This Project supports the Research, Development, Test, and Evaluation efforts of the Department of Defense (DoD) Explosive Safety Standards Board. It supports explosive safety effects research and testing to quantify hazards and to develop techniques to mitigate those hazards in all DoD manufacturing, testing, transportation, maintenance, storage, disposal of ammunition and explosives operations, and also to develop risk based explosives safety standards. Results are essential to the development and improvement of quantity-distance standards, hazard classification procedures, cost effective explosion-resistant facility design procedures, and personnel hazard/protection criteria.</p> <p>Project 858 - Army Explosives Safety Management Program: This Project establishes, validates or modifies explosives technical safety requirements per Department of Defense Manual 6055.09 and Department of the Army Pamphlet 385-64, Ammunition and Explosives Safety Standards. Project activities promote Research, Development, Test, and Evaluation (RDTE) of new and innovative explosives safety technologies that improve the survivability of Army personnel, facilities, and equipment as well as improve the health, safety and welfare of the general public (with highest priority directed to combat theater of operations).</p> <p>Project 859 - Life Cycle Pilot Process: This Project supports the implementation of the Single Manager for Conventional Ammunition (SMCA) Industrial Base Strategic Plan through technology investigations, model based process controls, pilot prototyping, and industrial assessments. It will assess life cycle production capabilities required for all ammunition families, address design for manufacturability to facilitate economical production, identify industrial and technology requirements, and address the ability of the production base to rapidly and cost effectively produce quality products. Cost reduction is an important part of the Life Cycle Pilot Process (LCPP). LCPP provides the resources to prototype critical technologies and develop the knowledge base to establish cost effective, environmentally safe and modern production processes in support of the munitions Industrial Base transformation. In addition, the LCPP program addresses Single Point Failures (SPFs) / No Source of supply within the National Technology Industrial Base (NTIB). LCPP provides support to reduce supply chain risk by investigating, developing and evaluating additional sources of supply for a known SPF.</p> <p>Project F21: The North Atlantic Treaty Organization (NATO) Ammunition Evaluation program funding ensures interchangeability of direct fire ammunition and weapons among all the NATO countries with all of the associated logistic, strategic and tactical advantages of the alliance. The Project involves development and testing compliance of NATO standardization agreements (STANAGS) and staffing of the North American Regional Test Center (NARTC). In addition, this Project supports small caliber ammunition, 40mm grenade munitions, medium caliber cannon ammunition, and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy, and general product improvements. This Project also supports the standardization and interchangeability of legacy and new production U.S. weapons and ammunition with Allied Nations to maximize battlefield interchangeability/compatibility under the auspices of the international Joint Ballistics Memorandum Of Understanding (JBMOU). Maximizing standardization, interchangeability, and exportability will also potentially increase Foreign Military Sales (FMS) of U.S. indirect fire Weapon and Munition products to support United States industrial base production and affordable Department of Defense pricing through increased economies of scale. FY 2020 funding will support NATO and JBMOU artillery and small arms ammunition interchangeability group meetings, documentation, and test operations.</p> <p>Project F24: Conventional Munitions Demilitarization (Demil): The Conventional Munitions Demilitarization technology Project supports the Single Manager for Conventional Ammunition (SMCA) responsibility per Department of Defense Instruction (DoDI) 5160.68 to plan, program, budget and fund a Joint Service Research and Development (R&D) program that develops capability and capacity as well as technology and facilities to support the SMCA mission to demil and dispose of conventional ammunition stored in the SMCA Resource, Recovery and Disposition Account (B5A). The program goals include SMCA efforts to increase efficiencies and effectiveness to reduce the demil stockpile; reduce processing costs including packaging, handling and crating; and increase capacity through improved demilitarization</p>		

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>
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capabilities and processes. Project F24 includes activities: (1) to establish requirements and develop processes to focus investments, assess capabilities, analyze alternatives, and recommend and implement R&D projects; (2) to improve products and processes that support existing capabilities; (3) to develop or improve demil methods and processes related to advance the primary demilitarization core thrust areas of destruction, disassembly, removal, resource recovery and recycling, and waste stream treatment; (4) to ensure safe and environmentally acceptable demil operations; (5) to transition R&D products to United States Army depots or plants as well as commercial facilities performing demil; and (6) to mitigate risk and close-out project activities.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	43.444	42.332	44.269	-	44.269
Current President's Budget	65.709	72.279	44.458	-	44.458
Total Adjustments	22.265	29.947	0.189	-	0.189
• Congressional General Reductions	-0.036	-0.053			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	29.000	-			
• Congressional Directed Transfers	-	30.000			
• Reprogrammings	-5.000	-			
• SBIR/STTR Transfer	-1.699	-			
• Adjustments to Budget Years	-	-	0.189	-	0.189

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 297: *Mun Survivability & Log*

Congressional Add: *Congressional Add - Navy Polymer cased small arms ammunition*

Congressional Add Subtotals for Project: 297

Project: 859: *Life Cycle Pilot Process*

Congressional Add: *Congressional Add*

Congressional Add Subtotals for Project: 859

Congressional Add Totals for all Projects

	FY 2018	FY 2019
	-	15.000
	-	15.000
	24.000	14.794
	24.000	14.794
	24.000	29.794

Change Summary Explanation

Fiscal Year (FY) 2018 increase includes \$29.000 million in congressional adds for: polymer cased small arms ammunition (\$5.000 million); and Life Cycle Pilot Process (\$5.000 million); and two Program Increases (\$5.000 million, \$14.000 million).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	
FY19 increase includes \$30.000 Million in Congressional Adds for: transformative technologies for propulsion manufacturing processes (\$11.000 million); industrial base resiliency (\$5.000 million); life cycle pilot processes (\$10.000 million); and polymer cased small arms ammunition (\$4.000 million).		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>				Project (Number/Name) 297 / <i>Mun Survivability & Log</i>			
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
297: <i>Mun Survivability & Log</i>	-	15.985	31.637	15.595	-	15.595	16.362	17.062	17.040	17.247	0.000	130.928
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the future force by making Army units more survivable through the investigation, testing and demonstration of munitions logistics system improvements that prevent or minimize catastrophic explosive events and accelerate ammunition resupply. Key thrust areas are munitions storage area survivability, Insensitive Munitions (IM) technology integration and compliance, ammunition management and asset visibility, weapon system rearm, munitions configured load enablers and advanced packaging and distribution system enhancements. Within each thrust area, a broad array of solutions will be identified, tested, and evaluated against developed system measures of effectiveness. Optimum, cost effective and efficient solutions that enable the rapid projection of lethal and survivable forces will be demonstrated. The early stages of force deployment are especially critical. Theater ammunition storage areas are vulnerable and present the enemy with lucrative targets. These areas and distribution nodes contain the only available munitions stocks in theater. Loss of these munition stocks could cripple the force, jeopardize the mission, and result in high loss of life. This Project mitigates vulnerabilities and ensures a survivable fighting force.

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

	FY 2018	FY 2019	FY 2020
Title: Munitions Predictive Life	1.514	1.378	1.260
<p>Description: This activity will demonstrate technologies and algorithms that can help assess munitions serviceability based upon aggregate environmental exposures, system cycling and munition degradation models. The activity will provide life cycle management tools for risk mitigation strategies, while reducing testing, inspection & surveillance required as well as improving weapon system reliability and warfighter effectiveness.</p> <p>FY 2019 Plans: Conduct qualification safety testing of an integrated second generation prototype next generation ammunition container based temperature/humidity exposure reliability sensor. Conduct qualification testing of a Multi Frequency Sensor Suite that will monitor munitions exposure to ambient radiation over their lifecycle for improved reliability knowledge. Conduct correlation testing on the passive time/temperature exposure sensor with legacy ammunition items and integrate. Conduct market survey of passive Radio Frequency Identification and low cost active environmental sensors for legacy munitions, select viable candidates, and test. Integrate passive propellant temperature sensor with fire control systems and processes. Incorporate automation friendly health monitors into automation supply point - scalable and continue integration testing.</p> <p>FY 2020 Plans: Demonstrate concept of operations of an integrated second generation ammunition container based temperature/humidity exposure reliability sensor. Demonstrate Multi Frequency Sensor Suite in a training environment that will monitor exposure to ambient radiation over their lifecycle with legacy ammunition items. Support qualification testing and required modifications of</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 297 / <i>Mun Survivability & Log</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>passive time/temperature exposure sensor. Conduct additional correlation testing on legacy ammunition items to prepare for broader stockpile integration. Conduct market survey of passive Radio Frequency Identification and low cost active environmental sensors for legacy munitions, select and test viable candidates. Conduct sensitivity analysis of near-real time propellant temperature on ballistic solutions. Incorporate munition monitoring technologies into demonstrations.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 funding level is lower than FY 2019 because multiple efforts are transitioning.</p>				
<p>Title: Insensitive Munitions (IM) Integration Program</p> <p>Description: Demonstrate multiple IM technologies and integrate into end item(s) to improve munitions survivability and warfighter safety. IM Technologies, using State-of-the-Art materials, will be developed in the areas of warhead, propulsion and propellants, explosives, packaging, and barriers. In addition, modeling and simulation will be used to reduce development and testing costs. Efforts will increase the number of IM compliant ammunition items fielded to mitigate munitions reaction to unplanned stimuli such as fire, fragments, enclosed heat build-up (cook-off), bullets, adjacent munitions reaction (sympathetic detonation), and shape charge jet attacks.</p> <p>FY 2019 Plans: Transition improvements from High Shear Mix project to qualified propellant materials to produce high-performing propellants with better fragment impact (FI) responses. Validate novel propellant technologies in medium and large caliber munitions to reduce hazards from FI threat. Demonstrate novel packaging heat management materials in mortars systems to delay catastrophic responses in Slow Cook Off (SCO) conditions. Validate packaging configurations that eliminate mass detonation events in tightly-packed medium caliber munitions. Optimize granulated melt-pour energetics to reduce mass-detonation hazards of tightly-packed medium caliber munitions while maintaining high-energy output.</p> <p>FY 2020 Plans: Conduct end item testing of a high energy pressed explosives to replace Comp A5 to reduce the reaction violence from shock and slow heating. Continue development of medium caliber, foamed celluloid cartridge cases to create a novel venting solution for shock and thermal events. Conduct fragment impact testing on new igniter formulations to replace Benite in 120mm tank munitions. Perform IM testing on the M433E1 to integrate technologies for warhead and packaging venting along with impact mitigation technologies. Continue optimization of plastic packaging containers for large caliber munitions to mitigate both fast and slow cook-off events.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 funding level is higher than FY 2019 due to anticipated increases in labor and testing costs.</p>		6.046	6.321	6.745
<p>Title: Improved Munitions Packaging</p>		3.551	3.076	2.133

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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
<p>Description: This activity will demonstrate upgrades to existing packaging components and materials to improve legacy ammunition survivability. These upgrades will enhance ammunition survivability and reliability, improve field ammunition operations, and improve packaging.</p> <p>FY 2019 Plans: Conduct verification testing on injection molded cylindrical container that integrates it for use with the M829A4 120mm tank and 120mm mortar munitions. Conduct verification testing for the plastic rectangular container to integrate it for use with legacy 5.56mm small caliber ammunition. Produce prototypes geared to ?lighten the load? and perform in-house engineering tests to validate. Perform final hazard classification testing on M6 and M7 blasting cap container design with Mycofoam. Conduct verification testing of a small caliber ammunition bulk packaging container for improved distribution efficiency. Facilitate implementation of new bulk container at LCAAP and identify other potential small caliber ammunition bulk container candidates. Conduct developmental testing of the initial plastic mortar container prototype for use with all families of mortars. Perform rough handling, drop testing, and other developmental testing on the rapid access container consolidator.</p> <p>FY 2020 Plans: Develop prototypes and perform engineering testing for the Rapid Access Container Consolidator (RACC) program for M2A2 containers. Perform engineering and verification testing on the Bulk Pack Container program for 7.62MM linked ammunition and continue to facilitate implementation of new design with LCAAP. Continue to conduct verification testing on injection molded cylindrical container for integration with the M829A4 120mm tank ammunition. Conduct qualification testing for the plastic rectangular container to integrate it for use with legacy 5.56mm small caliber ammunition. Conduct engineering and prototype testing on injection molded plastic mortar container for integration with 120mm mortar munitions. Conduct engineering testing on the lightweight M2A2 container as part of the Lighten the Load program for use on small caliber ammunition.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 funding level is lower than FY 2019 because multiple efforts are transitioning.</p>				
<p>Title: Ammo Provider</p> <p>Description: This activity demonstrates technologies that will assure a survivable munitions logistics system by increasing distribution velocity and protecting ammo storage areas. Technology areas to be investigated include ammunition asset visibility (including environmental sensors, marking technologies, and supply chain modeling), ammunition management (including improvements in stockpile surveillance and condition based management), sustainment (including pre-configured loads (soldier to unit size), field ammo reconfiguration capability, robotic handling, and improved load building capability), and force protection (including site planning software and field storage protection).</p> <p>FY 2019 Plans:</p>		4.874	5.252	5.457

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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
<p>Demonstrate multiple enablers including Ammunition Quality Decision Tool, Configured Load Building Tool, MHE applique interface kit and CADES as parts of an integrated ammunition scenario within ASP-S. Develop the design concept and down select sensor and scanning hardware for an automated truck scanning capability to enable conveyance level transfer of accountability and autonomous inspections of transported cargo in the ASP-S. Develop the design concept and down select platform, sensor and scanning hardware for a yard mule transport capability to enable local autonomous lift capability during the consolidation and put-away processes within the ASP-S. Perform engineering evaluation of an integrated round counting sensor device that enables automatic capturing of fired ammunition data from weapon systems to facilitate anticipatory resupply. Support continued use of DRAM and the Class V Adaptive Demand Estimation System (CADES) prototypes in operational demonstrations. Perform validation and verification testing for an integrated round counting sensor device that enables automatic capturing of fired ammunition data from weapon systems to facilitate anticipatory resupply. Develop artificial intelligence concepts and apply to ammunition handling activities such as turn in and retrograde operations. Conduct operational assessment of expeditionary MSS enhancements.</p> <p>FY 2020 Plans: Demonstrate multiple improved ammunition logistics enablers including Ammunition Quality Decision Tool, Configured Load Building Tool, MHE interface kit and Class V Adaptive Demand Estimation System (CADES), integrated through Cognitive Automated Supply Point Enhanced Robotics (CASPER), within Automated Supply Point-Scalable (ASP-S). Perform testing and initial user assessment for continued development of integrated round counting sensor device. Facilitates anticipatory resupply by enabling automatic reporting of quantity and type of fired ammunition through signature analysis from small and medium caliber weapon systems. Support continued development and field trials of Distribution and Retrograde Adaptive planning and execution Management (DRAM) and CADES prototypes through operational demonstrations. Develop artificial intelligence and mechanical systems to facilitate the turn in, inspection, and retrograde of small to medium caliber ammunition in forward tactical environments. Continue development and conduct incremental operational assessment of expeditionary Munitions Survivability Software (eMSS) enhancements.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Minor program adjustment</p>			
<p>Title: FY 2019 SBIR/STTR Transfer</p> <p>Description: FY 2019 SBIR/STTR Transfer</p> <p>FY 2019 Plans: FY 2019 SBIR/STTR Transfer</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>	-	0.610	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 297 / <i>Mun Survivability & Log</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 SBIR/STTR Transfer			
Accomplishments/Planned Programs Subtotals	15.985	16.637	15.595

	FY 2018	FY 2019
Congressional Add: Congressional Add - Navy Polymer cased small arms ammunition	-	15.000
FY 2019 Plans: Congressional Add - Navy Polymer cased small arms ammunition		
Congressional Adds Subtotals	-	15.000

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>				Project (Number/Name) 857 / <i>DoD Explosives Safety Standards</i>			
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
857: <i>DoD Explosives Safety Standards</i>	-	1.889	1.840	1.858	-	1.858	1.892	1.930	2.023	1.984	0.000	13.416
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports continuing technology investigations related to Explosives Safety Standards. It provides a coordinated Tri-Service mechanism for the collection and free exchange of technical data on the performance and effectiveness of all non-nuclear conventional munitions and weapons systems in a realistic operational environment.

This Project supports the Research, Development, Test, & Evaluation (RDTE) efforts of the Department of Defense (DoD) Explosive Safety Standards Board. It supports explosive safety effects research and testing to quantify hazards and to develop techniques to mitigate those hazards in all DoD manufacturing, testing, transportation, maintenance, storage, disposal of ammunition and explosives operations, and also to develop risk based explosives safety standards. Results are essential to the development and improvement of quantity-distance standards, hazard classification procedures, cost effective explosion resistant facility design procedures, and personnel hazard/protection criteria.

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

	FY 2018	FY 2019	FY 2020
Title: Explosive and Munitions Tests	1.137	1.056	1.117
Description: Testing aimed at solving practical problems and increasing predictability of the effects of explosions and impacts on people, materials and structures. Additionally, testing provides data on the interaction of explosives in various configurations. Testing results are used to improve predictability of effects from explosive incidents and improve criteria to protect people, structures and the environment from the damaging effects of DoD munitions.			
FY 2019 Plans: Continue testing of laboratory quantities, potential partnering effort for testing of underwater shock effects, further maturation of HD 1.3 testing and scaled testing of earth-covered magazines to determine blast pressures at intermagazine distance.			
FY 2020 Plans: Conduct scaled and full-scale testing of earth-covered magazines, and continue test program to characterize thermal/combustion hazards in explosives storage and operating facilities and develop models to predict these hazards.			
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 increase for full-scale testing of earth-covered magazines.			
Title: Explosive Safety Standards (ESS) Implementation Methodologies & Tools	0.400	0.375	0.389

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 857 / <i>DoD Explosives Safety Standards</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Description: Provide tools to support site planning and risk assessment in the garrison and contingency environments. Provide tools and improvements for UFC 3-340-02 and Substantial dividing wall criteria. Provide methodologies and tools to perform site-specific analyses, databases for critical explosives safety information, and standardized designs to reduce design costs. Develop models to predict response for large scale explosion effects.</p> <p>FY 2019 Plans: Will continue effort on harmonization with NATO and UN policy resulting in seamless NATO and multi-national operations. Initial phase of work to develop more refined secondary debris hazards from explosives storage buildings.</p> <p>FY 2020 Plans: Finalize transition of ESS to web hosting, with full capability for quantity-distance and risk-based siting of explosives facilities DoD-wide. Develop expanded suite of tools to meet diverse needs of the DoD explosives safety community.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Finalizing transition of ESS to web hosting.</p>				
<p>Title: Standard Development & Improvement</p> <p>Description: Improve and revise all DoD Explosives Safety Standards (for hazard classification, quantity distance, and protective construction) to keep them current with changing technology and incorporate knowledge gained from the testing program. Shape and leverage with international community (NATO & UN). Develop Advanced (e.g. risk-based) siting criteria.</p> <p>FY 2019 Plans: Develop tools & models required to calculate, estimate and predict explosives safety hazards, associated standoff distances, fragmentation distribution, personnel risks and other parameters. Additionally tools are required to develop and maintain explosives safety site plans.</p> <p>FY 2020 Plans: Pursue update of NATO criteria to better address debris and thermal hazards from explosives, as indicated by results of multi-year US test and modeling programs. Incorporate test results of earth-covered magazine blast load testing into DoDM 6055.09 and UFC 3-340-02.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: To pursue update of NATO criteria.</p>		0.352	0.350	0.352
<p>Title: FY19 SBIR/STTR adjustment</p> <p>FY 2019 Plans:</p>		-	0.059	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 857 / <i>DoD Explosives Safety Standards</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
FY19 SBIR/STTR adjustment				
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY19 SBIR/STTR adjustment				
Accomplishments/Planned Programs Subtotals		1.889	1.840	1.858
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				
E. Performance Metrics N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>				Project (Number/Name) 858 / <i>Army Explosives Safety Management Program</i>			
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
858: <i>Army Explosives Safety Management Program</i>	-	1.042	0.991	1.011	-	1.011	1.030	1.047	1.079	1.076	0.000	7.276
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project establishes, validates or modifies explosives technical safety requirements per Department of Defense Pamphlet 385-64, Ammunition and Explosives Safety Standards. Project activities promote Research, Development, Test, & Evaluation (RDTE) of new and innovative explosives safety technologies that improve the survivability of Army personnel, facilities, and equipment as well as improve the health, safety and welfare of the general public. FY20 funding will support continued testing, validation, and regulatory integration for permanent, temporary and mobile ammunition & explosives (A&E) facilities as well as operations. The Defense Ammunition Center/US Army Technical Center for Explosives Safety (DAC/USATCES) will team with and sponsor agencies (Joint Service, Academia, and Contractor) to improve the effectiveness of identifying, analyzing, and apply risk acceptance to A&E environments.

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

	FY 2018	FY 2019	FY 2020
<p>Title: Risk based explosives safety criteria</p> <p>Description: Development of risk based explosives safety criteria that will aid commanders and safety personnel in the transition from regulation to risk management.</p> <p>FY 2019 Plans: Continuing explosives testing and support of hazard research and exposure consequences.</p> <p>FY 2020 Plans: Will continue explosives testing and support of hazard research and exposure consequences.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funding increase due to within-Project re-prioritization based upon holistic program assessment.</p>	0.150	0.100	0.150
<p>Title: Development of enhanced protective structure designs</p> <p>Description: Develop enhanced protective structure designs that improve the survivability of Army personnel, facilities and equipment.</p> <p>FY 2019 Plans: Continuing explosives testing and support for improving protective construction designs.</p> <p>FY 2020 Plans:</p>	0.425	0.725	0.611

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 858 / <i>Army Explosives Safety Management Program</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Will continue explosives testing and support for improving protective construction designs. FY 2019 to FY 2020 Increase/Decrease Statement: Funding decrease due to within-Project re-prioritization and adjustment for inflation.				
Title: Development of explosive safety tools Description: Develop explosive safety tools for use by Army personnel. Explosive safety tools allow commanders and safety personnel to make explosive safety decisions using risk management methodologies. FY 2019 Plans: Continuing development of new methods and tools for risk assessment to improve explosive safety risk management decisions. FY 2020 Plans: Will continue development of new methods and tools for risk assessment to improve explosive safety risk management decisions. FY 2019 to FY 2020 Increase/Decrease Statement: Funding increase due to within-Project re-prioritization based upon holistic program assessment.		0.467	0.134	0.250
Title: FY19 SBIR/STTR adjustment FY 2019 Plans: FY19 SBIR/STTR adjustment FY 2019 to FY 2020 Increase/Decrease Statement: FY19 SBIR/STTR adjustment		-	0.032	-
Accomplishments/Planned Programs Subtotals		1.042	0.991	1.011
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				
E. Performance Metrics N/A				

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 859 / <i>Life Cycle Pilot Process</i>
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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
859: <i>Life Cycle Pilot Process</i>	-	29.345	20.434	5.600	-	5.600	5.700	5.800	5.900	5.900	0.000	78.679
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

To execute the Single Manager for Conventional Ammunition (SMCA) Industrial Base Strategic Plan, this project supports material and manufacturing technology investigations, assessments, modeling and simulation, pilot / scale-up prototype processes, and industrial assessments. Projects support overall Army's sustainment and modernization efforts for armaments and ammunition industrial base. Specifically, this project will assess life cycle production capabilities required for all ammunition families, address design for manufacturability to facilitate economical production, identify industrial and technology requirements and address the ability of the production base to rapidly and cost effectively produce quality products. Life Cycle Pilot Process (LCPP) provides the resources to prototype critical technologies and develop the knowledge base to establish cost effective, environmentally safe and modern production processes in support of the munitions Industrial Base transformation. In addition, the LCPP program addresses Single Point Failures (SPFs)/No Source of supply within the National Technology Industrial Base (NTIB). LCPP provides support to reduce supply chain risk by investigating, developing and evaluating additional sources of supply for a known SPF. FY 2020 funding will be used to continue testing and evaluation for new materials, investigations and manufacturing technologies.

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

	FY 2018	FY 2019	FY 2020
Title: Product Cost Thrust Area	1.686	1.261	2.159
Description: This thrust area seeks out new opportunities to reduce overall cost of armaments and ammunition components. Efforts will review and analyze legacy manufacturing processing for opportunities to integrate improved technology and materials to lean manufacturing processes to reduce overall unit cost.			
FY 2019 Plans: Continue and transition insensitive munitions explosives (IMX) riser reclamation prototype process to NTIB. Riser scrap is generated during the loading of melt pour ammunition. This effort investigates and develops prototype equipment to reclaim and reuse the energetic waste. Complete IMX waste solids for reprocessing. Repurpose IMX constituents (DNAN and NA - Dinitroanisole (DNAN) and nitro guanidine) in solids waste stream from M795 artillery LAP.			
FY 2020 Plans: Continue to evaluate new materials, processes and technology to reduce overall production and end item costs for the Army. Complete and transfer IMX riser reclamation project to Iowa Army Ammunition Plant. Complete ultrasonic inspection of slurry coated explosives effort. Effort seeks to monitor critical parameters of explosive manufacturing and increase production yield and reduce rework costs.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 859 / <i>Life Cycle Pilot Process</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Increase in product cost thrust area due to ultrasonic inspection effort.				
<p>Title: Single Point Failures (SPFs)</p> <p>Description: This thrust area seeks to mitigate single source and/or no source of supply to armaments and ammunition. Thrust area tests or evaluates alternative materials and processes to mitigate SPFs. These efforts are part of the overall strategy to reduce the number of SPFs in the NTIB. Additionally, thrust area efforts will address ammunition manufacturing capability shortfalls. This area leverages RDTE accomplishments and product knowledge to satisfy manufacturing requirements. FY 2020 efforts will continue evaluation of manufacturing shortfalls and testing to reduce the number of SPFs.</p> <p>FY 2019 Plans: Execute BDNA/F (acetaldehyde bis(dinitropropyl)acetal - BDNPA) and formaldehyde bis(dinitropropyl)acetal - BDNPF) SPF Mitigation. BDNA/F is an energetic plasticizer used in PAX-3 explosive. BDNA/F has no supply for production. Due to an increase in PAX-3 ammunition requirements, there is a requirement mitigate the SPF. Execute alternative anti-seize material for artillery fuze plugs. Currently there is one source of anti-seize material. This effort will identify and characterize alternative anti-seize lubricant. 2019 plans also include continuing mitigation of liquid battery reserve SPF for artillery fuzes. The cathode material on fuze batteries has only one source of supply. Effort will test and evaluate alternative cathode materials. Thrust area plans will also complete SPF densified basic magnesium carbonate (DBMC). DBMC is single source constituent in smoke grenade formulations. Effort will test and evaluate system performances of alternative supply sources.</p> <p>FY 2020 Plans: Continue to mitigate single source and/or no source of supply for armaments and ammunition. Transition mitigation plan to PM for their use in risk mitigation implementation supply strategies and assessing procurement strategies for affected end items. Continue BDNA/F SPF mitigation. Complete liquid reserve SPF and alternative anti-seize materials for artillery efforts.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease in SPF thrust area due to completion of BDNA/F SPF mitigation.</p>		1.303	1.925	1.384
<p>Title: Manufacturing Technology for Industrial Base Transformation</p> <p>Description: Project thrust area matures ammunition manufacturing technologies and processes to enhance capabilities to legacy armaments and ammunition manufacturing operations. Thrust area will pilot manufacturing technologies and transition technologies to affected industrial base for armaments and ammunition manufacturing operations. The FY 2020 program will continue to evaluate manufacturing and processes to enhance capabilities for legacy manufacturing operations.</p> <p>FY 2019 Plans: Complete test and evaluation of lead free primer automated manufacturing process. This effort will reduce operator exposure to hazardous materials and operations and improve product consistency and quality. The FY 2019 plans include process prove-</p>		2.356	2.255	2.057

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 859 / <i>Life Cycle Pilot Process</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020
<p>out. Efforts also continue nitrocellulose fines treatment. Manufacturing of nitrocellulose (NC) propellants results in the production of waste containing NC fines. The current disposal method is open burning. This effort evaluates and demonstrates a closed system disposal capability for NC fines. FY 2019 efforts also complete ammonium nitrate solution (ANSOL) / flyash study. To mitigate the cost of ANSOL disposal, effort will identify method to reuse ANSOL.</p> <p>FY 2020 Plans: Continue manufacturing technology assessments / investigations and develop technology transfer strategies for implementation to Army's industrial base. Complete ultrasonic inspection of slurry coated explosives effort. Effort seeks to monitor critical parameters of explosive manufacturing and increase production yield and reduce rework costs. Complete pre-cursor celluloid for foamed celluloid applications with OCONUS celluloid source. Effort will develop improved method to support foam celluloid applications.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Slight decrease in manufacturing technology for industrial base transformation thrust area due to single point failure thrust area mission priorities.</p>			
<p>Title: FY19 SBIR/STTR adjustment</p> <p>FY 2019 Plans: FY19 SBIR/STTR adjustment</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY19 SBIR/STTR adjustment</p>	-	0.199	-
Accomplishments/Planned Programs Subtotals	5.345	5.640	5.600

	FY 2018	FY 2019
Congressional Add: Congressional Add	24.000	14.794
FY 2018 Accomplishments: Congressional Add		
FY 2019 Plans: Congressional Add		
Congressional Adds Subtotals	24.000	14.794

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 859 / <i>Life Cycle Pilot Process</i>

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) F21 / <i>NATO Ammo Evaluation</i>
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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
F21: <i>NATO Ammo Evaluation</i>	-	0.566	0.741	0.750	-	0.750	0.750	0.750	0.750	0.750	0.000	5.057
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

North Atlantic Treaty Organization (NATO) Ammunition Evaluation program funding ensures interchangeability of ammunition and weapons among all the NATO countries with all of the associated logistic, strategic and tactical advantages of the alliance. This Project involves development and testing compliance of NATO standardization agreements (STANAGS) and staffing of the North American Regional Test Center (NARTC). In addition, this Project supports small caliber ammunition, 40mm grenade munitions, medium caliber cannon ammunition, and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy, and general product improvements. This Project also supports the standardization and interchangeability of legacy and new production United States (U.S.) weapons and ammunition with Allied Nations to maximize battlefield interchangeability/compatibility under the international Joint Ballistics Memorandum Of Understanding (JBMOU). Maximizing standardization, interchangeability, and exportability will also potentially increase Foreign Military Sales (FMS) of U.S. indirect fire Weapon and Munition products to support United States industrial base production and affordable Department of Defense pricing through increased economies of scale. FY 2020 funding will support NATO and JBMOU artillery and small arms ammunition interchangeability group meetings, documentation, and test operations.

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

	FY 2018	FY 2019	FY 2020
Title: New Ammo Design Qualification & NATO Mission Support	0.143	0.291	0.300
Description: This activity ensures complete interchangeability of small caliber, automated cannon-caliber, 40mm grenade ammunition, air burst capable 30mm/40mm ammunition, and weapons among NATO countries to achieve the associated logistic, strategic and tactical advantages.			
FY 2019 Plans: Continuing work to support NATO small arms ammunition, direct fire grenade, and large caliber interchangeability group meetings, documentation and test operations.			
FY 2020 Plans: Will continue work to support NATO small arms ammunition, direct fire grenade, and large caliber interchangeability group meetings, documentation and test operations.			
FY 2019 to FY 2020 Increase/Decrease Statement: Small change in Project requirements and estimated inflation.			
Title: Joint Ballistics Program Support	0.423	0.450	0.450

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) F21 / <i>NATO Ammo Evaluation</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: The activity supports the maturation, validation, and risk reduction of battlefield interchangeability/compatibility and associated enabling technologies between domestic U.S. and NATO/Allied Nations Indirect Fires Weapons and Munitions.</p> <p>FY 2019 Plans: FY 2019 continues ballistic testing including firing tables, safety, reliability, and performance.</p> <p>FY 2020 Plans: FY 2020 will continue interoperability testing and interchangeability group meetings.</p>			
Accomplishments/Planned Programs Subtotals	0.566	0.741	0.750

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>				Project (Number/Name) F24 / <i>Conventional Munitions Demil</i>			
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
F24: <i>Conventional Munitions Demil</i>	-	16.882	16.636	19.644	-	19.644	16.330	16.899	16.696	17.488	0.000	120.575
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Conventional Munitions Demilitarization Technology Project supports the Single Manager for Conventional Ammunition (SMCA) responsibility per Department of Defense Instruction (DoDI) 5160.68 to plan, program, budget and fund a Joint Service research and development program that develops capability and capacity as well as technology and facilities to support the SMCA mission to demilitarize and dispose of conventional ammunition stored in the SMCA Resource, Recovery and Disposition Account (B5A). Project goals include SMCA efforts to increase efficiencies and effectiveness to reduce the demil stockpile; reduce processing costs including packaging, handling and crating; and increase capacity through improved demil capabilities and processes. Project F24 includes several activities: (1) to establish requirements and develop processes to focus investments, assess capabilities, analyze alternatives, and recommend and implement RDT&E projects; (2) to improve products and processes that support existing capabilities; (3) to develop or improve demil methods and processes related to advance the primary demilitarization core thrust areas of destruction, disassembly, removal, resource recovery and recycling, and waste stream treatment; (4) to ensure safe and environmentally acceptable demil operations; (5) to transition RDT&E products to United States Army depots or plants as well as commercial facilities performing demil; and (6) to mitigate risk and close-out Project activities.

During Fiscal Year (FY) 2020 Project F24 will focus efforts on fielding alternative capabilities to open burn and open detonation. In FY20 Project F24 will also conduct conventional ammunition demilitarization operational testing on a Castalia system.

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

	FY 2018	FY 2019	FY 2020
Title: Advanced Destruction	6.369	4.001	4.233
Description: This effort focuses on developing capabilities and capacities for the destruction of munitions.			
FY 2019 Plans: Verifying functionality of LEMC ARMD under FOC conditions. Completing MCDF FOC Transition. Conducting an operational demonstration of the Rockeye Download Equipment at CAAA. Completing Operational Demonstration of Rockeye download equipment. Completing testing on ARMD Multi Motor and Build fixturing to install at ARMD. Conducting safety and assessment effort on the obsolete Nike Herc Missile. Conducting Analysis of Alternatives and Talos Demil process.			
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) F24 / <i>Conventional Munitions Demil</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Will conduct operational testing of a static detonation chamber. Will conduct conventional ammunition operational testing on a Castalia System. Will conduct an operational test at MCAAAP for Engine Starter Cartridges. Will conduct a static fire test of Nike Herc Missiles. Will conduct a safety and condition assessment on additional obsolete rocket motors</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY19 to FY20 resulting from MCDF Transition Occurring in FY20.</p>				
<p>Title: Resource Recovery and Recycling (R3)</p> <p>Description: This effort focuses on enhancing existing methods of munitions R3.</p> <p>FY 2019 Plans: Will conduct testing to determine cleanliness of ammunition scrap on the Automated Scrap Inspection System at an organic depot location. Will initiate a project for Improved Donor Recovery and conduct an operation test at MCAAAP. Will initiate a project on WDU25/B Tomahawk Warheads to recover explosive for use a donor material.</p> <p>FY 2020 Plans: Will initiate fabrication of components for Automated Scrap Inspection System. Will conduct an operational test on RP Mortar Demil Capability at CAAA.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY19 to FY20 for operation testing of RP Mortar Demil Capability and Phase II Donor Recovery Operational Testing.</p>		1.430	2.212	2.679
<p>Title: Advanced Removal</p> <p>Description: This effort develops technology to remove propellant and energetics from munitions.</p> <p>FY 2019 Plans: Conducting operational testing on IR Munitions Demil line at CAAA. Conducting Operational Testing of the 2.75-inch Rocket Demil Line at CAAA. Initiating design modifications and building fixturing to the RP demil line at CAAA to add RP Mortar Demil capability.</p> <p>FY 2020 Plans: Will transition an initial operational capability (IOC) for IR munitions at CAAA. Will transition an IOC for 2.75? Rockets at CAAA. Will initiate an Analysis of Alternative (AOA) for Insensitive Munitions (IM) Large Bombs. Will conduct an AOA for IM Autoclave Upgrades.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement:</p>		2.575	2.505	3.036

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) F24 / <i>Conventional Munitions Demil</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Increase from FY19 to FY20 for the AoAs of IM Large Bombs and IM Autoclave Upgrades.				
<p>Title: Advanced Waste Stream Treatment</p> <p>Description: This effort focuses on handling waste streams from munitions items.</p> <p>FY 2019 Plans: Initiating the building of the upgraded feed system on a rotary kiln incinerator at an organic location. Conducting an Analysis of Alternatives for a Bulk Energetics Confined Burn Capability located at Hawthorne Army Depot (HWAD). Initiating Feed Recipe Efficiency Evaluation project. Will initiate an evaluation of Recovered Energetic Materials for use as donor material.</p> <p>FY 2020 Plans: Will initiate installation of upgraded feed system at an organic installation. Will initiate a project to upgrade a RKI for CS gas treatment. Will initiate a design for a Bulk Energetic Confined Burn System at an organic location.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY19 to FY20 to support development of a new Bulk Energetic Confined Burn System Capability and Testing of Feed Recipe Efficiency Evaluation.</p>		1.809	3.241	3.682
<p>Title: Advanced Munitions Disassembly</p> <p>Description: This effort focuses on developing innovative and efficient processes to disassemble munitions.</p> <p>FY 2019 Plans: Initiating systemization of Family of Scatterable Mines (FASCAM) demil project to integrate the preprocessing Cryofracture capability of FASCAM mines with thermal processing in the rotary kiln at Crane Army Ammunition Activity (CAAA). Conducting operational demonstration of MK46 Torpedo Warhead segmenting capability at HWAD. Completing testing of capability developed to size reduce Reactive Armor Tiles. Completing testing on Thermal Treatment of Reactive Armor Tiles.</p> <p>FY 2020 Plans: Will continue systemization of a Family of Scatterable Mines (FASCAM) demil project to integrate the preprocessing Cryofracture capability of FASCAM mines with thermal processing in the rotary kiln at Crane Army Ammunition Activity (CAAA). Conduct an operational demonstration on 155mm APICM projectile download capability at HWAD.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase from FY19 to FY20 to conduct an operational demonstration on the 155mm APICM projectile download Capability.</p>		4.699	4.067	6.014
<p>Title: FY19 SBIR/STTR adjustment</p> <p>FY 2019 Plans:</p>		-	0.610	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) F24 / <i>Conventional Munitions Demil</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
FY19 SBIR/STTR adjustment			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY19 SBIR/STTR adjustment			
Accomplishments/Planned Programs Subtotals	16.882	16.636	19.644

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605857A / <i>Environmental Quality Technology Mgmt Support</i>
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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
Total Program Element	-	4.883	3.211	4.681	-	4.681	2.790	2.842	2.923	2.744	0.000	24.074
031: <i>Environmentally Sustainable Acquisition/Logistics</i>	-	4.201	2.290	4.119	-	4.119	2.185	2.228	2.272	2.318	0.000	19.613
06I: <i>Environmental Quality Technology Support</i>	-	0.682	0.921	0.562	-	0.562	0.605	0.614	0.651	0.426	0.000	4.461

A. Mission Description and Budget Item Justification

This Program Element (PE) funds environmental quality technology (EQT)-related management support functions including support of research, development, test and evaluation required for EQT technical integration efforts at demonstration/validation test sites, technical information and activities, test facilities and general test instrumentation, and EQT requirement assessments. Funds support the management of technology transfer associated with technology demonstrated and validated as part of Army EQT projects. In addition, this PE provides support to the Army weapon system acquisition community to address environmental quality requirements under the Environmentally Sustainable Acquisition/Logistics Program.

The Environmentally Sustainable Acquisition/Logistics Project includes program management for developing acquisition strategies that achieve system key performance parameters and sustain the environment without permanent and unacceptable change to the natural environment or human health from system concept refinement through disposal. The Project involves systematic consideration of environmental impacts, energy use, natural resources, installation impacts, economics, and quality of life. It provides support to the system acquisition community (Program and Project Managers) to integrate environmental quality analyses into the system acquisition process. The goal of the effort is to resolve environmental quality issues related to weapon systems that are identified during design, development, testing, operation, or support to reduce Army environmental liabilities and total ownership costs, including efforts to eliminate the use of hazardous and ozone-depleting materials from weapon systems and facilities.

The Pollution Prevention Tech Support Project funds the management support costs to execute the Toxic Metals Reduction, Airborne Lead Reduction, Low Global Warming Potential (LGWP), and Securing the Availability of Green Enhanced Coatings (SAGE-Coat) environmental quality technology programs, which support Cross Functional Teams and the Army's top modernization priorities by addressing potential obsolescence of legacy materials and current and emerging impacts on human health and the environment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605857A / <i>Environmental Quality Technology Mgmt Support</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	5.087	3.216	4.876	-	4.876
Current President's Budget	4.883	3.211	4.681	-	4.681
Total Adjustments	-0.204	-0.005	-0.195	-	-0.195
• Congressional General Reductions	-0.005	-0.005			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.199	-			
• Adjustments to Budget Years	-	-	-0.195	-	-0.195

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605857A / <i>Environmental Quality Technology Mgmt Support</i>				Project (Number/Name) 031 / <i>Environmentally Sustainable Acquisition/Logistics</i>			
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
031: <i>Environmentally Sustainable Acquisition/Logistics</i>	-	4.201	2.290	4.119	-	4.119	2.185	2.228	2.272	2.318	0.000	19.613
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Environmentally Sustainable Acquisition/Logistics (ESAL) Project provides support to the system acquisition community to integrate environmental quality issues and concerns into the life cycle system acquisition process, including human health risks, life safety, material obsolescence due to regulatory pressures, occupational exposures and energy efficiency. This includes helping the acquisition community address high priority issues associated with hexavalent chromium, cadmium and airborne lead. The focus of ESAL is on improving readiness, enabling mission capabilities, improving acquisition processes, reducing supportability burden, and minimizing total ownership cost. The Assistant Secretary of the Army for Installations, Energy and Environment has defined the functions of the ESAL project in coordination with the Army Acquisition Executive and the Assistant Secretary of the Army (Acquisition, Logistics, and Technology). This Project provides direct support to the Army acquisition community to pursue environmental sustainability and comply with legal statutes, policies and regulations during the life cycle of Army materiel. ESAL helps address Army Modernization Priorities, while sustaining readiness and achieving compliance with its weapon systems, industrial base, field and deployed activities directed by international treaties, Federal statutes, Executive Orders, Department of Defense (DoD) and Army policies and regulations.

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

	FY 2018	FY 2019	FY 2020
Title: Environmental Quality (EQ) Support	1.095	1.000	1.005
Description: Provide EQ Support to Acquisition Programs via Program Executive Offices (PEOs) / Program Managers (PMs).			
FY 2019 Plans: Provide support to PEOs / PMs and Cross Functional Teams (CFTs) to integrate EQ considerations into systems engineering activities. This includes fulfillment of National Environmental Policy Act requirements, definition of EQ technology needs to meet operational requirements, analysis of technical data to support implementation decisions, participation in technical and cost risk assessment activities, and assessment and revision of contractual and operational requirements for successful technology integration, operation and support. Analyze impending legal statutes impacting production, operation and support of weapon systems. Assess weapon system readiness impacts (e.g., production levels, training, operational tempo and maintenance activities) resulting from EQ issues affecting industrial base and garrisons. Will provide Army acquisition community representation in select Office of the Secretary of Defense (OSD) and Department of the Army (DA) committees addressing environmental legislation and rulemaking.			
FY 2020 Plans: Will provide support to PEOs / PMs and CFTs to integrate EQ considerations into systems engineering activities. This will include fulfillment of National Environmental Policy Act requirements, definition of EQ technology needs to meet operational requirements,			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605857A / <i>Environmental Quality Technology Mgmt Support</i>	Project (Number/Name) 031 / <i>Environmentally Sustainable Acquisition/Logistics</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
analysis of technical data to support implementation decisions, participation in technical and cost risk assessment activities, and assessment and revision of contractual and operational requirements for successful technology integration, operation and support. Will analyze impending legal statutes impacting production, operation and support of weapon systems. Will assess weapon system readiness impacts (e.g., production levels, training, operational tempo and maintenance activities) resulting from EQ issues affecting industrial base and garrisons. Will provide Army acquisition community representation in select OSD and DA committees addressing environmental legislation and rulemaking. FY 2019 to FY 2020 Increase/Decrease Statement: Fund change due to economic adjustments.				
Title: Environmental Quality Technology Management Description: Provide management support for Army EQ technology efforts. FY 2019 Plans: Provide system acquisition support to the Army's EQ technology program and coordination of EQ-related systems' needs for expanded RDTE efforts. Manage and oversee technology integration efforts by Army Life Cycle Management Commands for weapon systems in all stages of design, procurement and operations/support. Coordinate RDTE requirements among members of the Army EQ Technology Teams, coordinate technology evaluations and operational requirements in support of weapon system platform integration, manage and oversee test plan development, oversee testing activities, and analyze test results to support weapon systems engineering decision making. FY 2020 Plans: Will provide system acquisition support to the Army's EQ technology program and coordination of EQ-related systems' needs for expanded RDTE efforts in support of Army Modernization Priorities. Will manage and oversee technology integration efforts by Army Life Cycle Management Commands for weapon systems in all stages of design, procurement and operations/support. Will coordinate RDTE requirements among members of the Army EQ Technology Teams and Cross Functional Teams, will coordinate technology evaluations and operational requirements in support of weapon system platform integration, will manage and oversee test plan development, will oversee testing activities, and will analyze test results to support weapon systems engineering decision making. FY 2019 to FY 2020 Increase/Decrease Statement: Fund change due to economic adjustment.		0.749	1.217	1.137
Title: Ozone Depleting Substance Management Description: Oversee Army efforts to manage the use/elimination of ozone depleting substances on Army weapon systems.		0.453	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605857A / <i>Environmental Quality Technology Mgmt Support</i>	Project (Number/Name) 031 / <i>Environmentally Sustainable Acquisition/Logistics</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Title: Headquarters Army Environmental System (HQAES)</p> <p>Description: Headquarters Army Environmental System support (HQAES) is the Army's environmental enterprise business system of record enabling the Army to collect, analyze, and report environmental data. HQAES is used by Installations, Commands, Headquarters Department of the Army, and various service providers (e.g., U.S Army Corps of Engineers, U.S. Army Environmental Command) for managing the environmental program. HQAES is the feeder system for environmental liabilities reporting, which is the largest liability on the Army's financial statement. HQAES has the capability to track environmental project execution and end-to-end program management and provides visibility and transparency needed for cost and functional environmental management, including cleanup, compliance and conservation at active Army, Army National Guard; Army Reserve and Base Realignment and Closure (BRAC) installations.</p> <p>FY 2020 Plans: In FY20 the HQAES PMO will continue execution of capability enhancements to improve usability, enhance decision support, and improve the integrity and available of actionable data. This will include the following to include those identified during the roadmap/acquisition refinement:</p> <ul style="list-style-type: none"> - Provide remote capabilities to perform Environmental Performance Assessment System audits, data analysis, and other processes required for critical business lines - Develop data interfaces been remote applications, data storage systems or front-end views and HQAES - Integrate solid waste management capabilities - Integrate data from authoritative Army and DoD sources (real property, financial, geospatial, global mail etc.) - Provide universal reporting formats for Army-wide use <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funds are programmed every other year to support HQAES PMO.</p>		1.904	-	1.977
<p>Title: FY2019 SBIR/STTR Transfer</p> <p>Description: FY2019 SBIR/STTR Transfer</p> <p>FY 2019 Plans: FY2019 SBIR/STTR Transfer</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY2019 SBIR/STTR Transfer</p>		-	0.073	-
Accomplishments/Planned Programs Subtotals		4.201	2.290	4.119

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605857A / <i>Environmental Quality Technology Mgmt Support</i>	Project (Number/Name) 031 / <i>Environmentally Sustainable Acquisition/Logistics</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy TBD		
E. Performance Metrics N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605857A / <i>Environmental Quality Technology Mgmt Support</i>				Project (Number/Name) 061 / <i>Environmental Quality Technology Support</i>			
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
061: <i>Environmental Quality Technology Support</i>	-	0.682	0.921	0.562	-	0.562	0.605	0.614	0.651	0.426	0.000	4.461
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides Research, Development, Test, & Evaluation (RDTE) Management Support for the demonstration and validation of innovative technologies to modernize materials and processes required for current and future operational sustainment and warfighter training capabilities within the Army's Environmental Quality Technology program. The Project supports technologies that increase life safety, reduce Soldier and worker human health risks, enhance readiness and enable mission capabilities of the current and future force, while simultaneously increasing performance and standardization across the Army. This Project provides for management of RDTE activities conducted under project 0603779A (Environmental Quality Technology Dem/Val) / Project E21 (Environmental Quality Technology Dem/Val), which supports the Cross Functional Teams and the Army's top modernization priorities by addressing potential obsolescence of legacy materials and current and emerging impacts on human health and the environment. The Project expedites technology transition from the laboratory to operational use by establishing toxicology assessments to support the demonstration of modern materials and processes fulfilling or surpassing the performance requirements outlined in Material Specifications, Depot Maintenance Work Requirements, Technical Manuals, Drawings, and other technical data.

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

	FY 2018	FY 2019	FY 2020
Title: Management of Army Environmental Quality Technology Programs	0.682	0.439	0.562
Description: Manage and oversee the demonstration/validation of weapon system pollution prevention technologies within the Army's Environmental Quality Technology Program with a focus on eliminating the high priority issues associated with hexavalent chromium, cadmium and airborne lead through material substitution.			
FY 2019 Plans: Manage and oversee the demonstration/validation of three pollution prevention technology efforts: Toxic Metal Reduction in Surface Finishing of Army Weapon Systems; Airborne Lead Reduction from Army Weapon Systems; and Low Global Warming Potential Alternatives to Ozone Depleting Substances.			
FY 2020 Plans: Will manage and oversee the demonstration/validation of three technology efforts that support the Future Vertical Lift, Next Generation Combat Vehicle, Long Range Precision Fire and Soldier Lethality Army modernization priorities: Toxic Metal Reduction in Surface Finishing of Army Weapon Systems; Airborne Lead Reduction from Army Weapon Systems; and Low Global Warming Potential Alternatives to Ozone Depleting Substances.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605857A / <i>Environmental Quality Technology Mgmt Support</i>	Project (Number/Name) 061 / <i>Environmental Quality Technology Support</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Funds increase reflects slight shift in projected requirements related to Army modernization efforts.			
<p>Title: Environmental, Safety and Occupational Health Impacts of Short-Term Noise Assessment Procedures</p> <p>Description: Manage and oversee the demonstration and validation of technologies for making Army blast noise short-term noise assessment.</p> <p>FY 2019 Plans: Develop training modules for using short-term noise assessment tools. These self-guided on-line training modules will be for use by installation range managers and address the use of short-term noise assessment procedures and interpretation of results to minimize risk to training and maximize training throughput.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funds have been strategically realigned in support of holistic within-Project program assessment.</p>	-	0.247	-
<p>Title: Advanced Water Reuse Technology for Fixed Installations</p> <p>Description: Advanced water reuse technologies demonstration and guidance for Army fixed installations applications.</p> <p>FY 2019 Plans: Summarize results of prior demonstration studies, recommending updates to guidance documents from Army Public Health Center and Unified Facilities Criteria.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Funds strategically realigned in pursuit of within-Project requirements related to Army modernization priorities.</p>	-	0.235	-
Accomplishments/Planned Programs Subtotals	0.682	0.921	0.562

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks
D. Acquisition Strategy N/A
E. Performance Metrics N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605898A / <i>Army Direct Report Headquarters - R&D - MHA</i>
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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
Total Program Element	-	54.177	54.130	53.820	-	53.820	54.544	55.472	55.996	58.065	0.000	386.204
FJ2: <i>Army SHARP RDTE</i>	-	0.000	1.581	1.600	-	1.600	1.600	1.600	1.600	1.600	0.000	9.581
M65: <i>Army Test and Evaluation Command</i>	-	50.300	48.611	48.264	-	48.264	48.923	49.760	50.246	52.268	0.000	348.372
XW7: <i>Command HQ - ARI</i>	-	3.877	3.938	3.956	-	3.956	4.021	4.112	4.150	4.197	0.000	28.251

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funding for the salaries and related personnel benefits for authorized civilian personnel positions that provide for the management functions and the technical direction of the United States (U.S.) Army Test and Evaluation Command (ATEC) mission located at Aberdeen Proving Ground (APG), Maryland (Project M65 Army Test and Evaluation Command). It also provides funds supporting similar functions at the United States (U.S.) Army Research Institute for the Behavioral and Social Sciences (Project XW7 Command HQ - ARI), and provides funds for Army Headquarters to study and improve the Sexual Harassment / Assault Response and Prevention program (Project FJ2 Army SHARP RDTE).

ATEC plans, conducts and integrates developmental testing, independent operational testing, independent evaluations, and assessments to provide essential information to Soldiers and acquisition decision makers supporting the American Warfighter. Additionally, ATEC is a Direct Support to Army Futures Command (AFC). ATEC provides testing and independent evaluation support to AFC Cross Functional Team (CFT) efforts including risk reduction support to experiments, demonstrations, requirements, research, development, and acquisition. As such, ATEC priorities are aligned to the Army's Modernization priorities.

Project M65 includes staff/management functions of resource management, human resources, safety, security, environmental, strategic planning and information/technology support for command-wide databases in support of the developmental, evaluation and operational test mission with technical direction to the Army Evaluation Center (AEC), Aberdeen Proving Ground, Maryland; to the Operational Test Command (OTC), Fort Hood, Texas which consists of three forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air Defense Artillery Test Directorate, Fort Bliss, Texas; and the Fires Test Directorate, Fort Sill, Oklahoma) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Ft Hood, Texas; and to the seven Major Range and Test Facility Base (MRTFBs) and one non-MRTFB test range: Aberdeen Test Center (ATC) at APG, Maryland; West Desert Test Center (WDTC) at Dugway Proving Ground (DPG), Utah; Electronic Proving Ground (EPG) at Fort Huachuca, Arizona; White Sands Test Center (WSTC) at White Sands Missile Range (WSMR), New Mexico; Yuma Test Center (YTC) at Yuma Proving Ground (YPG), Arizona; Cold Regions Test Center (CRTC) at Fort Greely, Alaska; and Tropic Regions Test Center (TRTC) at various locations, as well as for Redstone Test Center (RTC) at Redstone Arsenal, Alabama. This is the operating budget for ATEC Headquarters, which provides technical direction for the annual execution of ~2,400 developmental tests; approximately ~52 operational events; and more than ~900 Evaluation and Safety documents supporting acquisition programs. ATEC's total authorized workforce amounts to a \$1.6 billion program in direct and reimbursable funding.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605898A / <i>Army Direct Report Headquarters - R&D - MHA</i>
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Project XW7 provides the non-Army Management Headquarters Activity (non-AMHA) management and administrative support that enables the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to accomplish its research mission and includes personnel/manpower execution and oversight. ARI's behavioral and social science research provides effective non-materiel solutions to help the Army adjust to changes in force size and structure, a variety of mission demands and contexts, challenges in human relations, and budgetary constraints. ARI is the only Science and Technology (S&T) laboratory that conducts research to enhance the Soldier lifecycle (e.g., selection, assignment, training, and leader development) and human relations (e.g., culture of dignity, respect, and inclusion).

Project FJ2 provides Army Management Headquarters a critical research capability to improve the Army Sexual Harassment / Assault Response and Prevention (SHARP) program, with a specific focus on prevention.

This PE does not finance test facility operations, test instrumentation, or test equipment.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	54.679	54.145	54.951	-	54.951
Current President's Budget	54.177	54.130	53.820	-	53.820
Total Adjustments	-0.502	-0.015	-1.131	-	-1.131
• Congressional General Reductions	-0.010	-0.015			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.492	-			
• Adjustments to Budget Years	-	-	-1.131	-	-1.131

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) FJ2 / Army SHARP RDTE
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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
FJ2: Army SHARP RDTE	-	0.000	1.581	1.600	-	1.600	1.600	1.600	1.600	1.600	0.000	9.581
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds contracts that cover critical research needs of the Army Sexual Harassment / Assault Response and Prevention (SHARP) Office and the greater Army with a specific focus on prevention. In Fiscal Year (FY) 2020 this contract achieves three goals: (1) to inform sexual harassment prevention research efforts (e.g., Consortium Research Fellows Program), (2) examine the nature of offending within the military to inform effective sexual assault prevention efforts, and (3) assess the efficacy of training/prevention/outreach efforts related to sexual assault, in particular but not limited to male service members. Ongoing efforts to meet the first goal will explore the nature of sexual harassment in the Army, identify the organizational costs related to harassment (e.g., increased turnover, lower job satisfaction, and job performance), and examine the role of sexual harassment as it relates to sexual assault within the continuum of harm. Based on these studies, the performer will recommend effective sexual harassment prevention strategies. Studies will ensure that Army SHARP programs build climates for dignity and respect free of sexual harassment. Some of these efforts may be achieved through a collaboration with the Consortium Research Fellows Program.

To meet the second goal, studies will examine behavioral patterns in offending within military sexual assault cases. For instance, behavioral patterns may reveal the nature of military sexual assault or identify potential vulnerabilities that could lead someone to perpetrate sexual assault. Studies may also be informed by offender patterns observed in research using administrative data sources. Based on this research, the performer will identify ways to reduce risk of sexual offending behavior, recommend ways to improve skills and abilities that will bolster one's ability to engage in healthy relationships, and inform effective sexual assault prevention practices.

To meet the third goal, research will (1) conduct male-specific assessments and (2) conduct other assessments that will assess the efficacy of training/prevention/outreach efforts related to sexual assault. The research will characterize the behaviors associated with military men's victimization and how they differ from those of service women, men's decision processes to file a formal report of sexual assault, and their experiences with the military sexual assault response systems. In particular, the research will focus on male victimization that occurred during military service rather than childhood sexual assault. Based on this research, the performer will identify ways to improve tailored recommendations for responding to and supporting male victims. This research will improve DoD prevention and response for male Service members. To meet the second part of this goal, the research may conduct assessments to evaluate the efficacy of training/prevention/outreach efforts related to sexual assault. This may involve conducting evaluation research to assess the effectiveness of individual programs or practices. Based on this research, the performer will determine whether these programs are effective and propose ways to improve SHARP efforts. This research will ensure that SHARP programs deliver effective training/prevention/outreach.

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

	FY 2018	FY 2019	FY 2020
Title: Role Identifications	-	1.530	1.600
Description: Funding is required to ensure that Army SHARP is in compliance with multiple Service or DoD requirements. NDAA Requirement S585 (FY 2012) requires the development of SAPR curriculum for Service members and civilian employees,			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) FJ2 / Army SHARP RDTE

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>NDAA Requirement 1725c (FY 2014) requires the identification of qualifications needed for Service and civilian personnel who are assigned to positions that include SAPR functions, NDAA Requirement S1733 requires the review of SAPR training and recommendations for modification based on identified inadequacies, and NDAA Requirement S538 (FY 2016) dictates that the Services develop efforts to improve prevention and response for male victims of sexual assault. Conducting research to meet these requirements is a necessary step in ensuring that training, prevention and outreach activities are having the desired effect and impact on the Total Force.</p> <p>FY 2019 Plans: This requirement funds contracts that cover critical research needs of the Army SHARP Office and the greater Army with a specific focus on prevention. Funding covers costs involved with conducting job analyses for SHARP positions, the creation of competency models for positions of trust, hiring subject matter experts to inform prevention research efforts (e.g., Consortium Research Fellows Program), assessing the efficacy of training/prevention/outreach efforts related to the sexual assault of male service members, providing research-based recommendations to installations executing prevention programs, and working with universities and industry to conduct research and present findings with SHARP stakeholders, Service partners, and the broader Army and DoD.</p> <p>FY 2020 Plans: To meet the second goal, research will examine behavioral patterns in offending within military sexual assault cases. For instance, behavioral patterns may reveal the nature of military sexual assault or identify potential vulnerabilities that could lead someone to perpetrate sexual assault. The research may also be informed by offender patterns observed in research using administrative data sources. Based on this research, the performer will identify ways to reduce risk of sexual offending behavior, recommend ways to improve skills and abilities that will bolster one's ability to engage in healthy relationships, and inform effective sexual assault prevention practices.</p> <p>To meet the third goal, research will (1) conduct male-specific assessments and (2) conduct other assessments that will assess the efficacy of training/prevention/outreach efforts related to sexual assault. The research will characterize the behaviors associated with military men's victimization and how they differ from those of service women, men's decision processes to file a formal report of sexual assault, and their experiences with the military sexual assault response systems. In particular, the research will focus on male victimization that occurred during military service rather than childhood sexual assault. Based on this research, the performer will identify ways to improve tailored recommendations for responding to and supporting male victims. This research will improve DoD prevention and response for male Service members. To meet the second part of this goal, the research may conduct assessments to evaluate the efficacy of training/prevention/outreach efforts related to sexual assault. This may involve conducting evaluation research to assess the effectiveness of individual programs or practices. Based on this research, the</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) FJ2 / Army SHARP RDTE

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
performer will determine whether these programs are effective and propose ways to improve SHARP efforts. This research will ensure that SHARP programs deliver effective training/prevention/outreach. FY 2019 to FY 2020 Increase/Decrease Statement: Consistent funding to support the Army's SHARP program.			
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	-	0.051	-
Accomplishments/Planned Programs Subtotals	-	1.581	1.600

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA				Project (Number/Name) M65 / Army Test and Evaluation Command			
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
M65: Army Test and Evaluation Command	-	50.300	48.611	48.264	-	48.264	48.923	49.760	50.246	52.268	0.000	348.372
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for the salaries and related personnel benefits for the authorized civilian personnel positions that provide for the management functions and the technical direction of the United States (U.S.) Army Test and Evaluation Command (ATEC) mission located at Aberdeen Proving Ground (APG), Maryland. ATEC plans, conducts and integrates developmental testing, independent operational testing, independent evaluations, and assessments to provide essential information to Soldiers and acquisition decision makers supporting the American Warfighter. Additionally, ATEC is a Direct Support to Army Futures Command (AFC). ATEC provides testing and independent evaluation support to AFC Cross Functional Team (CFT) efforts including risk reduction support to experiments, demonstrations, requirements, research, development, and acquisition. As such, ATEC priorities are aligned to the Army's Modernization priorities.

This Project includes staff/management functions of resource management, human resources, safety, security, environmental, strategic planning and information/technology support for command-wide databases in support of the developmental, evaluation and operational test mission with technical direction to the Army Evaluation Center (AEC), Aberdeen Proving Ground, Maryland; to the Operational Test Command (OTC), Fort Hood, Texas which consists of three forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air Defense Artillery Test Directorate, Fort Bliss, Texas; and the Fires Test Directorate, Fort Sill, Oklahoma) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Ft Hood, Texas; and to the seven Major Range and Test Facility Base (MRTFBs) and one non-MRTFB test range: Aberdeen Test Center (ATC) at APG, Maryland; West Desert Test Center (WDTC) at Dugway Proving Ground (DPG), Utah; Electronic Proving Ground (EPG) at Fort Huachuca, Arizona; White Sands Test Center (WSTC) at White Sands Missile Range (WSMR), New Mexico; Yuma Test Center (YTC) at Yuma Proving Ground (YPG), Arizona; Cold Regions Test Center (CRTC) at Fort Greely, Alaska; and Tropic Regions Test Center (TRTC) at various locations, as well as for Redstone Test Center (RTC) at Redstone Arsenal, Alabama. This is the operating budget for ATEC Headquarters, which provides technical direction for the annual execution of ~2,400 developmental tests; approximately ~52 operational events; and more than ~900 Evaluation and Safety documents supporting acquisition programs. ATEC's total authorized workforce amounts to a \$1.6 billion program in direct and reimbursable funding.

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

	FY 2018	FY 2019	FY 2020
Title: Army Test and Evaluation Command	50.300	48.059	48.264
Description: Civilian labor and other support required to manage and administer the Army test and evaluation mission at ATEC. ATEC plans, conducts and integrates developmental testing, independent operational testing, independent evaluations, assessments and experiments to provide essential information to Soldiers and acquisition decision makers supporting the American Warfighter.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) M65 / Army Test and Evaluation Command

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p><i>FY 2019 Plans:</i> Will fund authorized civilian salaries, associated expenses (supplies, equipment, travel, etc.) and other support required to manage and administer the Army test and evaluation mission at ATEC.</p> <p><i>FY 2020 Plans:</i> Will fund authorized civilian salaries, associated expenses (supplies, equipment, travel, etc.) and other support required to manage and administer the Army test and evaluation mission at ATEC.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> Continuity of effort.</p>			
<p><i>Title:</i> FY 2019 SBIR / STTR Transfer</p> <p><i>Description:</i> FY 2019 SBIR / STTR Transfer</p> <p><i>FY 2019 Plans:</i> FY 2019 SBIR / STTR Transfer</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY 2019 SBIR / STTR Transfer</p>	-	0.552	-
Accomplishments/Planned Programs Subtotals	50.300	48.611	48.264

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) XW7 / Command HQ - ARI
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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
XW7: Command HQ - ARI	-	3.877	3.938	3.956	-	3.956	4.021	4.112	4.150	4.197	0.000	28.251
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The United States (U.S.) Army Research Institute for the Behavioral and Social Sciences (ARI) is the only Science and Technology (S&T) laboratory that conducts research to enhance the Soldier lifecycle (e.g., selection, assignment, training, leader development) and human relations (e.g., culture of dignity, respect, and inclusion). This Project supports the non-Army Management Headquarters Activity (non-AMHA) management and administrative functions to enable ARI to accomplish its research mission and includes activities such as budget execution, procurement oversight, RDT&E (Research, Development, Test, & Evaluation) program planning and evaluation, management control, security/safety, logistics, information technology, and personnel/manpower execution and oversight. ARI's behavioral and social science research provides effective non-materiel solutions to help the Army adjust to changes in force size and structure, a variety of mission demands and contexts, challenges in human relations, and budgetary constraints.

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

	FY 2018	FY 2019	FY 2020
Title: Civilian Pay	3.877	3.938	3.956
Description: This effort will provide personnel for management, administrative, personnel, budget, and support functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Laboratory conducting the Army's personnel, training, leader development, and organizational performance Research and Development (R&D) program.			
FY 2019 Plans: Providing personnel for management, administrative, personnel, budget, and support functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Laboratory conducting the Army's personnel, training, leader development, and organizational performance R&D program.			
FY 2020 Plans: Will provide personnel for management, administrative, personnel, budget, and support functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Laboratory conducting the Army's personnel, training, leader development, and organizational performance R&D program.			
FY 2019 to FY 2020 Increase/Decrease Statement: Funding increase due to inflation.			
Accomplishments/Planned Programs Subtotals	3.877	3.938	3.956

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) XW7 / Command HQ - ARI
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		
E. Performance Metrics N/A		

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0606001A / <i>Military Ground-Based CREW Technology</i>							
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	-	7.600	4.890	4.291	-	4.291	4.289	4.341	4.439	4.602	0.000	34.452
FD4: <i>Military Ground-Based CREW Technology</i>	-	7.600	4.890	4.291	-	4.291	4.289	4.341	4.439	4.602	0.000	34.452

A. Mission Description and Budget Item Justification

The Secretary of the Army was designated the Executive Agent for Military Ground-Based Counter Radio-Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) Technology on 1 December 2013, pursuant to DoD Directive 5101.14 "Military Ground-Based Military CREW Technology". The Program Executive Office for Intelligence, Electronic Warfare & Sensors (PEO IEW&S) is assigned the responsibility to fulfill the duties of the DoD Military Ground-Based CREW Technology Single Manager. The DoD Single Manager (SM) is responsible for ensuring joint operational interoperability and compatibility between relevant DoD and coalition systems; interfaces with all DoD Services and other government agencies involved in CREW Technologies; and collaborates with multiple foreign countries on the RCIED threat and CREW technologies to ensure synergy between the technologies. The DoD SM chairs the Joint Program Board and represents the Army at the Force Protection Electronic Countermeasures (ECM) Working Group and Five Eyes (FVEYS) consortium.

Fiscal Year (FY) 2020 Base dollars in the amount of \$4.291 million will support the execution of DoD SM responsibilities. Funding will be used to continue efforts supporting and sustaining lab and field test infrastructures

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	7.916	4.896	4.891	-	4.891
Current President's Budget	7.600	4.890	4.291	-	4.291
Total Adjustments	-0.316	-0.006	-0.600	-	-0.600
• Congressional General Reductions	-0.006	-0.006			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.310	-			
• Adjustments to Budget Years	-	-	-0.600	-	-0.600

Change Summary Explanation

In FY20, reduction of \$0.600 million represents program rephasing of base funding for FY20 and out-years.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0606001A / <i>Military Ground-Based CREW Technology</i>				Project (Number/Name) FD4 / <i>Military Ground-Based CREW Technology</i>			
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
FD4: <i>Military Ground-Based CREW Technology</i>	-	7.600	4.890	4.291	-	4.291	4.289	4.341	4.439	4.602	0.000	34.452
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Secretary of the Army was designated the Executive Agent for Military Ground-Based Counter Radio-Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) Technology on 1 December 2013, pursuant to DoD Directive 5101.14 "Military Ground-Based Military CREW Technology". The Program Executive Office for Intelligence, Electronic Warfare & Sensors (PEO IEW&S) is assigned Executive Agent responsibilities to fulfill the duties of coordination and support of DoD Military Ground-Based CREW Technology testing and interoperability across all Services and Other Government Agencies (OGA). The PEO is responsible for ensuring joint operational interoperability and compatibility between relevant DoD and Coalition systems; interfaces with all DoD Services and Other Government Agencies (OGA) involved in CREW Technologies; and collaborates with multiple foreign countries on the RCIED threat and CREW technologies to ensure synergy between the technologies. The PEO chairs the Joint Program Board and represents the Army at the Force Protection Electronic Countermeasures (ECM) Working Group and Five Eyes (FVEYS) consortium.

Fiscal Year (FY) 2020 Base dollars in the amount of \$4.291 million will provide for efforts supporting and sustaining lab and field test infrastructures.

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

	FY 2018	FY 2019	FY 2020
Title: Test Technologies	7.600	4.241	4.291
Description: Ensuring joint operational interoperability and compatibility between relevant DoD and Coalition systems; interfaces with all DoD Services and Other Government Agencies (OGA) involved in CREW Technologies; and collaborates with multiple foreign countries on the RCIED threat and CREW technologies to ensure synergy between the technologies.			
FY 2019 Plans: Funding will be used to provide continued support to cellular test infrastructure, including the sustainment and maintenance of the Advanced Communication Equipment. This includes hardware and personnel to sustain network, radio, backhaul, and instrumentation needed to sustain the network, as well as network connections to core systems.			
FY 2020 Plans: Funding will be used to provide continued support to cellular test infrastructure, including the sustainment and maintenance of the Advanced Communication Equipment. This includes, but not limited to hardware and personnel to sustain network, radio, backhaul, and instrumentation needed to sustain the network, as well as network connections to core systems.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606001A / <i>Military Ground-Based CREW Technology</i>	Project (Number/Name) FD4 / <i>Military Ground-Based CREW Technology</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Increase of \$50K due to testing costs.				
Title: FY 2019 SIBR / STTR Transfer		-	0.649	-
FY 2019 Plans: FY 2019 SIBR / STTR Transfer				
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SIBR / STTR Transfer				
Accomplishments/Planned Programs Subtotals		7.600	4.890	4.291
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				
E. Performance Metrics				
N/A				

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606002A / <i>Ronald Reagan Ballistic Missile Defense Test Site</i>
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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
Total Program Element	-	59.042	62.940	62.069	-	62.069	68.786	59.244	59.676	69.489	0.000	441.246
XW9: <i>Reagan Test Site</i>	-	59.042	62.940	62.069	-	62.069	68.786	59.244	59.676	69.489	0.000	441.246

A. Mission Description and Budget Item Justification

The Ronald Reagan Ballistic Missile Defense Test Site (RTS), with its remote location and one-of-a-kind instrumentation systems, provides a valuable strategic test environment that cannot be replicated. Its function is to: 1) support test and evaluation of major Army and DoD acquisition programs of strategic importance to the national defense; and 2) provide space operations and intelligence data (Space Situational Awareness, object tracking & identification) in support of U.S. Strategic Command (USSTRATCOM), acting as a high value contributing sensor to the U.S. Space Surveillance Network. Due to its unique geography and instrumentation, RTS is able to provide unmatched data collection capabilities that provide critical test data for programs of national interest to include: Army Missile Defense; Defense Advanced Research Projects Agency hypersonic Boost-Glide developmental tests; Air Force and Navy Intercontinental Ballistic Missile (ICBM) developmental and operational tests; Army, Air Force, Navy, and Missile Defense Agency (MDA) operational, demonstration, and validation tests; National Aeronautics and Space Administration (NASA) scientific and unique space programs; NASA ionospheric studies; space debris tracking; and data collection in support of space experiments.

Funding in this Program Element (PE) covers management and contracting personnel support (salaries and travel) to enable the management of the test and evaluation of major Army and Department of Defense (DoD) missile systems for the Ronald Reagan Ballistic Missile Defense Test Site (RTS). Funds also provide contracting support for end item procurement, life cycle acquisition planning, and solicitation, negotiation, award, execution and management for weapon systems contracts. This PE provides contractors to accomplish key operations and maintenance functions for RTS instrumentation suites and also provides mission essential bandwidth via a fiber optic cable system. Funds provide the expertise required for operating and maintaining a number of one-of-a-kind radar, optical, telemetry, command/control/communications, safety, and data reduction systems. These systems include: the four unique radars of the Kiernan Reentry Measurement Site; Super Recording Automatic Digital Optical Tracker long range video-metric tracking systems; high density data recorders for high data-rate telemetry collected by ten antennas; an underwater acoustic impact location system; and data analysis/reduction hardware/software and Continental United States (CONUS) based mission control center. The Advanced Research Project Agency Long-Range Tracking and Instrumentation Radar and the Target Resolution Discrimination Experiment radars located at RTS are the only radars in this area of operation that have deep-space tracking capability. The Millimeter Wave Radar is one of the highest resolution imaging radars in the world, providing critical intelligence data. Funding also enables weapon system assessment of operational effectiveness and suitability for the Army, Air Force, Navy and MDA, which all have programs planned that have significant test and data gathering requirements at RTS. This test data cannot be obtained except through the use of technical facilities available on and in the vicinity of RTS. Program supports Army's PATRIOT air defense system; Air Force's Minuteman III ICBM and the Space and Missile Center's associated programs; MDA's Ballistic Missile Defense System, ICBM Targets, and Layered Ballistic Missile Defense operational tests (including: PATRIOT, Terminal High-Altitude Area Defense , and Aegis Weapon System), and NASA's space experiments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606002A / <i>Ronald Reagan Ballistic Missile Defense Test Site</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	61.254	63.011	62.752	-	62.752
Current President's Budget	59.042	62.940	62.069	-	62.069
Total Adjustments	-2.212	-0.071	-0.683	-	-0.683
• Congressional General Reductions	-0.045	-0.071			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.167	-			
• Adjustments to Budget Years	-	-	-0.683	-	-0.683

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0606002A / <i>Ronald Reagan Ballistic Missile Defense Test Site</i>				Project (Number/Name) XW9 / <i>Reagan Test Site</i>			
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
XW9: <i>Reagan Test Site</i>	-	59.042	62.940	62.069	-	62.069	68.786	59.244	59.676	69.489	0.000	441.246
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project covers operations and mission support functions at the Ronald Reagan Ballistic Missile Defense Test Site and is managed by Program Executive Office Missiles & Space.

The Reagan Test Site (RTS) with its remote location and one of kind instrumentation systems provides a valuable strategic test environment that cannot be replicated. Its function is to: 1) support test and evaluation of major Army and DoD acquisition programs of strategic importance to the national defense; and 2) to provide space operations and intelligence data (Space Situational Awareness; object tracking & identification) in support of U.S. Strategic Command (USSTRATCOM), acting as a high value contributing sensor to the U.S. Space Surveillance Network. Due to its unique geography and instrumentation, RTS is able to provide unmatched data collection capabilities to provide critical test data for programs of national interest to include: Army Missile Defense; Defense Advanced Research Projects Agency hypersonic Boost-Glide developmental tests; Air Force and Navy Intercontinental Ballistic Missile (ICBM) developmental and operational tests; Army, Air Force, Navy, and Missile Defense Agency (MDA) operational/ demonstration/ validation tests; National Aeronautics and Space Administration (NASA) scientific and unique space programs; NASA ionospheric studies; space debris tracking; and data collection in support of space experiments.

Funding in this Program Element (PE) covers management and contracting personnel support (salaries and travel) to enable the management of the test and evaluation of major Army and Department of Defense (DoD) missile systems for the Ronald Reagan Ballistic Missile Defense Test Site (RTS). Funds also provide contracting support for end item procurement, life cycle acquisition planning, and solicitation, negotiation, award, execution and management for weapon systems contracts. This PE provides contractors to accomplish key operations and maintenance functions for RTS instrumentation suites and also provides mission essential bandwidth via a fiber optic cable system. Funds provide the expertise required for operating and maintaining a number of one-of-a-kind radar, optical, telemetry, command/control/communications, safety, and data reduction systems. These systems include the four unique radars of the Kiernan Reentry Measurement Site; Super Recording Automatic Digital Optical Tracker long range video-metric tracking systems; high density data recorders for high data-rate telemetry collected by ten antennas; an underwater acoustic impact location system; and data analysis/reduction hardware/software and Continental United States (CONUS) based mission control center. The Advanced Research Project Agency Long-Range Tracking and Instrumentation Radar and the Target Resolution Discrimination Experiment radars located at RTS are the only radars in this area of operation that have deep-space tracking capability. The Millimeter Wave Radar is one of the highest resolution imaging radars in the world, providing critical intelligence data. Funding also enables weapon system assessment of operational effectiveness and suitability for the Army, Air Force, Navy and MDA, which all have programs planned that have significant test and data gathering requirements at RTS. This test data cannot be obtained except through the use of technical facilities available on and in the vicinity of RTS. Program supports Army's PATRIOT air defense system; Air Force's Minuteman III ICBM and the Space and Missile Center's associated programs; MDA's Ballistic Missile Defense System, ICBM Targets, and Layered Ballistic Missile Defense operational tests (including: PATRIOT, Terminal High-Altitude Area Defense , and Aegis Weapon System), and NASA's space experiments.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606002A / <i>Ronald Reagan Ballistic Missile Defense Test Site</i>	Project (Number/Name) XW9 / <i>Reagan Test Site</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Title: Civilian Pay (RTS)</p> <p>Description: Funding covers civilians to perform management oversight of Army and DOD Missile Test programs.</p> <p>FY 2019 Plans: Continue to provide government personnel support (salaries) to enable the management of the test and evaluation of major Army and DoD missile systems.</p> <p>FY 2020 Plans: Will continue to provide government personnel support (salaries) to enable the management of the test and evaluation of major Army and DoD missile systems.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to inflation</p>		5.435	5.114	5.793
<p>Title: Temporary Duty (TDY)/Training/Supplies - Military and Civilian</p> <p>Description: Funding will provide for travel and training for civilians and military to assist in the testing of the Army and DoD Missile system Programs.</p> <p>FY 2019 Plans: Continue to provide government personnel support (training and travel) to enable the management of the test and evaluation of major Army and DoD missile systems.</p> <p>FY 2020 Plans: Will continue to provide government personnel support (training and travel) to enable the management of the test and evaluation of major Army and DoD missile systems.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to expected need for TDY / training / supplies.</p>		1.075	0.639	1.009
<p>Title: Outside Obligations/Other Government Agencies (OGAs)</p> <p>Description: Funding provided to other Government Agencies for reimbursable-type work efforts.</p> <p>FY 2019 Plans: Continue to provide support to test and evaluation of major Army and DoD missile systems.</p> <p>FY 2020 Plans:</p>		5.807	8.129	6.255

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606002A / <i>Ronald Reagan Ballistic Missile Defense Test Site</i>	Project (Number/Name) XW9 / <i>Reagan Test Site</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Will continue to provide support to test and evaluation of major Army and DoD missile systems.				
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease due to reduced support required from OGAs				
Title: Fiber Optic Cable (Kwajalein Cable System (KCS))/Inner Ring Submarine Description: Fiber Optic Cable is Provides lease cost for Fiber Optic Cable between Kwajalein and Guam.		6.347	11.443	10.877
FY 2019 Plans: Continue to provide funding for lease of the KCS fiber optic cable between Kwajalein Island and Guam, and for backup satellite. Will fund annual fiber maintenance agreement.				
FY 2020 Plans: Will continue to provide funding for lease of the KCS fiber optic cable between Kwajalein Island and Guam, and for backup satellite. Will fund annual fiber maintenance agreement.				
FY 2019 to FY 2020 Increase/Decrease Statement: Decrease due to change in requirement/scope.				
Title: RTS Contractor Prime Pay (KRS) Description: Provide funding for Prime contractor to perform technical Operation and Maintenance support to support test and space missions.		22.420	22.525	27.274
FY 2019 Plans: Continue to provide technical O&M support (test planning, instrumentation operations and maintenance, systems engineering, flight safety, and launch ordnance) to assure the capability of the Range to support test and space missions. Begins buydown of critical maintenance backlog.				
FY 2020 Plans: Will continue to provide technical O&M support (test planning, instrumentation operations and maintenance, systems engineering, flight safety, and launch ordnance) to assure the capability of the Range to support test and space missions. Continues the buy-down of critical maintenance backlog.				
FY 2019 to FY 2020 Increase/Decrease Statement: Increase aligns with expected workload for FY20.				
Title: Contractor Material		1.970	3.963	4.042

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606002A / <i>Ronald Reagan Ballistic Missile Defense Test Site</i>	Project (Number/Name) XW9 / <i>Reagan Test Site</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Description: Provide for materials to maintain range capabilities and support test operations.</p> <p>FY 2019 Plans: Continue to provide critical non-labor materials to maintain critical range capabilities and prevent obsolescence in support of test operations. Begins buydown of critical maintenance backlog.</p> <p>FY 2020 Plans: Will continue to provide critical non-labor materials to maintain critical range capabilities and prevent obsolescence in support of test operations. Continues the buy-down of critical maintenance backlog.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to inflation.</p>			
<p>Title: Federally Funded Research and Development Centers (FFRDC) Contractor Pay (MIT/LL)</p> <p>Description: Provide for technical expertise to RTS leadership for the overall performance of Range Operations.</p> <p>FY 2019 Plans: Continue to provide technical advice to RTS leadership in support of Range operations, strategic planning, and technical execution of critical technology.</p> <p>FY 2020 Plans: Will continue to provide technical advice to RTS leadership in support of Range operations, strategic planning, and technical execution of critical technology.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Decrease due to reduced support from Massachusetts Institute for Technology (MIT) Lincoln Laboratory.</p>	3.600	5.432	3.411
<p>Title: Contractor Pay Meteorological</p> <p>Description: Provide capability for weather sensing capability which allows for test planning and execution of the program.</p> <p>FY 2019 Plans: Continue to provide support for sustained weather sensing capabilities, including weather reporting via radar data. This capability provides critical data to test planning and execution.</p> <p>FY 2020 Plans: Will continue to provide support for sustained weather sensing capabilities, including weather reporting via radar data. This</p>	2.118	2.150	2.203

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606002A / <i>Ronald Reagan Ballistic Missile Defense Test Site</i>	Project (Number/Name) XW9 / <i>Reagan Test Site</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
capability provides critical data to test planning and execution. FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to inflation.				
Title: Ground Transportation Description: Provide transportation of material and passenger between Kwajalein and continental U.S. (CONUS). FY 2019 Plans: Continuing to provide mission specific material and passenger transportation via air (Air Mobility Command) and sea (Surface Deployment and Distribution Command) between Kwajalein Atoll and CONUS. FY 2020 Plans: Continuing to provide mission specific material and passenger transportation via air (Air Mobility Command) and sea (Surface Deployment and Distribution Command) between Kwajalein Atoll and CONUS. FY 2019 to FY 2020 Increase/Decrease Statement: Change due to historical use.		0.505	0.861	0.525
Title: Mission Specific Environmental Description: Ensures Range Readiness and all regulatory environmental requirements are compliant with range and test requirements. FY 2019 Plans: Continue to provide the capability to assess and maintain the Range Readiness and compliance with environmental requirements. FY 2020 Plans: Will continue to provide the capability to assess and maintain the Range Readiness and compliance with environmental requirements. FY 2019 to FY 2020 Increase/Decrease Statement: Increase due to public environmental meetings held every two years		0.654	0.552	0.680
Title: USNS Worthy - Shipyard Description: Provide for maintenance to keep all parts of the ship operational for testing.		8.480	-	-
Title: Army Contracting Command (ACC) Support		0.631	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606002A / <i>Ronald Reagan Ballistic Missile Defense Test Site</i>	Project (Number/Name) XW9 / <i>Reagan Test Site</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Description: Contracting support to administrator the contract vehicle for the program.			
Title: FY2019 SBIR/STTR Transfer Description: SBIR/STTR adjustment	-	2.132	-
FY 2019 Plans: SBIR/STTR Adjustment			
FY 2019 to FY 2020 Increase/Decrease Statement: SBIR/STTR adjustment			
Accomplishments/Planned Programs Subtotals	59.042	62.940	62.069

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks
D. Acquisition Strategy N/A
E. Performance Metrics N/A

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0606003A / CounterIntel and Human Intel Modernization
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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
Total Program Element	-	0.000	2.636	1.050	1.875	2.925	2.064	2.625	2.091	2.057	0.000	14.398
FI9: Counterl Intel and Human Intel Modernization	-	0.000	2.636	1.050	1.875	2.925	2.064	2.625	2.091	2.057	0.000	14.398

A. Mission Description and Budget Item Justification

The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Program Element (PE) supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions. Modernization of these systems is a core component of ensuring overmatch on current and future battlefields. Beginning in Fiscal Year (FY) 2019, funding for these efforts was transferred to PE 0606003 / Project FI9 (Counter Intel and Human Intel Modernization) from PE 0303028A (INTEL SPT TO FORCE XXI) / Project FG2 (Counterintelligence & Human Intel Modernization).

Lines of effort include the following:

The Joint Service Counter C4ISR Initiative conducts technical analyses and research focused on centers of gravity within the C4ISR architecture of adversary weapon systems that enable successful kinetic and non-kinetic engagements. The Army will use the intelligence provided from this effort to inform the development of offensive cyber and advanced electronic warfare capabilities against adversaries as well as countermeasure development against key adversary weapon systems.

Army HUMINT collection conducted through all phases of the operational spectrum in order to provide DoD Commanders, Planners, and Decision Makers valuable insight of the capabilities, intentions, or activities of foreign governments or elements thereof, foreign operations, foreign persons, and international terrorism organizations. Also provides advance HUMINT training using Nationally validated courses, standardized practices, and proven Tactics, Techniques, and Procedures.

The Battlefield Information Collection and Exploitation Systems (BICES) Geospatial Intelligence (GEOINT) Web Presence will resource contractor development to deliver software to provide data interoperability between U.S. and BICES networks for GEOINT finished products. The software will provide releasable intelligence data to coalition users that support and partner with US forces to accomplish US policy goals in theater.

GEOINT Rapid Development will resource contractor development and testing to deliver new GEOINT capabilities to the Army. Tasked work considers current warfighter intelligence gaps and develops potential solutions using tried and untried methodologies for collection, processing, and analysis alongside mission partner programs. The team then validates and tests approaches and delivers the techniques to the warfighter-supporting analyst team to support operations.

Intelligence Needs Integration will resource contractor design, software development, and testing to populate ground component intelligence needs to external intelligence needs systems and provide the results to the ground component customers. Non-Army analysts can then provide intelligence using approaches not currently provided by the Army, giving the ground commander a greater resolution.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606003A / <i>CounterIntel and Human Intel Modernization</i>
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The GEOINT Product Catalog will resource contractor design, software development, testing and integration. The delivered software will provide analysts and requirements managers a guided, quick reference tool to choose from the hundreds GEOINT approaches available to close their intelligence gaps.

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	2.636	2.685	-	2.685
Current President's Budget	0.000	2.636	1.050	1.875	2.925
Total Adjustments	0.000	0.000	-1.635	1.875	0.240
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-1.635	1.875	0.240

Change Summary Explanation

FY20 requirements have been split between Base and OCO. OCO portion is assigned to United States Central Command (CENTCOM), Operation Inherent Resolve (OIR).

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0606003A / <i>CounterIntel and Human Intel Modernization</i>				Project (Number/Name) F19 / <i>CounterIntel and Human Intel Modernization</i>			
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
F19: <i>CounterIntel and Human Intel Modernization</i>	-	0.000	2.636	1.050	1.875	2.925	2.064	2.625	2.091	2.057	0.000	14.398
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Program Element (PE) supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions. Modernization of these systems is a core component of ensuring overmatch on current and future battlefields. Beginning in Fiscal Year (FY) 2019, funding for these efforts was transferred to PE 0606003 / Project F19 (Counter Intel and Human Intel Modernization) from PE 0303028A (INTEL SPT TO FORCE XXI) / Project FG2 (Counterintelligence & Human Intel Modernization).

Lines of effort include the following:

The Joint Service Counter C4ISR Initiative conducts technical analyses and research focused on centers of gravity within the C4ISR architecture of adversary weapon systems that enable successful kinetic and non-kinetic engagements. The Army will use the intelligence provided from this effort to inform the development of offensive cyber and advanced electronic warfare capabilities against adversaries as well as countermeasure development against key adversary weapon systems.

The Battlefield Information Collection and Exploitation Systems (BICES) Geospatial Intelligence (GEOINT) Web Presence will resource contractor development to deliver government-owned software. This software provides data interoperability between U.S. and BICES networks for GEOINT data. The software will select, transmit, and integrate intelligence data across existing Cross Domain Transfer devices between systems on U.S. and the 10+ BICES networks.

GOTCHA (radar imagery) GEOINT Integration will resource contractor development and testing to deliver new GEOINT capabilities to the Army. Tasked work includes rapid research, validation and test activities based on non-traditional collectors and collector phenomenology to deliver non-traditional GEOINT to the warfighter based on special collections. Development activities will include software deliveries to existing enterprise workflow services to incorporate the new techniques being delivered to the National System for Geospatial Intelligence (NSG).

National Geospatial-Intelligence Agency (NGA) Systems to Military Intelligence Programs (MIP) will resource contractor design, software development, and testing. The delivered software will integrate analyst process status with NGA enterprise systems for Army GEOINT missions.

The GEOINT Product Catalog will resource contractor design, software development, testing and integration. The delivered software will provide analysts and requirements managers a guided, quick reference tool to identify GEOINT approaches needed to close intelligence gaps.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606003A / <i>CounterIntel and Human Intel Modernization</i>	Project (Number/Name) F19 / <i>Counterl Intel and Human Intel Modernization</i>

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>Title: Counterintelligence Activities</p> <p>Description: The CI and HUMINT Modernization Project supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat the foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions.</p> <p>FY 2019 Plans: Funding supports development & testing of software code integrating existing and new algorithms to analyze multiple data source to record, identify, sort, and prioritize behaviors indicative of espionage, national security compromises, and other foreign and insider threats. The new, more capable software sets will facility counterintelligence analysis, insider threat detection, counterintelligence investigative focus, and automated exchange and display of critical counterintelligence information.</p> <p>FY 2020 Base Plans: Funding supports development & testing of software code integrating existing and new algorithms to analyze multiple data source to record, identify, sort, and prioritize behaviors indicative of espionage, national security compromises, and other foreign and insider threats. The new, more capable software sets will facility counterintelligence analysis, insider threat detection, counterintelligence investigative focus, and automated exchange and display of critical counterintelligence information.</p> <p>FY 2020 OCO Plans: The Battlefield Information Collection and Exploitation Systems (BICES) Geospatial Intelligence (GEOINT) Web Presence will resource contractor development to deliver software to provide data interoperability between U.S. and BICES networks for GEOINT finished products. The software will provide releasable intelligence data to coalition users that support and partner with US forces to accomplish US policy goals in theater.</p> <p>GEOINT Rapid Development will resource contractor development and testing to deliver new GEOINT capabilities to the Army. Tasked work considers current warfighter intelligence gaps and develops potential solutions using tried and untried methodologies for collection, processing, and analysis alongside mission partner programs. The team then validates and tests approaches and delivers the techniques to the warfighter-supporting analyst team to support operations.</p>	-	2.636	1.050	1.875	2.925

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606003A / <i>CounterIntel and Human Intel Modernization</i>	Project (Number/Name) F19 / <i>CounterIntel and Human Intel Modernization</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Intelligence Needs Integration will resource contractor design, software development, and testing to populate ground component intelligence needs to external intelligence needs systems and provide the results to the ground component customers. Non-Army analysts can then provide intelligence using approaches not currently provided by the Army, giving the ground commander a greater resolution.					
The GEOINT Product Catalog will resource contractor design, software development, testing and integration. The delivered software will provide analysts and requirements managers a guided, quick reference tool to choose from the hundreds GEOINT approaches available to close their intelligence gaps.					
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY20 increase reflects OCO to Base transfer of requirements.					
Accomplishments/Planned Programs Subtotals	-	2.636	1.050	1.875	2.925

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

Remarks

D. Acquisition Strategy
N/A

E. Performance Metrics
N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0606942A / <i>Assessments and Evaluations Cyber Vulnerabilities</i>							
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	88.300	4.500	-	4.500	4.500	4.500	4.500	4.680	0.000	110.980
FL2: <i>Cyber Vulnerabilities Assessments and Evaluations</i>	-	0.000	88.300	4.500	-	4.500	4.500	4.500	4.500	4.680	0.000	110.980

A. Mission Description and Budget Item Justification

This Program Element (PE) funds cyber vulnerabilities evaluations of major weapon systems in alignment with Section 1647 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2016, and of critical infrastructure in alignment with Section 1650 of NDAA 2017. Efforts in this PE will: 1) identify, assess, and mitigate operational risk from cyber vulnerabilities as it pertains to critical Army weapon systems in an operational configuration; and 2) assure the confidentiality, availability, and integrity of the information and control systems that underpin Army facilities and critical infrastructure by inventorying and assessing Facility-Related Control Systems (FRCS).

Weapon systems evaluations will assess and mitigate operational risk from a peer or near-peer adversary profile in accordance with existing testing requirements of the acquisition cycle. Where applicable, these evaluations will include tabletop exercises, lab assessments, and exercise/operational assessments of Program Executive Officer Command, Control, Communications-Tactical (PEO C3T) and ground weapon systems. Cyber hardening efforts will apply knowledge from weapon systems vulnerability assessments to identify gaps and develop mitigation strategies to reduce operational risk and prioritize resources. Prioritization will be based on mission criticality, impact to readiness, and threat. This PE also provides for enhancement of existing Red Team elements and efforts attributed to Combatant Command mission-level cyber vulnerability assessments.

Evaluations of cyber vulnerabilities at critical infrastructure will focus on Task Critical Assets, Defense Critical Assets, and on units with high priority Quadrennial Defense Review missions and their supporting infrastructure. This PE provides for the training of teams to conduct cyber vulnerability evaluations on critical infrastructure. Once trained, these teams will conduct cooperative vulnerability and penetration assessments (Blue Teaming), adversarial assessments (Red Teaming), and assist with conducting assessments of cyber dependencies, vulnerabilities and threats in accordance with DoDI 8501.1 "Risk Management Framework." Funding will also provide for Contractor subject matter expertise to conduct Security Control Assessments and Deep Cyber Resiliency Assessments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606942A / <i>Assessments and Evaluations Cyber Vulnerabilities</i>
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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	88.300	0.000	-	0.000
Current President's Budget	0.000	88.300	4.500	-	4.500
Total Adjustments	0.000	0.000	4.500	-	4.500
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	4.500	-	4.500

Change Summary Explanation

Fiscal Year (FY) 2020 funding is to continue conducting Cyberspace Operational Resiliency Assessments at both Platform and Installation levels (CORA-P/I).

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0606942A / <i>Assessments and Evaluations Cyber Vulnerabilities</i>				Project (Number/Name) FL2 / <i>Cyber Vulnerabilities Assessments and Evaluations</i>			
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
FL2: <i>Cyber Vulnerabilities Assessments and Evaluations</i>	-	0.000	88.300	4.500	-	4.500	4.500	4.500	4.500	4.680	0.000	110.980
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) funds cyber vulnerabilities evaluations of major weapon systems in alignment with Section 1647 of the National Defense Authorization Act (NDAA) for Fiscal Year 2016, and of critical infrastructure in alignment with Section 1650 of NDAA 2017. Efforts in this PE will: 1) identify, assess, and mitigate operational risk from cyber vulnerabilities as it pertains to critical Army weapon systems in an operational configuration; and 2) assure the confidentiality, availability, and integrity of the information and control systems that underpin Army facilities and critical infrastructure by inventorying and assessing Facility-Related Control Systems (FRCS).

Weapon systems evaluations will assess and mitigate operational risk from a peer or near-peer adversary profile in accordance with existing testing requirements of the acquisition cycle. Where applicable, these evaluations will include tabletop exercises, lab assessments, and exercise/operational assessments of Program Executive Officer Command, Control, Communications-Tactical (PEO C3T) and ground weapon systems. Cyber hardening efforts will apply knowledge from weapon systems vulnerability assessments to identify gaps and develop mitigation strategies to reduce operational risk and prioritize resources. Prioritization will be based on mission criticality, impact to readiness, and threat. This PE also provides for enhancement of existing Red Team elements and efforts attributed to Combatant Command mission-level cyber vulnerability assessments.

Evaluations of cyber vulnerabilities at critical infrastructure will focus on Task Critical Assets, Defense Critical Assets, and on units with high priority Quadrennial Defense Review missions and their supporting infrastructure. First, this PE provides for the training of teams to conduct cyber vulnerability evaluations on critical infrastructure. Once trained, these teams will conduct cooperative vulnerability and penetration assessments (Blue Teaming), adversarial assessments (Red Teaming), and assist with conducting assessments of cyber dependencies, vulnerabilities and threats in accordance with DoDI 8501.1 "Risk Management Framework." Funding will also provide for Contractor subject matter expertise to conduct Security Control Assessments and Deep Cyber Resiliency Assessments.

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

	FY 2018	FY 2019	FY 2020
Title: Cyberspace Operational Resiliency Assessment ? Platform (CORA-P)	-	30.800	2.250
Description: CORA-P is the Army's response to Section 1647 of the 2016 National Defense Authorization Act (NDAA) which directed the Department of the Defense (DoD) to evaluate cyber vulnerabilities of major weapon systems. The effort will assess and mitigate operational risk from cyber vulnerabilities of major weapon systems from a peer or near-peer adversary profile in coordination with existing testing requirements of the acquisition cycle.			
FY 2019 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606942A / <i>Assessments and Evaluations Cyber Vulnerabilities</i>	Project (Number/Name) FL2 / <i>Cyber Vulnerabilities Assessments and Evaluations</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>Funding provides for the completion of the eight critical weapon systems already in some stage of the evaluation process. Additionally, provides for the 11 remaining Program Executive Officer Command, Control, Communications-Tactical (PEO C3T) and ground weapon systems identified as a part of the Section 1647 directive by conducting tabletop exercises, lab assessments, and exercise/operational assessments (where applicable). Provides for the enhancement of existing red team elements and efforts attributed to Combatant Command (COCOM) mission level assessments.</p> <p>Cyber hardening efforts will apply the knowledge from weapon systems vulnerability assessments (CORA-P) to identify the gaps, develop mitigation strategies to reduce operational risk and prioritize resources. Prioritization will be based on mission criticality, impact to readiness, and threat.</p> <p>FY 2020 Plans: The performance objectives is to conduct CORA-P vulnerability assessments and to produce the requisite vulnerability assessments reports in support of the Planning, Programming, and Budgeting and Execution (PPBE) cycle. These deliverables include extensive cyber tabletop exercises and other non-operational activities to identify precisely cyber threats that pose a risk to Army mission operations. Identifying cyber threats to CORA-P/I ensures that cyber survive-ability requirements are articulated sufficiently to ensure Army weapon systems and installations are designed/redesigned to prevent, mitigate and recover from adversarial current and future cyber-attacks.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 funding is to continue conducting CORA-P vulnerability assessments.</p>				
<p>Title: Cyberspace Operational Resiliency Assessment ? Installation (CORA-I)</p> <p>Description: CORA-I is the Army?s response to Section 1650 of the 2017 NDAA which directed the DoD to develop and execute a plan to evaluate and mitigate cyber vulnerabilities of Army Installations critical infrastructure. The evaluations will focus on Task Critical Assets, Defense Critical Assets, and on units with high priority Quadrennial Defense Review (QDR) missions and their supporting infrastructure.</p> <p>FY 2019 Plans: Funding provides for the training of teams to conduct cyber vulnerability assessments on critical infrastructure. Once trained these teams will conduct cooperative vulnerability and penetration assessments (Blue Teaming), adversarial assessments (Red Teaming), and assist with conducting assessments of cyber dependencies, vulnerabilities and threats in accordance with DoDI 8510.1 ?Risk Management Framework.? Funding also provides for Contractor subject matter expertise to conduct Security Control Assessments and Deep Cyber Resiliency Assessments.</p>		-	57.500	2.250

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606942A / <i>Assessments and Evaluations Cyber Vulnerabilities</i>	Project (Number/Name) FL2 / <i>Cyber Vulnerabilities Assessments and Evaluations</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>The 2017 Army Cybersecurity Strategy for FRCS established the requirement to inventory and conduct Risk Management Framework on legacy systems. Concurrently, the Unified Facility Criteria 4-010-06 established the requirement to design cybersecurity protections into FRCS within all new MILCON projects. The cyber hardening efforts will apply the knowledge from critical installation vulnerability assessments (CORA-I) to identify the gaps, develop mitigation strategies to FRCS, and prioritize resources. Prioritization will be based on mission criticality, impact to readiness, and threat.</p> <p>FY 2020 Plans: The performance objectives is to conduct CORA-I vulnerability assessments and to produce the requisite vulnerability assessments reports in support of the PPBE cycle. These deliverables include extensive cyber tabletop exercises and other non-operational activities to identify precisely cyber threats that pose a risk to Army mission operations. Identifying cyber threats to CORA-P/I ensures that cyber survive-ability requirements are articulated sufficiently to ensure Army weapon systems and installations are designed/redesigned to prevent, mitigate and recover from adversarial current and future cyber-attacks.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 funding is to continue conducting CORA-I vulnerability assessments.</p>			
Accomplishments/Planned Programs Subtotals	-	88.300	4.500

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0303260A / <i>Defense Military Deception Initiative</i>							
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	-	1.708	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.708
FA9: <i>Security Initiatives</i>	-	1.708	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.708

Note

Fiscal Year 2018 is the last year of funding for the Security Initiatives Program.

A. Mission Description and Budget Item Justification

The Defense Military Deception Initiative (DMDI) is a response to the Secretariat and Global Security Initiatives to support identified Army Research, Development, Test and Evaluation (RDTE) requirements to ensure capability, capacity and readiness of Army Military Deception (MILDEC) capabilities. DMDI executes RDTE on MILDEC capabilities, next generation devices, and technologies to support Army's ability to meet current and emerging requirements. DMDI integrates RDTE prototypes with Component programs for acquisition, sustainment and maintenance.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	1.779	0.000	0.000	-	0.000
Current President's Budget	1.708	0.000	0.000	-	0.000
Total Adjustments	-0.071	0.000	0.000	-	0.000
• Congressional General Reductions	-0.001	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.070	-			

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0303260A / Defense Military Deception Initiative	Project (Number/Name) FA9 / Security Initiatives
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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
FA9: Security Initiatives	-	1.708	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.708
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Fiscal Year 2018 is the last year of funding for the Security Initiatives Program.

A. Mission Description and Budget Item Justification

The Defense Military Deception Initiative (DMDI) is a response to Secretariat and Global Security Initiatives to support identified Army Research, Development, Test and Evaluation (RDTE) requirements to ensure capability, capacity and readiness of Army Military Deception (MILDEC) capabilities. DMDI executes RDTE on MILDEC capabilities, next generation devices, and technologies to support Army's ability to meet current and emerging requirements. DMDI integrates RDTE prototypes with Component programs for acquisition, sustainment and maintenance.

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

	FY 2018	FY 2019	FY 2020
Title: Security Initiatives	1.708	-	-
Description: The Defense Military Deception Initiative (DMDI) is in response to Secretariat and Global Security Initiatives to support identified Army Research, Development, Test and Evaluation (RDTE) requirements to ensure capability, capacity and readiness of Army Military Deception (MILDEC) capabilities. DMDI executes RDTE on MILDEC capabilities, next generation devices, and technologies to support Army's ability to meet current and emerging requirements. DMDI integrates RDTE prototypes with Component programs for acquisition, sustainment and maintenance.			
Accomplishments/Planned Programs Subtotals	1.708	-	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0909999A / <i>Financing for Cancelled Account Adjustments</i>							
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	-	0.654	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.654
900: <i>CLOSED ACCT ADJMT-M</i>	-	0.654	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.654

A. Mission Description and Budget Item Justification

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.654	0.000	0.000	-	0.000
Total Adjustments	0.654	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.654	-		-	-

Change Summary Explanation

FY18 increase reflects Financing for Cancelled Account Adjustments.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0909999A / <i>Financing for Cancelled Account Adjustments</i>	Project (Number/Name) 900 / <i>CLOSED ACCT ADJMT-M</i>
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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
900: <i>CLOSED ACCT ADJMT-M</i>	-	0.654	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.654
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program accomplishes closed account adjustments.

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

	FY 2018	FY 2019	FY 2020
Title: Cancelled Account Adjustments	0.654	-	-
Accomplishments/Planned Programs Subtotals	0.654	-	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A