Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604818A *I Army Tactical Command & Control Hardware & Software*							
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	-	157.852	169.607	140.637	-	140.637	143.727	110.032	104.286	92.288	Continuing	Continuing
323: *Common Hardware Systems*	-	5.033	4.873	5.481	-	5.481	5.003	4.099	4.210	5.003	Continuing	Continuing
334: *Common Software*	-	0.808	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.808
C29: *Centralized Technical Support Facility (CTSF)*	-	4.843	8.809	8.637	-	8.637	7.088	6.754	7.105	7.139	Continuing	Continuing
C34: *Army Tac C2 Sys Eng*	-	7.457	7.998	9.483	-	9.483	9.716	9.985	11.706	12.085	Continuing	Continuing
EJ4: *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*	-	59.370	39.975	30.969	-	30.969	31.600	26.500	27.900	27.800	Continuing	Continuing
EJ5: *MOUNTED COMPUTING ENVIRONMENT (MCE)*	-	16.271	19.166	12.664	-	12.664	18.600	7.496	8.211	6.376	Continuing	Continuing
EJ6: *TACTICAL ENHANCEMENT*	-	25.000	17.851	1.853	-	1.853	2.868	0.000	0.000	0.000	0.000	47.572
EK9: *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*	-	4.655	8.004	3.649	-	3.649	3.378	3.150	3.428	3.934	Continuing	Continuing
EQ8: *Mobile/Handheld Computing Environment (M/HHCE)*	-	11.402	9.477	4.857	-	4.857	5.160	4.469	4.102	6.121	Continuing	Continuing
ER9: *Expeditionary Army Command Post*	-	9.601	34.642	35.505	-	35.505	33.493	23.246	20.107	10.007	Continuing	Continuing
EW3: *Unit Task Reorganization (UTR) Development*	-	13.412	18.812	27.539	-	27.539	26.821	24.333	17.517	13.823	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Army Tactical Command and Control Hardware & Software funding line supports the Army's Network Modernization Strategy Lines of Efforts LOE 1 - Unified Network; LOE 1 - Network Enabling Functions; LOE 2 - Common Operating Environment; LOE - Interoperability, LOE 4 - Command posts. Further detail provided in R2A.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604818A *I Army Tactical Command & Control Hardware & Software*

Project 323, the Common Hardware Systems (CHS) program supports the Army's Network Modernization Strategy Line of Effort (LOE) 1 Network Enabling Functions. CHS is a designated Army Strategic Source that acquires and sustains highly flexible, cost effective, and simplified non developmental C4ISR solutions that integrates the latest and emerging commercial technology onto the Converged Mission Command Network.

CHS provides technical support, environmental and survivability testing, system design, end of life/configuration management, and strengthens cyber security/supply chain risk management across Army tactical programs to ensure interoperability and integration of hardware throughout the computing infrastructure. CHS continuously analyzes and tracks hardware from cradle-to-grave, from emerging technology until end-of-life. CHS conducts hardware evaluations that facilitate and simplify the selection of common hardware solutions across numerous Army programs and agencies including: Mission Command; Tactical Network; Tactical Radios; Distributed Common Ground Station Army; Aviation Systems; Counter Rocket, Artillery, Mortar; Communication Electronics Command; Communications Electronics Research, Development, and Engineering Command, among others. CHS rapidly procures common hardware configurations across the Integrated Tactical Network (ITN), Common Operating Environment (COE), the sustainment community, and tactical programs that enables the continuous modernization in support of all four Network Modernization Lines of Effort and future Network CFT experimentation. CHS logistical services include worldwide 72 hour turnaround repair through strategically located support centers for tactical military units, tailorable supply chain and cybersecurity measures, manages customizable warranty, maintenance and failure rate reporting, and technical support services to support specific Army program requirements. CHS supports better buying power initiatives by creating efficiencies through economies of scale, price breaks, streamlined processes, reduced cycle times, and centralized contracting.

Project 334, the Common Software (CS) program, is the suite of systems through which the Army develops, integrates and tests common software products and/or components used for communication between Army Mission Command Systems and Joint and coalition Command and Control (C2) applications. The CS project provides state-of-the-art software technologies and functionality that is used by numerous Mission Command (MC) and joint systems to eliminate the need for service independent development and duplication of effort. The CS project also manages and performs technology demonstrations of emerging technologies for future use by Army C2 systems. The CS program is a cornerstone in the Army's COE modernization efforts. There is no FY20 RDTE funding since Common SW will be transitioning into sustainment in FY19.

Project C29, the Central Technical Support Facility (CTSF), is the Army's single strategic facility responsible for executing Army Interoperability Certification (AIC) system of system verification/validation checkout, testing, and configuration management for the Army's LandWarNet Baseline. The Centralized Technical Support Facility (CTSF) funding line supports the Army's Network Modernization Strategy Line of Effort LOE 1B Network Enabling Functions.

Project C34 supports the Army's Network Modernization Strategy LOE 1, Unified Network. The Army Tac C2 Sys Eng project funds the PEO Command, Control, Communications-Tactical (PEO C3T) Technical Management Division (TMD), which effectively manages the System-of-Systems engineering, Enterprise and Integration efforts for the continuing evolution of the network within the PEO C3T portfolio of technology across the capability enhancement packages to deliver efficient and effective cross-domain technical solutions.

Project EJ4, the Command Post Computing Environment (CPCE), is one of the computing environments under the Common Operating Environment (COE) initiative, a major Army Network Modernization Strategy Line of Effort of the Network Cross-Functional Team (N-CFT). CPCE provides a common software infrastructure framework (common interface, data, and services) upon which future Warfighter capabilities can be built. CPCE development efforts initially target Command and Control (C2)

and Situational Awareness (SA) capability development at tactical echelons that span from Army Service Component Commands (ASCC) to Battalion level. The CPCE will be the central computing environment developed to support command posts and combat operations, and will be interoperable with Mounted and Mobile/Handheld systems.

Project EJ5, the Mounted Computing Environment (MCE), is one of the six computing environments (CEs) formalized by the AAE under the Common Operating Environment (COE) initiative. MCE standardizes end-user environments and enables streamlined deployment of new warfighting applications while leveraging existing hardware under the Joint Battle Command - Platform program. Requirements for the MCE are established in the AROC approved COE Information Systems Initial Capability Document (IS ICD) and the draft Mounted Computing Environment Requirements Definition Package (RDP 1). FY20 funding provides the means to continue to manage and develop MCE in concert with the Army's future COE strategy.

Project EJ6, Tactical Enhancement supports the evaluation and testing requirements for Terrestrial Transmission (TRILOS) and Troposcatter Transmission (TROPO) capabilities procured and fielded under the Signal Modernization (SIGMOD) funding line, B00010. TRILOS and TROPO will provide redundancy communications in a Satellite denied environment by providing improved Line of Sight and beyond line of sight radio systems. In addition this funding will support development of Network Centric Waveform-Resilient (NCW-R). NCW-R is a critical, near-term set of modifications to the current WIN-T SATCOM waveform that will provide limited protection against our adversaries' ability to jam tactical SATCOM Command and control communications on Wideband Global SATCOM (WGS) satellites. NCW-R will provide anti- jam capability and resiliency to WIN-T Program of Record satellite terminals in contested environments. The NCW-R waveform software will operate on WIN-T satellite modems. NCW-R will provide a bridging capability until the next generation protected satellite constellation is launched by the Air Force (projected FY28/29). The current anti-jam protection is limited to two SMART-T terminals per BCT, division and Corps HQs, leaving battalions vulnerable to being isolated during jamming events.

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Project EK9, Unified Network Operations (UNO) will deliver an integrated Network Operations (NetOps) capability, based upon an open framework, aggregating data, which enables common planning, configuration, management, monitoring, and defense of the Network. This will be accomplished through the integration, co-hosting, and federation of multiple NetOps systems from the hand held devices to the Enterprise. UNO aligns with the Army's intent to develop NetOps prototypes, conduct development operations (DevOps), get user feedback, make adjustments and ultimately deliver enhanced capabilities to the operational force in the shortest time possible using what is available in industry or through other government agencies through an adapt and buy approach based on experimentation and demonstration.

Project ER9, Command Post Integrated Infrastructure (CPI2), fields mobile Command Post Nodes by integrating supporting mission command solutions in accordance with Directed Requirement with a FY20 First Unit Equipped in order to enhance the survivability and mobility of brigade and below command post formations. On order, Command Post Integrated Infrastructure will replace selected elements of the legacy command post to provide improved expeditionary capability, survivability, agility, and scalability for Corps and Division Main and Tactical Command Posts, Brigade Main and Tactical Command Posts, and Battalion Command Posts. It will ensure information and support systems are introduced into the Command Post through physical integration allowing the commander to tailor the Command Post as missions dictate.

Project EQ8, Mobile/Handheld Computing Environment, supports the Nett Warrior (NW) Program (named in honor of Medal of Honor recipient Colonel Robert C. Nett), also known as the Ground Soldier System (GSS) Program. The program leverages commercial smart devices and secure Army tactical radios to provide the

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dismounted leader an integrated mission command and situational awareness system for use during combat operations. The NW system provides leaders electronic real-time information on friendly positions; information about enemy activity and movement; navigational data and map imagery; a collaborative planning tool; and other mission related graphics which effectively puts the power of the entire Army tactical network in the hands of the dismounted leader.

Project EW3, Unit Task Reorganization (UTR),supports the Army's Network Modernization Strategy LOE 1, Unified Network. UTR is the process performed by the S6 and their staff to affect change on the network in order to support the operational mission and dynamic nature of the Army. Currently network challenges exist during this process with regard to: maintaining accurate and up to date information, distributing configuration files and activating / re-establishing the network. UTR strives to make authoritative NETOPS Data available across all systems, reduce cognitive burden for soldiers to plan and manage the network and reduce manual touch labor.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	164.409	178.693	128.654	-	128.654
Current President's Budget	157.852	169.607	140.637	-	140.637
Total Adjustments	-6.557	-9.086	11.983	-	11.983
• Congressional General Reductions	-0.103	-0.200			
• Congressional Directed Reductions	-26.500	-13.886			
• Congressional Rescissions	-	-			
• Congressional Adds	25.000	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.954	-			
• Adjustments to Budget Years	-	-	11.983	-	11.983

Change Summary Explanation

FY 2020 Base funding increase of $11.983 million is driven by the following program changes in support of Army Network Modernization efforts:
- Project 323 / Common Hardware Systems was decreased by $.084M
- Project C29/ CTSF was decreased by $.074M
- Project EJ4 / Command Post Computing Environment (CPCE) was increased by $10.319M
- Project EJ5 / Mounted Computing Environment (MCE) was increased by $4.464M
- Project EJ6 / Tactical Enhancement was decreased by $10.009M
- Project EK9 / Tactical Network Operations and Management was decreased by $5.042M
- Project EQ8 / Mobile/Handheld Computing Environment (M/HHCE) was decreased by $4.705M
- Project ER9 / Expeditionary Army Command Post was increased by $20.114M
- Project EW3 / Unit Task Reorganization (UTR) Development was decreased by $3.0M

FY 2018 Congressional Rescissions:
Project C34: $0.193M

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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Project EK9: $4.655M

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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**
323: *Common Hardware Systems*	-	5.033	4.873	5.481	-	5.481	5.003	4.099	4.210	5.003	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 323, the Common Hardware Systems (CHS) program supports the Army's Network Modernization Strategy Line of Effort (LOE) 1 Network Enabling Functions. CHS is a designated Army Strategic Source that acquires and sustains highly flexible, cost effective, and simplified non developmental C4ISR solutions that integrates the latest and emerging commercial technology onto the Converged Mission Command Network.

CHS provides technical support, environmental and survivability testing, system design, end of life/configuration management, and strengthens cyber security/supply chain risk management across Army tactical programs to ensure interoperability and integration of hardware throughout the computing infrastructure. CHS continuously analyzes and tracks hardware from cradle-to-grave, from emerging technology until end-of-life. CHS conducts hardware evaluations that facilitate and simplify the selection of common hardware solutions across numerous Army programs and agencies including: Mission Command; Tactical Network; Tactical Radios; Distributed Common Ground Station Army; Aviation Systems; Counter Rocket, Artillery, Mortar; Communication Electronics Command; Communications Electronics Research, Development, and Engineering Command, among others. CHS rapidly procures common hardware configurations across the Integrated Tactical Network (ITN), Common Operating Environment (COE), the sustainment community, and tactical programs that enables the continuous modernization in support of all four Network Modernization Lines of Effort and future Network CFT experimentation. CHS logistical services include worldwide 72 hour turnaround repair through strategically located support centers for tactical military units, tailorable supply chain and cybersecurity measures, manages customizable warranty, maintenance and failure rate reporting, and technical support services to support specific Army program requirements. CHS supports better buying power initiatives by creating efficiencies through economies of scale, price breaks, streamlined processes, reduced cycle times, and centralized contracting.

CHS is a model for modern acquisition strategy that provides hardware solutions including servers, storage, clients, networking devices, ruggedized platforms, hand held end devices, operational transit cases, installation kits, and peripheral devices, procured from 65 small and 40 large businesses. CHS is partnered with the CECOM Integrated Logistics Support Center (ILSC) to develop a model for sustaining COTS IT using the Standard Army Supply System. CHS uses a Public Private Partnership (P3) with Tobyhanna Army Depot in order to leverage the innovation, resources and leadership skills of both TYAD and CHS in order to provide the best value to the Soldier.

CHS supports Better Buying Power (BBP) initiatives by creating efficiencies on a micro and macro level through volume discounting, economies of scale, the elimination of duplication of effort, reduced barriers to entry, price breaks, streamlined processes, reduced cycle times, and centralized contracting. CHS provides the Army with a highly efficient Return on Investment (ROI), approximately 33:1, having provided customer PMs with validated cost avoidances of nearly $800 Million since FY14.

FY 2020 funds support CHS to continue enabling the streamlined and rapid acquisition and delivery of CHS equipment and associated logistical services in support of customer requirements. It will support technology insertions and enable hardware and systems engineering, and evaluations. FY20 requirements support the initiation of

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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CHS 6 contract pre award activities and CHS Information Systems infrastructure - Common Hardware Systems-Rapid Acquisition and Procurement Integrated Database System (CHS-RAPIDS).

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Acquisition Support for CHS and customer programs ***Description:*** Funding is provided for the following effort. ***FY 2019 Plans:*** Will continue CHS program support and acquisition support for CHS and customer programs. ***FY 2020 Base Plans:*** Will continue acquisition support for CHS and customer programs. CHS rapidly procures common hardware configurations across the Common Operating Environment (COE), the sustainment community, and tactical programs that enables the continuous modernization of a converged network. PMO costs will be covered by OMA funding. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to shifting resources to expand acquisition manpower in order to support a larger customer base and an expected increase in requirements based on becoming a designated Army Strategic Source.	2.853	2.699	3.333	-	3.333
Title: Logistical service support for customer programs ***Description:*** Funding is provided for the following effort. ***FY 2019 Plans:*** Will continue CHS Logistical service support for customer programs. ***FY 2020 Base Plans:*** CHS logistical services include worldwide 72-hour turnaround repair through strategically located support centers for tactical military units, tailorable supply chain and cybersecurity measures, manages customizable warranty, maintenance and failure rate reporting, and technical support services to support specific Army program requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to shifting manpower away from logistics and onto the acquisition support side to accommodate increased customer requirements.	0.623	0.439	0.422	-	0.422
Title: Technical and Test Support for customer programs	1.557	1.557	1.726	-	1.726

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** 323 / *Common Hardware Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Funding is provided for the following effort. ***FY 2019 Plans:*** Will continue CHS Technical and Test Support for customer programs. ***FY 2020 Base Plans:*** CHS provides technical support, environmental and survivability testing, system design, end of life/configuration management, and strengthens cyber security/supply chain management across Army tactical programs to ensure interoperability and integration of hardware throughout the computing infrastructure. CHS conducts hardware evaluations that facilitate and simplify the selection of common hardware solutions across numerous Army programs and agencies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to shifting resources to support a larger customer base and an expected increase in requirements based on becoming a designated Army Strategic Source.					
Title: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** Accounting for SBIR STTR ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Accounting for SBIR STTR	-	0.178	-	-	-
Accomplishments/Planned Programs Subtotals	5.033	4.873	5.481	-	5.481

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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contractual tools that enable supported programs to effectively and efficiently establish organic sustainment support for commercial IT and utilizes hardware failure data and logistical analysis to support programs sustainment strategy decisions.

E. Performance Metrics

N/A

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Costs	C/FP	Various : Various	83.563	-		-		-		-		-	0.000	83.563	-
Product Procurement	C/FP	Various : Various	92.177	-		-		-		-		-	0.000	92.177	-
Technology Insertion	C/FP	Various : Various	17.780	-		-		-		-		-	0.000	17.780	-
CHS-5 Non-Recurring Engineering	C/FP	Various : Various	0.472	-		-		-		-		-	0.000	0.472	-
Program & Acquisition Support	C/FP	Various : Various	-	2.853	Dec 2017	2.699	Dec 2018	3.333	Dec 2019	-		3.333	Continuing	Continuing	Continuing
Logistical Service Support	C/FP	Various : Various	-	0.623	Dec 2017	0.439	Dec 2018	0.422	Dec 2019	-		0.422	Continuing	Continuing	Continuing
Technical & Test Support	C/FP	Various : Various	-	1.557	Dec 2017	1.557	Dec 2018	1.726	Dec 2019	-		1.726	Continuing	Continuing	Continuing
		Subtotal	193.992	5.033		4.695		5.481		-		5.481	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR	SS/TBD	APG, MD : APG, MD	-	-		0.178		-		-		-	0.000	0.178	-
		Subtotal	-	-		0.178		-		-		-	0.000	0.178	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	193.992	5.033		4.873		5.481		-		5.481	Continuing	Continuing	N/A

Remarks

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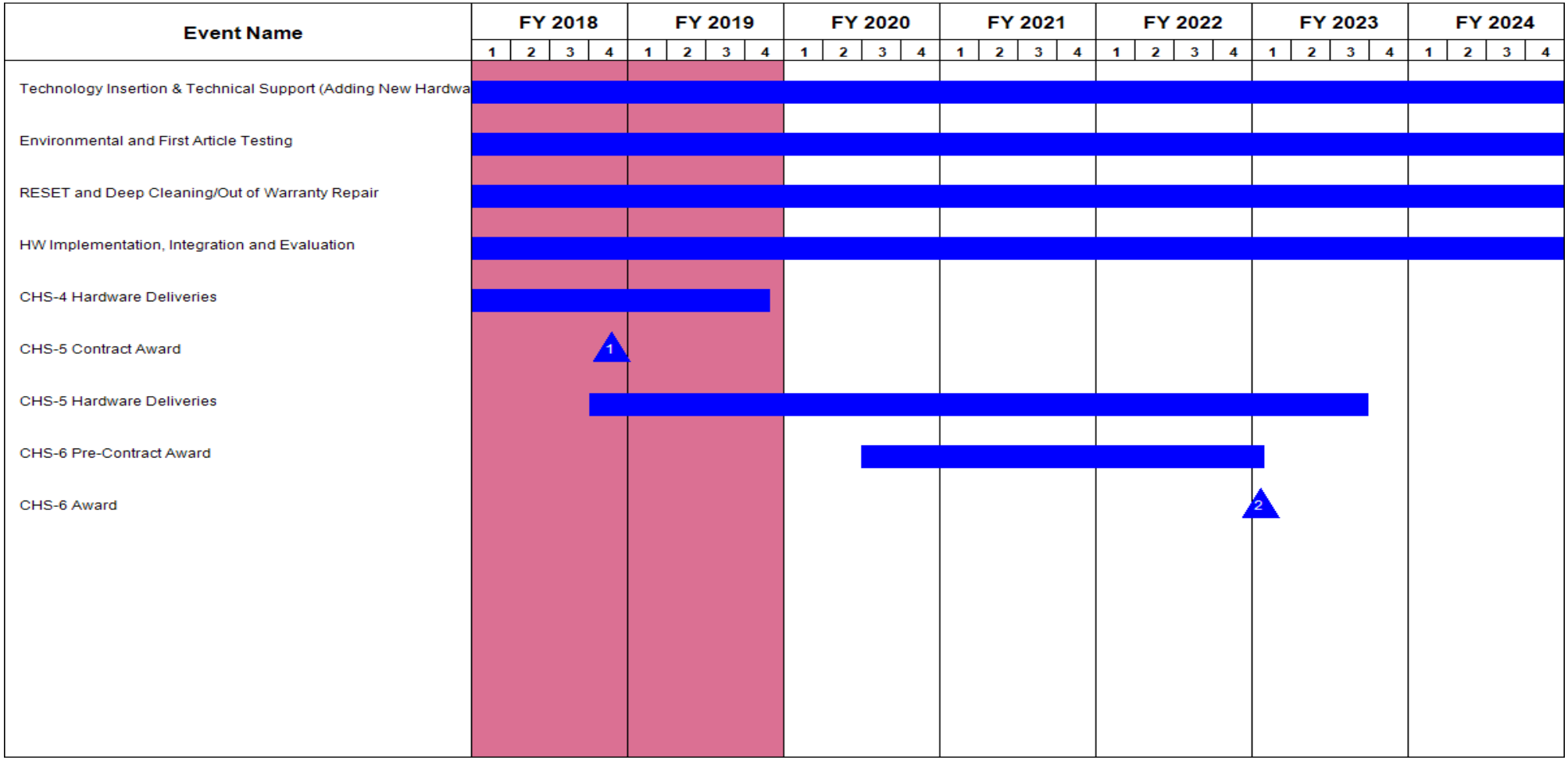

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Technology Insertion & Technical Support (Adding New Hardware to Conntract)	1	2007	4	2024
Environmental and First Article Testing	1	2006	4	2024
RESET and Deep Cleaning/Out of Warranty Repair	1	2006	4	2024
HW Implementation, Integration and Evaluation	1	2006	4	2024
CHS-4 Hardware Deliveries	1	2012	4	2019
CHS-5 Contract Award	4	2018	4	2018
CHS-5 Hardware Deliveries	4	2018	3	2023
CHS-6 Pre-Contract Award	3	2020	1	2023
CHS-6 Award	1	2023	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
334: *Common Software*	-	0.808	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.808
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

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

There is no funding past FY18 since CS will be transitioning into sustainment in FY19.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Common Software development in support of the C4ISR community ***Description:*** Interoperability and Backwards Compatibility efforts	0.753	-	-	-	-
Title: Program Management ***Description:*** Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and IPTs	0.055	-	-	-	-
Accomplishments/Planned Programs Subtotals	0.808	-	-	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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

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

In accordance with the approved Net-enabled Mission Command Initial Capabilities Document (NeMC ICD), software capability will be developed in 3-year increments to facilitate messaging, mediation and addressing for Army, Joint and Coalition Partners. The product development funded under this R-Form is an integral part of the C4ISR systems, and a core communication component of the virtualized infrastructure and will be accomplished in part under a Project Manager, Mission Command (PM MC) General Services Administration (GSA) engineering services contract approach which will consist of multiple prime contractors competitively bidding on a single development solicitation. This strategy is designed to optimize opportunities for improved interoperability among the systems, to capture the benefits of competition, and to ensure the rapid integration of new capabilities into warfighter systems. This strategy is also designed to reduce the physical footprint, the logistics support requirements, and to increase operational efficiency by integration of additional system interoperability services which reduce duplication of effort and cost; and allows for development of communication standards across the DoD community.

E. Performance Metrics

N/A

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Management	Various	PM Mission Command : Aberdeen, MD	13.181	0.055		-		-		-		-	0.000	13.236	-
		Subtotal	13.181	0.055		-		-		-		-	0.000	13.236	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Common Software Product Engineering/Software Development	C/CPFF	Various Contractors : Various Locations	5.384	-		-		-		-		-	0.000	5.384	-
Mission Command/Army System Engineering & Integration	C/CPFF	Future Skies : Wall Township, NJ	8.764	-		-		-		-		-	0.000	8.764	6.679
Engineering & Integration for Joint and Coalition Interoperability	C/CPFF	Various Contractors : Various Locations	3.362	-		-		-		-		-	0.000	3.362	-
Evaluation, modification, validation & integration of developed SW	C/CPFF	Various Contractors : Various Locations	5.808	-		-		-		-		-	0.000	5.808	4.159
Tactical Server Infrastructure and Application Development	C/CPFF	CECOM Software Engineering Center : APG, MD	5.271	-		-		-		-		-	0.000	5.271	-
Common Software Product Engineering/Software Development	C/FFP	FUTURE SKIES : Wall Twp, NJ	-	0.753		-		-		-		-	0.000	0.753	-
		Subtotal	28.589	0.753		-		-		-		-	0.000	29.342	N/A

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test/ Operational Test	MIPR	Various : Various Locations	9.207	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	9.207	-		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	50.977	0.808		0.000		-		-		-	Continuing	Continuing	N/A

Remarks

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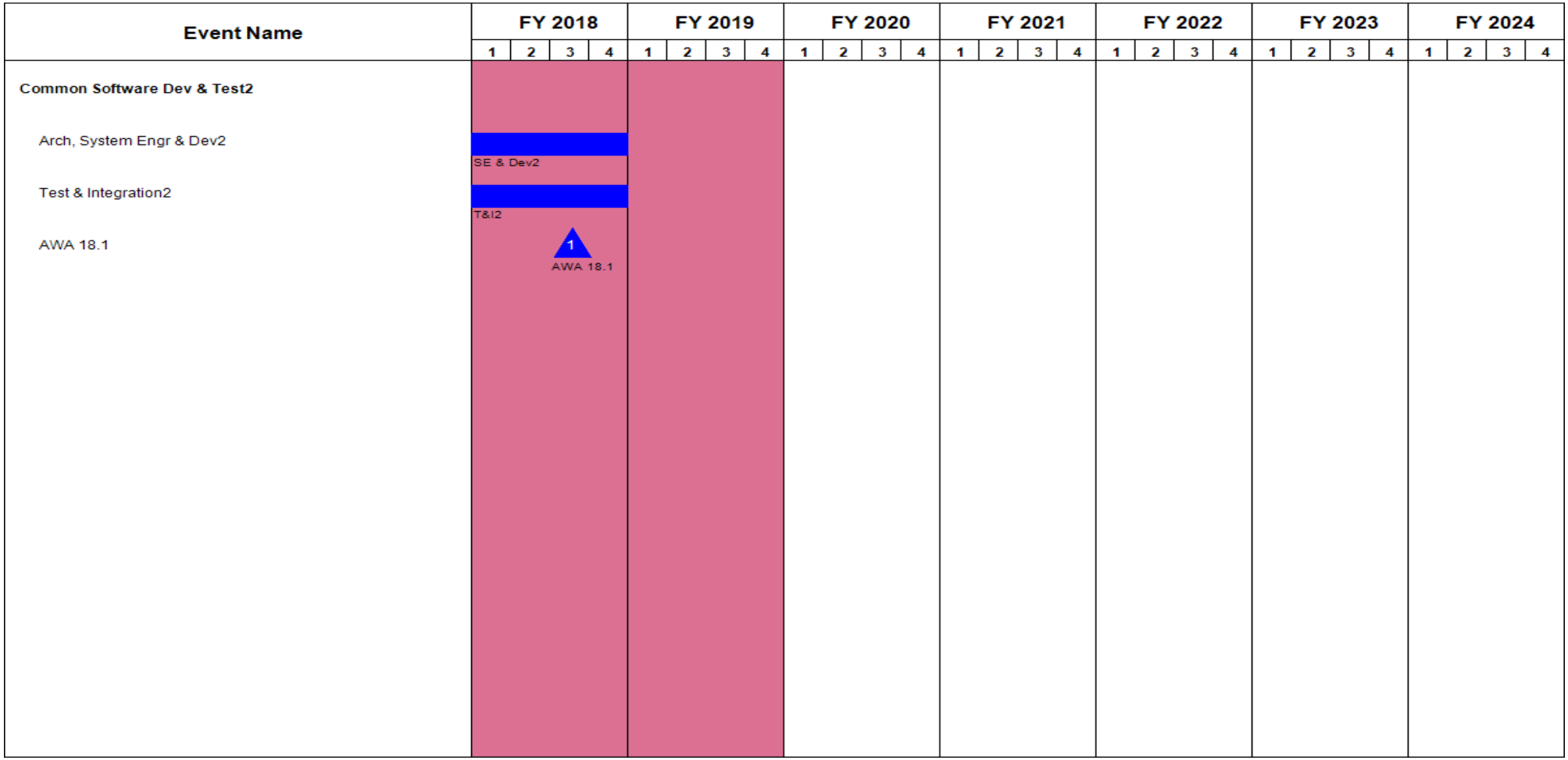

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** 334 / *Common Software*

Schedule Details

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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
C29: *Centralized Technical Support Facility (CTSF)*	-	4.843	8.809	8.637	-	8.637	7.088	6.754	7.105	7.139	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C29, The Centralized Technical Support Facility (CTSF) supports the Army's Network Modernization Strategy Line of Effort LOE 1 Network Enabling Functions.

The Central Technical Support Facility's (CTSF) directed mission is to perform Army Interoperability Certification (AIC) testing and configuration management for all operational through tactical level Command, Control, Communications, Computing, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems (individual, family, and system of systems), applications, and hardware prior to release to the field. The CTSF accomplishes this through the enforcement of a standards based architecture while supporting the development and implementation of an integrated computing infrastructure and a converged network. The CTSF functions as the CIO/G6's designated independent test agent and Land/WarNet/Mission Command (LWN/MC) configuration manager. The CTSF provides validated test data to the Department of the Army and Joint agencies to accredit interoperability certifications. The distributed test environment of the CTSF is accomplished through the Federation of Net-centric Sites (FaNS) construct. This FaNS construct addresses distributed integration development and testing using the core infrastructure of the CTSF to harness Army and Joint expertise/resources. Through these federated resources, the CTSF executes or supports interoperability development, integration and certification testing of the systems and system of systems in the Warfighter Mission Area, to include Network Evaluation spinouts, as they become part of the Army's LandWarNet. The cited work is consistent with Strategic Planning Guidance and the Army Modernization and Strategy Plan.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Army Interoperability Certification (AIC) Testing	3.526	4.884	4.618	-	4.618
Description: Conduct Army Interoperability Certification (AIC), planning/coordination/scheduling/ and reporting of Common Operating Environment (COE) and software block testing (local and distributed). Provide stakeholders data collection/data analysis/data dissemination/simulation/stimulation verification/validation. Manage the set-up, configuration, integration, operations and maintenance of the LandWarNet/Mission Command (LWN/MC) systems within the CTSF test environments. Function as the CIO/G-6's Independent Test Agent for Program Managers of LWN/MC systems that have an Acquisition Life Cycle requirement for testing interoperability of software and associated hardware prior to fielding to the Warfighter. Report the results of Army Interoperability Certification Tests to the CIO/G-6, PM, and TRADOC communities to support updates to the G-3/5/7 managed baseline.					
FY 2019 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue SWB11-12, and COE v3 and beyond test planning, test case development, test environment architecture set-up, to include information assurance software compliance, and software test tools. Conduct interoperability testing for the SWB11-12 systems that comprise the LWN/MC baseline. Support the ASA(ALT) led Interoperability and Integration Event (I2E) for COE v3.0. Conduct COE v3.0 planning, test case development and architecture set-up incorporating CP testing construct for the CE. Continue work to define the testing methodology as part of the Army transition to a COE strategy, while working to incrementally implement and utilize distributed CP test processes and test architectures that will comprise the Federated Integration Environment (FIE). ***FY 2020 Base Plans:*** Continue SWB11-12, and COE v3 and beyond test planning, test case development, test environment architecture set-up, to include cyber security posture assessment and adjustment activities for the systems that comprise the Army?s tactical baselines Conduct interoperability testing for the SWB11-12 systems that comprise the LWN/MC baseline to ensure the tactical integrated computing infrastructure is interoperable in a System of Systems (SoS) environment and to enable the CIO/G-6 to enforce a standards based architecture. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change in requirement					
Title: Engineering Services ***Description:*** Provide network engineering support to establish and maintain tactical architectures on the CTSF test floors and to deploying/fielded units at training centers around the world (NIE, JRTC, NTC, JMRC). System engineering support provides hardware virtualization, Army End Point Security System (AESS) support, system validation and integration support to numerous PMs on the integration and risk reduction labs, and assists Army programs with interoperability assessments and AIC rehearsal. Modify and merge army data products for CTSF test architectures. Develop/Maintain Applications for CTSF in-house programs. ***FY 2019 Plans:*** Support AIC Integration and Testing. Continue Network Integration Checkout prior to each AIC. Continue support to PMs for integration of future COE insertions and integration. Identify and incorporate software tools to monitor performance and assist in issue resolution. Integrate and implement HBSS technology. Assist PMs in the development of HBSS policies. Assist integration and test architectures to include Program of Record (POR) and non-POR radio communications devices to provide PMs and Materiel Developers testing in realistic environments. Provide CTSF network and systems engineering for validation of end-to-end sensor	0.151	0.156	0.158	-	0.158

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
and platform communications and interoperability. Provide software patch validation; network support for integration and test floors; network support to fielded units; and systems engineering and analysis support to system of systems integration activities. Provide PMs and CTSF Configuration Management (CM) with a Virtualization Suite and assist in virtualizing software. Plan and conduct engineering evaluations for AIC testing and data collection in the Network Integration Evaluation (NIE)/Capability Integration Evaluation (CIE) to leverage the operational environment and NIE/CIE resources. Support Army Warfare Assessment (AWA), Joint Users Interoperability Communications Exercise (JUICE), and Bold Quest technology and interoperability demonstrations. Assist Assistant Secretary of the Army (Acquisition, Logistics and Technology) [ASA(ALT)] in developing and refining Control Point Testing for COE and distributed testing between the Computing Environments (CEs). Assist the CEs in Federation of Net-Centric Sites (FaNS) accreditation for distributed testing. Assist ASA(ALT) in defining the COE architectures and services. Assist in interoperability issues for multiple Combatant Commands. Conduct radio Verification and Validation. Application Programmers continue to develop and modify Configuration Management Tool Suite version 3 (CMTS3) modules.					
FY 2020 Base Plans: Maintain Network Baseline and Modernization in accordance with the Mission Command Network Modernization Implementation Plan to include Network support for integration and test floors, network support to fielded units, and systems engineering and analysis support to system of systems integration activities. Plan and conduct engineering evaluations for AIC testing and data collection in the Capability Integration Evaluation (CIE) to leverage the operational environment and CIE resources. Work with Network Cross Functional Team on Network modernization. Support AIC Integration and Testing. Continue Network Integration Checkout prior to each AIC. Continue support to PMs for tactical network availability of future COE insertions and integration. Provide CTSF network and systems engineering for validation of end-to-end sensor and platform communications and interoperability. Continue to modernize network equipment and capabilities, research wireless networks and tactical feasibility. Identify and incorporate software tools to monitor network performance and assist in issue resolution. Application Programmers continue to develop and modify Configuration Management Tool Suite version 3 (CMTS3) modules. Assist PMs with integrating systems into the CTSF tactical Network. Integrate and implement Army End Point Security System (AESS) technology, assist PMs in the development of AESS policies. Update CTSF Standard Operating Procedures (SOPs) for CTSF controls ensuring that all users, information systems, and networks that reside within the CTSF Test Floor Network have a strong cybersecurity posture and CTSF is in compliance for Risk Management Framework (RMF) accreditation and continuous monitoring. As part of the CTSF Information Assurance Vulnerability Management (IAVM) Plan, all Network and systems devices are updated with the latest Information Assurance Vulnerability Alerts (IAVA)					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
and Security Technical Implementation Guides (STIGs) on a quarterly schedule. Support Army Warfighting Exercises and Combatant Commands with interoperability technical support as required. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant changes					
Title: Configuration Management ***Description:*** As the CTSF Configuration Management Office, provide CM functional and physical configuration management and change management to the CTSF Army Interoperability Certification test floor environment. As Army Configuration Management Office (ACMO), establish and maintain oversight control of the Army Master Library for the Army Interoperability Certified Fielded Baseline (AICFB). Archive system software and data products, correlated with their associated documentation, for the Army LandWarNet Mission Command Baseline (ALWNMCB), a subset of the AICFB. Establish and maintain the configuration and change management to the AICFB and the ALWNMCB for Lifecycle Software Management (LCSM). Provide support to the Army Staff (ARSTAF), Material Developers (MATDEV), Project Managers (PM), and System Owners (SO) through the orderly management of product configuration information and product change management (ChM), which enables capability revisions, improved reliability and maintainability, extended life, and reduced cost. Maintain and improve the Configuration Management Tracking System version 3 (CMTSIII), the Army?s authoritative database management system (DBMS) for configuration management (CM) of the systems comprising Coalition Interoperability Assurance and Validation (CIAV), and the Warfighter Mission and Business Mission Areas of the Army Information Technology (IT) portfolio. Assist the CIO/G6 in conducting accreditation inspections and training for Federation of Net-centric Sites (FaNS) locations. ***FY 2019 Plans:*** Provide CM functional and physical configuration management and change management to the CTSF Army Interoperability Certification test floor environment. Provide CM functional and physical configuration management and change management to the AICFB, to include archiving the required system software, data products and documentation, while correlating the relevant data within the CMTSIII DBMS for visibility to users Army wide. Provide baseline reconciliation to the four quarterly CIO/G6 AICFB reports, identifying to commanders and their G-3/G-6 staff the Army?s AIC certified, Interoperability Capability and Limitations assessed, AIC waivered, and AIC exempted system software that is authorized to connect to the Army?s network. Assist the CIO/G6 in conducting accreditation inspections and training for Federation of Net-centric	0.499	2.717	2.769	-	2.769

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Sites (FaNS) locations. Continue CMTSIII evolutionary developments. Initiate changes to enable CMTSIII to maintain currency/compatibility with Common Operating Environment evolutionary developments. ***FY 2020 Base Plans:*** Provide CM functional and physical configuration management and change management to the CTSF Army Interoperability Certification test floor environment. Provide CM functional and physical configuration management and change management to the AICFB, to include archiving the required system software, data products and documentation, while correlating the relevant data within the CMTSIII DBMS for visibility to users Army wide. Provide baseline reconciliation to the four quarterly CIO/G6 AICFB reports, identifying to commanders and their G-3/G-6 staff the Army?s AIC certified, Interoperability Capability and Limitations assessed, AIC waivered, and AIC exempted system software that is authorized to connect to the Army?s network. Assist the CIO/G6 in conducting accreditation inspections and training for Federation of Net-centric Sites (FaNS) locations. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant change in requirement					
Title: Management Operations/Program Office ***Description:*** Provide management operations consisting of planning, programming and executing funds; planning and programming for required personnel; planning, programming and executing contracts supporting AIC testing processes; identifying reimbursable tests and collecting/allocating appropriate funds; planning and programming logistics activities, managing/controlling/documenting physical assets and inventories; and perform oversight and coordination of physical security with hosting installation. ***FY 2019 Plans:*** Continue to utilize CMTSIII Resource Management Module and Reporting as well as FMIS for use in documenting/programming/executing funds and personnel levels of effort associated with mission activities. Program and execute funding; plan and program manpower requirements and coordinate with CECOM G8 for implementation; identify contracting requirements and develop strategy for implementation in conjunction with CECOM Acquisition Center. Track testing schedule, prepare/coordinate/track customer funding for AIC testing activities (e.g. COE v3.0 tests, CS 11-12 Bi-Annual testing, Joint, Coalition), and infrastructure support. Continue to provide field support coordination for unit training and exercises upon request. Maintain existing infrastructure while continuing to develop coordinate planning/engineering activities associated with transition	0.667	1.052	1.092	-	1.092

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
to permanent facility; continue to enhance physical security, access control, force protection, COOP and EAP activities and exercises. Continue inventory accountability programs and asset control. ***FY 2020 Base Plans:*** Program and execute funding. Plan and program manpower, identify contracting requirements and develop strategy for implementation in conjunction with CECOM Acquisition Center. Track testing schedule, prepare/ coordinate/track customer funding for AIC testing activities and infrastructure support. Continue to provide field support coordination for unit training and exercises upon request. Maintain existing infrastructure while continuing to develop coordinate planning/engineering activities associated with transition to permanent facility; continue to enhance physical security, access control, force protection, COOP and EAP activities and exercises. Continue inventory accountability programs and asset control. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant increase (inflation).					
Accomplishments/Planned Programs Subtotals	4.843	8.809	8.637	-	8.637

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Transition from executing a single test event at a time to multiple simultaneous test events using new universal mission threads, providing speed and efficiency to the test/acquisition timeline. Execute system of systems interoperability testing and certification through the use of Government and Systems Engineering and Technical Analysis (SETA) contract personnel experienced in product development and interoperability testing. Testing and certification occurs in a cyclical fashion, with an expectation of an annual Software Block/Capability Set test followed with cyclical multiple test events to ensure integrity of software baselines to the Warfighter. Engineering Services provides strategic integration of software into a system of systems/family of systems environment to support interoperability testing. Establish and maintain Configuration Management and version control of the Army's Interoperable Battle Command LandWarNet Baseline. Distributed testing capability uses local assets and leverages other federated test facilities to create synergy and realize efficiencies.

E. Performance Metrics

N/A

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MITRE Corp	FFRDC	Engineering Services : Fort Hood, TX	17.178	-		-		-		-		-	0.000	17.178	-
In-House	Allot	Engineering Services : Fort Hood, TX	2.548	-		-		-		-		-	0.000	2.548	-
FY19 SBIR STTR Transfer	TBD	TBD : TBD	-	-		0.224		-		-		-	0.000	0.224	-
		Subtotal	19.726	-		0.224		-		-		-	0.000	19.950	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CECOM Matrix	Allot	Program and Budget Analysis Support : Fort Hood, TX/ Aberdeen Proving Grounds, MD	4.119	0.363		0.741		0.755		-		0.755	Continuing	Continuing	Continuing
In-House Support	Allot	Management Operations, Logistics Support : Fort Hood, TX	9.928	-		-		-		-		-	0.000	9.928	-
ISSA/Training/TDY	Allot	Site Support Activities : Fort Hood, TX	0.062	0.245		0.250		0.275		-		0.275	Continuing	Continuing	Continuing
Supplies	C/UCA	Management Operations, Logistics Support : Fort Hood, TX	1.375	0.059		0.061		0.062		-		0.062	Continuing	Continuing	Continuing
Moving Costs	Allot	Management Operations, Logistics Support : Fort Hood, TX	-	-		-		0.001		-		0.001	0.000	0.001	Continuing

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	15.484	0.667		1.052		1.093		-		1.093	Continuing	Continuing	N/A

Remarks

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

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CECOM R2 3G	C/CPFF	Test, Configuration Management : Fort Hood, TX	10.548	0.633		3.467	May 2019	2.880	May 2020	-		2.880	Continuing	Continuing	Continuing
CECOM S3	C/CPFF	Facilities, Maintenance, Security : Fort Hood, TX	9.000	1.226		1.227	Aug 2019	1.260	Aug 2020	-		1.260	Continuing	Continuing	Continuing
ISSA	MIPR	Utilities & NEC Support : Fort Hood, TX	4.945	-		-		-		-		-	0.000	4.945	-
ARL Matrix	MIPR	Test : Fort Hood, TX	6.374	-		-		-		-		-	0.000	6.374	-
In-House Support	Allot	Test : Fort Hood,TX	5.100	2.316		2.827		3.398		-		3.398	Continuing	Continuing	Continuing
Instrumentation	C/UCA	Test Equipment Infrastructure : Fort Hood, TX	3.184	0.001		0.012		0.006		-		0.006	Continuing	Continuing	Continuing
		Subtotal	39.151	4.176		7.533		7.544		-		7.544	Continuing	Continuing	N/A

Remarks

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	74.361	4.843		8.809		8.637		-		8.637	Continuing	Continuing	N/A

Remarks

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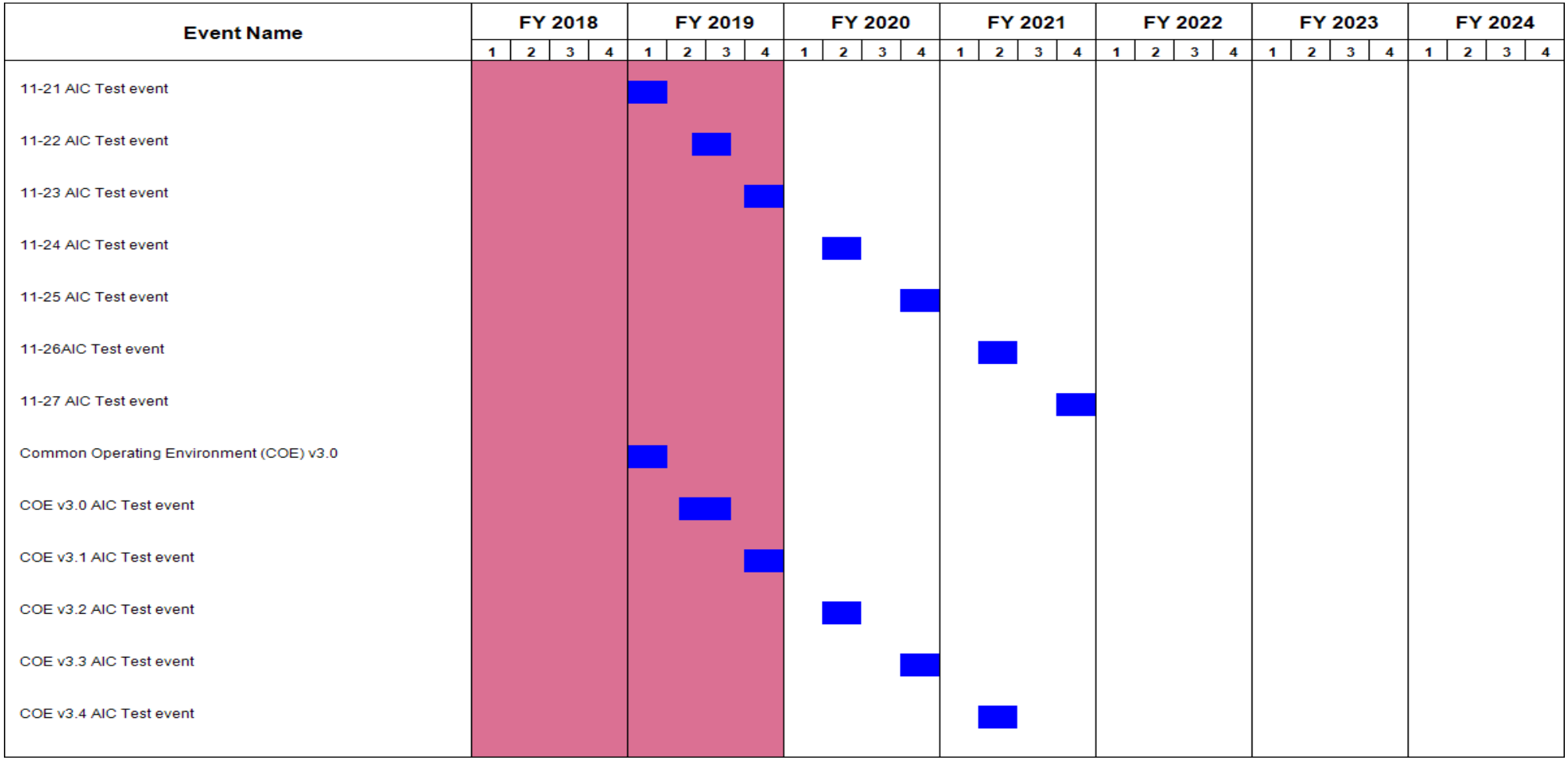

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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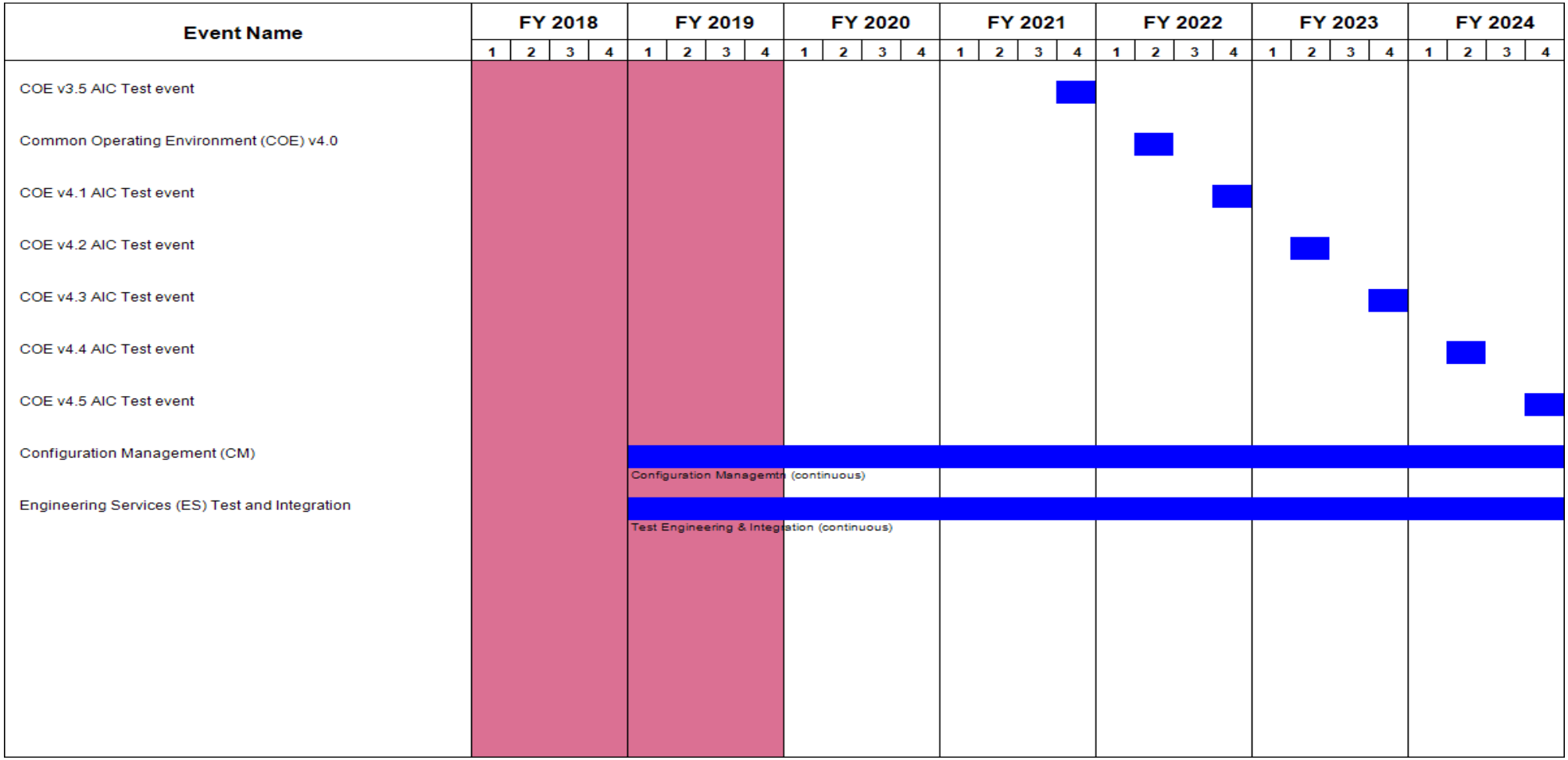

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
11-21 AIC Test event	1	2019	1	2019
11-22 AIC Test event	2	2019	3	2019
11-23 AIC Test event	4	2019	4	2019
11-24 AIC Test event	2	2020	2	2020
11-25 AIC Test event	4	2020	4	2020
11-26AIC Test event	2	2021	2	2021
11-27 AIC Test event	4	2021	4	2021
Common Operating Environment (COE) v3.0	1	2019	1	2019
COE v3.0 AIC Test event	2	2019	3	2019
COE v3.1 AIC Test event	4	2019	4	2019
COE v3.2 AIC Test event	2	2020	2	2020
COE v3.3 AIC Test event	4	2020	4	2020
COE v3.4 AIC Test event	2	2021	2	2021
COE v3.5 AIC Test event	4	2021	4	2021
Common Operating Environment (COE) v4.0	2	2022	2	2022
COE v4.1 AIC Test event	4	2022	4	2022
COE v4.2 AIC Test event	2	2023	2	2023
COE v4.3 AIC Test event	4	2023	4	2023
COE v4.4 AIC Test event	2	2024	2	2024
COE v4.5 AIC Test event	4	2024	4	2024
Configuration Management (CM)	1	2019	4	2024
Engineering Services (ES) Test and Integration	1	2019	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*				Project (Number/Name) C34 / *Army Tac C2 Sys Eng*			
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**
C34: *Army Tac C2 Sys Eng*	-	7.457	7.998	9.483	-	9.483	9.716	9.985	11.706	12.085	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C34, Army TAC C2 Sys Eng, supports the Army's Network Modernization Strategy LOE 1, Unified Network. The System of Systems Engineering coordinates technical efforts across and outside of PEO C3T to ensure integration with the current and future Mission Command Network. Project C34 provides technical support for LOE 1-4 that informs the design and solutions with specific emphasis on the ability for the different efforts to be integrated and interoperable with one another. Project C34, Army Tactical Command and Control Systems Engineering: This project funds the PEO Command, Control, Communications-Tactical (PEO C3T) Technical Management Division (TMD) System of Systems engineering and integration, experimentation, acquisition management, testing, fielding and sustainment support to ensure interoperability and affordability within the PEO C3T portfolio. The TMD focuses on System-of-Systems (SoS) Engineering and Integration for the Mission Command Network with increased emphasis on immediate Warfighter needs as well as leveraging emerging technologies. Fiscal Year 2020 will focus on the continued development, implementation and integration of the Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance (C5ISR) network architectures. This includes development of a technology enhancement roadmap for SoS capability evolution across the PEO C3T portfolio that incorporates Cross Functional Team initiatives; network integration support and design products for system validation through various N-CFT lead experimentation and integration testing; integration of tactical Networked capabilities for all Mission Command Network systems, initial fieldings, and integration events; integration of tactical information assurance solutions and security measures for consistent cyber protection; and support to N-CFT evaluations and contract actions.

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Title: Continue Mission Command Network Synchronization and Integration Support	0.112	0.118	0.146	-	0.146
Description: .					
FY 2019 Plans: Continue the support of current force and the development of future force C5ISR across the tactical network to ensure all Assistant Secretary of the Army (Acquisition, Logistics & Technology) (ASA(ALT)) programs are synchronized and redundancies and overlapping capabilities are reduced across the network and in synchronization with Common Operating Environment.					
FY 2020 Base Plans: Continue the support of current force and the development of future force C5ISR across the tactical network to ensure all Assistant Secretary of the Army (Acquisition, Logistics & Technology) (ASA(ALT)) programs					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
are synchronized and redundancies and overlapping capabilities are reduced across the network and in synchronization with Common Operating Environment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Planned program area increase supports continued design work.					
Title: Continue Developmental Test and Integration Test Support between Programs of Record (PORs) and platforms / Command Posts (CPs) to execute System-of-Systems (SoS) and Interoperability ***Description:*** . ***FY 2019 Plans:*** Continue to mature/revise the design, configuration and establishment of the system of systems integration test infrastructure architecture and implementation. Continue to provide the infrastructure and support in conducting integration testing and systems engineering for C3T non-program of record and program of record systems, products, technical insertions, and systems under evaluation to ensure integration of capabilities across the network. Maintain the FANS Accreditation in support of COE risk reduction testing. Continue the design and coordination of integration testing across the Mission Command Network systems. ***FY 2020 Base Plans:*** Continue to mature/revise the design, configuration and establishment of the system of systems integration test infrastructure architecture and implementation. Continue to provide the infrastructure and support in conducting integration testing and systems engineering for C3T non-program of record and program of record systems, products, technical insertions, and systems under evaluation to ensure integration of capabilities across the network. Maintain support of COE risk reduction testing. Continue the design and coordination of integration testing across the Mission Command Network systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports continued development.	1.087	1.147	1.419	-	1.419
Title: Continue Tactical Network Engineering ***Description:*** . ***FY 2019 Plans:***	0.623	0.657	0.814	-	0.814

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Develop effective engineering strategies to integrate tactical applications for use across the C3T enterprise network. Continue to perform network planning and integration activities across all cross-domain system-of-systems future capabilities and technologies. ***FY 2020 Base Plans:*** Develop effective engineering strategies to integrate tactical applications for use across the C3T enterprise network. Continue to perform network planning and integration activities across all cross-domain system-of-systems future capabilities and technologies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports continued engineering.					
Title: Conduct and Support System Interoperability Engineering and Development of System-of-Systems (SoS) Architectural Products ***Description:*** . ***FY 2019 Plans:*** Within the PEO C3T portfolio, continue to assess Emerging Technologies, identify critical integrated test points, monitor developmental testing at integration points, develop architectural data processes and products, and facilitate the transition of Network capabilities to the warfighter. ***FY 2020 Base Plans:*** Within the PEO C3T portfolio and in conjunction with N-CFT activities, continue to assess Emerging Technologies, identify critical integrated test points, monitor developmental testing at integration points, develop architectural data processes and products, and facilitate the transition of Network capabilities to the warfighter. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports continued development efforts.	1.400	1.476	1.827	-	1.827
Title: Continue Development and Implementation of Tactical Information Assurance (IA) ***Description:*** . ***FY 2019 Plans:*** Implement ARCYBER, CIO/G6 and CYBERCOM guidance for execution of Information Assurance policies and procedures at the tactical level. Continue to document the current tactical IA network architecture with the goal of developing recommendations to eliminate inconsistencies/duplications, increasing the security posture,	0.211	0.223	0.276	-	0.276

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
decreasing complexity of operations, and decreasing costs. Continue to plan and design security measures and IA requirements across the tactical network for future capabilities. ***FY 2020 Base Plans:*** Implement ARCYBER, CIO/G6 and CYBERCOM guidance for execution of Information Assurance policies and procedures at the tactical level. Continue to document the current tactical IA network architecture with the goal of developing recommendations to eliminate inconsistencies/duplications, increasing the security posture, decreasing complexity of operations, and decreasing costs. Continue to plan and design security measures and IA requirements across the tactical network for future capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports continuing development efforts.					
Title: Continue System of Systems Development ***Description:*** . ***FY 2019 Plans:*** Continue to effectively manage overall System-of-Systems Engineering, Enterprise, and Integration efforts for the PEO C3T portfolio of technology and capability enhancement programs. Continue to conduct SoS engineering design for capabilities planned to field in FY20, FY21 and FY22. . ***FY 2020 Base Plans:*** Continue to effectively manage overall System-of-Systems Engineering, Enterprise, and Integration efforts for the PEO C3T portfolio of technology and capability enhancement programs. Continue to conduct SoS engineering design for capabilities planned to field in FY20, FY21 and FY22 to include Program of Record and emerging LOE technologies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports continued SoS development.	2.492	2.628	3.254	-	3.254
Title: System of Systems (SoS) Engineering and Integration Evolution of the Network ***Description:*** . ***FY 2019 Plans:*** Continue to implement cross PEO System of Systems Engineering and Integration processes, analysis and S&T coordination to ensure successful development Engineering and Testing of current and future systems. Continue	1.339	1.412	1.747	-	1.747

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
to develop streamlined processes to support ASA(ALT) SoSE&I and implement Value Engineering (VE) and Lean Six Sigma initiatives across all PEO C3T capabilities to include the Mission partner Environment. ***FY 2020 Base Plans:*** In Conjunction with LOE and CFT efforts, continue to implement cross PEO System of Systems Engineering and Integration processes, analysis and S&T coordination to ensure successful development Engineering and Testing of current and future systems. Continue to develop streamlined processes to support ASA(ALT) OCE and implement Value Engineering (VE) and Lean Six Sigma initiatives across all PEO C3T capabilities to include the Mission partner Environment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports continuing SoS integration efforts.					
Title: FY18 Rescission	0.193	-	-	-	-
Title: SBIR/STTR ***FY 2019 Plans:*** tax ***FY 2019 to FY 2020 Increase/Decrease Statement:*** SBIR / STTR adjustment now shown in PB20 for FY19 APPN	-	0.337	-	-	-
Accomplishments/Planned Programs Subtotals	7.457	7.998	9.483	-	9.483

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Not applicable for this item.

D. Acquisition Strategy

This project provides the technical and programmatic disciplines required for systems engineering and integration, experimentation, acquisition management, testing, interoperability, support to fielding and sustainment. It will focus on System-of-Systems (SoS) Systems Engineering and Integration for the tactical network with increased emphasis on immediate Warfighter needs as well as leveraging emerging technologies, through the G3 LandWarNet Capability Set Development and Integration. The Technical Management Division (TMD) will ensure that the Program Executive Office Command, Control, Communications-Tactical (PEO C3T) capability portfolio is effectively SoS engineered and integrated to meet the tactical Warfighter's evolving mission needs.

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

N/A

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Emerging Technologies	SS/FP	CACI : Aberdeen Proving Ground, MD	21.092	-		-		-		-		-	0.000	21.092	-
Emerging Technologies	SS/FP	Southwest Research Installation : Aberdeen Proving Ground, MD	0.175	-		-		-		-		-	0.000	0.175	-
System Of System Engineering and Integration, Current and Strategic Initiatives	C/T&M	CSC Aberdeen Proving Ground /Fort Hood, TX : APG	57.690	-		-		-		-		-	0.000	57.690	-
System of System Engineering & Integration, Current & Strategic Initiative, Architecture Integration	C/CPFF	Bowhead (extension) : Aberdeen Proving Ground, MD	11.112	2.164		0.807	Oct 2018	-		-		-	0.000	14.083	-
System of System Engineering & Integration, Current & Strategic Initiative, Architecture Integration	Various	TBD (previously Bowhead. Bowhead PoP ends 12/2018) : APG MD	-	-		2.421	Dec 2018	3.958	Dec 2019	-		3.958	Continuing	Continuing	Continuing
Architecture Integration	C/T&M	CSC : various	9.005	-		-		-		-		-	0.000	9.005	-
Systems Engineering Support	SS/FP	LOCKHEED MARTIN : Eatontown, NJ	7.799	-		-		-		-		-	0.000	7.799	-
Systems Engineering Support	C/CPFF	Northrop Grumman : Arlington, VA	5.282	-		-		-		-		-	0.000	5.282	-
Systems Engineering Support	Various	Various : APG, MD	3.432	0.314		0.322	Oct 2018	0.800	Oct 2019	-		0.800	Continuing	Continuing	Continuing
System of System Architectures, Engineering, and Integration	SS/FP	MITRE : Aberdeen Proving Ground, MD/ Eatontown, NJ	95.332	3.660		3.760	Sep 2019	4.255	Sep 2020	-		4.255	Continuing	Continuing	Continuing
Tactical Network Initialization	SS/FP	Future Skys Inc. : Neptune, NJ	0.600	-		-		-		-		-	0.000	0.600	-

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System of System Engineering and Integration	C/T&M	CSC : Huntsville, AL	0.183	-		-		-		-		-	0.000	0.183	-
System of System Engineering and Integration	C/T&M	Viatech : NJ	0.367	-		-		-		-		-	0.000	0.367	-
		Subtotal	212.069	6.138		7.310		9.013		-		9.013	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IN-HOUSE SUPPORT	Various	PEO C3T : APG, MD	32.730	0.949		-		-		-		-	0.000	33.679	-
MATRIX	Various	Various : Aberdeen Proving Ground, MD	13.232	0.370		0.351		0.470		-		0.470	Continuing	Continuing	Continuing
OTHER GOVERNMENT SUPPORT	Various	Various : Various	7.377	-		-		-		-		-	0.000	7.377	-
SBIR/STTR TAX	TBD	N/A : N/A	-	-		0.337		-		-		-	0.000	0.337	-
		Subtotal	53.339	1.319		0.688		0.470		-		0.470	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	265.408	7.457		7.998		9.483		-		9.483	Continuing	Continuing	N/A

Remarks

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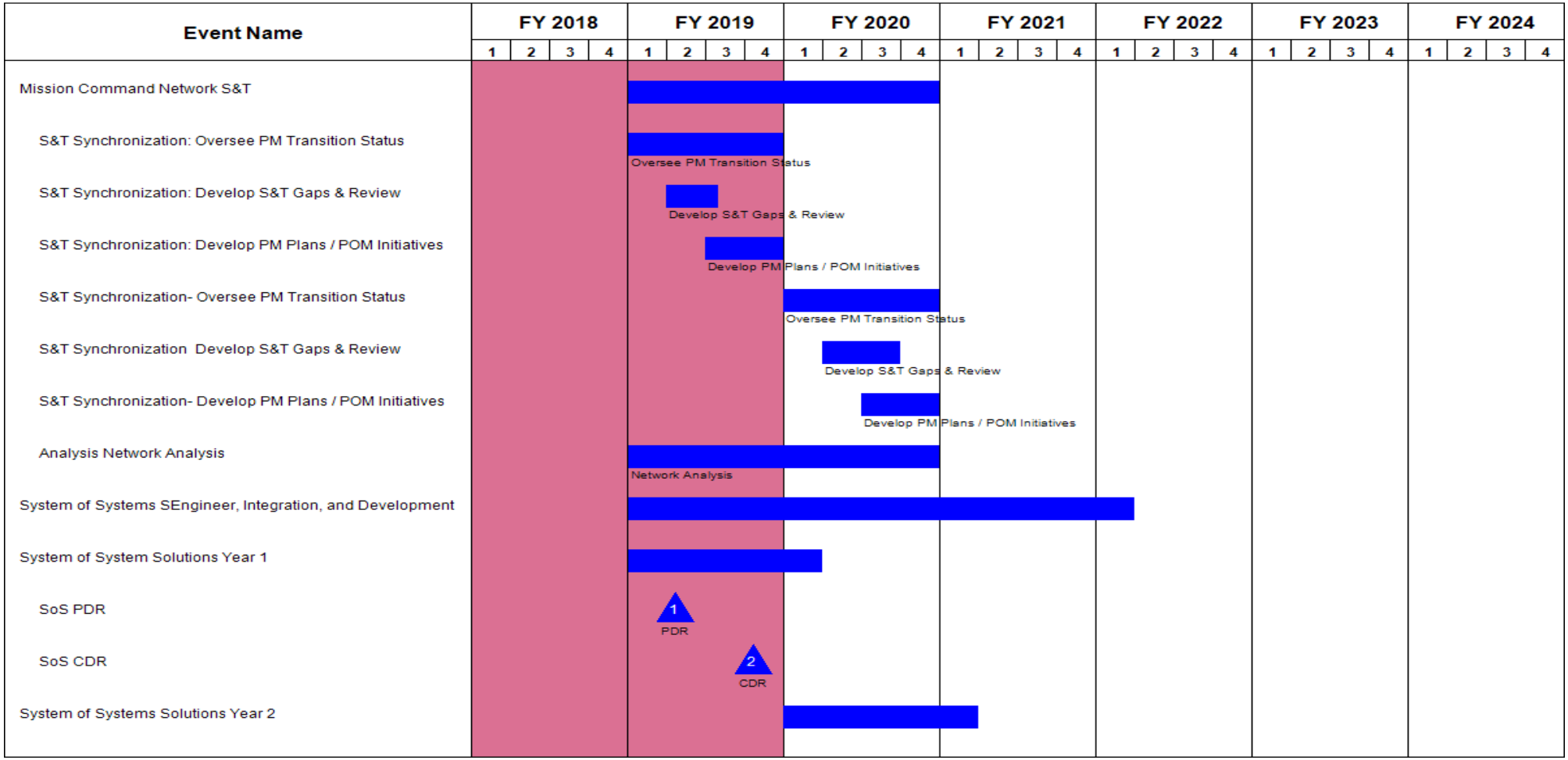

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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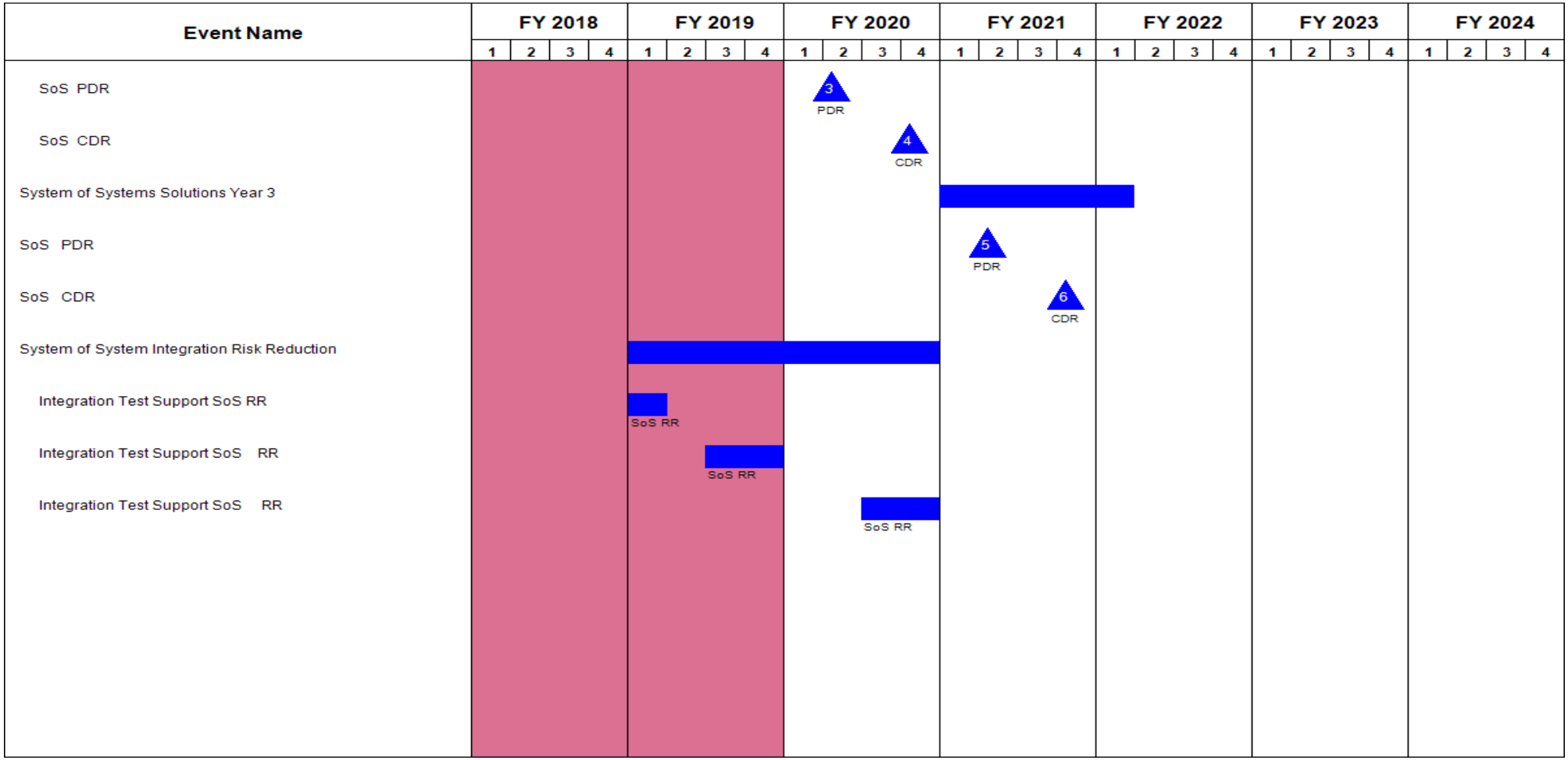

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** C34 / *Army Tac C2 Sys Eng*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Mission Command Network S&T	1	2019	4	2020
S&T Synchronization: Oversee PM Transition Status	1	2019	4	2019
S&T Synchronization: Develop S&T Gaps & Review	2	2019	3	2019
S&T Synchronization: Develop PM Plans / POM Initiatives	3	2019	4	2019
S&T Synchronization- Oversee PM Transition Status	1	2020	4	2020
S&T Synchronization Develop S&T Gaps & Review	2	2020	3	2020
S&T Synchronization- Develop PM Plans / POM Initiatives	3	2020	4	2020
Analysis Network Analysis	1	2019	4	2020
System of Systems SEngineer, Integration, and Development	1	2019	1	2022
System of System Solutions Year 1	1	2019	1	2020
SoS PDR	2	2019	2	2019
SoS CDR	4	2019	4	2019
System of Systems Solutions Year 2	1	2020	1	2021
SoS PDR	2	2020	2	2020
SoS CDR	4	2020	4	2020
System of Systems Solutions Year 3	1	2021	1	2022
SoS PDR	2	2021	2	2021
SoS CDR	4	2021	4	2021
System of System Integration Risk Reduction	1	2019	4	2020
Integration Test Support SoS RR	1	2019	1	2019
Integration Test Support SoS RR	3	2019	4	2019
Integration Test Support SoS RR	3	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*				Project (Number/Name) EJ4 / *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*			
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**
EJ4: *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*	-	59.370	39.975	30.969	-	30.969	31.600	26.500	27.900	27.800	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Operating Environment (COE) is an approved set of computing technologies and standards that enables secure and interoperable applications to be developed and executed rapidly across a variety of computing environments (i.e., server(s), client, mobile, sensors, and platform). The Command Post Computing Environment (CPCE) is one of the six computing environments under the COE, which provides the movement and maneuver applications, common computing services such as Cyber tools and e-mail, and includes tactical server capabilities within Command Posts at all echelons (Battalion to Army Service Component Commander).

Command Post Computing Environment (CPCE) supports the Army Network Modernization Strategy Line of Effort 2, Common Operating Environment

The CPCE implements an integrated, interoperable, cyber-secure, cost-effective software infrastructure that serves as the host for a unified set of multiple warfighting functional applications within the command post. This software infrastructure will be central to the COE, allowing interoperability between command posts, mounted platforms, and dismounted handheld devices while supporting collaboration using a common picture with Joint and Unified Action partners. CPCE will provide a core software infrastructure including a common operating picture (COP) tool, common look and feel (user interface), common data strategy, interoperable tactical messaging/chat, and essential movement and maneuver capabilities. CPCE software infrastructure and applications will reside on Tactical Server Infrastructure (TSI) hardware and previously fielded BCCS/TSI servers. The CPCE eliminates "stove-piped" legacy systems, duplicative or redundant implementations, simplifies future application development efforts, and enhances interoperability and data sharing across multiple echelons. Acquisition Goals of the CPCE include: Acquisition Agility, Open System Architectures, Reduced Life Cycle Costs, and a Cyber-Hardened Foundation for applications and services.

The initial version of CPCE completed Initial Operational Test and Evaluation at NIE 18.2 in November 2018, a Fielding / Software Deployment decision is targeted for 2QFY19 along with entering the acquisition life cycle. The new program of record will be comprised of the tactical server infrastructure, Mission Command software infrastructure, and movement/maneuver Warfighting function applications. First Unit Equipped in 4QFY19.

Requirements for the CPCE are established in the AROC approved COE Information Systems Initial Capability Document (IS ICD) and the CPCE Requirements Definition Package (RDP).

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Title: System Requirements Engineering	5.201	3.241	2.500	-	2.500

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Engineering effort is required to determine technical implementation strategy of high-level requirements into discrete software capabilities. Requirements consolidation, analysis, adjudication, and management of multiple Joint Capabilities Integration Development System (JCIDS) documents, directives, and other sources to determine full capability requirements for CPCE. Effort includes ongoing Requirements Configuration Control Board (CCB) process and decomposition of high-level (L1) requirements into low-level (L2, L3) sub-requirements. Formalized requirements are codified in System / Subsystem Specification (SSS) and multiple System Requirements Specifications (SRS). ***FY 2019 Plans:*** For FY19, will continue to ingest infrastructure requirements for incorporation into later versions of CPCE software. Will continue to refine a formal governance process for the incorporation of additional Program of Record (POR) functionality. Assist Programs of Record with determining overlapping requirements that are already satisfied by the CPCE core utilities. Maintain the MC SSS Requirements Verification Traceability Matrix (RVTM) and SSS/SRS. ***FY 2020 Base Plans:*** Consolidate, adjudicate, and codify specific technical requirements for future capabilities to be implemented in CPCE core infrastructure and warfighting function applications. Establish process for analysis and technical implementation of external capabilities that are to be incorporated into CPCE and must be interoperable and backwards compatible with legacy systems. This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** System requirements engineering decreases as the initial version of CPCE is base-lined and fielded. Future requirement engineering will focus on additional capabilities and maturing of the infrastructure baseline.					
Title: SW Dev - Core Infrastructure ***Description:*** Provides a core software infrastructure that underpins an integrated mission command capability in command posts, from ASCC to Battalion echelons that provides simplicity, intuitiveness, core services and applications, common look and feel, and warfighter functionality in the areas of Fires, Logistics, Intelligence, Airspace Management and Maneuver. Primary software development efforts include development of a simple Common Operating Picture (COP), a Common Geospatial solution (map), a user interface with "common look	26.363	23.452	17.669	-	17.669

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
and feel", common Data Services including an extensible database and data persistence, tactical messaging and translation, and backwards compatibility to previously fielded legacy systems. Software development efforts focus on designing the system to reduce the training burden on the Soldier, and the creation of an Integrated Software Development Kit (ISDK) that allows external developers the ability to integrate new capabilities without rebuilding common components. ***FY 2019 Plans:*** Continue the final integration of the CPCE v3 COTS underlying infrastructure, Core Utilities, backwards compatibility, and Warfighter Function (WfF) Applications into a holistic System of Systems and ensuring that those subsystems function together in accordance to Program requirements and specifications. These responsibilities include software engineering and development of DevOps, test engineering, and release management, Command, Control and Intelligence (C2I) Ultra Light, Open Routing, Data Flows, Extensible Map Platform (EMP) Renderer, Map Based Planning, Joint and Coalition Interoperability, and Tactical Server Infrastructure (Size, Weight and Performance improvement). ***FY 2020 Base Plans:*** Continue to incorporate new capabilities into the CPCE infrastructure, both COTS and Government-developed. Development and integration of new capabilities and features including additional movement and maneuver functions, engineer functions, and mission planning functions including Map-based Planning Services (MBPS), Joint Planning Services (JPS), and direct data ingest from other warfighting systems. This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** System Software Dev-Core Infrastructure cost will decrease as the initial software infrastructure baseline has been developed and future efforts will be to integrate other Warfighting functional capabilities in to the CPCE baseline..					
Title: Hardware/Software Integration ***Description:*** Hardware / Software Integration within the Command Post Computing Environment consists of research, development, and engineering efforts required to select, engineer, and field a Commercial off the Shelf hardware server and related components. The CPCE software will reside on converged Tactical Server Infrastructure (TSI) server stacks, which host multiple software infrastructure components including Microsoft	9.553	4.050	2.900	-	2.900

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ4 / *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exchange, SharePoint, Defensive Cyber Operations (DCO) tools, SQL databases, Active Directory, and others. This enterprise software is tightly-coupled with, and engineered for, specific TSI hardware using virtual machine (VM) technology and must serve as the basis for all other warfighting functions and mission command system software loaded on the server. ***FY 2019 Plans:*** For FY19, primary effort includes continued development of VM structure of the TSI server architecture to incorporate more processing power and functionality in a reduced footprint. Ongoing efforts to migrate Program of Record functionality to the CPCE will require TSI server stack accommodations and reengineering. This engineering includes server deployment script automation. ***FY 2020 Base Plans:*** For FY20, efforts will focus on new design requirements for the TSI server architecture to achieve further savings in size, weight, and power. Engineering efforts will continue to refine the automated server provisioning and configuration tool that will allow rapid provisioning of new software capabilities and remote system querying and patching. Additional engineering effort will be required to ensure DCO tools are integrated and unique hardware requirements are accounted for. This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Hardware/Software Integration requirements will decrease as the TSI server automation / configuration tool achieves a stable baseline.					
Title: Joint & Coalition Interoperability ***Description:*** Consists of efforts in support of Joint Interoperability and Coalition Partner Interoperability. One of the goals of CPCE is to improve the sharing of mission command capabilities among the US Armed Services and our Coalition partners. Engineering effort is required to determine and implement technical approaches to solving data classification and interoperability problems amongst other US services and partner nations. ***FY 2019 Plans:*** CPCE Joint and Coalition Interoperability plans for FY19 include continued participation in the Program Manager-Computing Environment Working Group (PM-CEWG) and Senior Steering Group-Acquisition (SSG-	0.070	0.600	0.400	-	0.400

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
A) events. In addition, CPCE will provide Defense Information Systems Agency (DISA) with engineering requirements for integration and interfaces with the Global Command and Control System - Joint Enterprise (GCCS-JE) and specific requirements for Disconnected, Intermittent, or Limited (DIL) communications in a Denied Operational Environment. This effort will support the DISA's mission to execute contract award for the Global Command and Control System - Joint Enterprise (GCCS-JE) in FY19. ***FY 2020 Base Plans:*** CPCE Joint and Coalition Interoperability plans for FY20 include continued participation in the Program Manager-Computing Environment Working Group (PM-CEWG) and Senior Steering Group-Acquisition (SSG-A) events. CPCE will continue to assist Defense Information Systems Agency (DISA) with engineering support for integration with the Global Command and Control System - Joint Enterprise (GCCS-JE) and specific requirements for Disconnected, Intermittent, or Limited (DIL) communications in a Denied Operational Environment. In FY20, CPCE will continue to engineer complete Fires and C2/SA interoperability with the USMC. This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Joint and Coalition costs will decrease slightly.					
Title: Test and Evaluation ***Description:*** Test and evaluation efforts include the planning and conduct of Command Post Computing Environment (CPCE) / Mounted Computing Environment (MCE) T&E events including Developmental Test (DT), System Software Acceptance Testing (SSAT), Integration Events, Risk Reduction Events, Initial Operational Test and Evaluation (IOT&E), and Follow-on Test and Evaluation (FOT&E). ***FY 2019 Plans:*** CPCE/MCE completed Initial Operational Test & Evaluation (IOTE) in November 2018 and will participate in after action reviews, adjudicate findings and observations from the formal test. CPCE/MCE will participate in Army Interoperability Certification (AIC) testing for certification of IERs via Army Mission Threads. ***FY 2020 Base Plans:*** In FY20, CPCE will conduct multiple developmental tests, experiments, and user juries as new software capabilities and features are developed. CPCE software will also participate in Army Interoperability	7.618	2.350	0.500	-	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ4 / *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Certification (AIC) testing, Joint Warfighter Assessments, and Army Warfighter Exercises (Wfx), requiring technical system support. This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Test requirements decrease in FY20.					
Title: Program Management ***Description:*** Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and IPTs. ***FY 2019 Plans:*** Management and oversight funding for government support to be transitioned to OMA funding. Technical Area Contract support will continue for this effort which includes System Development and engineering changes to hardware, software, and network), System Analysis of Program of Record (PoR) systems and future systems, Technical Readiness Assessments, and Stakeholder Technical Interchange Meetings/Events. This support includes the creation and implementation of Functional Support Agreements between PM Mission Command and various Government support agencies such as the Army Research and Development Center (ARDEC) CECOM Research Development and Engineering Command (CERDEC), and other PEOs (e.g. PEO IEW&S). Program Management efforts in the FY19 timeframe will also include business area support to ensure funding and contracts are planned and available for all SW development, system engineering, and T&E efforts. ***FY 2020 Base Plans:*** Program office management in the areas of Business, Technical, and Logistics remains a requirement in FY20. This support includes personnel covered by Functional Support Agreements between PM Mission Command and various Government support agencies such as the Army Research and Development Center (ARDEC) CECOM Research Development and Engineering Command (CERDEC), and other PEOs (e.g. PEO IEW&S). Program Management efforts in the FY20 timeframe will also include business area support to ensure funding and contracts are planned and available for all SW development, system engineering, and DT efforts.	7.576	3.500	5.350	-	5.350

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program Management requirements increase from FY19 to FY20 as additional PMO support is required to maintain a baseline, develop a new baseline, and coordinate with other PoRs and Services to ensure interoperability.					
Title: Product Support ***Description:*** Product Support includes all efforts related to type classification, materiel release, provisioning, life cycle sustainment strategies, training development, and total package fielding. ***FY 2019 Plans:*** In FY19, CPCE will conduct a logistics demonstration to verify and validate Technical Data Products and complete the formal Life Cycle Sustainment Plan (LCSP), oversee all aspects of total package fielding, common new equipment training and delivery of the final system to the First Unit Equipped (FUE). ***FY 2020 Base Plans:*** For FY20, CPCE will continue to maintain the fielded baseline version of CPCE infrastructure, update and distribute Technical Data Products for the future baseline software, and continue to oversee and manage all aspects of total package fielding, and new equipment training (NET). This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Product Support costs remain stable from FY19 to FY20.	2.989	1.500	1.650	-	1.650
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:***	-	1.282	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ4 / *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 SBIR / STTR Transfer					
Accomplishments/Planned Programs Subtotals	59.370	39.975	30.969	-	30.969

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• B70000: *COE Tactical Server Infrastructure (TSI)*	-	20.500	77.533	-	77.533	94.972	97.150	116.234	104.616	Continuing	Continuing

Remarks

Related to CPCE is the Tactical Server Infrastructure (TSI) funding line, B70000, which funds computer hardware servers/hosting platforms for CPCE software.

D. Acquisition Strategy

CPCE supports the Army's Common Operating Environment (COE). It will provide foundational capabilities and services for command post software infrastructure, movement and maneuver applications, tactical DCO infrastructure capabilities and warfighting function applications. The Tactical Server Infrastructure (TSI) hardware will host the CPCE core infrastructure and warfighting function applications.

The initial version of CPCE (v3) meets Minimum Essential Capabilities (MECs) as codified in the approved Command Post Integrated Infrastructure (CPI2) Directed Requirement. The initial version of CPCE completed Initial Operational Test and Evaluation at NIE 18.2 in November 2018, a Fielding / Software Deployment decision is targeted for 2QFY19 along with entering the acquisition life cycle. The new program of record will be comprised of the tactical server infrastructure, Mission Command software infrastructure, and movement/maneuver Warfighting function applications. First Unit Equipped in 4QFY19.

The CPCE is an integration effort consisting of Commercial-Off-The-Shelf / Non-Developmental Item (COTS/NDI) software and Government-developed software that allows for backwards compatibility and development of warfighting capability applications.

Government partners include the U.S. Army Armament Research, Development and Engineering Center (ARDEC) Weapons Software Engineering Center (WSEC), Communications-Electronics Command (CECOM) Software Engineering Center (SEC), Aviation and Missiles Research and Development Center (AMRDEC) Software Engineering Directorate (SED) and Communications-Electronics Research, Development and Engineering Center (CERDEC). Commercial suppliers are assigned efforts through GSA Mission Command Engineering Services vehicles and Multiple Award Task Order (MATO) contracts. Hardware, core software and associated licenses to support converged system architecture is Commercial-off-the-Shelf (COTS) and procured through existing vehicles from GSA, Common Hardware Systems (CHS) and the Army Computer Hardware Enterprise Software and Solutions (CHESS).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ4 / *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*

E. Performance Metrics

N/A

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Support (Gov't-Core)	Sub Allot	PM Mission Command : APG, MD	4.750	0.853		-		-		-		-	0.000	5.603	-
PM Support (Gov't-Matrix)	IA	Various Matrix Orgs incl CECOM SEC, LRC, G8, G2, PRD, et al) : APG, MD	4.079	1.668		1.000		2.500		-		2.500	0.000	9.247	-
PM Support (SETA Contractor)	C/FFP	Multiple incl CSRA and others : APG, MD	7.798	5.055		2.500	Nov 2018	2.850	Nov 2019	-		2.850	0.000	18.203	-
		Subtotal	16.627	7.576		3.500		5.350		-		5.350	0.000	33.053	N/A

Remarks

Funding for Core government support (Management and Oversight of CPCE) transitions to OMA Appropriation in FY19.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Requirements Engineering	Various	SW Dev Contractors and Multiple Matrix Orgs : Various Locations	18.630	5.201		3.241	Oct 2018	2.500	Oct 2019	-		2.500	0.000	29.572	-
Software Development - Core Infrastructure	Option/ Various	ARDEC, CERDEC, Systematic : Picatinny, NJ APG, MD Centerville, VA	106.078	26.363		23.452	Oct 2018	17.669	Oct 2019	-		17.669	0.000	173.562	-
Joint and Coalition Interoperability	Various	Multiple : Various	0.226	0.070		0.600	Feb 2019	0.400	Nov 2019	-		0.400	0.000	1.296	-
Hardware / Software Integration	Various	multiple : APG Md	9.648	9.553		4.050	Oct 2018	2.900	Oct 2019	-		2.900	0.000	26.151	-
FY 2019 SBIR / STTR Transfer	TBD	SBIR / STTR Transfer : Various	-	-		1.282		-		-		-	0.000	1.282	-

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	134.582	41.187		32.625		23.469		-		23.469	0.000	231.863	N/A

Remarks

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

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Support	C/FFP	SCCI : Austin, TX	-	2.989		1.500	Jun 2019	1.650	Jun 2020	-		1.650	0.000	6.139	-
		Subtotal	-	2.989		1.500		1.650		-		1.650	0.000	6.139	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Develop and Conduct Tests and Assessments	MIPR	Multiple Test Agencies : Multiple Locations (Primary APG)	6.735	7.618		2.350	Oct 2018	0.500	Oct 2019	-		0.500	0.000	17.203	-
		Subtotal	6.735	7.618		2.350		0.500		-		0.500	0.000	17.203	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	157.944	59.370		39.975		30.969		-		30.969	0.000	288.258	N/A

Remarks

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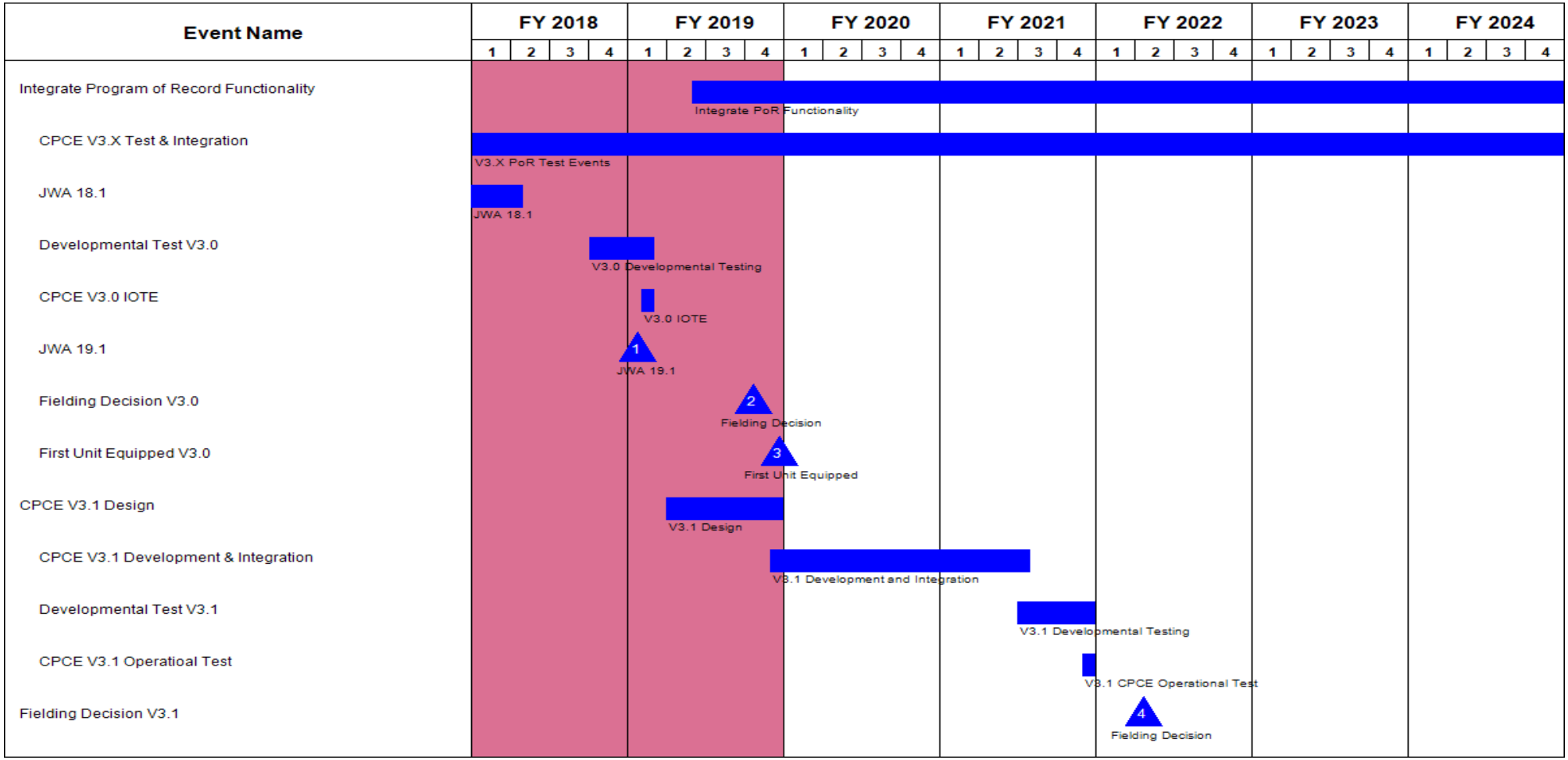

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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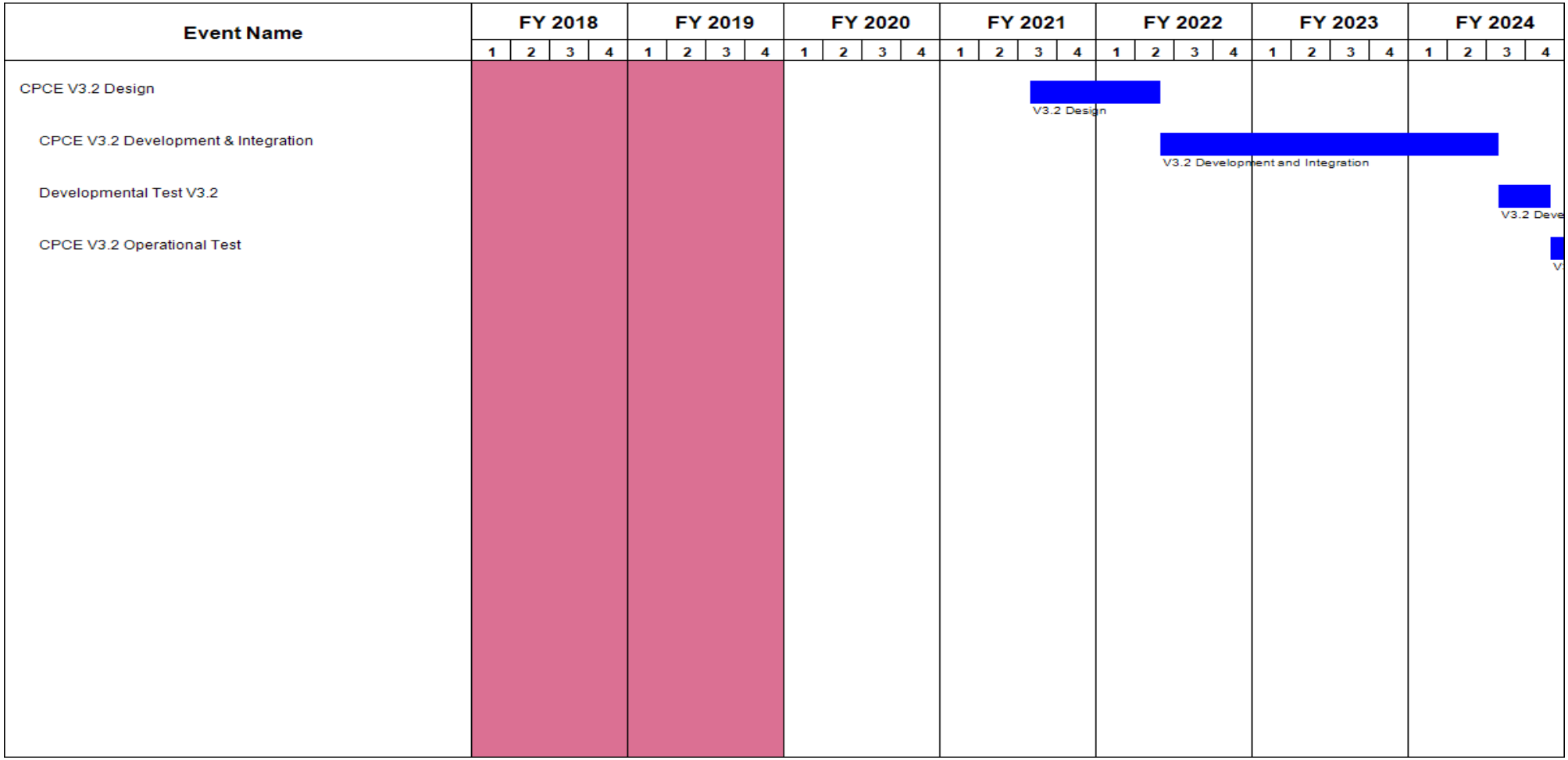

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Integrate Program of Record Functionality	2	2019	4	2024
CPCE V3.X Test & Integration	1	2018	4	2024
JWA 18.1	1	2018	1	2018
Developmental Test V3.0	4	2018	1	2019
CPCE V3.0 IOTE	1	2019	1	2019
JWA 19.1	1	2019	1	2019
Fielding Decision V3.0	4	2019	4	2019
First Unit Equipped V3.0	4	2019	4	2019
CPCE V3.1 Design	2	2019	4	2019
CPCE V3.1 Development & Integration	4	2019	3	2021
Developmental Test V3.1	3	2021	4	2021
CPCE V3.1 Operatioal Test	4	2021	4	2021
Fielding Decision V3.1	2	2022	2	2022
CPCE V3.2 Design	3	2021	2	2022
CPCE V3.2 Development & Integration	2	2022	3	2024
Developmental Test V3.2	3	2024	4	2024
CPCE V3.2 Operational Test	4	2024	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EJ5: *MOUNTED COMPUTING ENVIRONMENT (MCE)*	-	16.271	19.166	12.664	-	12.664	18.600	7.496	8.211	6.376	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Operating Environment (COE) is an approved set of computing technologies and standards that enables secure and interoperable applications to be developed and executed rapidly across a variety of computing environments (i.e., server(s), client, mobile, sensors, and platform). The Mounted Computing Environment (MCE) is one of six computing environments under the COE, which provides standardization of end-user environments and enables streamlined deployment of new warfighting applications while leveraging existing hardware under the Joint Battle Command-Platform (JBC-P) program.

The Mounted Computing Environment supports the Army Network Modernization Strategy Line of Effort 2, Common Operating Environment by utilizing:
- Interoperable data, message, and waveforms
- Sensors and applications that enable operations across domains
- Integration with Joint C4ISR and strike capabilities

Requirements for the MCE are established in the Army Requirements Oversight Council (AROC)-approved COE Information Systems Initial Capability Document (IS ICD) and the Mounted Computing Environment Requirements Definition Package (RDP). FY20 funding provides the means to continue to manage and develop MCE in concert with the Army's future COE strategy.

Mounted Computing Environment RDT&E resources are used to improve and add software applications while JBC-P RDT&E is used to improve JBC-P hardware, network performance and add network resiliency.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Software Development	9.163	10.841	5.535	-	5.535
Description: Provides an integrated mission command capability across Platforms, through all echelons, that provides simplicity, intuitiveness, core services and applications, common look and feel, and warfighter functionality in the areas of Fires, Logistics, Intelligence, and Maneuver. Primary software development efforts include development of S/A functions and MC applications on a Common Geospatial solution [map], a user interface with "common look and feel", and common Data Services.					
FY 2019 Plans:					

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Focus is on integrating existing capability and enabling new capability development in preparation for 4QFY19 fielding of the COE. These responsibilities include continued development of software architecture in conjunction with CPCE, foundational infrastructure, test engineering, Map Based Planning, and Joint and Coalition Interoperability. ***FY 2020 Base Plans:*** Incorporate new capabilities into the MCE V3 COTS infrastructure, core utilities, backwards compatibility, and Warfighter Function (WfF) Applications into a holistic System of Systems and ensuring that those subsystems function together in accordance to program requirements and specifications. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Software development funding decreased to the level of prioritized capabilities to be provided in MCEv3.x.					
Title: Software/Systems Engineering ***Description:*** Perform Software/Systems Engineering in support of the development of MCE capabilities, applications, and services, to include, but not limited to, conducting engineering studies, software architecture development, system analyses, technical readiness assessments, technical interchange meetings/events, and development of related reports and other deliverables. Coordinate the development of common infrastructure components with the CPCE. ***FY 2019 Plans:*** Development of software architecture constructs to sustain and integrate existing capability and enable new capability development. System engineering expertise in support of COE baselines, focusing on hardware/ software integration, engineering, and development of common services across platforms. Includes planning and engineering of future MCE capabilities using COTS, i.e.: Common Authentication; performance characterization on different HW/SW configurations using Mounted Family of Computer Systems (MFoCS); and coordination of interoperability between external CEs. Continue design efforts, to include integration and lab based developmental and system of systems testing, specifically, GPS updates for platform, platform/sensor integration for platform, Risk Management Framework (RMF)/Information Assurance (IA) certification, C2IUL integration, wireless integration into platform, and the Hybrid Operating System. ***FY 2020 Base Plans:***	4.172	3.905	5.279	-	5.279

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
In FY20, MCE will continue software maturity, integration of 3rd party Program of Record (POR) applications onto the baseline software architecture, and platform integration onto the Army's platforms. MCE will also conduct experimentation with Army units in order to receive direct feedback from users of the MCE software. This feedback and unit experimentation will help shape the future software releases of MCE software to the Army. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Systems engineering funding increased to support level of capabilities to be developed in FY20.					
Title: Test and Evaluation ***Description:*** Test and evaluation efforts include the planning and conduct of combined Command Post/Mounted Computing Environment T&E events including Developmental Test, Software Acceptance Testing, Integration Events, Risk Reduction Events, and Initial Operational Test and Evaluation (IOT&E). ***FY 2019 Plans:*** In FY19, MCE will participate in formal Initial Operational Test & Evaluation (IOTE) after action reviews and adjudicate findings and observations from the formal test. Following IOTE, MCE will participate in Army Interoperability Certification (AIC) testing for certification of IERs via Army Mission Threads. ***FY 2020 Base Plans:*** In FY20, MCE will continue with Developmental Testing (DT) as we improve the current MCE software baseline and as we migrate existing and future 3rd party Programs of Record (POR) developed applications onto the common MCE software baseline. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Test requirements will decrease in FY20 since there are no planned major test events, but Developmental Testing will still occur.	1.912	2.730	0.400	-	0.400
Title: Program Management ***Description:*** Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and Integrated Project Teams. ***FY 2019 Plans:***	1.024	0.987	1.450	-	1.450

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Management and oversight funding to be transitioned to OMA funding. Technical Area support of this effort includes System Development and engineering changes to hardware, software, and network), System Analysis of Program of Record (PoR) systems and future systems, Technical Readiness Assessments, and Stakeholder Technical Interchange Meetings/Events. This support includes the creation and implementation of Functional Support Agreements between PM Mission Command and various Government support agencies such as the Army Research and Development Center (ARDEC) CECOM Research Development and Engineering Command (CERDEC), and other PEOs (e.g. PEO IEW&S). Program Management efforts in the FY19 timeframe will also include business area support to ensure funding and contracts are planned and available for all SW development, system engineering, and T&E efforts. ***FY 2020 Base Plans:*** Technical Area Contract support will continue for this effort which includes System Development and engineering changes to hardware, software, and network), System Analysis of Program of Record (PoR) systems and future systems, Technical Readiness Assessments, and Stakeholder Technical Interchange Meetings/Events. This support includes the creation and implementation of Functional Support Agreements between PM Mission Command and various Government support agencies such as the Army Research and Development Center (ARDEC) CECOM Research Development and Engineering Command (CERDEC), and other PEOs (e.g. PEO IEW&S). Program Management efforts in the FY20 timeframe will also include business area support to ensure funding and contracts are planned and available for all SW development, system engineering, and DT efforts. This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program Management requirements will need to increase from FY19 to FY20 to support development of MCE Software and integration of 3rd Party POR Applications onto the MCE Software and integration onto the Army's platforms.					
Title: FY2019 SBIR/STTR Transfer ***FY 2019 Plans:*** FY2019 SBIR/STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2019 SBIR/STTR Transfer	-	0.703	-	-	-
Accomplishments/Planned Programs Subtotals	16.271	19.166	12.664	-	12.664

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

MCE supports the Army's Common Operating Environment (COE), and will serve as the future software for Joint Battle Command - Platform (JBC-P). The JBC-P program provides the hardware and network, while JBC-P software will be replaced with MCE. Future development will continue to leverage JBC-P hardware and MCE software and integrate multiple warfighting systems into the platform (mounted) environment.

MCE is being developed over time, with the initial set of v3 Minimum Essential Capabilities (MECs) being delivered in 4QFY19. Subsequent deliveries of capabilities are expected on a 5 year cycle, in accordance with the AROC approved COE IS ICD. This cycle may be adjusted depending on many factors, including fielding priorities, effectiveness of backwards compatibility, and time required to develop and test new capabilities.

To accomplish the goals of the MCE, PEO C3T PM MC architects, designs, and develops the hardware, software, network solutions and capabilities required to achieve compliance with the COE. Primary systems architecture engineering is conducted by in-house Government engineering staff with contracted support, matrix elements and MITRE Corporation, a Federally Funded Research and Development Center. Test and Evaluation support is provided by in-house PM MC TMD staff, with support from contractor firms, for preparation and conduct of specific risk reduction events and test events. Developmental testing is being conducted by the software development teams with Government oversight and coordination. IOT&E efforts will be supported by the ATEC community. Hardware to support system architecture and software development is comprised of standardized equipment and is procured using existing contract vehicles such as Mounted Family of Computer Systems (MFoCS).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Support(Mixed support: Matrix; SETA Contractor)	Various	PM Mission Command : Aberdeen Proving Ground, MD	2.352	1.024		0.987		1.450		-		1.450	Continuing	Continuing	-
		Subtotal	2.352	1.024		0.987		1.450		-		1.450	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	PM Mission Cmd, Multiple Matrix Orgs and SW Dev Contractors : Aberdeen Proving Ground, MD	7.719	9.163		10.841		5.535		-		5.535	Continuing	Continuing	-
Software/Systems Engineering	Various	PM Mission Cmd, Multiple Matrix Orgs and SW Dev Contractors : Aberdeen Proving Ground, MD	15.023	4.172		3.905		5.279		-		5.279	Continuing	Continuing	-
FY2019 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.703		-		-		-	0.000	0.703	-
		Subtotal	22.742	13.335		15.449		10.814		-		10.814	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test, Evaluation and Integration	MIPR	Multiple Test Agencies; Multiple	3.078	1.912		2.730		0.400		-		0.400	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Locations : Aberdeen Proving Ground, MD													
		Subtotal	3.078	1.912		2.730		0.400		-		0.400	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	28.172	16.271		19.166		12.664		-		12.664	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

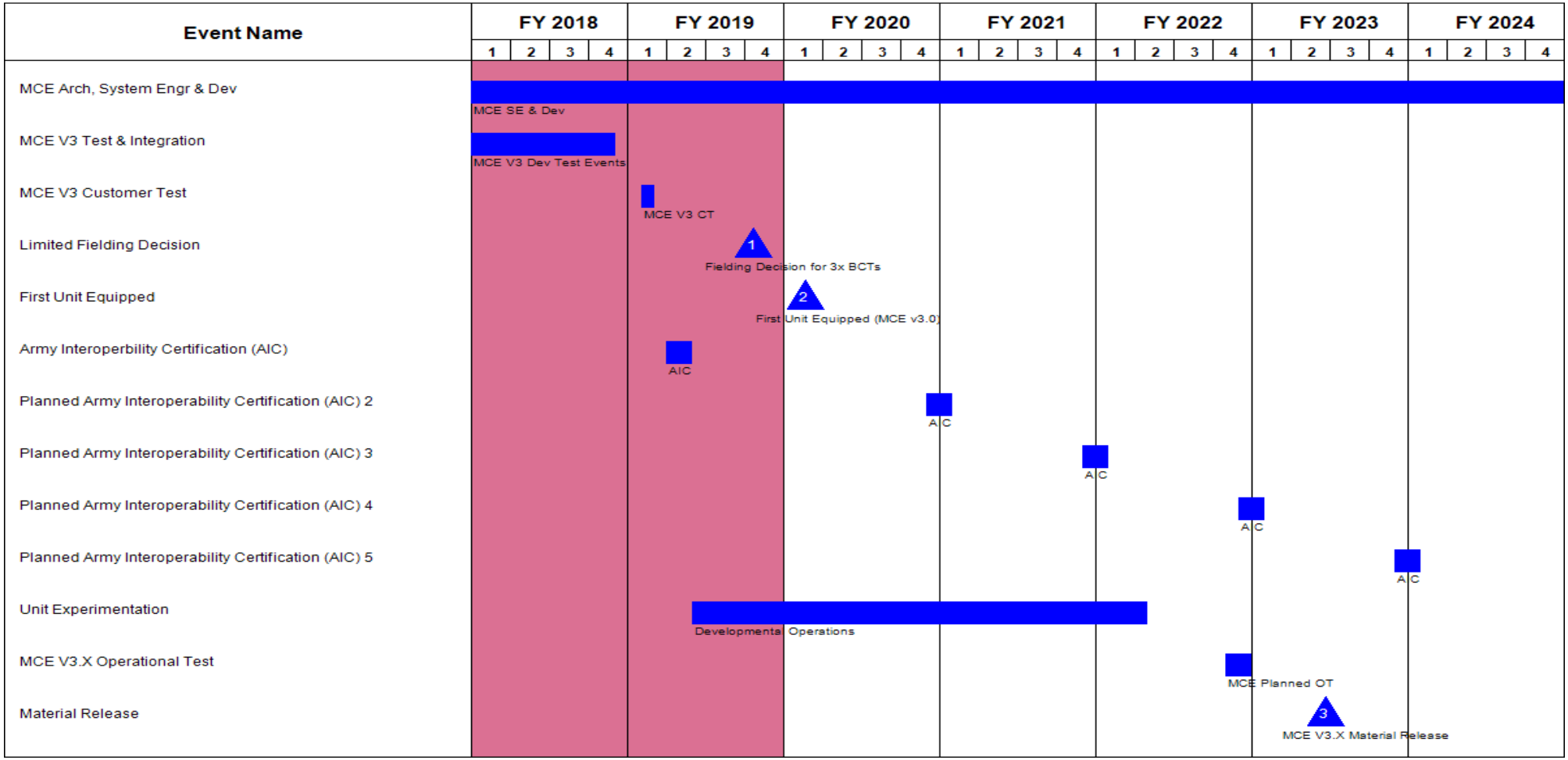

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

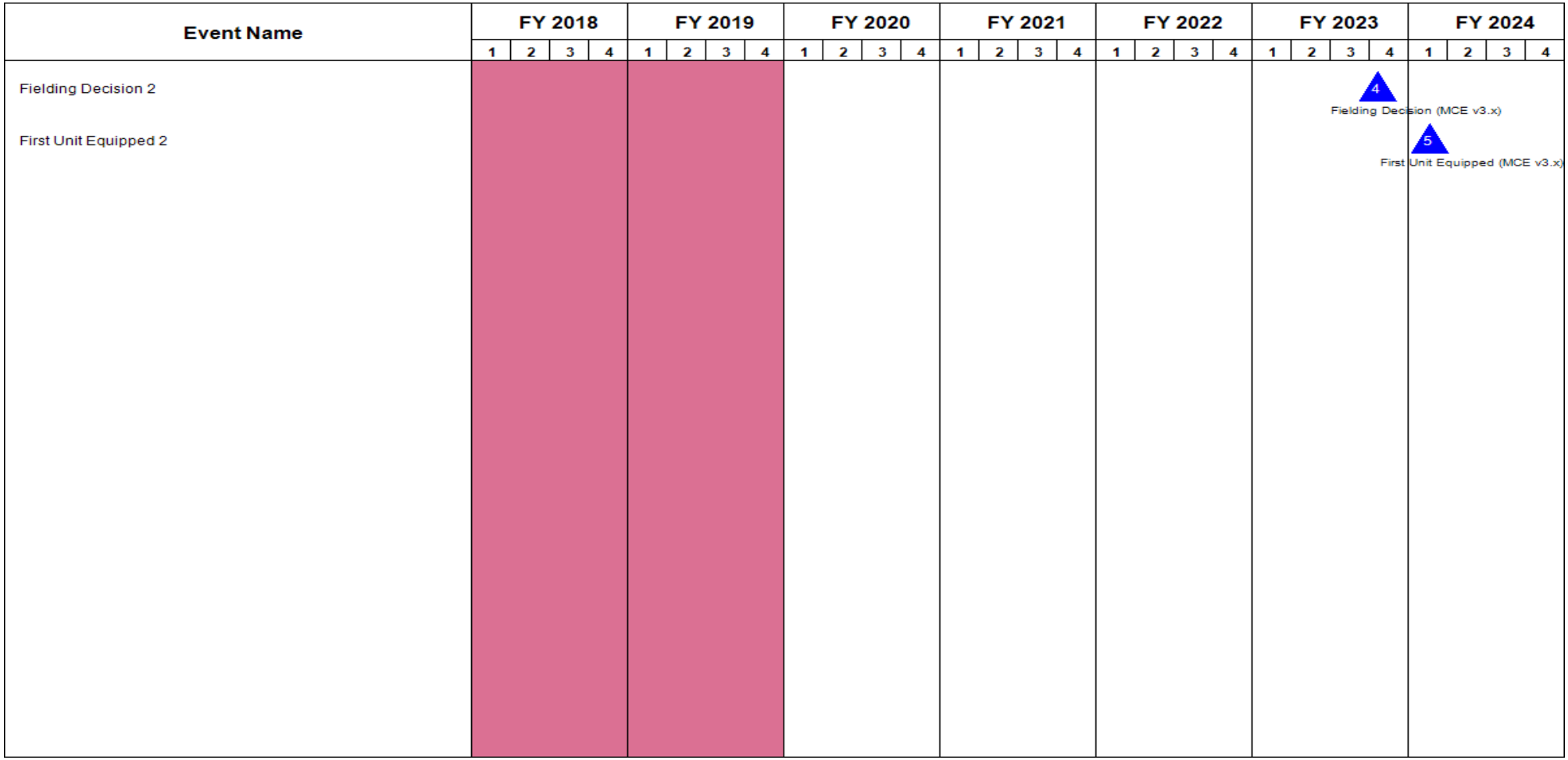

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MCE Arch, System Engr & Dev	4	2016	4	2024
MCE V3 Test & Integration	3	2017	4	2018
MCE V3 Customer Test	1	2019	1	2019
Limited Fielding Decision	4	2019	4	2019
First Unit Equipped	1	2020	1	2020
Army Interoperbility Certification (AIC)	2	2019	2	2019
Planned Army Interoperability Certification (AIC) 2	4	2020	1	2021
Planned Army Interoperability Certification (AIC) 3	4	2021	1	2022
Planned Army Interoperability Certification (AIC) 4	4	2022	1	2023
Planned Army Interoperability Certification (AIC) 5	4	2023	1	2024
Unit Experimentation	2	2019	2	2022
MCE V3.X Operational Test	4	2022	4	2022
Material Release	2	2023	2	2023
Fielding Decision 2	4	2023	4	2023
First Unit Equipped 2	1	2024	1	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EJ6 / *TACTICAL ENHANCEMENT*	

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
EJ6: *TACTICAL ENHANCEMENT*	-	25.000	17.851	1.853	-	1.853	2.868	0.000	0.000	0.000	0.000	47.572
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project EJ6, the Tactical Enhancement supports the Army's Network Modernization Strategy Line Of Effort (LOE) 1 - Unified Network

Tactical Enhancement supports the evaluation and testing requirements for Terrestrial Transmission (TRILOS) and Troposcatter Transmission (TROPO) capabilities procured and fielded under the Signal Modernization (SIGMOD) funding line, B00010. TRILOS and TROPO will provide redundancy communications in a Satellite denied environment by providing improved Line of Sight and beyond line of sight radio systems.

In addition this funding will support development of Network Centric Waveform-Resilient (NCW-R). NCW-R is a critical, near-term set of modifications to the current WIN-T SATCOM waveform that will provide limited protection against our adversaries' ability to jam tactical SATCOM Command and control communications on Wideband Global SATCOM (WGS) satellites. NCW-R will provide anti- jam capability and resiliency to WIN-T Program of Record satellite terminals in contested environments. The NCW-R waveform software will operate on WIN-T satellite modems. NCW-R will provide a bridging capability until the next generation protected satellite constellation is launched by the Air Force (projected FY28/29). The current anti-jam protection is limited to two SMART-T terminals per BCT, division and Corps HQs, leaving battalions vulnerable to being isolated during jamming events.

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

FY20 funds support NCW-R developmental testing effort to add a projected satellite communication capability to tactical network

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: IOT&E for TROPO systems	-	8.269	-	-	-
FY 2019 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ6 / *TACTICAL ENHANCEMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY19 $8.6M are needed for TROPO IOT&E testing. Due to production contract award date slip (Feb 2019) Operational Test is now planned for 3QFY20. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funds were moved to Protected AJ TACSAT line 173142/F18 to support future development of protected SATCOM.					
Title: Development of NCW-R ***FY 2019 Plans:*** $8.927are needed for NCW-R development. NCW-R is an improvement of the NCW waveform and provides a bridging Protected SATCOM capability for Army tactical formations until the Army and Air Force deploy the Protected Tactical Waveform (PTW) and its associated Infrastructure. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funds in FY20 & FY21 were moved to Protected SATCOM line (1713142.F18) for future development of protected satellite.	25.000	8.927	-	-	-
Title: Development Testing of NCW-R ***FY 2020 Base Plans:*** Development testing for NCW-R modem ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports development testing for NCW-R modem	-	-	1.853	-	1.853
Title: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer decrement of $655K	-	0.655	-	-	-
Accomplishments/Planned Programs Subtotals	25.000	17.851	1.853	-	1.853

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ6 / *TACTICAL ENHANCEMENT*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• B00010: *Signal Modernization Program*	280.944	82.180	153.933	-	153.933	174.041	190.207	224.490	221.457	0.000	1,327.252

Remarks

B00010 : OPA funding line for Signal Modernization (SIGMOD)

D. Acquisition Strategy

These funds will be used to conduct System Evaluation and Formal Testing of the various Signal Mod capabilities, specifically the TROPO and Terrestrial Transmission (TRILOS) systems. This is in order to facilitate integration into the WIN-T tactical networks. These test events will meet all mandatory testing requirements with full ATEC oversight. This Acquisition Strategy will integrate proven Commercial-Off-The-Shelf (COTS) capabilities into existing WIN-T nodes to expand and enhance network capacity and user access. The TROPO and TRILOS capabilities are acquired as ACAT III programs to replace legacy equipment in the field while utilizing DoDI 5000.02 standard acquisition approaches, starting with Milestone C Determination for TRILOS (3QFY17) and TROPO (4QFY18).

The Army will continue NCW-R development in FY19 and conduct developmental testing beginning in 2nd quarter FY20, followed by certification for operational use over Wideband Global SATCOM (WGS) satellites by Army Space and Missile Defense Command. The Army projects to begin fielding this improved, resilient, satellite communication waveform in 4th Quarter FY20.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EJ6 / *TACTICAL ENHANCEMENT*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NCW-R	SS/CPFF	CODES1403AALION SCIENCE AND TECHNOLOGY CORPORATION : 202BURR RIDGE IL 60527-0849FACILITY	1.500	25.000	Jul 2018	8.927	Jan 2019	-		-		-	0.000	35.427	-
		Subtotal	1.500	25.000		8.927		-		-		-	0.000	35.427	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.655	Jan 2019	-		-		-	0.000	0.655	-
		Subtotal	-	-		0.655		-		-		-	0.000	0.655	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TRILOS Testing	MIPR	ATEC : Aberdeen Proving Ground, MD	19.823	-		-		-		-		-	0.000	19.823	-
TROPO Testing	MIPR	ATEC : Aberdeen Proving Ground, MD	-	-		8.269	Nov 2019	-		-		-	0.000	8.269	-
NCW-R Testing	TBD	GTACS- contract - L3 : Aberdeen Proving Ground, MD	-	-		-		1.853	May 2020	-		1.853	0.000	1.853	-
		Subtotal	19.823	-		8.269		1.853		-		1.853	0.000	29.945	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EJ6 / *TACTICAL ENHANCEMENT*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.323	25.000		17.851		1.853		-		1.853	0.000	66.027	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ6 / *TACTICAL ENHANCEMENT*

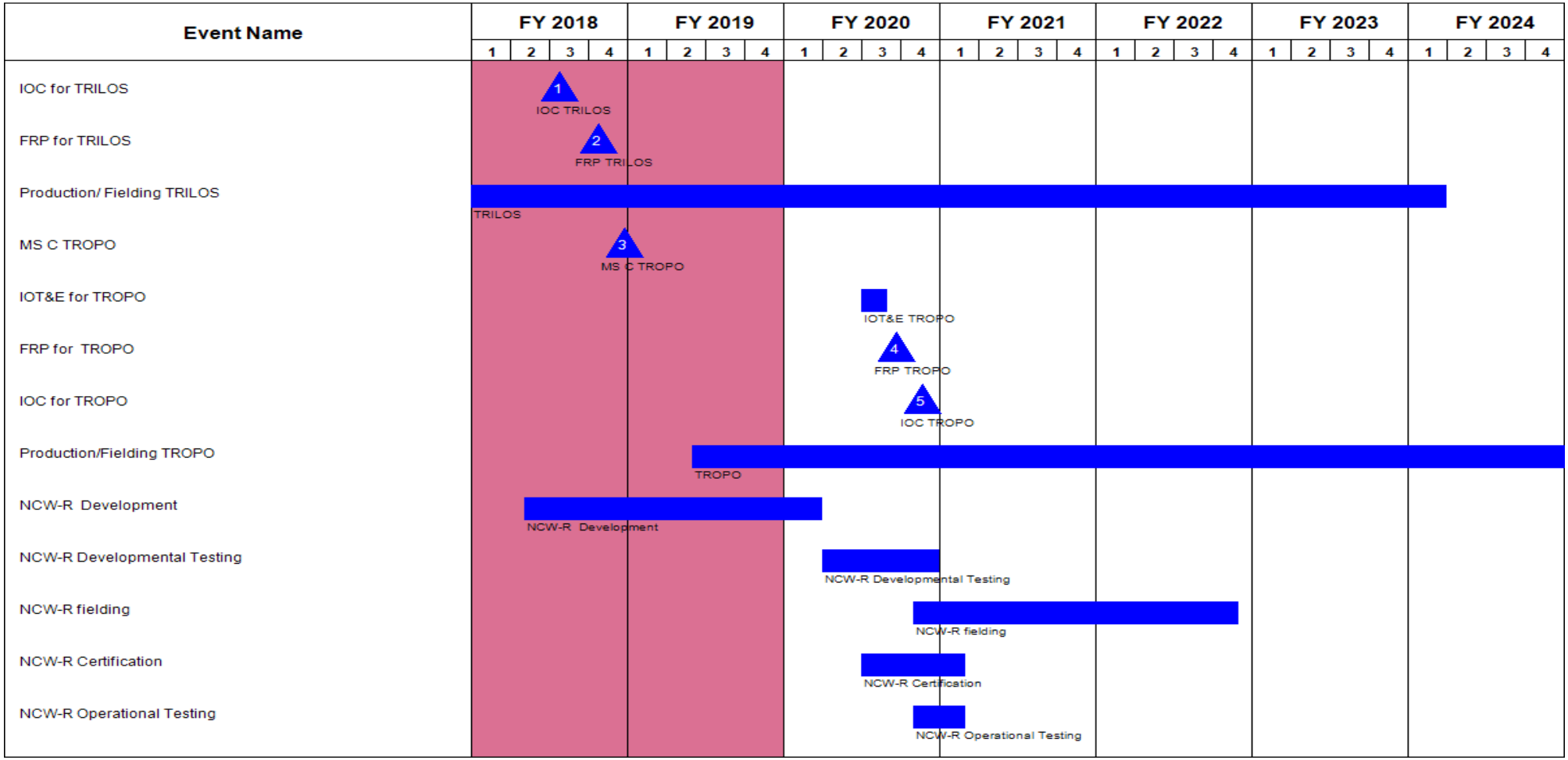

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ6 / *TACTICAL ENHANCEMENT*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BCT SUT for TS-SCI support (NIE 17.2)	4	2017	4	2017
IOT&E for TRILOS	4	2017	4	2017
IOC for TRILOS	3	2018	3	2018
FRP for TRILOS	4	2018	4	2018
Production/ Fielding TRILOS	4	2017	1	2024
MS C TROPO	4	2018	4	2018
IOT&E for TROPO	3	2020	3	2020
FRP for TROPO	3	2020	3	2020
IOC for TROPO	4	2020	4	2020
Production/Fielding TROPO	2	2019	2	2025
NCW-R Development	2	2018	1	2020
NCW-R Developmental Testing	2	2020	4	2020
NCW-R fielding	4	2020	4	2022
NCW-R Certification	3	2020	1	2021
NCW-R Operational Testing	4	2020	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*				Project (Number/Name) EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*			
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**
EK9: *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*	-	4.655	8.004	3.649	-	3.649	3.378	3.150	3.428	3.934	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Tactical Network Operations (NetOps) Management (TNOM) is the official nomenclature for the funding line.
Unified Network Operations (UNO) is the effort that the funding line funds.

A. Mission Description and Budget Item Justification

Line of Effort 1A: Unified Network (Tactical Network Operations (NetOps) Management (TNOM))

Unified Network Operations (UNO) will leverage MTA (Mid-Tier Acquisition) (Section 804) rapid prototyping efforts to develop UNO v1.0 via NetOps capabilities that build upon current efforts, expand those efforts to address CSA priorities, and include emerging capability requirements stemming from Network Cross Functional Team (CFT) initiatives and requirements.

UNO will operationally standardize, integrate, and simplify NetOps capabilities existing at the enterprise/strategic, operational, and tactical levels.

UNO will deliver an integrated Network Operations (NetOps) capability, based upon an open framework, aggregating data, which enables common planning, configuration, management, monitoring, and defense of the Network. This will be accomplished through the integration, co-hosting, and federation of multiple NetOps systems from the hand held devices to the Enterprise. UNO aligns with the Army's intent to develop NetOps prototypes, conduct DevOps, get user feedback, make adjustments and ultimately deliver enhanced capabilities to the operational force in the shortest time possible using what is available in industry or through other government agencies through an adapt and buy approach based on experimentation and demonstration.

FY20 funding will continue support of MTA (Mid-Tier Acquisition) (Section 804) rapid prototyping efforts of UNO v1.0 via capabilities that will be expanded upon based on Network CFT initiatives and directed requirements. UNO v1.0 will be comprised of Network Management, Integrated Planner, Radio Planner, and Federated Data Repository capabilities that utilize the try, buy, decide strategy put forth by Army leadership. The UNO Program Office Management will utilize FY20 funding in support of requisite planning, documentation, and management functions in support of rapid prototyping efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development	-	6.881	2.899	-	2.899

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Network Operations Development ***FY 2019 Plans:*** FY19 funding will establish MTA (Section 804) rapid prototyping efforts of UNO v1.0 via NetOps capabilities to address CSA priorities, and include emerging capability requirements stemming from Network CFT initiatives and requirements. Support delivering integrated capabilities to plan, install, operate, maintain, and secure the Army?s end-to-end network in support of the commander?s mission priorities. Capabilities UNO will expand based upon Network CFT initiatives and requirements are Network Management, Integrated Planner, Radio Planner, and Federated Data Repository utilizing the try, buy, decide strategy put forth by Army leadership. Development of UNO's Radio Planner capability provides the ability to plan and create configuration files as well as manage the latest Tactical radio elements of the Department of Defense Information Network ? Army (DoDIN-A) and monitoring focused on the status of mission network services effectivity. Development of the UNO's Network Management function will provide the ability to manage and troubleshoot the network elements that comprise the DoDIN-A, monitor a local node for network health status, performance, location, and security, in addition to displaying monitored data to the local operator. Management elements include, but are not limited to, the Command Post, Brigades, Echelons, etc. UNO's improvement of the Integrated Planner functionality allows NetOps capabilities to plan, manage and operate the Tactical Internet DoDIN-A with common operating picture, automate the planning functions and the resource management to support unit task organization, and interface with managers and monitors. Initial implementation of UNO's Federated Data Repository enables unit task reorganization (UTR) acting as the distributed data store for NetOps data and provide services that will be used by NetOps planning and management systems and a federated data store that operates over existing Army Tactical networks, typically characterized as a Disconnected, Intermittent and Bandwidth Limited (DIL) operating environment. ***FY 2020 Base Plans:*** FY20 funding will continue support of MTA (Section 804) rapid prototyping efforts of UNO v1.0 via NetOps capabilities to address CSA priorities, and include emerging capability requirements stemming from Network					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
CFT initiatives and requirements. Support delivering integrated capabilities to plan, install, operate, maintain, and secure the Army?s end-to-end network in support of the commander?s mission priorities. Capabilities UNO will expand based upon Network CFT initiatives and requirements are Network Management, Integrated Planner, Radio Planner, and Federated Data Repository utilizing the try, buy, decide strategy put forth by Army leadership. Development of UNO's Radio Planner capability provides the ability to plan and create configuration files as well as manage the latest Tactical radio elements of the Department of Defense Information Network ? Army (DoDIN-A) and monitoring focused on the status of mission network services effectivity. Development of the UNO's Network Management function will provide the ability to manage and troubleshoot the network elements that comprise the DoDIN-A, monitor a local node for network health status, performance, location, and security, in addition to displaying monitored data to the local operator. Management elements include, but are not limited to, the Command Post, Brigades, Echelons, etc. UNO's improvement of the Integrated Planner functionality allows NetOps capabilities to plan, manage and operate the Tactical Internet DoDIN-A with common operating picture, automate the planning functions and the resource management to support unit task organization, and interface with managers and monitors. Continued advancement of UNO's Federated Data Repository enables unit task reorganization (UTR) acting as the distributed data store for NetOps data and provide services that will be used by NetOps planning and management systems and a federated data store that operates over existing Army Tactical networks, typically characterized as a Disconnected, Intermittent and Bandwidth Limited (DIL) operating environment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The FY19 to FY20 decrease is due to a delay of approved requirements.					
Title: Management Services ***Description:*** Program Management Support ***FY 2019 Plans:*** FY19 funding will establish the UNO Program Office Management support of requisite planning, documentation, and management functions in support of rapid prototyping efforts.	-	0.750	0.750	-	0.750

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
The FY19 funding will allow the UNO Program Office Management the ability to adhere to all requisite policy and reporting functions associated with MTA (Section 804) programs. ***FY 2020 Base Plans:*** FY20 funding will continue support the UNO Program Office Management support of requisite planning, documentation, and management functions in support of rapid prototyping efforts. The FY20 funding will allow the UNO Program Office Management the ability to adhere to all requisite policy and reporting functions associated with MTA (Section 804) programs.					
Title: FY18 Congressional Rescission ***Description:*** All FY18 funding was declared excess due to funding ahead of need based on a lack of a validated requirement.	4.655	-	-	-	-
Title: FY19 SBIR/STTR Transfer ***FY 2019 Plans:*** FY19 SBIR/STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 accounts for SBIR/STTR Transfer	-	0.373	-	-	-
Accomplishments/Planned Programs Subtotals	4.655	8.004	3.649	-	3.649

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

UNO will leverage the MTA (Section 804) Rapid Prototyping acquisition strategy allowing for rapid prototyping of NetOps Solutions employing innovative technologies to demonstrate new Plan, Manage, Provision, and Secure Network capabilities that meet Army modernization and operational needs, CSA priorities, and emerging capability requirements stemming from Network Cross Functional Team (CFT) initiatives and requirements.

UNO will provide adequate experimentation and incorporate Soldier feedback to mitigate cost, schedule, and performance risks early in program lifecycle, receive analysis of technology/design maturity and component integration/interoperability, and provide requirement refinement.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*

The objective of the MTA (Section 804) will develop and deliver three prototypes into experimentation events for user feedback in FY20 (UNO v1.0), FY21 (UNO v1.1), and FY22 (UNO v1.2) within simulated operational environment(s) in order to provide operational capabilities in FY21 (UNO v1.0), FY22 (UNO v1.1), FY23 (UNO v1.2), within five years of the development of an approved requirement.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/TBD	Various : Various	-	-		0.750	Apr 2019	0.750		-		0.750	Continuing	Continuing	Continuing
		Subtotal	-	-		0.750		0.750		-		0.750	Continuing	Continuing	N/A

Remarks

Funding will support the UNO Program Office Management support of requisite planning, documentation, and management functions in support of rapid prototyping efforts, in addition to subsequent yearly fielding decisions. The funding will allow the UNO Program Office Management the ability to adhere to all requisite policy and reporting functions associated with MTA (Section 804) programs.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/TBD	TBD : TBD	-	-		6.881	Apr 2019	2.899		-		2.899	0.000	9.780	-
Fy19 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.373		-		-		-	0.000	0.373	-
		Subtotal	-	-		7.254		2.899		-		2.899	0.000	10.153	N/A

Remarks

Funding will support MTA (Section 804) rapid prototyping efforts of UNO via NetOps capabilities that build upon current efforts, expand those efforts to address CSA priorities, and include emerging capability requirements stemming from Network CFT initiatives and directed requirements. Support delivering integrated capabilities to plan, install, operate, maintain, and secure the Army's end-to-end network in support of the commander's mission priorities.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY18 Congressional Rescission	C/TBD	NA : NA	-	4.655		-		-		-		-	0.000	4.655	-
		Subtotal	-	4.655		-		-		-		-	0.000	4.655	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.655		8.004		3.649		-		3.649	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*

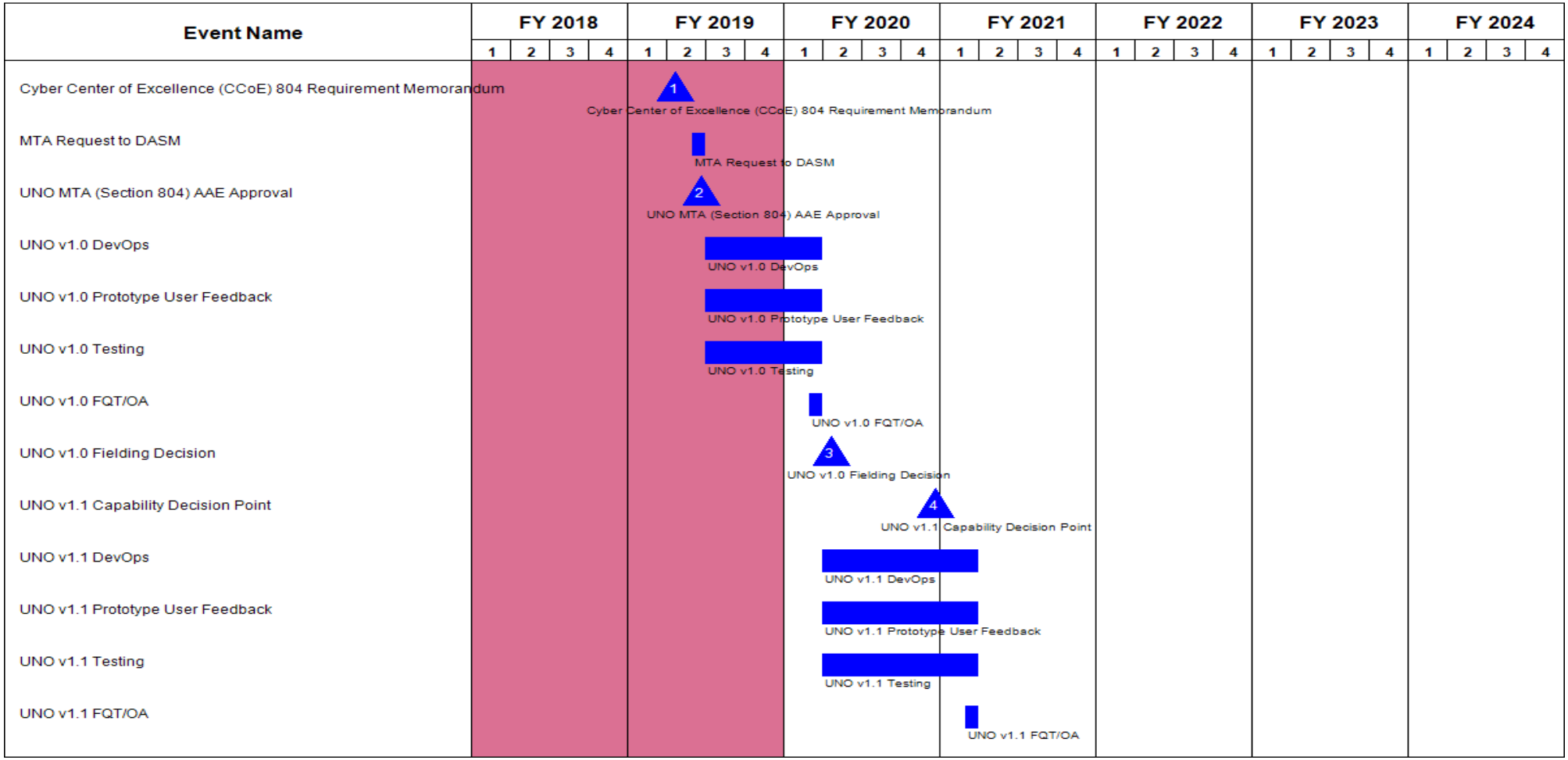

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*

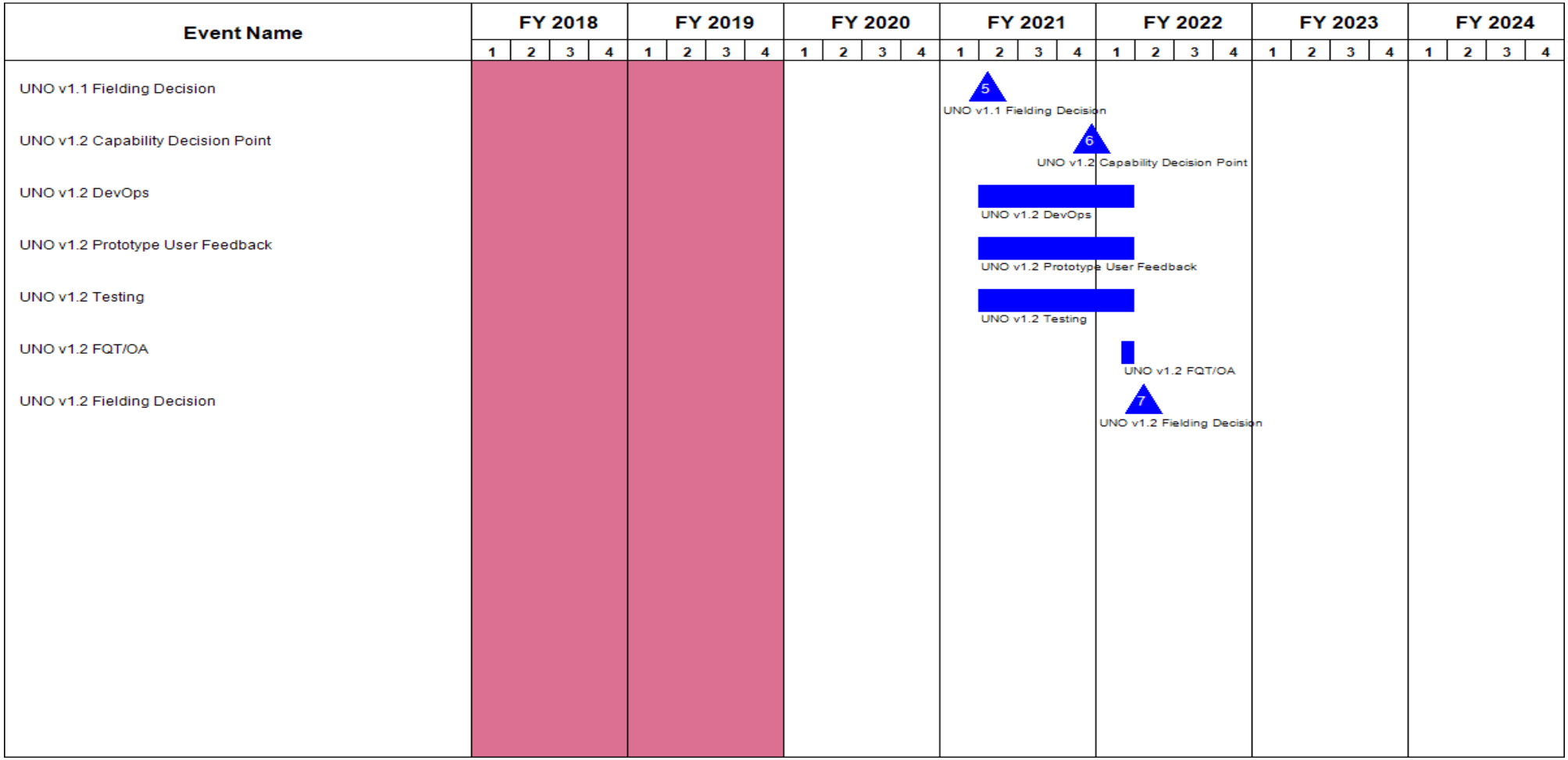

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Cyber Center of Excellence (CCoE) 804 Requirement Memorandum	2	2019	2	2019
MTA Request to DASM	2	2019	2	2019
UNO MTA (Section 804) AAE Approval	2	2019	2	2019
UNO v1.0 DevOps	3	2019	1	2020
UNO v1.0 Prototype User Feedback	3	2019	1	2020
UNO v1.0 Testing	3	2019	1	2020
UNO v1.0 FQT/OA	1	2020	1	2020
UNO v1.0 Fielding Decision	2	2020	2	2020
UNO v1.1 Capability Decision Point	4	2020	4	2020
UNO v1.1 DevOps	2	2020	1	2021
UNO v1.1 Prototype User Feedback	2	2020	1	2021
UNO v1.1 Testing	2	2020	1	2021
UNO v1.1 FQT/OA	1	2021	1	2021
UNO v1.1 Fielding Decision	2	2021	2	2021
UNO v1.2 Capability Decision Point	4	2021	4	2021
UNO v1.2 DevOps	2	2021	1	2022
UNO v1.2 Prototype User Feedback	2	2021	1	2022
UNO v1.2 Testing	2	2021	1	2022
UNO v1.2 FQT/OA	1	2022	1	2022
UNO v1.2 Fielding Decision	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EK9 / *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*

Note

Program projects MTA (Section 804) approval will support rapid prototyping efforts of UNO via NetOps capabilities that build upon current efforts, expand those efforts to address CSA priorities, and include emerging capability requirements stemming from Network Cross Functional Team (CFT) initiatives and directed requirements. Support delivering integrated capabilities to plan, install, operate, maintain, and secure the Army's end-to-end network in support of the commander's mission priorities. UNO's capabilities will expand on Network CFT initiatives and directed requirements are Network Management, Integrated Planner, Radio Planner, and Federated Data Repository utilizing the try, buy, decide strategy put forth by Army leadership.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army												Date: March 2019
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*				Project (Number/Name) EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*			
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**
EQ8: *Mobile/Handheld Computing Environment (M/HHCE)*	-	11.402	9.477	4.857	-	4.857	5.160	4.469	4.102	6.121	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project EQ8 - The Common Operating Environment (COE) is an approved set of computing technologies and standards that enables secure and interoperable applications to be developed and executed rapidly across a variety of computing environments. The Mobile/Handheld Computing Environment (M/HH CE) is one of the six computing environments under the COE, which provides the standards for all Army hand held applications enabling the use of common End User Devices by Soldiers, thereby eliminating redundant devices and reducing the Soldiers' load.

The M/HH CE supports the Army Network Modernization Strategy Line of Effort (LOE) 1 (Unified Network) and LOE 2 (Common Operating Environment) by utilizing (1) interoperable data, message, and waveforms, (2) sensors and applications that enable operations across domains and (3) integration with Joint C4ISR and strike capabilities. Nett Warrior (NW) complies with the technical standards documented by the M/HH CE and provides the dismounted common computational platform for other products relevant to dismounted Soldiers. Through compliance with the M/HH CE, software applications from other programs are integrated with the NW system, reducing the need for duplicate hardware and resulting in reduced Soldier Load. NW leverages commercial smart phone devices and secure Army tactical radios to provide the dismounted leader an integrated mission command and situational awareness for use during combat operations. NW applied feedback from conventional and Special Operations units to procure and implement Secure but Unclassified (SBU) networking equipment for Security Force Assistance Brigades to enable faster, more flexible Mission Command data exchanges with Joint and Coalition forces while maintaining the existing integrated mission command capability with Joint Battle Command Platform systems. NW uses Commercial-Off-The-Shelf (COTS) and Non Developmental (NDI) communications equipment to create a robust and flexible SBU network that enables faster and more accurate decision making in fights at the tactical level.

Requirements for the M/HH CE are established in the AROC approved COE Information Systems Initial Capability Document (IS ICD) and the draft M/HH CE Requirements Definition Package (RDP).

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Title: Test and Evaluation	2.139	1.971	1.009	-	1.009
Description: Test and Evaluation including annual Network Integration Evaluation (NIE) and Joint Warfighting Assessment (JWA) to gain Soldier feedback.					
FY 2019 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue NW test and 3rd party applications evaluation for technical verification at developmental test events and user verification. Conduct a planned Follow-on Test and Evaluation (FOT&E). Support NW as a baseline CIE and JWA system including: Brigade level support, equipping, training, and spares for NW; conduct yearly Army Interoperability Certification; environmental testing; and Information Assurance penetration prevention testing for new commercial smart devices, software and accessories. Support Army Expeditionary Warrior Experiment (AEWE) testing. ***FY 2020 Base Plans:*** Continue NW test and 3rd party applications evaluation for technical verification at developmental test events and user verification. Conduct a planned assessment of Integrated Tactical Network (ITN) in an IBCT. Support NW as a baseline NIE/JWA system including: Brigade level support, equipping, training, and spares for NW; conduct yearly Army Interoperability Certification; environmental testing; and Information Assurance penetration prevention testing for new commercial smart devices, software and accessories. Support Army Expeditionary Warrior Experiment (AEWE) testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Reduction from FY19 to FY20 based on completion of FOT&E in FY19.					
Title: Hardware and Software Integration and Evaluation for Capability Improvements	3.496	3.758	1.924	-	1.924
Description: Hardware and Software Integration and Evaluation for Capability Improvements ***FY 2019 Plans:*** Continue to evaluate next End User Devices (EUD) and associated hardware components to stay aligned with commercial and Army evolving requirements. Provide NW software / hardware updates to support incorporation of 3rd party applications onto NW EUD platform, Army Interoperability Certification (AIC) and cyber security testing. Support DARPA Squad X integration and transition. ***FY 2020 Base Plans:*** Continue to evaluate next End User Devices (EUD) and associated hardware components to stay aligned with commercial and Army evolving requirements. Provide NW software / hardware updates to support incorporation of 3rd party software applications onto NW EUD platform, Army Interoperability Certification (AIC) and cyber security testing. Support DARPA Squad X integration and transition. Update software to M/HH CE standards					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
as revised to maintain compliance with COE. Continue integration of Cyber Electromagnetic Activities (CEMA) capability into the NW system to support EW threat detections and location finding. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Reduction from FY19 to FY20 based on fewer third party applications to integrate.					
Title: Software Development & Integration ***Description:*** Funding is provided for the following efforts. ***FY 2019 Plans:*** Continue to evaluate next generation NW map engine and Operating System (OS) trade studies and assured Position, Navigation and Timing (PNT) software development efforts with NW. Update NW Software Development Kit (SDK) with new functionality. Continue incorporating the Army?s Common Operating Environment (COE) 3.0 Cross-Cutting Capabilities into NW software. Continue development of NW?s next generation Service Oriented Architecture. ***FY 2020 Base Plans:*** Continue to evaluate next generation NW map engine and Operating System (OS) trade studies and Assured Position, Navigation and Timing (PNT) software development efforts with NW. Update NW Software Development Kit (SDK) with new functionality. Continue software upgrades to ITN component software based on security and operational requirements. Continue incorporating the Army's Common Operating Environment (COE) 3.0 Cross-Cutting Capabilities into NW software. Continue development of NW's next generation Service Oriented Architecture. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Reduction from FY19 to FY20 based on fewer third party applications to integrate.	2.744	1.002	0.513	-	0.513
Title: Conduct SEPM Support to NW ***Description:*** Conduct Systems Engineering and Program Management Support to Nett Warrior ***FY 2019 Plans:*** Continue to conduct government systems / software engineering and program management support for NW program. Will collect input from Soldiers to improve NW size, weight, power, fightability, safety and effectiveness via surveys. Will manage system configuration, and execute test, development and integration planning	2.251	1.727	1.068	-	1.068

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
including investigation and analysis of emerging innovative commercial technologies to lower the size, weight, power, cost, and increase Nett Warrior functionality. ***FY 2020 Base Plans:*** Continue to conduct government systems / software engineering and program management support for NW program. Will collect input from Soldiers to improve NW size, weight, power, fightability, safety and effectiveness via surveys. Will manage system configuration, and execute test, development and integration planning including investigation and analysis of emerging innovative commercial technologies to reduce the size, weight, power, cost, increase NW and ITN functionality. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Reduction from FY19 to FY20 based on fewer third party applications to integrate.					
Title: MHHCE Governance ***FY 2019 Plans:*** Continue to provide Mobile Handheld Computing Environment (MHH/CE) governance and standards development for external program integration to eliminate separate handheld devices and reduce Soldier load. ***FY 2020 Base Plans:*** Continue to provide Mobile Handheld Computing Environment (MHH/CE) governance and standards development for external program integration to eliminate separate handheld devices and reduce Soldier load. Maintain compliance with overarching COE standards. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Reduction from FY19 to FY20 based on fewer third party applications to integrate.	0.772	0.672	0.343	-	0.343
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	-	0.347	-	-	-
Accomplishments/Planned Programs Subtotals	11.402	9.477	4.857	-	4.857

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• R80501: *Ground Soldier System*	135.768	36.506	111.955	1.760	113.715	156.860	182.214	185.487	188.819	0.000	999.369

Remarks

D. Acquisition Strategy

To capitalize on commercial industry's investment in advanced smart device technology as well as innovation and changes within Army, NW requires annual RDT&E funding for integration and evaluation of new technology. Through this process and at low cost, the Army is able to integrate and evaluate for combat utility the hundreds of millions spent in product development by the major commercial device manufactures. The Nett Warrior (NW) program provides situational awareness and mission command to dismounted combat leaders through a secure commercial smart device, power source, cables and the Integrated Tactical Network. NW funds development and evaluation of new technology and software integration through a combination of competitively awarded contracts. Various existing follow on procurement contracts are utilized to procure a combination of COTs and GOTs NW equipment to include supporting services. NW program completed LRIP/MS C in 2012 followed by two LRIP decisions in 2013-14 in preparation for IOT&E under DOT&E oversight in 4QFY14- 1QFY15. This IOT&E event led to an additional NW Low Rate Initial Production (LRIP) decision in 2015 and a Full Rate Production Decision in FY17. Now in production, NW aggressively seeks operational feedback and, using the DevOps process, identifies and implements capability improvements.

E. Performance Metrics

N/A

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering & Program Management Support	Various	Various : Various	2.405	2.251		1.727		1.411		-		1.411	Continuing	Continuing	-
		Subtotal	2.405	2.251		1.727		1.411		-		1.411	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware/Software Integration & Evaluation	Various	Various : Various	4.323	3.496		3.578		1.924		-		1.924	Continuing	Continuing	-
Soldier Borne Sensor	MIPR	Various : Various	7.500	0.772		1.752		-		-		-	0.000	10.024	-
		Subtotal	11.823	4.268		5.330		1.924		-		1.924	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development and Integration	Various	Various : Various	1.333	2.744		1.002		0.513		-		0.513	Continuing	Continuing	-
FY2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.347		-		-		-	0.000	0.347	-
		Subtotal	1.333	2.744		1.349		0.513		-		0.513	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Various Testing Organizations	Various	Various : Various	2.119	2.139		1.071		1.009		-		1.009	Continuing	Continuing	-
		Subtotal	2.119	2.139		1.071		1.009		-		1.009	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	17.680	11.402		9.477		4.857		-		4.857	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

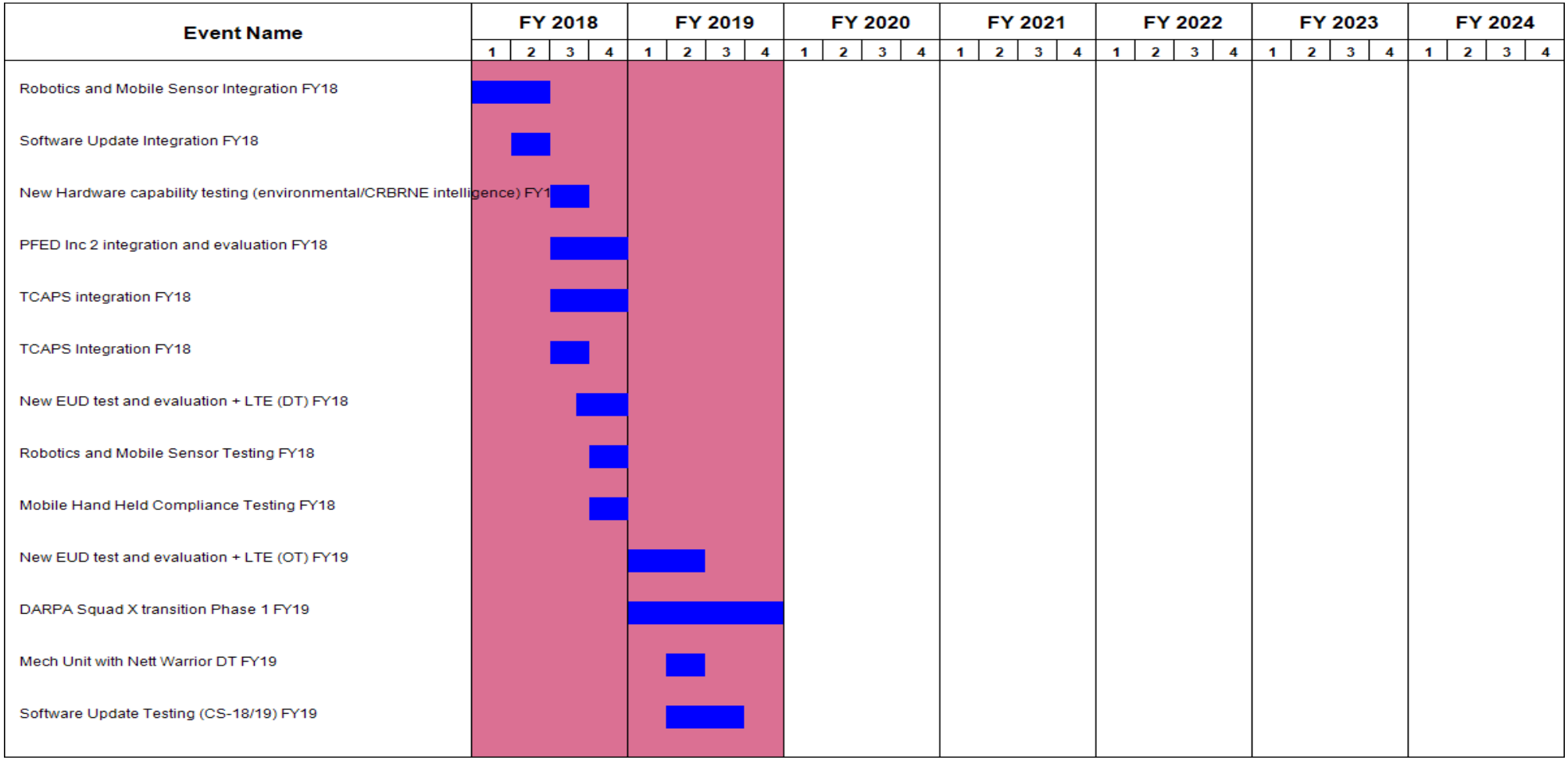

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

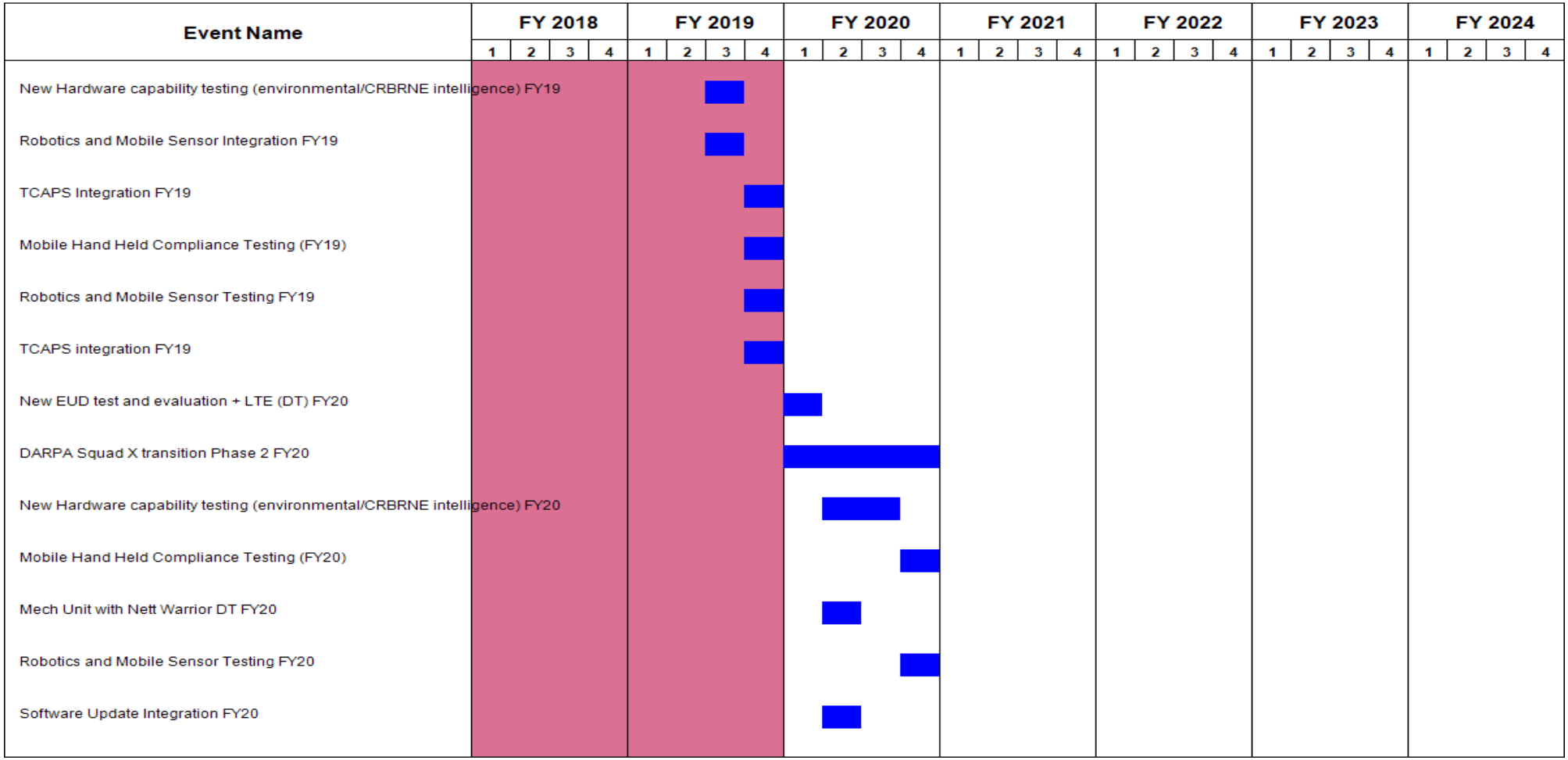

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

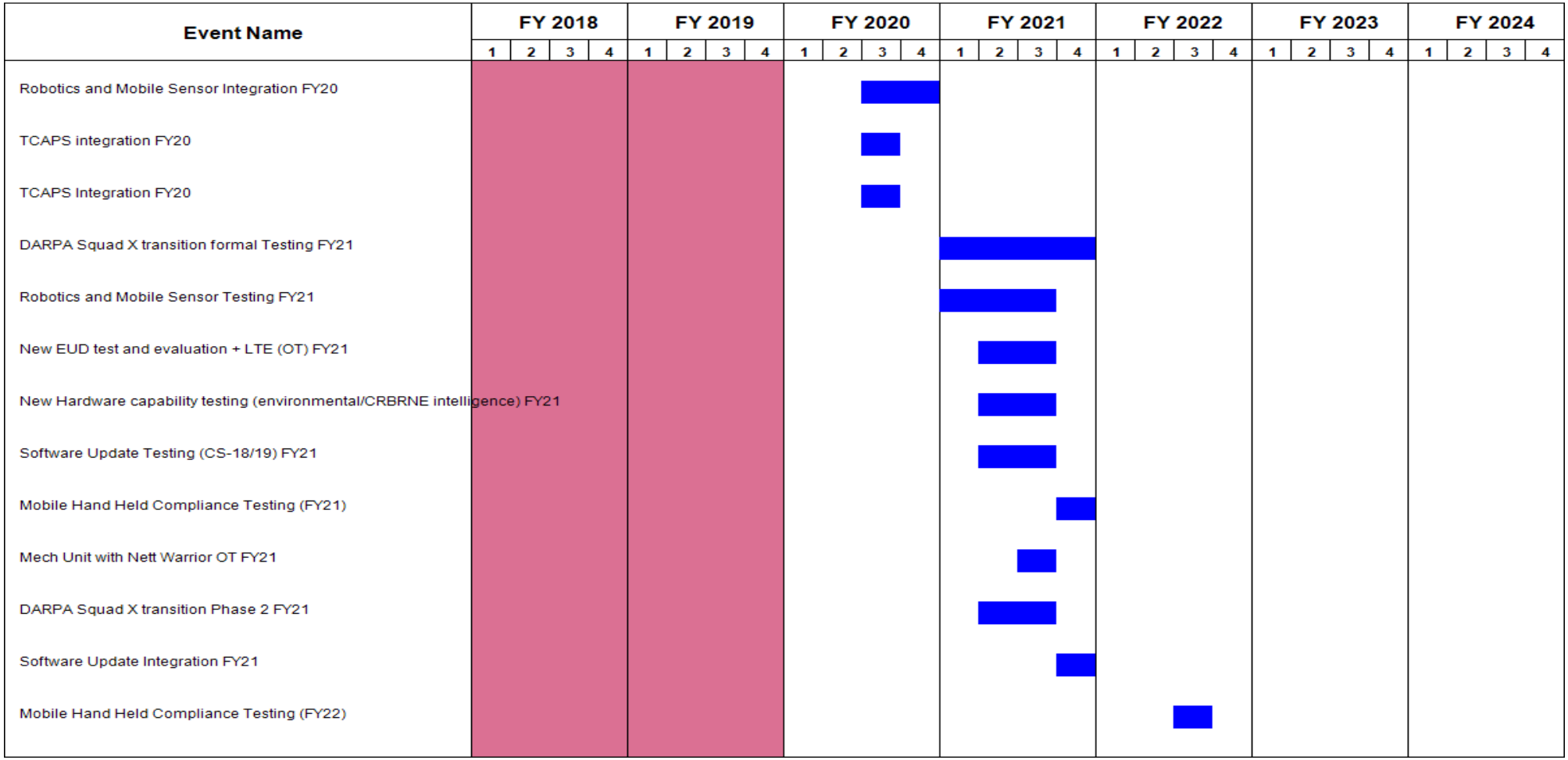

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

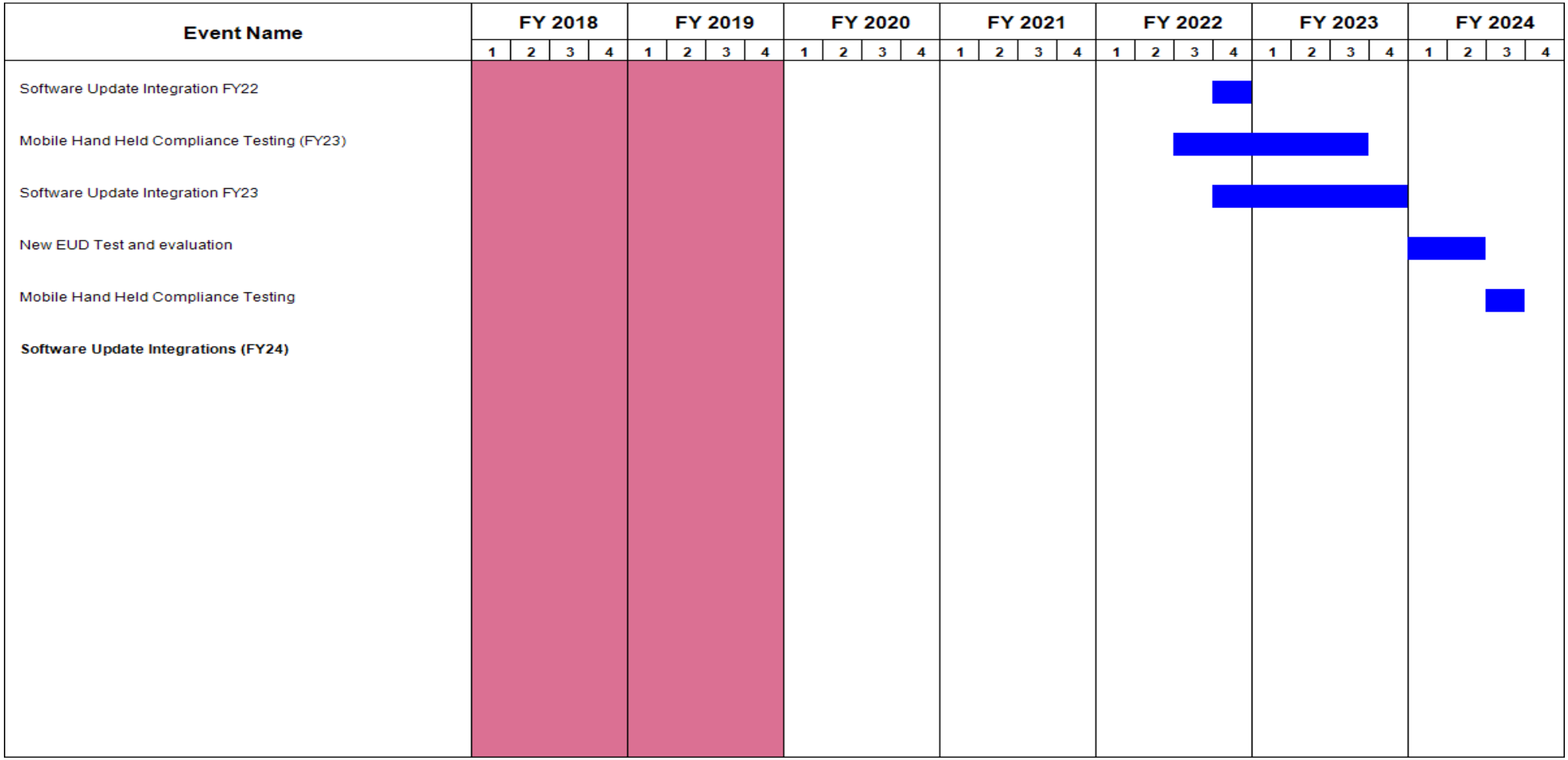

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

Schedule Details

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

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Mobile Hand Held Compliance Testing (FY19)	4	2019	4	2019
Robotics and Mobile Sensor Testing FY19	4	2019	4	2019
TCAPS integration FY19	4	2019	4	2019
New EUD test and evaluation + LTE (DT) FY20	1	2020	1	2020
DARPA Squad X transition Phase 2 FY20	1	2020	4	2020
New Hardware capability testing (environmental/CRBRNE intelligence) FY20	2	2020	3	2020
Mobile Hand Held Compliance Testing (FY20)	4	2020	4	2020
Mech Unit with Nett Warrior DT FY20	2	2020	2	2020
Robotics and Mobile Sensor Testing FY20	4	2020	4	2020
Software Update Integration FY20	2	2020	2	2020
Robotics and Mobile Sensor Integration FY20	3	2020	4	2020
TCAPS integration FY20	3	2020	3	2020
TCAPS Integration FY20	3	2020	3	2020
DARPA Squad X transition formal Testing FY21	1	2021	4	2021
Robotics and Mobile Sensor Testing FY21	1	2021	3	2021
New EUD test and evaluation + LTE (OT) FY21	2	2021	3	2021
New Hardware capability testing (environmental/CRBRNE intelligence) FY21	2	2021	3	2021
Software Update Testing (CS-18/19) FY21	2	2021	3	2021
Mobile Hand Held Compliance Testing (FY21)	4	2021	4	2021
Mech Unit with Nett Warrior OT FY21	3	2021	3	2021
DARPA Squad X transition Phase 2 FY21	2	2021	3	2021
Software Update Integration FY21	4	2021	4	2021
Mobile Hand Held Compliance Testing (FY22)	3	2022	3	2022
Software Update Integration FY22	4	2022	4	2022
Mobile Hand Held Compliance Testing (FY23)	3	2022	3	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Software Update Integration FY23	4	2022	4	2023
New EUD Test and evaluation	1	2024	2	2024
Mobile Hand Held Compliance Testing	3	2024	3	2024
Software Update Integrations (FY24)	3	2024	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*				Project (Number/Name) ER9 / *Expeditionary Army Command Post*			
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**
ER9: *Expeditionary Army Command Post*	-	9.601	34.642	35.505	-	35.505	33.493	23.246	20.107	10.007	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Expeditionary Army Command Post funding line supports the Army Network Modernization Strategy Line of Effort 4: Command Post

The Command Post initiative is to implement capabilities that enable the Army to employ command posts across the operational spectrum, from early entry to major combat operations, and that resolve current issues with set up and tear down, survivability, mobility, suitability and footprint. This Line of Effort (LOE) will focus on developing and obtaining approval of requirements for integrated command posts, then delivering these integrated command post designs to Army units.

The CPI2 program addresses the requirements for more mobile, scalable, interoperable, and agile command posts. Current stationary command posts are deemed too large and take too long to setup and teardown making them vulnerable to near peer detection and targeting technologies. By integrating mission command warfighting functions on to formation appropriate vehicle platforms, a dispersed command post construct will enable the battle staff to blend in with the overall maneuver formation while giving the commander the ability to synchronize the close fight on the move. This dispersed mobile command post consists of Mission Command Platforms (MCPs) and Command Post Support Vehicles (CPSVs). The MCP is a formation appropriate vehicle that provides digital workstations for all mission command warfighting functions. The CPSV is the hub of the dispersed command post; it hosts mission command servers, radios, local area network components and a secure wireless capability.

The CPI2 Materiel Development Decision Acquisition Decision Memorandum was signed on 21 June 2018 and directs CPI2 to be executed in a two increment approach. Increment 1 will develop capabilities to address needs identified in the signed Command Post (CP) Directed Requirement (DR) while Increment 2 will execute requirements as identified in the emerging CPI2 Capability Development Document (CDD). Using the buy, try, assess, and decide improved acquisition model which leverages user experimentation to inform follow on program requirements, Increment 1 will prototype and integrate available commercial off the shelf and government programs of record (PORs) that provide mission command and communications functions within the command post. Subsequently, CPI2 will initiate Increment 2 based on an emerging CDD to replace legacy command post systems at Corps, Division, Brigade Combat Teams (BCT) and their subordinate Battalion formations.

FY20 funding provides for the design engineering, prototype manufacturing, and integration efforts for BCTs, with a government solution for First Unit Equipped and an industry solution for the following BCTs. FY20 funding also delivers an experimental Mobile Command Group formation to 1 Corps/Division. Funding includes obtaining the required MCP/CPSV vehicle platforms and Command Post infrastructure systems. In FY20, CPI2 will conduct several training and test events that will provide user assessments on all experimental solutions to inform future design updates and program requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** ER9 / *Expeditionary Army Command Post*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development ***Description:*** Includes the costs for design/integration/fabrication and prototyping efforts to address capability gaps identified in current Army command post formations. Costs include ancillary items and platform requirements. ***FY 2019 Plans:*** Product Development supports Phase 2 of the Command Post Directed Requirement for acquiring select platforms and ancillary items for System Design, Prototyping, Platform Integration, Assembly for Mission Command Platform (MCP) and Command Post Support Vehicle (CPSV) for 2 Brigade Combat Teams (BCT's). This efforts funding will be executed by Program Executive Office Command, Control, Communications - Tactical. ***FY 2020 Base Plans:*** Product Development continues efforts initiated in FY19 for System Design, Development Engineering and Platform Integration/Assembly to achieve delivery of Brigade Combat Teams (BCT's) in FY20. Product Development also delivers an experimental Mobile Command Group formation to 1 Corps/Division. Includes engineering and prototyping fixes following user assessments to inform the future CPI2 solutions. This efforts funding will be executed by Program Executive Office Command, Control, Communications Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Government furnished equipment procured in FY19 was one time purchase.	9.601	29.852	25.705	-	25.705
Title: Systems Test and Evaluation ***Description:*** Costs required for test activities to inform CPI2 solution set. ***FY 2020 Base Plans:*** Includes costs for test events in FY20 for Developmental test (DT), Operational Assessment (OA) and Early User Tests (EUT) to obtain user feedback from selected units to inform future manufacturing/prototyping designs. This efforts funding will be executed by Program Executive Office Command, Control, Communications - Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Test events not conducted in prior year.	-	-	4.000	-	4.000
Title: Program Office Management	-	3.200	3.300	-	3.300

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** ER9 / *Expeditionary Army Command Post*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Contractor/Matrix Labor support and program travel. ***FY 2019 Plans:*** Contract and Matrix personnel to support CPI2 in achieving mission requirements to include managing simultaneous design/prototyping efforts being pursued by both government and industry with goal of delivery 2 Brigade Combat Teams (BCT) in FY20. This efforts funding will be executed by Program Executive Office Command, Control, Communications - Tactical. ***FY 2020 Base Plans:*** Contract and Matrix personnel to support CPI2 in achieving mission requirements to include managing multiple design/prototyping efforts, test events and training. This efforts funding will be executed by Program Executive Office Command, Control, Communications - Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta is driven by inflation.					
Title: Support Costs ***Description:*** Program costs for training and development of data packages. ***FY 2020 Base Plans:*** Supports development of data packages and New Equipment Training (NET) for planned fielding's in FY20. This efforts funding will be executed by Program Executive Office Command, Control, Communications - Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Costs tied to fielding solutions with 2 BCT not delivered in prior year.	-	-	2.500	-	2.500
Title: FY19 SBIR / STTR Transfer ***FY 2019 Plans:*** FY19 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 SBIR / STTR Transfer	-	1.590	-	-	-
Accomplishments/Planned Programs Subtotals	9.601	34.642	35.505	-	35.505

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** ER9 / *Expeditionary Army Command Post*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• B29801: *CPI2*	-	2.855	0.000	-	0.000	50.000	50.000	50.000	50.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

CPI2 Increment 1 will work with the government and with industry to capitalize on their experiences with mobile Command Posts to perform risk reduction events on experimental solutions for the Command Post Support Vehicle and Mission Command Platform as outlined in the Command Post Directed Requirement (DR).

CPI2 will develop the first BCT set through experimentation conducted at Research, Development, Engineering, Command (RDECOM) via a Functional Support Agreement (FSA) for the First Unit Equipped (FUE) for BCT #1. Additionally, CPI2 will leverage industry advancements and innovation using full and open competition with the C5SIR Other Transaction Authority (OTA) to design and prototype the MCP/CPSV for the second BCT set. Finally, CPI2 will deliver an experimental Mobile Command Group formation to 1 Corps/Division. FY20 will culminate with test events on all prototype designs, leading to a Milestone C in FY21 to select the Command Post (CP) solution set for fielding the remaining 3 BCTs and 1 Corps/Division identified in the CP DR.

The CPI2 Capability Development Document (CDD) is projected to re-enter JCIDS staffing in FY19, which will specify the requirements for the CPI2 Increment 2. Increment 2 will execute a competitive contract award planned based on Request For Proposal (RFP) responses and source selection process. This contract is projected to be a 5 year Firm Fixed Priced/Cost Plus Fixed Fee (FFP/CPFF) contract for the design, engineering, prototyping, Developmental Test (DT), New Equipment Training (NET), one Limited User Test (LUT), and one Operational Test (OT) which will encompass CPI2 variants at Corps, Division, and Brigade and Battalion echelons with Option Years for production.

Where needed, CPI2 will leverage existing contracts managed by Project Manager (PM) Joint Light Tactical Vehicle (JLTV), Project Manager (PM) Armored Multi-Purpose Vehicle (AMPV) and Project Manager (PM) Stryker Brigade Combat Team (SBCT) for integration efforts associated with their respective platforms.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) ER9 / *Expeditionary Army Command Post*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Management	WR	Various : Aberdeen Proving Ground MD	-	0.108		3.200	Oct 2018	3.300	Oct 2019	-		3.300	Continuing	Continuing	Continuing
		Subtotal	-	0.108		3.200		3.300		-		3.300	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ISO Containers	C/IDIQ	BERG : TBD	-	9.493	Jul 2018	-		-		-		-	0.000	9.493	-
BCT 1 Design/Fabrication/ Integration	MIPR	CERDEC-PIF : Aberdeen Proving Ground, MD	-	-		8.852	Feb 2019	10.300	Oct 2019	-		10.300	Continuing	Continuing	-
BCT 2 Design/Fabrication/ Integration	C/FFP	TBD : TBD	-	-		9.500	Jun 2019	14.905	Oct 2019	-		14.905	Continuing	Continuing	-
Platforms	MIPR	PD Medium Tactical Vehicles : Warren, Michigan	-	-		7.000	Feb 2019	-		-		-	0.000	7.000	-
Ancillary Items	MIPR	Various : Various	-	-		4.000	Feb 2019	-		-		-	0.000	4.000	-
MCG Experimentation	MIPR	TBD : TBD	-	-		0.500	Mar 2019	0.500	Oct 2019	-		0.500	0.000	1.000	-
FY19 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		1.590		-		-		-	0.000	1.590	-
		Subtotal	-	9.493		31.442		25.705		-		25.705	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tech Manuals/ Training Development Packages,ECPs	TBD	TBD : TBD	-	-		-		2.500	Oct 2019	-		2.500	Continuing	Continuing	-
		Subtotal	-	-		-		2.500		-		2.500	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) ER9 / *Expeditionary Army Command Post*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Test and Evaluation	MIPR	ATEC/TCM MC : Various	-	-		-		4.000	Mar 2020	-		4.000	0.000	4.000	-
		Subtotal	-	-		-		4.000		-		4.000	0.000	4.000	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	9.601		34.642		35.505		-		35.505	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** ER9 / *Expeditionary Army Command Post*

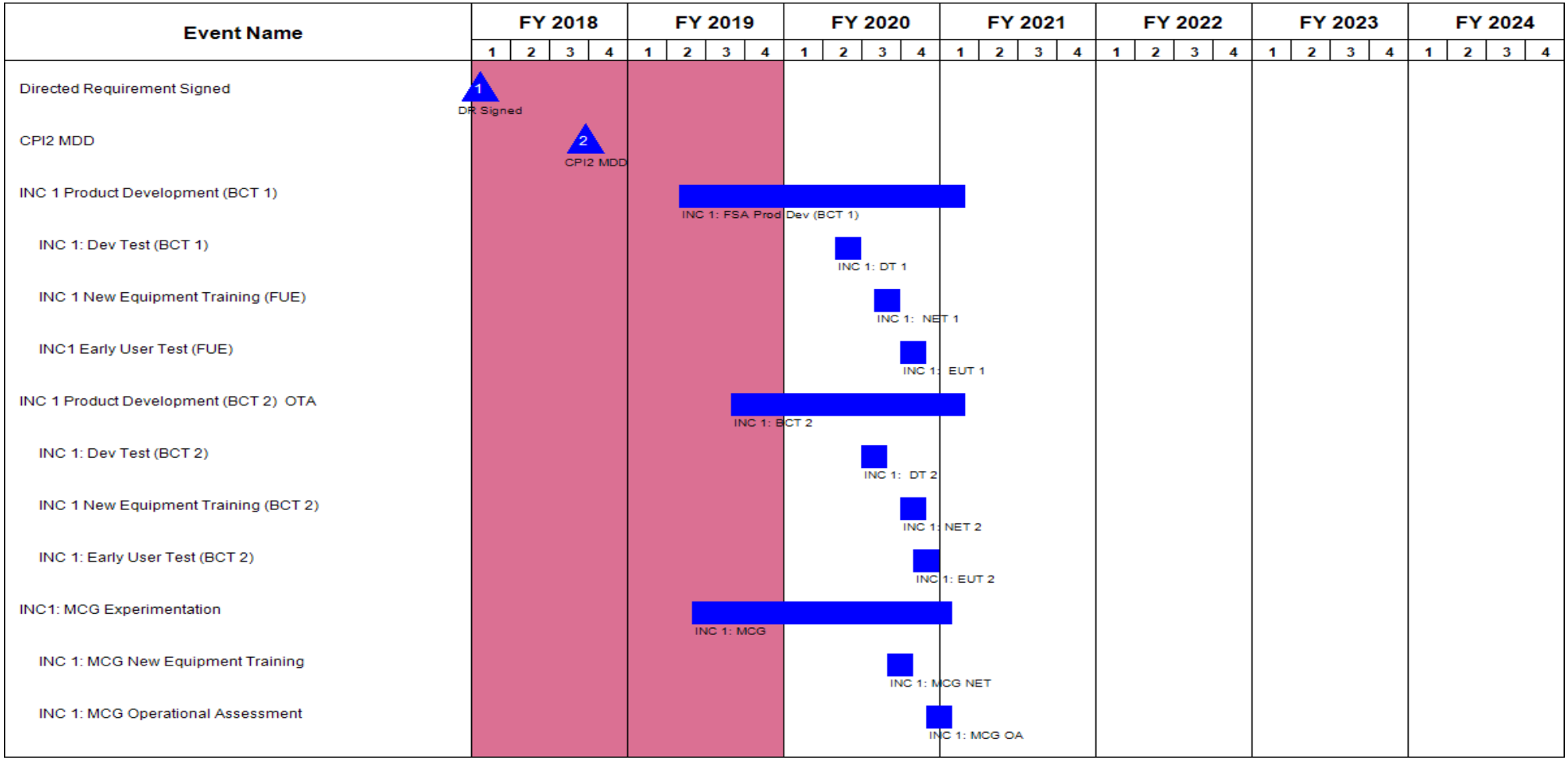

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** ER9 / *Expeditionary Army Command Post*

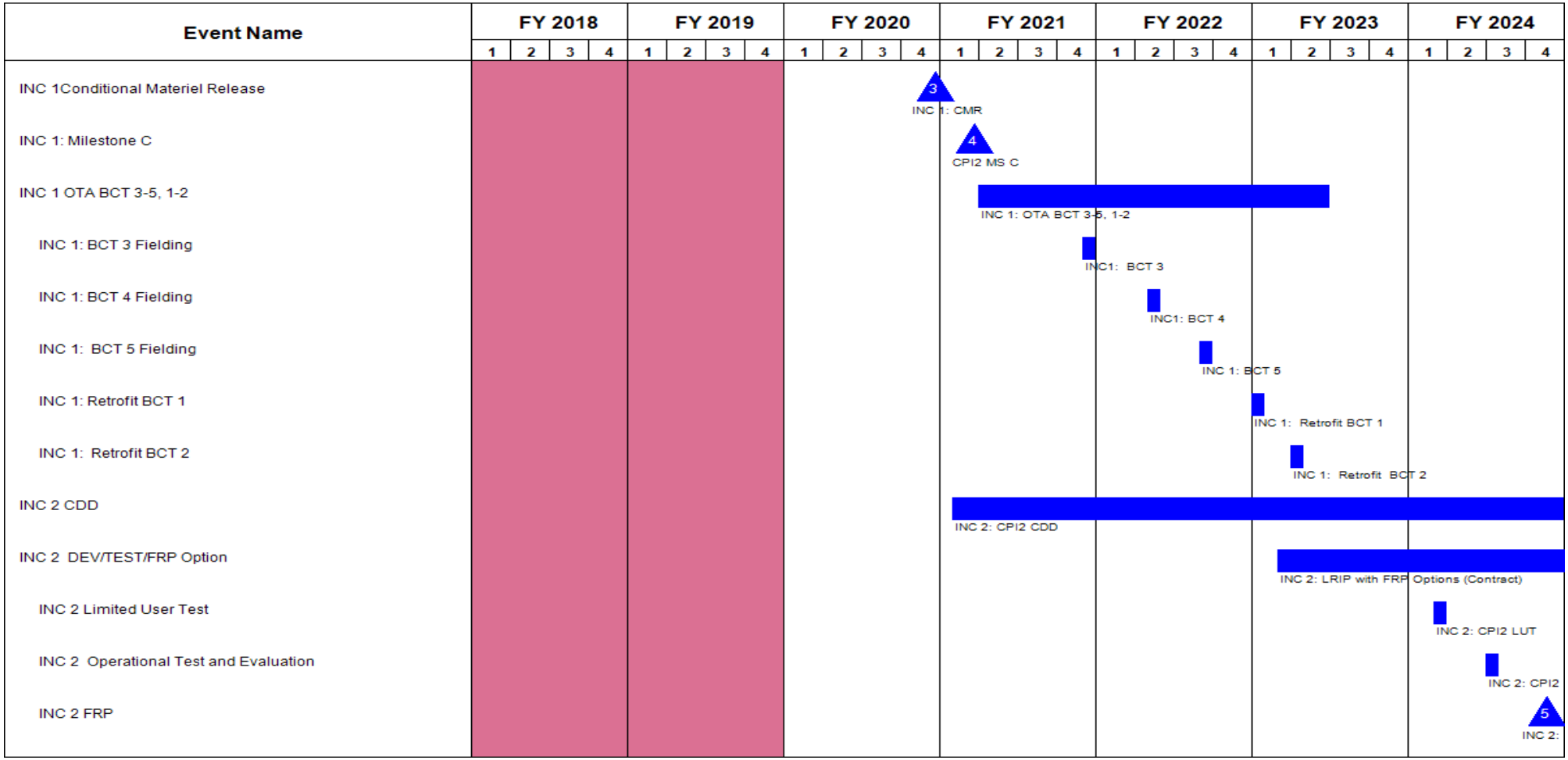

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** ER9 / *Expeditionary Army Command Post*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Directed Requirement Signed	1	2018	1	2018
CPI2 MDD	3	2018	3	2018
INC 1 Product Development (BCT 1)	2	2019	1	2021
INC 1: Dev Test (BCT 1)	2	2020	2	2020
INC 1 New Equipment Training (FUE)	3	2020	3	2020
INC1 Early User Test (FUE)	4	2020	4	2020
INC 1 Product Development (BCT 2) OTA	3	2019	1	2021
INC 1: Dev Test (BCT 2)	3	2020	3	2020
INC 1 New Equipment Training (BCT 2)	4	2020	4	2020
INC 1: Early User Test (BCT 2)	4	2020	4	2020
INC1: MCG Experimentation	2	2019	1	2021
INC 1: MCG New Equipment Training	3	2020	4	2020
INC 1: MCG Operational Assessment	4	2020	1	2021
INC 1Conditional Materiel Release	4	2020	4	2020
INC 1: Milestone C	1	2021	1	2021
INC 1 OTA BCT 3-5, 1-2	2	2021	2	2023
INC 1: BCT 3 Fielding	4	2021	4	2021
INC 1: BCT 4 Fielding	2	2022	2	2022
INC 1: BCT 5 Fielding	3	2022	3	2022
INC 1: Retrofit BCT 1	1	2023	1	2023
INC 1: Retrofit BCT 2	2	2023	2	2023
INC 2 CDD	1	2021	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** ER9 / *Expeditionary Army Command Post*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
INC 2 DEV/TEST/FRP Option	1	2023	1	2028
INC 2 Limited User Test	1	2024	1	2024
INC 2 Operational Test and Evaluation	3	2024	3	2024
INC 2 FRP	4	2024	4	2024

Note

INC 2 Events assume approval of CPI2 CDD.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*				Project (Number/Name) EW3 / *Unit Task Reorganization (UTR) Development*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
EW3: *Unit Task Reorganization (UTR) Development*	-	13.412	18.812	27.539	-	27.539	26.821	24.333	17.517	13.823	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project EW3, Unit Task Reorganization (UTR), supports the Army's Network Modernization Strategy LOE 1, Unified Network. The UTR effort introduces a common set of network operations tools and infrastructure that enable Standards Based Architecture, Converged Networks, and an Integrated Computing Infrastructure supporting the S6 and staff's ability to conduct Network Management, Network Planning, and Network Re-Establishment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Network Management	3.340	6.526	9.300	-	9.300
Description: UTR is introducing improvements to the way the network is managed, reducing stovepiped management systems and replacing them with integrated tools that provide a consolidated, as well as detailed, view of the network and its components. ***FY 2019 Plans:*** - Support for Peer to Peer (P2P) development, enterprise Over-the-Air Management (eOTAM) oversite, Application Program Interface (API) development and test support - Development of eOTAM code for data reduction, security updates, and radio reporting - Support for ODIN app development on Common Operating Environment (COE) v3 and CERDEC support for testing and potential ramp off. ***FY 2020 Base Plans:*** - Continue P2P development, eOTAM oversight, API development and test support - Continue development of eOTAM code for data reduction, security updates, and radio reporting - Continue support for On Demand Information Network (ODIN) application development on COE v3 and CERDEC support for testing and potential ramp off. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 funding has increased for Network Management by $2.774M due to allocation of funds towards eOTAM and ODIN software development and code upgrades as well as support to test efforts.					
Title: Network Planning	1.565	0.667	0.667	-	0.667

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: UTR is supporting the development of integrated planning tool suite that will improve the ability of Signal Soldiers to plan and develop configurations for upcoming operations and deployments. These tools will provide a holistic planning capability for Converged Networks and Computing Infrastructure incorporating data exchanges between the mission command tools and the network planning tools. ***FY 2019 Plans:*** Efforts to provide Crypto Planning interface and analysis of mission threads to create workflow charts for UTR automation using Rapid Provisioning System (RPS) and other tactical capabilities. ***FY 2020 Base Plans:*** Development of analytic and planning tools that support Signal Planning in coordination with Mission Command Systems and Applications.					
Title: Network Re-Establishment ***Description:*** UTR is implementing tools and technology to reduce the amount of time and troops required to provision network devices with configurations developed during the planning process. Providing a means to deliver configurations without requiring a manual involvement by the Soldier, UTR is leveraging Over the Network (OTN) and Over the Air (OTA) methods to query, load, activate, and monitor network devices. ***FY 2019 Plans:*** Complete automated provisioning and patching components of RPS to include User Interface (UI), complete integration efforts for Tactical Server Infrastructure (TSI)v2 Small and TSIv2 Large, complete API documentation and sample code to allow the integration of other hardware and software platforms into the RPS framework. Modularize embedded device code; Analyze mission threads; Deployment of Master Configuration Management Data Base (CMDB) hardware and software (Intra); Deployment of Master CMDB hardware and software (Licensing); Create single UI (UTR Admin); Create single UI (Admin UI); Enable data replication (Data Replication Enhancements); Implement logging and alerting (Tasking); Implement logging and alerting (Logging/ Alerting); Implement logging and alerting (Enhance Configuration Management (CM)); Enable data replication (Sync Service Enhancements); Maintain security compliance (Extend RPS API); Maintain security compliance (UTR RPS API) ***FY 2020 Base Plans:***	4.950	5.651	12.209	-	12.209

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continued development of provisioning systems to increase Over the Network and Over the Air capabilities as well as Direct Connection devices that automate provisioning, patching, and updating. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 funding has increased by $5.157 million to account for the additional of security compliance functions in extension of Rapid Provisioning System Application Program Interfaces.					
Title: Infrastructure ***Description:*** UTR is supporting the development of various elements to facilitate the S6 and staff?s ability to execute wartime functions. Developing data models, interface standards, and data repositories that are integrated with the tools and systems that comprise the network. ***FY 2019 Plans:*** Data model development, architecture and data analysis associated with Federated Data Repository, implementation of Identity Store Orchestration Tool, Modularization of embedded device code, deployment of Master CMDB software ***FY 2020 Base Plans:*** Continue development of network components that support centralized data, security, and information exchanges, enabling Signal Soldier activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase from FY19 to FY20 funding in the amount of .188K is primarily driven by escalation on continuing efforts.	2.345	3.664	3.852	-	3.852
Title: System of Systems Engineering and Portfolio Management ***Description:*** Systems engineering and program management support to include development and maintenance of the NetOps architecture, Systems Engineering Plan, Risk Management Plan, Rapid Prototyping, IPT Management, Requirements Engineering, Integrated Master Schedule, and budget formulation and execution. ***FY 2019 Plans:*** Continue Systems of Systems Engineering and program management across NetOps portfolio including establishing Architecture and updates of portfolio Management Plan, Risk Management Plan, Rapid Prototyping,	1.212	1.615	1.511	-	1.511

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
IPT/Working Group Management, Requirements Engineering, synchronization of efforts to Integrated Master Schedule. ***FY 2020 Base Plans:*** Continue Systems of Systems Engineering and program management across NetOps portfolio including establishing Architecture and updates of portfolio Management Plan, Risk Management Plan, Rapid Prototyping, IPT/Working Group Management, Requirements Engineering, synchronization of efforts in Integrated Master Schedule. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 funding has decreased by $.104M to account for adjustments to contractor level of support.					
Title: SBIR/STTR/FFRDC ***FY 2019 Plans:*** FY19 HQDA taxes for Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 reflects includes 689K of SBIR/STTR tax amounts not currently identified for FY20.	-	0.689	-	-	-
Accomplishments/Planned Programs Subtotals	13.412	18.812	27.539	-	27.539

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EW3 / *Unit Task Reorganization (UTR) Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network Management	C/CPFF	BAH / GS00Q09BGD0019 : APG, MD	0.356	-		0.500	Oct 2018	0.620		-		0.620	Continuing	Continuing	Continuing
Network Management	MIPR	Matrix Organizations : APG MD	-	-		0.500		1.000		-		1.000	Continuing	Continuing	Continuing
Network Management	TBD	TBD : APG, MD	-	-		-		0.400	Nov 2019	-		0.400	Continuing	Continuing	Continuing
Network Management	Various	Harris : APG, MD	0.335	1.000		3.075	Oct 2018	4.100	Oct 2019	-		4.100	Continuing	Continuing	Continuing
Network Management	FFRDC	MITRE : APG, MD	1.200	1.200	Oct 2017	2.400	Oct 2018	3.130		-		3.130	Continuing	Continuing	Continuing
Network Management	Allot	PM TR : APG, MD	0.009	-		0.050		0.050		-		0.050	Continuing	Continuing	Continuing
Network Management	C/CPFF	WSEC (SAIC) W31P4Q-15-A-0024 : APG, MD	0.966	1.140		-		-		-		-	0.000	2.106	-
Network Planning	C/CPFF	ARL/AEWD W911NF-15-D-0008 Task Order 0005 : APG, MD	0.367	0.600		-		-		-		-	0.000	0.967	-
Network Planning	TBD	G2 : San Diego	0.442	-		-		-		-		-	0.000	0.442	-
Network Planning	Various	Federal Resources Contract DLA CodeMettle support : APG, MD	0.417	0.390		-		-		-		-	0.000	0.807	-
Network Planning	C/CPFF	SPAWAR T4S Support via NM RIL N68936-16-D-0016 : APG, MD	0.550	0.575		0.667		-		-		-	0.000	1.792	-
Network Planning	Various	JENM OTA : APG	-	-		-		0.667		-		0.667	Continuing	Continuing	Continuing
Network Reestablishment	C/IDIQ	Microsoft HC1028-13-D-0013 : APG MD	3.713	4.950		5.651		10.808		-		10.808	Continuing	Continuing	Continuing
Infrastructure	TBD	GSA BAH/Contract # GS00Q09BGD0019 Order #	0.317	0.038		-		0.258		-		0.258	Continuing	Continuing	Continuing

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

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		GSQ0015AJ0098 : APG MD													
Infrastructure	C/CPFF	JHU-APL / CPM -16 : APG MD	0.391	-		0.150		0.300		-		0.300	Continuing	Continuing	Continuing
Infrastructure	TBD	RIK-OTA-18-R-NFDR : APG MD	-	2.095		2.514		2.552		-		2.552	Continuing	Continuing	Continuing
Infrastructure	MIPR	SEC Lab - Integration Facility : APG MD	-	-		1.000		1.000		-		1.000	Continuing	Continuing	Continuing
SoS System Engineering	C/CPFF	Bowhead W15P7T-15-D-0010 : APG MD	-	0.250		0.400		0.400		-		0.400	Continuing	Continuing	Continuing
SoS System Engineering	C/CPFF	GSA BAH/Contract # GS00Q09BGD0019, Task Order # GSQ0015AJ0098 : APG MD	-	0.511		0.511		0.511		-		0.511	Continuing	Continuing	Continuing
SoS System Engineering	FFRDC	MITRE A280 : APG MD	-	0.297		0.297		0.297		-		0.297	Continuing	Continuing	Continuing
SoS System Engineering	Various	Various : APG MD	0.946	0.366		0.408		1.446		-		1.446	Continuing	Continuing	Continuing
FY19 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.689		-		-		-	0.000	0.689	-
		Subtotal	10.009	13.412		18.812		27.539		-		27.539	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.009	13.412		18.812		27.539		-		27.539	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

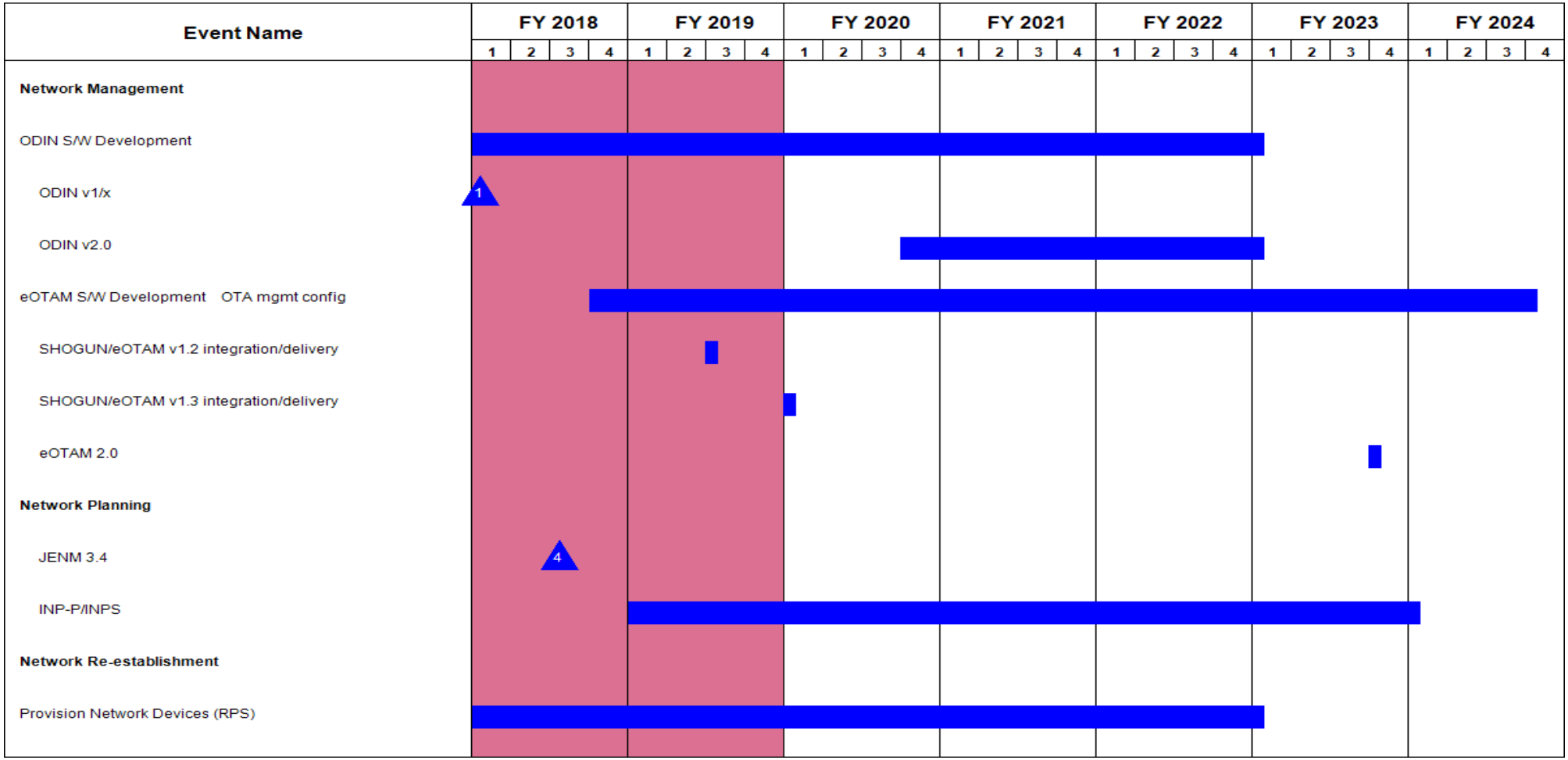

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

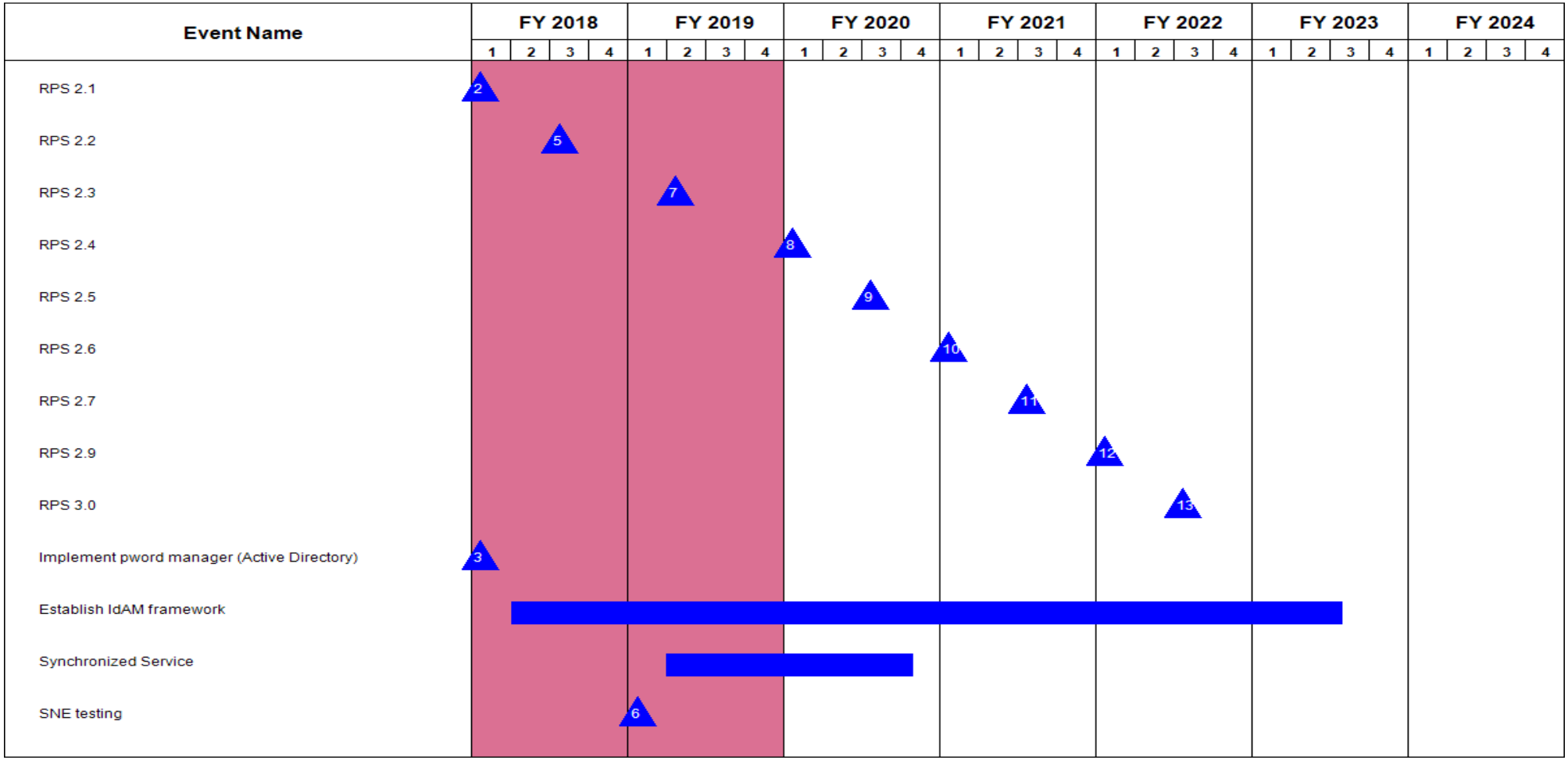

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

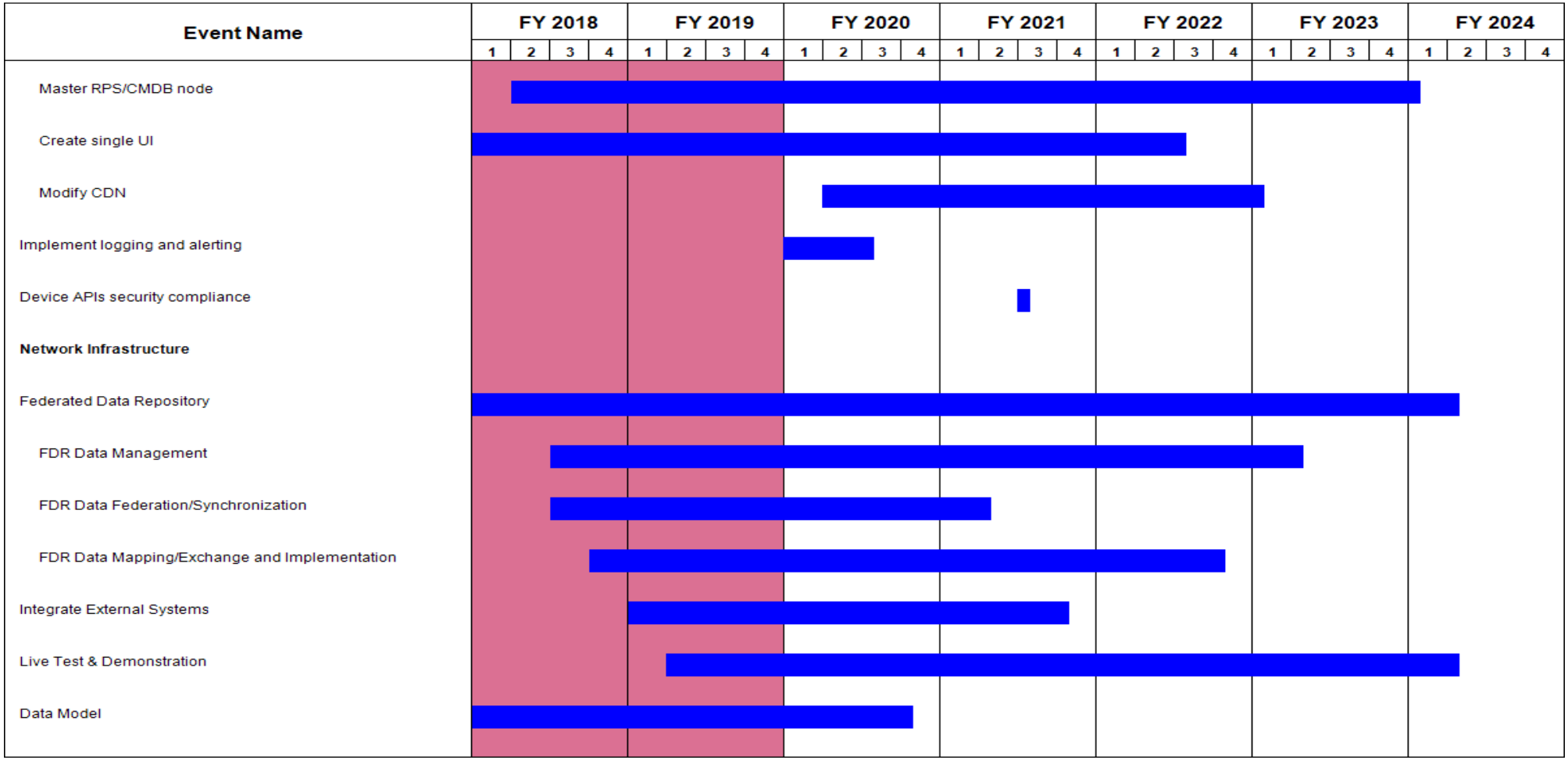

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

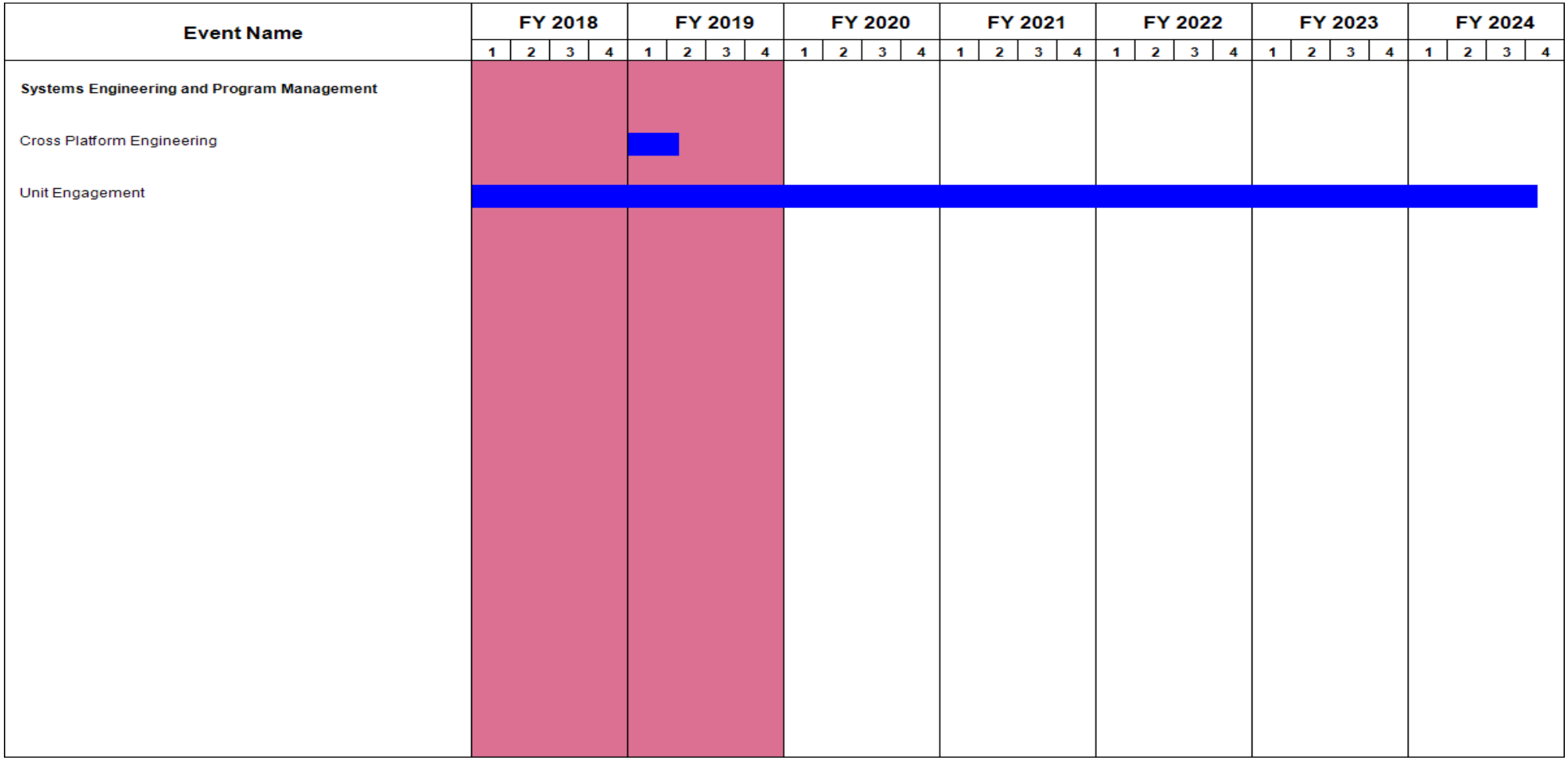

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Network Management	1	2018	4	2024
ODIN S/W Development	1	2018	1	2023
ODIN v1/x	1	2018	1	2018
ODIN v2.0	4	2020	1	2023
eOTAM S/W Development OTA mgmt config	4	2018	4	2024
SHOGUN/eOTAM v1.2 integration/delivery	3	2019	3	2019
SHOGUN/eOTAM v1.3 integration/delivery	1	2020	1	2020
eOTAM 2.0	4	2023	4	2023
Network Planning	1	2018	1	2024
JENM 3.4	3	2018	3	2018
INP-P/INPS	1	2019	1	2024
Network Re-establishment	1	2017	2	2024
Provision Network Devices (RPS)	1	2018	1	2023
RPS 2.1	1	2018	1	2018
RPS 2.2	3	2018	3	2018
RPS 2.3	2	2019	2	2019
RPS 2.4	1	2020	1	2020
RPS 2.5	3	2020	3	2020
RPS 2.6	1	2021	1	2021
RPS 2.7	3	2021	3	2021
RPS 2.9	1	2022	1	2022
RPS 3.0	3	2022	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Implement pword manager (Active Directory)	1	2018	1	2018
Establish IdAM framework	2	2018	3	2023
Synchronized Service	2	2019	4	2020
SNE testing	1	2019	1	2019
Master RPS/CMDB node	2	2018	1	2024
Create single UI	1	2018	3	2022
Modify CDN	2	2020	1	2023
Implement logging and alerting	1	2020	3	2020
Device APIs security compliance	3	2021	3	2021
Network Infrastructure	3	2018	2	2024
Federated Data Repository	1	2018	2	2024
FDR Data Management	3	2018	2	2023
FDR Data Federation/Synchronization	3	2018	2	2021
FDR Data Mapping/Exchange and Implementation	4	2018	4	2022
Integrate External Systems	1	2019	4	2021
Live Test & Demonstration	2	2019	2	2024
Data Model	1	2018	4	2020
Systems Engineering and Program Management	1	2018	4	2024
Cross Platform Engineering	1	2019	2	2019
Unit Engagement	1	2018	4	2024