Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	124.749	128.676	162.704	-	162.704	-	-	-	-	-	-
323: *Common Hardware Systems*	-	5.255	4.816	4.592	-	4.592	-	-	-	-	-	-
C29: *Centralized Technical Support Facility (CTSF)*	-	8.406	6.981	11.438	-	11.438	-	-	-	-	-	-
C34: *Army Tac C2 Sys Eng*	-	9.092	9.351	11.473	-	11.473	-	-	-	-	-	-
EJ4: *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*	-	29.694	26.485	35.117	-	35.117	-	-	-	-	-	-
EJ5: *MOUNTED COMPUTING ENVIRONMENT (MCE)*	-	10.033	9.994	21.874	-	21.874	-	-	-	-	-	-
EJ6: *TACTICAL ENHANCEMENT*	-	-	-	7.860	-	7.860	-	-	-	-	-	-
EK9: *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*	-	3.499	3.252	3.366	-	3.366	-	-	-	-	-	-
EQ8: *Mobile/Handheld Computing Environment (M/HHCE)*	-	4.658	4.967	5.105	-	5.105	-	-	-	-	-	-
ER9: *Expeditionary Army Command Post*	-	27.706	43.803	52.477	-	52.477	-	-	-	-	-	-
EW3: *Unit Task Reorganization (UTR) Development*	-	26.406	19.027	9.402	-	9.402	-	-	-	-	-	-

Note

Project EJ6 / TACTICAL ENHANCEMENT is a new start for Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

This funding line supports the Army Network Modernization Strategy LOE 1, Unified Network, LOE 2 - Common Operating Environment and LOE 4 - Command posts. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

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Project 323, the Common Hardware Systems (CHS), is an ACAT III program and mandated Army Strategic Source that acquires and sustains highly flexible, cost-effective, and simplified non-developmental solutions that integrates the latest and emerging commercial information technology onto the Converged Mission Command Network. This funding line supports all of the Army's Network Modernization Strategy Lines of Effort: (1) Unified Network, (2) Common Operating Environment, (3) Interoperability, and (4) Command Post Mobility and Survivability. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve network modernization strategy goals. This funding line also supports network solution procurement and sustainment for U.S. Army Reserves, U.S. Army National Guard, U.S. Navy, U.S. Air Force, U.S. Marine Corps, Federal Bureau of Investigation, and other Federal Agencies. 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, Joint Services, and other Federal Agencies. CHS supports better buying power initiatives by creating efficiencies through economies of scale, price breaks, streamlined processes, reduced cycle times, and centralized contracting.

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, the Army Tac C2 Sys Eng project funds the PEO Command, Control, Communications-Tactical (PEO C3T) the System-of-Systems engineering, Enterprise and Integration efforts. The system engineering efforts are to facilitate the overall network interoperability of all the various programs that must be able to seamlessly connect together while addressing their individual distinct requirements. Efforts address continuing evolution of the network within the PEO C3T portfolio of technology across capability enhancement packages, in line with the Network CFT capability set strategy, to deliver efficient and effective cross-domain technical solution.

Project EJ4, the Command Post Computing Environment (CPCE) implements an integrated, interoperable, cyber-secure, software infrastructure that serves as the host for a unified set of multiple warfighting functional applications within the command post at all echelons (Battalion to Army Service Component Commander); eliminating "stove-piped" legacy systems, duplicative or redundant implementations, simplifying future application development efforts, and enhancing interoperability and data sharing across multiple echelons. CPCE software infrastructure and applications reside on Tactical Server Infrastructure (TSI) hardware and previously fielded BCCS/ TSI servers. CPCE/TSI provides the hardware infrastructure to host capabilities, such as movement and maneuver applications, network enabling tools (i.e. Cyber Situational Understanding and Tactical Defensive Cyber Operation Infrastructure) and warfighting function applications. This software infrastructure provides the Army's premier Common Operating Picture (COP) solution, allowing interoperability between command posts, mounted platforms, and dismounted handheld devices while supporting collaboration with Joint and Unified Action partners. CPCE provides common look and feel (user interface), common data strategy, interoperable tactical messaging/ chat, and essential movement and maneuver capabilities.

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 is now called, Mounted Mission Command - Software (MMC-S), an ACAT II program, after a successful Materiel Development Decision (MDD) briefing in Feb. 2020. MMC-S 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 MMC-S are established in the AROC approved COE Information

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Systems Initial Capability Document (IS ICD) and the approved Mounted Computing Environment Requirements Definition Package (RDP). The MMC-S will provide incremental improvements with additional application capabilities over time, and will be interoperable with Command Post and Mobile/Handheld systems.

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 FY 2028/2029). 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.

Project EK9, Tactical Network Operations Management's (TNOM) purpose is to create Unified Network Operations (UNO). UNO is a software centric, integrated NetOps capability being developed, as a rapid prototype - proceeding under Section 804 Mid-Tier Acquisition (MTA) authority granted by the Army Acquisition Executive (AAE)'s 14 May 2019 Acquisition Decision Memorandum (ADM). Enabling common planning, configuration, monitoring, provisioning, management, and defense of the Network, UNO configures and integrates tactical and enterprise networks to allow delivery of information and communications among Soldiers at all echelons utilizing network resources prioritized according to the Commander's intent. In developing UNO, TNOM follows the Army's Development of Operations (DevOps) approach - creating Network Operations (NetOps) prototypes, gaining user feedback, making adjustments and ultimately delivering enhanced capabilities to the operational force in the shortest time possible. UNO development incorporates solutions available in industry and through government agencies - assessing them in an adapt-and-buy approach informed by experimentation, demonstration, and modernization.

Project EQ8, Mobile/Handheld Computing Environment (M/HHCE), is one of the six computing environments (CEs) formalized by the AAE under the Common Operating Environment (COE) initiative and supports the Nett Warrior (NW) also known as the Ground Soldier Systems (GSS) program. The program leverages commercial smart devices and secure Army tactical radios, Commercial 4G/LTE/WIFI and cloud-based infrastructure to provide the dismounted leader an integrated mission command and situational awareness system for use during combat operations. The NW system provides leaders electronic real-time information on friendly positions; information about enemy activity and movement; navigational data and map imagery; a collaborative planning tool; and other mission related graphics which effectively puts the power of the entire Army tactical network in the hands of the dismounted leader. The NW hardware is the computational platform that other M/HHCE systems run their applications. The M/HHCE will provide incremental improvements with additional application capabilities over time, and will be interoperable with Command Post CE and Mounted CE systems.

Project ER9, Command Post Integrated Infrastructure (CPI2), fields mobile Command Post nodes by integrating mission command solutions into vehicle platforms and mounted shelter systems to enhance the survivability and mobility of command post formations. CPI2 will replace selected elements of the legacy command post to provide improved expeditionary capability, survivability, agility, and scalability for command post formations at all echelons. By integrating mission command

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
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warfighting functions on to 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.

Project EW3, Unit Task Reorganization (UTR) funding line supports the Army Network Plan Framework objective to deliver a Standards Based Network Architecture. This will enable modernizing the Mission Command Network through the coordination of a common set of network operations tools and infrastructure development supporting the unit communication staff's ability to conduct Network Planning, Network Provisioning and Network Management. Network Planning efforts include the development of an integrated planning tool suite to improve Signal Soldiers ability to plan and develop configurations for upcoming operations and deployments. Network Provisioning efforts include development of tools and technology that provide a means to deliver configurations developed during the Network Planning with little to no manual involvement by the Soldier. Network Management efforts replace stove-piped management systems and replaces them with integrated tools that provide a consolidated, as well as detailed, view of the network and its components.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	129.974	162.513	156.333	-	156.333
Current President's Budget	124.749	128.676	162.704	-	162.704
Total Adjustments	-5.225	-33.837	6.371	-	6.371
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-28.269			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.225	-5.568			
• Adjustments to Budget Years	-	-	6.371	-	6.371

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army												Date: May 2021
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COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
323: *Common Hardware Systems*	-	5.255	4.816	4.592	-	4.592	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Hardware Systems (CHS) is an ACAT III program and mandated Army Strategic Source that acquires and sustains highly flexible, cost-effective, and simplified non-developmental solutions that integrate the latest and emerging commercial information technology onto the Converged Mission Command Network. This funding line supports all of the Army's Network Modernization Strategy Lines of Effort: (1) Unified Network Transport, (2) Common Operating Environment, (3) Interoperability, and (4) Command Post Mobility and Survivability. Efforts are aligned to support the Network Cross-Functional Team (CFT) capability set approach to achieve network modernization strategy goals. This funding line also supports network solution procurement and sustainment for U.S. Army Reserves, U.S. Army National Guard, U.S. Navy, U.S. Air Force, U.S. Marine Corps, Federal Bureau of Investigation, and other Federal agencies. Since FY19, CHS has seen a 47 percent increase in its customer base and continues to see an increase in unit procurements.

CHS provides technical support, environmental and survivability testing, system design, and end-of-life and configuration management services 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. The program conducts hardware evaluations that facilitate and simplify the selection of common hardware solutions across numerous Army programs, agencies, Joint Services, and other Federal Agencies including: Mission Command; Tactical Network; Tactical Radios; Distributed Common Ground Station Army; Aviation Systems; Counter Rocket, Artillery, Mortar; Communication Electronics Command; Combat Capabilities Development Command (CCDC), Army National Guard and Reserves, Navy, Airforce, Marines, the Federal Bureau of Investigation, 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 enable the continuous modernization in support of all four Army Network Modernization Lines of Effort and Network CFT requirements. CHS logistical services include worldwide, 72-hour turn-around repair through strategically located support centers for tactical military units. These support centers provide tailorable supply chain and cybersecurity measures, customizable warranty management, maintenance and failure rate reporting, and technical support services to support specific Army program requirements.

CHS is a model for modern acquisition strategy that strengthens the U.S. cybersecurity supply chain and manages risk by providing hardware solutions including servers, storage, clients, networking devices, tactical radios, ruggedized platforms, hand-held end devices, operational transit cases, installation kits, and peripheral devices procured from a mix of small and large businesses. CHS partners with the CECOM Integrated Logistics Support Center (ILSC) to develop a model for sustaining COTS IT using the Standard Army Supply System. CHS maintains a Public-Private Partnership (P3) with Tobyhanna Army Depot (TYAD) in order to leverage the innovation, resources and leadership skills of both TYAD and CHS in order to provide the best value to the taxpayer while delivering the best capability 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. The program provides the Army with a highly efficient Return on Investment (ROI) of approximately 30:1.

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Acquisition Support ***Description:*** Funding is provided for the following effort. ***FY 2021 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 2022 Plans:*** Will continue acquisition support for CHS and customer programs. CHS rapidly procures common hardware configurations across all four Network Modernization Lines of Effort and Network Cross Functional Team (CFT). Supports tactical programs that enable the continuous modernization of a unified network requirements, the sustainment community, and DoD and Federal Government customers. Additional efforts include pre-award activities for the 6th generation CHS contract. PMO costs will be covered by OMA funding. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease of .229 from FY21 to FY22 covers the decrease to scope.	3.373	2.552	2.323
Title: Logistical Service Support ***Description:*** Funding is provided for the following effort. ***FY 2021 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 2022 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 2021 to FY 2022 Increase/Decrease Statement:*** The increase of .041 from FY21 to FY22 covers the standard inflation of labor and materials cost.	0.339	0.359	0.400
Title: Technical and Test Support ***Description:*** Funding is provided for the following effort.	1.543	1.705	1.667

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
FY 2021 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 2022 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 2021 to FY 2022 Increase/Decrease Statement:*** The decrease of .038 from FY21 to FY22 covers the decrease in scope.			
Title: Contract Support Services ***Description:*** Funding is provided for the following effort. ***FY 2021 Plans:*** Contract Support Services are required to provide continuing expedited acquisition support for customer procurements. ***FY 2022 Plans:*** Contract Support Services are required to provide continuing expedited acquisition support for customer procurements. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase of .002 from FY21 to FY22 covers the standard inflation of labor and materials cost.	-	0.200	0.202
Accomplishments/Planned Programs Subtotals	5.255	4.816	4.592

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

CHS is currently executing an approved acquisition strategy to facilitate the procurement of commercial IT through a single step, full and open competition contract. The fifth generation of the contract (CHS-5) was awarded on 24 AUG 2018; 5 years/IDIQ. A single prime vendor was selected as the program integrator. The CHS-5 contract

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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provides seamless, rapid, and consolidated procurement of commercial IT, customizable sustainment strategies, non-personal services, and continuous technology upgrades to support tactical programs fielding schedules, configuration management, and ruggedization.
Since the inception of the CHS-5 contract, there have been 208 technology insertions, 461 delivery orders, 57 task orders, and 212,096 items delivered to 133 unique customers. Additionally, since its inception, the CHS-5 contract yielded a cost avoidance of $211 million to its customers. FY20 yielded 411 actions awarded (87 TIs, 290 DOs, and 34 TOs) for a total of $474,854,623. FY20 actions surpassed FY19 by 7.3%.

The sixth generation CHS contract (CHS-6) is in the early stages of development. Extensive market research is being conducted to identify the acquisition strategy for this effort. The CHS PMO holds frequent and open discussions with industry to ensure the requirements are clearly understood and feedback can be gleaned from hardware developers and manufacturers to maximize competition. The CHS PMO is exploring innovative ways to shape the CHS-6 contract to allow all Federal Agencies with tactical requirements to achieve their missions and strategic initiatives by providing a rapid and streamlined process and access to critical Commercial Information Technology. The CHS-6 contract award is estimated to be 2QFY23.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SBIR/STTR Transfer	Various	Various : TBD	-	0.226		0.182	Jan 2021	-		-		-	0.000	0.408	-
		Subtotal	-	0.226		0.182		-		-		-	0.000	0.408	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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	-
Acquisition Support	C/FP	Various : Various	5.552	3.147	Dec 2019	2.370	Dec 2020	2.323	Dec 2021	-		2.323	Continuing	Continuing	Continuing
Logistical Service Support	C/FP	Various : Various	1.062	0.339	Dec 2019	0.359	Dec 2020	0.400	Dec 2021	-		0.400	Continuing	Continuing	Continuing
Technical & Test Support	C/FP	Various : Various	3.114	1.543	Dec 2019	1.705	Dec 2020	1.667	Dec 2021	-		1.667	Continuing	Continuing	Continuing
		Subtotal	203.720	5.029		4.434		4.390		-		4.390	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Support Services	SS/CR	APG, MD : APG, MD	-	-		0.200	Dec 2020	0.202	Dec 2021	-		0.202	0.000	0.402	-
		Subtotal	-	-		0.200		0.202		-		0.202	0.000	0.402	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	203.720	5.255		4.816		4.592		-		4.592	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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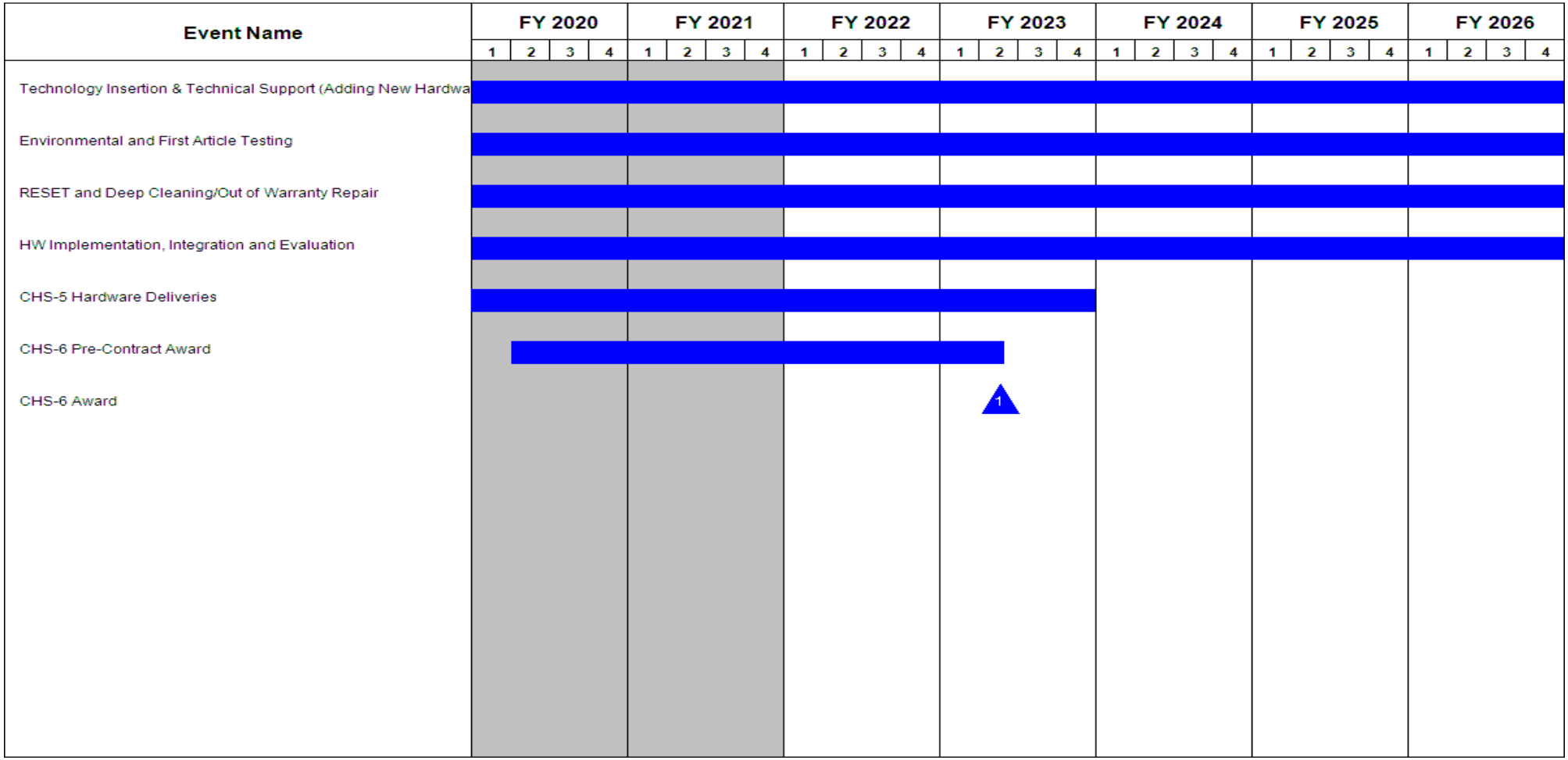

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Technology Insertion & Technical Support (Adding New Hardware to Contract)	1	2007	4	2026
Environmental and First Article Testing	1	2006	4	2026
RESET and Deep Cleaning/Out of Warranty Repair	1	2006	4	2026
HW Implementation, Integration and Evaluation	1	2006	4	2026
CHS-4 Hardware Deliveries	1	2012	4	2019
CHS-5 Contract Award	4	2018	4	2018
CHS-5 Hardware Deliveries	4	2018	4	2023
CHS-6 Pre-Contract Award	2	2020	2	2023
CHS-6 Award	2	2023	2	2023

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COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
C29: *Centralized Technical Support Facility (CTSF)*	-	8.406	6.981	11.438	-	11.438	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C29, The Centralized Technical Support Facility (CTSF): The CTSF is the Army's premier test and certification facility for System of Systems interoperability, functioning as CIO/G6's designated independent test agent and Land/WarNet/Mission Command (LWN/MC) configuration manager. The Central Technical Support Facility's (CTSF) directed mission is to perform Army Interoperability Certification (AIC) testing and configuration management for all 23 operational through tactical level Command, Computing, Control, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) systems, Mission and Space systems, Aviation systems and other 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 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 2020	FY 2021	FY 2022
Title: Army Interoperability Certification (AIC) Testing	5.308	4.875	3.893
Description: Conduct Army Interoperability Certification (AIC), planning/coordination/scheduling/ and reporting of Common Operating Environment (COE) and software block testing (local and distributed). Additionally, provide stakeholders data collection/data analysis/data dissemination/simulation/stimulation verification/validation in support of Army geospatial interoperability certification, system of system cybersecurity posture assessment and individual system cybersecurity policy adjustment. 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 HQDA 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. Act as the central control node to synchronize the HQDA G-6 accredited Federation of Net-centric Sites (FaNS) distributed AIC testing environment. Report the results of Army Interoperability Certification tests to the HQDA G-6, PM, TRADOC and AFC communities.			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** C29 / *Centralized Technical Support Facility (CTSF)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Continue SWB11-12 test planning, test case development, test environment architecture set-up, for interoperability testing, Geospatial Information Systems (GIS) interoperability assessment, 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 G6 to enforce a standards based architecture. Mature the capability that assists CIO/ G-6 requirement to support ATEC and AFC by executing interoperability assessments of Cross-Functional Team (CFT) solutions. Execute discreet AIC test events (up to 6x/yr) and maintain an enduring discreet AIC test capability. Implement an AIC Secret Releasable test environment that integrates Army and the Mission Partner Environment and support testing with our FYES, ABCANZ, and G-3 Big Ten Coalition partners. ***FY 2022 Plans:*** Continue SWB11-12 test planning, test case development, test environment architecture set-up, for interoperability testing, Geospatial Information Systems (GIS) interoperability assessment, cybersecurity posture adjustment and assessment activities for the systems that comprise the Army?s tactical software baselines. Conduct COE v3.0 planning, test case development and architecture set-up to support the technical standards update timelines for the Army?s tactical software baseline. Conduct interoperability testing for the SWB11-12 and COE v3.0 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 HQDA G-6 to enforce a standards based architecture. Complete the virtualization of the technical environment and test methodology needed to virtualize the tactical network and the tactical systems required to support AIC testing. Partner with ATEC and AFC to leverage the CTSF assets in support of PMs? Operational Test activities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to leveraged efficiencies in contractor manpower utilization in support of mission execution.			
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 (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. Continuously seek emerging markets. Develop/Maintain Applications for CTSF Configuration Tracking System Version 4 (CMTSv4). ***FY 2021 Plans:*** Provide Network support for integration and test floors, network support to fielded units, and systems engineering and analysis support to system of systems integration activities. Integrate and implement Army End Point Security System (AESS) technology,	0.094	0.162	0.195

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
assist PMs in the development of AESS policies. Plan and conduct engineering evaluations for AIC testing and data collection in the Joint Warfighter Assessment (JWA)/Capability Integration Evaluation (CIE) to leverage the operational environment and JWA/CIE resources. Work with Network Cross Functional Team on Network modernization and Integrated Tactical Network (ITN) design and testing. Assist integration and test architecture development to include Program of Record (POR) and non-POR radio communications devices to provide PMs and Materiel Developers testing in realistic environments. Conduct radio Verification and Validation. Support Army Test and Evaluation Command (ATEC) and Army Futures Command interoperability assessments of Cross-Functional Team (CFT) solutions. Continue efforts to implement an AIC Secret Releasable test environment network that integrates Army and the Unified Action Partners (UAP). ***FY 2022 Plans:*** Provide Network support for integration and test floors, network support to fielded units, and systems engineering and analysis support to system of systems integration activities. Enhance the Security posture of the CTSF by ensuring the latest Information Assurance Vulnerability Alerts (IAVAs) and Security Technical Implementation Guides (STIGs) are implemented as required by Risk Management Framework (RMF). Integrate and implement Army End Point Security System (AESS) technology, assist PMs in the development of AESS policies. Plan and conduct engineering evaluations for AIC testing and data collection in the Joint Warfighter Assessment (JWA)/Capability Integration Evaluation (CIE) to leverage the operational environment and JWA/ CIE resources. Work with Network Cross Functional Team on Network modernization and Integrated Tactical Network (ITN) design and testing. Assist integration and test architectures to include Program of Record (POR) and non-POR Soldier radio waveforms to provide PMs and Material Developers testing in realistic environments. Support Army Test and Evaluation Command (ATEC) and Army Futures Command interoperability assessments of Cross-Functional Team (CFT) solutions. Continue efforts to implement an AIC Secret Releasable test environment network that integrates Army and the Unified Action Partners (UAP). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase due use of Cost and Economic Analysis Center (CEAC) planning rate for 1 Acq Demo work year.			
Title: Configuration Management	2.271	1.558	1.028
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. Additionally, as the 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, and extended life-cycle. Maintain and improve the			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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 HQDA G-6 conduct accreditation inspections and training for Federation of Net-centric Sites (FaNS) locations. ***FY 2021 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 2022 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 HQDA G-6 in conducting accreditation inspections and training for Federation of Net-centric Sites (FaNS) locations. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to leveraged efficiencies in contractor manpower utilization in support of mission execution.			
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 2021 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	0.732	0.385	0.370

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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 transitioning 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 2022 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; continue to enhance physical security, access control, force protection, Continuity Of Operations (COOP) and Emergency Action Plan (EAP) activities and exercises. Continue inventory accountability programs and asset control. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease due to reduction in TDY/Training costs and reduction in ISSA cost related to reduction in total square footage for CTSF.			
Title: Modernization ***Description:*** Technical modernization FY22-23 effort for Army Interoperability Certification (AIC) to enhance CTSF testing capabilities. Estimated cost of modernization is approximately $6M in investment with virtualization efforts and test automation. Funding provided for hardware & software integration for virtualization and automation, software licensing, and labor and other supporting integration efforts. ***FY 2021 Plans:*** Implementation of AIC/CSTF Tiger Team forecasting efficiencies and determining requirements for FY22-23 virtualization and automation efforts. ***FY 2022 Plans:*** Implementation of the automation and virtualization efforts to support the technical modernization of AIC testing. Funding provided for purchase of hardware & software integration, virtualization and automation, software licensing and labor and other integration efforts. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase is due to approval and implementation of AIC testing modernization efforts.	0.001	0.001	5.952
Accomplishments/Planned Programs Subtotals	8.406	6.981	11.438

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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	-
		Subtotal	19.726	-		-		-		-		-	0.000	19.726	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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	5.223	0.482		0.142		0.145		-		0.145	0.000	5.992	-
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	0.557	0.230		0.180		0.160		-		0.160	0.000	1.127	-
Supplies	C/UCA	Management Operations, Logistics Support : Fort Hood, TX	1.495	0.020		0.063		0.065		-		0.065	0.000	1.643	-
Moving Costs	Allot	Management Operations, Logistics Support : Fort Hood, TX	-	0.001		0.001		0.001		-		0.001	0.000	0.003	-
		Subtotal	17.203	0.733		0.386		0.371		-		0.371	0.000	18.693	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Under "open-the-door" cost model, all In-house support efforts are included under Test & Evaluation.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CECOM RS3	C/CPFF	Test, Configuration Management : Fort Hood, TX	14.654	4.090	May 2020	3.547	Sep 2021	2.539	Sep 2022	-		2.539	0.000	24.830	-
CECOM GSA BMO SB SITE SUPPORT SERVICES	C/T&M	Facilities, Maintenance, Security : Fort Hood, TX	11.453	1.218	Aug 2020	1.328	Sep 2021	1.354	Sep 2022	-		1.354	0.000	15.353	-
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	10.243	2.358		1.712		1.214		-		1.214	0.000	15.527	-
Instrumentation	C/UCA	Test Equipment Infrastructure : Fort Hood, TX	3.191	0.006		0.007		0.008		-		0.008	0.000	3.212	-
Virtualization	MIPR	Test, Configuration Management : Fort Hood, TX	1.091	0.001	Feb 2021	0.001	Feb 2021	5.952		-		5.952	0.000	7.045	-
		Subtotal	51.951	7.673		6.595		11.067		-		11.067	0.000	77.286	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 2022 Army			Date: May 2021
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	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	88.880	8.406		6.981		11.438		-		11.438	0.000	115.705	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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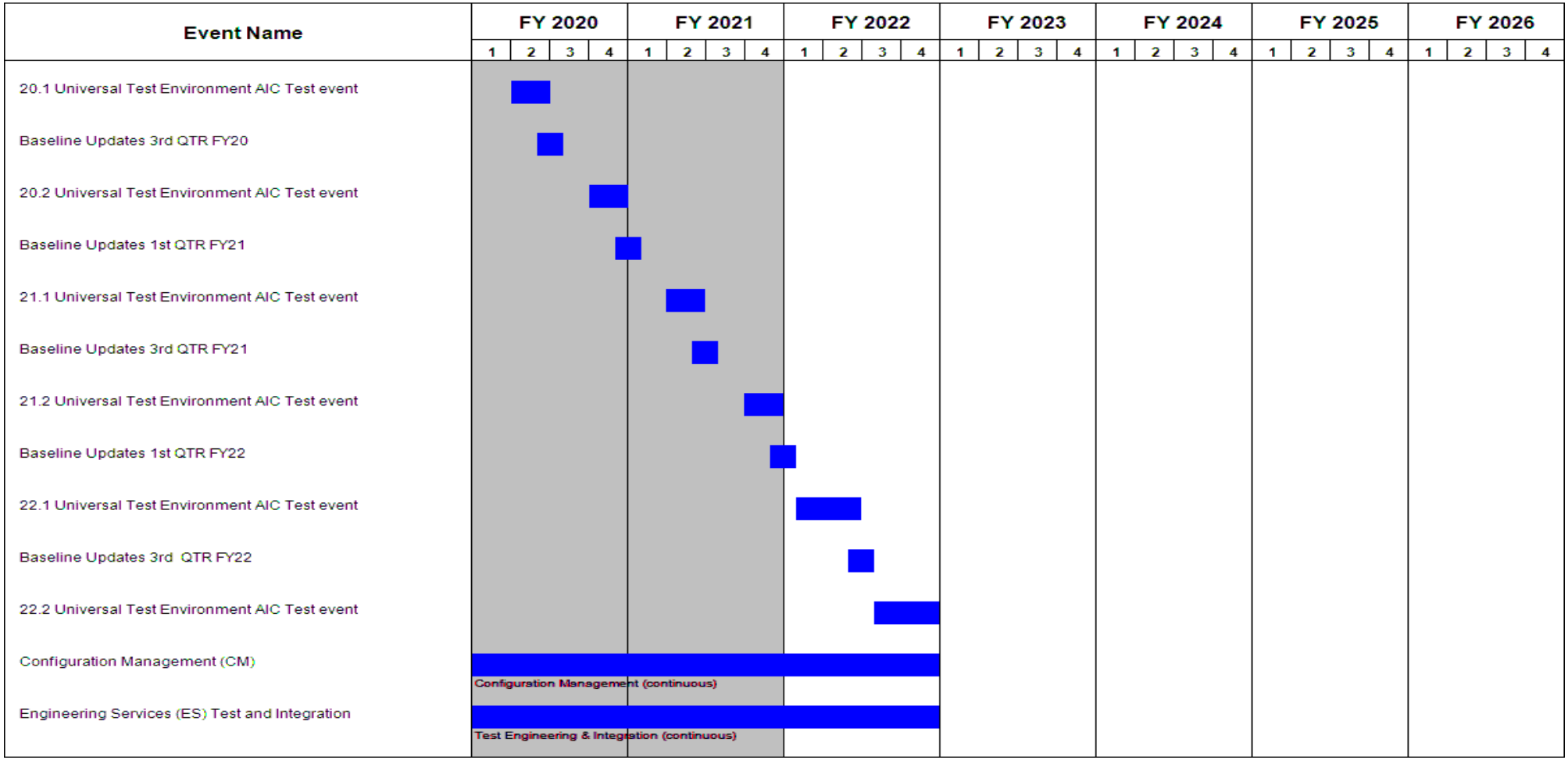

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
20.1 Universal Test Environment AIC Test event	2	2020	2	2020
Baseline Updates 3rd QTR FY20	2	2020	3	2020
20.2 Universal Test Environment AIC Test event	4	2020	4	2020
Baseline Updates 1st QTR FY21	4	2020	1	2021
21.1 Universal Test Environment AIC Test event	2	2021	2	2021
Baseline Updates 3rd QTR FY21	2	2021	3	2021
21.2 Universal Test Environment AIC Test event	4	2021	4	2021
Baseline Updates 1st QTR FY22	4	2021	1	2022
22.1 Universal Test Environment AIC Test event	1	2022	2	2022
Baseline Updates 3rd QTR FY22	2	2022	3	2022
22.2 Universal Test Environment AIC Test event	3	2022	4	2022
Configuration Management (CM)	1	2019	4	2022
Engineering Services (ES) Test and Integration	1	2019	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
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COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
C34: *Army Tac C2 Sys Eng*	-	9.092	9.351	11.473	-	11.473	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C34, Army Tactical Command and Control Systems Engineering supports the Army's Network Modernization Strategy. Project C34 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 programs aligned and in support of Network CFT LOEs 1 through 4 (Unified Network, Common Operating Environment, Interoperability, and Command Post Mobility & Survivability) that informs the design and solutions with specific emphasis on the ability for the different efforts to be integrated and interoperable with one another. Efforts support the Network CFT capability set strategy.

Project C34, Army Tactical Command and Control Systems Engineering: This project funds the PEO Command, Control, Communications-Tactical (PEO C3T) 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 effort 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 2022 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 maturing the 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 and integration events; integration of tactical information assurance solutions and security measures for consistent cyber protection; and support to N-CFT evaluations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Mission Command Network Synchronization and Integration Support	0.084	0.144	0.381
Description: Funds are for the following effort: ***FY 2021 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 2022 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			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
and overlapping capabilities are reduced across the network and in synchronization with Army Modernization priorities and Cross Functional Team activities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase funding supports additional work for Army Modernization priorities.			
Title: 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:*** Funds support the following effort: ***FY 2021 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 2022 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 systems, products, technical insertions, and systems under evaluation to ensure integration of capabilities across the network. Develop integration testing tools designed to enhance DEVSECOPS implementation and more expeditious testing cycles. Expand infrastructure and support to establish and maintain an AIC FaNS facility. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase funding to improve DEVSECOPS integration testing and AIC FaNs.	1.357	1.399	1.979
Title: Tactical Network Engineering ***Description:*** Funds support the following efforts: ***FY 2021 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 2022 Plans:***	0.752	0.803	0.843

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Develop effective engineering strategies to integrate tactical applications for use across the Mission Command network. Continue to perform network planning and integration activities across all cross-domain system-of-systems future capabilities and technologies. Develop or support development of networking documentation that defines integration of evolving Capability Set systems. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase due to inflation.			
Title: Conduct and Support System Interoperability Engineering and Development of System-of-Systems (SoS) Architectural Products ***Description:*** Funds support the following efforts: ***FY 2021 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 2022 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. Provide technical support to exercises and demonstrations of Army modernization initiatives such as Mission Partner Environment SEC/REL implementation and AFC Project Convergence. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase funding supports additional DoD and Army Modernization experimentation and demonstrations.	1.766	1.803	2.451
Title: Development and Implementation of Tactical Information Assurance (IA) ***Description:*** Funds support the following efforts: ***FY 2021 Plans:*** Will continue to 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 2022 Plans:***	0.214	0.273	0.286

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Will continue to 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 2021 to FY 2022 Increase/Decrease Statement:*** Increase due to inflation.			
Title: System of Systems Development ***Description:*** Funds support the following efforts: ***FY 2021 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 FY 2021, FY 2022 and FY 2023 to include Program of Record and emerging LOE technologies. ***FY 2022 Plans:*** Continue to effectively develop technical implementation of 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 FY 2023 and FY 2025 to include Program of Record and emerging LOE technologies. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase due to inflation.	3.233	3.201	3.362
Title: System of Systems (SoS) Engineering and Integration Evolution of the Network ***Description:*** Funds support the following efforts: ***FY 2021 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 2022 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	1.686	1.728	2.171

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
systems. Continue to develop streamlined processes to support AFC and ASA(ALT) OCSE SE strategy. Develop solutions to address technical configuration management challenges introduced by CS baselines and DEVSECOPS strategies. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase funding to implement improved configuration management engineering tools to mitigate capability set pace.			
Accomplishments/Planned Programs Subtotals	9.092	9.351	11.473

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. Efforts align to support the acquisition strategies of the programs that must connect to the network.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System of System Engineering & Integration, Current & Strategic Initiative, Architecture Integration	C/CPFF	Bowhead : APG MD	2.750	3.850	Dec 2019	3.907	Nov 2020	1.900	Nov 2021	-		1.900	Continuing	Continuing	Continuing
Systems Engineering Support	Various	Various : APG, MD	4.068	0.732	Oct 2019	0.790	Oct 2020	6.901	Oct 2021	-		6.901	Continuing	Continuing	Continuing
System of System Architectures, Engineering, and Integration	SS/FP	MITRE : Aberdeen Proving Ground, MD/ Eatontown, NJ	103.081	4.148	Sep 2020	4.172	Oct 2020	2.180	Oct 2021	-		2.180	Continuing	Continuing	Continuing
		Subtotal	109.899	8.730		8.869		10.981		-		10.981	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MATRIX	MIPR	CERDEC : Aberdeen Proving Ground, MD	14.102	0.362		0.482		0.492		-		0.492	Continuing	Continuing	Continuing
		Subtotal	14.102	0.362		0.482		0.492		-		0.492	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	124.001	9.092		9.351		11.473		-		11.473	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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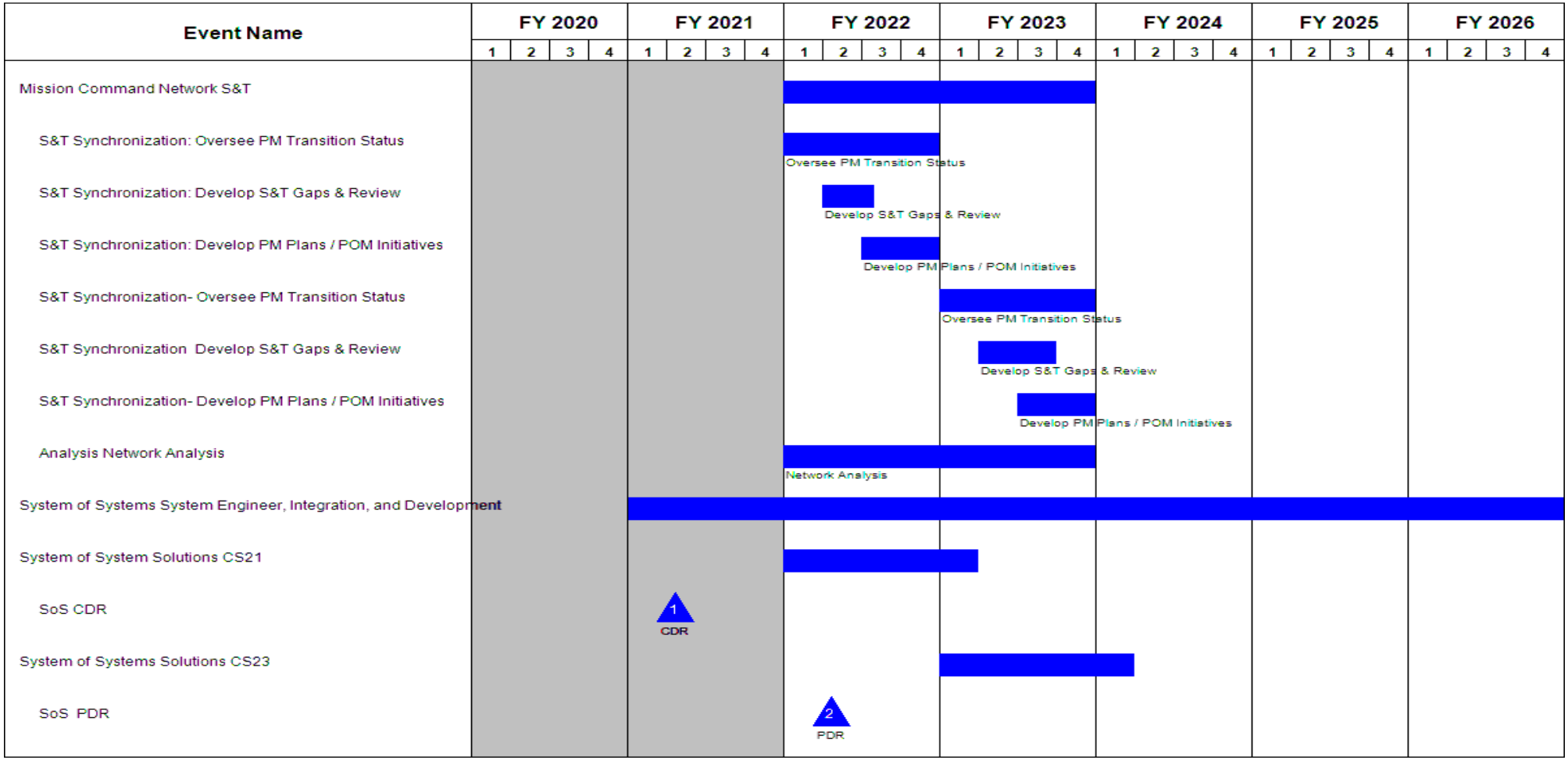

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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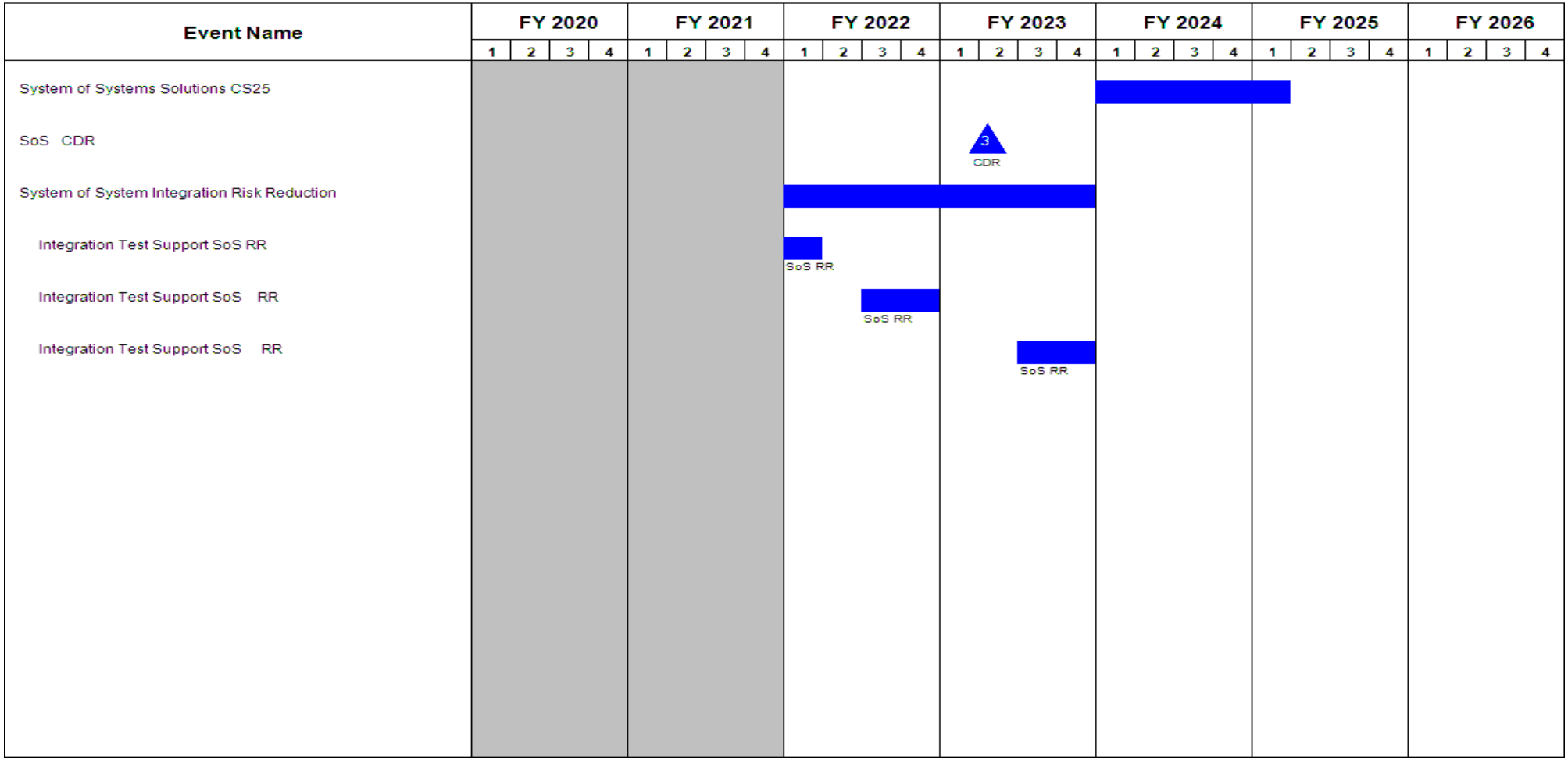

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Mission Command Network S&T	1	2022	4	2023
S&T Synchronization: Oversee PM Transition Status	1	2022	4	2022
S&T Synchronization: Develop S&T Gaps & Review	2	2022	3	2022
S&T Synchronization: Develop PM Plans / POM Initiatives	3	2022	4	2022
S&T Synchronization- Oversee PM Transition Status	1	2023	4	2023
S&T Synchronization Develop S&T Gaps & Review	2	2023	3	2023
S&T Synchronization- Develop PM Plans / POM Initiatives	3	2023	4	2023
Analysis Network Analysis	1	2022	4	2023
System of Systems System Engineer, Integration, and Development	1	2021	4	2026
System of System Solutions CS21	1	2022	1	2023
SoS CDR	2	2021	2	2021
System of Systems Solutions CS23	1	2023	1	2024
SoS PDR	2	2022	2	2022
System of Systems Solutions CS25	1	2024	1	2025
SoS CDR	2	2023	2	2023
System of System Integration Risk Reduction	1	2022	4	2023
Integration Test Support SoS RR	1	2022	1	2022
Integration Test Support SoS RR	3	2022	4	2022
Integration Test Support SoS RR	3	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
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COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
EJ4: *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*	-	29.694	26.485	35.117	-	35.117	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Network-Cross Functional Team's Army Network Modernization Strategy Line of Effort (LOE) 2, Common Operating Environment (COE).

Command Post Computing Environment (CPCE) implements an integrated, interoperable, cyber-secure, software infrastructure that serves as the host for a unified set of multiple warfighting functional applications within the command post at all echelons (Battalion to Army Service Component Commander); eliminating "stove-piped" legacy systems, duplicative or redundant implementations, simplifying future application development efforts, and enhancing interoperability and data sharing across multiple echelons.

The CPCE software infrastructure and applications reside on Tactical Server Infrastructure (TSI) hardware and previously fielded BCCS/TSI servers. CPCE/TSI provides the hardware infrastructure to host capabilities, such as movement and maneuver applications, network enabling tools (i.e. Cyber Situational Understanding and Tactical Defensive Cyber Operation Infrastructure) and warfighting function applications. This software infrastructure provides the Army's premier Common Operating Picture (COP) solution, allowing interoperability between command posts, mounted platforms, and dismounted handheld devices while supporting collaboration with Joint and Unified Action partners. CPCE provides common look and feel (user interface), common data strategy, interoperable tactical messaging/ chat, and essential movement and maneuver capabilities.

FY 2022 funding will extend the capabilities of the CPCE software infrastructure, and support Capability Set 23 (CS23). CPCE Increment 2 will bring additional warfighting function capabilities, and is focused primarily on the convergence of existing command post systems managed by Army programs of record. Warfighting functions and systems planned for convergence in Increment 2 include Intel, Fires, and Aviation systems. Improvements to the CPCE infrastructure to accommodate legacy system integration will also be required. Additionally, as part of Increment 2 and CS23, multiple Science and Technology efforts will reach Technology Readiness Level 6 and will be integrated and tested for inclusion into the CPCE architecture. Continued RDTE efforts will include ongoing development in the area of data, from ingesting of feeds, to persistence (storage) of data and querying.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: SW Dev - Core Infrastructure	21.253	16.477	25.402
Description: Provides a core software infrastructure that underpins an integrated mission command capability in command posts, from Army Service Component Command (ASCC) to Battalion echelons that provides simplicity, intuitiveness, core services			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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 enhancement of the Common Operating Picture (COP), a Common Geospatial solution (map), a user interface with "common look 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 2021 Plans:*** Continue to facilitate legacy system capability convergence,incorporate new Commercial off the shelf (COTS) and Government-developed capabilities into the CPCE infrastructure. Development and integration of new capabilities and features including additional movement and maneuver functions, engineer functions, Infrastructure modification/improvement to support legacy system capability convergence, CPCE Capability Drop 1 (CD1) requirements, Cross-Cutting Capabilities (CCC) enhancements and enhancements for Movement and Maneuver. ***FY 2022 Plans:*** For FY22, CPCE Increment 2 efforts focus on warfighting function / legacy system convergence and the implementation and integration of emerging Science & Technology (S&T) efforts. Convergence during FY22 will focus on Intel, Fires, and Aviation capabilities. Specific S&T efforts include Geospatially-Enabled Operational Design (GEOD), Automated Analytics for the Operational Environment (A2OE), Rainmaker, and Information Trust. Additionally ongoing development of the movement and maneuver functions and core infrastructure improvements continue in support of Capability Set 23. This includes continued integration of the latest commercial software solutions and updates. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase is due to increased integration effort required to converge multiple warfighting functions and legacy systems into CPCE. As CPCE Inc 0 and Inc 1 developed the underlying framework for convergence, Inc 2 (aligned with CS23) will require increased support in the areas of development, system architecture design, and testing to ensure additional capabilities and multiple S&T efforts converge effectively, allowing future system divestment decisions.			
Title: Hardware/Software Integration ***Description:*** Hardware / Software Integration within CPCE/TSI consists of research, development, and engineering efforts required to select, engineer, and field a COTS hardware server and related components. The CPCE software resides on converged Tactical Server Infrastructure (TSI) server stacks, which host multiple software infrastructure components including Microsoft Exchange, SharePoint, Defensive Cyber Operations (DCO) tools, SQL databases, Active Directory, and others. This	2.813	2.823	3.180

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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 2021 Plans:*** For FY 2021, efforts will continue to focus on design enhancements 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. Engineering of Cyber Situational Understanding (SU) integration will begin. ***FY 2022 Plans:*** For FY22, complete the updates to the CPCE Increment 1 hardware and software integration efforts. Integration will include incorporating progressive updates to the core software infrastructure, convergence of map based planning services and the aviation mission planning system into the CPCE software infrastructure. CPCE Increment 2 agile development and convergence efforts are in full effect during FY22. Integration of warfighter applications into the CPCE software and/or direct inject into the TSI hardware will be accomplished during this FY and continue through FY23, in order to meet Army Network Modernization Strategy goals for LOE 2, and Common Operating Environment functions. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase aligns with the expansion of the CPCE integration on the TSI servers to support current Army Network Modernization Strategy goals for LOE2 and Common Operating Environment functions.			
Title: Test and Evaluation ***Description:*** Test and evaluation efforts include the planning and conduct of Command Post Computing Environment (CPCE) T&E event including Developmental Test (DT), System Software Acceptance Testing (SSAT), Integration Events, Risk Reduction Events, and the Integrated Test Strategy and Operational Assessments. ***FY 2021 Plans:*** In FY 2021, CPCE will conduct multiple developmental tests to support CPCE Increment 1 capabilities and features. CPCE software will also participate in Army Interoperability Certification (AIC) testing, and Operational Assessments to inform an Increment 1 fielding decision. ***FY 2022 Plans:***	3.085	4.687	4.112

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
CPCE/TSI will continue Developmental Testing (DT), System Software Acceptance Testing (SSAT), Integration Events, Risk Reduction Events, as part of the Integrated Test Strategy for the Increment 1 update, which is expected to be released in 4QFY22 to meet Army senior leaders? objectives of maintaining the latest software baseline in the field. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease aligns to reduced number of operational test events planned for FY22.			
Title: Program Management ***Description:*** Program management includes overall management of program. Includes participation in program planning meetings and IPTs. ***FY 2021 Plans:*** Program office management in the areas of Technical, and Logistics remains a requirement in FY 2021. 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), and Combat Capabilities Development Command (CCDC). Program Management efforts in the FY 2021 timeframe will also include management of all SW development, system engineering, exercise support, DT and Operational Assessment efforts. ***FY 2022 Plans:*** Program office management of engineering and logistics teams remains a requirement in FY 2022. 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), and Combat Capabilities Development Command (CCDC). Program Management efforts in the FY 2022 timeframe will also include management of all SW development, system engineering, exercise support, and testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding remains relatively constant from FY 2021 to FY 2022.	2.543	2.498	2.423
Accomplishments/Planned Programs Subtotals	29.694	26.485	35.117

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• B70000: *COE Tactical Server Infrastructure (TSI)*	67.533	86.198	99.858	-	99.858	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

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

D. Acquisition Strategy

CPCE/TSI is an Acquisition Category II program structured in increments to deliver capability every two years. Increment 1 aligns with Capability Drop (CD) 1 and Increment 2 will align with CD 2.

In accordance with DoD direction that procurement and modification of Commercial Off-the-Shelf (COTS) products is the preferred acquisition approach, CPCE/TSI procured a COTS battle management system to serve as the underlying core infrastructure, and is modifying that COTS product to meet additional Army requirements, including backwards compatibility with legacy systems. For development of additional capabilities to be integrated into the COTS system, CPCE/TSI follows the Agile development approach (Epics, Iterations, and Sprints) that allows capabilities to be engineered, developed and tested rapidly.

The Combat Capabilities Development Command (CCDC) Armaments Center Weapons and Software Engineering Center (WSEC) and the Communications-Electronics Command (CECOM) Software Engineering Center (SEC) are prime Government partners in system development. Commercial suppliers are assigned efforts through GSA Mission Command Engineering Services vehicles and Multiple Award Task Order (MATO) contracts.

Hardware (server) platforms are COTS and procured under the Tactical Services Infrastructure (TSI) funding line through existing vehicles from GSA, Common Hardware Systems (CHS) and the Army Computer Hardware Enterprise Software and Solutions (CHESS).

CPCE Inc 0 brings the core software infrastructure and initial movement and maneuver capabilities. Inc 1 will meet the requirements of the CPCE Requirements Definition Package and Capability Drop 1 and focuses on enhancements to Inc 0 and enabling legacy system convergence. Inc 2 will bring additional warfighting function capabilities and enhancements to existing capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Support (Gov't-Core)	Sub Allot	PM Mission Command : APG, MD	5.603	-		-		-		-		-	0.000	5.603	-
PM Support (Gov't-Matrix)	IA	Various Matrix Orgs incl CECOM SEC, ILSC, PRD, et al) : APG, MD	5.747	0.942		-		0.839	Oct 2021	-		0.839	Continuing	Continuing	-
PM Support (SETA Contractor)	C/FFP	Multiple incl CACI and others : APG, MD	18.101	1.601	Nov 2019	2.498	Nov 2020	1.584	Nov 2021	-		1.584	Continuing	Continuing	-
		Subtotal	29.451	2.543		2.498		2.423		-		2.423	Continuing	Continuing	N/A

Remarks

Funding for Core government support (Management and Oversight of CPCE/TSI) transitioned to OMA Appropriation in FY19.
Funding remains relatively constant from FY21 to FY22.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Requirements Engineering	Various	SW Dev Contractors and Multiple Matrix Orgs : Various Locations	23.831	-		-		-		-		-	0.000	23.831	-
Software Development - Core Infrastructure	Option/ Various	ARDEC, CCDC, Systematic : Picatinny, NJ APG, MD Centerville, VA	155.462	21.253	Oct 2019	16.477	Oct 2020	25.402	Nov 2021	-		25.402	Continuing	Continuing	-
Joint and Coalition Interoperability	Various	Multiple : Various	0.296	-		-		-		-		-	0.000	0.296	-
Hardware / Software Integration	IA	Various Matrix Orgs incl CECOM SEC, ARDEC, ILSC, PRD, et al) : APG Md	23.084	2.813	Oct 2019	2.823	Oct 2020	3.180	Dec 2021	-		3.180	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	202.673	24.066		19.300		28.582		-		28.582	Continuing	Continuing	N/A

Remarks

Software Development efforts will be managed through a combination of PM Mission Command technical staff, Matrix Organizations (C5ISR CCDC, AMRDEC) and software development contractor firms (contracts and task orders to be determined and competed as necessary).
Increase in Software Development-Core Infrastructure is due to increased integration effort required to converge multiple warfighting functions and legacy systems into CPCE. As CPCE Inc 0 and Inc 1 developed the underlying framework for convergence, Inc 2 (aligned with CS23) will require increased support in the areas of development, system architecture design, and testing to ensure additional capabilities and multiple S&T efforts converge effectively, allowing future system divestment decisions.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Support	C/FFP	SSCI : Austin, TX	2.989	-		-		-		-		-	0.000	2.989	-
		Subtotal	2.989	-		-		-		-		-	0.000	2.989	N/A

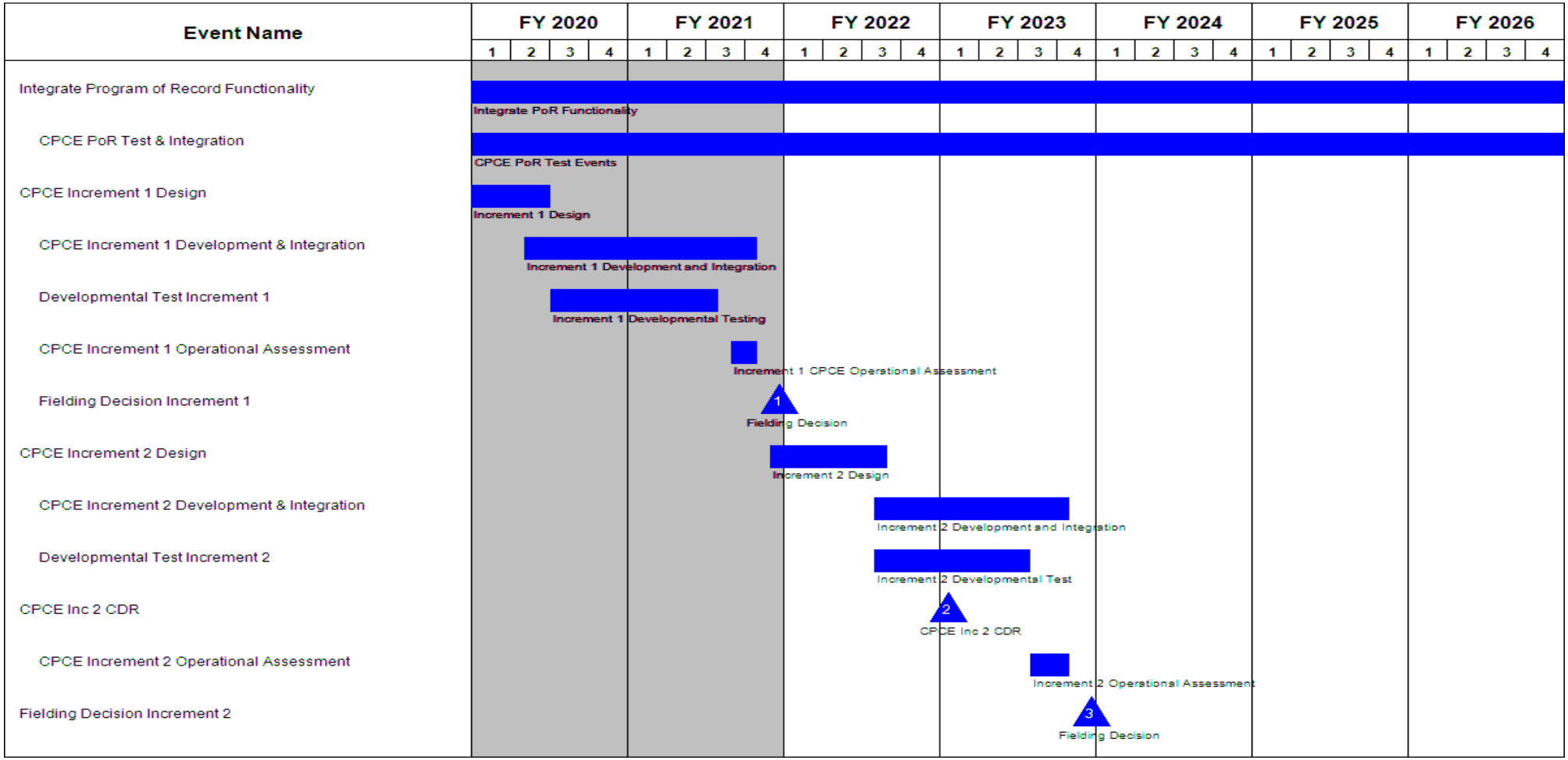
Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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)	15.894	3.085	Oct 2019	4.687	Oct 2020	4.112	Oct 2021	-		4.112	Continuing	Continuing	-
		Subtotal	15.894	3.085		4.687		4.112		-		4.112	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	251.007	29.694		26.485		35.117		-		35.117	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ4 / *COMMAND POST COMPUTING ENVIRONMENT (CPCE)*



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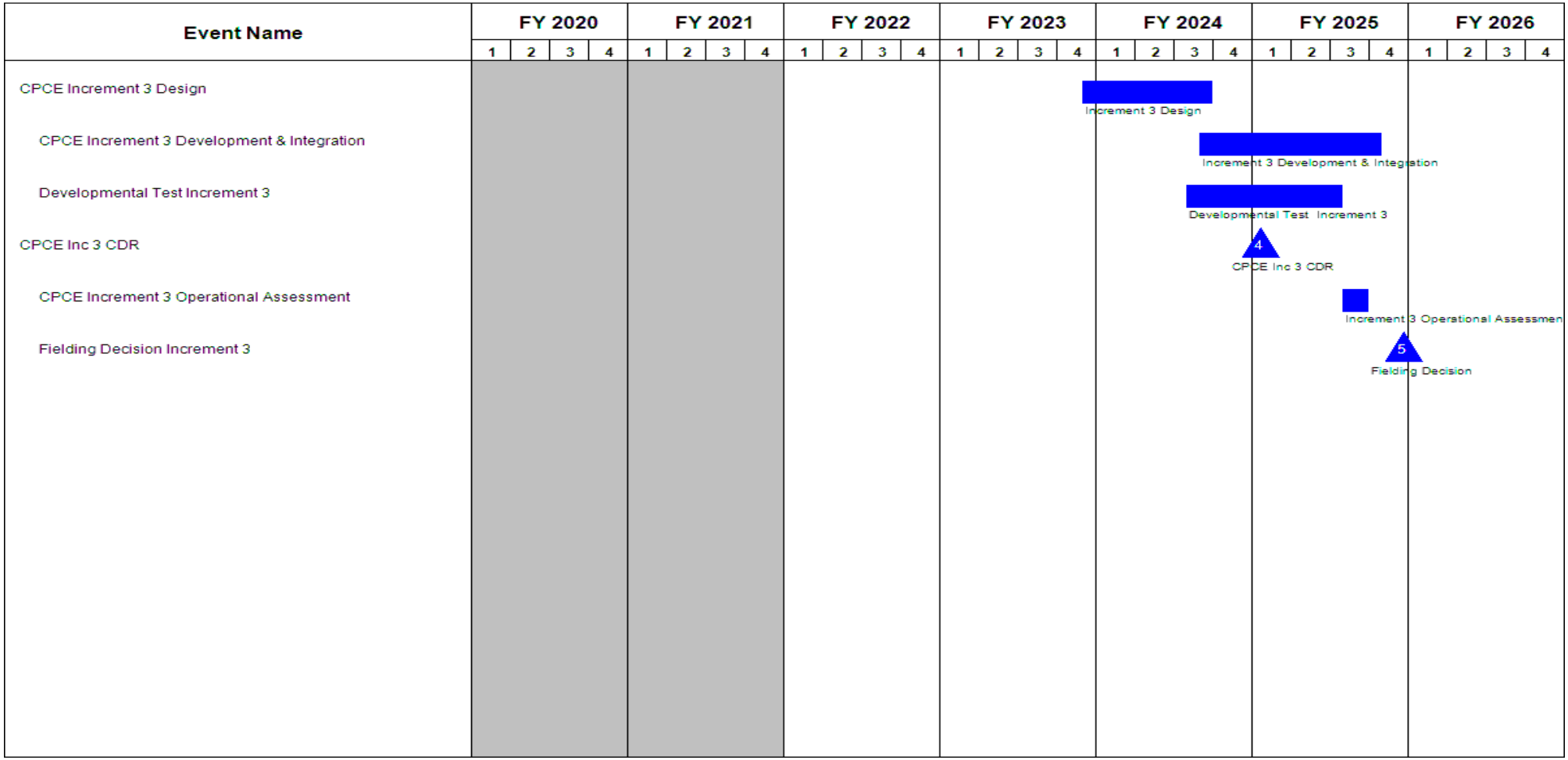

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Integrate Program of Record Functionality	2	2019	4	2026
CPCE PoR Test & Integration	1	2018	4	2026
CPCE Increment 1 Design	3	2019	2	2020
CPCE Increment 1 Development & Integration	2	2020	4	2021
Developmental Test Increment 1	3	2020	3	2021
CPCE Increment 1 Operational Assessment	3	2021	4	2021
Fielding Decision Increment 1	4	2021	4	2021
CPCE Increment 2 Design	4	2021	3	2022
CPCE Increment 2 Development & Integration	3	2022	4	2023
Developmental Test Increment 2	3	2022	3	2023
CPCE Inc 2 CDR	1	2023	1	2023
CPCE Increment 2 Operational Assessment	3	2023	4	2023
Fielding Decision Increment 2	4	2023	4	2023
CPCE Increment 3 Design	4	2023	3	2024
CPCE Increment 3 Development & Integration	3	2024	4	2025
Developmental Test Increment 3	3	2024	3	2025
CPCE Inc 3 CDR	1	2025	1	2025
CPCE Increment 3 Operational Assessment	3	2025	3	2025
Fielding Decision Increment 3	4	2025	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army												Date: May 2021
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*				Project (Number/Name) EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*			
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
EJ5: *MOUNTED COMPUTING ENVIRONMENT (MCE)*	-	10.033	9.994	21.874	-	21.874	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy LOE 2, Common Operating Environment (COE). PdM efforts are aligned to support the Network-Cross Functional Team (N-CFT) Capability Set approach to achieve the Army's Network Modernization Strategy.

The Mounted Computing Environment (MCE) supports N-CFT LOE 2 by providing:
- Critical Interoperability features that bridge the communications gap between the Command Post Computing Environment (CPCE) and Mobile Handheld Computing Environment (Nett Warrior)
- Data mediation, message format translation, and waveform exchanges across all CEs delivering improved information dissemination
- Mounted Common Operating Picture (COP) data sources, shared blue / red situational awareness, and Position / Location Information across the CEs
- Common, reusable services that enable Warfighting Function (WfF) convergence for rapid capability development and delivery with reduced costs for external PORs
- Mounted platform data sensor collection, processing, and disbursement applications that enable and enhance WfFs on the battlefield
- Foundational Cross-Cutting Capabilities (CCCs) that integrate with Joint C5ISR and strike capabilities

The MCE, which is one of six Computing Environments (CE) under the COE, internally develops and hosts applications (apps) developed by programs external to Project Manager Mission Command (PM MC) to provide robust WfF capabilities. MCE RDTE funding is executed to develop Mounted Mission Command-Software (MMC-S) (described below) to enable these convergence efforts.

Requirements for MMC-S (MCE) are established in the Army Requirements Oversight Council (AROC)-approved COE Information Systems Initial Capability Document (IS ICD) and the MCE Requirements Definition Package (RDP). MMC-S will support the next-generation network, transceiver, and more mature cross-Computing Environment (CE) interfaces.

At the Materiel Development Decision (MDD) review, the Milestone Decision Authority (MDA) signed an Acquisition Decision Memorandum (ADM) in June 2020 designating MMC-S as an ACAT II program of record (POR) under the MCE RDP.

MMC-S employs a Developmental Operations (DevOps) process to incrementally develop capability to satisfy Warfighter requirements and inform fielding decisions. DevOps activities will incorporate new capabilities and enhancements driven by the RDP and based on user feedback. Furthermore, MMC-S will provide the foundation to support third-party application convergence onto the MMC-S baseline. MMC-S utilizes the Android Tactical Assault Kit (TAK), which is a geospatial infrastructure and military situational awareness application that allows for precision targeting, surrounding land formation intelligence, situational awareness, navigation, and data sharing.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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)*

FY 2022 funding supports the continued development of the MMC-S baseline, version 3.1, for a Limited User Test (LUT) and Army Interoperability Certification (AIC) culminating in a Limited Deployment Decision in 4QFY22. Furthermore, FY 2022 funding begins the second phase of MMC-S development, version 3.2, and implementation of new capabilities to support additional networks and bolster cross-Computing Environment (CE) interfaces. These efforts are aligned to Capability Set 23.

MCE RDTE (project EJ5) resources are used for MCE (MMC-S) software development, while JBC-P RDTE is used to improve JBC-P hardware, network performance, and resiliency.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Software Development	7.294	9.137	15.357

Description: MMC-S provides an integrated mission command capability across Platforms, through all echelons, delivering simplicity, intuitiveness, core services and applications, a common look and feel, and functionality across all Warfighting Functions (WfF); Fires, Logistics, Intelligence, and Maneuver. Software development is focused on enhanced situational awareness functions, cross-cutting data exchange services, and Mission Command applications displayed on the next-generation common geospatial solution [map] through a graphical user interface that delivers a "common look and feel" across the CEs.

FY 2021 Plans:
Continued development and incorporation of baseline capabilities of MMC-S version 3.1 focused on infrastructure, core utilities, backwards compatibility, and WfF application convergence into a holistic system of systems, while ensuring subsystems function together in accordance with program requirements, specifications, and interoperability requirements. MMC-S will develop initial 3rd Party Apps; initial Sustainment WfF capabilities; Over-the-Air (OTA) updates for software patches, Information Assurance (IA), and maps; message standards migration; network path diversity for Commercial Solutions for Classified (CSfC), Wi-Fi, and Iridium satellite communications; Automated Primary, Alternate, Contingency, and Emergency (APACE) data mapping; Assured-Position/ Navigation/Timing (A-PNT), anti-jam, and spoofing resilient Global Positioning System (GPS); and route planning and navigation.

FY 2022 Plans:
FY 2022 funding will continue development and incorporation of baseline capabilities of MMC-S version 3.1 focused on infrastructure, core utilities, backwards compatibility, and WfF application convergence into a holistic system of systems, while ensuring subsystems function together in accordance with program requirements, specifications, and interoperability requirements. These efforts require extensive development of complex capabilities to ensure robust features are delivered to the Warfighter.

FY 2022 funding will begin development of the next SW version, MMC-S version 3.2, that will focus on multiple platforms and programs such as: Platform Integration (Stryker, JLTV, Abrams, Bradley, AMPV), Sensor Integration (Long-Range Acquisition System (LRAS), Improved Target Acquisition System (ITAS), Fire-Support Sensor System (FS3), Netted Lethality Upgrades, Precision Fires - Mounted Integration, finalize OTA Updates (Over The Network Keying (OTNK), Map Updates), Remote Display,

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Improved Route Planning / Navigation, Network Path Diversity (Smart Routing / APACE), additional 3rd Party Application Integration, Message Standards Migration, Netted asset (Non A-PNT), and VICTORY migration. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase supports completion of MMC-S version 3.1 and begins development of version 3.2, which is encompasses more complex feature development and integration efforts. Version 3.2 is focused on convergence efforts with multiple platforms, platform data collection sensors, and complex interoperability requirements.			
Title: Software/Systems Engineering ***Description:*** Perform Software and Systems Engineering (SE) in support of the development of MMC-S (MCE) capabilities, applications and services, to include, but not limited to, executing engineering studies, software architecture development, system analysis, technical readiness assessments, technical exchange meetings and events, and development of related reports and deliverables described in the MCE RDP. SEs will coordinate the development of common infrastructure components with CPCE and M/HHCE to define and incorporate the COE cross-cutting capabilities. ***FY 2021 Plans:*** In FY 2021, MMC-S will execute required version 3.1 systems engineering activities, integration of 3rd party Program of Record (PoR) applications onto the baseline software architecture, focused on supporting MMC-S delivery to the Army's wheeled platforms (applique). MMC-S will execute DevOps with Army units in order to receive user feedback and inform MMC-S maturation. This Soldier (user) feedback will help shape future software development efforts to ensure the best capability is delivered to the Warfighter. ***FY 2022 Plans:*** In FY 2022, MMC-S will continue required version 3.1 systems engineering activities, and begin version 3.2 SE activities to integrate 3rd party PoR applications onto the baseline software architecture, and platform integration onto the Army's wheeled platforms. MMC-S will continue DevOps with Army units in order to receive user feedback on MMC-S versions 3.1 and 3.2 to inform software development, refinement, and inform fielding decisions. SE activities will directly support MMC-S version 3.1?s LUT and AIC to inform the LDD in support of CS23. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase supports MMC-S version 3.1 completion and inception of version 3.2, focused on convergence efforts with multiple platforms, platform data collection sensors, and complex interoperability requirements. Version 3.2 requires significant software and systems engineering efforts to ensure these complex features are developed and delivered to the Warfighter.	0.617	0.058	0.675
Title: Test and Evaluation	1.058	0.065	4.925

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Description: Test and evaluation (T&E) efforts consist of planning and execution for required test events to inform fielding decisions and ensure the safe delivery of capability to the Warfighter. T&E events include: Development Operations (DevOps), Developmental Tests (DT), Software Assurance Tests, CS23 Integration Events, Risk Reduction Tests, Limited User Test (LUT), Army Interoperability Certification (AIC) , Security Control Assessment-Validation, and Initial Operational Test and Evaluation (IOT&E). ***FY 2021 Plans:*** In FY 2021, MMC-S will utilize DevOps to enhance the MMC-S baseline to meet Warfighter requirements. MMC-S will integrate existing 3rd party Programs of Record (PoR) applications onto the common MMC-S baseline. MMC-S will execute required Developmental Tests, Software Assurance Tests, CS23 Integration Events, Risk Reduction Tests, and Security Control Assessment-Validation tests in preparation for required FY22 Test activities to inform fielding decisions. ***FY 2022 Plans:*** MMC-S will execute an MMC-S version 3.1 Limited User Test (LUT), to measure effectiveness, suitability, and survivability and provide an Adversary Assessment (AA) report to support the MMC-S v3.1 Software Materiel Release (SMR) review in 3Q23. The Army Interoperability Certification (AIC) will be executed to certify that MMC-S is interoperable and integrated with other systems on the tactical network. Both the LUT and AIC are required prior to the Limited Deployment Decision (LDD) in 4QFY22. MMC-S will execute version 3.2 DevOps events to inform development efforts. In addition, version 3.1 CS23 Integration Events will inform the v3.1 LDD and the development of MMC-S v3.2 DevOps plans. MMC-S will utilize DevOps to enhance the MMC-S baseline to meet Warfighter requirements. Resources will support required instrumentation Verification, Validation, and Accreditation (VV&A) activities in preparation for the FY23 version 3.1 IOT to inform FDD. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase supports MMC-S v3.1 LUT, AIC, IOT preparation activities, and MMC-S v3.2 integrated-platform DevOps events.			
Title: PM Support (Matrix & Contractor)	1.064	0.734	0.917
Description: Program management includes overall management of program execution, major text events, reporting, technical support, and logistical support. Includes participation in program planning meetings, Integrated Project Teams, Technical Exchange Meetings, stakeholder management, 3rd party application convergence, and Science and Technology efforts and convergence. These efforts are continuous for the life of the program. They are not tied to specific versions of MMC-S. ***FY 2021 Plans:*** Technical area contract support includes system development and engineering changes to MMC-S, system analysis of Program of Record (PoR) systems and future systems for integration and convergence, technical readiness assessments, and stakeholder			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
technical exchange meetings and events. This support includes the creation and implementation of Functional Support Agreements (FSAs) between PM Mission Command and various Government support agencies, such as the Combat Capabilities Development Command (CCDC) C5ISR (Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance) Center, and other PEOs (e.g. PEO GCS). Program Management efforts in FY 2021 include business area support to ensure funding and contracts are planned and available for SW development, system engineering, and test efforts. ***FY 2022 Plans:*** Will continue to provide Technical area contract support includes system development and engineering changes to MMC-S, system analysis of Program of Record (PoR) systems and future systems for integration and convergence, technical readiness assessments, and stakeholder technical exchange meetings and events. This support includes the creation and implementation of Functional Support Agreements (FSAs) between PM Mission Command and various Government support agencies, such as the Combat Capabilities Development Command (CCDC) C5ISR (Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance and Reconnaissance) Center, and other PEOs (e.g. PEO GCS). Program Management efforts in FY 2021 include business area support to ensure funding and contracts are planned and available for SW development, system engineering, and test efforts. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding increase will support the highly-complex MMC v3.2 development and external stakeholder coordination and continue MMC v3.1 development, integration, and delivery to the Warfighter.			
Accomplishments/Planned Programs Subtotals	10.033	9.994	21.874

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

MCE is the Army's initiative to provide simple and intuitive Mission Command on-the-Move (MCoTM) and situational awareness down to the platoon level. It is standards based, protected, and supports incremental improvements and WfF app capability enhancements. MMC-S leverages existing JBC-P hardware and network, and is deployed as a SW only upgrade to replace JBC-P SW. The MMC-Software will exploit the MMC-Transport (BFT 3 network) and hardware capability-maturation, continuously enhancing capabilities, security, and network resiliency that outpaces adversarial countermeasures and threats. MMC-S provides a common user-experience that enables leaders to lead and fight their formations from anywhere on the battlefield. MMC-S serves as the data mediator between disparate CEs, the Command Post Computing Environment (CPCE) and the Mobile Handheld Computing Environment (Nett Warrior), enabling seamless Mission Command and Common Operating Picture (COP) generation across all three CEs.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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)*

MMC-S utilizes an incremental development approach, leveraging DevOps, to ensure capability is delivered quickly, satisfies requirements, and addresses Warfighter feedback. This agile development process injects enhancements into the baseline software, making it easier and faster to incorporate technological advances. The product office conducts commercial software assessments to determine applicability and suitability for inclusion in the MMC-S baseline.

Software development increments and fielding decisions are agile and are programmatically aligned with the two-year Army Capability Sets within the five-year Requirements Development Package (RDP; i.e. - IT Box). MMC-S is developed in Capability Assessment Packages (CAP), which are small groupings of requirements and capability that are manageable, tailorable, and scalable to meet Warfighter needs. The CAPS are developed by the Lead Systems Integrator (LSI) in three to twelve month timeframes. Collections of CAPs form MMC-S Engineering Releases (ER) / Capability Drops (CDs), which build upon one another leading to a complete incremental release (i.e. version 3.1). Incremental releases will be fielded with the Army Capability Sets. LDD in 4QFY22 for Increment v3.1 is aligned to CS23. Full Deployment Decision (FDD) for MMC-S v3.1 is scheduled for 4QFY23. FDD for MMC-S v3.2 is scheduled for 4QFY24, aligned to CS25. FDD for MMC-S v3.3 is scheduled for 4QFY26, aligned to CS27.

At the Materiel Development Decision (MDD) review, the Milestone Decision Authority (MDA) signed an Acquisition Decision Memorandum (ADM) in June 2020 designating MMC-S as an ACAT II program of record (POR) under the MCE RDP.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Support (Matrix & Contractor)	Various	PM Mission Command : Aberdeen Proving Ground, MD	4.600	1.064		0.734	Nov 2020	0.917	Nov 2021	-		0.917	Continuing	Continuing	-
		Subtotal	4.600	1.064		0.734		0.917		-		0.917	Continuing	Continuing	N/A

Remarks

Funding increase will support the highly-complex MMC v3.2 development and external stakeholder coordination and continue MMC v3.1 development, integration, and delivery to the Warfighter.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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	29.514	7.294		9.137	Dec 2020	15.357	Dec 2021	-		15.357	Continuing	Continuing	-
Software/Systems Engineering	Various	PM Mission Cmd, Multiple Matrix Orgs and SW Dev Contractors : Aberdeen Proving Ground, MD	20.923	0.617		0.058	Feb 2021	0.675	Nov 2021	-		0.675	Continuing	Continuing	-
		Subtotal	50.437	7.911		9.195		16.032		-		16.032	Continuing	Continuing	N/A

Remarks

FY 2021 to FY 2022 funding increase supports completion of MMC-S version 3.1 and begins development of version 3.2, focused on complex convergence efforts with multiple platforms, platform data collection sensors, and complex interoperability requirements.

Also supports increased Software/Systems Engineering efforts to ensure robust features are delivered to the Warfighter.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test, Evaluation and Integration	MIPR	Multiple Test Agencies; Multiple Locations : Aberdeen Proving Ground, MD	7.869	1.058		0.065	Nov 2020	4.925	Nov 2021	-		4.925	Continuing	Continuing	-
		Subtotal	7.869	1.058		0.065		4.925		-		4.925	Continuing	Continuing	N/A

Remarks

FY 2021 to FY 2022 funding increase supports MMC-S v3.1 LUT, AIC, and MMC-S v3.2 integrated-platform DevOps events, as well as initial planning costs for the FY23 IOT.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	62.906	10.033		9.994		21.874		-		21.874	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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)*

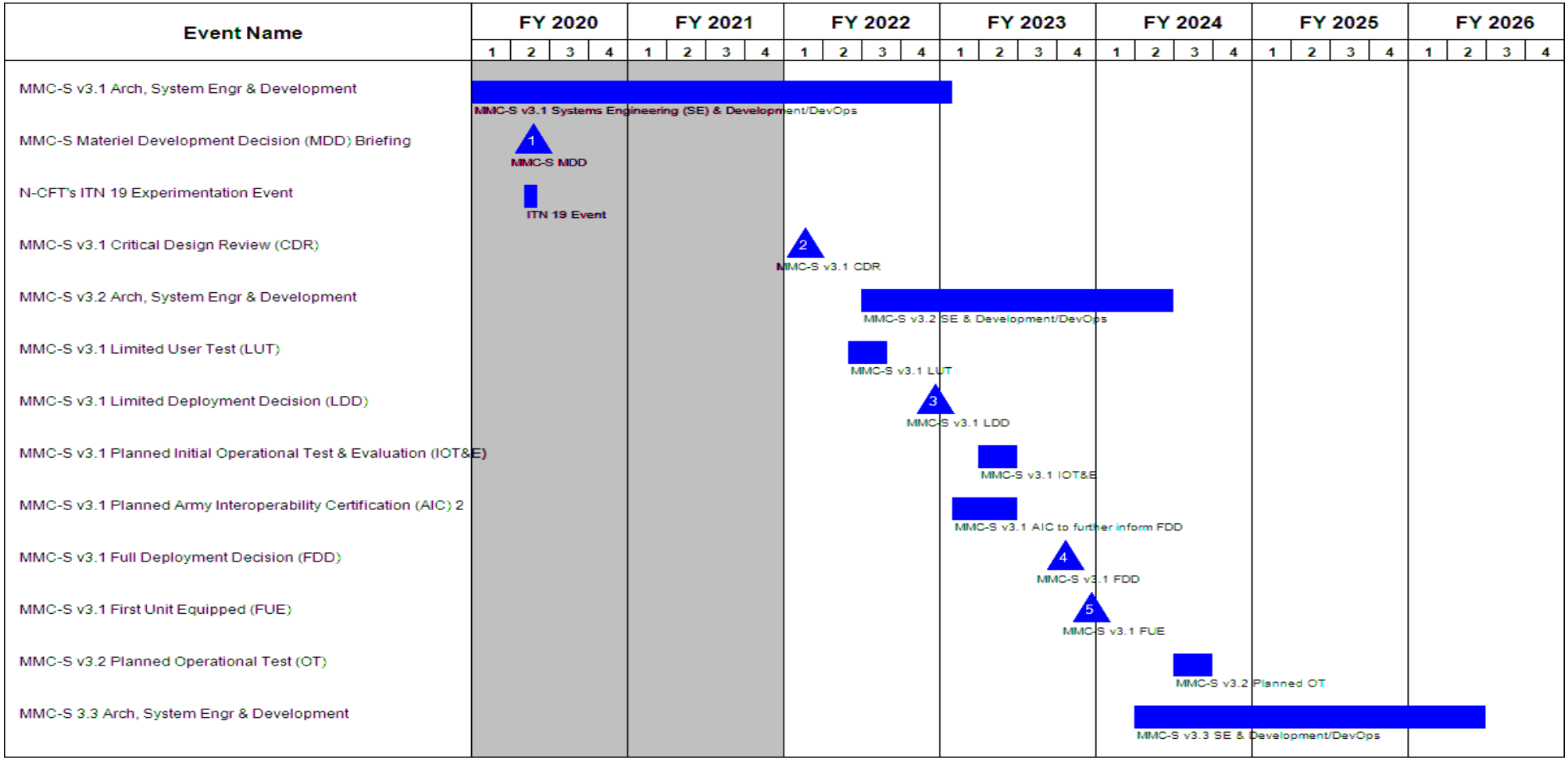


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

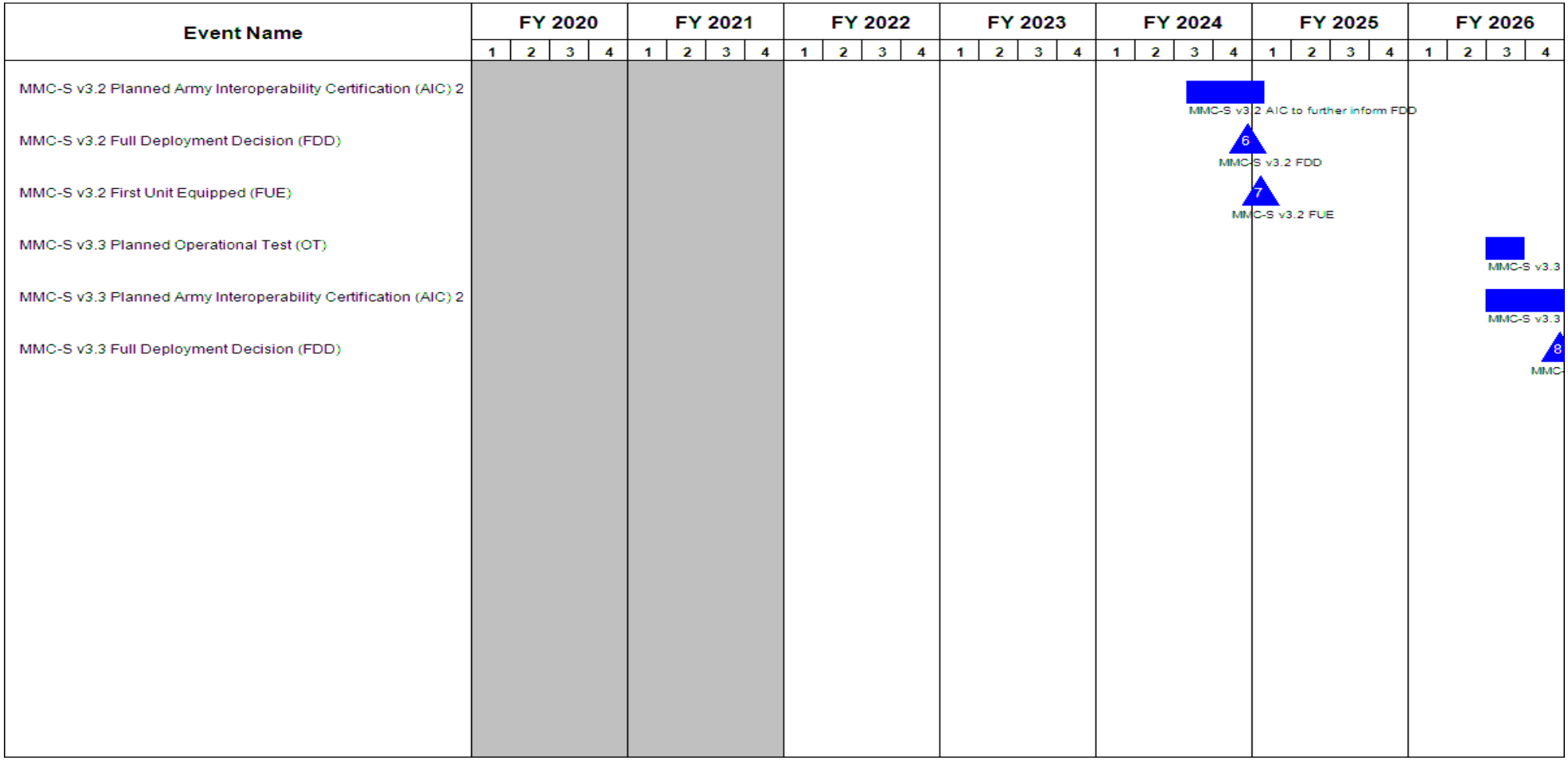


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ5 / *MOUNTED COMPUTING ENVIRONMENT (MCE)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MMC-S v3 Test & Integration	3	2017	4	2018
MMC-S v3.1 Arch, System Engr & Development	1	2019	1	2023
MMC-S v3 Customer Test	1	2019	1	2019
MMC-S Materiel Development Decision (MDD) Briefing	2	2020	2	2020
N-CFT's ITN 19 Experimentation Event	2	2020	2	2020
MMC-S v3.1 Critical Design Review (CDR)	1	2022	1	2022
MMC-S v3.2 Arch, System Engr & Development	3	2022	2	2024
MMC-S v3.1 Limited User Test (LUT)	2	2022	3	2022
MMC-S v3.1 Limited Deployment Decision (LDD)	4	2022	4	2022
MMC-S v3.1 Planned Initial Operational Test & Evaluation (IOT&E)	2	2023	2	2023
MMC-S v3.1 Planned Army Interoperability Certification (AIC) 2	1	2023	2	2023
MMC-S v3.1 Full Deployment Decision (FDD)	4	2023	4	2023
MMC-S v3.1 First Unit Equipped (FUE)	4	2023	4	2023
MMC-S v3.2 Planned Operational Test (OT)	3	2024	3	2024
MMC-S 3.3 Arch, System Engr & Development	2	2024	2	2026
MMC-S v3.2 Planned Army Interoperability Certification (AIC) 2	3	2024	1	2025
MMC-S v3.2 Full Deployment Decision (FDD)	4	2024	4	2024
MMC-S v3.2 First Unit Equipped (FUE)	1	2025	1	2025
MMC-S v3.3 Planned Operational Test (OT)	3	2026	3	2026
MMC-S v3.3 Planned Army Interoperability Certification (AIC) 2	3	2026	1	2027
MMC-S v3.3 Full Deployment Decision (FDD)	4	2026	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
EJ6: *TACTICAL ENHANCEMENT*	-	-	-	7.860	-	7.860	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY 2022.

Project EJ6 / TACTICAL ENHANCEMENT is a new start for Fiscal Year (FY) 2022.

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

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

SIGMOD Capabilities:

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.

COMMAND POST NETWORKING: Enables Command Post networking capabilities by providing communications solutions to enable a more survivable Command Post against near peer advisories. The solutions will utilize advanced waveform and antenna improvements to decrease radio frequency detection and interception in the battlefield and will be integrated onto the appropriate platforms to increase Command Post survivability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: IOT&E for TROPO systems	-	-	5.060
Description: Funds support TROPO IOT&E			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
$5,060K funds TROPO IOT&E testing requirement ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Project EJ6 / TACTICAL ENHANCEMENT is a new start for FY 2022. Funding required to execute TROPO IOT&E in FY 2022.			
Title: Command Post Networking ***Description:*** Funds support Command Post Networking ***FY 2022 Plans:*** $2,800K funds Command Post Networking efforts ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Project EJ6 / TACTICAL ENHANCEMENT is a new start for FY 2022. Funding required to execute Command Post Networking efforts in FY 2022	-	-	2.800
Accomplishments/Planned Programs Subtotals	-	-	7.860

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• B00010: *Signal Modernization Program*	128.913	151.179	140.036	-	140.036	-	-	-	-	-	-

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 systems. This is in order to facilitate integration into the 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 Tactical Network nodes to expand and enhance network capacity and user access. The TROPO 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 TROPO (4QFY18).

The Acquisition Strategy will integrate proven Commercial-Off-the-Shelf (COTS) capabilities into existing Tactical Network nodes to provide a more secure network connection between command posts, command post vehicles and end user devices.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sig Mod	SS/FP	TBD : TBD	1.392	-		-		-		-		-	0.000	1.392	-
Army Withhold and Unit Task Reorganization (UTR) Realignment	SS/FFP	Harris Corp : Arlington, VA	7.777	-		-		-		-		-	0.000	7.777	-
		Subtotal	9.169	-		-		-		-		-	0.000	9.169	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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	27.416	-		-		-		-		-	0.000	27.416	-
		Subtotal	27.416	-		-		-		-		-	0.000	27.416	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 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	-	-		-		5.060	Apr 2022	-		5.060	0.000	5.060	-
Command Post Networking	TBD	TBD : TBD	-	-		-		2.800	Apr 2022	-		2.800	0.000	2.800	-
		Subtotal	19.823	-		-		7.860		-		7.860	0.000	27.683	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	56.408	-	0.000	7.860	-	7.860	0.000	64.268	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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*

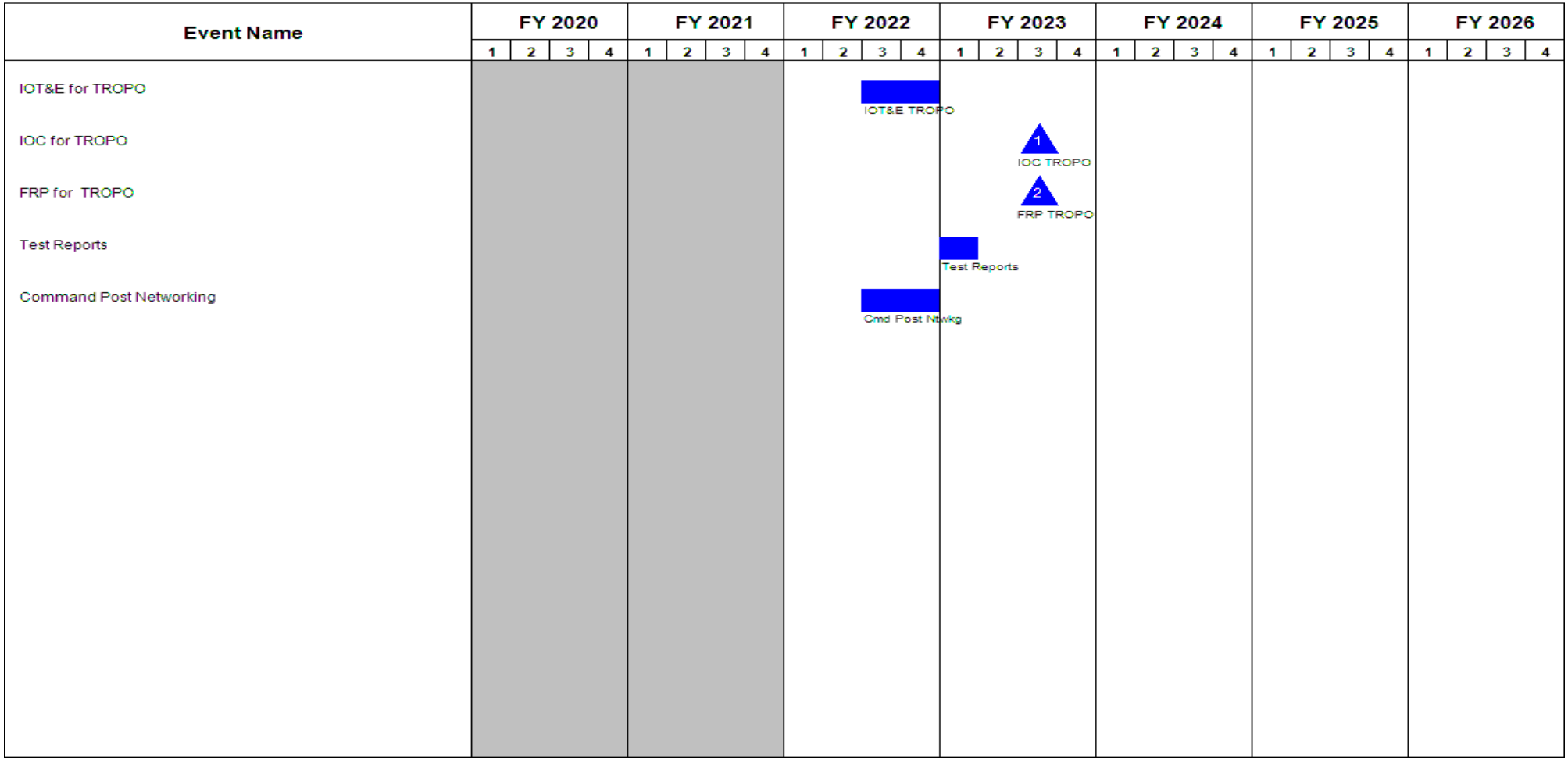


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EJ6 / *TACTICAL ENHANCEMENT*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IOT&E for TROPO	3	2022	4	2022
IOC for TROPO	3	2023	3	2023
FRP for TROPO	3	2023	3	2023
Test Reports	1	2023	1	2023
Command Post Networking	3	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army											Date: May 2021	
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
EK9: *TACTICAL NETWORK OPERATIONS AND MANAGEMENT*	-	3.499	3.252	3.366	-	3.366	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding line supports the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

Tactical Network Operations Management's (TNOM) purpose is to create Unified Network Operations (UNO). UNO is a software centric, integrated NetOps capability being developed, as a rapid prototype - proceeding under Section 804 Mid-Tier Acquisition (MTA) authority granted by the Army Acquisition Executive (AAE)'s 14 May 2019 Acquisition Decision Memorandum (ADM). Enabling common planning, configuration, monitoring, provisioning, management, and defense of the Network, UNO configures and integrates tactical and enterprise networks to allow delivery of information and communications among Soldiers at all echelons utilizing network resources prioritized according to the Commander's intent. In developing UNO, TNOM follows the Army's Development Operations (DevOps) approach - creating Network Operations (NetOps) prototypes, gaining user feedback, making adjustments and ultimately delivering enhanced capabilities to the operational force in the shortest time possible. UNO development incorporates solutions available in industry and through government agencies - assessing them in an adapt-and-buy approach informed by experimentation, demonstration, and modernization.

FY 2022 funding supports MTA (Section 804) rapid prototyping efforts of UNO v1.1 via NetOps capabilities that build upon current efforts, efforts that align with Chief of Staff of the Army (CSA) guidance to provide delivery of simplified NetOps capabilities across the tactical network, and include emerging capability requirements stemming from Network Cross-Functional Team (CFT) initiatives and directed requirements. UNO will also support the delivery of integrated capabilities to plan, install, operate, maintain, and secure the Army's end-to-end network in support of the commander's mission priorities. Army's approved requirements for UNO are found in the Integrated Tactical Network (ITN) Abbreviated - Capability Definition Document (A-CDD) dated 26 June 2019.

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2020**	**FY 2021**	**FY 2022**
Title: Product Development	2.404	3.252	3.366
Description: Network Planner provides the product development of workflows that guide Soldiers through planning the Tactical Radios, SATCOM, Line of Sight (LOS) and TROPO systems, automates the analysis process to recommend locations to place LOS Nodes based on Area of Responsibility, improves Planning accuracy for Antenna & Radio templates, based on updated performance parameters, simplifies configuration operations through the use of a centralized network database and supports Unit Task Reorganization (UTR), and provides consistent look and feel with embedded training.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
Network Management provides the product development into the Network Common Operational Picture (COP) for all tactical networks systems, management to Tactical Radios, SATCOM Line of Sight (LOS) and TROPO systems, network status information to monitor and adjust the network to meet mission requirements, and consistent look and feel with embedded training. ***FY 2021 Plans:*** FY 2021 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 development, assessments, and deliveries of 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 MTA will support prototyping of NetOps capabilities that enable command and control of the Tactical Network which will provide simplicity via a Common Operating Picture (COP), a flexible framework enabling rapid integration of future commercial/ government tools, and reliable network information to the Soldiers. The Network Planner and Network Management capabilities will support Network CFT initiatives and directed requirements utilizing the adapt and buy approach, as well as modernization, put forth by Army leadership. Continues product development of the simplified Network Planner functionality, which enables automated NetOps capabilities to plan, manage and operate the Tactical Network via user workflows and reduces the cognitive burden to the Soldiers. Will continue development of Radio Planning capabilities in order to plan and create configuration files for emerging Integrated Tactical Network (ITN) radios and waveforms. Continues product development of the simplified Network Management functionality, which enables the management and troubleshooting of the network elements that comprise the Tactical Network by monitoring local nodes for network health status, performance, location, and security, in addition to displaying monitored data to the local operator. Will continue enhancement and integration of the Federated Data Repository, which reduces time in task to the Soldiers and enables rapid Unit Task Reorganization (UTR). ***FY 2022 Plans:*** FY 2022 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 development, assessments, and deliveries of integrated capabilities to plan, install, operate, maintain, and secure the Army's end-to-end network in support of the commander's mission priorities.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
UNO's MTA will support prototyping of NetOps capabilities that enable command and control of the Tactical Network which will provide simplicity via a Common Operating Picture (COP), a flexible framework enabling rapid integration of future commercial/ government tools, and reliable network information to the Soldiers. The Network Planner and Network Management capabilities will support Network CFT initiatives and directed requirements utilizing the adapt and buy approach, as well as modernization, put forth by Army leadership. Continues product development of the simplified Network Planner functionality, which enables automated NetOps capabilities to plan, manage and operate the Tactical Network via user workflows and reduces the cognitive burden to the Soldiers. Will continue development of Radio Planning capabilities in order to plan and create configuration files for emerging Integrated Tactical Network (ITN) radios and waveforms. Continues product development of the simplified Network Management functionality, which enables the management and troubleshooting of the network elements that comprise the Tactical Network by monitoring local nodes for network health status, performance, location, and security, in addition to displaying monitored data to the local operator. Will continue enhancement and integration of the Federated Data Repository, which reduces time in task to the Soldiers and enables rapid Unit Task Reorganization (UTR). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY21 to FY22 represents continuation of NetOps component development.			
Title: Testing ***Description:*** Testing in support of the UNO MTA development efforts	1.095	-	-
Accomplishments/Planned Programs Subtotals	3.499	3.252	3.366

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• BA9312: *NETWORK MANAGEMENT SYSTEM*	13.534	5.230	21.625	-	21.625	-	-	-	-	-	-

Remarks

BA9312 (Network Management System) investments into UNO provide engineering support and integration of Network Planner and Network Management capabilities. Continued investments provide ability to conduct DevOps w/ Soldier feedback via Pilot exercises.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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*

D. Acquisition Strategy

Unified Network Operations (UNO) (EK9) supports the Section 804, mid-tier acquisition (MTA) authority granted by the Army Acquisition Executive (AAE)'s 14 May 2019 Acquisition Decision Memorandum (ADM).

UNO will leverage the MTA (Section 804) Rapid Prototyping acquisition strategy allowing for rapid prototyping of NetOps Solutions using incremental development and employing Commercial Off-The-Shelf (COTS) innovative technologies to demonstrate new Plan, Manage, Provision, and Secure Network capabilities that meet Army modernization and operational needs. 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.

The objective of the MTA (Section 804) is to develop and deliver prototypes into experimentation events for user feedback through FY 2024 within simulated operational environment(s) in order to provide operational capabilities within five years of the development of an approved requirement.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
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*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/FFP	Various : Various	7.631	2.404	Feb 2020	3.252	Jan 2021	3.366	Jan 2022	-		3.366	0.000	16.653	-
		Subtotal	7.631	2.404		3.252		3.366		-		3.366	0.000	16.653	N/A

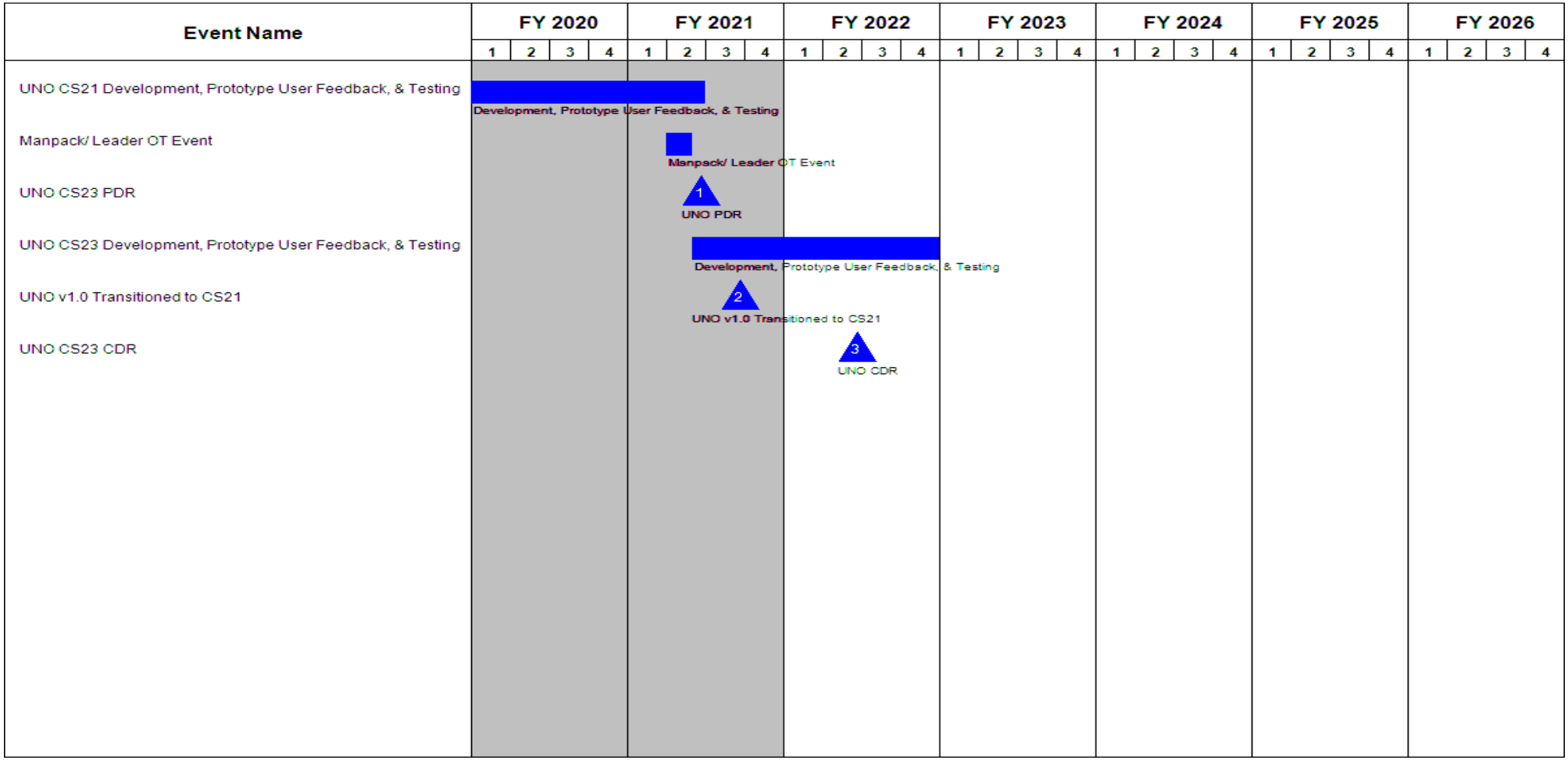
Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	MIPR	ATEC support : Various	-	0.264	Dec 2019	-		-		-		-	0.000	0.264	-
Network Planner Lab Hardware	MIPR	Network Planner Lab Hardware Procurement : APG	-	0.831	Mar 2020	-		-		-		-	0.000	0.831	-
		Subtotal	-	1.095		-		-		-		-	0.000	1.095	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.631	3.499		3.252		3.366		-		3.366	0.000	17.748	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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 Office conducted several Planner Soldier Feedback opportunities including:
Network Management:

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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*

FHTX/11th TTSB: 20-25SEP20
FBTX/86th ESB/11th TTSB: 27SEP-2OCT20
FHAZ/40th ESB/11th TTSB: 27SEP-2OCT20

Network Planning:
Weekly working group user sessions
Coordination w/ 11 Signal Brigade, Warrant officers representing CW4, SC/255N, and the 101 AD S6.

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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**
MTA Request to DASM	2	2019	2	2019
UNO MTA (Section 804) AAE Approval	3	2019	3	2019
UNO MTA (Section 804) Rapid Prototyping Start	3	2019	3	2019
UNO CS21 Development, Prototype User Feedback, & Testing	3	2019	2	2021
Manpack/ Leader OT Event	2	2021	2	2021
UNO CS23 PDR	2	2021	2	2021
UNO CS23 Development, Prototype User Feedback, & Testing	2	2021	4	2022
UNO v1.0 Transitioned to CS21	3	2021	3	2021
UNO CS23 CDR	2	2022	2	2022

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 2022 Army												Date: May 2021
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
EQ8: *Mobile/Handheld Computing Environment (M/HHCE)*	-	4.658	4.967	5.105	-	5.105	-	-	-	-	-	-
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/HHCE) 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.

Nett Warrior (NW) and Integrated Visual Augmentation System (IVAS) are the instantiation of the M/HHCE and comply with the technical standards documented by the M/HHCE and provide the dismounted common computational platform for other products relevant to dismounted Soldiers. Through compliance with the M/HHCE, software applications from other programs are integrated with the NW and IVAS systems, reducing the need for duplicate hardware resulting in reduced Soldier Load. The M/HHCE is directly aligned to the Army Network Modernization Strategy Line of Effort (LOE) 1 (Unified Network). M/HHCE also supports the Army Network Modernization Strategy LOE 2 (Common Operating Environment). These efforts are aligned to the Army's Tactical Network Capability Set development and fielding plans 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. NW leverages commercial smart phone devices and secure Army tactical radios to provide the dismounted leader an integrated mission command and situational awareness capability for use during combat operations. NW applied feedback from conventional and Special Operations units to procure and implement Secret and Secure But Unclassified (SBU) networking equipment for BCTs and the 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 Mounted CE (e.g., JBCP) system. NW uses Commercial-Off-The-Shelf (COTS) and Non Developmental (NDI) computational & communication equipment to create a robust and flexible Integrated Tactical 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), the M/HHCE Requirements Definition Package (RDP), and the NW Capability Development Document in lieu of Capability Production Document. This project is in the Army's Top 100 Modernization efforts. M/HHCE ploys a Developmental Operations (DevOps) process to incrementally develop capability over time to satisfy requirements and meet fielding decisions. FY 2022 funding will continue DevOps activities to incorporate new capability and enhancements based on user feedback, as well as lay the groundwork to support migration of third-party applications onto the M/HHCE software baselines. Additionally, FY 2022 funding provides for integration/test equipment and risk reduction events/preparation to support Army Interoperability Certification (AIC) scheduled for 1QFY22.

M/HHCE RDT&E resources are used to improve and add software applications / ATAK plug-ins and support NW system integration to enhance Soldier capabilities, network performance, and network resiliency.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
Title: Test and Evaluation	0.965	1.070	0.980
Description: Test and evaluation efforts include the planning and conduct of combined COE events with Command Post/Mounted Computing Environment, Software Acceptance Testing, System Integration Events, Risk Reduction Events, Security Penetration Testing and Operational Assessment like annual Army Expeditionary Warrior Experiment (AEWE) to gain Soldier Touch point feedback on new capabilities. ***FY 2021 Plans:*** Conduct 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 S/ABCT. Support NW as a baseline 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 2022 Plans:*** Continue NW system test and 3rd party applications evaluation for technical verification at developmental test events and user verification. Support planned assessment of Integrated Tactical Network (ITN) in ABCT. Conduct yearly environmental testing to characterize commercial & military items, Information Assurance penetration prevention testing off integration of commercial devices, software and accessories into NW baseline. Support Army Expeditionary Warrior Experiment (AEWE) assessment to gain Soldier touch point feedback on dismounted capabilities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 expecting minor decrease focus on Vertical Height Antenna ?Heavy variant (two radios) and technical testing / operational assessment for extended Battalion range communication.			
Title: Hardware and Software Integration and Evaluation for Capability Improvements	1.879	1.420	1.630
Description: Hardware and Software Integration and Evaluation for Capability Improvements ***FY 2021 Plans:*** 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 integration and transition of future technologies. Update software to M/HHCE standards 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 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
Continue to evaluate next future 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, and cyber security improvements. Complete integration of Dismounted Assured PNT Gen 1 integration into the NW. Extending Vertical Height Antenna capability to support Battalion comms ranges. Continue to mature PANTHER (SBIR) capability within NW to provide non-GPS based approach for determining approximate position location information. Start DARPA SHARE multi-level security integration on EUD. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 expecting minor increase due to Vertical Height Antenna ?Heavy variant hardware to support hardware integration.			
Title: Software Development & Integration ***Description:*** Funding is provided for the following efforts. ***FY 2021 Plans:*** 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 and Tactical Assault Kit plug-ins. ***FY 2022 Plans:*** Continue software development incorporating the Army's Common Operating Environment (COE) Cross-Cutting Capabilities into NW. Continue software updates to ITN component software based on security and operational requirements in support CS23 ITN efforts. Complete Dismounted Assured PNT Gen 1.x plug-ins and Intra Soldier Wireless software manager to support routing of data to various soldier carried devices. Update NW software development kit with added NW functionality. Complete NW tactical cloud IL5 ecosystem (SBU) to IL6 (to handle up to secret) integration efforts to allow for over the air updates to fielded NW systems for STIG compliance, OS, application updates and remote troubleshooting. Transition from S&T, in conjunction with IVAS program, early spirals of Leader Planning & Decision Tools (Semi-Automated Route planning tool) and Remote Aerial Sensing capabilities to further integrate RF Sensing network traffic and visualizing radio frequency emitters in the battlespace NW & IVAS from CDC-Soldier Center Soldier Sensored Soldier Science and Technology TTA. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Minor increase from FY21 based on planned S&T transition spiral.	0.469	1.433	1.450
Title: Conduct SEPM Support to NW ***Description:*** Conduct Systems Engineering and Program Management Support to Nett Warrior	1.024	0.750	0.521

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
FY 2021 Plans: 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 2022 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 2021 to FY 2022 Increase/Decrease Statement:*** Slight decrease in manpower, about 1 person equivalent, realigning under Test & Evaluation and H/W integration.			
Title: M/HHCE Governance ***Description:*** Development of the M/HHCE standards and M/HHCE governance. ***FY 2021 Plans:*** Provide Mobile Handheld Computing Environment (M/HHCE) governance and standards development for external program integration with NW and IVAS to eliminate separate handheld devices and reduce Soldier load. Maintain compliance with overarching COE standards. ***FY 2022 Plans:*** Continue to provide Mobile Handheld Computing Environment (M/HHCE) governance and standards development for external program integration with NW and IVAS to eliminate separate handheld devices and reduce Soldier load. Maintain compliance with overarching COE standards.	0.321	0.294	0.294
Title: SBIR/STTR Transfer ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638.	-	-	0.230
Accomplishments/Planned Programs Subtotals	4.658	4.967	5.105

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• R80501: *Ground Soldier System*	122.400	137.481	150.244	-	150.244	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

To capitalize on commercial industry's investment in advanced smart device technology as well as innovation and changes within Army, Nett Warrior (NW) and IVAS require 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 NW and IVAS programs provide situational awareness and mission command to dismounted combat leaders through secure smart devices, a central power source, cables and the Integrated Tactical Network voice and data transport layers. NW funds development and evaluation of new technology and software integration through a combination of competitively awarded contracts and Other Transaction Authorities (OTAs). Various existing follow on procurement contracts are utilized to procure a combination of COTs and GOTs equipment to include supporting services. The 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 October 2017. Now in production, NW seeks operational feedback and uses the DevOps process to identify and implement new capabilities. M/HHCE standards are updated annually under the M/HHCE governance process.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering & Program Management Support	Various	Various : Various	6.377	1.024		0.750		0.521		-		0.521	Continuing	Continuing	-
SBIR/STTR Transfer	TBD	Various : Various	-	-		-		0.230		-		0.230	Continuing	Continuing	-
		Subtotal	6.377	1.024		0.750		0.751		-		0.751	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware/Software Integration & Evaluation	Various	Various : Various	11.397	1.879		1.420		1.630		-		1.630	Continuing	Continuing	-
MHH Governance	MIPR	Various : Various	10.030	0.321		0.294		0.294		-		0.294	Continuing	Continuing	-
		Subtotal	21.427	2.200		1.714		1.924		-		1.924	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development and Integration	Various	Various : Various	5.079	0.469		1.433		1.450		-		1.450	Continuing	Continuing	-
		Subtotal	5.079	0.469		1.433		1.450		-		1.450	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	Various	Various : Various	5.329	0.965		1.070		0.980		-		0.980	Continuing	Continuing	-
		Subtotal	5.329	0.965		1.070		0.980		-		0.980	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / *Army Tactical Command & Control Hardware & Software*	Project (Number/Name) EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	38.212	4.658		4.967		5.105		-		5.105	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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)*

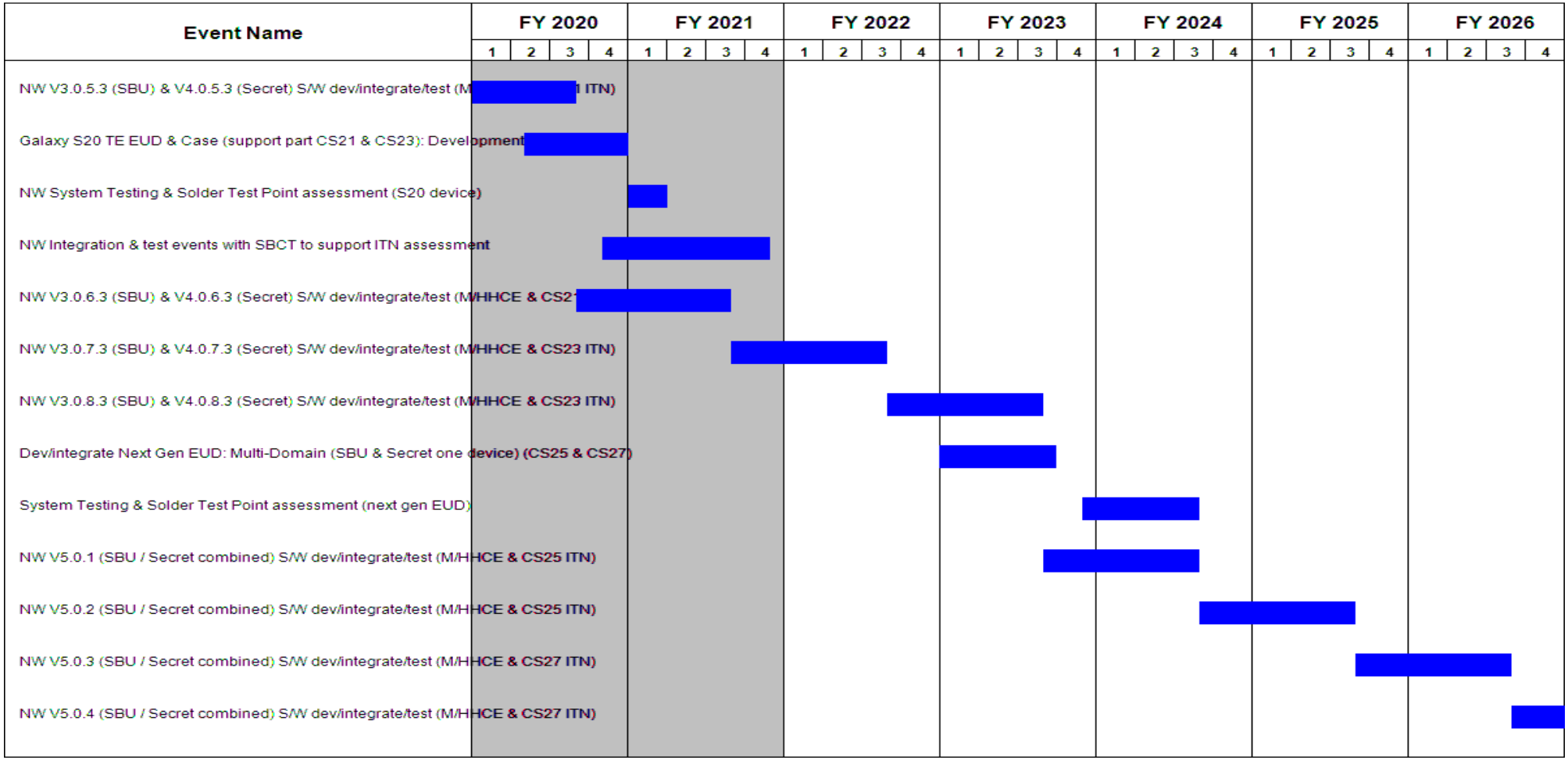


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

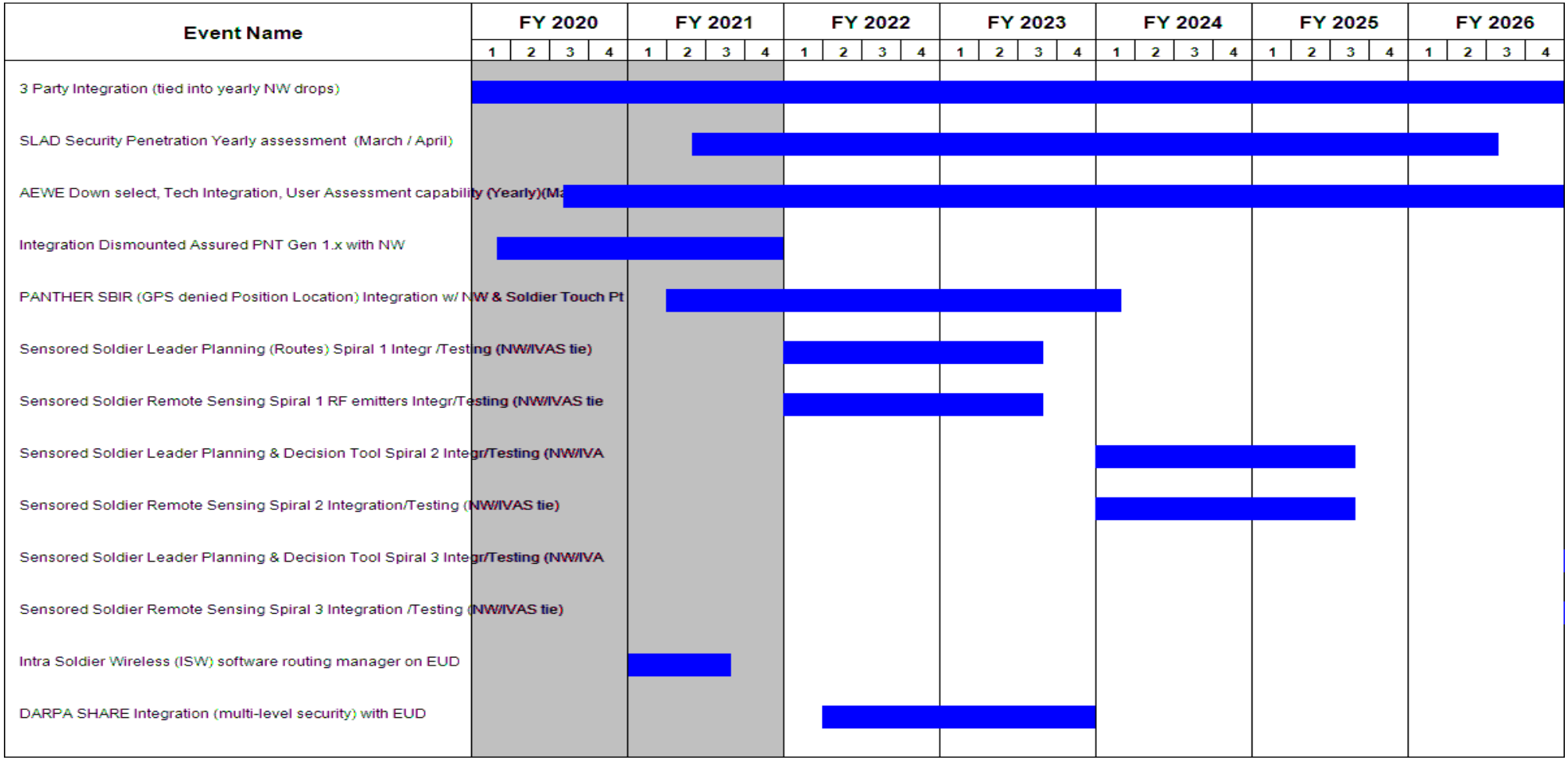


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

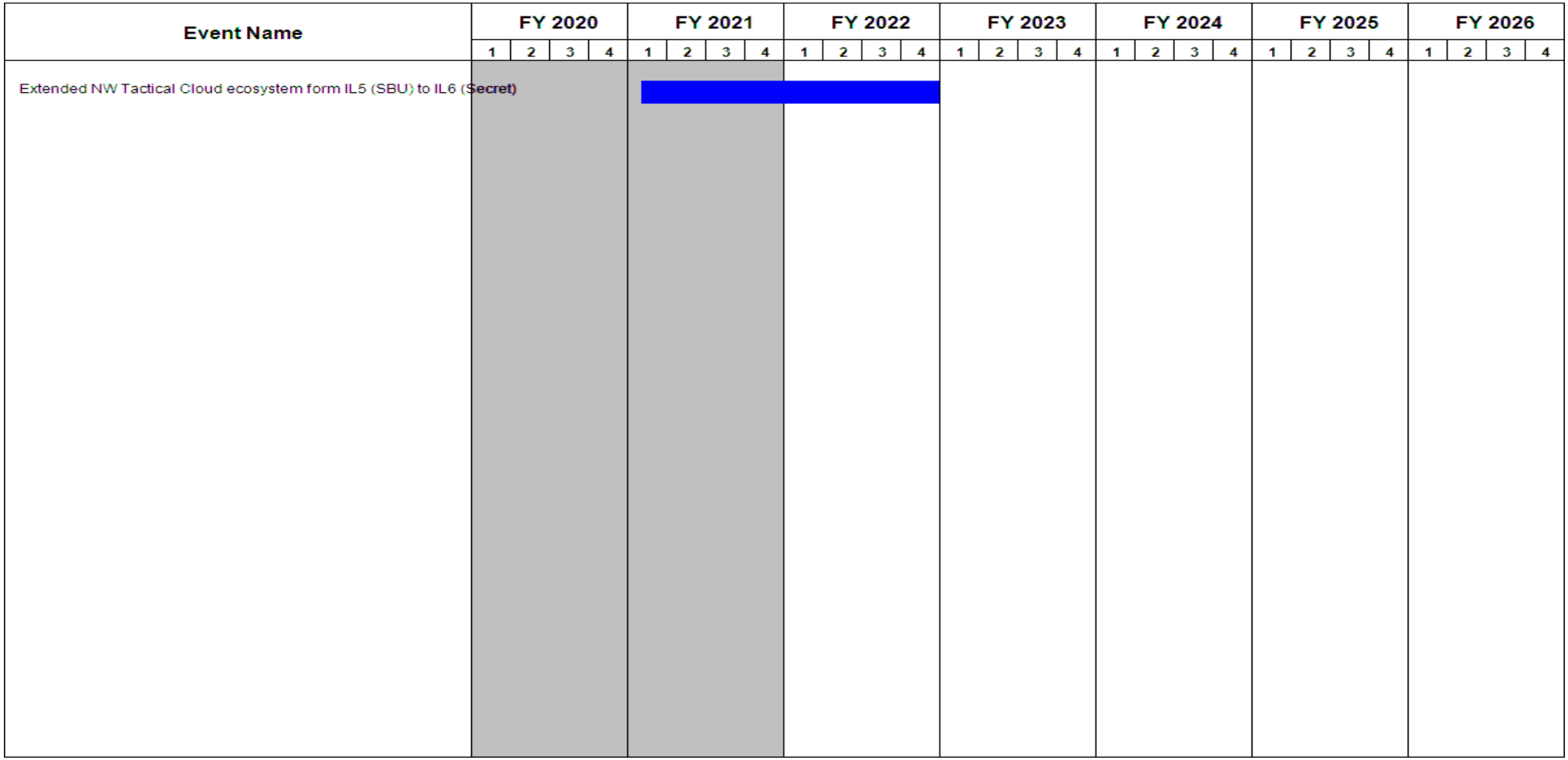


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EQ8 / *Mobile/Handheld Computing Environment (M/HHCE)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
NW V3.0.5.3 (SBU) & V4.0.5.3 (Secret) S/W dev/integrate/test (M/HHCE & CS21 ITN)	1	2020	3	2020
Galaxy S20 TE EUD & Case (support part CS21 & CS23): Development / integration	2	2020	4	2020
NW System Testing & Solder Test Point assessment (S20 device)	1	2021	1	2021
NW Integration & test events with SBCT to support ITN assessment	4	2020	4	2021
NW V3.0.6.3 (SBU) & V4.0.6.3 (Secret) S/W dev/integrate/test (M/HHCE & CS21 ITN	3	2020	3	2021
NW V3.0.7.3 (SBU) & V4.0.7.3 (Secret) S/W dev/integrate/test (M/HHCE & CS23 ITN)	3	2021	3	2022
NW V3.0.8.3 (SBU) & V4.0.8.3 (Secret) S/W dev/integrate/test (M/HHCE & CS23 ITN)	3	2022	3	2023
Dev/integrate Next Gen EUD: Multi-Domain (SBU & Secret one device) (CS25 & CS27)	1	2023	3	2023
System Testing & Solder Test Point assessment (next gen EUD)	4	2023	3	2024
NW V5.0.1 (SBU / Secret combined) S/W dev/integrate/test (M/HHCE & CS25 ITN)	3	2023	3	2024
NW V5.0.2 (SBU / Secret combined) S/W dev/integrate/test (M/HHCE & CS25 ITN)	3	2024	3	2025
NW V5.0.3 (SBU / Secret combined) S/W dev/integrate/test (M/HHCE & CS27 ITN)	3	2025	3	2026
NW V5.0.4 (SBU / Secret combined) S/W dev/integrate/test (M/HHCE & CS27 ITN)	3	2026	3	2027
3 Party Integration (tied into yearly NW drops)	1	2020	4	2026
SLAD Security Penetration Yearly assessment (March / April)	2	2021	3	2026
AEWE Down select, Tech Integration, User Assessment capability (Yearly)(May-Feb)	3	2020	4	2026
Integration Dismounted Assured PNT Gen 1.x with NW	1	2020	4	2021
PANTHER SBIR (GPS denied Position Location) Integration w/ NW & Soldier Touch Pt	2	2021	1	2024
Sensored Soldier Leader Planning (Routes) Spiral 1 Integr /Testing (NW/IVAS tie)	1	2022	3	2023
Sensored Soldier Remote Sensing Spiral 1 RF emitters Integr/Testing (NW/IVAS tie	1	2022	3	2023
Sensored Soldier Leader Planning & Decision Tool Spiral 2 Integr/Testing (NW/IVA	1	2024	3	2025
Sensored Soldier Remote Sensing Spiral 2 Integration/Testing (NW/IVAS tie)	1	2024	3	2025

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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**
Sensored Soldier Leader Planning & Decision Tool Spiral 3 Integr/Testing (NW/IVA	1	2027	3	2028
Sensored Soldier Remote Sensing Spiral 3 Integration /Testing (NW/IVAS tie)	1	2027	3	2028
Intra Soldier Wireless (ISW) software routing manager on EUD	1	2021	3	2021
DARPA SHARE Integration (multi-level security) with EUD	2	2022	4	2023
Extended NW Tactical Cloud ecosystem form IL5 (SBU) to IL6 (Secret)	1	2021	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army												Date: May 2021
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 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
ER9: *Expeditionary Army Command Post*	-	27.706	43.803	52.477	-	52.477	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Command Post Integrated Infrastructure (CPI2) is executed in a two Increment approach. Upon approval of CPI2 Capability Development Document (CDD) , 9 April 2020, the CPI2 Increment nomenclature was recommended for update to align capability to the underlying requirements document. The update to the Increments was done to mitigate confusion of the scope in each increment of the program. The former Increment 1 is now designated as Increment 0 aligned to the Command Post (CP) Directed Requirement (DR) signed 14 Dec 2017. The former Increment 2 is now designated as Increment 1 and is aligned to the CPI2 CDD.

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy Line of Effort (LOE) #4 Command Post. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

The Command Post Integrated Infrastructure (CPI2) program addresses the Army requirements for a more mobile, scalable, interoperable, and agile command posts. Currently fielded 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. Specific to Corps/Div, CPI2 will provide a Mobile Command Group (MCG) consisting of formation- appropriate platforms that supports Corps/Div Commanders/Staff with high priority functions while on the move.

Increment 0 experimentation will design and prototype an MCP and CPSV capability for two Brigade Combat teams (BCT's), a Division Main and Division MCG. Increment 0 focuses on the integrating CPI2 MCP and CPSV capability on the Family of Medium Tactical Vehicles (FMTV) platforms and shelter systems to provide mobile capability and increased survivability to the Command Post. The BCT designs will be tested to solicit soldier feedback and inform an Increment 0 Milestone C production decision for a limited production set of 5 BCTs. Division Main and Division MCG tests will inform Inc 1 designs and potentially drive future requirement updates as to how best to execute CPI2 at the Division Main.

Increment 1 will expand CPI2 capability entering at Milestone B by focusing on the development and prototype and testing of the MCP/CPSV/MCG for formation-appropriate platforms (Stryker, AMPV and JLTV) that were not addressed in Increment 0. The production decision at Increment 1 Milestone C will support the CPI2 Capability Development Document (CDD) requirement to field CPI2 capability to 86 Army units. These combined capabilities will enable the Army to employ

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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*

command posts across the operational spectrum, from early entry to major combat operations that will resolve current command post issues with set up and tear down, survivability, mobility, suitability and footprint.

FY 2022 funding will support design/development/prototyping of the MCP/CPSV on the formation appropriate platforms for Stryker, AMPV, JTLV using their existing contracts. Other efforts include prototype design and test for a Towable Expeditionary Shelter System (TESS) for use at Division and Corps. Funds execute engineering changes based on soldier feedback from Operational Assessments, acquisition of equipment to support product development, testing, logistical support and program management.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Product Development	20.072	33.488	41.481
Description: Includes the costs for design/integration/fabrication and prototyping efforts to address capability gaps identified in current Army command post formations. Also includes equipment and ancillary items necessary to develop an operational concept of CPI2 utilizing the Mission Command Platform, Command Post Support Vehicle and Mobile Command Group. ***FY 2021 Plans:*** FY 2021 initiates the funding for the design engineering, and prototype development of formation appropriate platforms (Stryker, FMTV, APMV, JLTV) to meet design requirements for Command Post Mission Command Platform (MCP) , Command Post Support Vehicles (CPSV) and Mobile Command Groups (MCG) to include shelter systems and equipment needed to meet CPI2 functionality. Additional design improvements for CPI2 to be based on unit feedback. Includes costs to deliver 2 Brigade Combat Teams and a Division Main for unit experimentation for CPI2 Increment 1. Funding includes costs to address engineering change proposals and program management. This efforts funding will be executed by Program Executive Office Command, Control, Communications Tactical. ***FY 2022 Plans:*** FY 2022 funds continue design engineering, and prototype development of Mission Command Platforms and Command Post Support Vehicles for formation appropriate platforms (APMV, JLTV, Stryker) by executing funds on their existing platform contracts. FY22 also funds engineering change proposals for updates to improve CPI2 designs based on soldier feedback from Operational Assessments. This funding will be executed by Program Executive Office Command, Control, Communications - Tactical (PEO-C3T). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase associated with need to procure Stryker prototypes and ramp up in AMPV/JLTV EMD.			
Title: Systems Test and Evaluation	0.740	5.174	3.502
Description: Costs required for test activities to inform CPI2 solution set. ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Conduct initial test/safety activities necessary for completion of delivery of two brigade combat teams and a Division main, as well as formation appropriate platform testing (Stryker, FMTV, APMV, JLTV) associated with design improvements for Command Post MCP, CPSV and MCG. This efforts funding will be executed by Program Executive Office Command, Control, Communications - Tactical. ***FY 2022 Plans:*** FY22 funds provide for safety confirmation for platforms and shelter systems, testing for the Towable Expeditionary Shelter System (TESS), test articles and test planning. This funding will be executed by Program Executive Office Command, Control, Communications -Tactical (PEO-C3T). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Minor decrease driven by changes in test schedule and scope from FY21 to FY22.			
Title: Program Office Management ***Description:*** Contractor/Matrix Labor support and program travel. ***FY 2021 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 2022 Plans:*** Contract and Matrix personnel to support CPI2 in achieving mission requirements to include managing multiple design/prototyping efforts, test events and training. This funding will be executed by Program Executive Office Command, Control, Communications - Tactical (PEO-C3T). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Program Support increase is driven by inflation and minor increase to address managing multiple Platform EMD efforts.	3.869	4.178	4.388
Title: Support Costs ***Description:*** Program costs for training and development of data packages. ***FY 2021 Plans:***	3.025	0.963	3.106

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Funding supports updates necessary to technical data packages and training for test events as well as initial design changes with formation appropriate platforms (Stryker, AMPV, FMTV, JLTV). This efforts funding will be executed by Program Executive Office Command, Control, Communications - Tactical. ***FY 2022 Plans:*** Funding supports updates necessary to technical data packages and training for test events as well as initial design updates to Technical Data Packages for the platforms in the CPI2 formations. Includes retrograde of the two test units. This funding will be executed by Program Executive Office Command, Control, Communications - Tactical (PEO-C3T). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase driven by retrograde of BCT 1 and BCT 2 to take back equipment issued during Operational Assessment.			
Accomplishments/Planned Programs Subtotals	27.706	43.803	52.477

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• B29801: *CPI2*	-	23.000	49.410	-	49.410	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The CPI2 Materiel Development Decision (MDD) Acquisition Decision Memorandum (ADM) was signed on 21 June 2018 and directs CPI2 to be executed in two increments. Following the approval of the CPI2 Capability Development Document (CDD), 9 April 2020 , the nomenclature for the two Increments was recommended for update to align with the supporting requirements documents. Increment 0 (formerly Increment 1) aligns to the Command Post Directed Requirement (CP DR) and Increment 1 (formerly Increment 2) aligns with the approved CDD.

Increment 0 development is focused on the design/development of a Mission Command Platform (MCP) and Command Post Support Vehicle (CPSV) on Family of Medium Tactical Vehicles (FMTV) platforms and associated shelter systems to develop a more mobile, survivable command post. The capability developed will address needs identified in the signed CP DR to experiment with a Brigade Combat Team (BCT) , a Division Main and a platform based Mobile Command Group (MCG) to 1 Division. Increment 0 is using the Buy, Try, Assess, and Decide acquisition model which leverages user experimentation to inform follow-on program requirements. Increment 0 will prototype and integrate available commercial off the shelf (COTS) as well as Government Programs of Record (PoRs) equipment that provide mission command and communications functions within the command post. Increment 0 will work with the Government and with Industry to capitalize on their experiences with mobile Command Posts. CPI2 Increment 0 will develop BCT #1 through experimentation conducted with Combat Capabilities Development Center (CCDC) via a Functional Support Agreement (FSA). CPI2 executed a full and open competition under Other Transaction Authority (OTA) to award a contract for design and prototyping the MCP/CPSV for BCT #2. The integration efforts of the government and industry led designs for BCT 1 and BCT 2 will culminate with 2 Operational

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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Assessments on the BCT MCP and CPSV prototype designs, leading to an Increment 0 Milestone C. The Increment 0 Milestone C will authorize production of 3 new BCT's and any necessary updates/retrofit to the first two experimental units to satisfy the conditions of the CP DR to deliver 5 BCTs of CPI2 capability.

Increment 0 will experiment at the Division Main executing an Indefinite Delivery Indefinite Quantity (IDIQ) contract. CPI2 will experiment with a Stryker based Mobile Command Group (MCG) to 1 Division via an FSA with Project Manager (PM) Stryker Brigade Combat Team (SBCT). The Division Main and MCG serve to provide a baseline for user inputs for any future CPI2 CDD updates. Any production decisions for Division and MCG would be addressed in the Increment 1 Milestone C.

Increment 1 will execute requirements aligned to the CPI2 Capability Development Document (CDD) to replace designated legacy command post systems at Corps, Division, Brigades, Battalions and select Multi-Functional Support Brigades (MFSB). Increment 1 will expand CPI2 capability by developing the MCP/CPSV variants for formation appropriate platforms (Stryker,AMPV,JLTV) via mods to their existing contracts and includes necessary design testing. The Milestone B for Increment 1 will authorize CPI2 to enter EMD for platform development not addressed in Increment 1; specifically for SBCT, JLTV and AMPV platforms to issue funds on their existing Programs of Record (PoR) contracts for the design/development of their MCP/CPSV/MCG.

The Increment 1 Milestone C will initiate the LRIP production and fielding of CPI2 FMTV platforms and shelter systems. CPI2 will pursue a full and open award to contract with industry for the engineering, installation and production of the MCP/CPSV/MCG solution for vehicle platforms and shelter systems. An operational test will be conducted to asses CPI2 on the FMTV platform prior to a Full Rate Production decision. CPI2 will be responsible for the delivering CPI2 equipment to the vendor for installation. Vehicle platforms will be supplied to CPI2; funded and provided by the existing vehicle PoR contracts. Due to the differing durations for development of the formation appropriate platforms (Stryker, AMPV, JLTV); each PoR will assess the CPI2 solution via their individual Functional Qualification Test (FQT). Upon successful test, CPI2 will coordinate with the Milestone Decision Authority (MDA) to request authority to fund the CPI2 installation vendor via Engineering Change Proposal (ECP) to accommodate installation on the Stryker,AMPV,JLTV platforms.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Civilian Labor	Allot	PM MC : Aberdeen Proving Ground MD	0.108	-		-		-		-		-	Continuing	Continuing	Continuing
SETA Support	MIPR	CACI : Aberdeen Proving Ground, MD	0.770	1.850	Oct 2019	1.964	Nov 2020	-		-		-	0.000	4.584	-
SETA Support	MIPR	Booz Allen Hamilton : Aberdeen Proving Ground, MD	-	-		-		2.063	Dec 2021	-		2.063	Continuing	Continuing	Continuing
Matrix Support	MIPR	Various : Aberdeen Proving Ground, MD	1.720	2.019	Oct 2019	2.214	Nov 2020	2.325	Dec 2021	-		2.325	Continuing	Continuing	Continuing
		Subtotal	2.598	3.869		4.178		4.388		-		4.388	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BCT 1 Design/Fabrication/ Installation	MIPR	CCDC-C5ISR : Aberdeen Proving Ground, MD	4.296	3.513	Dec 2019	2.947	Dec 2020	-		-		-	Continuing	Continuing	Continuing
BCT 2 Design/Fabrication/ Installation	C/FFP	ELBIT : Ft.Worth, Texas	4.129	5.628	Sep 2020	6.278	Nov 2020	-		-		-	Continuing	Continuing	Continuing
Engineering Changes	Option/ FFP	ELBIT : Ft.Worth, Texas	-	-		1.850	Jun 2021	1.322	Oct 2021	-		1.322	Continuing	Continuing	Continuing
Division Design/ Fabrication/Installation	C/IDDQ	BRTRC : Ft.Bliss, Texas	1.338	4.002	Dec 2019	5.736	Nov 2020	0.760	Oct 2021	-		0.760	Continuing	Continuing	Continuing
Vehicle Platforms	Allot	PdM MPVS : Detroit Aresnal, MI	9.764	0.278	Jan 2020	-		-		-		-	Continuing	Continuing	Continuing
Ancillary Items	MIPR	Various : Various	3.122	1.516	Oct 2019	1.175	Oct 2020	0.864	Dec 2021	-		0.864	Continuing	Continuing	Continuing
CPI2 Core Kits	Various	Multiple : Multiple	5.569	4.101	Oct 2019	1.700	Mar 2021	1.150	Oct 2021	-		1.150	Continuing	Continuing	-
Mobile Command Group Experimentation	MIPR	PM SBCT : Warren, MI	0.345	0.080	Nov 2020	3.102	Feb 2021	-		-		-	Continuing	Continuing	Continuing
ISO Containers	Allot	BERG : Spokane, WA	11.100	-		-		-		-		-	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army		Date: May 2021
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*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Stryker MCP Design/ Development	Allot	PM SBCT : Detroit, MI	-	-		5.604	Apr 2021	25.681	Oct 2021	-		25.681	Continuing	Continuing	Continuing
AMPV MCP Design/ Development	Allot	PM AMPV : Detroit Aresnal, MI	-	-		1.406	Apr 2021	5.151	Jan 2022	-		5.151	Continuing	Continuing	Continuing
JLTV MCP/CPSV Design/ Development	Allot	PM JLTV : Detroit , MI	-	-		1.406	Apr 2021	4.021	Jan 2022	-		4.021	Continuing	Continuing	Continuing
Rigid Wall Shetler Design	MIPR	CCDC-C5ISR : APG, MD	-	-		1.483	May 2021	1.450	Jan 2022	-		1.450	Continuing	Continuing	Continuing
TESS Design/ Development (Medium/ Large)	Allot	PdM FSS : Natick, MA	-	0.954	Jun 2020	0.801	May 2021	1.082	Jan 2022	-		1.082	Continuing	Continuing	Continuing
		Subtotal	39.663	20.072		33.488		41.481		-		41.481	Continuing	Continuing	N/A

Remarks

1) Product Development increase with Stryker is driven requirement for 5 Stryker prototypes to include A-KITs and integration.
2) CPI2 funds existing contracts managed by Stryker,AMPV and JLTV to execute design/development.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tech Manuals/Training Development Packages	Various	Various : Various	-	3.025	Feb 2020	0.963	Mar 2021	1.001	Oct 2021	-		1.001	Continuing	Continuing	Continuing
Retrograde (BCT1&2)	TBD	TBD : TBD	-	-		-		2.105	Dec 2021	-		2.105	0.000	2.105	-
		Subtotal	-	3.025		0.963		3.106		-		3.106	Continuing	Continuing	N/A

Remarks

Retrograde: CPI2 plan to take back and un-install equipment/platforms from BCT 1 and 2 experimentation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Test and Evaluation	MIPR	Various : Various	-	0.740	Mar 2020	5.174	Nov 2020	3.502	Feb 2022	-		3.502	Continuing	Continuing	Continuing
		Subtotal	-	0.740		5.174		3.502		-		3.502	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	42.261	27.706		43.803		52.477		-		52.477	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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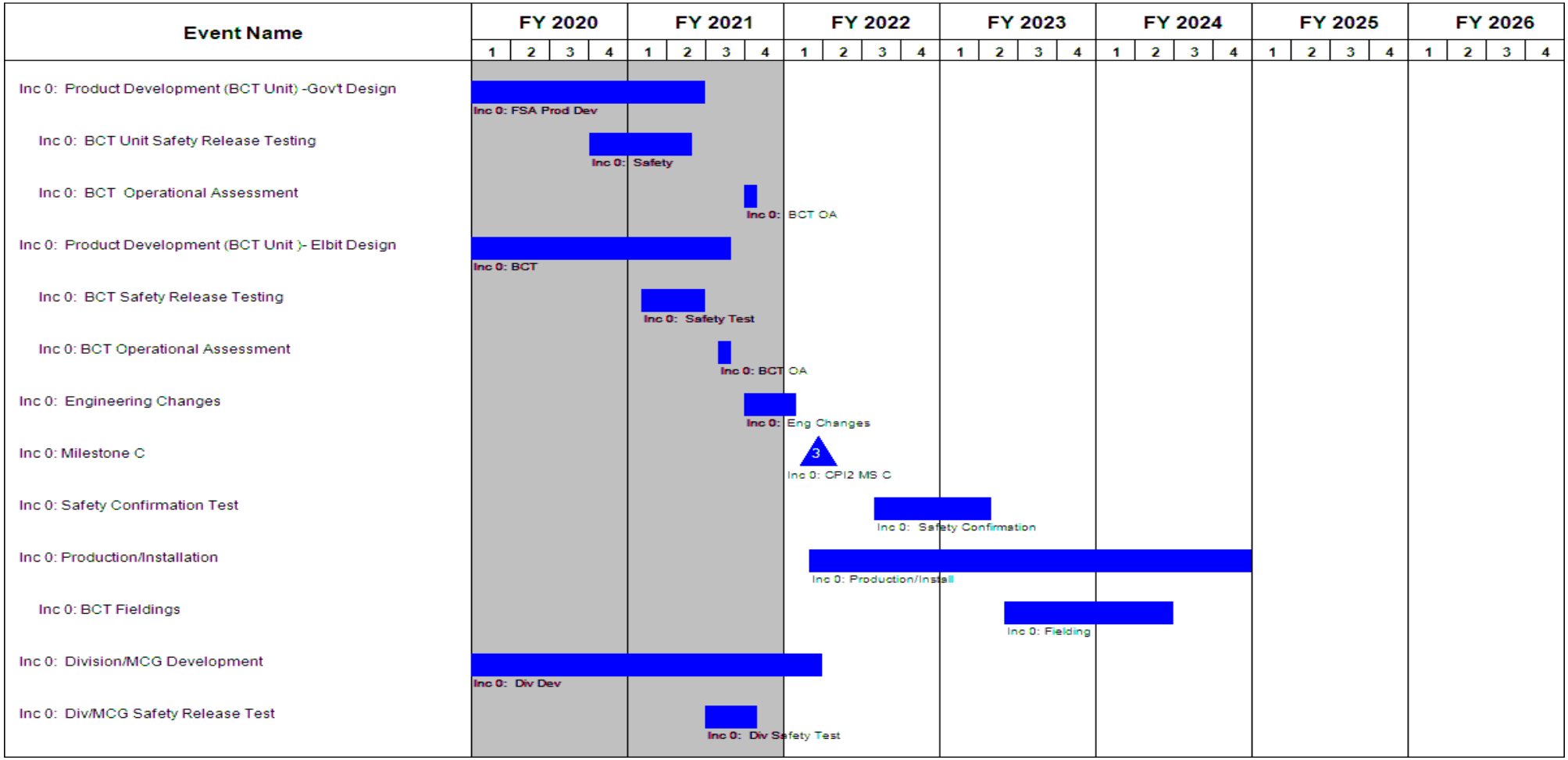
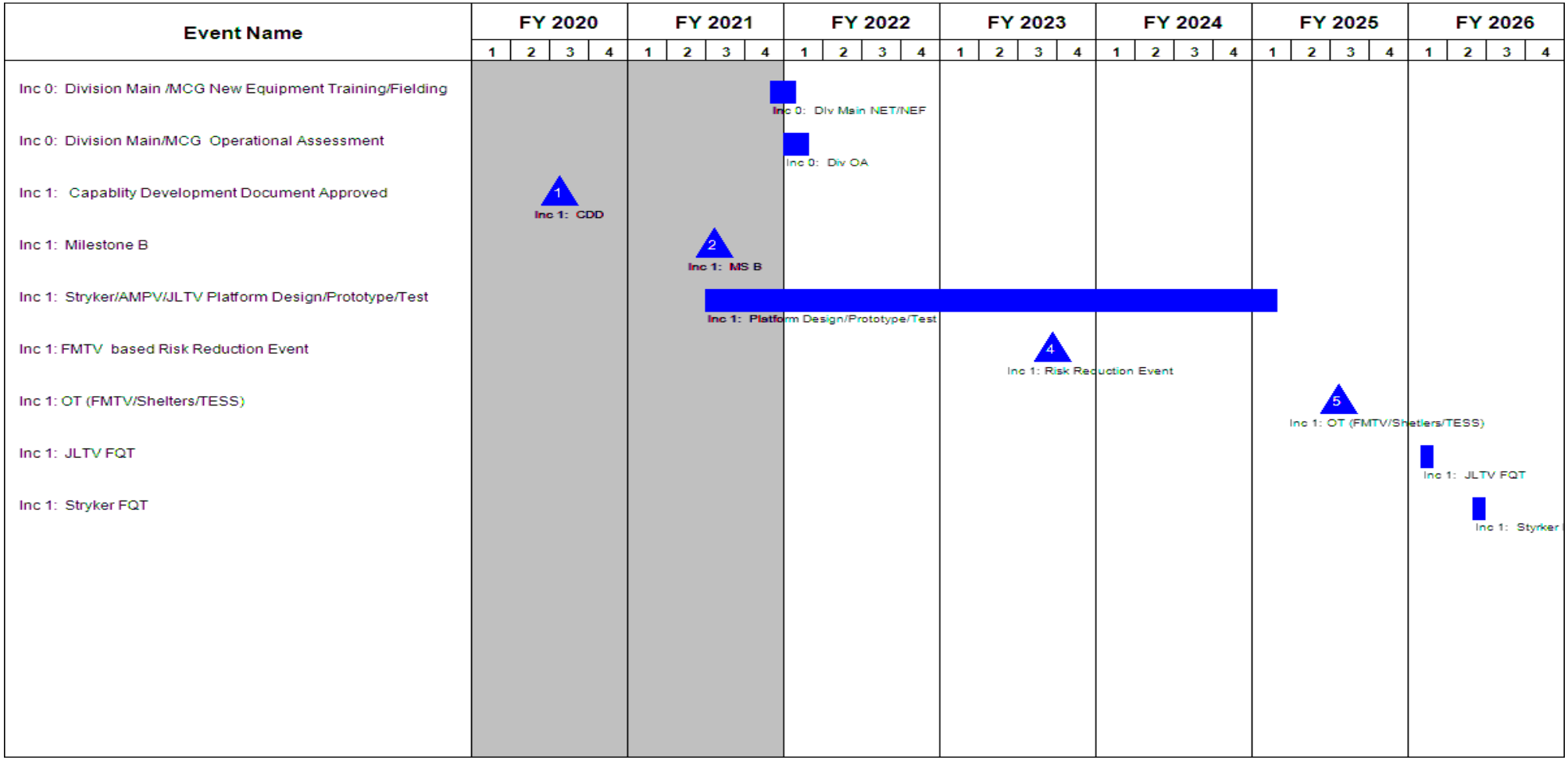


Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** ER9 / *Expeditionary Army Command Post*



Note

1) Inc 0: Test: Nomenclature updated from Limited User Test to Operational Assessment to better define scope of the event.
2) Inc 0: DIV Main and MCG experiment do not drive Inc 0 MS C decision for BCT 3-4 -5 but serve to potentially inform future CDD updates.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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3) Inc 1: AMPV FQT not shown (planned in FY27).

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Command Post Directed Requirement Signed	1	2018	1	2018
CPI2 MDD	3	2018	3	2018
Inc 0: MS A	2	2019	2	2019
Inc 0: Product Development (BCT Unit) -Gov't Design	2	2019	2	2021
Inc 0: BCT Unit Safety Release Testing	4	2020	2	2021
Inc 0: BCT Operational Assessment	4	2021	4	2021
Inc 0: Product Development (BCT Unit)- Elbit Design	4	2019	3	2021
Inc 0: BCT Safety Release Testing	1	2021	2	2021
Inc 0: BCT Operational Assessment	3	2021	3	2021
Inc 0: Engineering Changes	4	2021	1	2022
Inc 0: Milestone C	1	2022	1	2022
Inc 0: Safety Confirmation Test	3	2022	2	2023
Inc 0: Production/Installation	1	2022	4	2024
Inc 0: BCT Fieldings	2	2023	2	2024
Inc 0: Division/MCG Development	4	2019	1	2022
Inc 0: Div/MCG Safety Release Test	3	2021	4	2021
Inc 0: Division Main /MCG New Equipment Training/Fielding	4	2021	1	2022
Inc 0: Division Main/MCG Operational Assessment	1	2022	1	2022
Inc 1: Capablity Development Document Approved	3	2020	3	2020
Inc 1: Milestone B	3	2021	3	2021
Inc 1: Stryker/AMPV/JLTV Platform Design/Prototype/Test	3	2021	1	2025
Inc 1: FMTV based Risk Reduction Event	3	2023	3	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Inc 1: OT (FMTV/Shelters/TESS)	3	2025	3	2025
Inc 1: JLTV FQT	1	2026	1	2026
Inc 1: Stryker FQT	2	2026	2	2026

Note

1) Test: Nomenclature updated since PB21 from Limited User Test to Operational Assessment in to better define scope of event.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
EW3: *Unit Task Reorganization (UTR) Development*	-	26.406	19.027	9.402	-	9.402	-	-	-	-	-	-
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. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

UTR supports the Army Network Plan Framework objective to deliver a Standards Based Network Architecture. This will enable the modernization of the Mission Command Network through the coordination of a common set of network operations tools and infrastructure development supporting the unit communication staff's ability to Manage the Network through the (1) development of an integrated planning tool suite to improve Signal Soldiers ability to plan and develop configurations for upcoming operations and deployments; (2) development of tools and technology that provide a means to deliver configurations with little to no manual involvement by the Soldier and (3) replacement of stove-piped management systems with integrated tools that provide a consolidated, as well as detailed, view of the network and its components.

FY 2022 UTR funding will be used to continue development of network components that support centralized data, security, and information exchanges; continue development of Radio Planning capabilities in order to plan and create configuration files for emerging Integrated Tactical Network (ITN) radios and waveforms; continue development of network device and provisioning systems; and continue the development of a network manager that monitors and displays network health status, performance, location and security to local operator.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: Network Provisioning	9.272	6.318	-
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. This provides a means to deliver configurations without requiring manual involvement by the Soldier, and for devices to report configuration and operational status in accordance with the Standards Based Architecture. The Rapid Provisioning Systems (RPS) Master Node installation in the Mission Command Support Center (MCSC) in FY 20 provided Integrated global patch management capabilities into across Brigade Combat Teams (BCTs).			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
Continue development of provisioning systems, and support system integration into use of Standards Based Architecture, including continuing development of Radio capabilities in order to plan and create configuration files for emerging ITN radios and waveforms. Code completion and refinement for closeout and transition to sustainment the Rapid Provisioning System (RPS) effort to automatically patch & provision SATCOM systems. Automated provisioning of the Command Post Computing Environment (CPCE) Tactical Server Infrastructure (TSI) stack in FY 22 for deployment in CS 23. Continuing development of Radio over the air management capabilities in order to plan and create configuration files for emerging ITN radios and waveforms. Over the Air loading via Black Sails for TrellisWare Radios and PRC-148C. Develop Gang Load capability to load multiple radios in parallel via Universal Serial Bus (USB) drives. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Recategorization and alignment of remaining provisioning efforts captured under Network Management.			
Title: Network Management ***Description:*** UTR introduces improvements to the way the network is managed, reducing closed management systems and replacing them with integrated tools that provide a consolidated, as well as detailed, view of the network and its components. Integrated management of Transportable Tactical Command Communications (T2C2)- Heavy and Lite, Satellite Transportable Terminal (STT), Tactical Communications Node (TCN)-Lite, Scalable Class of Unified Terminals (SCOUT) was provided as part of the Network Manager (NOMS) and deployed in FY 20 to Expeditionary Signal Battalion (ESB?s) and part of CS 21. The initial Tactical Radio Integration Kit (TRIK) Management interface was developed and provided in CS 21 as part of Integrated Tactical Network (ITN). ***FY 2021 Plans:*** - Continue development of network components that support centralized data, security, and information exchanges, enabling Signal Soldier activities. - Additional development of Direct Connection devices that enable automated provisioning, patching, and monitoring. - Continue development of the Network Planning functions that enable automated NetOps capabilities to plan the tactical network, reducing the cognitive burden to Soldiers, as well as development of analytic and planning tools that support Signal Planning in coordination with Mission Command Systems and Applications.	15.784	11.932	9.119

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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 2020	FY 2021	FY 2022
- Continue product development of Network Management functionality enabling the ability to manage and troubleshoot the network devices that comprise the Tactical Network, monitor nodes for network health status, performance, location, and security, in addition to displaying monitored data to the local operator. ***FY 2022 Plans:*** - Complete delivery of vendor neutral Application Programming Interface (API) that supports network health status across warfighting applications and S6 tools & services as well as communication across various services. - Continue development of network components that support centralized data, security, and information exchanges, enabling Signal Soldier activities. - Implementation of Bandwidth efficient & NSA approved Over the Network and Over the Air capabilities to provision and reconfigure tactical radios that support Integrated Visual Augmentation System (IVAS), Hand Held Computing Environment (HH CE) & Mounted Computing Environment (MCE). - Continue product development of Network Management functionality enabling the ability to manage and troubleshoot the network devices that comprise the Tactical Network, monitor nodes for network health status, performance, location, and security, in addition to displaying monitored data to the local operator. Extend management interfaces for services (Network Manager & Battalion (BN) and Below Manager). - Continue development of the Tactical radio planner to include planning for additional waveforms, Demand Assigned Multiple Access (DAMA), Satellite Communications (SATCOM), Planning. - Integration of Tactical Network Initialization & Configuration (TNIC) Initialization Process through Initialization Tool Suite. - Continue development of SATCOM planner as replacement for the Tactical Network Toolkit (TNT) Network Management System (NMS) planner for SATCOM systems targeting deployment in CS 23. - Continue development of consolidated Satellite Access Requests & receipt of Satellite Access Authorizations. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in requirements reflecting transition to steady state development and support.			
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 2021 Plans:***	1.350	0.777	0.283

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
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 2022 Plans:*** Continue Systems of Systems Engineering and program management across NetOps portfolio.. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in requirements reflecting transition to steady state development and support.			
Accomplishments/Planned Programs Subtotals	26.406	19.027	9.402

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Unit Task Reorganization (UTR) is an overarching effort that supports the establishment of a standards-based network architecture and integration of requirements across multiple efforts in the tactical network. UTR resources are applied directly to current products which are modified through Engineering Change Proposals and Modified Work Orders to comply with network standards. This enables current systems to share the information, reducing time and task for soldiers as well as new systems to access the network. Efforts are enduring to react to evolving prioritization of requirements. A variety of contracting approaches are used depending on needs, such as Other Transactions, Indefinite Delivery/Indefinite Quantity, or Systems Engineering Technical Assistance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army			Date: May 2021
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network Provisioning	C/IDIQ	Microsoft : Redmond, WA	10.573	1.813	Mar 2020	1.000	Nov 2020	-		-		-	0.000	13.386	-
Network Provisioning	MIPR	Matrix Organizations : APG MD	2.866	4.117	Nov 2019	3.371	Nov 2020	-		-		-	0.000	10.354	-
Network Provisioning	FFRDC	MITRE : Mclean, VA	3.600	1.252	Oct 2019	1.271	Oct 2020	-		-		-	0.000	6.123	-
Network Provisioning	C/CPFF	Telesis : Mclean, VA	5.521	1.436	Aug 2020	0.321	Mar 2021	-		-		-	0.000	7.278	-
Network Provisioning	Option/ CPAF	ESP : APG, MD	-	0.654	Nov 2019	0.355	Nov 2020	-		-		-	0.000	1.009	-
Network Management	C/FFP	Various : TBD	19.564	15.317	Nov 2019	11.532	Dec 2020	9.119	Jan 2022	-		9.119	Continuing	Continuing	Continuing
Network Management	MIPR	PEO Soldier : Arlington VA	0.792	-		-		-		-		-	0.000	0.792	-
Secure Wireless - SFF	C/Various	Various : Various	4.091	-		-		-		-		-	0.000	4.091	-
Network Management	MIPR	C5ISR : APG, MD	-	0.467	Mar 2020	0.400	Nov 2020	-		-		-	0.000	0.867	-
		Subtotal	47.007	25.056		18.250		9.119		-		9.119	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SoS SE and PM	C/CPAF	BAH : APG MD	1.765	1.350	Nov 2019	0.777	Nov 2020	0.283	Nov 2021	-		0.283	Continuing	Continuing	Continuing
		Subtotal	1.765	1.350		0.777		0.283		-		0.283	Continuing	Continuing	N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	48.772	26.406		19.027		9.402		-		9.402	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
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*

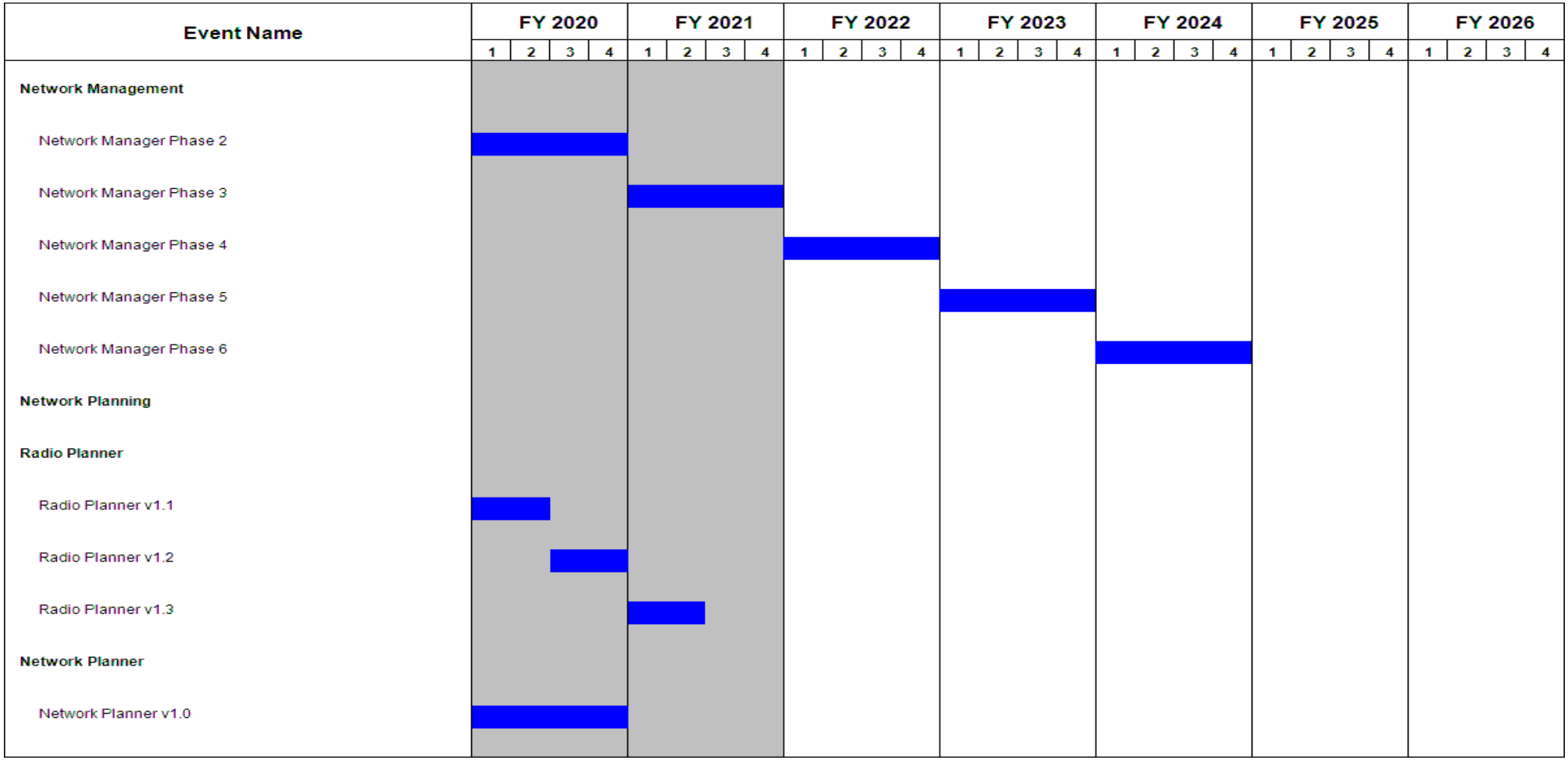

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

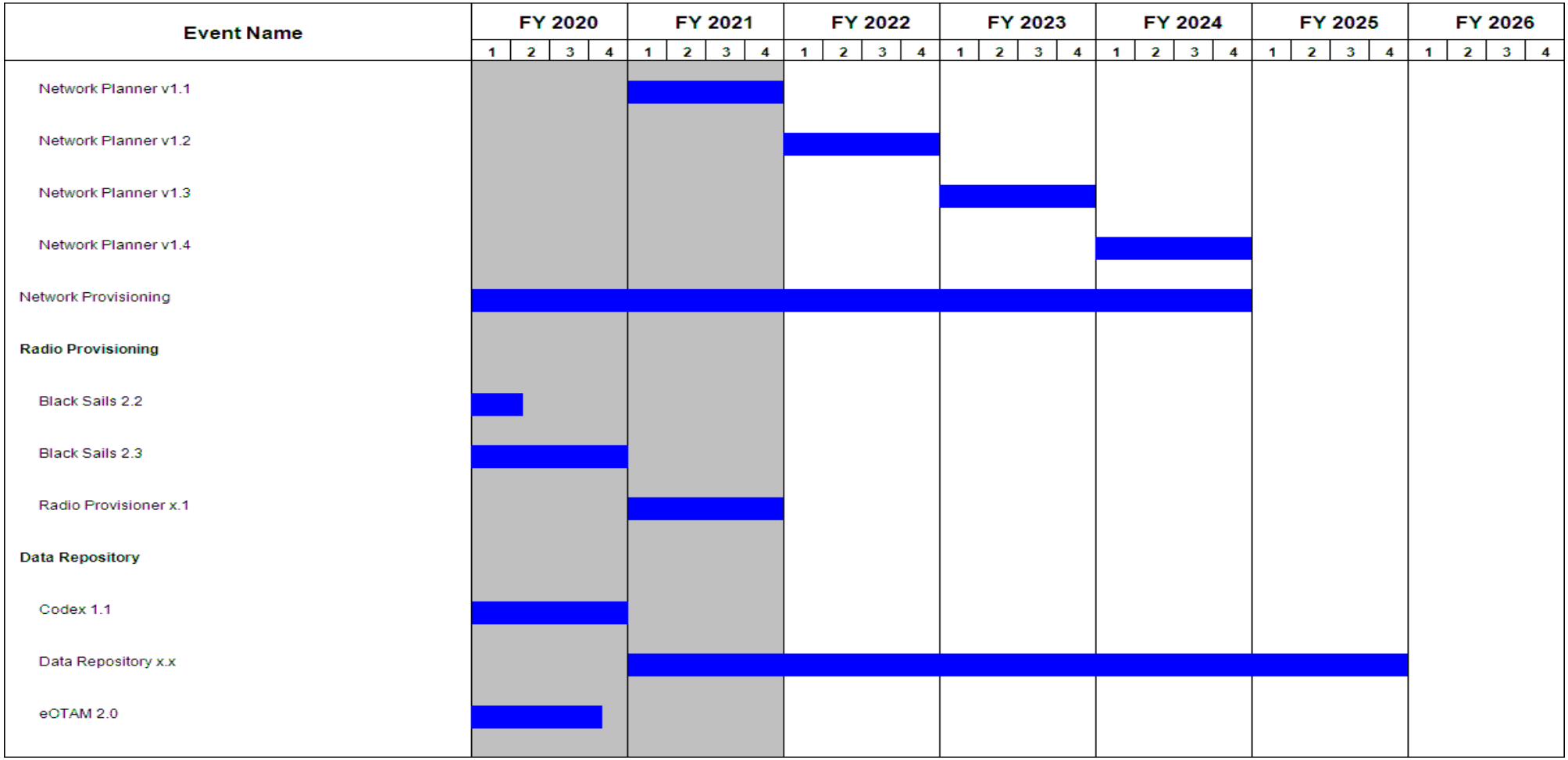

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

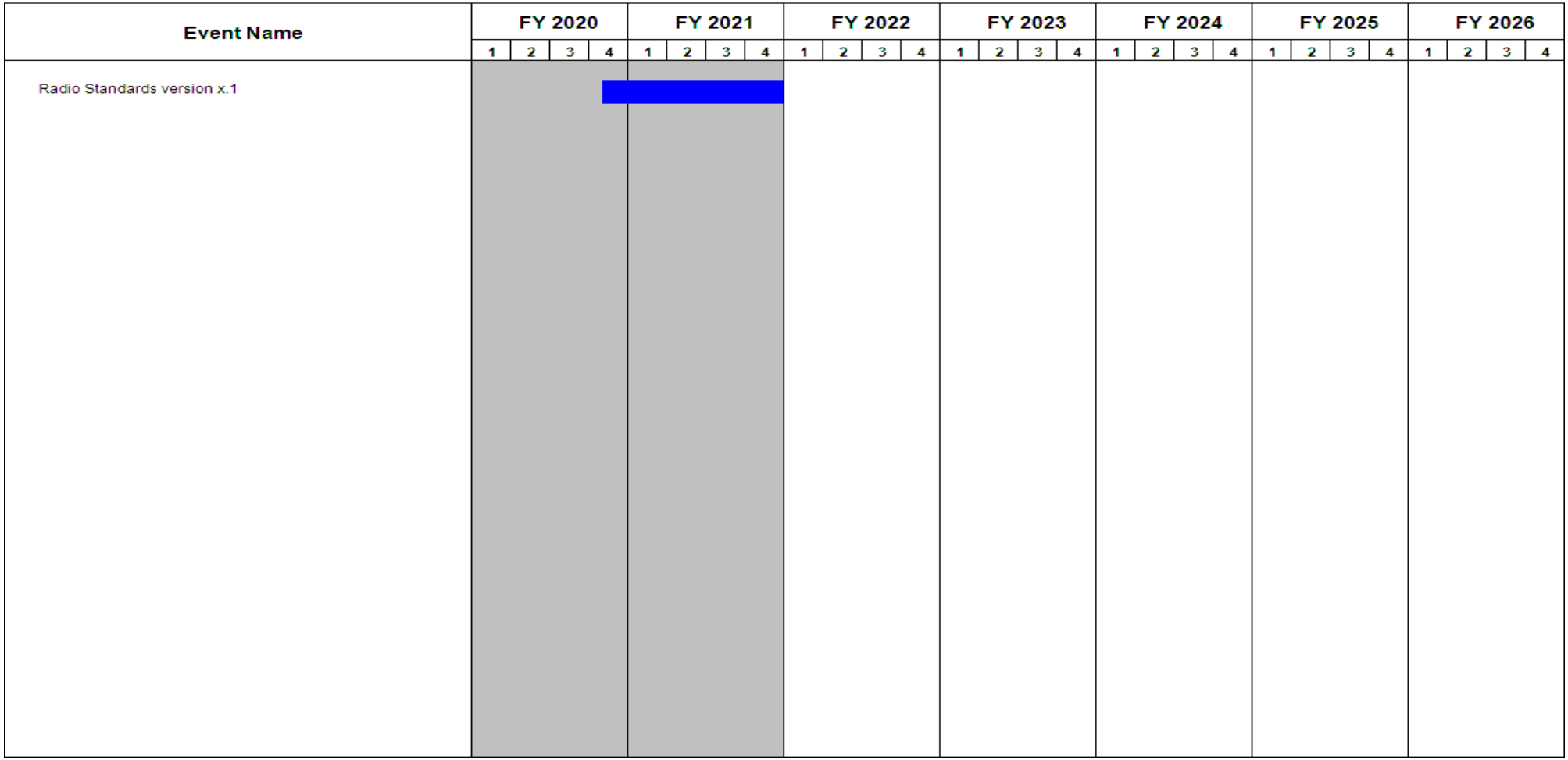

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604818A / *Army Tactical Command & Control Hardware & Software*	**Project (Number/Name)** EW3 / *Unit Task Reorganization (UTR) Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Network Management	1	2019	4	2024
Network Manager Phase 1	1	2019	4	2019
Network Manager Phase 2	1	2020	4	2020
Network Manager Phase 3	1	2021	4	2021
Network Manager Phase 4	1	2022	4	2022
Network Manager Phase 5	1	2023	4	2023
Network Manager Phase 6	1	2024	4	2024
Network Planning	1	2020	4	2024
JENM 3.5	1	2019	4	2019
Radio Planner	1	2019	2	2021
Radio Planner v1.0	4	2018	4	2018
Radio Planner v1.1	1	2020	2	2020
Radio Planner v1.2	3	2020	4	2020
Radio Planner v1.3	1	2021	2	2021
Network Planner	1	2020	4	2024
Network Planner v1.0	1	2020	4	2020
Network Planner v1.1	1	2021	4	2021
Network Planner v1.2	1	2022	4	2022
Network Planner v1.3	1	2023	4	2023
Network Planner v1.4	1	2024	4	2024
Network Provisioning	1	2019	4	2024
Rapid Provisioning System (RPS) 2.4	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
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	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Radio Provisioning	1	2019	4	2022
Black Sails 2.0	3	2019	3	2019
Black Sails 2.1	4	2019	4	2019
Black Sails 2.2	1	2020	1	2020
Black Sails 2.3	2	2019	4	2020
Radio Provisioner x.1	1	2021	4	2021
Data Repository	1	2019	4	2025
Codex 1.0	1	2019	1	2019
Codex 1.1	1	2020	4	2020
Data Repository x.x	1	2021	4	2025
eOTAM 2.0	3	2019	4	2020
Radio Standards version x.1	4	2020	4	2021