Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force											Date: March 2024	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 1206415F / *U.S. Space Command Research and Development Support*							
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
Total Program Element	-	8.350	14.892	28.392	0.000	28.392	29.093	29.672	30.932	31.542	Continuing	Continuing
641234: *USSPACECOM Rapid Prototype Demonstration*	-	8.350	14.892	28.392	0.000	28.392	29.093	29.672	30.932	31.542	Continuing	Continuing

A. Mission Description and Budget Item Justification

U.S. Space Command Research and Development laboratory program directly supports achieving the lines of effort described in the Defense Space Strategy and USSPACECOM Strategic Plan 2027: (1) Building a comprehensive military advantage in space; (2) integrating military space power into national, joint, and combined operations; (3) shaping the strategic environment; and (4) cooperation with allies, partners, industry, and other U.S. Government department and agencies by overcoming capability gaps that directly affect current and future space operations. This program accomplishes these tasks through five (5) lines of effort: (1) space-based effects studies and analysis to ensure mission readiness; (2) science and technology (S&T) and Research and Development (R&D) demonstrations and rapid operational prototyping to ensure space superiority; (3) performing space-based effects future shaping and campaign modeling via model-based systems engineering and analysis in the USSPACECOM J8 CAVE; (4) performing operational assessments to improve warfighting capabilities; and (5) building coalitions with allies, partners, and industry through operational systems and data integration.

NAVWAR includes defensive actions that ensures the integrity and availability of friendly use of positioning, navigation, and timing (PNT) information while offensively denying the same to an adversary. NAVWAR, the management of PNT information, requires a coordinated employment of space, cyberspace, and electromagnetic warfare (EW) capabilities, enabled by intelligence, surveillance, and reconnaissance (ISR) and electromagnetic spectrum (EMS) management. Funds are used to develop and integrate NAVWAR offensive and defensive capabilities and to create and maintain NAVWAR knowledge, and tactics, techniques and procedures (TTP) to ensure NAVWAR superiority across the DoD. IAW the most recent Unified Command Plan, USSPACECOM is responsible to plan, coordinate, integrate, synchronize and assess, and as directed, execute global offensive and defensive space operations in coordination with, or in support of other combatant commands (CCMD), Services, U.S. government agencies, allies and partners, and as directed, other entities. These operations can occur in the terrestrial or space domains, or through the EMS. Additional responsibilities include advocating for and providing space capabilities such as PNT information to CCMDs, allies, partners and other entities, as directed. NAVWAR operations, TTPs, and expertise is developed and supported throughout the DoD in large part by the USSPACECOM's Joint Navigation Warfare Center (JNWC). The JNWC leads the research, development, testing and assessment of alternative PNT and NAVWAR options IOT advocate across Services and the other CCMDs to achieve PNT overmatch. NAVWAR expertise is developed in part by JNWC-led PNT Operational Field Assessments (POFA) that assess Red and Blue PNT-related capabilities, limitation, and vulnerabilities. GYPSY POFAs are linked to Commander, USSPACECOM's Joint Exercise Program (JEP) and nested within the Chairman's Exercise Program (CEP) and CCMD's Tier 1 exercises [PACIFIC SENTRY, SPACE SENTRY and AUSTERE CHALLENGE are examples] and provide operationally realistic threat-representation, and PNT-contested environments for analytical assessment of air, ground, maritime, space and cyberspace mission capabilities. FORTUNE POFAs and PNT capability and vulnerability assessments are associated with Service exercises or mission events. PRISM POFAs encompass all other operations, actions, and activities (OAAs) and other assessments to include evaluation and rapid innovation and development of NAVWAR capabilities and/or solutions to establish and maintain PNT and NAVWAR superiority across the DoD. Assessments inform materiel and non-materiel solutions, service acquisition decisions, capability gaps, intelligence gaps, TTP development and implementation to mitigate effects on warfighter operations in the anticipated theater NAVWAR threat environments.

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Air Force	Date: March 2024
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	8.350	14.892	12.698	0.000	12.698
Current President's Budget	8.350	14.892	28.392	0.000	28.392
Total Adjustments	0.000	0.000	15.694	0.000	15.694
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	15.694	0.000	15.694

Change Summary Explanation

Increase reflects transfer of Program 1202140F USSPACECOM Service Support to Activities for Modeling & Simulation and Positioning, Navigation, Timing (PNT) to 1206415F starting in FY2025.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force											Date: March 2024	
Appropriation/Budget Activity 3600 / 4					R-1 Program Element (Number/Name) PE 1206415F / *U.S. Space Command Research and Development Support*				Project (Number/Name) 641234 / *USSPACECOM Rapid Prototype Demonstration*			
COST ($ in Millions)	**Prior Years**	**FY 2023**	**FY 2024**	**FY 2025 Base**	**FY 2025 OCO**	**FY 2025 Total**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**Cost To Complete**	**Total Cost**
641234: *USSPACECOM Rapid Prototype Demonstration*	-	8.350	14.892	28.392	0.000	28.392	29.093	29.672	30.932	31.542	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

U.S. Space Command Research and Development laboratory program directly supports achieving the lines of effort described in the Defense Space Strategy and USSPACECOM Strategic Plan 2027: (1) Building a comprehensive military advantage in space; (2) integrating military space power into national, joint, and combined operations; (3) shaping the strategic environment; and (4) cooperation with allies, partners, industry, and other U.S. Government department and agencies by overcoming capability gaps that directly affect current and future space operations. This program accomplishes these tasks through five (5) lines of effort: (1) space-based effects studies and analysis to ensure mission readiness; (2) science and technology (S&T) and Research and Development (R&D) demonstrations and rapid operational prototyping to ensure space superiority; (3) performing space-based effects future shaping and campaign modeling via model-based systems engineering and analysis in the USSPACECOM J8 CAVE; (4) performing operational assessments to improve warfighting capabilities; and (5) building coalitions with allies, partners, and industry through operational systems and data integration.

NAVWAR includes defensive actions that ensures the integrity and availability of friendly use of positioning, navigation, and timing (PNT) information while offensively denying the same to an adversary. NAVWAR, the management of PNT information, requires a coordinated employment of space, cyberspace, and electromagnetic warfare (EW) capabilities, enabled by intelligence, surveillance, and reconnaissance (ISR) and electromagnetic spectrum (EMS) management. Funds are used to develop and integrate NAVWAR offensive and defensive capabilities and to create and maintain NAVWAR knowledge, and tactics, techniques and procedures (TTP) to ensure NAVWAR superiority across the DoD. IAW the most recent Unified Command Plan, USSPACECOM is responsible to plan, coordinate, integrate, synchronize and assess, and as directed, execute global offensive and defensive space operations in coordination with, or in support of other combatant commands (CCMD), Services, U.S. government agencies, allies and partners, and as directed, other entities. These operations can occur in the terrestrial or space domains, or through the EMS. Additional responsibilities include advocating for and providing space capabilities such as PNT information to CCMDs, allies, partners and other entities, as directed. NAVWAR operations, TTPs, and expertise is developed and supported throughout the DoD in large part by the USSPACECOM's Joint Navigation Warfare Center (JNWC). The JNWC leads the research, development, testing and assessment of alternative PNT and NAVWAR options IOT advocate across Services and the other CCMDs to achieve PNT overmatch. NAVWAR expertise is developed in part by JNWC-led PNT Operational Field Assessments (POFA) that assess Red and Blue PNT-related capabilities, limitation, and vulnerabilities. GYPSY POFAs are linked to Commander, USSPACECOM's Joint Exercise Program (JEP) and nested within the Chairman's Exercise Program (CEP) and CCMD's Tier 1 exercises [PACIFIC SENTRY, SPACE SENTRY and AUSTERE CHALLENGE are examples] and provide operationally realistic threat-representation, and PNT-contested environments for analytical assessment of air, ground, maritime, space and cyberspace mission capabilities. FORTUNE POFAs and PNT capability and vulnerability assessments are associated with Service exercises or mission events. PRISM POFAs encompass all other operations, actions, and activities (OAAs) and other assessments to include evaluation and rapid innovation and development of NAVWAR capabilities and/or solutions to establish and maintain PNT and NAVWAR superiority across the DoD. Assessments inform materiel and non-materiel solutions, service acquisition decisions, capability gaps, intelligence gaps, TTP development and implementation to mitigate effects on warfighter operations in the anticipated theater NAVWAR threat environments.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Space Research, Analysis, Development, Prototyping, Modification, Verification, and Validation	8.350	14.892	16.607
Description: Provide quantitative assessments that define the benefits of technology investments for capability development and inform requirements using an integrated concept definition, simulation, and performance analysis capability. A staff of diverse Subject Matter Experts (SMEs) utilizing standardized systems engineering methodology, modeling and development tools and techniques delivers independent government performance evaluations, which exercise campaign level orders of battle to support the investment in gap filling capabilities against evolving threats. Study, research, develop, modify, verify, and validate new and existing program models for space mission areas and modify existing models to portray the impact of potentially new space-based capabilities. ***FY 2024 Plans:*** - Baseline software tool baseline for CAVE and complete red, blue, grey and green model development; integrate accurate models of the contested and congested space environment; - Develop and extend modeling techniques, including incorporation of artificial intelligence and machine learning throughout the operations centers; - Evaluate space system emerging concepts resiliency, survivability, effectiveness, and lethality impacts against campaign plan measures of effectiveness and performance; - Examine pathfinder solutions and demonstrate the utility of sustained space operations (e.g., sustained space maneuver); - Analyze on-orbit satellite capabilities and contribution to USSPACECOM defense and resilience against advanced threats; - Assess space C5ISRT, battlespace awareness, and data fusion throughout the CCMD for efficiency gains and areas of improvement; - Focus study, analysis, research and engineering activities from Federally Funded Research and Development Centers (FFRDCs), UARCs, National Laboratories, OSD and DoD Laboratories, Academia and industry partners to identify suitable technology and concepts for rapid innovation and closure of UCP capability gaps against advanced threats. ***FY 2025 Plans:*** - Improve software tool baseline for CAVE and update red, blue, grey and green model development; continue to integrate accurate models of the contested and congested space environment; - Continue to develop and extend modeling techniques, including advancements in artificial intelligence and machine learning throughout the operations centers; - Evaluate space system emerging concepts resiliency, survivability, effectiveness, and lethality impacts against campaign plan measures of effectiveness and performance; - Leverage model-based gap assessments of current and future space-based effects to effect technology demonstrations and rapid operational prototyping opportunities; - Implement COAs to support efficiency gains and improvements in space C5ISRT, battlespace awareness, and data fusion;			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
- Examine pathfinder solutions and demonstrate the utility of sustained space operations (e.g., sustained space maneuver); - Analyze on-orbit satellite capabilities and contribution to USSPACECOM defense and resilience against advanced threats; - Focus study, analysis, research and engineering activities from Federally Funded Research and Development Centers (FFRDCs), UARCs, National Laboratories, OSD and DoD Laboratories, Academia and industry partners to identify suitable technology and concepts for rapid innovation and closure of UCP capability gaps against advanced threats. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Funding increased due to increase in requirements.			
Title: PNT Operational Assessments ***Description:*** The JNWC will investigate, operationally assess, and simulate current, emerging, and potential threats and mitigation strategies for denial of blue force PNT capabilities as well as preventing the hostile use of PNT information. Major Performers - Best value to the government selected contractors, universities, government facilities, federally funded research and development centers, laboratories, or other organizations. ***FY 2024 Plans:*** Execution of operational assessments in live open-air, laboratory hardware in the loop, simulation, and anechoic chamber environments to assess advanced and potential PNT threats and assist in development of tactics, techniques and procedures [TTP] to mitigate these threats. Continued evaluation of innovative technologies to prevent the hostile use of PNT information and rapidly develop and present NAVWAR playbook options for the joint force; including modeling and simulation tools to enable NAVWAR operations. ***FY 2025 Plans:*** Execution of operational assessments in live open-air, laboratory hardware in the loop, simulation, and anechoic chamber environments to assess advanced and potential PNT threats and assist in development of tactics, techniques and procedures[TTP] to mitigate these threats. Continued evaluation of innovative technologies to prevent the hostile use of PNT information and rapidly develop and present NAVWAR playbook options for the joint force; including modeling and simulation tools to enable NAVWAR operations. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** Increased funding to cover increased development and testing costs.	-	0.000	11.785
Accomplishments/Planned Programs Subtotals	8.350	14.892	28.392

Exhibit R-2A, RDT&E Project Justification: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Any new projects funded in this program will be awarded using competitive procedures to the maximum extent possible.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force			Date: March 2024
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development of software and tools to model contested space	Various	Not specified. : TBD	-	8.350	Oct 2022	-		-		-		-	Continuing	Continuing	-
USSPACECOM: Contested Space Modeling for CAVE	Various	Various : TBD	-	-		4.273	Oct 2023	4.757		0.000		4.757	Continuing	Continuing	-
USSPACECOM: Classified Space Threat-Based Studies and Analysis	Various	Various : TBD	-	-		4.059	Oct 2023	4.465		0.000		4.465	Continuing	Continuing	-
USSPACECOM: Commerical Capability Integration Platform Integration into USSPACECOM Operations	Various	Various : TBD	-	-		1.700	Jan 2024	1.500		0.000		1.500	Continuing	Continuing	-
USSPACECOM: Space Operations Research and Development	Various	Various : TBD	-	-		2.500	Feb 2024	2.750		0.000		2.750	Continuing	Continuing	-
USSPACECOM: Space Operations Application Prototyping and Integration	Various	Various : TBD	-	-		0.560	Apr 2024	1.100		0.000		1.100	Continuing	Continuing	-
Position Navigation and Timing Operational Field Assessments	Various	Various : Kirtland, AFB, NM	-	-		-		11.785	Oct 2024	-		11.785	Continuing	Continuing	-
		Subtotal	-	8.350		13.092		26.357		0.000		26.357	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Extended modeling techniques	MIPR	Dynepic : TBD	-	-		0.600	Feb 2024	0.660	Oct 2024	0.000		0.660	Continuing	Continuing	-
		Subtotal	-	-		0.600		0.660		0.000		0.660	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Security/IT CAVE Support	MIPR	Galapagos : TBD	-	-		1.200	Oct 2023	1.375	Oct 2024	0.000		1.375	Continuing	Continuing	-
		Subtotal	-	-		1.200		1.375		0.000		1.375	Continuing	Continuing	N/A

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	8.350		14.892		28.392		0.000		28.392	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

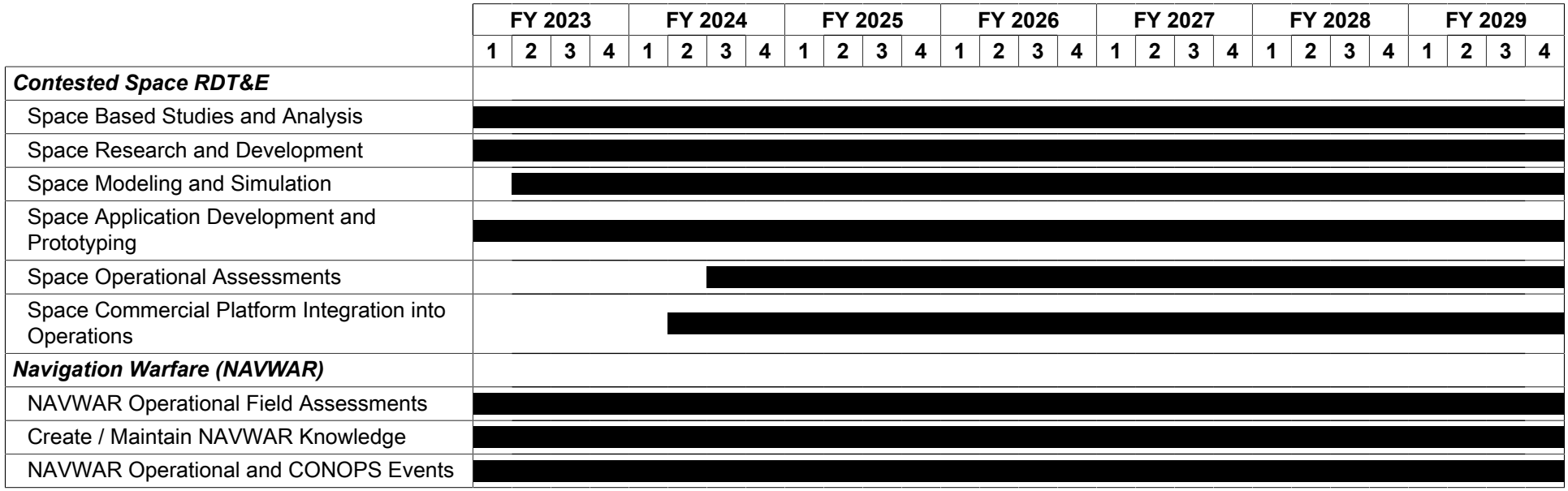

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Air Force		Date: March 2024
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 1206415F / *U.S. Space Command Research and Development Support*	**Project (Number/Name)** 641234 / *USSPACECOM Rapid Prototype Demonstration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Contested Space RDT&E				
Space Based Studies and Analysis	1	2023	4	2029
Space Research and Development	1	2023	4	2029
Space Modeling and Simulation	2	2023	4	2029
Space Application Development and Prototyping	1	2023	4	2029
Space Operational Assessments	3	2024	4	2029
Space Commercial Platform Integration into Operations	2	2024	4	2029
Navigation Warfare (NAVWAR)				
NAVWAR Operational Field Assessments	1	2023	4	2029
Create / Maintain NAVWAR Knowledge	1	2023	4	2029
NAVWAR Operational and CONOPS Events	1	2023	4	2029