

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification:** PB 2022 Office of the Secretary Of Defense **Date:** May 2021

<b>Appropriation/Budget Activity</b> 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)	<b>R-1 Program Element (Number/Name)</b> PE 0603727D8Z I Joint Warfighting Program (JWP)
---	---

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	48.874	4.532	3.869	2.169	-	2.169	-	-	-	-	-	-
<i>727: Joint Warfighting</i>	48.874	4.532	3.869	2.169	-	2.169	-	-	-	-	-	-

**A. Mission Description and Budget Item Justification**

The Joint Warfighting Program (JWP) supports the Assistant Secretary of Defense for Acquisition (ASD(A))'s responsibilities for acquisition and portfolio management. JWP underwrites analyses, studies, limited scope experiments, wargaming, and partnerships that define joint capability gaps and develops credible requirements for follow-on acquisition efforts. These analyses and assessments deliver independent perspectives on potential remedies to align acquisition investments and solutions for joint capability gaps created by future warfighting environments and emerging threats. JWP supports mission engineering integration management, as well as other high priority emerging issues requiring independent analysis to inform acquisition decisions that impact National Security.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022 Base</b>	<b>FY 2022 OCO</b>	<b>FY 2022 Total</b>
Previous President's Budget	4.846	3.871	3.994	-	3.994
Current President's Budget	4.532	3.869	2.169	-	2.169
Total Adjustments	-0.314	-0.002	-1.825	-	-1.825
• Congressional General Reductions	-	-0.002			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	-0.314	-	-1.825	-	-1.825

**Change Summary Explanation**

The \$-1.825 million program adjustment in FY 2022 is due to internal realignments of funds within the department for National Defense Strategy priorities.

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2022 Office of the Secretary Of Defense **Date:** May 2021

<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603727D8Z / Joint Warfighting Program (JWP)	<b>Project (Number/Name)</b> 727 / Joint Warfighting
--	---	---

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
<i>727: Joint Warfighting</i>	48.874	4.532	3.869	2.169	-	2.169	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

**A. Mission Description and Budget Item Justification**

The Joint Warfighting Program (JWP) supports the Assistant Secretary of Defense for Acquisition (ASD(A))'s responsibilities for acquisition and portfolio management. JWP underwrites analyses, studies, limited scope experiments, wargaming, and partnerships that define joint capability gaps and develops credible requirements for follow-on acquisition efforts. These analyses and assessments deliver independent perspectives on potential remedies to align acquisition investments and solutions for joint capability gaps created by future warfighting environments and emerging threats. JWP supports mission engineering integration management, as well as other high priority emerging issues requiring independent analysis to inform acquisition decisions that impact National Security.

**Anticipated Impact:**

Provides analytical support for acquisition efforts for ASD(A) staff elements and joint customers. It promotes analyses and assessments for acquisition insights and decisions focused on capability development serving the needs of joint forces and the warfighter.

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

	FY 2020	FY 2021	FY 2022
<b>Title:</b> Acquisition Analysis for Joint Capability Requirements	4.532	3.869	2.169
<b>Description:</b> Small Satellite Coordinating Activity:			
- SSCA Phase 3 is kicked off in June 2020 to develop an integrated SmallSat and related technology roadmap and strategy for implementation and maintenance.			
- Focus groups have organized to mature the technical and nontechnical areas of the roadmap led by “volunteer” DoD organizations and deliver an assessment of their landscape and recommendations detailing critical needs for Department investment.			
-Established critical ecosystem partnerships across the national security community.			
-Established an on-going and highly impactful working group activity that will continue to inform Department efficiencies and objectives.			

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Office of the Secretary Of Defense		<b>Date:</b> May 2021		
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603727D8Z / <i>Joint Warfighting Program (JWP)</i>	<b>Project (Number/Name)</b> 727 / <i>Joint Warfighting</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p>-Revised and matured the SmallSat Roadmap such that it can begin to directly inform OUSD(A&amp;S) priorities for Future Years Defense Program 2022-2026.</p> <p>Mission Engineering Data Modeling in Strategic Portfolio Reviews:</p> <p>-Provided Mission Engineering Data Modeling and Characterization to support OSD Cost Assessment and Program Evaluation (CAPE) and Joint Staff Strike Strategic Portfolio Review (SPR). Identified minimum set of critical data types and developed a pilot case for authoritative data modeling that is repeatable and scalable for mission capability portfolio management.</p> <p>-Continued development of the Mission Universal Specification Environment (MUSE) mission engineering application. Based on pilot case from the SPR, integrated user models to support machine learning and provide automation in the MUSE User Interface.</p> <p>-Delivered initial automated task extraction methodology and started coding in MUSE to facilitate automatic population of warfighter task information (e.g. Uniform Joint Task Lists) into the MUSE database.</p> <p>-Continued Agile development sprints in progress toward a MUSE/Mission Engineering and Integration (ME&amp;I) presentation and demo for senior leadership in September (may be delayed/extended to October due to COVID-19 impacts).</p> <p>Mission Engineering (ME) Capabilities Development:</p> <p>-Developed technical ME analytical framework (the effects/kill-chain framework) and application tool (MUSE). Integrated analytical tools to identify and exploit opportunities for interoperability with potential allied partners.</p> <p>- Executed three bi-monthly agile development sprints and implemented a New Agile Sprint “Drum Beat” to complete development and delivery of a MUSE Proof of Concept.</p> <p>-Redesigned MUSE to utilize prior and its data sources as an example/use case to demonstrate the MUSE proof of concept with additional functionality.</p> <p>-Developed a draft Program Agreement (PA) for U.S.-AUS Analytics and Decision Support for Force Design and Development.</p> <p>Mission Engineering-Automate Effects/Kill Chain &amp; Architecture Products into M&amp;S tools:</p>				

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Office of the Secretary Of Defense	<b>Date:</b> May 2021
--	-----------------------

<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603727D8Z / Joint Warfighting Program (JWP)	<b>Project (Number/Name)</b> 727 / Joint Warfighting
--	---	---

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
---	----------------	----------------	----------------

<p>-This line funded development of an automated methodology to execute Mission Engineering and Integration to transition from static architectures to executable dynamic models for time-dependent assessments of complex operations.</p> <p>-Developed prototype plan for methodology and tools to develop and assess Mission Effects Chain (MEC) using a model-based systems engineering approach combined with automation technologies. The plan leveraged existing methodology and tools, including technologies developed and matured under the Navy’s Small Business Innovation Research program. The prototype plan also provided an initial Cost Estimate of the work required to develop a framework for department-wide mission engineering approaches and practices.</p> <p>-Began implementation of an initial MEC model prototype to characterize the behavior of multi-platform combat scenario. The model prototype includes MEC behavior, interfaces (messages &amp; data), and system requirements/metrics that support trade studies and test objectives.</p> <p>-Began building an initial MEC Automated Test and Retest (ATRT) prototype that uses the MEC model as the basis for automated analysis from recorded data.</p> <p>Cyber Resilience Wargames:</p> <p>-Wargame was conducted in support of USINDOPACOM and assessed the cyber risk to Wideband Global Satellite Communication working group in a contested cyber environment. Key participating organizations included USSTRATCOM, USCYBERCOM, USSPACECOM, Army Space and Missile Defense Command, and the National Reconnaissance Office. Results are classified.</p> <p>-Cyber Invictus Wargame was conducted in support of USCYBERCOM and assessed the capability and capacity of the Cyber Protection Teams within the Cyber Mission Force. Key participating Combatant Commands include: USSPACECOM, USSTRATCOM, USEUCOM, USCENTCOM, USINDOPACOM, USTRANSCOM. Results are classified.</p> <p>Anticipated Impact: Provides analytical support for acquisition efforts for ASD(A) staff elements and joint customers. It promotes analyses and assessments for acquisition insights and decisions focused on capability development serving the needs of joint forces and the warfighter.</p> <p><b>FY 2021 Plans:</b></p>			
--	--	--	--

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Office of the Secretary Of Defense		<b>Date:</b> May 2021
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603727D8Z / Joint Warfighting Program (JWP)	<b>Project (Number/Name)</b> 727 / Joint Warfighting

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p>Conduct acquisition analysis through a portfolio management lens to address the critical joint warfighting mission areas critical to national defense. Major focus areas will support the following projects:</p> <ul style="list-style-type: none"> <li>-Mission Engineering Effects/Kill Chain Development to build effects/kill chains as part of foundational framework for the Mission Engineering and Integration Approach.</li> <li>-Mission Engineering Data Modeling in partnership with Cost Assessment and Program Evaluation (CAPE) and Joint Staff to pilot authoritative data modeling that is repeatable and scalable for capability portfolio management.</li> <li>-Mission Engineering analysis to develop a methodology to transition from static architectures to executable dynamic models for time-dependent assessments of complex operations.</li> <li>-Adaptive Acquisition Framework (AAF) Pathway analysis to develop and implement a system of metrics specific or unique to each of the pathways within the Department of Defense's AAF.</li> <li>-Comprehensive Data Strategy is a field study and prototyping of a human-centered system to integrate, analyze, and share acquisition data for portfolio and cross-portfolio decisions. This effort will provide a baseline for sourcing a capability that supports these tasks across the DoD.</li> <li>-Small Satellite Coordination Activity effort is to optimize efficiencies and productivity in defense spending by executing critical technical, systems engineering, and program management oversight tasks based on a sound technical foundation in network design, architecture development, systems engineering and net-centric operations.</li> <li>-Software Development effort is to develop system and waveform concepts for close proximity secure satellite communications, which includes determination of the high level requirements and the threat environment such a system may face. Furthermore, this effort will explore techniques to implement secure software updates for remote embedded systems. This effort will ensure end to end software integrity, automation of software updates, and verification of security.</li> <li>-Space Command and Control (C2) Independent Review: NDAA-directed task, SASC FY 2020 NDAA Committee Rpt 116-14 directed the USD(A&amp;S) to enter into an agreement with a federally funded research and development center (FFRDC) to review the Air Force's Space C2 program and submit the final report to the congressional defense committees.</li> <li>-Small Satellite Coordination Activity (SSCA): JWP funding supported SSCA Phase 2 and Phase 3 with focus on nine mission areas for further development. Each mission area is developing a roadmap for continued development.</li> </ul>			

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Office of the Secretary Of Defense		<b>Date:</b> May 2021
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603727D8Z / Joint Warfighting Program (JWP)	<b>Project (Number/Name)</b> 727 / Joint Warfighting

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p>-Provide in-depth nuclear weapons technical, engineering, integration support, system of system engineering analysis, nuclear cert and testing analysis for nuclear weapons activities to monitor nuclear modernization and nuclear sustainment.</p> <p>-Perform research and analysis in support of strategic arms control implementation planning oversight responsibilities. Evaluate DoD Component program plans to identify arms control treaty compliance issues of concern and advises on options for maximizing warfighter capabilities within legal constraints of existing arms control agreements.</p> <p>-Implement an adaptive acquisition framework to streamline the acquisition process and enable program execution.</p> <p>-Establish and refine capability portfolio management practices and processes to promote efficiency, integration, and effective end-to-end capabilities.</p> <p>-Implement execution and procurement of Missile Defeat and Defense Enhancements to improve the capacity and capabilities of interceptors.</p> <p><b>FY 2022 Plans:</b> Conduct acquisition analysis through a portfolio management lens to address the critical joint warfighting mission areas critical to national defense. Major focus areas will support the following projects:</p> <p>-Mission Engineering Effects/Kill Chain Development to build effects/kill chains as part of foundational framework for the Mission Engineering and Integration Approach.</p> <p>-Mission Engineering Data Modeling in partnership with Cost Assessment and Program Evaluation (CAPE) and Joint Staff to pilot authoritative data modeling that is repeatable and scalable for capability portfolio management.</p> <p>-Mission Engineering analysis to develop a methodology to transition from static architectures to executable dynamic models for time-dependent assessments of complex operations.</p> <p>-Adaptive Acquisition Framework Pathway analysis to develop and implement a system of metrics specific or unique to each of the pathways within the Department of Defense's Adaptive Acquisition Framework.</p>			

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Office of the Secretary Of Defense		<b>Date:</b> May 2021
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603727D8Z / Joint Warfighting Program (JWP)	<b>Project (Number/Name)</b> 727 / Joint Warfighting

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

	FY 2020	FY 2021	FY 2022
<p>-Comprehensive Data Strategy is a field study and prototyping of a human-centered system to integrate, analyze, and share acquisition data for portfolio and cross-portfolio decisions. This effort will provide a baseline for sourcing a capability that supports these tasks across the DoD.</p> <p>-Small Satellite Coordination Activity effort is to optimize efficiencies and productivity in defense spending by executing critical technical, systems engineering, and program management oversight tasks based on a sound technical foundation in network design, architecture development, systems engineering and net-centric operations.</p> <p>-Software Development effort is to develop system and waveform concepts for close proximity secure satellite communications, which includes determination of the high level requirements and the threat environment such a system may face. Furthermore, this effort will explore techniques to implement secure software updates for remote embedded systems. This effort will ensure end to end software integrity, automation of software updates, and verification of security.</p> <p>-Space C2 Independent Review: NDAA-directed task - SASC FY 2020 NDAA Committee Rpt 116-14 directed the USD(A&amp;S) to enter into an agreement with a FFRDC to review the Air Force's Space C2 program and submit the final report to the congressional defense committees.</p> <p>-Small Satellite Coordination Activity (SSCA): JWP funding supported SSCA Phase 2 and Phase 3 with focus on nine mission areas for further development. Each mission area is developing a roadmap for continued development.</p> <p>-Provide in-depth nuclear weapons technical, engineering, integration support, system of system engineering analysis, nuclear certification and testing analysis for nuclear weapons activities to monitor nuclear modernization and nuclear sustainment.</p> <p>-Perform research and analysis in support of strategic arms control implementation planning oversight responsibilities. Evaluate DoD Component program plans to identify arms control treaty compliance issues of concern and advises on options for maximizing warfighter capabilities within legal constraints of existing arms control agreements.</p> <p>-Implement an adaptive acquisition framework to streamline the acquisition process and enable program execution.</p> <p>-Establish and refine capability portfolio management practices and processes to promote efficiency, integration, and effective end-to-end capabilities.</p>			

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2022 Office of the Secretary Of Defense		<b>Date:</b> May 2021		
<b>Appropriation/Budget Activity</b> 0400 / 3	<b>R-1 Program Element (Number/Name)</b> PE 0603727D8Z / Joint Warfighting Program (JWP)	<b>Project (Number/Name)</b> 727 / Joint Warfighting		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>
<p>-Implement execution and procurement of Missile Defeat and Defense Enhancements to improve the capacity and capabilities of interceptors.</p> <p><b>FY 2021 to FY 2022 Increase/Decrease Statement:</b> ASD(A) adjusted funding and focus to address mission priority areas and realigned funding for enduring requirements for independent analyses in support of agile software development and software provenance mission areas. In FY 2020 and beyond, this segment is combined with Acquisition Analytic Development of Joint Military Requirements.</p>				
<b>Accomplishments/Planned Programs Subtotals</b>		4.532	3.869	2.169
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				