Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force											Date: May 2021	
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 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*							
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	-	0.000	0.000	82.438	0.000	82.438	-	-	-	-	-	-
645352: *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	-	0.000	0.000	82.438	0.000	82.438	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department of the Air Force (DAF) Technical Architecture Design, Integration, and Evaluation activity resources two primary pillars - (1) DAF Architecture Design and Integration and (2) DAF Architecture Demonstration and Evaluation - to address critical gaps and move the DAF toward a superior architecture grounded in superior capabilities. This PE is not a new start, funding is realigned within the Department of the Air Force to this standalone PE to better align DAF objectives, since the DAF Technical Architecture, Design, Integration, and Evaluation activities enable open and integrated architectures across the entirety of the Department rather than any single program.

Potential adversaries are modernizing faster than anticipated. They are advancing individual systems while bringing families of systems (or systems of systems) together into an architecture to deny U.S. interests and counter potential U.S. action. One such example is the increasingly coupled investments and integration of space, air, and maritime sensing with long-range missile systems. The mix of capabilities and the integration of capabilities are just as important as the individual systems themselves because they have to work together in order to achieve the necessary operational effects and do so on increasingly rapid timelines. Successful companies follow a similar approach across product lines, and the same approach is needed for the DAF. The DAF must not only invest in superior capabilities but also invest in superior architectures that enable those capabilities to both integrate and modernize.

First, the DAF Force needs a technical architecture that couples with operational mission threads, such as Decision Superiority and Information Advantage, Agile Combat Employment with Distributed Operations and Layered Defense, Rapid All-Domain Kill Chains, Logistics Under Attack, and Space Defense. The Department does not have an integrated reference architecture. Therefore, it should not be a surprise if capabilities do not work together as desired or the technical achievements fail to match the desired operational effects intended by warfighters across the Air Force and Space Force. An integrated architecture is necessary and must regularly and dynamically mature as threats advance and new technological opportunities arise. In other words an architecture must play both defense and offense effectively to adapt to these challenges and opportunities. This architecture must also flex vertically - meaning programs and platforms themselves must be built with agility via open systems and open standards so that they can adapt and upgrade components quickly in response to threats or opportunities to integrate technology as advances are made. While having an integrated architecture is far too uncommon in the Department of the Air Force, it is a standard commercial practice. Efforts in this arena often fail to produce the desired results as organizations often stop at the "blueprint" phase or the design phase and fail to move from a great design into mission-ready capabilities on the battlefield. Therefore, the next pillar is a critical companion to achieving results.

Second, the DAF needs to experiment with and test these systems of systems. The Department of the Air Force does not have a deliberate campaign that integrates demonstration and evaluation at the force-level (i.e., architecture level). Great designs may not have traction when meeting reality, and traditional system-level testing and experimentation are not designed to yield insights into the effectiveness of capabilities working together to achieve integrated mission effects. This is the perennial

problem of not demonstrating and evaluating like one fights. Architecture Demonstrations and Evaluations, which were originally conceived to be focused on networking, ultimately serve a much broader purpose in highlighting architecture gaps and potential solutions. By taking Architecture Demonstrations and Evaluations to the field, the Department of the Air Force has uncovered mission-critical gaps that might not have been found at test ranges—meaning they would have been discovered on the road to conflict when it would likely be too late to correct. Therefore, a regular campaign of learning at the architecture level—with demonstration and evaluation of how and where the Department of the Air Force fights is critical to moving to a deliberate approach that impacts overall architecture design, investments, requirements for future capabilities, and acquisition baseline updates for current systems.
This activity is directed by the Chief Architect of the Department of the Air Force with oversight by the Secretary of the Air Force alongside the Chief of Staff of the Air Force and Chief of Space Operations. This activity is executed by the Air Force Research Laboratory.

This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver Department of the Air Force Technical Architecture Design, Integration, and Evaluation for emergent or unanticipated weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	82.438	0.000	82.438
Total Adjustments	0.000	0.000	82.438	0.000	82.438
• 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	82.438	0.000	82.438

Change Summary Explanation

FY 2022 funding increased compared to FY 2021 by 82.438 million. Funding increased due to realignment of resources within the Department of the Air Force from PE 0604003F Advanced Battle Management System (ABMS) to PE 0604006F Department of the Air Force Technical Architecture Design, Integration, and Evaluation to better align Department of the Air Force objectives, since Department of the Air Force Technical Architecture Design, Integration, and Evaluation enables transition and open architecture across the entirety of the Department of the Air Force rather than within a single program. This is not a new start.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force	Date: May 2021
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 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Title: DAF Architecture Design and Integration	-	0.000	29.106

Description: The Department does not have an integrated reference architecture. Therefore, it should not be a surprise if capabilities do not work together as desired or the technical achievements fail to match the desired operational effects intended by warfighters across the Air Force and Space Force. An integrated architecture is critical and must regularly and dynamically mature as threats advance and new technological opportunities arise. In other words an architecture must play both defense and offense effectively to adapt to these challenges and opportunities. This architecture must also flex vertically - meaning programs and platforms themselves must be built with agility via open systems and open standards so that they can adapt and upgrade components quickly in response to threats or opportunities to integrate technology as advances are made. While having an integrated architecture is less common in the Department, it is a standard commercial practice. This pillar focuses on closing these systems and systems-of-systems modularity and integrated capability gaps.
The Department of the Air Force Architecture Design and Integration pillar focuses on horizontal integration of vertically-oriented weapon systems in order to deliver superior systems-of-systems capabilities under different mission scenarios as well as enable those weapon systems with open standards and modular open system. This pillar develops mission-focused and functional architectures, fosters open standards and open systems approaches, establishes cloud-based environments to enable cross-cutting architecture development across Program Executive Offices, Major Commands, and Space Deltas, analyzes the technical and operational feasibility of new technical concepts that may be brought into the architecture through the science, technology, research, development and experimentation enterprises, and fosters the integration of capabilities into the architecture.

FY 2021 Plans:
N/A

FY 2022 Plans:
FY 2022 plans capitalize on DAF Architecture Design and Integration activities previously accomplished within individual programs and will include objectives such as: (1) design technical architectures to enable Department of the Air Force Service Chiefs' cross-cutting priority missions, including Decision Superiority and Information Advantage, Agile Combat Employment, Distributed Operations, and Layered Defense, and Rapid All-domain Kill Chains; (2) design and develop functional cross-cutting architectures such as an enterprise data architecture and associated infrastructure; (3) foster and mature accessible open architecture and standards to enable program agility and adaptability; (4) develop foundational cloud-based digital models of Air Force and Space Force platforms across classification levels; and (5) help drive current and future programs towards the architecture through program objective investments and acquisition program modernization.

FY 2021 to FY 2022 Increase/Decrease Statement:
FY 2022 funding increased compared to FY 2021 by 29.106 million. Funding increased due to realignment of resources within the Department of the Air Force from PE 0604003F ABMS to PE 0604006F Department of the Air Force Technical Architecture

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force	Date: May 2021
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 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
Design, Integration, and Evaluation to better align Department of the Air Force objectives, since Department of the Air Force Technical Architecture Design, Integration, and Evaluation enables transition and open architecture across the entirety of the Department of the Air Force rather than within a single program. This is not a new start.			
Title: DAF Architecture Demonstration and Evaluation	-	0.000	53.332
Description: Department of the Air Force (DAF) Architecture Demonstration and Evaluation demonstrates and evaluates the integration of capabilities, not just individual capabilities. This work is a deliberate campaign that integrates demonstration and evaluation at the force-level (i.e., architecture level). This is critical because great designs on paper may not have traction when meeting reality, and traditional system-level testing and experimentation are not designed to yield insights into the effectiveness of capabilities working together to achieve integrated mission effects. By taking Architecture Demonstrations and Evaluations to the field, the DAF also uncovers mission-critical gaps that may not be uncovered at test ranges—meaning they would have been discovered on the road to conflict when it could be too late to correct. Therefore, a regular campaign of learning at the architecture level with demonstration and evaluation of how and where the Department of the Air Force fights is critical to moving from simply buying systems and hoping they compose into a family of systems in conflict to a deliberate approach that impacts overall architecture design, investments, requirements for future capabilities, and acquisition baseline updates for current systems. The DAF Architecture Demonstration and Evaluation effort focuses on addressing these needs. The DAF Architecture Demonstration and Evaluation pillar enables and conducts architecture-level demonstration and testing throughout the year and specifically at capstone Architecture Evaluations at key points to evaluate the integrated mission-oriented and functional-oriented architectures. These events further evaluate agility by adjusting operational scenarios from technical sprint to technical sprint to better reflect the uncertainty that a potential conflict might bring. The live demonstrations also enable focused objectives for integration with the joint force, allies, and partners and lower barriers to transition prototypes into operational programs. The Architecture Evaluations approach is modeled after modern commercial industry best practices and elements of the Special Operations community. This line of effort also includes costs for architecture evaluation infrastructure, test personnel, range access, consumables, travel, operational concept and non-materiel development, technical sprints to solve near-term gaps, and other evaluation-specific activities. The necessity of conducting evaluations at the architecture level and the speed required by the operational needs compel enhanced approaches to traditional test and analysis capabilities, namely new, innovative, and sufficiently-resourced test and analysis infrastructure, networks, and core subject matter expertise to include employment of military, civilian, reserve, and contractor capabilities. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** FY 2022 plans capitalize on DAF Architecture Demonstration and Evaluation activities previously accomplished within individual programs and will include objectives such as: (1) demonstrate and evaluate technical architecture designs to enable Department			

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force	Date: May 2021
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604006F *I Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2020	FY 2021	FY 2022
of the Air Force Service Chiefs' cross-cutting priority missions, including Decision Superiority and Information Advantage, Agile Combat Employment, Distributed Operations, and Layered Defense, and Rapid All-domain Kill Chains as well as functional architectures such as enterprise data capabilities; (2) identify needed changes to architectures and architecture-driven requirements for modernization programs and program objective budget investments; (3) solve select "quick win" technical gaps identified as part of the evaluations; (4) assess the military utility of technology solutions to achieve the Department of the Air Force architecture designs; and (5) enhance evaluation infrastructure at test locations and augment relocatable test capabilities to enable Continental United States and Outside the Continental United States evaluations. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2022 funding increased compared to FY 2021 by $53.332 million. Funding increased due to realignment of resources within the Department of the Air Force from PE 0604003F ABMS to PE 0604006F Department of the Air Force Technical Architecture Design, Integration, and Evaluation to better align Department of the Air Force objectives, since Department of the Air Force Technical Architecture Design, Integration, and Evaluation enables transition and open architecture across the entirety of the Department of the Air Force rather than within a single program. This is not a new start.			
Accomplishments/Planned Programs Subtotals	-	0.000	82.438

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

This is a continuation of FY 2021 efforts in PE 0604003F ABMS realigned to PE 0604006F Department of the Air Force Technical Architecture Design, Integration, and Evaluation in order to better align Department of the Air Force objectives since Department of the Air Force Technical Architecture Design, Integration, and Evaluation enables transition and open architecture across the entirety of the Department of the Air Force rather than within a single program. This is not a new start.

E. Acquisition Strategy

Contracting strategies vary based on activity; please see R3 for additional details.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	

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
DAF Architecture Designand Integration Contract 1	MIPR	Various : Various	-	-		-		3.185	Nov 2021	-		3.185	-	-	-
DAF Architecture Designand Integration Contract 2	MIPR	MIT/LL : Lexington, MA	-	-		-		3.006	Nov 2021	-		3.006	-	-	-
DAF Architecture Design and Integration Modelingand Analysis Contract 1	MIPR	Various : Various	-	-		-		2.513	Nov 2021	-		2.513	-	-	-
DAF Architecture Design and Integration Modelingand Analysis Contract 2	MIPR	JHU APL : Laurel, MD	-	-		-		3.981	Nov 2021	-		3.981	-	-	-
DAF Architecture Design and Integration Modelingand Analysis Infrastructure	RO	SAIC : Reston, VA	-	-		-		0.904	Nov 2021	-		0.904	-	-	-
DAF Architecture Technology SolutionsSprint 1	Various	Various : Various	-	-		-		5.440	Dec 2021	-		5.440	-	-	-
DAF Architecture Technology SolutionsSprint 2	Various	Various : Various	-	-		-		6.620	Apr 2022	-		6.620	-	-	-
DAF Architecture Technology SolutionsSprint 3	Various	Various : Various	-	-		-		5.858	Jul 2022	-		5.858	-	-	-
DAF Mission Architecture	MIPR	Various : Various	-	-		-		5.065	Dec 2021	-		5.065	-	-	-
DAF Program Architecture	MIPR	Various : Various	-	-		-		3.397	Dec 2021	-		3.397	-	-	-
		Subtotal	-	-		-		39.969		-		39.969	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force			Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	

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
DAF Architecture Designand Evaluation Support	MIPR	Various : Various	-	-		-		4.673	Nov 2021	-		4.673	-	-	-
DAF ArchitectureEngineering Support	Reqn	Various : Various	-	-		-		8.145	Oct 2021	-		8.145	-	-	-
		Subtotal	-	-		-		12.818		-		12.818	-	-	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
DAF ArchitectureEvaluation	Various	Various : Various	-	-		-		3.971	Dec 2021	-		3.971	-	-	-
DAF ArchitectureEvaluation ExecutionTeam	MIPR	Booz Allen Hamilton : McClean, VA	-	-		-		10.650	Oct 2021	-		10.650	-	-	-
DAF ArchitectureEvaluation MissionExecution	Various	Various : Various	-	-		-		2.986	Dec 2021	-		2.986	-	-	-
DAF ArchitectureEvaluation Infrastructure	Various	Various : Various	-	-		-		6.966	Dec 2021	-		6.966	-	-	-
		Subtotal	-	-		-		24.573		-		24.573	-	-	N/A

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
Program ManagementAdministration	Various	Various : Various	-	-		-		5.078	Oct 2021	-		5.078	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

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
		Subtotal	-	-		-		5.078		-		5.078	-	-	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	-	-		0.000		82.438		-		82.438	-	-	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

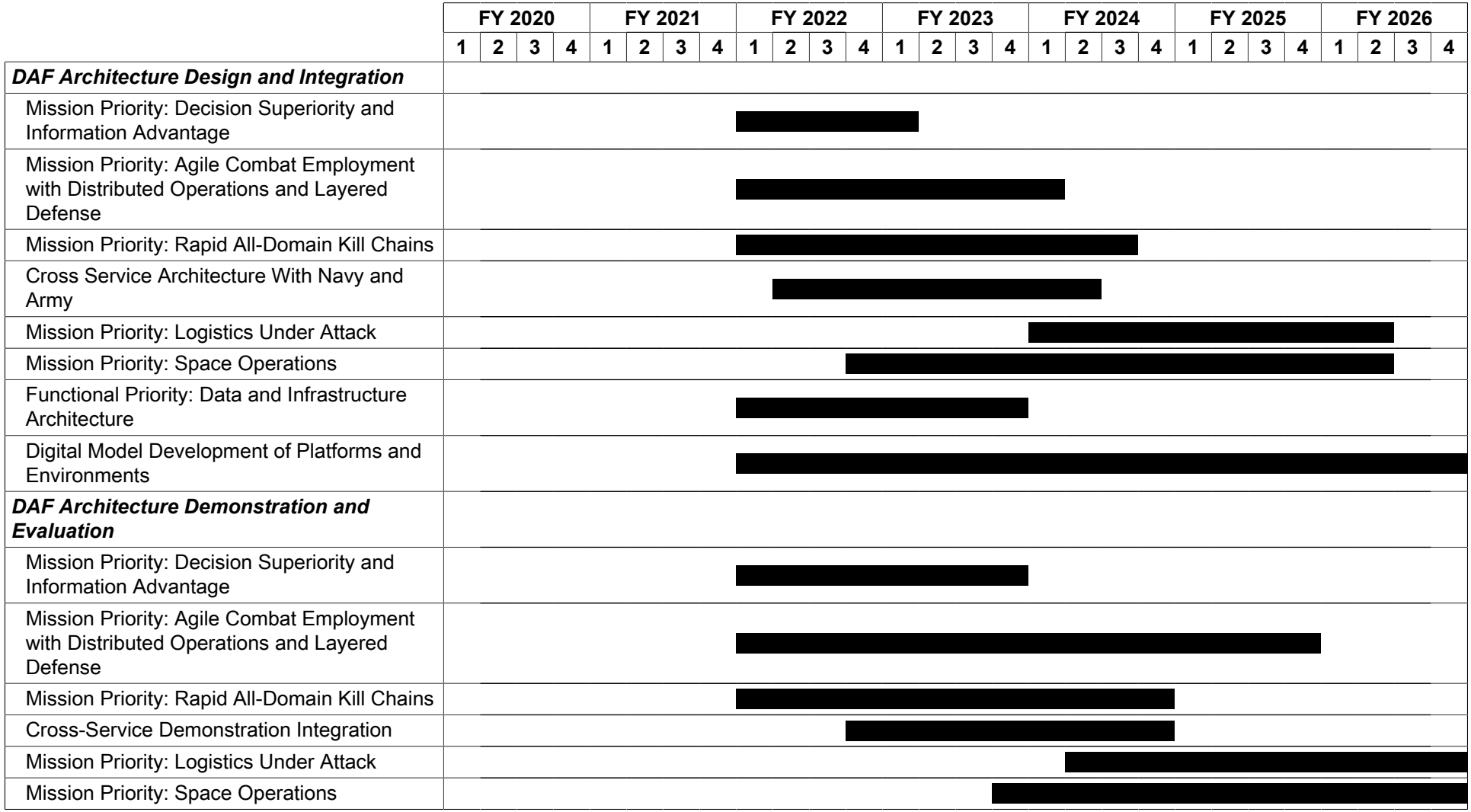

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

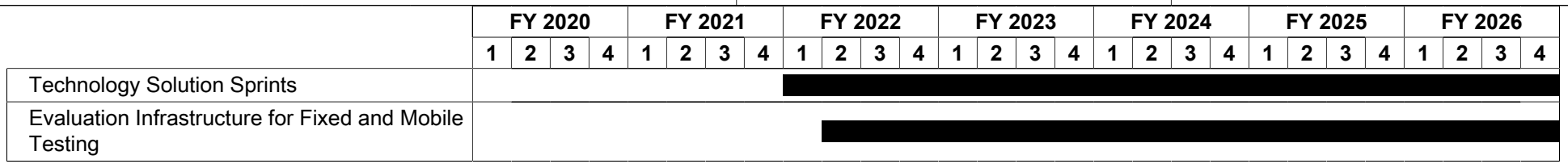

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force		Date: May 2021
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604006F / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*	**Project (Number/Name)** 645352 / *Department of the Air Force Technical Architecture Design, Integration, and Evaluation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DAF Architecture Design and Integration				
Mission Priority: Decision Superiority and Information Advantage	1	2022	1	2023
Mission Priority: Agile Combat Employment with Distributed Operations and Layered Defense	1	2022	1	2024
Mission Priority: Rapid All-Domain Kill Chains	1	2022	3	2024
Cross Service Architecture With Navy and Army	2	2022	2	2024
Mission Priority: Logistics Under Attack	1	2024	2	2026
Mission Priority: Space Operations	4	2022	2	2026
Functional Priority: Data and Infrastructure Architecture	1	2022	4	2023
Digital Model Development of Platforms and Environments	1	2022	4	2026
DAF Architecture Demonstration and Evaluation				
Mission Priority: Decision Superiority and Information Advantage	1	2022	4	2023
Mission Priority: Agile Combat Employment with Distributed Operations and Layered Defense	1	2022	4	2025
Mission Priority: Rapid All-Domain Kill Chains	1	2022	4	2024
Cross-Service Demonstration Integration	4	2022	4	2024
Mission Priority: Logistics Under Attack	2	2024	4	2026
Mission Priority: Space Operations	4	2023	4	2026
Technology Solution Sprints	1	2022	4	2026
Evaluation Infrastructure for Fixed and Mobile Testing	2	2022	4	2026