Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force											Date: April 2022	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	684.931	1,105.404	1,014.708	0.000	1,014.708	808.922	687.032	667.090	684.853	Continuing	Continuing
673501: *Air Vehicle - Tech Refresh 3*	-	0.000	86.327	67.210	0.000	67.210	0.000	0.000	0.000	8.534	Continuing	Continuing
673502: *Air Vehicle Block 4 Planning & Sys Eng*	-	0.000	324.233	390.091	0.000	390.091	337.544	286.611	210.250	247.711	Continuing	Continuing
673503: *Test and Evaluation (T&E)*	-	0.000	262.733	270.841	0.000	270.841	220.685	173.884	216.008	196.950	Continuing	Continuing
673504: *Propulsion (PP)*	-	0.000	153.091	14.891	0.000	14.891	11.737	10.384	10.343	10.615	Continuing	Continuing
673505: *Maintenance Systems (MxS)*	-	0.000	50.409	49.836	0.000	49.836	41.949	33.483	30.201	29.608	Continuing	Continuing
673506: *Combat Data Systems (CDS)*	-	0.000	60.039	53.248	0.000	53.248	39.407	29.726	35.993	39.130	Continuing	Continuing
673507: *Training Systems & Simulation*	-	0.000	72.712	74.619	0.000	74.619	61.333	54.568	61.850	67.697	Continuing	Continuing
673508: *Infrastructure & Support Costs*	-	0.000	67.860	74.101	0.000	74.101	73.433	75.014	78.088	80.237	Continuing	Continuing
673509: *DevSecOps*	-	0.000	28.000	19.871	0.000	19.871	22.834	23.362	24.357	4.371	Continuing	Continuing
675346: *F-35*	-	684.931	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the United States Navy, United States Air Force, United States Marine Corps and International Partners countries. There are three variants the F-35A Conventional Takeoff and Landing variant; F-35B Short Take Off and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. Maximum commonality among the variants, consistent with National Disclosure Policy, will minimize total air system life cycle costs. Planning, systems engineering, development, and testing for Block 4 continues across the F-35 Air System to include the air vehicle, propulsion system, combat data systems, maintenance systems, and training systems as Initial Operational Capability (IOC) has been met for each variant.

The JSF Continuous Capability Development & Delivery (C2D2) efforts provide incremental warfighting capability improvements to maintain joint air dominance against evolving threats. Block 4 capability requirements were initiated through ongoing Service-led operational analysis of warfighting gaps identified in the Fifth Generation Fighter Modernization Initial Capabilities Document (ICD), and through F-35 JSF Block 4 Mission Decomposition analysis completed in FY2014. These analyses

served as the basis for the Block 4 Capability Development Document (CDD), staffed through the Air Force Requirements Oversight Council (AFROC) and signed by the USAF Chief of Staff in January 2015. Joint Requirements Oversight Council (JROC) approved the CDD 21 March 2017. Modernization activities in FY2022 and FY2023 continue with the incremental releases of Block 4 capabilities. Block 4 efforts include a robust weapons integration portfolio and provide new opportunities for International Partners to assess, integrate, and field unique capabilities based on global sovereign requirements.

The United Kingdom, Italy, Netherlands, Canada, Australia, Denmark and Norway are participants in F-35 modernization. The program shown here reflects United States Air Force funding. Foreign Military Sales are ongoing separately.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY21 $47.9M was expended for civilian pay expenses in this program element, and in FY22 $46.9M is forecasted for civilian pay expenses in this program element.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	695.869	985.404	0.000	0.000	0.000
Current President's Budget	684.931	1,105.404	1,014.708	0.000	1,014.708
Total Adjustments	-10.938	120.000	1,014.708	0.000	1,014.708
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	120.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	9.999	0.000			
• SBIR/STTR Transfer	-20.937	0.000			
• Other Adjustments	0.000	0.000	1,014.708	0.000	1,014.708

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 675346: *F-35*		
Congressional Add: *JASSM*	10.000	-
Congressional Add Subtotals for Project: 675346	10.000	-
Congressional Add Totals for all Projects	10.000	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*

Change Summary Explanation

The FY2023 budget submission accomplishments/planned programs (R-2A) has been updated to mirror the Joint Strike Fighters Program Management Office organizational structure in order to provide more transparency and visibility to development efforts across the F-35 enterprise. Also, the Project Cost Analysis (R-3) exhibit has been updated to include additional cost categories to better display executing efforts.

Technical: Not applicable.
Schedule: Not applicable.

The FY 2022 President's Budget submittal did not reflect FY 2023 through FY 2026 funding. Therefore, an explanation of the change between the two budget positions for FY 2023 cannot be made in a relevant manner.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673501 / *Air Vehicle - Tech Refresh 3*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673501: *Air Vehicle - Tech Refresh 3*	-	0.000	86.327	67.210	0.000	67.210	0.000	0.000	0.000	8.534	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, Air Vehicle - Technology Refresh 3 (TR-3) was established as a separate, distinct project within the Continuous Capability Development & Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request.

A. Mission Description and Budget Item Justification

Technology Refresh 3 (TR-3) conducts post Critical Design Review (CDR) design activities. This effort will develop and deliver a TR-3 system through full flight-worthy certification and production readiness review for Lot 15. The design of TR-3 subsystems Integrated Core Processor (ICP), Aircraft Memory System (AMS), and Panoramic Cockpit Display Electronics Unit and Display Unit (PCD-EU, PCD-DU) configurations will contain new backplane technology, commercial operating systems, and modified middleware necessary to support Block 3F functionality and incorporation of all Block 4 capabilities. This work includes nonrecurring engineering for the development, test, and certification of the ICP, AMS, PCD-EU, and PCD-DU, and includes processing capacity to ensure long term viability for future capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Technology Refresh 3 (TR-3)	0.000	86.327	67.210	0.000	67.210
Description: Technology Refresh 3 (TR-3) conducts post Critical Design Review (CDR) design activities. This effort will develop and deliver a TR-3 system through full flight-worthy certification and production readiness review for Lot 15. The design of TR-3 subsystems Integrated Core Processor (ICP), Aircraft Memory System (AMS), and Panoramic Cockpit Display Electronics Unit and Display Unit (PCD-EU, PCD-DU) configurations will contain new backplane technology, commercial operating systems, and modified middleware necessary to support Block 3F functionality and incorporation of all Block 4 capabilities. This work includes nonrecurring engineering for the development, test, and certification of the ICP, AMS, PCD-EU, and PCD-DU, and includes processing capacity to ensure long term viability for future capabilities.					
FY 2022 Plans: The TR-3 program will continue laboratory system integration and test, modify Developmental and Operational test aircraft with TR-3 and Next Gen Distributed Aperture System (DAS) hardware, perform ground test activities, and perform flight test through FY2022. This will include the necessary labor and Non-recurring engineering to support Developmental and Operational test aircraft modifications, as well as the necessary mission planning					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673501 / *Air Vehicle - Tech Refresh 3*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
systems to support flight test operations. Finally, this will include multiple software releases to both lab and flight test, and will also result in the final software updates for Core Process Software (CPSW), Pilot Systems Software (PSSW), and TR-3 hardware. ***FY 2023 Base Plans:*** The TR-3 program will complete laboratory system integration and test, flight test, and system certification requirements. The program will also deliver necessary hardware and complete modifications of Operational Test aircraft to support fleet fielding recommendations. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The decrease from FY2022 to FY2023 is due to the program nearing completion. This is driven by the ramp down and completion of sub tier supplier scope, and completion of system integration at the Prime.					
Accomplishments/Planned Programs Subtotals	0.000	86.327	67.210	0.000	67.210

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673501 / *Air Vehicle - Tech Refresh 3*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TR-3 Prime LM Development	C/CPIF	LM/FORT WORTH TX : TBD	-	-		75.878	Oct 2021	67.210	Oct 2022	-		67.210	Continuing	Continuing	-
TR-3 Prime LM Next GenDAS Shipsets Proc	C/CPIF	LM/FORT WORTH TX : TBD	-	-		6.146	Feb 2022	-		-		-	Continuing	Continuing	-
TR-3 Prime LM OT NRE	C/CPIF	LM/FORT WORTH TX : TBD	-	-		2.049	Nov 2021	-		-		-	Continuing	Continuing	-
TR-3 Prime LM OT NextGen DAS NRE	C/CPIF	LM/FORT WORTH TX : TBD	-	-		2.049	Nov 2021	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		86.122		67.210		-		67.210	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TR-3 Project Support	MIPR	Various : TBD	-	-		0.205	Nov 2021	-		-		-	Continuing	Continuing	-
		Subtotal	-	-		0.205		-		-		-	Continuing	Continuing	N/A

Remarks

1. Government support at National Security Agency (NSA) / Communications Electronics Research Development and Engineering Center (CERDEC) in support of TR-3 development.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		86.327		67.210		-		67.210	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673501 / *Air Vehicle - Tech Refresh 3*

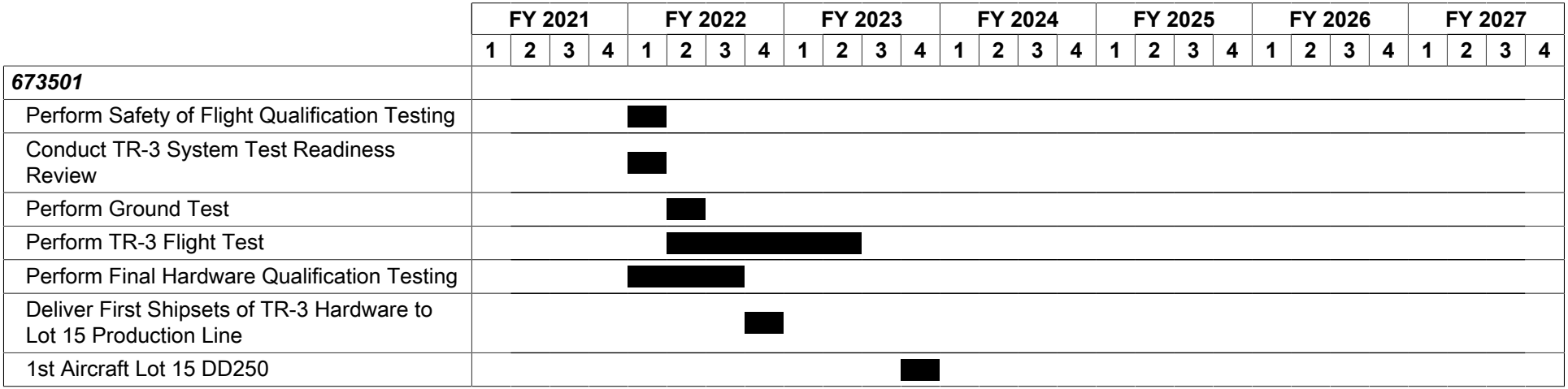

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673501 / *Air Vehicle - Tech Refresh 3*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673501				
Perform Safety of Flight Qualification Testing	1	2022	1	2022
Conduct TR-3 System Test Readiness Review	1	2022	1	2022
Perform Ground Test	2	2022	2	2022
Perform TR-3 Flight Test	2	2022	2	2023
Perform Final Hardware Qualification Testing	1	2022	3	2022
Deliver First Shipsets of TR-3 Hardware to Lot 15 Production Line	4	2022	4	2022
1st Aircraft Lot 15 DD250	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673502 / *Air Vehicle Block 4 Planning & Sys Eng*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673502: *Air Vehicle Block 4 Planning & Sys Eng*	-	0.000	324.233	390.091	0.000	390.091	337.544	286.611	210.250	247.711	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, Air Vehicle - Block 4 Planning & Sys Eng was established as a separate, distinct project within the Continuous Capability Development & Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for fiscal years FY2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2023 request.

A. Mission Description and Budget Item Justification

The F-35 Air Vehicle Program Management Office (AV PMO) development portfolio includes efforts to improve the F-35 air vehicle lethality, survivability, and interoperability in response to emerging threats outlined in the National Security Strategy and Operational Plans. The AV PMO delivers these capabilities utilizing a Continuous Capability Development and Delivery (C2D2) strategy combining traditional hardware upgrades and agile software integration processes. As a function of congressional desire for increased transparency and the F-35 organizational pivot, this is the second budget cycle in which AV PMO budget requirements have been comprehensively and discretely defined within a dedicated BPAC.

F-35 Block 4 Modernization is designed to counter the full spectrum of evolving near-peer enemy threats to ensure US and Allied forces have freedom of operation even in the face of advanced adversary Anti Access/Area Denial (A2/AD) capabilities. As designed, Block 4 consists of three principle lines of effort: development of software-based capabilities, development and integration of new and modernized aircraft hardware which enable the development of new capabilities, and new weapons integration. Efforts under the Air Vehicle / Block 4 Planning and Systems Engineering project range from requirements decomposition and preliminary design of capabilities through completion of Developmental Flight Test. These activities are a continuation of the previous Block 4 developmental contracts, and include activities required to enable the successful completion of Flight Test, to include select facility upgrades required for research, development, test and evaluation. Block 4 upgraded capabilities and continuous improvements will maintain Air System viability against the evolving threats indicated in the Electronic Warfare Initial Capabilities Document (ICD), the Fifth Generation Fighter Modernization ICD, and the Block 4 Capability Development Document (CDD). Additionally, the Block 4 capabilities will reduce life cycle cost, improve Air System Integration, and improve operational suitability. Weapons integration efforts included under this project include Advanced Anti-Radiation Guided Missile Extended Range (AARGM-ER) integration, employment envelope expansion for current F-35 weapons, non-recurring engineering (NRE) for obsolescence, and Increased Air-to-Air Missile Carriage.

Included in the Air Vehicle (AV)/Block 4 Planning and Systems Engineering effort is both Prime and Government Systems Engineering Support needed for Avionics/ Electronic Warfare and Weapons Integration efforts to include studies, analysis and risk reduction efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673502 / *Air Vehicle Block 4 Planning & Sys Eng*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Air Vehicle Block 4 Planning & Sys Eng	0.000	324.233	390.091	0.000	390.091
Description: The F-35 Air Vehicle Program Management Office (AV PMO) development portfolio includes efforts to improve the F-35 air vehicle lethality, survivability, and interoperability in response to emerging threats outlined in the National Security Strategy and Operational Plans. As designed, Block 4 consists of three principle lines of effort: development of software-based capabilities, development and integration of new and modernized aircraft hardware which enable the development of new capabilities, and new weapons integration. Included in the Air Vehicle (AV)/Block 4 Planning and Systems Engineering effort is both Prime and Government Systems Engineering Support needed for Avionics/ Electronic Warfare and Weapons Integration efforts to include studies, analysis and risk reduction efforts. ***FY 2022 Plans:*** Continue with Agile development of capabilities through Flight Test. Continue requirements decomposition and preliminary design activities for advanced Block 4 capabilities. Continue Post-Preliminary Design Review (PDR) risk reduction activities to include Air-Ship Integration and planning. Continue development and maturity of key long lead capabilities and service unique weapons. Complete development of software drops to be available for fielding to meet warfighter need. Support efforts for airframe, air vehicle systems, air-ship integration, mission systems, future capabilities studies and weapons integration efforts. Continue support for Block 4 Capabilities and support preliminary systems engineering efforts associated with obsolescence NRE, AARGM-ER, and increased air-to-air missile carriage. Continued engineering support for avionics, weapons, studies & analyses, and risk reduction efforts. ***FY 2023 Base Plans:*** Continue with Agile development of capabilities through Developmental and Operational Flight Test. Continue requirements decomposition and preliminary design activities for advanced Block 4 capabilities. Continue development and maturity of key long lead capabilities and service unique weapons, enabling A2/AD strategies including increased payloads, integrated fires, passive weapons, interoperability and multi-spectrum dominance in response to near-peer threats. Initiate development of enhanced cyber detection and mitigation capability for the F-35 in response to critical and emerging threats. Continue and expand application of cyber resilience engineering processes and tools for software, hardware, and weapons, through flight test. Continuing development and timely delivery of software to meet warfighter need. Continue supporting efforts for airframe, air vehicle systems, Air-Ship integration, including Electromagnetic Aircraft Launch System and Advanced Arresting Gear (EMALS/AAG) launch bulletins and related work, mission systems, future capabilities studies and weapons integration efforts. Continue support for Block 4 Capabilities and support preliminary systems engineering efforts					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673502 / *Air Vehicle Block 4 Planning & Sys Eng*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
associated with obsolescence NRE, AARGM-ER, AGM-158 Joint Air to Surface Standoff Missile (JASSM) family of weapons, and increased air-to-air missile carriage. Continue systems engineering, integration, and test (SEIT) development for avionics, weapons, studies & analyses, and risk reduction efforts. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The increase from FY2022 to FY2023 is due to award of additional Block 4 scope to include the design, development, and integration of several advanced Electronic Warfare hardware elements enabling F-35 wide-band spectrum dominance. Also, the addition of the scope to support Advanced F-35 Datalink enables increased lethality in support of integrated fires and beyond line-of-sight Anti-access/Area denial (A2/AD) arenas expected in a near peer conflict. Additionally, the increase reflects integration of advanced weapons functions including AARGM-ER, AGM-158, Increased Air-to-Air Missile Carriage, and Net Enabled Weapon functionality.					
Accomplishments/Planned Programs Subtotals	0.000	324.233	390.091	0.000	390.091

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The C2D2 acquisition strategy is to employ both Cost and Fixed Price Incentive contracts for the Block 4 engineering and development efforts. A new modernization contract structure will be established for all post SDD Block 4 efforts. In addition, a separate Basic Ordering Agreement or Indefinite Quantity/Indefinite Delivery contract is planned to provide a long term approach to upgrading and maintaining laboratories and test aircraft and supporting technology maturation for future C2D2 capabilities. FY23 begins systems engineering, integration, and test (SEIT) development.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673502 / *Air Vehicle Block 4 Planning & Sys Eng*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AV Prime LM Phase II Cape/Development	C/CPIF	LM /Fort Worth TX : TBD	-	-		289.078	Oct 2021	328.008	Oct 2022	-		328.008	Continuing	Continuing	-
AV Prime LM Phase II Fee	C/CPIF	LM /Fort Worth TX : TBD	-	-		10.244	Oct 2021	10.244	Oct 2022	-		10.244	Continuing	Continuing	-
AV Prime LM Air Vehicle Integration	C/CPFF	LM /Fort Worth TX : TBD	-	-		2.500	Oct 2021	2.500	Oct 2022	-		2.500	Continuing	Continuing	-
AV Systems Engineering	Various	Various : TBD	-	-		6.381	Dec 2021	8.624	Dec 2022	-		8.624	Continuing	Continuing	-
AV Cyber Survivability	Various	Various : TBD	-	-		-		9.834	Oct 2022	-		9.834	Continuing	Continuing	-
		Subtotal	-	-		308.203		359.210		-		359.210	Continuing	Continuing	N/A

Remarks

1. Breaking out Cyber survivability as separate line item in FY23

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AV Mission Systems Support	Various	Various : TBD	-	-		10.530	Nov 2021	7.881	Nov 2022	-		7.881	Continuing	Continuing	-
AV Vehicle Systems Support	Various	Various : TBD	-	-		0.500	Nov 2021	17.000	Nov 2022	-		17.000	Continuing	Continuing	-
AV CSO Development Support	Various	Various : TBD	-	-		5.000	Nov 2021	6.000	Nov 2022	-		6.000	Continuing	Continuing	-
		Subtotal	-	-		16.030		30.881		-		30.881	Continuing	Continuing	N/A

Remarks

1. Increase FY23 AV Vehicle system support due to ramp up of EMALS AAG support.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		324.233		390.091		-		390.091	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673502 / *Air Vehicle Block 4 Planning & Sys Eng*	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673502 / *Air Vehicle Block 4 Planning & Sys Eng*

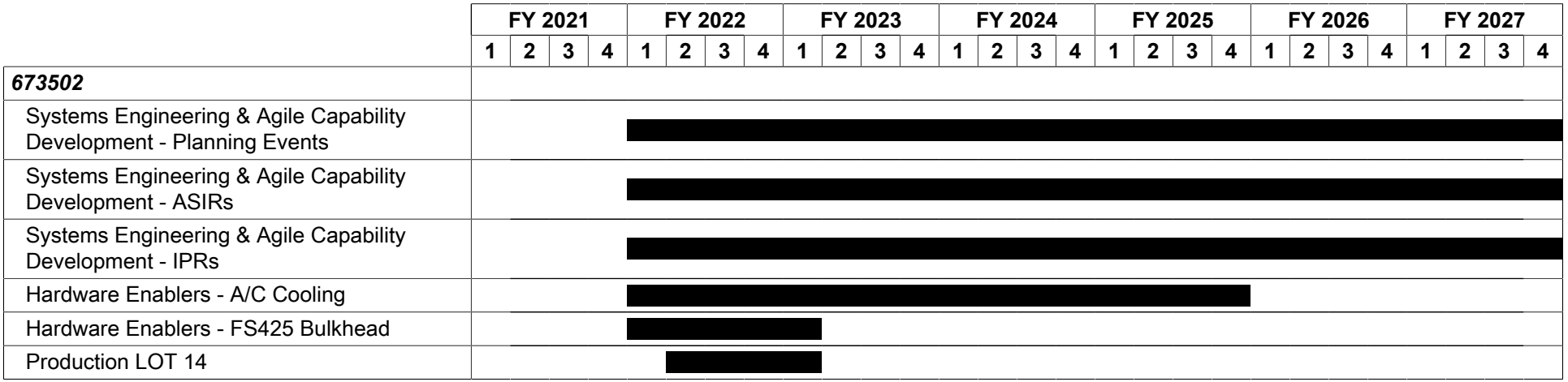

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673502 / *Air Vehicle Block 4 Planning & Sys Eng*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673502				
Systems Engineering & Agile Capability Development - Planning Events	1	2022	4	2027
Systems Engineering & Agile Capability Development - ASIRs	1	2022	4	2027
Systems Engineering & Agile Capability Development - IPRs	1	2022	4	2027
Hardware Enablers - A/C Cooling	1	2022	4	2025
Hardware Enablers - FS425 Bulkhead	1	2022	1	2023
Production LOT 14	2	2022	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673503 / *Test and Evaluation (T&E)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673503: *Test and Evaluation (T&E)*	-	0.000	262.733	270.841	0.000	270.841	220.685	173.884	216.008	196.950	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, Test and Evaluation (T&E) was established as a separate, distinct project within the Continuous Capability Development & Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request.

A. Mission Description and Budget Item Justification

Integrated Test activities in support of C2D2, to include Lockheed Martin support at all test sites. Non-recurring engineering required to plan for the service life extension of existing DT aircraft and modifications necessary to bring DT aircraft fleet to a more production-representative and sustainable configuration, and to develop flight test instrumentation and release test software to meet Block 4 requirements. Additional upgrades required to support development and evaluation of improvements driven by changes in the threat environment and as identified in the Electronic Warfare Initial Capabilities Document (ICD), the Fifth Generation Fighter Modernization ICD, and the Block 4 Capability Development Document (CDD). Efforts include non-recurring engineering and procurement of a test article to evaluate service life of F-35B STOVL Aircraft. Integrated test also supports the evaluation of upgrades to Autonomic Logistics Information System (ALIS), fielding of Operational Data Integrated Network (ODIN) Base Kits, regression testing of fielded weapons upgrades, and various validation/verification efforts.

Costs in the Accomplishments/Planned and Program R2A section have been broken out into the following R-2A categories: Development Foundation Contract, Development Test, Operational Test, Future Flight Test Capabilities/Investments, Ground Test and Simulation Infrastructure. All of the development efforts presented in the budget submission existed in prior years and were rolled up under previously submitted Accomplishments/ Planned and Program costs in Test and Evaluation category.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Development Foundation Contract (DFC) Flight Test and Tech Refresh	0.000	90.257	90.605	0.000	90.605
Description: Flight test infrastructure at Edwards Air Force Base (AFB) and Pax River Naval Air Station (NAS) and F-35 tech refresh for laboratory development at Fort Worth, TX for Lockheed Martin Aeronautics and its subcontractors (LM Aero). This includes investment planning and other test planning activities required for Block 4 development, integration, developmental test and evaluation. Funding is required for the Lockheed Martin Integrated Test Force contractor labor, suppliers, and material. Other support efforts are provided for airframe, air vehicle systems, air-ship integration, mission systems, weapons integration, offboard mission support, autonomic logistics development, joint reprogramming enterprise and modeling and joint simulation					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
environment activities, including Nimble Lightning efforts. Other costs in support of ranges, chase planes and DT site operations. ***FY 2022 Plans:*** Continue support to F-35 capability enhancements identified in approved requirements documents. This includes flight testing new software development builds and hardware capabilities. Developmental Foundation Contract (DFC) will support C2D2 flight test, and implement technology refresh and modernization to upgrade and modify hardware and software at the module level. ***FY 2023 Base Plans:*** Support F-35 capability enhancements identified in approved requirements documents. DFC will provide flight test for C2D2 Block 4 capabilities including weapons testing, as well as continue annualized technology refresh and specific lab modernization efforts. These efforts will upgrade and modify hardware and software at the module level and facilitate test integration with the development process. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increases due to inflation cost factors.					
Title: Developmental Test (DT) ***Description:*** Government test site Integrated Test activities to support development of Air Vehicle C2D2 and TR-3 programs, as well as inherent maintenance systems, training systems, and combat data systems test support. Testing includes ground, logistics, and flight testing of incremental flight software releases, weapon integration, Diminishing Manufacturing Sources (DMS)/fleet sustainment, service-life extension, hardware refresh, and regression efforts to ensure total system integration meets program requirements. Test site capabilities to meet program requirements include infrastructure, ranges, engineering, administration, logistics, maintenance, controls, information technologies, classified facilities, and service unique supporting capabilities. The sites to be funded include but are not limited to Naval Air Warfare Center Aircraft Division (NAWCAD) Pax River, NAWCAD China Lake, and Edwards AFB. ***FY 2022 Plans:*** Continue to support Integrated Test capacity and flight test execution (manpower, weapons, flight hours, range time, and chase, target & tanker support assets) to develop, verify, and test capabilities as directed by the F-35 JPO. Major program testing includes TR-3 integration, Block 4 weapons integration, incremental software	0.000	33.600	43.916	0.000	43.916

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
releases with new capability and bug fixes, integrated system evaluations, multi-ship operations, and mission effectiveness evaluations. ***FY 2023 Base Plans:*** Continue to support Integrated Test capacity and flight test execution (manpower, weapons, flight hours, range time, and chase, target & tanker support assets) to develop, verify, and test capabilities as directed by the F-35 JPO. Major program testing includes Block 4 weapons integration, incremental software releases with new capability and bug fixes, integrated system evaluations, multi-ship operations, and mission effectiveness evaluations. Continued funding for Development Test Aircraft Modification broken out from the rest of the Development activities. This is continued support from FY22 for Developmental Test (DT) aircraft modifications in order to be test-ready and operationally-representative. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase due to ramp up development activities and addition of funding line for Development Test Aircraft Modification from Operational Test category.					
Title: Operational Test (OT) ***Description:*** Government test site Integrated Test activities to support development of Air Vehicle C2D2 and TR-3 programs, as well as inherent maintenance systems, training systems, and combat data systems test support. Testing includes ground, logistics, and flight-testing of incremental flight software releases, weapon integration, DMS/fleet sustainment, hardware refresh and regression efforts to ensure total system integration meets program requirements in an operationally representative environment. Test site capabilities to meet program requirements include infrastructure, ranges, engineering, administration, logistics; maintenance, controls, information technologies, classified facilitates, and service unique supporting capabilities. The sites to be funded include but are not limited to Nellis AFB and Yuma Air Station. ***FY 2022 Plans:*** Funding will support Integrated Test capacity and flight test execution (manpower, weapons, flight hours, range time, and chase, target & tanker support assets) to develop, verify, and test capabilities as directed by the F-35 JPO. Major program testing includes TR-3 integration, Block 4 weapons integration, incremental software	0.000	23.975	19.762	0.000	19.762

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
releases with new capability and deficiency report fixes, integrated system evaluations, multi-ship operations and mission effectiveness evaluations in an operationally representative environment. ***FY 2023 Base Plans:*** Funding will support Integrated Test capacity and flight test execution (manpower, weapons, flight hours, range time, and chase, target & tanker support assets) to develop, verify, and test capabilities as directed by the F-35 JPO. Major program testing includes TR-3 integration, Block 4 weapons integration, incremental software releases with new capability and deficiency report fixes, integrated system evaluations, multi-ship operations and mission effectiveness evaluations in an operationally representative environment. Funding will also be required for any Operational Test (OT) aircraft modifications in order to be test-ready and operationally-representative. Funding also includes the execution of the remaining 64 OT virtual mission trials and IOT&E close out tasks. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease due to reducing overall flight test execution at Nellis AFB and Edwards AFB.					
Title: Future Flight Test Capabilities/Investments ***Description:*** Test fleet modifications, test mission equipment/assets, instrumentation capability, and data center investments are required to continue to support Block 4 capability development and integrated test requirements. TR-3 related capability requires current test aircraft and replacement test aircraft configurations to be modified to new hardware, software, and instrumentation systems. Program priorities, flight test demand, data quantity/ bandwidth upgrades, and capability delivery schedules require a steady update to test fleet configurations. Modifications and instrumentation design/ procurement/install are long-lead efforts requiring stable funding and contract vehicles to meet program needs. ***FY 2022 Plans:*** Continue incremental funding of Lot 14 Undefinitized Contract Award for FTI design, procurement and installation (CF-84 & BF-154). Continues FTI design/ fabrication/installation (long-lead NRE, parts procurement, kit fabrication) for replacement test aircraft (16x unique designs). Continues NRE/procurement/installation to retrofit or maintain test aircraft viability. Additionally, development, procurement, and installation of flight test data center system upgrades to support Integrated Testing across multiple F-35 stakeholder sites. FTI development, procurement, fabrication, and installation for current/future service loaner aircraft in order to continue Integrated Testing with Service Operational Test organizations. Further, continue integration and procurement efforts for	0.000	100.242	103.420	0.000	103.420

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
required Block 4 test mission assets, includes but not limited to weapons test vehicles, unique test mission equipment, and other test execution support equipment. ***FY 2023 Base Plans:*** Continue incremental funding of Lot 14 Contract for FTI design, procurement and installation. Continues FTI design/ fabrication/installation (long-lead NRE, parts procurement, kit fabrication) for replacement test aircraft (16x unique designs). Continues NRE/procurement/installation to retrofit or maintain test aircraft viability. Additionally, development, procurement, and installation of flight test data center system upgrades to support Integrated Testing across multiple F-35 stakeholder sites. FTI development, procurement, fabrication, and installation for current/future service loaner aircraft in order to continue Integrated Testing with Service Operational Test organizations. Further, continue integration and procurement efforts for required Block 4 test mission assets, includes but not limited to weapons test vehicles, unique test mission equipment, and other test execution support equipment. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in funding due to ramp up of activities across the board, to include Lot 17 Flight Science, Flight Science Lite, Operational Test TR-3 Flight Test Investments, etc.					
Title: Ground Test and Simulation Infrastructure (GTSI) ***Description:*** Ground Test & Simulation Infrastructure capabilities from Block 4 early-on design and development through Installed Systems Verification activities prior to Developmental Flight Test for all variants of the F-35 aircraft. Infrastructure efforts include Laboratory Developments of Improvements & Modernization (I&M) assets used for design, development and test of Block 4 capabilities, and development of Ground Test & Evaluation Capabilities for digital and non-digital installed systems verification. Laboratory Developments will focus on the pure development of Block 4 capabilities through a Capability Verification Infrastructure that meets required fidelities that would advance the high quality development of the Air System capabilities. Ground Test & Simulation Infrastructure will also include capabilities for cyber testing for TR-3 assessments within three main areas: air vehicle, information systems, and supply chain. ***FY 2022 Plans:*** Continue Ground Test & Simulation Infrastructure improvements and modernization capabilities needed for Block 4 air system developments. Test infrastructure improvements include vendor lab needed capabilities to develop scheduled Block 4 software drop aircraft deliverables, and tech refresh efforts for aging equipment and	0.000	14.659	13.138	0.000	13.138

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Operating System (OS) migration to meet Authority to Operate (ATO) needs. Develop F-35 mission threads for continued digital verification automated capabilities for early-on software development, and continue aircraft cyber improvements and testing efforts. ***FY 2023 Base Plans:*** Continue Ground Test & Simulation Infrastructure improvements and modernization capabilities needed for Block 4 air system developments to include but are not limited to Advanced Anti-Air Threat Simulation (AATS), Automatic Test & Re-Test (ATRT), Big Data Platform (BDP), Friendly and Threat Signal Development and Delivery, Multi-Spectral Environment improvements, etc. Efforts required to enable efficiencies in the Capability Verification process and decrease reliance on Flight Test Operations as the overwhelmingly sole means of Verification. Test Infrastructure improvements include Vendor lab capabilities as well as USG Organic Infrastructure. Develop F-35 mission threads for continued digital verification automated capabilities for early-on software development, and continue aircraft cyber improvements and testing efforts. Major Investments include improvements to Digital Capabilities and Analysis and Ground Integrated Battlespace Verification. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease in funding for FY2023 in the GT&S portfolio due to some Developments being fielded for the Ground Test Infrastructure and maturing and stabilization of other Developments.					
Accomplishments/Planned Programs Subtotals	0.000	262.733	270.841	0.000	270.841

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The new Test & Evaluation Project Unit will maximize use of existing F-35 contracts, where possible, for the various T&E-related capabilities and investments outlined in Sections A-C above. For example, provisions for new instrumentation on new flight test aircraft are being implemented when applicable via existing Production contracts in order to allow installation of the required hardware while those airframes are still on the assembly line. This will save significant costs and effort that would be required if instrumentation installation occurred after aircraft delivery. Other modifications and/or non-recurring engineering (NRE) may be implemented via existing contracts being managed by the Air Vehicle Program Management Office as part of the Block 4 engineering and development efforts. In addition, a separate Cost-Plus-Incentive-Fee-type contract is planned to provide a long-term approach to upgrading and maintaining laboratories and also for maintaining the older existing SDD test aircraft.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

Viability modifications to the SDD test aircraft are being contracted via a combination of Streamlined Delivery Orders for NRE and hardware as well as a Cost Plus-type contract, using both to expedite the right modifications as needed at the right time in order to avoid test
aircraft grounding and to maximize their availability. In addition, separate Basic Ordering Agreements or Indefinite Quantity/Indefinite Delivery contracts may be used to implement a long-term approach to upgrading and maintaining laboratories and test aircraft and supporting technology maturation for future capabilities. Several new cost reduction initiatives are being studied to determine possible migration away from Lockheed-Martin support to less-expensive organic support (via either government solutions, local test-base support contracts, or a combination of both) in areas such as test aircraft maintenance, test operations support, and networks/knowledge management. Other initiatives are being pursued to move more test data collection requirements from the open-air ranges to ground test chambers, computer-based models and simulations, or other laboratory venues where possible.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DFC - Prime LM Developmental Foundation Contract	C/CPIF	LM; Fort Worth TX : TBD	-	-		90.258	Nov 2021	90.605	Nov 2022	-		90.605	Continuing	Continuing	-
OT - Prime LM Operation Test Aircraft Modification	C/CPIF	LM; Fort Worth TX : TBD	-	-		4.540	Jun 2022	3.600	Aug 2023	-		3.600	Continuing	Continuing	-
FI - Prime LM DT AC Viability	C/CPIF	LM; Fort Worth TX : TBD	-	-		24.584	Dec 2021	25.876	Dec 2022	-		25.876	Continuing	Continuing	-
FI - Flight Test Asset	C/CPIF	LM; Fort Worth TX : TBD	-	-		56.072	Dec 2021	56.930	Dec 2022	-		56.930	Continuing	Continuing	-
DT - Prime LM Development Test Aircraft Modification	C/CPIF	LM; Fort Worth TX : TBD	-	-		-		8.550	Aug 2023	-		8.550	Continuing	Continuing	-
		Subtotal	-	-		175.454		185.561		-		185.561	Continuing	Continuing	N/A

Remarks

R-3 Acronyms correspond to R-2A categories, per below breakout:
DFC - Development Foundation Contract (DFC) Flight Test
OT - Operational Test
DT - Developmental Test
FI - Future Flight Test Capabilities and Investments
GTS - Ground Test Simulation and Infrastructure
Flight Test assets include DT and OT weapons procurement to support Test and assets needed for flight test instrumentation

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT - Developmental Test & Evaluation PAX	WR	NAWCAD: Pax River MD : TBD	-	-		17.210	Dec 2021	18.114	Dec 2022	-		18.114	Continuing	Continuing	-
DT - Developmental Test & Evaluation CLK	WR	NAWCAD: China Lake, CA : TBD	-	-		0.819	Dec 2021	0.862	Dec 2022	-		0.862	Continuing	Continuing	-
DT - Developmental Test & Evaluation EDW	MIPR	Edwards AFB, CA : TBD	-	-		15.570	Dec 2021	16.390	Dec 2022	-		16.390	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673503 / *Test and Evaluation (T&E)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OT - Operational Test & Evaluation - UOTT	MIPR	Nellis AFB, NV : TBD	-	-		10.379	Dec 2021	10.662	Dec 2022	-		10.662	Continuing	Continuing	-
FI - Operational Test & Evaluation	MIPR	Nellis AFB, NV : TBD	-	-		19.586	Dec 2021	20.614	Dec 2022	-		20.614	Continuing	Continuing	-
OT - IOT&E Completion	MIPR	Edwards AFB, CA : TBD	-	-		9.056	Nov 2021	5.500	Nov 2022	-		5.500	Continuing	Continuing	-
GTS - Ground Test & Simulation (T&E) Capabilities	Various	Various : TBD	-	-		12.065	Jul 2022	10.408	Jun 2023	-		10.408	Continuing	Continuing	-
GTS - Cyber Test & Evaluation	Various	Various : TBD	-	-		2.594	Dec 2021	2.730	Dec 2022	-		2.730	Continuing	Continuing	-
		Subtotal	-	-		87.279		85.280		-		85.280	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		262.733		270.841		-		270.841	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

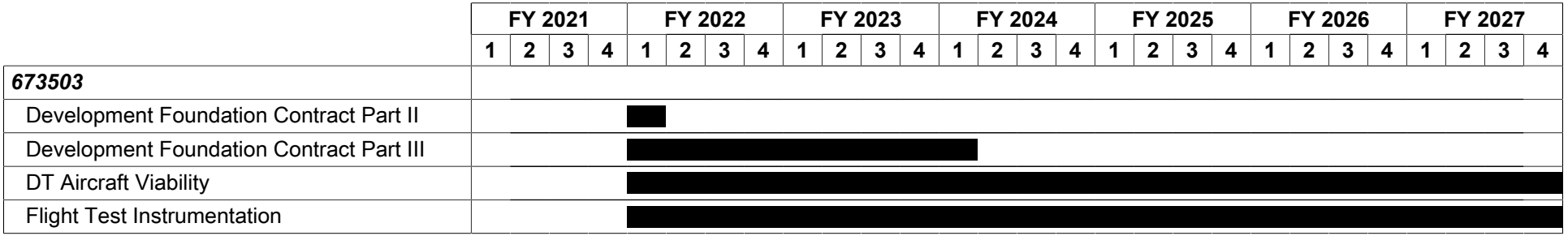

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673503 / *Test and Evaluation (T&E)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673503				
Development Foundation Contract Part II	1	2022	1	2022
Development Foundation Contract Part III	1	2022	1	2024
DT Aircraft Viability	1	2022	4	2027
Flight Test Instrumentation	1	2022	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673504 / *Propulsion (PP)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673504: *Propulsion (PP)*	-	0.000	153.091	14.891	0.000	14.891	11.737	10.384	10.343	10.615	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY2022, Propulsion (PP) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This Project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request.

A. Mission Description and Budget Item Justification

Propulsion F135 projects within the Continuous Capability Development and Delivery (C2D2) are provided for developmental efforts for propulsion systems and test engine requirements such as Block 4 Integrated Flight Test Support, Engine Flight Test Mechanics, Flight Test Engineering, Engine Hardware, Test Engine Procurements, research, component and capability development, prototypes, various studies, and other associated government costs integral to support the developmental stages for engine modernization and improvement to support the F135 engine. Testing and development of the three F-35 aircraft variants require engine propulsion funding to enable continued flight hours. Flight hours are budgeted and planned to meet the Block 4 flight test timelines, and required Flight Test support. Flight Test Support efforts will transition to Organic support by FY2026. Transition of Flight Test Support requirements to organic capability includes efforts performed by contractor and government installations, Autonomic Logistics Information System / Operational Data Integrated Network (ALIS/ODIN) transition, and Final Flight Release (FFR) engine support efforts. Propulsion C2D2 provides funding for requirements to support the Air Vehicle modernization efforts with signature predicting improvements and a bridge program for engine modernization. Engine Modernization is predicted to begin in FY2024.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Propulsion (PP)	0.000	153.091	14.891	0.000	14.891
Description: Propulsion F135 Block 4 Integrated Flight Test Support includes efforts such as Engine Flight Test Mechanics, Flight Test Engineers, Replacement Engine Hardware, Test Engine Procurements, and other associated government costs. For C2D2 to be able to continue to test all three aircraft variants, propulsion support is required to enable continued flying. A consistent number of flights and flight hours are planned over the last year of the support contract, which requires a similar level of propulsion support. There are additional requirements to support the Air Vehicle modernization efforts in increasing the capability of the engine to handle bleed air/weight/thrust/performance increases. Additionally, as the current contract for Propulsion Flight Test Support comes to an end, there is a desire to move toward Organic support in the future. To enable this, conversion to engine tracking in the ALIS/ODIN system is required. To update the tracking system and convert parts away from development/SK parts, a considerable amount of funding is required over the FY23 and FY24					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673504 / *Propulsion (PP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total

calendar years. Finally, FY23 will be the beginning of the program's Engine Signature Predictor (ESP) task, which will enable improved assessment of LO capabilities and increased limits.

FY 2022 Plans:

Continued Propulsion F135 Block 4 Integrated Flight Test Support to include efforts such as Engine Flight Test Mechanics, Flight Test Engineers, Replacement Engine Hardware, Test Engine Procurements, and other associated government costs. The Flight Test Fleet is planning to maintain elevated aircraft inventory at twelve aircraft in FY2022 (from 11 in FY2020). This again includes seven at Edwards Air Force Base and five at Patuxent River Naval Air Base. Flights and Engine Flight Hours (EFH) are expected to maintain their FY2021 levels at 960 flights and 1920 flight hours. As the FFR engines have aged past their design life, it is necessary to purchase three Initial Service Release (ISR) engines (two STOVL and one CTOL) to enable continued propulsion support of flight test. Continued incremental funding for two ISR engines, which has been funded with FY2020 and FY2021 dollars. An additional spare engine will be purchased in FY2022.

FY 2023 Base Plans:

Continued Propulsion F135 Block 4 Integrated Flight Test Support to include Engine Flight Test Mechanics, Flight Test Engineering, Engine Hardware, Test Engine Procurements, research, component and capability development, prototypes, various studies, and other associated government costs integral to support the developmental stages for engine modernization and improvement to support the F-35 Air Vehicle. The Flight Test Fleet will maintain elevated aircraft inventory at twelve aircraft in FY2023. This includes seven at Edwards Air Force Base and five at Patuxent River Naval Air Base. Flights and Engine Flight Hours (EFH) are expected to maintain their FY2021 and FY2022 levels at 240 flights and 480 flight hours per quarter. Flight Test Support efforts will transition to Organic support by FY2026. Transition of Flight Test Support requirements to organic capability includes efforts performed by contractor and government installations, Autonomic Logistics Information System / Operational Data Integrated Network (ALIS/ODIN) transition, and Final Flight Release (FFR) engine support efforts. FY2023 Propulsion C2D2 provides funding for requirements to support the Air Vehicle modernization efforts, Engine signature predicting improvement efforts, and continuing F135 Engine Modernization developmental efforts.

FY 2023 OCO Plans:

N/A

FY 2022 to FY 2023 Increase/Decrease Statement:

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673504 / *Propulsion (PP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Decrease from FY2022 to FY2023 is due to a reduction of hardware procurements required to support flights and flight hours required in FY2023 to meet Block 4 test events					
Accomplishments/Planned Programs Subtotals	0.000	153.091	14.891	0.000	14.891

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The C2D2 acquisition strategy is to employ both Cost and Fixed Price Incentive contracts for the Block 4 engineering and development efforts. A new modernization contract structure will be established for all post SDD Block 4 efforts. In addition, a separate Basic Ordering Agreement or Indefinite Quantity/Indefinite Delivery contract is planned to provide a long term approach to upgrading and maintaining laboratories and test aircraft and supporting technology maturation for future C2D2 capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673504 / *Propulsion (PP)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PP Prime PW C2D2 Propulsion DT Aircraft Procurement Engine	C/FPIF	PW; East Hartford, CT : East Hartford, CT	-	-		11.739	Nov 2021	1.000	Nov 2022	-		1.000	Continuing	Continuing	-
PP Prime PW C2D2 Propulsion Flight Test	C/CPIF	PW; East Hartford, CT : East Hartford, CT	-	-		16.533	Oct 2021	11.829	Oct 2022	-		11.829	Continuing	Continuing	-
PP DevSecOps Emulation Lab	C/CPIF	PW; East Hartford, CT : East Hartford, CT	-	-		2.458	Oct 2021	0.000	Oct 2022	-		0.000	Continuing	Continuing	-
PP F135 Engine Growth Development	Various	PW; East Hartford, CT : East Hartford, CT	-	-		122.049	Oct 2021	1.472	Oct 2022	-		1.472	Continuing	Continuing	-
		Subtotal	-	-		152.779		14.301		-		14.301	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PP Program Management Support	Various	Various : TBD	-	-		0.312	Nov 2021	0.590		-		0.590	Continuing	Continuing	-
		Subtotal	-	-		0.312		0.590		-		0.590	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		153.091		14.891		-		14.891	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673504 / *Propulsion (PP)*

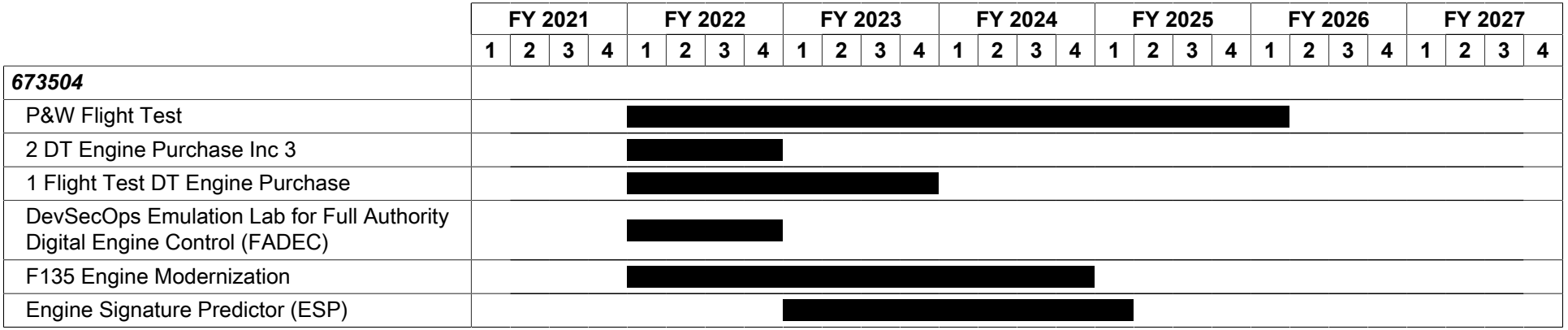

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673504 / *Propulsion (PP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673504				
P&W Flight Test	1	2022	1	2026
2 DT Engine Purchase Inc 3	1	2022	4	2022
1 Flight Test DT Engine Purchase	1	2022	4	2023
DevSecOps Emulation Lab for Full Authority Digital Engine Control (FADEC)	1	2022	4	2022
F135 Engine Modernization	1	2022	4	2024
Engine Signature Predictor (ESP)	1	2023	1	2025

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673505 / *Maintenance Systems (MxS)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673505: *Maintenance Systems (MxS)*	-	0.000	50.409	49.836	0.000	49.836	41.949	33.483	30.201	29.608	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, Maintenance Systems (MxS) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request.

A. Mission Description and Budget Item Justification

Autonomic Logistics Information System (ALIS) is the current F-35 program solution for delivering core maintenance and logistics information solutions to F-35 warfighters. ALIS will continue to deliver the core logistics and maintenance infrastructure requirements for the F-35 enterprise as ALIS evolves into Operational Data Integrated Network (ODIN). ALIS includes features such as aircraft scheduling, training delivery, record keeping, technical data delivery, supply chain management, maintenance management, pilot and maintenance debriefing, and mission planning. Current ALIS development efforts are focused on low cost and high return investments that provide a high confidence return on investment in the short term, significant warfighter impact, and/or offer synergy with ODIN development efforts.

ODIN will incrementally provide a modern, user-friendly integrated information system for the F-35 to deliver core maintenance and logistics information solutions. ODIN will be comprised of multiple elements to include modern hardware, architectures, software development methods, data environments, and platforms. Leveraging agile and modern software development practices, ODIN will serve as the primary logistics tool to support F-35 warfighter operations, health and diagnostics, mission planning, supply chain management, maintenance, and training. ODIN will substantially decrease F-35 administrator and maintainer workload, increase readiness rates for all F-35 variants, and allow software engineers to rapidly develop and deploy updates in response to changing warfighter requirements and improve data management, quality, and integrity. The ALIS to ODIN transition is intended to enable holistic fleet management, improve performance, enhance readiness, and reduce costs to the F-35 program. ODIN is comprised of both hardware and software which support the flow of Unclassified and Classified aircraft and maintenance-related data.

Prognostics and Health Management (PHM) encompasses the Air-System set of software, technical data and capabilities to enable optimal maintenance, and resolution of aircraft failures and impending failures. On-aircraft software identifies failures, enables reporting of status to the pilot, and records data for life cycle management and sustaining engineering. The data processed by ALIS/ODIN supports maintenance debriefs, life cycle management via Assess Material Condition (AMC), and failure resolution via Health Reporting Codes (HRCs) and Anomaly and Failure Resolution System (AFRS). Maintenance performance (inclusive of reliability and maintainability) is enhanced via the collection and reporting of the Failure Reporting and Corrective Action System (FRACAS). Applied advanced analytics on the aggregate PHM is used for airframe lifing and enterprise use, and improves responsiveness to operational needs.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673505 / *Maintenance Systems (MxS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Operational Data Integrated Network (ODIN) ***Description:*** ODIN efforts will focus on building a modern architecture and the data platform/environment(s), conducting cybersecurity and user-focused testing, and developing user training. ***FY 2022 Plans:*** Program will continue to modernize and reduce sustainment costs of the F-35 logistics information system by delivering incremental capabilities to transition aircraft, data, and operations from ALIS to ODIN. Program will continue maturing the ODIN infrastructure (hardware/cloud based development and production infrastructure). ODIN efforts will focus on building a modern architecture and the data platform/environment(s), conducting cybersecurity and user-focused testing, and developing user training. Program will execute initiatives that support enabling the ODIN requirements by modernizing ALIS applications where applicable; leveraging commercial and government off the shelf; and maximizing re-use from existing US Services logistics modernization efforts. ***FY 2023 Base Plans:*** Continue to modernize and reduce sustainment costs of the F-35 logistics information system by delivering incremental capabilities to transition aircraft, data, and operations from ALIS to ODIN. Initiate next-gen ODIN hardware refresh analysis and trade studies to support targeted five year hardware replacement. Implement the ODIN cloud-based infrastructure, migrate ALIS development into the government managed cloud environment, and begin transition to the new ODIN Enterprise Architecture. Continue modernization of the ODIN data architecture and implementation of the government managed ODIN data processing, analytics and archive environment. Efforts will continue in cybersecurity survivability and development of user-focused training. Execute efforts continuing to modernize current applications where applicable, leveraging commercial and government off the shelf and maximizing re-use from existing US Services logistics modernization efforts. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase from FY2022 to FY2023 due to inflation.	0.000	47.131	48.836	0.000	48.836
Title: Prognostics and Health Management (PHM) ***Description:*** Develop PHM failure resolution improvements by analyzing Anomaly and Failure Resolution System (AFRS) technical data and increasing Assess Material Condition algorithm development and implementation.	0.000	3.278	1.000	0.000	1.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673505 / *Maintenance Systems (MxS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY 2022 Plans: Develop PHM failure resolution improvements by analyzing Anomaly and Failure Resolution System (AFRS) technical data, as identified by the associated affordability war room initiatives and Performance-to-Plan metrics, and increasing Assess Material Condition algorithm development and implementation. Develop government-hosted PHM data storage and analytics infrastructure. Begin Systems Engineering and architecture development of PHM Downlink capability. ***FY 2023 Base Plans:*** Continue development of PHM failure resolution improvements by analyzing Anomaly and Failure Resolution System (AFRS) technical data, as identified by the associated affordability war room initiatives and Performance-to-Plan metrics, and Assess Material Condition algorithm development and implementation. Continue development of government-hosted PHM data storage and analytics infrastructure. Continue Systems Engineering and architecture development of PHM Downlink capability. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY2022 to FY2023 as program began development and implementation of 12 of the 15 priority AMC algorithms on non-Annualized FY22-23 Site Activation and Hardware (SAHW) Mod 89 contract vehicle in FY2022. Remaining 3 algorithms will begin development in 2022 and be completed in FY2023.					
Accomplishments/Planned Programs Subtotals	0.000	50.409	49.836	0.000	49.836

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673505 / *Maintenance Systems (MxS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MxS Prime LM ODIN	C/CPFF	LM; Ft Worth Tx : TBD	-	-		22.997	Nov 2021	24.218	Nov 2022	-		24.218	Continuing	Continuing	-
MxS Prime PW ODIN	C/CPFF	PW; E Hartford, CT : TBD	-	-		4.835	Nov 2021	4.932	Nov 2022	-		4.932	Continuing	Continuing	-
MxS Prime LM PHM	C/CPFF	LM; Ft Worth Tx : TBD	-	-		3.278	Nov 2021	1.000	Nov 2022	-		1.000	Continuing	Continuing	-
		Subtotal	-	-		31.110		30.150		-		30.150	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MxS ODIN Development Support	Various	Various : TBD	-	-		19.299	Nov 2021	19.686	Nov 2022	-		19.686	Continuing	Continuing	-
		Subtotal	-	-		19.299		19.686		-		19.686	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		50.409		49.836		-		49.836	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673505 / *Maintenance Systems (MxS)*

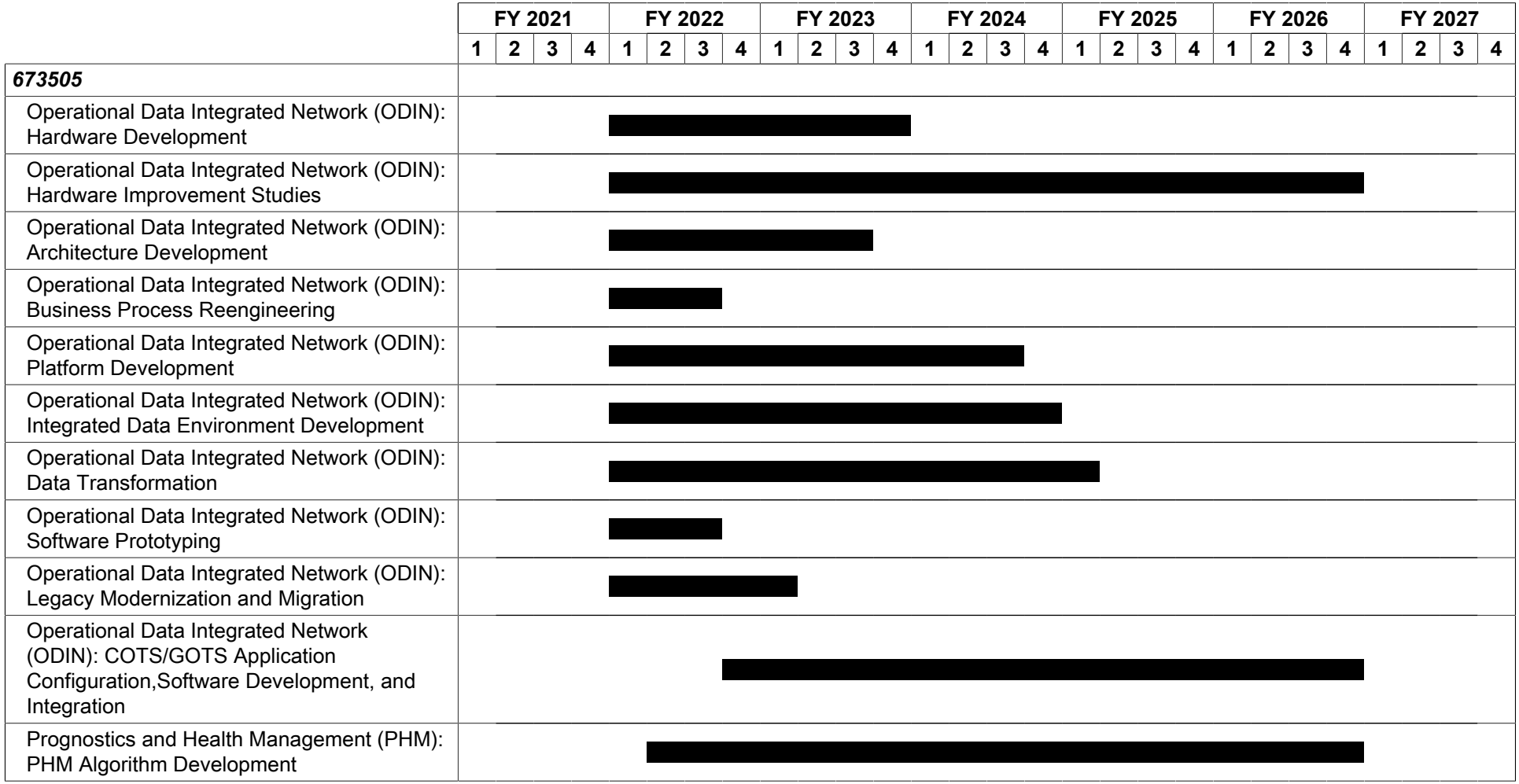

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673505 / *Maintenance Systems (MxS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673505				
Operational Data Integrated Network (ODIN): Hardware Development	1	2022	4	2023
Operational Data Integrated Network (ODIN): Hardware Improvement Studies	1	2022	4	2026
Operational Data Integrated Network (ODIN): Architecture Development	1	2022	3	2023
Operational Data Integrated Network (ODIN): Business Process Reengineering	1	2022	3	2022
Operational Data Integrated Network (ODIN): Platform Development	1	2022	3	2024
Operational Data Integrated Network (ODIN): Integrated Data Environment Development	1	2022	4	2024
Operational Data Integrated Network (ODIN): Data Transformation	1	2022	1	2025
Operational Data Integrated Network (ODIN): Software Prototyping	1	2022	3	2022
Operational Data Integrated Network (ODIN): Legacy Modernization and Migration	1	2022	1	2023
Operational Data Integrated Network (ODIN): COTS/GOTS Application Configuration,Software Development, and Integration	4	2022	4	2026
Prognostics and Health Management (PHM): PHM Algorithm Development	2	2022	4	2026

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673506 / *Combat Data Systems (CDS)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673506: *Combat Data Systems (CDS)*	-	0.000	60.039	53.248	0.000	53.248	39.407	29.726	35.993	39.130	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, Combat Data Systems (CDS) was established as a separate, distinct project within the Continuous Capability Development & Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request.

A. Mission Description and Budget Item Justification

Investment and modernization activities required for Block 4 development, integration, test and evaluation of Mission Data Tools, Verification & Validation Systems, and Mission Planning Software/Hardware. Funding related to key deliveries to Electronic Warfare Squadrons and F-35 Operational Squadrons and enables government and contractor labor for mission planning support environment and joint reprogramming enterprise. Other costs support Technology Investment for key Modernization / Innovation activities and Cloud based DevSecOps infrastructure.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Joint Reprogramming Environment (JRE)	0.000	39.550	39.992	0.000	39.992
Description: Investment and modernization activities required for Block 4 development, integration, test and evaluation of Mission Data Tools, Verification & Validation Systems, and Mission Planning Software/Hardware. Funding related to key deliveries to Electronic Warfare Squadrons and F-35 Operational Squadrons and enables government and contractor labor for joint reprogramming enterprise. Other costs support Technology Investment for key Modernization/Innovation activities and Cloud based DevSecOps infrastructure. ***FY 2022 Plans:*** Continue efforts for the AGILE development of Common Reprogramming Tools (CRT) to provide Electronic Warfare Squadrons with essential software tools that reduce Mission Data File (MDF) development time and human error and increase combat effectiveness. The CRT effort will continue in decomposition of requirements and begin software coding to support development of the software tool. Continue effort to upgrade Reprogramming Verification & Validation Systems (RVVS) to meet the Block 4 capability requirements and meet next generation threats. RVVS plans to conduct critical System Engineering Technical Review events to move forward in the design and delivery including acquiring equipment. Continue activities on the Capability Upgrade/ Refresh Contract (CURC) to accomplish three main objectives including upgrading the Radar Stimulator Interface (RSI), provide Win10 compliance, and redesign the IT infrastructure. In addition, the refresh effort					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673506 / *Combat Data Systems (CDS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
upgrades multiple United States Reprogramming Laboratory (USRL) computer systems for security compliance, and removes obsolete parts and deficient technology to form the new backbone of the USRL IT infrastructure for all future mission data production, test, and fielding. Continue ongoing efforts to support aircraft in relation to Technology Refresh-3 (TR-3), Continuous Capability Development and Delivery (C2D2), Capability Upgrade and Refresh, and Network Boundary Consolidation. Continue development support for defining, managing and acquiring the F-35 Reprogramming capability enhancements identified in approved requirements documents for Block 4 and modernization efforts and support efforts for joint reprogramming enterprise activities. ***FY 2023 Base Plans:*** Continue efforts for the AGILE development of Common Reprogramming Tools (CRT) to provide Electronic Warfare Squadrons with essential software tools that reduce Mission Data File (MDF) development time and human error and increase combat effectiveness. The CRT effort will continue software coding and testing to support development / deployment of the software tool. Continue ongoing design and delivery efforts to upgrade Reprogramming Verification & Validation Systems (RVVS) to meet the Block 4 capability requirements and meet next generation threats. Continue ongoing efforts to support aircraft in relation to Technology Refresh-3 (TR-3), Continuous Capability Development and Delivery (C2D2), and Network Boundary Consolidation. Continue development support for defining, managing and acquiring the F-35 Reprogramming capability enhancements identified in approved requirements documents for Block 4 and modernization efforts and support efforts for joint reprogramming enterprise activities, including CRT and Software In The Loop (SITL). Begin efforts on the Systems, Engineering, Integration & Test (SEIT) contract to integrate Block 4 software data loads at reprogramming laboratories. Begin efforts to perform laboratory integration to complete of the F-35 Reprogramming Laboratory (FRL). ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase from FY22 to FY23 due to inflation.					
Title: Mission Planning Support Environment (MPSE) ***Description:*** Investment and modernization activities required for Block 4 development, integration, test and evaluation of Mission Data Tools, Verification & Validation Systems, and Mission Planning Software/Hardware. Funding related to key deliveries to Electronic Warfare Squadrons and F-35 Operational Squadrons and enables government and contractor labor for mission planning support environment. Other costs support Technology Investment for key Modernization/Innovation activities and Cloud based DevSecOps infrastructure.	0.000	20.489	13.256	0.000	13.256

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673506 / *Combat Data Systems (CDS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
FY 2022 Plans: Continue development support for defining, managing and acquiring the F-35 Mission Planning capability enhancements identified in approved requirements documents for Block 4 and modernization efforts within the mission planning support hardware and software boundary. Continue development support of the Mission Planning System Environment (MPSE) software suite that is customized for each and every air vehicle Operational Flight Program (OFP) / Software Data Load (SDL) release to support the features and enhancements of that release. Continue development of the F-35 Next Generation Mission Planning (formerly Open Secure Collaboration Architecture (OSCAR)) to: a) Replace the Joint Mission Planning Software (JMPS) framework that is facing end-of-life, increasing cost, decreasing performance, and limited capability growth, and b) Replace the Ground Data Receptacle (GDR) cross-domain solution and encryption/decryption device that has been assessed by the National Security Agency (NSA) to have high cyber security risks and not able to meet NSA Raise-the-Bar requirements without a complete redesign. Continue ongoing efforts to transition F-35 mission planning software development to AGILE and DevSecOps methodologies to reduce costs and increase speed of delivering capabilities to the warfighter. Continue ongoing efforts to transition F-35 mission planning software development workload from contractor to the Government, securing organic software development capability and reducing costs.					
FY 2023 Base Plans: Continue development support for defining, managing and acquiring the F-35 Mission Planning capability enhancements identified in approved requirements documents for Block 4 and modernization efforts within the mission planning support hardware and software boundary. Continue development support of the Mission Planning System Environment (MPSE) software suite that is customized for each and every air vehicle Operational Flight Program (OFP) / Software Data Load (SDL) release to support the features and enhancements of that release. Continue development of the F-35 Next Generation Mission Planning in order to a) replace the Joint Mission Planning Software (JMPS) framework that is facing end-of-life, increasing cost, decreasing performance, and limited capability growth, and b) Replace the Ground Data Receptacle (GDR) cross-domain solution and encryption/decryption device that has been has been assessed by the NSA to have high cyber security risks and not able to meet NSA Raise-the-Bar requirements without a complete re-design. Continue ongoing efforts to transition F-35 mission planning software development to AGILE and DevSecOps methodologies to reduce costs and increase speed of delivering capabilities to the warfighter. Continue ongoing efforts to transition F-35 mission planning software development workload from contractor to the Government, securing organic software development capability and reducing costs.					
FY 2023 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673506 / *Combat Data Systems (CDS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY2022 to FY2023 due to completion of efforts associated with Government Systems Engineering and Testing, specifically the Partner Analysis Laboratory Operations, Lab Based Security Assessment, and Baseline Performance Measurement.					
Accomplishments/Planned Programs Subtotals	0.000	60.039	53.248	0.000	53.248

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673506 / *Combat Data Systems (CDS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CDS Prime JRE Development - CRT Increment 1	C/CPFF	LM; Ft Worth Tx : TBD	-	-		6.900	Oct 2021	13.360	Oct 2022	-		13.360	Continuing	Continuing	-
CDS Prime JRE Development - RVVS	C/CPIF	LM; Ft Worth Tx : TBD	-	-		5.700	Jul 2022	14.282	Jul 2023	-		14.282	Continuing	Continuing	-
CDS Prime JRE Development - CURC	C/CPFF	LM; Ft Worth Tx : TBD	-	-		12.750	Oct 2021	0.000	Oct 2022	-		0.000	Continuing	Continuing	-
CDS Prime JRE Development - TR-3	C/CPAF	LM; Ft Worth Tx : TBD	-	-		2.987	Apr 2022	0.742	Apr 2023	-		0.742	Continuing	Continuing	-
CDS Prime JRE Development - SEIT	C/CPAF	LM; Ft Worth Tx : TBD	-	-		0.000		2.888	Oct 2022	-		2.888	Continuing	Continuing	-
CDS Prime JRE Development - FRL	Various	Various : TBD	-	-		0.000		0.938	Oct 2022	-		0.938	Continuing	Continuing	-
CDS Prime JRE Development - Capability Development	Various	Various : TBD	-	-		2.100	Dec 2021	6.840	Dec 2022	-		6.840	Continuing	Continuing	-
CDS Prime MPSE Development F-35 Next Generation Mission Planning	C/CPIF	LM; Ft Worth Tx : TBD	-	-		15.750	Jul 2022	3.922	Jul 2023	-		3.922	Continuing	Continuing	-
CDS Prime MPSE Development - CapabilityDevelopment	Various	Various : TBD	-	-		0.000		5.908	Oct 2022	-		5.908	Continuing	Continuing	-
		Subtotal	-	-		46.187		48.880		-		48.880	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CDS JRE Development Support	Various	Various : TBD	-	-		9.113	Dec 2021	0.942	Dec 2022	-		0.942	Continuing	Continuing	-
CDS MPSE Development Support	Various	Various : TBD	-	-		4.739	Dec 2021	3.426	Dec 2022	-		3.426	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673506 / *Combat Data Systems (CDS)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		13.852		4.368		-		4.368	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		60.039		53.248		-		53.248	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673506 / *Combat Data Systems (CDS)*

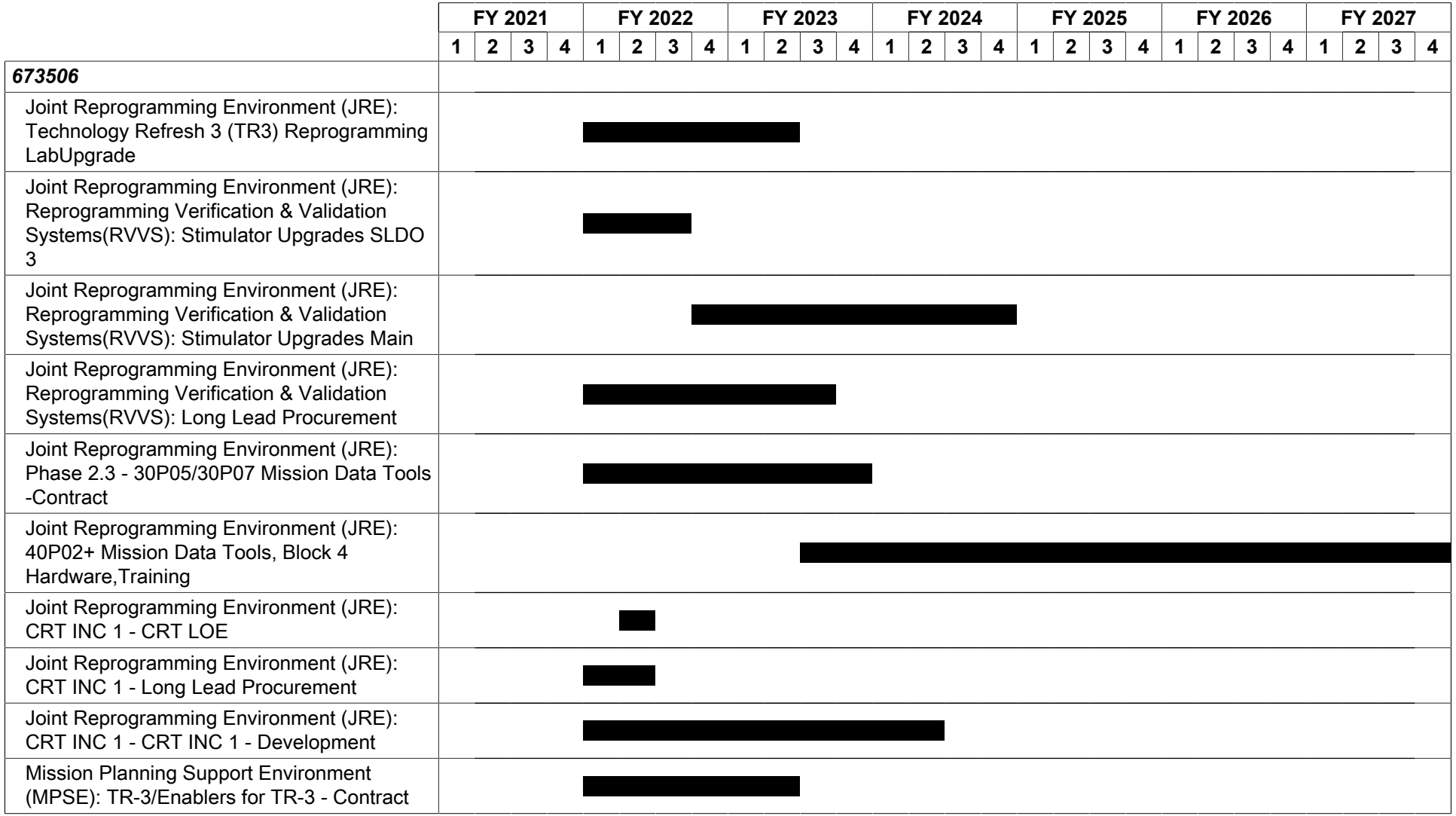

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673506 / *Combat Data Systems (CDS)*

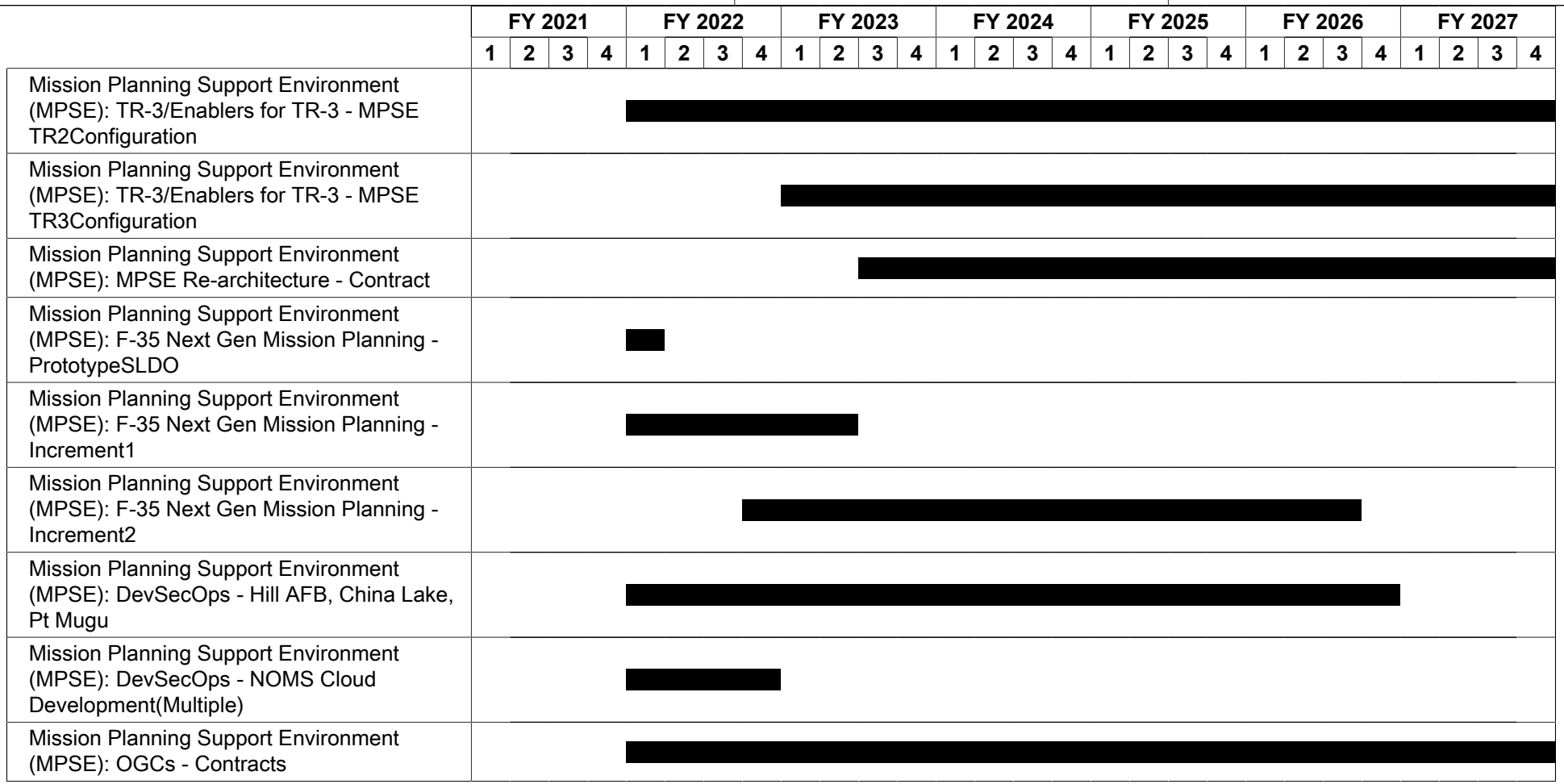

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673506 / *Combat Data Systems (CDS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673506				
Joint Reprogramming Environment (JRE): Technology Refresh 3 (TR3) Reprogramming LabUpgrade	1	2022	2	2023
Joint Reprogramming Environment (JRE): Reprogramming Verification & Validation Systems(RVVS): Stimulator Upgrades SLDO 3	1	2022	3	2022
Joint Reprogramming Environment (JRE): Reprogramming Verification & Validation Systems(RVVS): Stimulator Upgrades Main	4	2022	4	2024
Joint Reprogramming Environment (JRE): Reprogramming Verification & Validation Systems(RVVS): Long Lead Procurement	1	2022	3	2023
Joint Reprogramming Environment (JRE): Phase 2.3 - 30P05/30P07 Mission Data Tools -Contract	1	2022	4	2023
Joint Reprogramming Environment (JRE): 40P02+ Mission Data Tools, Block 4 Hardware,Training	3	2023	4	2027
Joint Reprogramming Environment (JRE): CRT INC 1 - CRT LOE	2	2022	2	2022
Joint Reprogramming Environment (JRE): CRT INC 1 - Long Lead Procurement	1	2022	2	2022
Joint Reprogramming Environment (JRE): CRT INC 1 - CRT INC 1 - Development	1	2022	2	2024
Mission Planning Support Environment (MPSE): TR-3/Enablers for TR-3 - Contract	1	2022	2	2023
Mission Planning Support Environment (MPSE): TR-3/Enablers for TR-3 - MPSE TR2Configuration	1	2022	4	2027
Mission Planning Support Environment (MPSE): TR-3/Enablers for TR-3 - MPSE TR3Configuration	1	2023	4	2027
Mission Planning Support Environment (MPSE): MPSE Re-architecture - Contract	3	2023	4	2027
Mission Planning Support Environment (MPSE): F-35 Next Gen Mission Planning - PrototypeSLDO	1	2022	1	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673506 / *Combat Data Systems (CDS)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Mission Planning Support Environment (MPSE): F-35 Next Gen Mission Planning - Increment1	1	2022	2	2023
Mission Planning Support Environment (MPSE): F-35 Next Gen Mission Planning - Increment2	4	2022	3	2026
Mission Planning Support Environment (MPSE): DevSecOps - Hill AFB, China Lake, Pt Mugu	1	2022	4	2026
Mission Planning Support Environment (MPSE): DevSecOps - NOMS Cloud Development(Multiple)	1	2022	4	2022
Mission Planning Support Environment (MPSE): OGCs - Contracts	1	2022	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673507 / *Training Systems & Simulation*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673507: *Training Systems & Simulation*	-	0.000	72.712	74.619	0.000	74.619	61.333	54.568	61.850	67.697	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, Training Systems and Simulation (TSS) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request.

A. Mission Description and Budget Item Justification

The F-35 Training Systems & Simulation Program Management Office (TSS PMO) development portfolio is aligned with the program's Continuous Capability Development & Delivery (C2D2) efforts and is organized in three primary lines of effort; Training System Capability Development (TSCD), Training Systems Investments (TSI) Roadmap, and Joint Simulation Environment (JSE) Development. As a function of the F-35 organizational pivot, this is the first budget cycle in which TSS PMO budget requirements have been comprehensively and discretely defined within a dedicated BPAC.

Training System Capability Development (TSCD): Efforts will continue with a primary focus on alignment of Training System capabilities with other elements of the Air System. Specific efforts will include development of Block 4 capabilities to equivalent maturity of those in the Air Vehicle enabling release of one capability upgrade per year to the fleet, continued development of the Production Runtime Server (PRTS) - Pilot Training Device TR-3 equivalent - to enable Block 4 capabilities, continued development of Live-Virtual-Constructive (LVC) capabilities including Distributed Mission Training (DMT), and appropriate lab infrastructure to enable Training System development.

Training Systems Investments (TSI) Roadmap: Efforts will continue with a focus on implementation of the modernization activities outlined in the TSS PMO roadmaps that will target the requirement for higher fidelity training to the warfighter. Specific efforts will include software architecture modernization, hardware architecture modernization and Synthetic Threat Enhancement.

Joint Simulation Environment (JSE): Efforts will continue with a focus on remaining F-35 In-a-Box (FIAB) software integration, complex threat/sensor model integration to establish operationally representative simulation environment required for operational test trial validity, and the completion of Verification, Validation and Accreditation (VV&A) activities enabling successful IOT&E Run-for-Score events. Efforts will include FIAB development, threat/sensor model fidelity upgrades, new threat/sensor model development, and JSE upgrades to enable effective verification of Block 4 capabilities. Efforts will continue toward expansion of JSE capability to Wright Patterson AFB, Edwards AFB and Nellis AFB.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Training Systems Capability Development (TSCD)	0.000	35.810	40.430	0.000	40.430

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673507 / *Training Systems & Simulation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Description: Efforts will continue with a primary focus on alignment of Training System capabilities with other elements of the Air System. Specific efforts will include development of capabilities (Capability Increments (CI) 1-3) to equivalent maturity of those in the Air Vehicle enabling release of one capability upgrade per year to the fleet, continued development of the Production Runtime Server (PRTS) - Pilot Training Device TR-3 equivalent - to enable CI1-3 capabilities, continued development of Live-Virtual-Constructive (LVC) capabilities including Distributed Mission Training (DMT), and appropriate lab infrastructure to enable Training System development. ***FY 2022 Plans:*** Efforts will continue to support development, integration and test of Block 4 capabilities in the Training System with a focus on equivalent capability maturity between the Training System and other elements of the Air System and preparing a relevant capability upgrade (Pilot Training, Maintainer Training, Instructional Products) for release to the fleet in FY2022. Additionally, PRTS will continue critical development, integration and test activities required to enable Block 4 training capabilities. The DMT program will continue with development activities to ensure DMT capability remains fully integrated with CI1-3 capabilities and in-line with overall Air System capability to include certified and exportable Cross Domain Solutions (CDS) to enable fully integrated DMT across the F-35 Enterprise. Within the LVC portfolio, requirements derivation and planning activities for Enhanced Embedded Training and Tactical Combat Training System (TCTS) II integration will continue to evolve. Training System lab infrastructure assets will be configured to enable current and future Training System development activities across the portfolio. ***FY 2023 Base Plans:*** Efforts will continue to support development, integration and test of Capability Increment (CI) 1-3 capabilities in the Training System with a focus on equivalent capability maturity between the Training System and other elements of the Air System and preparing relevant capability upgrades (Pilot Training, Maintainer Training, Instructional Products) for release to the fleet in FY2023. Additionally, PRTS will continue critical development, integration and test activities required to enable TR-3 training capabilities. The DMT program will continue with development activities to ensure DMT capability remains fully integrated with CI1-3 capabilities and in-line with overall Air System capability to include certified and exportable Cross Domain Solutions (CDS) to enable fully integrated DMT across the F-35 Enterprise. Within the LVC portfolio, requirements derivation and planning activities for Enhanced Embedded Training and TCTS II integration will continue to evolve. Training System lab infrastructure assets will be configured to enable current and future Training System development activities across the portfolio. Effects Based Simulation (EBS) will continue design, development and integration activities to support requirements analysis and pilot training tasks. EBS was formerly carried as an effort in the Joint Simulation					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673507 / *Training Systems & Simulation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Environment (JSE) R-2A category, but will align to the Training System Capability Development (TSCD) R-2A category beginning in FY23. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding increased due to EBS realigning from the JSE R-2A category to the TSCD R-2A category.					
Title: Training Systems Investments (TSI) Roadmap ***Description:*** Efforts will continue with a focus on implementation of the modernization activities outlined in the TSS PMO roadmaps that will target the requirement for higher fidelity training to the warfighter. Specific efforts will include software architecture modernization, hardware architecture modernization and Synthetic Threat Enhancement. ***FY 2022 Plans:*** Efforts will continue to refine and implement TSS PMO investment roadmaps with the objective to enable operationally relevant and higher fidelity training to the warfighter with focus on training to support the high-end fight. Software architecture modernization efforts (F-35 Lightning Integrated Training Environment (FLITE)) will continue with an intent to integrate FLITE into the Pilot Training Device (PTD) software baseline in FY2022 (objective) or FY2023 (threshold). Hardware architecture modernization efforts will continue with an intent to conduct tradeoff analyses of smaller footprint PTD rapid prototype activities to support eventual Program of Record production cut-in. Synthetic Threat Enhancement efforts will continue to improve the quantity, density and fidelity of relevant synthetic threat integration in the family of PTDs with intent to incrementally integrate synthetic threat improvement in each annual PTD capability upgrade to the fleet. Opportunities to leverage JSE synthetic threat investment toward a common threat environment across Training Systems and JSE architectures will continue to mature with an intent to minimize duplicative investment in multiple synthetic threat environments across the F-35 Enterprise. ***FY 2023 Base Plans:*** Efforts will continue to refine and implement TSS PMO investment roadmaps with the objective to enable operationally relevant and higher fidelity training to the warfighter with focus on training to support the high-end fight. Software architecture modernization efforts (FLITE) will complete with an intent to integrate FLITE into the PTD software baseline in FY2023 (threshold). Hardware architecture modernization efforts will continue with an intent to finalize smaller footprint Pilot Training Device (PTD) rapid prototype activities to support eventual Program of Record production cut-in in 2023. Synthetic Threat Enhancement efforts will continue to	0.000	15.717	13.930	0.000	13.930

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673507 / *Training Systems & Simulation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
improve the quantity, density and fidelity of relevant synthetic threat integration in the family of PTDs with intent to incrementally integrate synthetic threat improvement in each annual PTD capability upgrade to the fleet. Activities to leverage JSE synthetic threat investment toward a common threat environment across Training Systems and JSE architectures will increase with an intent to minimize duplicative investment in multiple synthetic threat environments across the F-35 Enterprise. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Although the budget allocation for Training Systems Investments decreases slightly in FY2023, efforts to improve the F-35 Training systems to enable operationally relevant and higher fidelity training to the warfighter will increase. Efforts to integrate the JSE synthetic threat environment will increase in FY2023, with a threshold integration date of 2025. Additionally, efforts will ramp up to prototype and develop a small footprint training device that meets evolving warfighter need.					
Title: Joint Simulation Environment (JSE) Development ***Description:*** Efforts will continue with a focus on completion of F-35 IOT&E events at the NAS Patuxent River facility while upgrading JSE capabilities at NAS Patuxent River to enable effective verification of CI1-3 capabilities. Additionally, efforts will continue toward development of Effects Based Simulation (EBS) capabilities as well as Virtual Warfare Center (VWC) capabilities. ***FY 2022 Plans:*** Efforts will continue with a focus on completion of Verification, Validation and Accreditation (VV&A) activities enabling successful IOT&E Run-for-Score events. Concurrently, upgrading JSE capability will enable effective verification of Block 4 capabilities (sensor model fidelity, complex threat models and F-35 In-a-Box (FIAB) upgrades) (objective). Efforts will continue toward expansion of JSE capability to Wright Patterson AFB, Edwards AFB and Nellis AFB in FY2023 (objective). Effects Based Simulation (EBS) will continue design, development and integration activities to support requirements analysis and pilot training tasks. Efforts will continue to support F-35 participation in events at the Virtual Warfare Center (VWC), including Nimble Lightning. ***FY 2023 Base Plans:*** Efforts will continue with a focus on the completion of IOT&E operational test trails through completion of Run-for-Score events. Efforts will include FIAB software development and integration, threat/sensor model fidelity upgrades, new threat/sensor model development, and JSE upgrades to enable effective verification of Block 4 capabilities. Efforts will continue toward expansion of JSE capability to Wright Patterson AFB, Edwards AFB and	0.000	21.185	20.259	0.000	20.259

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673507 / *Training Systems & Simulation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Nellis AFB. F-35 participation in events at the Virtual Warfare Center (VWC), including Nimble Lightning, will be continued and included in BPAC 673502 - Air Vehicle Block 4 Planning & Sys Eng. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased as a result of expected efficiencies in the development of Block 4 F-35 IAB and a shift of cost from development to sustainment. Block 4 F-35 IAB will leverage development from a common software baseline, reducing duplication of work in software development.					
Accomplishments/Planned Programs Subtotals	0.000	72.712	74.619	0.000	74.619

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

For FY2021 and FY2022, the majority of Training System capability development requirements (CI1-3 development, PRTS development, Lab Infrastructure) will be executed via training specific CLINs in Enterprise-level development contracts (Block 4 - Phase 2.3, Development Foundation). Training System Investment requirements will be executed via a combination of training specific CLINs in Enterprise-level contracts, TSS PMO specific contract actions and Other Transaction Authority (OTA) contracts. JSE development requirements will be executed via a combination of Enterprise-level contract actions and MIPR transactions to support OGC activities.

In concert with continued maturation of the F-35 organizational pivot, the TSS PMO acquisition strategy will transition toward TSS PMO controlled contract actions that will enable more effective oversight of PMO cost-schedule-performance execution.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673507 / *Training Systems & Simulation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Prime LM Training System Alignment (TSCD)	C/CPAF	Lockheed Martin : Ft. Worth, TX	-	-		14.330	Nov 2021	15.580	Nov 2022	-		15.580	Continuing	Continuing	157.972
TSS Prime LM PTD TR-3 Development (TSCD)	C/CPAF	Lockheed Martin : Ft. Worth, TX	-	-		11.448	Nov 2021	12.450	Nov 2022	-		12.450	Continuing	Continuing	84.564
TSS Prime LM Training Lab Infrastructure (TSCD)	C/CPFF	Lockheed Martin : Ft. Worth, TX	-	-		8.780	Nov 2021	9.550	Nov 2022	-		9.550	Continuing	Continuing	76.127
TSS Live-Virtual-Constructive (LVC) - DMT (TSCD)	C/CPFF	Lockheed Martin : Ft. Worth, TX	-	-		1.252	Nov 2021	1.250	Nov 2022	-		1.250	Continuing	Continuing	35.717
TSS Effects Based Simulation Development (TSCD)	C/CPAF	Not specified. : TBD	-	-		-		1.600	Nov 2022	-		1.600	Continuing	Continuing	-
TSS Hardware Re-architecture (TSI)	Various	Not specified. : TBD	-	-		7.261	Nov 2021	6.430	Nov 2022	-		6.430	Continuing	Continuing	15.166
TSS Software Re-architecture (TSI)	C/CPAF	Lockheed Martin : Ft. Worth, TX	-	-		5.955	Nov 2021	5.280	Nov 2022	-		5.280	Continuing	Continuing	45.545
TSS Synthetic Threat Enhancement (TSI)	C/CPFF	Lockheed Martin : Ft. Worth, TX	-	-		2.501	Nov 2021	2.220	Nov 2022	-		2.220	Continuing	Continuing	15.227
TSS JSE Prime LM FIAB Development	C/CPIF	Lockheed Martin : Ft. Worth, TX	-	-		9.105	Nov 2021	9.714	Nov 2022	-		9.714	Continuing	Continuing	54.073
TSS JSE VWC Development	Various	Various : TBD	-	-		0.995	Nov 2021	-		-		-	Continuing	Continuing	7.696
		Subtotal	-	-		61.627		64.074		-		64.074	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS JSE Pax Development Support	Various	NAWCAD : NAS Patuxent River, MD	-	-		8.725	Nov 2021	8.665	Nov 2022	-		8.665	Continuing	Continuing	51.671
TSS JSE Other Development Support	Various	Various : TBD	-	-		0.821	Nov 2021	1.880	Nov 2022	-		1.880	Continuing	Continuing	16.383

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673507 / *Training Systems & Simulation*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS JSE EBS Development Support	Various	Various : TBD	-	-		1.539	Nov 2021	-		-		-	Continuing	Continuing	5.826
		Subtotal	-	-		11.085		10.545		-		10.545	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		72.712		74.619		-		74.619	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673507 / *Training Systems & Simulation*

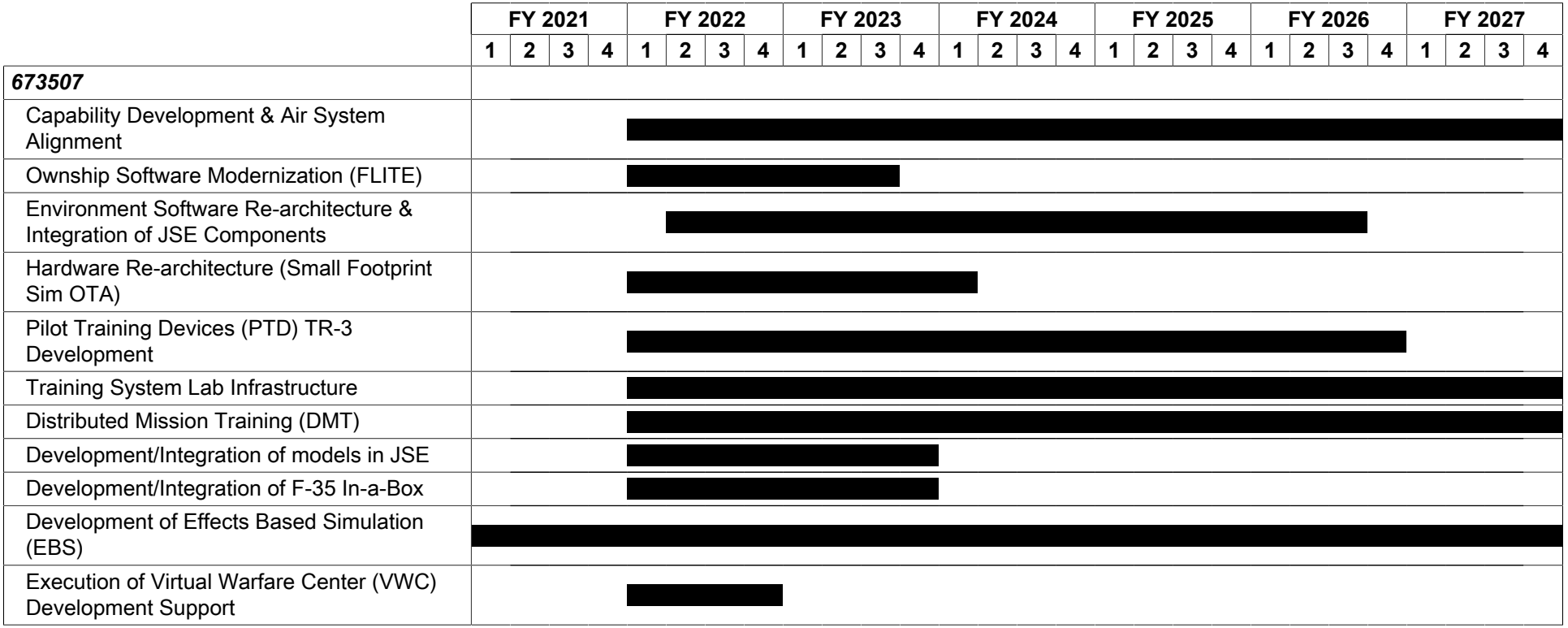

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673507 / *Training Systems & Simulation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673507				
Capability Development & Air System Alignment	1	2022	4	2027
Ownship Software Modernization (FLITE)	1	2022	3	2023
Environment Software Re-architecture & Integration of JSE Components	2	2022	3	2026
Hardware Re-architecture (Small Footprint Sim OTA)	1	2022	1	2024
Pilot Training Devices (PTD) TR-3 Development	1	2022	4	2026
Training System Lab Infrastructure	1	2022	4	2027
Distributed Mission Training (DMT)	1	2022	4	2027
Development/Integration of models in JSE	1	2022	4	2023
Development/Integration of F-35 In-a-Box	1	2022	4	2023
Development of Effects Based Simulation (EBS)	1	2021	4	2027
Execution of Virtual Warfare Center (VWC) Development Support	1	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673508 / *Infrastructure & Support Costs*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673508: *Infrastructure & Support Costs*	-	0.000	67.860	74.101	0.000	74.101	73.433	75.014	78.088	80.237	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, Infrastructure and Support Costs was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request.

A. Mission Description and Budget Item Justification

The F-35 Joint Program Office equips U.S. and allied forces with operational F-35 weapon systems in support of military and national security operations. The acquisition and product support workforce provides cutting edge weapon systems, sustainment capabilities, and is charged with providing management, tools, and technical and business capabilities needed to oversee acquisition programs throughout their life cycle. The acquisition workforce funded in this program element will support all phases of acquisition programs to include material solution analysis, technology development, engineering and manufacturing development, production and deployment, and operations and support. This funding does not include costs for base operating support civilian personnel. This program element supports both civilian pay and non-pay support requirements. Additional infrastructure and program management support costs include travel, supplies, contractor support, off-base leases, program office IT, cybersecurity, model-based systems engineering, and risk reduction studies, directly related to Block 4 and TR3 developmental efforts.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, 0606398F. In FY21 $47.9M was expended for civilian pay expenses in this program element, and in FY22 $46.9M is forecasted for civilian pay expenses in this program element.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: F-35 JPO AFLCMC Civilian Pay	-	0.000	50.862	0.000	50.862
Description: The acquisition and product support workforce provides cutting edge weapon systems, sustainment capabilities, and is charged with providing management, tools, and technical and business capabilities needed to oversee F-35 acquisition programs throughout it's life cycle. This effort is a continuation of FY22 and not a new start. Correcting in FY23 to provide transparency.					
FY 2022 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673508 / *Infrastructure & Support Costs*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Fund the F-35 Joint Program Office acquistion and product support workforce. ***FY 2023 Base Plans:*** Fund the F-35 Joint Program Office acquistion and product support workforce. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** The Average Work Year Cost (AWYC) has been updated based on FY22 actual costs. Increase from FY 2022 to FY 2023 is due to "F-35 JPO AFLCMC Civilian Pay" was included in Core Program Support/CSS Support, and in FY23, AFLCMC Civilian Pay is captured on its own line.					
Title: Core Program Support/CSS Support ***Description:*** Includes off-base leases, Advisory and Assistance Services (A&AS), travel, supplies, Navy Working Capital fund subject matter expert support, program office IT, cybersecurity, model-based systems engineering, and risk reduction studies. ***FY 2022 Plans:*** Support program office efforts, including Arlington, VA program unique off-base lease costs, Contract Support Services (CSS) support, travel, supplies, Navy working capital technical subject matter expert (SME) labor, program office IT, cybersecurity, model-based systems engineering, and risk reduction studies. ***FY 2023 Base Plans:*** Continue to support program office efforts, including Arlington, VA program unique off-base lease costs, CSS support, travel, supplies, Navy working capital technical SME labor, program office IT, cybersecurity, model-based systems engineering, and risk reduction studies, directly related to Block 4 and TR3 developmental efforts. ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Decrease from FY2022 to FY2023 is due to "Core Program Support/CSS Support" including F-35 JPO AFLCMC Civilian Pay, and in FY23, AFLCMC Civilian Pay is captured on its own line.	0.000	67.860	23.239	0.000	23.239
Accomplishments/Planned Programs Subtotals	0.000	67.860	74.101	0.000	74.101

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673508 / *Infrastructure & Support Costs*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673508 / *Infrastructure & Support Costs*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Core Program Support Cyber Risk Reduction	Various	Various : TBD	-	-		1.000	Dec 2021	1.200	Dec 2022	-		1.200	Continuing	Continuing	-
Core Program Support Model-Based Systems Engineering	Various	Various : TBD	-	-		0.200	Dec 2021	0.500	Dec 2022	-		0.500	Continuing	Continuing	-
		Subtotal	-	-		1.200		1.700		-		1.700	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
F-35 JPO AFLCMC Civilian Pay	MIPR	Wright Patterson AFB, OH : TBD	-	-		46.862	Oct 2021	50.862	Oct 2022	-		50.862	Continuing	Continuing	-
CSS Support/Civ Support	Various	Various : TBD	-	-		7.070	Dec 2021	7.570	Dec 2022	-		7.570	Continuing	Continuing	-
Core Program Support Off-Base Leases	MIPR	WHS : NCR	-	-		12.228	Oct 2021	12.569	Oct 2022	-		12.569	Continuing	Continuing	-
Core Program Support Travel	Various	Various : TBD	-	-		0.500	Oct 2021	0.900	Oct 2022	-		0.900	Continuing	Continuing	-
Core Program Support GPC	Various	Various : TBD	-	-		-		0.500	Dec 2022	-		0.500	Continuing	Continuing	-
		Subtotal	-	-		66.660		72.401		-		72.401	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		67.860		74.101		-		74.101	Continuing	Continuing	N/A

Remarks

FY23 travel increase over FY22 assumes travel at the pre-Covid levels. GPC is not a new start, providing additional transparency into the JPO's Infrastructure & Support Cost requirements

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673508 / *Infrastructure & Support Costs*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
673508																												
Continued JPO Infrastructure and Support Costs									[redacted]																			

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673508 / *Infrastructure & Support Costs*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673508				
Continued JPO Infrastructure and Support Costs	1	2023	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 673509 / *DevSecOps*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
673509: *DevSecOps*	-	0.000	28.000	19.871	0.000	19.871	22.834	23.362	24.357	4.371	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022, DevSecOps was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request.

A. Mission Description and Budget Item Justification

The F-35 Software Development, Security & Operations (DevSecOps) Cloud platform environment allows for US Government and contracted software development teams to produce, test and deploy capabilities for F-35 supported Project Management Offices (PMO). This includes providing support to the Combat Data Systems (CDS), Air Vehicle (AV), Maintenance Systems (MxS), Propulsion (PP), and Training Systems and Simulation (TSS) PMOs. The mission of DevSecOps is to provide a centralized and consolidated F-35 software development environment, allowing for rapid release cycles to keep the F-35 ahead of its adversaries. Investment and modernization of DevSecOps include efforts to support F-35 Software Modernization efforts, develop organic government software and testing capabilities, enhance the security posture of the development pipeline, and support goals of reducing long-term on-premise infrastructure environments cost ultimately resulting in reducing fleet delivery timelines.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: DevSecOps Support	0.000	28.000	19.871	-	19.871
Description: Reference Mission Description and Budget Item Justification.					
FY 2022 Plans: Continue development and support for DevSecOps infrastructure, platform, software development pipeline, and joint F-35 organizational connections. Establish initial capabilities and expand existing software development efforts with the goal of transitioning dispersed and separated software development environments into model based systems engineering and a fully collaborative requirements to development environment. Additional goals of delivering flight worthy rapid prototyping of capability, virtual test capability, and transitioning workloads to lower cost software sustainment efforts. New requirements from PMOs are expected. Prepare environment for on-boarding, as well as transitioning the PMOs from separate pillars to a centralized JPO-managed cloud environment. Includes software licensing for PMO tool sets and associated applications. Major cost drivers include requirements tool, and collaboration tools, authentication tools - supporting Single Sign On and Multi-Factor Authentication and Compiler tools. For software tooling efforts, working towards an eventual consolidation of tools across the PMOs (i.e. application rationalization) with an end goal of a standardized compiler tool sets					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673509 / *DevSecOps*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
and Cybersecurity compliance. Accordingly, talent/consumption (hardware and software to run the environment) contracts must be renewed and expanded. Cybersecurity requirements must also be met, meaning additional resources for security processes, monitoring, scanning, vulnerability identification plus mitigation, and meeting all requirements for DoD compliance to obtain ongoing/continuous Authority to Operate (ATO). ***FY 2023 Base Plans:*** Continue development and support for DevSecOps infrastructure, platform, software development pipeline, and joint F-35 organizational connections. Continue to develop a transition plan to stand-up a team consisting of Industry and Government software development in support of software modernization and DevSecOps Cloud transition. Establish initial capabilities and expand existing software development efforts with the goal of transitioning dispersed and separated software development environments into model based systems engineering and a fully collaborative requirement to development environment. Capabilities include software development environment for Maintenance Systems Operational Data Integrated Network (ODIN), Autonomic Logistics Information System (ALIS) to ODIN migration, Combat Data System's Mission Planning, Propulsion's Offboard Management System, and Air Vehicle Mission System domains. Additional goals of delivering flight-worthy rapid prototyping of capability, virtual test capability, and transitioning workloads to lower cost software sustainment efforts. New requirements from PMOs are expected. Prepare environment for on-boarding, as well as transitioning the PMOs from separate pillars to a centralized JPO-managed cloud environment. Includes software licensing for PMO tool sets and associated applications. Major cost drivers include requirements tool, and collaboration tools, authentication tools - supporting Single Sign On, Multi-Factor Authentication and development tools. For software tooling efforts, working towards an eventual consolidation of tools across the PMOs (i.e. application rationalization) with an end goal of a standardized compiler tool sets and Cybersecurity compliance. Accordingly, talent/consumption (hardware and software to run the environment) contracts must be renewed and expanded. Cybersecurity requirements must also be met, meaning additional resources for security processes, monitoring, scanning, vulnerability identification plus mitigation, and meeting all requirements for DoD compliance to obtain ongoing/continuous Authority to Operate (ATO) and continuous Authority to Operate (cATO). ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding decreased due to the removal of Platform One scope and an update to the Cloud estimate based on component and service data actuals.					
Accomplishments/Planned Programs Subtotals	0.000	28.000	19.871	-	19.871

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673509 / *DevSecOps*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

The DevSecOps Acquisition Strategy is based on the CSAF 180-day delivery sprint. Phase 1 demonstrates prototype designs, integration of Defense Industry Base partners and PMOs, appropriate set of technology stacks to be integrated, identifying return on investment (ROI) and buying down technical risk. Technology maturation; putting in place the necessary contracts for talent, licenses and Cloud consumption to support software pipeline delivery for F-35. Production and Development; building, testing and deploying Cloud ecosystems Impact Level (IL) 2 - 6+ and software development pipeline utilizing contracted and government support. Operation and Support; maintain Cloud ecosystem utilizing industry research, resources, talent and technology modernization methodologies with the focus on reducing long-term costs for the program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673509 / *DevSecOps*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev Ops Development Support - Talent	Various	Various : TBD	-	-		16.000	Dec 2021	10.021	Dec 2022	-		10.021	Continuing	Continuing	-
Dev Ops Development Support - Licenses	C/FFP	Various : TBD	-	-		7.000	Oct 2021	5.250	Oct 2022	-		5.250	Continuing	Continuing	-
Dev Ops Development Support - Cloud Support	C/FFP	Various : TBD	-	-		5.000	Oct 2021	2.850	Oct 2022	-		2.850	Continuing	Continuing	-
Dev Ops Development Support - Industry Stand-up	C/FFP	Various : TBD	-	-		-		1.750	Mar 2023	-		1.750	Continuing	Continuing	-
		Subtotal	-	-		28.000		19.871		-		19.871	Continuing	Continuing	N/A

Remarks

DevSecOps Ecosystem Standup used for centralized software development in JPO-managed cloud.

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		28.000		19.871		-		19.871	Continuing	Continuing	N/A

Remarks

Industry Stand-up is not a new start, providing additional transparency into the JPO's DevSecOps requirements. DevSecOps Ecosystem Standup used for centralized software development in JPO-managed cloud.

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673509 / *DevSecOps*

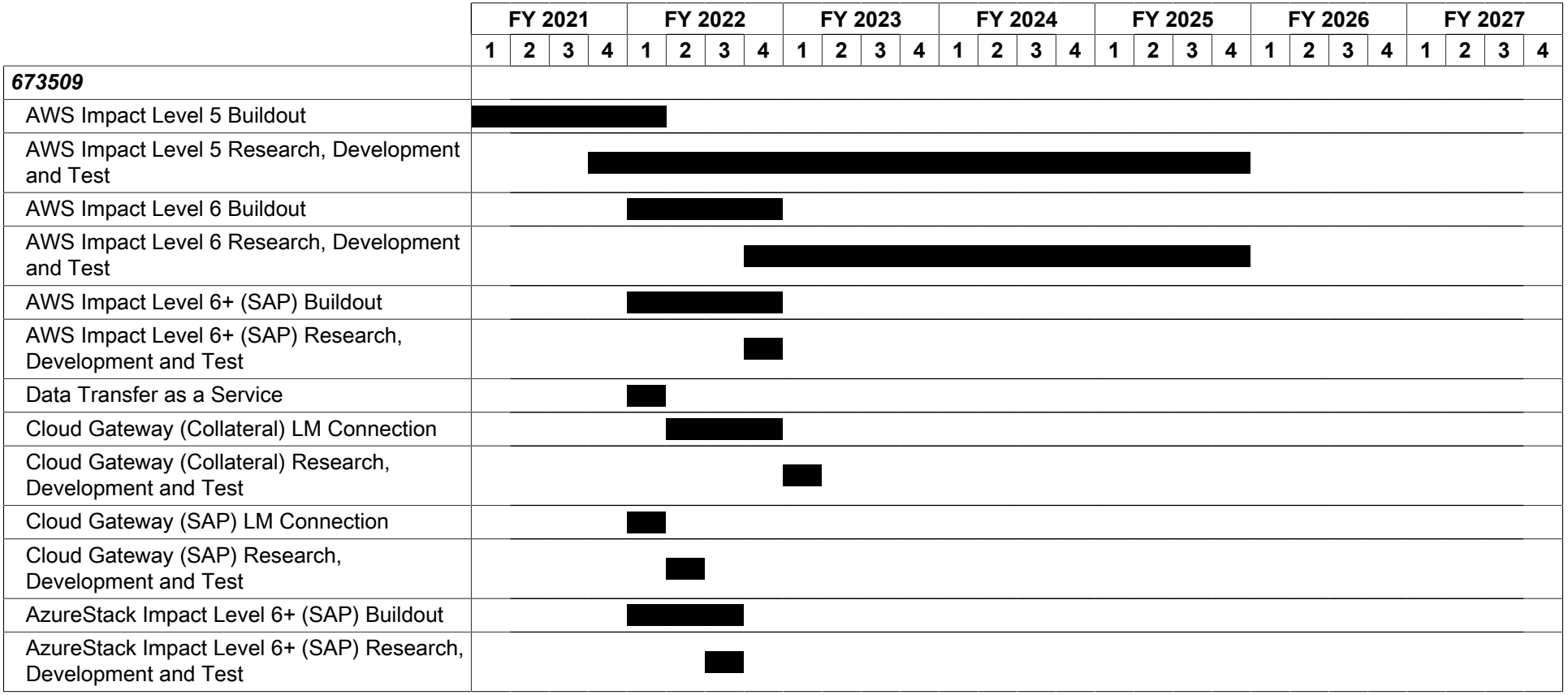

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 673509 / *DevSecOps*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
673509				
AWS Impact Level 5 Buildout	1	2021	1	2022
AWS Impact Level 5 Research, Development and Test	4	2021	4	2025
AWS Impact Level 6 Buildout	1	2022	4	2022
AWS Impact Level 6 Research, Development and Test	4	2022	4	2025
AWS Impact Level 6+ (SAP) Buildout	1	2022	4	2022
AWS Impact Level 6+ (SAP) Research, Development and Test	4	2022	4	2022
Data Transfer as a Service	1	2022	1	2022
Cloud Gateway (Collateral) LM Connection	2	2022	4	2022
Cloud Gateway (Collateral) Research, Development and Test	1	2023	1	2023
Cloud Gateway (SAP) LM Connection	1	2022	1	2022
Cloud Gateway (SAP) Research, Development and Test	2	2022	2	2022
AzureStack Impact Level 6+ (SAP) Buildout	1	2022	3	2022
AzureStack Impact Level 6+ (SAP) Research, Development and Test	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 675346 / *F-35*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
675346: *F-35*	-	684.931	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

64840F BPAC 675346 was reduced to zero in FY22 due to breakout of new BPACs per Congressional mandate

A. Mission Description and Budget Item Justification

F-35 Continuous Capability Development and Delivery (C2D2) provides continuing incremental upgrades of the three F-35 variants and associated ground equipment. Upgrades are essential capabilities for Air Interdiction and Strategic Attack, Close Air Support, Suppression and Destruction of Enemy Air Defenses, Offensive and Defensive Counter Air and expanded Surface Warfare. The C2D2 acquisition strategy is based upon incremental deliveries of capabilities. The strategy includes periodic deliveries with a focus on hardware, tech refresh and software. C2D2 capability planning includes an efficient transition from F-35 SDD to C2D2. As SDD development activities ramp down C2D2 will assume responsibility for improvements and modernization efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Product Development - Air Vehicle (AV) / Block 4 Planning and Systems Engineering	193.182	0.000	0.000	0.000	0.000
Description: Block 4 Planning and Systems Engineering from preliminary design and requirements decomposition through completion of Developmental Flight Test for all variants of the F-35 aircraft. Modernization efforts include Requirements Decomposition and continuous development and release of capabilities identified as Block 4 upgrades. This is a continuation of the previous Block 4 developmental contracts, which will include activities leading to successful completion of Developmental Flight Test, to include select facility upgrades required for Block 4 research, development, test and evaluation. Included in Block 4 are upgraded capabilities and continuous improvements to maintain Air System viability against evolving threats indicated in the Electronic Warfare Initial Capabilities Document (ICD), the Fifth Generation Fighter Modernization ICD, and the Block 4 Capability Development Document (CDD), reduce life cycle cost, and improve operational suitability. Continuous risk reduction activities to include Air System Integration, preplanning for subsequent Block 4 Modernization events, and investments to deliver the full Block 4 Air System capabilities as needed. Efforts also included are Advanced Anti-Radiation Guided Missile Extended Range (AARGM-ER), non-recurring engineering (NRE) for obsolescence, and 6 In The Bay early systems engineering. C2D2 capability planning includes an efficient transition from F-35 System Development and Demonstration (SDD) to C2D2. As SDD development activities ramp down C2D2 will assume responsibility for improvements and modernization efforts.					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Beginning in FY 2022, Air Vehicle - Block 4 Planning & Sys Eng was established as a separate, distinct project within the Continuous Capability Development & Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This Project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request. ***FY 2022 Plans:*** Efforts continued in BPAC 673502. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Title: AV Product Development - Technology Refresh 3 (TR-3) ***Description:*** Technology Refresh 3 (TR-3) conducts post Critical Design Review (CDR) design activities. This effort will develop and deliver a TR-3 system through full flight-worthy certification and production readiness review for Lot 15. The design of TR-3 subsystems Integrated Core Processor (ICP), Aircraft Memory System (AMS), and Panoramic Cockpit Display Electronics Unit and Display Unit (PCD-EU, PCD-DU) configurations will contain new backplane technology, commercial operating systems, and modified middleware necessary to support Block 3F functionality and incorporation of all Block 4 capabilities. This work includes nonrecurring engineering for the developing, test, and certification of the ICP, AMS, PCD-EU, and PCD-DU, and includes processing capacity to ensure long term viability for future capabilities. Beginning in FY 2022, Air Vehicle - Technology Refresh 3 (TR-3) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This Project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request. ***FY 2022 Plans:***	161.290	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Efforts continued in BPAC 673501. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Title: Infrastructure and Support Costs ***Description:*** Funding will support infrastructure investment planning and other test planning activities required for Block 4 development, integration, test and evaluation. Funding related to the Integrated Test Force, government, and contractor labor. Support efforts for airframe, air vehicle systems, air ship integration, mission systems, weapons integration, offboard mission support, autonomic logistics development, joint reprogramming enterprise and modeling and joint simulation environment activities, including Nimble Lightning efforts. Other costs in support of ranges, chase planes and Developmental Test (DT) site operations. USAF only will fund additional Program Management Activities (PMA) to transition to a final hybrid product support integrator (HPSI) which will support sustainment analysis with product support managers, focused on long term strategic planning and transition to a final integrated support plan. Other costs support Technology Investment for Modernization, Cloud based DevSecOps infrastructure, and COCOM Requirements for Coalition Mission Data Files (CMDx) to reduce fratricide in coalition environments. Beginning in FY 2022, Infrastructure and Support Costs was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This Project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY2022 request. ***FY 2022 Plans:*** Efforts continued in BPAC 673508. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:***	42.690	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Title: Test and Evaluation (TE) ***Description:*** Integrated Test activities in support of Block 4, to include Lockheed Martin and Pratt & Whitney support at all test sites. Non-recurring engineering required to plan for the service life extension of existing Developmental Test (DT) aircraft and modification necessary to bring DT aircraft fleet to a more production representative and sustainable configuration, and to develop flight test instrumentation and release test software to meet Block 4 requirements. Additional upgrades required to support development and evaluation of improvements driven by changes in the threat environment and as identified in the Electronic Warfare Initial Capabilities Document (ICD), the Fifth Generation Fighter Modernization ICD, and the Block 4 Capability Development Document (CDD). Efforts include non-recurring engineering and procurement of a test article to evaluate service life of F-35B STOVL Aircraft. Beginning in FY 2022, Test and Evaluation (T&E) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request. ***FY 2022 Plans:*** Efforts continued in BPAC 673503. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	141.760	0.000	0.000	0.000	0.000
Title: Maintenance Systems (MxS) Operational Data Integrated Network (ODIN) / Autonomic Logistics Information System (ALIS) Development	20.772	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Description: The F-35 Operational Data Integrated Network (ODIN) is the F-35 program solution for delivering core maintenance and logistics information system solutions to F-35 warfighters. Leveraging agile and modern software development practices, ODIN will replace ALIS to serve as the primary logistics tool to support F-35 warfighter operations, health and diagnostics, mission planning, supply chain management, maintenance, and training. ODIN will substantially decrease F-35 administrator and maintainer workload, increase readiness rates for all F-35 variants, and allow software engineers to rapidly develop and deploy updates in response to changing warfighter requirements and improve data management, quality and integrity. ODIN is intended to provide the data to enable holistic fleet management, improve performance, enhance readiness, and reduce costs to the F-35 program. It comprises both hardware and software, and supports the flow of Unclassified and Classified aircraft and maintenance-related data. Autonomic Logistics Information System (ALIS) will continue to deliver the core logistics and maintenance infrastructure requirements for the F-35 enterprise until ODIN is fielded at all sites. ALIS includes features such as aircraft scheduling, training delivery, record keeping, technical data delivery, supply chain management, maintenance management, pilot and maintenance debriefing, and mission planning. ALIS development is only focused on low cost and high return investments that provide a high confidence return on investment in the short term, significant warfighter impact, and/or offer synergy with ODIN development efforts. Beginning in FY2022, Maintenance Systems (MxS) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request. ***FY 2022 Plans:*** Efforts continued in BPAC 673505. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
N/A					
Title: Combat Data Systems (CDS) ***Description:*** Investment and modernization activities required for Block 4 development, integration, test and evaluation of Mission Data Tools, Verification & Validation Systems, and Mission Planning Software/Hardware. Funding related to key deliveries to Electronic Warfare Squadrons and F-35 Operational Squadrons and enables government and contractor labor for mission planning and joint reprogramming enterprise. Beginning in FY 2022, Combat Data Systems (CDS) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This Project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request. ***FY 2022 Plans:*** Efforts continued in BPAC 673506. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A	36.612	0.000	0.000	0.000	0.000
Title: Propulsion (PP) ***Description:*** Propulsion F135 Block 4 Integrated Flight Test Support includes efforts such as Engine Flight Test, Test Engine Procurements, and other associated government costs. For C2D2 to be able to continue to test all three aircraft variants, propulsion support is required to enable continued flying. Increased flights and flight hours are planned over the next 2 years, requiring elevated propulsion support. All of the current Full Flight Release (FFR) engines supporting Flight Test are at or nearing their life limits, requiring the purchase of new Initial Service Release (ISR) engines to replace them. This replacement effort is planned to occur over the next few years to enable continued flight capability.	18.975	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Beginning in FY 2022, Propulsion (PP) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This Project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request. ***FY 2022 Plans:*** Efforts continued in BPAC 673504. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Title: Training Systems (TSS) ***Description:*** Training System efforts include continuous development and release of capabilities identified as Block 4 upgrades integral to an aligned Air System. This is a continuation of previous Block 4 developmental efforts, which will include: capability development, architecture upgrades to support capability delivery, enhanced synthetic threat integration, opportunities to leverage JSE investments toward Training System requirements, and facility/lab upgrades required for research, development, test, and evaluation. Included in Block 4 are upgraded capabilities and continuous improvements to maintain Air System viability and alignment against evolving threats indicated in the Electronic Warfare Initial Capabilities Document (ICD), Fifth Generation Fighter Modernization ICD, Block 4 Capability Development Document (CDD), and TSS PMO Roadmap. Distributed Mission Training (DMT) Development and Test from preliminary design through completion of development, testing and fielding of the initial DMT capability for the United States Air Force, United States Navy, and United States Marine Corps. The DMT effort is developing the Joint Interoperability Interface (JII) as the filter for the F-35 simulator to interface with the various network standards. The DMT hardware and software components will be added to the Pilot Training Device (PTD) configuration baseline, yielding a fielded training capability for all F-35 services and customers with distributed training network capability. This is a continuation of previous DMT efforts. Included in DMT are upgraded capabilities and continuous improvements to maintain Air System viability against evolving threats, reduce life cycle cost, and improve operational suitability. Funding	45.230	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
will support hardware purchase and planning for installation and test activities required for DMT development, integration, test, and evaluation. Funding related to contractor labor. Support efforts for Full Mission Simulator, Deployable Mission Rehearsal Trainer, and Tactical Environment Simulator capability developments. The Joint Simulation Environment (JSE) will continue efforts to allow for completion of F-35 IOT&E events at the Patuxent River NAS facility. Efforts to upgrade JSE capabilities at Patuxent River NAS to support future F-35 Block 4 needs will continue and efforts to bring future JSE facilities at Wright Patterson AFB, Edwards AFB, and Nellis AFB online in FY23. Efforts to determine feasibility of integrating the JSE, F-35 In-a-Box (FIAB) and the F-35 Effects Based Simulator (EBS) with F-35 Training software to move towards a common software architecture will begin. F-35 EBS will continue development of unclassified and classified capabilities, and deliver formal software releases to current and new domestic and international partners and stakeholders. Continuation of efforts to support events involving the F-35, including Nimble Lightning, at the Virtual Warfare Center (VWC). Beginning in FY 2022, Training Systems and Simulation (TSS) was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This Project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request. ***FY 2022 Plans:*** Efforts continued in BPAC 673507. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Title: DevSecOps	14.420	0.000	0.000	0.000	0.000
Description: Beginning in FY 2022, DevSecOps was established as a separate, distinct project within the Continuous Capability Development and Delivery (C2D2) Program Element, per Congressional direction. Efforts are continued from BPAC 675346, which is still included at the end of the R-2A for FY 2020 and FY 2021. This					

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Project has also been updated to reflect the directed project categories to provide traceability between current execution and the FY 2022 request. ***FY 2022 Plans:*** Efforts continued in BPAC 673509. ***FY 2023 Base Plans:*** N/A ***FY 2023 OCO Plans:*** N/A ***FY 2022 to FY 2023 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	674.931	0.000	0.000	0.000	0.000

	FY 2021	FY 2022
Congressional Add: JASSM	10.000	-
FY 2021 Accomplishments: F-35 Air System Integration Assessment (ASIA) study completed to determine feasibility of full integration of Joint Air to Surface Standoff Missile Extended Range (JASSM-ER) on the F-35A. JASSM integration conducts preliminary integration analysis, risk reduction activities, and long lead test asset procurement for the JASSM family of weapons on F-35A/B/C variants. JASSM integration provides F-35 with a highly survivable long range precision strike capability against high value, well defended, fixed, and relocatable targets.		
Congressional Adds Subtotals	10.000	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 0604840N: *BLI 2936: F-35C C2D2*	377.005	481.962	-	-	-	-	-	-	-	Continuing	Continuing
• RDTE 07 0604840M: *BLI 3410: F-35B C2D2*	370.431	515.746	-	-	-	-	-	-	-	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDTE 07 International: *International Continuous Capability Development and Delivery*	264.799	358.159	346.820	-	346.820	306.563	265.900	215.209	193.862	Continuing	Continuing

Remarks

This is a joint program with no executive service. Service Acquisition Executive (SAE) authority alternates between the Department of the Navy and the Department of the Air Force and currently resides with the Navy. The United Kingdom, Italy, Netherlands, Canada, Australia, Denmark, and Norway are participants in the SDD phase of JSF.

D. Acquisition Strategy

The C2D2 acquisition strategy is to employ both Cost and Fixed Price Incentive contracts for the Block 4 engineering and development efforts. A new modernization contract structure will be established for all post SDD Block 4 efforts. In addition, a separate Basic Ordering Agreement or Indefinite Quantity/Indefinite Delivery contract is planned to provide a long term approach to upgrading and maintaining laboratories and test aircraft and supporting technology maturation for future C2D2 capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AV Prime LM Phase II Development	C/CPIF	Lockheed Martin : Ft Worth, TX	-	176.206	Nov 2020	-		0.000	Nov 2022	-		0.000	Continuing	Continuing	-
AV Prime LM TR-3 Development	C/CPIF	Lockheed Martin : Ft Worth, TX	-	166.843	Nov 2020	-		-		-		-	Continuing	Continuing	-
TSS VWC Nimble Lightening	C/CPFF	Various : Various	-	0.410	Jan 2021	-		-		-		-	Continuing	Continuing	-
TE Flight Test Assets	Various	Lockheed Martin : Ft Worth, TX	-	9.760	Dec 2020	-		-		-		-	Continuing	Continuing	-
TE Prime LM TBD DT AC Viability	C/CPFF	Lockheed Martin : Ft Worth, TX	-	6.000	Dec 2020	-		-		-		-	Continuing	Continuing	-
PP Prime PW Propulsion	SS/CPFF	Pratt Whitney : East Hartford, CT	-	18.970	Nov 2020	-		-		-		-	Continuing	Continuing	-
TE Prime LM Developmental Foundation Contract	C/CPIF	Lockheed Martin : Ft Worth, TX	-	79.250	Nov 2020	-		-		-		-	Continuing	Continuing	-
CDS Prime LM JRE Dev.	C/CPFF	Lockheed Martin : Ft Worth, TX	-	25.010	Nov 2020	-		-		-		-	Continuing	Continuing	-
MxS Prime LM ALIS	C/CPFF	Lockheed Martin : Ft Worth, TX	-	0.000	Dec 2020	-		-		-		-	Continuing	Continuing	-
MxS Prime LM ODIN	C/CPIF	Lockheed Martin : Ft Worth, TX	-	6.710	Nov 2020	-		-		-		-	0.000	6.710	-
AV Prime LM Air Vehicle Integration	C/CPIF	Lockheed Martin : Ft Worth, TX	-	0.000	Nov 2020	-		-		-		-	Continuing	Continuing	-
TE Prime LM F-35B Fatigue Test Article	C/CPIF	Lockheed Martin : Ft Worth, TX	-	0.000	Dec 2020	-		-		-		-	0.000	0.000	-
TSS Prime LM Training Investments	C/CPIF	Lockheed Martin : Ft Worth, TX	-	8.000	Dec 2020	-		-		-		-	0.000	8.000	-
AV Systems Engineering	Various	Various : Various	-	7.120	Jan 2021	-		-		-		-	Continuing	Continuing	-
TSS Prime LM - JSE	C/CPIF	Lockheed Martin : Ft Worth, TX	-	6.920	Dec 2020	-		-		-		-	Continuing	Continuing	-
CDS Prime LM Mission Planning Software Environment (MPSE)	C/CPIF	Lockheed Martin : Ft Worth, TX	-	3.250	Dec 2020	-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JASSM LM Integration	TBD	TBD : TBD	-	10.000	Jun 2021	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	524.449		-		0.000		-		0.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Development Support - JSE	WR	Various : Various	-	8.300	Dec 2020	-		-		-		-	Continuing	Continuing	-
AV Mission Systems Support	Various	Various : Various	-	4.140	Dec 2020	-		-		-		-	Continuing	Continuing	-
AV Vehilce Systems Support	Various	Various : Various	-	0.000	Dec 2020	-		-		-		-	Continuing	Continuing	-
TSS Development Support - Training Systems	Various	Various : Various	-	4.090	Dec 2020	-		-		-		-	Continuing	Continuing	-
AV CSO Development support	Various	Various : Various	-	1.270	Dec 2020	-		-		-		-	Continuing	Continuing	-
CDS JRE IPT Development Support	Various	Various : Various	-	25.010	Dec 2020	-		-		-		-	Continuing	Continuing	-
MxS Dev Ops Development Support	Various	Various : Various	-	2.500	Dec 2020	-		-		-		-	Continuing	Continuing	-
MxS ALIS / ODIN Development Support	Various	Various : Various	-	1.730	Dec 2020	-		-		-		-	Continuing	Continuing	-
CDS MPSE Re-Arch Development Support	Various	Various : Various	-	3.580	Dec 2020	-		-		-		-	Continuing	Continuing	-
PP Propulsion Development Support	Various	Various : Various	-	0.000	Dec 2020	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	50.620		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 675346 / *F-35*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TE Developmental Test & Evaluation - PAX	WR	NAWCAD : Patuxent River, MD	-	6.523	Dec 2020	-		-		-		-	Continuing	Continuing	-
TE Developmental Test & Evaluation - CL	WR	NAWCWD : China Lake, CA	-	6.523	Dec 2020	-		-		-		-	Continuing	Continuing	-
TE Developmental Test & Evaluation - Edwards AFB	MIPR	Edwards AFB : Edwards AFB, CA	-	6.523	Dec 2020	-		-		-		-	Continuing	Continuing	-
TE Developmental Test & Evaluation - Various	Various	Various : Various	-	6.523	Dec 2020	-		-		-		-	Continuing	Continuing	-
TE Operational Test & Evaluation - UOTT	MIPR	Nellis AFB : Nellis AFB, NV	-	20.670	Dec 2020	-		-		-		-	Continuing	Continuing	-
TE USMC Operational Test & Evaluation - VMX-1	WR	Yuma Air Station : Yuma Air Station, NV	-	0.000	Dec 2020	-		-		-		-	Continuing	Continuing	-
TE USN Operational Test & Evaluation - VX-9	WR	Various : Various	-	0.000	Nov 2020	-		-		-		-	Continuing	Continuing	-
TE Ground Test	Various	Various : Various	-	0.000		-		-		-		-	Continuing	Continuing	-
		Subtotal	-	46.762		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFLCMC Civilian Pay	C/CPAF	AFLCMC Civ Pay : Wright Patterson AFB, OH	-	34.730	Oct 2020	-		-		-		-	Continuing	Continuing	-
Financial Mgmt Database Support IDS	C/CPAF	Various : Various	-	0.250	Dec 2020	-		-		-		-	Continuing	Continuing	-
Earned Value/Finance/ Cost ACT-I	C/CPAF	Various : Various	-	0.500	Dec 2020	-		-		-		-	Continuing	Continuing	-
Operating Core Support	C/FP	Various : Various	-	1.910	Dec 2020	-		-		-		-	Continuing	Continuing	-
Other Core Contractor Support	C/CPAF	NAWCAD/WD : Vatious	-	0.000		-		-		-		-	Continuing	Continuing	-
Travel	Various	Not specified. : TBD	-	0.020	Dec 2020	-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force			Date: April 2022
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0604840F / *F-35 C2D2*	Project (Number/Name) 675346 / *F-35*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DevSecOps	Various	Not specified. : TBD	-	25.690	Oct 2020	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	63.100		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	684.931		-		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
675346																												
Funds allocated to this BPAC in error. Placeholder event.									[redacted]																			

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0604840F / *F-35 C2D2*	**Project (Number/Name)** 675346 / *F-35*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
675346				
Funds allocated to this BPAC in error. Placeholder event.	1	2023	4	2023