Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force											Date: February 2016	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0401318F / *CV-22*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	37.698	27.776	16.702	0.000	16.702	17.455	16.634	14.724	14.984	74.005	219.978
676033: *CV-22 RDT&E POST PRODUCTION*	0.000	37.698	27.776	16.702	0.000	16.702	17.455	16.634	14.724	14.984	74.005	219.978
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 212
Project MDAP/MAIS Code(s): N42

A. Mission Description and Budget Item Justification

The CV-22 is the Air Force Special Operations Forces (SOF) variant of the joint multi-mission V-22 tilt-rotor aircraft. The aircraft provides long-range infiltration, exfiltration, and re-supply of SOF in politically sensitive and hostile/denied areas. The Navy is the lead service for the joint V-22 program and has overall responsibility for managing all V-22 variants, including the Air Force CV-22 variant. CV-22 RDT&E funding provides for the development, integration, and testing of mission critical aircraft modifications to improve operational effectiveness, platform survivability, and aircraft availability.

Block 20: RDT&E funding provides for improved long-range communications, situational awareness capabilities, and aircraft software upgrades needed to address operational requirements specified in the V-22 Block C/20 Capabilities Production Document (CPD).

Enhanced Self-Deployment: RDT&E funding provides for the design, development, and testing of aircraft modifications to improve aircraft self-deployment capabilities (e.g., operating range, global response time), to evaluate emerging threats to the aircraft and mission accomplishment, and to identify and assess emerging air vehicle, propulsion system, avionics, electronic warfare, and weapon system capability requirements and potential solutions to satisfy these requirements.

Improved Inlet Solution (IIS): RDT&E funding provides for design, development, and testing of modifications to the CV-22 propulsion system to reduce ingestion of sand/dust and other particulate matter in austere operating environments. These upgrades will significantly improve Engine Time on Wing (ETOW) and overall aircraft readiness/availability, and reduce platform operating/life cycle costs.

Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM): RDT&E funding provides for upgrades and enhancements to the CV-22 navigation, flight management, and aircraft Identification Friend or Foe (IFF) systems that will bring the aircraft into compliance with Federal Aviation Administration (FAA) and international mandates and other technical guidance for access to, and operations within worldwide airspace.

Other/Future Capabilities: The V-22 Joint Program Office continually assesses user-specified requirements for improved operational safety, suitability, and mission effectiveness. Funding also provides for future modification planning, and for aircraft engineering changes/upgrades to address diminishing manufacturing source (DMS) and component obsolescence issues that adversely affect aircraft readiness and operational availability rates.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force	Date: February 2016
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

Unites States Special Operations Command (USSOCOM) and the Air Force (AF) jointly fund many CV-22 development projects. USSOCOM funds the development, integration, and testing of SOF-unique mission equipment and capabilities, while the AF funds service-common/basic air vehicle enhancements, CV-22 implementation, and testing of MV-22 configuration changes, the integration of Air Force and Navy maintenance and information systems used with the CV-22, and support for aircraft qualification and operational testing. USSOCOM and AF jointly fund corrective measures for identified aircraft deficiencies, and for Block 20 development. Block 20 Increments 1 and 3 were developed with AF funds, and Increment 2 was developed with USSOCOM funds.

This program is in Budget Activity 7, Operational Systems 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.

The FY2017 funding request was reduced by $0.667 million to account for the availability of prior year execution balances.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	38.719	36.576	17.369	0.000	17.369
Current President's Budget	37.698	27.776	16.702	0.000	16.702
Total Adjustments	-1.021	-8.800	-0.667	0.000	-0.667
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-8.800			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.021	0.000			
• Other Adjustments	0.000	0.000	-0.667	0.000	-0.667

Change Summary Explanation

FY15: The FY2015 funding was reduced by $1.021 million for Small Business Innovative Research.

FY16: The FY2016 funding was reduced by $8.8 million due to a Congressionally directed reduction for Improved inlet solution delay.

FY17: The FY2017 funding request was reduced by $0.667 million to account for the availability of prior year execution balances.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: CV-22 Block 20 RDT&E	15.113	0.000	0.000	0.000	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	

C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Description: Develop, test, and evaluate additional capabilities for the CV-22 aircraft. The V-22 Joint Program Office is developing improved operational safety, suitability, and effectiveness configuration changes. Block 20 development includes improved communications capabilities, aircraft software improvements, and other requirements specified in the V-22 Block C/20 CPD. ***FY 2015 Accomplishments:*** Conducted Beyond Line of Sight (BLOS) communications system ground and flight testing. Flight testing continues through 1Q/FY2017. ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** N/A ***FY 2017 OCO Plans:*** N/A					
Title: Enhanced Self-Deployment Capabilities ***Description:*** Incrementally develops capabilities to enhance self-deployment capabilities, such as improved ice protection, engine performance, engine infrared suppression, navigation, communications, and battle space awareness/networking capabilities; electronic warfare; weapons systems; defensive avionics systems; weight reduction initiatives; and changes to the underlying aircraft systems necessary to enable these capabilities. The enhanced self-deployment capabilities major thrust contains funding for initial risk reduction and trade studies that may impact other existing major thrusts, or result in new major thrusts. ***FY 2015 Accomplishments:*** Conducted risk reduction and assessment of emerging operational capability requirements and existing technologies/solutions. Conducted crew system design, developed display interface document, updated system interface control document, and conducted System Readiness Review (SRR) to incorporate a new Directional Infrared Countermeasure (DIRCM) signal processor and Advanced Threat Warning (ATW) missile warning sensors in response to requirements in a USSOCOM Joint Urgent Operational Need (JOUN). ***FY 2016 Plans:***	15.501	17.180	5.182	0.000	5.182

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	

C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Conduct risk reduction and assessment of emerging and existing technologies (e.g., weapon systems, improved engine performance, and weight reduction initiatives). Conduct design/development activities to integrate an Intelligence Broadcast Receiver (IBR) upgrade (obsolescence issue). Conduct preliminary design review (PDR) and critical design review (CDR) for ATW sensors; and conduct developmental test and evaluation (DT&E) and operational test and evaluation (OT&E). ***FY 2017 Base Plans:*** Conduct risk reduction and assessment of emerging and existing technologies. Continue design and development activities to integrate the IBR upgrade, and identify/assess potential solutions for an engine infrared suppression modification/redesign to improve maintainability and aircraft availability. ***FY 2017 OCO Plans:*** N/A					
Title: Improved Inlet Solution (IIS) ***Description:*** Provides for modifications to the CV-22 propulsion system to reduce sand/dust and other particulate matter ingestion, increase engine time on wing and overall aircraft readiness/availability rates, and reduce operations and support costs. This is Air Force Special Operations Command's #1 modification priority for the CV-22 weapon system. IIS is a joint V-22 effort being developed in conjunction with the Department of the Navy. ***FY 2015 Accomplishments:*** Continued design and development activities. Completed PDR and conducted CDR. Purchased instrumentation for flight test aircraft. ***FY 2016 Plans:*** Continue design and development. Conduct post-CDR development activities. Conduct wind tunnel icing testing, develop hardware for test aircraft, and develop/deliver Joint Avionics Software Suite (JASS) software for DT&E. ***FY 2017 Base Plans:*** Conduct Test Readiness Review (TRR), modify test aircraft, start DT&E, and assess aircraft software changes. ***FY 2017 OCO Plans:***	7.084	10.596	10.294	0.000	10.294

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force	Date: February 2016
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
N/A					
Title: Communication, Navigation, Surveillance / Air Traffic Management ***Description:*** Provides for improvements to current navigation, flight management, and IFF systems that will bring the CV-22 into compliance with U.S. and international mandates and other technical guidance for continued access to, and interoperability with worldwide airspace. CNS/ATM is a joint V-22 effort being developed in conjunction with the Department of the Navy. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Base Plans:*** Conduct JASS and display software development SRR. ***FY 2017 OCO Plans:*** N/A	0.000	0.000	1.226	0.000	1.226
Accomplishments/Planned Programs Subtotals	37.698	27.776	16.702	0.000	16.702

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDT&E,DW: BA07: PE 1160403BB: *Special Operations, Aviation Systems*	0.176	0.000	15.590	0.000	15.590	14.259	21.635	4.961	0.000	0.000	59.438
• PDW: BA02: Line Item Special Ope...: *CV-22 Modification*	21.578	33.582	19.008	0.000	19.008	34.878	23.124	21.336	21.763	337.937	2,103.126
• APAF: BA04: Line Item #V022A0: *CV-22 (MYP)*	15.000	64.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4,310.929
• APAF: BA05: Line Item #V02200: *CV-22 Mods*	74.874	58.603	63.395	0.000	63.395	65.892	68.843	70.825	72.131	345.301	890.270

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force	Date: February 2016
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• APAF: BA07; Line Item # C0V220: *CV-22 Post-Production Support*	16.931	3.353	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.284
• RDT&E,N: BA05: PE 0604262N: *V-22A*	50.188	76.483	174.423	0.000	174.423	145.342	97.583	64.184	67.500	209.793	9,963.512

Remarks

In addition to the funding identified in the table above, prior year funding includes $520.411 in RDT&E, DW, BA07, PE 1160421BB: Special Operations, CV-22 Development, and $413.235M in RDT&E, AF, BA05, PE 0401318F: CV-22

E. Acquisition Strategy

The V-22 Joint Program Office (Naval Air Systems Command (NAVAIRSYSCOM), PMA-275) is developing new capabilities for the V-22 in block increments. Block 0 and Block 10 have been developed & fielded, and Block 20 development is scheduled to complete 31 Dec 2016.
--Improved Inlet Solution: NAVAIRSYSCOM awarded a cost plus fixed fee contract for IIS development and test in June 2014 with BA05 funds. After FY14, BA07 funds continue this effort. The FY2017 plan is to add incremental funding to the established contract.
--CNS/ATM: Development will be contracted with Raytheon and Bell-Boeing. The Raytheon effort will be contracted sole source on a delivery order to an existing Indefinite Delivery Indefinite Quantity (IDIQ) contract. The Bell-Boeing effort will be contracted sole source on a delivery order to an existing basic ordering agreement (BOA).
--Enhanced Self-Deployment Capabilities: The FY2017 plan is to order studies and analyses sole source from Bell-Boeing on an established BOA.

Development activities for the V-22 program are performed primarily by the prime contractor, Bell-Boeing, selected on a sole-source basis. Bell-Boeing is a strategic partnership between Bell Helicopter and Boeing Integrated Defense Systems. Efforts are underway to increase competition where feasible, depending primarily on the level of platform integration required.

F. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Block 20 Development	SS/CPFF	Bell Boeing : Amarillo, TX	0.000	6.905	Apr 2015	0.000		0.000		0.000		0.000	0.000	6.905	162.279
CV-22 Osprey Enhanced Self-deployment Capability	Various	Various : Various	0.000	15.501	Sep 2015	16.970	Mar 2016	2.000	Mar 2017	0.000		2.000	62.881	97.352	0.000
V-22 Osprey Improved Inlet Solution (IIS)	SS/CPFF	Bell Boeing : Amarillo, TX	0.000	7.084	May 2015	7.476	Mar 2016	10.294	Dec 2016	0.000		10.294	6.209	31.063	69.660
V-22 Osprey CNS/ATM	SS/CPFF	Various : Various	0.000	0.000		0.000		1.226	Mar 2017	0.000		1.226	18.774	20.000	TBD
		Subtotal	0.000	29.490		24.446		13.520		0.000		13.520	87.864	155.320	-

Remarks

Block 20 Development Target Value of Contract differs from total cost because most of the Block 20 development cost was funded in PE 0401318F, BA05. In addition, the SOF peculiar development efforts were funded by USSOCOM MFP-11 funding.

IIS Development Target Value of Contract differs from total cost because this is a joint development funded by Navy and Air Force. Navy funding for IIS is shown in RDT&E,N PE 0604262N budget exhibit.

Prior Years funding ($322.656M) was executed in PE 0401318F, BA05.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Engineering Technical Support	Various	Various : Various	0.000	1.728	Apr 2015	2.100	Dec 2015	1.835	Mar 2017	0.000		1.835	23.821	29.484	0.000
		Subtotal	0.000	1.728		2.100		1.835		0.000		1.835	23.821	29.484	0.000

Remarks

Prior Years Funding $40.454M was executed in PE 0401318F (BA05).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey Test & Evaluation Technical Support	Various	Various : Various	0.000	5.777	Nov 2014	1.027	Mar 2016	1.115	Dec 2016	0.000		1.115	15.622	23.541	0.000
		Subtotal	0.000	5.777		1.027		1.115		0.000		1.115	15.622	23.541	0.000

Remarks

Prior Years Funding $46.764M was executed in PE 0401318F (BA05).

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-22 Osprey PMA/Travel	Allot	AFLCMC/WIV : Patuxent River, MD	0.000	0.703	Nov 2014	0.203	Nov 2015	0.232	Nov 2016	0.000		0.232	10.495	11.633	-
		Subtotal	0.000	0.703		0.203		0.232		0.000		0.232	10.495	11.633	-

Remarks

Prior Years Funding $3.361M was executed in PE 0401318F (BA05).

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	37.698		27.776		16.702		0.000		16.702	137.802	219.978	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

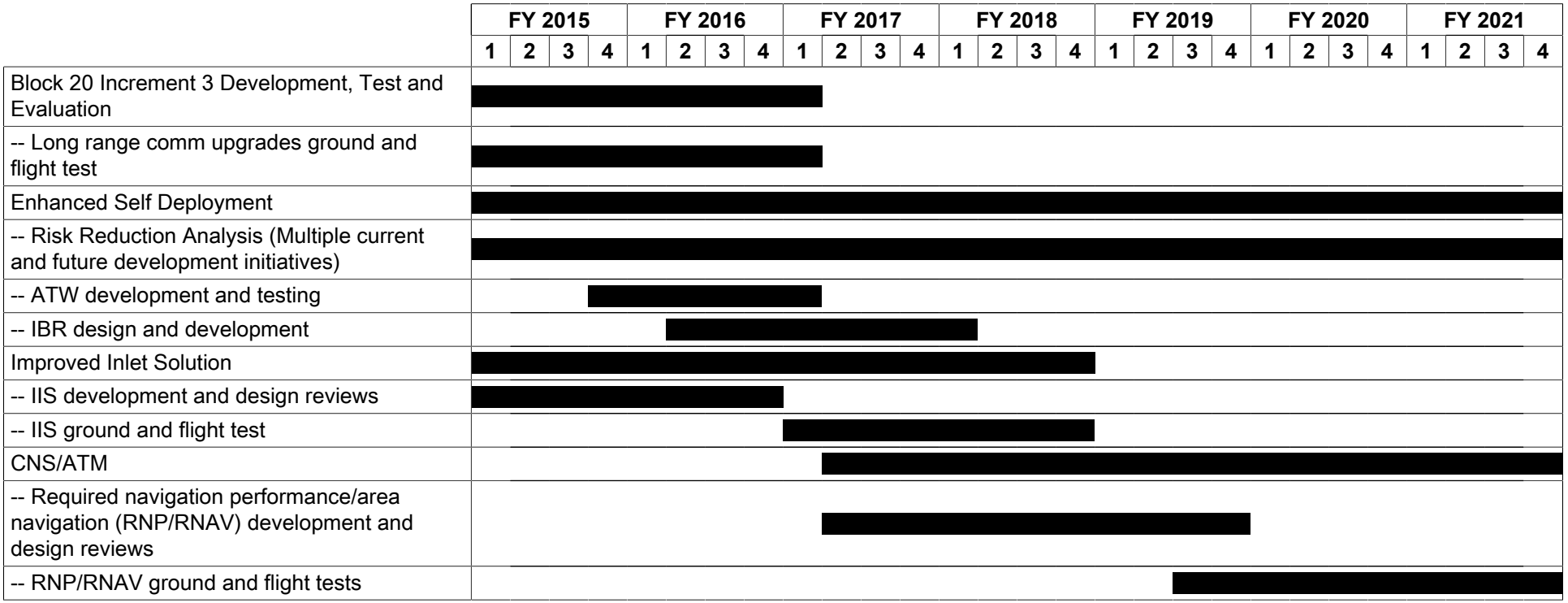

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0401318F / *CV-22*	**Project (Number/Name)** 676033 / *CV-22 RDT&E POST PRODUCTION*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Block 20 Increment 3 Development, Test and Evaluation	1	2015	1	2017
-- Long range comm upgrades ground and flight test	1	2015	1	2017
Enhanced Self Deployment	1	2015	4	2021
-- Risk Reduction Analysis (Multiple current and future development initiatives)	1	2015	4	2021
-- ATW development and testing	4	2015	1	2017
-- IBR design and development	2	2016	1	2018
Improved Inlet Solution	1	2015	4	2018
-- IIS development and design reviews	1	2015	4	2016
-- IIS ground and flight test	1	2017	4	2018
CNS/ATM	2	2017	4	2021
-- Required navigation performance/area navigation (RNP/RNAV) development and design reviews	2	2017	4	2019
-- RNP/RNAV ground and flight tests	3	2019	4	2021