Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force											Date: February 2018	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	-	17.732	6.306	6.271	0.000	6.271	6.452	6.565	6.701	6.822	Continuing	Continuing
673587: *Air Traffic Control Systems*	-	17.732	6.306	6.271	0.000	6.271	6.452	6.565	6.701	6.822	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

To support the Air Force worldwide flying mission, this program element funds research, development, and management of new air traffic control communications, surveillance, positioning, and precision approach and landing systems. When applicable, this includes joint efforts with the Federal Aviation Administration (FAA) and coordination with the International Civil Aviation Organization and the North Atlantic Treaty Organization. ATCALS development funding currently focuses on the Next Generation (NextGen) Air Transportation System (ATS), Air Traffic Control Future Technology (ATC), and Deployable Radar Approach Control (D-RAPCON) programs as described below.

NextGen ATS. This is the United States initiative for the transformation of the National Airspace System (NAS) over the next 20-30 years to enhance safety, security, efficiency, affordability and capacity, meeting the requirements of all users of the NAS. This interagency effort is designed to enable the transition from a ground infrastructure dominated Air Traffic Management capability to a capability that leverages advances in aircraft Performance Based Navigation (PBN), non-radar based surveillance services, and transition from solid-state analog voice communications to networked digital voice and data exchange. Per Deputy Secretary of Defense Direction (28 Dec 07 Memo), the Air Force is the Department of Defense (DoD) lead Service for NextGen ATS implementation and architecture development. NextGen ATS will be built on key elements from existing programs and technologies and on new systems under development. As these technologies and architectures mature, ground system upgrades will be coordinated and fielded concurrently with aircraft avionics capabilities that are acquired and integrated into Air Force aircraft (manned and unmanned). These efforts will involve aircraft avionics as well as fixed based and deployable air traffic control and landing systems. FY19 efforts will continue to use the Lead Service Office (LSO) process to continue enabling Unmanned Aircraft System (UAS) access to the National Airspace (NAS), develop a NextGen ATS DoD Strategic Roadmap, Consolidated Avionics Repository, add new capabilities to Notice to Airmen (NOTAMs) software, and outline DoD and Air Force equities and requirements via in-depth analysis of FAA NextGen ATS programs and timelines. Portfolio analysis will be captured in DoD NextGen ATS charters to guide Services through a broad and complex NextGen ATS environment. To minimize integration costs, the LSO will work with other organizations such as the Aerospace Management Systems Division, across the Air Force and the DoD, to adopt a common framework with practical guidelines to evaluate the validity of NextGen ATS initiatives with the Air Force's mission. These efforts support the development of operational strategies that realize the achievement of valid NextGen ATS initiatives in concert with acquisition strategies in integrated avionics advances for systems such as Mode 5 Identification Friend or Foe (IFF), Global Positioning System (GPS) Military (M)-Code, Automatic Dependent Surveillance-Broadcast (ADS-B), Data Communications (Data Comm), and PBN. In support of (UAS) operations, FY19 program office efforts will also continue to support requests for implementation of Ground Based Sense and Avoid (GBSAA) at new locations which will allow UAS integration into the National Airspace System (NAS) without the use of ground observers or chase aircraft. In FY19, the Air Force Flight Standards Agency (AFFSA) will continue NextGen ATS strategic planning efforts, conduct lead service operational test and evaluation as required, and also examine new civil air traffic control and landing system technologies that may have military utility to include an Early Operational Assessment (EOA) of Remote Virtual ATC Tower System technology. In total, these efforts will focus on

enabling DoD aircraft to take advantage of NextGen ATS envisioned efficiencies, developing policies/procedures to reduce costs while ensuring airspace access, seamlessly integrating UASs into the NAS and international airspaces, improving the display of aircraft position to air traffic controllers, determining future requirements for digital communications with manned and unmanned aircraft, and enhancing flight safety.

Deployable Radar Approach Control (D-RAPCON). D-RAPCON will replace the 40 year old Air National Guard (ANG) AN/MPN-14K and Active Duty (AD) AN/TPN-19 Airport Surveillance Radar and Operations Shelter subsystems with state-of-the-art digital systems. Due to diminishing manufacturing sources, modification and overhaul of the existing systems has proven to be ineffective. On average, due to systemic equipment failures, no more than four of the existing 14 systems are deployable at any given time and none are fully mission capable. The current AN/TPN-19 (4 systems) and AN/MPN-14K (10 systems) operational availability rates are 25% and 60% respectively versus a requirement of D-RAPCON of 98%. D-RAPCON will provide aircraft surveillance/sequencing, air traffic control communications, automation capabilities for terminal area air traffic control operations, and Mode 5 Identification Friend or Foe and secure communication capabilities (a deferred key system attribute). D-RAPCON will also be deployed with a fixed base or deployable Instrument Landing System, a fixed or mobile control tower, and a fixed or mobile Tactical Air Navigation system to provide a complete air traffic control capability. D-RAPCON will support the full range of tactical military, worldwide humanitarian, and domestic disaster relief operations. The primary surveillance radar coverage (non-cooperative targets) extends out 60 nautical miles (nm) and the secondary surveillance radar coverage (cooperative targets) will increase from 120 nm to 200 nm. The D-RAPCON Capability Development Document was approved by the Air Force Requirements Oversight Council on 8 Feb 11. Related OPAF funds are in PE 0305114F Weapon System Code 833010.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the ATCALS weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

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 of subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	9.770	6.306	6.318	0.000	6.318
Current President's Budget	17.732	6.306	6.271	0.000	6.271
Total Adjustments	7.962	0.000	-0.047	0.000	-0.047
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	7.962	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-0.047	0.000	-0.047

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

Change Summary Explanation

FY17 Congressional add ($7.962M) is for Remote Virtual Air Traffic Control (ATC) Tower early operational assessment (EOA). The EOA will be conducted by the Air Force Flight Standards Agency (AFFSA).

C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NextGen ATS	12.982	6.306	6.271	-	6.271
Description: Includes efforts to implement NextGen ATS efficiencies and capabilities. Focus is on Automatic Dependent Surveillance Broadcast (ADS-B) integration risk reduction, seamless integration of Unmanned Aircraft Systems (UASs) into civil airspace, Lead Service Office(LSO)/HBA Joint Program Office (JPO) technical support/architecture development, development of NextGen ATS aircraft performance based navigation avionics roadmaps, a Consolidated Avionics Repository, surveillance radar/ADS-B integration/automation system upgrades, D-RAPCON Mode 5/Secure Communications integration analysis, Notice to Airmen software upgrades, and conduct of an Early Operational Assessment of Remote Virtual Air Traffic Control Tower technology. ***FY 2018 Plans:*** -Continue to execute analysis of NextGen ATS programs and capture results through charters and incorporate into NextGen ATS DoD Strategic Roadmap which will include the following tasks: -- Continue evaluation of solutions for Self-Contained Approaches. -- Continue evaluation of solutions for Alternative Positioning, Navigation, and Timing (APNT). -- Begin evaluation of Enhanced Flight Vision System solutions. -- Continue to advance electronic flight bag applications across all major commands. -- Continue to analyze FAA radar divestiture impacts and AF radar and FAA ADS-B coverage data for establishing a minimum operating network (MON). -- Continue to develop solutions/timeline to integrate Data Comm equipage into DoD fleet. -- Continue use of performance based navigation roadmap/charter and developed analytical methods to transition performance based navigation analysis to Air Mobility Command. -- Continue to support requests for implementation of UAS GBSAA capability at new locations. -- Continue to develop policy and strategy for UAS implementation in global civil and military airspace. -- Continue to support implementation of ADS-B Out through ATC accommodation procedures for DoD aircraft not equipped with ADS-B Out. -- Begin analysis on avionics security based on known threats. -- Continue development of the Consolidated Avionics Repository to track DoD Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) capabilities.					

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Begin D-RAPCON lead Service operational test and evaluation. - Begin development of Notice to Airmen (NOTAMs) software upgrades to enhance NOTAM creation and query applications. - Continue integration analysis of Mode 5 IFF/Secure Comm into D-RAPCON. - Using FY17 Congressional add funds, award a full and open competition contract to conduct and Early Operational Assessment of Remote Virtual Air Traffic Control Tower technology and potential to support AF flying/ATC missions in lieu of brick and mortar control towers. ***FY 2019 Base Plans:*** - Will continue to execute analysis of NextGen ATS programs and capture results through charters and incorporate into NextGen ATS DoD Strategic Roadmap which will include the following tasks: -- Will continue to advance Instrument Approach Operations. -- Will continue to investigate areas of optimized Flight Operations. -- Will continue to support implementation of ADS-B Out through ATC accommodation procedures for DoD aircraft not equipped with ADS-B Out. -- Will continue analysis on avionics security based on known threats. -- Will continue development of solutions to integrate Data Comm capability into DoD fleet. -- Will continue to advance electronic flight bag applications. -- Will continue to coordinate with interagency partners to promote UAS integration into civil airspace. - Will complete D-RAPCON lead Service operational test and evaluation. - Will continue development of Notice to Airmen (NOTAMs) software upgrades to enhance NOTAM creation and query applications. - Will continue integration analysis of Mode 5 IFF/Secure Comm into D-RAPCON. - Will begin Early Operational Assessment of a Remote Virtual Air Traffic Control Tower capability to assess ability to meet AF flying/ATC missions in lieu of brick and mortar control towers. - Will conduct analysis of options to develop Procedures for Air Navigation Service - Operations (Pans-Ops)Terminal Instrument procedures (TERPS) capability. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decreased due to inflation					
Title: D-RAPCON	4.750	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Effort supports D-RAPCON engineering, manufacturing, and development and government developmental and operational testing of one Pre-Production Unit (PPU) leading to Milestone C and production decisions in FY19. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	17.732	6.306	6.271	-	6.271

D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPAF 03 Line Item 833010: *Air Traffic Control and Landing Systems*	18.466	65.079	53.703	33.400	87.103	46.363	36.831	56.568	19.077	Continuing	Continuing
• OPAF 05 Line Item 861900: *Spares and Repair Parts*	1.009	1.294	0.932	0.000	0.932	0.950	3.120	4.798	1.613	Continuing	Continuing

Remarks

E. Acquisition Strategy

ATCALS is a basket program element with multiple programs in various stages of acquisition which provide the air traffic control infrastructure to support peacetime and wartime missions. The current acquisition strategy is focused on replacing 1960/70s era deployable and fixed based equipment with mature off-the-shelf technology with remote maintenance capability while also looking to the future under the NextGen ATS initiative.

Current contracting efforts include D-RAPCON development, GBSAA/NextGen ATS planning and implementation, and conduct of an Early Operational Assessment (EOA) of Remote Virtual ATC Control Tower technology. The contracting strategy for D-RAPCON development is based on award of a competitive fixed price incentive firm contract emphasizing off-the-shelf technology and maximizing the use of non-developmental items. The contract includes engineering, manufacturing, and development and test with follow-on production options. GBSAA and NextGen ATS Enterprise Architecture Implementation Tasks are being executed via Military Inter-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force	Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*

Departmental Purchase Requests, and Project Orders with various organizations (FAA, MITRE, Army, Air Force Research Laboratory, and Air Force Flight Standards Agency). The Remote Virtual ATC Control Tower EOA contract will be a full and open competition using Other Transaction Authority.

The Air Force Program Executive Officer (PEO) for Battle Management (BM) is the PEO for ATCALS. PEO/BM is also the delegated milestone decision authority for ATCALS. The Air Force Life Cycle Management Center Aerospace Management Systems Division (AFLCMC/HBA) is aligned under the PEO/BM and includes program management, contracts, logistics, and financial management support.

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 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NOTAM Software	C/FFP	TBD : TBD	-	-		0.418	Jun 2018	0.421	Nov 2018	-		0.421	Continuing	Continuing	-
D-RAPCON	C/FPIF	Raytheon : Marlborough, MA	-	1.710	Nov 2016	-		-		-		-	Continuing	Continuing	54.980
Remote Virtual ATC Control Tower EOA	C/FFP	TBD : TBD	-	4.500	Aug 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	6.210		0.418		0.421		-		0.421	Continuing	Continuing	N/A

Remarks

D-RAPCON total cost and target value of contract differ as target value of contract includes prior years costs and the total cost only includes FY16-FY18. Total cost with prior years does not differ from the contract target value.

FINANCIAL MANAGEMENT: D-RAPCON is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike traditional R&D programs, however, the D-RAPCON "Acquisition Phase" contract is a FPIF contract with progress payments. 20 percent of incurred costs are withheld until the end of the contract, when they are liquidated. Mandatory funding obligations and progress payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program health.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NextGen ATS LSO/JPO Enterprise Architecture Implementation Support	MIPR	FAA : Washington, DC	-	2.592	Mar 2017	2.583	Mar 2018	2.755	Mar 2019	-		2.755	Continuing	Continuing	-
NextGen ATS AFFSA Strategic Planning	WR	MITRE : Hanscom AFB, MA	-	0.650	Jan 2017	0.350	Jan 2018	0.350	Jan 2019	-		0.350	Continuing	Continuing	-
NextGen ATS Support Cost	WR	Various : Various	-	0.128	Feb 2017	0.088	Feb 2018	0.073	Feb 2019	-		0.073	Continuing	Continuing	-
NextGen ATS GBSAA Support	MIPR	Various : Various	-	0.200	May 2017	0.200	May 2018	-		-		-	Continuing	Continuing	-
D-RAPCON Support Cost	MIPR	Various : Various	-	0.740	Oct 2016	-		-		-		-	Continuing	Continuing	-
Remote Virtual ATC Control Tower Infrastructure	MIPR	Various : Various	-	3.450	May 2018	-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	7.760		3.221		3.178		-		3.178	Continuing	Continuing	N/A

Remarks

Various contract types, performing activity and city/states are result of the use of Military Interdepartmental Purchase Requests (MIPR), Work Request (WR), Purchase Requests (PR), Project Orders (PO), etc. that are sent to multiple agencies in support of some tasks.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NextGen ATS Surveillance Radar/Automation System Upgrades (Mode 5)	WR	Various : Various	-	1.250	Dec 2017	1.650	Nov 2017	1.650	Nov 2018	-		1.650	Continuing	Continuing	-
Remote Air Traffic Control Tower Capability EOA	WR	Various : Various	-	0.250	Apr 2017	0.767	Apr 2018	0.772	Apr 2019	-		0.772	Continuing	Continuing	-
D-RAPCON Operational Test & Evaluation (OT&E)	WR	Various : Various	-	-		0.250	Nov 2017	0.250	Nov 2018	-		0.250	Continuing	Continuing	-
Subtotal			-	1.500		2.667		2.672		-		2.672	Continuing	Continuing	N/A

Remarks

Various contract types, performing activity and city/states are result of the use of Military Interdepartmental Purchase Requests (MIPR), Work Request (WR), Purchase Requests (PR), Project Orders (PO), etc. that are sent to multiple agencies in support of some tasks.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA) - D-RAPCON	WR	Various : Bedford, MA	-	2.262	Oct 2016	-		-		-		-	Continuing	Continuing	-
Subtotal			-	2.262		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	Project (Number/Name) 673587 / *Air Traffic Control Systems*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

In FY18, PMA will be funded with Other Procurement Air Force (OPAF) funds.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	17.732		6.306		6.271		-		6.271	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

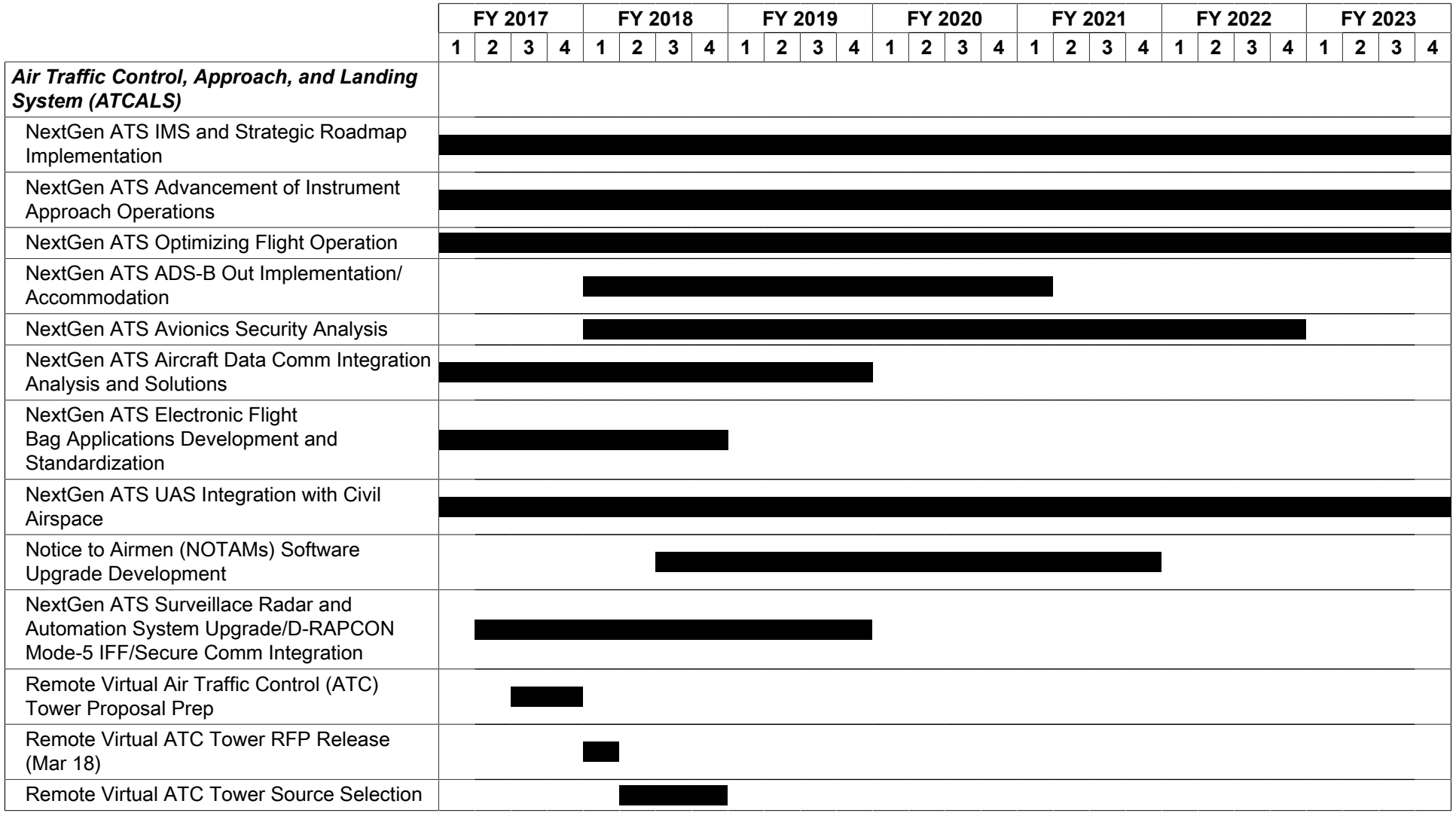

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

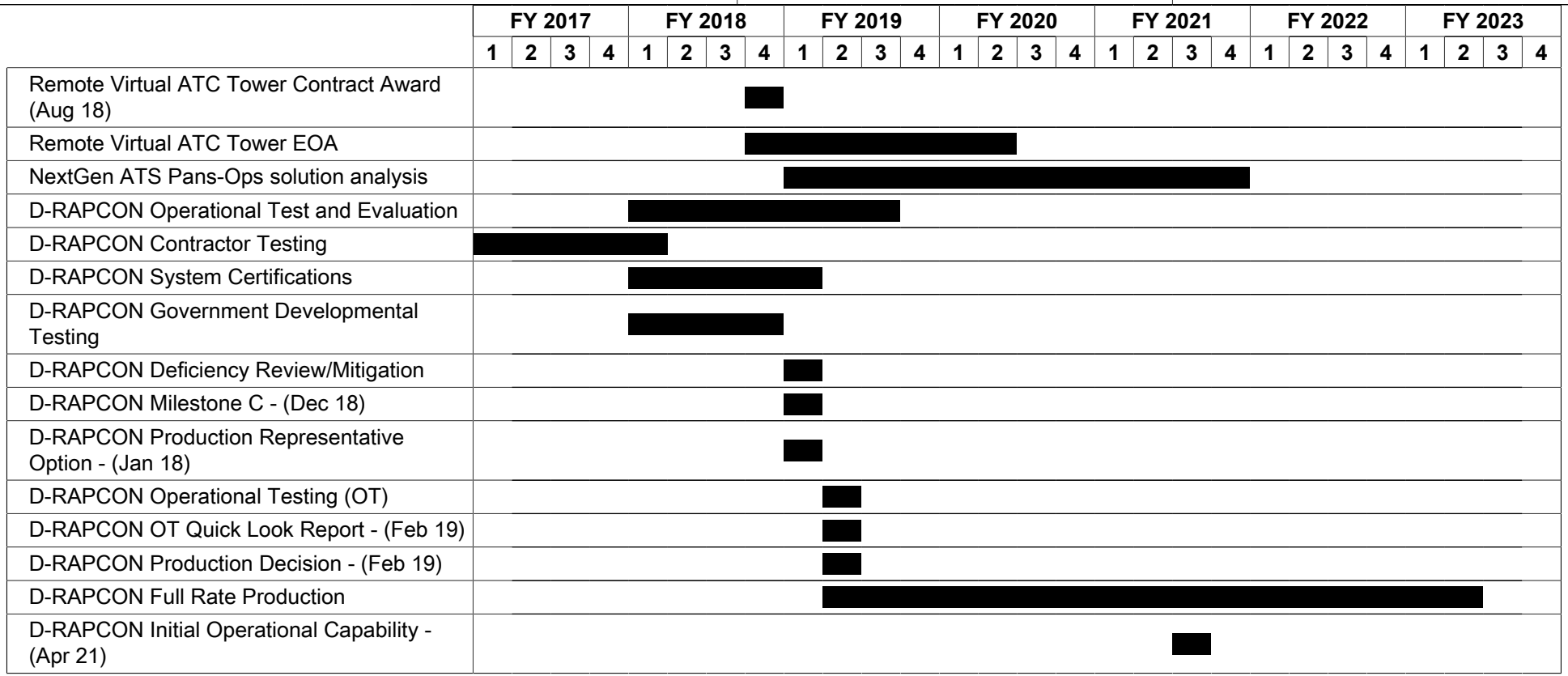

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Air Traffic Control, Approach, and Landing System (ATCALS)				
NextGen ATS IMS and Strategic Roadmap Implementation	1	2017	4	2023
NextGen ATS Advancement of Instrument Approach Operations	1	2017	4	2023
NextGen ATS Optimizing Flight Operation	1	2017	4	2023
NextGen ATS ADS-B Out Implementation/Accommodation	1	2018	1	2021
NextGen ATS Avionics Security Analysis	1	2018	4	2022
NextGen ATS Aircraft Data Comm Integration Analysis and Solutions	1	2017	4	2019
NextGen ATS Electronic Flight Bag Applications Development and Standardization	1	2017	4	2018
NextGen ATS UAS Integration with Civil Airspace	1	2017	4	2023
Notice to Airmen (NOTAMs) Software Upgrade Development	3	2018	4	2021
NextGen ATS Surveillace Radar and Automation System Upgrade/D-RAPCON Mode-5 IFF/Secure Comm Integration	2	2017	4	2019
Remote Virtual Air Traffic Control (ATC) Tower Proposal Prep	3	2017	4	2017
Remote Virtual ATC Tower RFP Release (Mar 18)	1	2018	1	2018
Remote Virtual ATC Tower Source Selection	2	2018	4	2018
Remote Virtual ATC Tower Contract Award (Aug 18)	4	2018	4	2018
Remote Virtual ATC Tower EOA	4	2018	2	2020
NextGen ATS Pans-Ops solution analysis	1	2019	4	2021
D-RAPCON Operational Test and Evaluation	1	2018	3	2019
D-RAPCON Contractor Testing	1	2017	1	2018
D-RAPCON System Certifications	1	2018	1	2019
D-RAPCON Government Developmental Testing	1	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0305114F / *Air Traffic Control, Approach, and Landing System (ATCALS)*	**Project (Number/Name)** 673587 / *Air Traffic Control Systems*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
D-RAPCON Deficiency Review/Mitigation	1	2019	1	2019
D-RAPCON Milestone C - (Dec 18)	1	2019	1	2019
D-RAPCON Production Representative Option - (Jan 18)	1	2019	1	2019
D-RAPCON Operational Testing (OT)	2	2019	2	2019
D-RAPCON OT Quick Look Report - (Feb 19)	2	2019	2	2019
D-RAPCON Production Decision - (Feb 19)	2	2019	2	2019
D-RAPCON Full Rate Production	2	2019	2	2023
D-RAPCON Initial Operational Capability - (Apr 21)	3	2021	3	2021