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 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1206442F / *Evolved SBIRS*							
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	-	0.000	71.018	643.126	0.000	643.126	936.450	1,503.891	2,257.813	2,014.802	Continuing	Continuing
657009: *Space Mod Initiative*	-	0.000	0.000	186.556	0.000	186.556	230.723	220.516	200.731	221.409	Continuing	Continuing
657106: *EVOLVED SBIRS*	-	0.000	71.018	257.865	0.000	257.865	181.468	145.843	270.514	300.058	Continuing	Continuing
657120: *Evolved SBIRS Space*	-	0.000	0.000	198.705	0.000	198.705	524.259	1,137.532	1,786.568	1,493.335	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** N42												

Note

Evolved SBIRS Ground and Space Modernization Initiative funds for FY 2019-2023 transferred from PE 1206441F to PE 1206442F. New Project 657120 Evolved SBIRS Space created within PE 1206442F for transparency between space and ground efforts.

A. Mission Description and Budget Item Justification

The Evolved Space Based Infrared System (SBIRS) RDT&E FY2019 budget justification exhibits describe the Next Generation Overhead Persistent Infrared (Next-Gen OPIR) Space, Ground, and Space Modernization Initiative (SMI) programs.

1. SMI (Project 657009: Space Mod Initiative): The primary objective is to enable and inform future decisions, and maintain and evolve a capable, resilient, and affordable OPIR architecture. This will be accomplished using maturing technologies and mitigating risk areas to modernize OPIR systems within the Department's constrained resources. SMI supports the SBIRS Program of Record (PoR) by assessing future parts and material obsolescence, designing future space and ground modifications focused on affordability and capability, and maximizing the effectiveness of existing system data products. SMI funds engineering activities to reduce both production and future system costs through manufacturing and producibility enhancements, and technology insertion. SMI will also mature potential technology upgrades at the component and system level for future space and ground architecture enhancements. SMI includes studies and risk reduction activities to evolve the current PoR constellation, reduce production timelines, and reduce recurring production costs. SMI activities are balanced and phased to enable an expanded trade space and improve the competitive environment. The three major thrust areas under SMI are Demonstrations, Technical Maturation and Data Exploitation. The Demonstrations mature and demonstrate technologies in ground and on-orbit prototypes, advance system performance and algorithms for tactical and strategic applications to enhance PoR capabilities and reduce program risks for future OPIR systems, whether new systems or evolutions of the current PoR. Technology Maturation assesses needs to support resiliency of PoR assets and future architectures to be responsive to the evolving threat environment. Data Exploitation enables access to OPIR data sources to expand technical intelligence and battlespace awareness processing and data dissemination tools to support warfighters and other data users.

2. Next-Gen OPIR-Ground (Project 657106: Evolved SBIRS): The Future Operational Resilient Ground Evolution (FORGE) will consist of Command and Control (C2) migration to Enterprise Ground Services (EGS), modernization of Mission Data Processing (MDP), and required development/upgrades to Remote Ground Stations (RGS) to meet the current and future space domain demands. The FORGE effort will implement an open framework for MDP and migration of C2 satellite operations

to integrate with EGS. FORGE and EGS efforts will provide the flexibility to integrate new MDP capabilities and more efficiently allow the system to meet evolving warfighter needs. The Next-Gen OPIR-Ground includes risk reduction efforts and cyber enhancements for the PoR and Next-Gen OPIR-Ground.

3. Next-Gen OPIR-Space (Project 657120: Evolved SBIRS Space): The primary mission is to provide initial missile warning of a ballistic missile attack on the US, its deployed forces and its allies. Next-Gen OPIR-Space enhances detection and improves reporting of intercontinental ballistic missile launches, submarine launched ballistic missile launches, and tactical ballistic missile launches. Development consists of the Next-Gen OPIR Polar and Geostationary Earth Orbit (GEO) satellites with new payloads in a highly resilient bus, providing real-time persistent global infrared coverage to meet the validated requirements based on Air Force Space Command (AFSPC) guidance on current and future space domain demands.

The current and future space domain demands that space systems be responsive to new and changing threats, and can rapidly integrate new capabilities to make our warfighting force more resilient in a contested battlespace. This agility, survivability, and rapid reconstitution must extend through the entire space warfighting enterprise, to include how we learn about the threat; develop solutions; acquire, test, deploy, train, operate and integrate new systems into the greater system of systems; and ensure our space mission force is ready to defeat a thinking adversary in a complex, multi-domain battlespace. The enterprise will use all of its elements to accelerate decision-making, prototype potential solutions, rapidly integrate decision-making tools and sustain a war-winning capability by delivering multi-domain effects in, from, and through space and cyberspace enabling battle management and resilience options to "fight through."

This program element may include necessary civilian pay expenses required to manage, execute, and deliver SMI and Next-Gen OPIR Ground and Space weapon system capabilities. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392F and 1206398F.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	71.018	5.766	0.000	5.766
Current President's Budget	0.000	71.018	643.126	0.000	643.126
Total Adjustments	0.000	0.000	637.360	0.000	637.360
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	637.360	0.000	637.360

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 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*

Change Summary Explanation

In FY2019 - FY2023 Evolved SBIRS Ground (Project 657106) and Space Modernization Initiative (Project 657009) funds transferred from PE 1206441F to PE 1206442F in order to isolate the SBIRS PoR development through completion, align SMI with future efforts, and merge Next-Gen OPIR Space and Ground funds in the same PE. A new Project 657120 (Evolved SBIRS Space) was created within PE 1206442F for transparency between Space and Ground efforts.

FY2019:
SMI: +$136.201M transferred from PE 1206441F, +$52.000M added for Demonstrations, and -$1.645M for inflation adjustment;
Next-Gen OPIR-Space: +$67.192M transferred from PE 1206441F, +$131.513M added for development;
Next-Gen OPIR-Ground: +$28.847M transferred from PE 1206441F, +$158.000M added for risk reduction activities and implementation of cyber modernization

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / *Evolved SBIRS*	Project (Number/Name) 657009 / *Space Mod Initiative*	

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
657009: *Space Mod Initiative*	-	0.000	0.000	186.556	0.000	186.556	230.723	220.516	200.731	221.409	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The primary objective of SMI is to enable and inform future decisions, and maintain and evolve a capable, resilient, and affordable OPIR architecture. This will be accomplished using maturing technologies and mitigating risk areas to modernize OPIR systems within the Department's constrained resources. SMI supports the SBIRS Program of Record (PoR) by assessing future parts and material obsolescence, designing future space and ground modifications focused on affordability and capability, and maximizing the effectiveness of existing system data products. SMI funds engineering activities to reduce both production and future system costs through manufacturing and producibility enhancements, and technology insertion. SMI will also mature potential technology upgrades at the component and system level for future space and ground architecture enhancements. SMI includes studies and risk reduction activities to evolve the current PoR constellation, reduce production timelines, and reduce recurring production costs. SMI activities are balanced and phased to enable an expanded trade space and improve the competitive environment. The three major thrust areas under SMI are Demonstrations, Technical Maturation and Data Exploitation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Demonstrations	-	-	69.082
Description: The Demonstrations mature and demonstrate OPIR technologies in ground and on-orbit prototypes, advance system performance, algorithms, and resiliency for future OPIR systems. The demonstrations explore technology maturation, qualification of new components, and subsystem/component prototyping to evolve the OPIR architecture. The demonstrations support maturation of MDP algorithms for tactical and strategic applications which are critical efforts to enhance PoR capabilities and to reduce program risks for future OPIR systems, whether new systems or evolutions of the PoR. The Wide Field Of View (WFOV) demonstration matures WFOV technology and validates multi-mission capabilities including the potential for a single sensor to simultaneously perform strategic and tactical missions. Collection of on-orbit WFOV data is critical to develop algorithms to process large data sets generated by emerging large format focal planes and to reduce risk for possible future architectures. The WFOV payload and bus are separate development efforts. The WFOV testbed program provides a bus capable of demonstrating on-orbit mission performance and mitigating the development risks for employing WFOV sensors. The testbed program includes contractual options to integrate, test, and launch prototype, developmental WFOV payloads with a government-owned free-flyer spacecraft or on a host government or commercially owned satellite. The WFOV Testbed will host the WFOV payload. As an integrated Space Vehicle, the WFOV system will prove on-orbit mission performance of WFOV sensors. The WFOV payload will provide the critical on-orbit data required to develop and validate WFOV algorithms, as well as on-board MDP throughput requirements for strategic missile warning.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657009 / *Space Mod Initiative*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
The technology demonstration space vehicles under development are responsive to emerging stressing targets to the current missile warning architecture, as well as the rapidly evolving threats to the enterprise to inform the future OPIR architecture to include SBIRS, the Missile Defense Agency (MDA), and other mission partners. The assets will be Class-C missions with a 3-5 year designed mission life and an initial launch capability beginning in 2024. The technology demonstrations will incorporate resiliency components and features while advancing the state of the art performance technology. The demonstrations will focus on the rapid acquisition, technology insertion, and launch of advanced missile warning technologies and system resiliency components. These assets will incorporate threat mitigation technologies and other resiliency features with the goal of demonstrating these technologies in ground and on-orbit. These demonstrations will facilitate tech insertion, validate technical performance, inform future OPIR requirements, and reduce technical risk to the enterprise. ***FY 2019 Plans:*** Complete support of WFOV Space Vehicle integration and test. Begin integrated WFOV Space Vehicle end-to-end test and maintenance. Continue Systems Engineering, Integration and Test (SEIT) activities, including inter-segment testing and Information Assurance accreditation approval. Begin launch service integration. Continue concept refinement of technology demonstration space vehicles, and hold design reviews. Select up to two contractors to develop a system level Critical Design Review (CDR) design, mature ground integration plan, begin development of engineering model for a resiliency ground demonstration in sensor test bed, and begin procuring long lead items. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2019 funds transferred from PE 1206441F.			
Title: Technology Maturation	-	-	57.631
Description: Assess technology needs to support resiliency of PoR assets and future architectures, that are responsive to the evolving threat environment. Perform trade and design studies to assess obsolescence, affordability, capability design modifications, and Concept of Operations (CONOPS) for the OPIR mission. Based on study outcomes, mature technologies and manufacturability to reduce cost, schedule, and technical risk for new component and subsystem designs that may be used in the future systems to include processors, algorithms, Focal Plane Arrays (FPA), optical filters, on-board processors, and other payload components for future missile warning satellites. Develop modeling and simulation (M&S) capabilities, and engineering model prototypes for hardware/software integration and testing to reduce risk and mature technologies applicable to future systems and architectures. Develop sensor ground test bed incorporating M&S software, breadboards/brassboards, test equipment, and data reduction software to provide an evaluation capability for prototype systems and hardware. The test bed will			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657009 / *Space Mod Initiative*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
validate requirements and ensure technical maturity for next-gen payload technologies as well as threat mitigation components and techniques. ***FY 2019 Plans:*** Continue prototyping resilient hardware and maturing critical technologies that include large format FPAs, resilient FPAs, resilient processing algorithms, pointing mirrors, threat warning sensors, and processors. Continue to develop technology options to address emerging threats and stressing targets to current and future OPIR systems. Continue to develop and space qualify emerging technologies to reduce risk for SBIRS and future OPIR programs. Continue to develop system resiliency and advanced technology concepts via ground and on-orbit demos in order to validate requirements, demonstrate performance, develop CONOPS, and prove enhanced system capabilities. Continue the integration of sensor test bed components and begin resiliency tests in sensor ground test bed. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2019 funds transferred from PE 1206441F.			
Title: Data Exploitation	-	-	59.843
Description: Exploit existing OPIR data sources (Defense Support Program (DSP), SBIRS Highly Elliptical Orbit (HEO), SBIRS GEO Scanner, SBIRS GEO Starer, Commercially Hosted Infrared Payload (CHIRP), and other classified sources) through data collection, processing, fusion, data dissemination, algorithm development and testing, network connectivity, and sensor performance assessments. SBIRS and other sensors provide a rich data set for exploitation. SMI data exploitation enables access to raw and processed data for data analysts and application developers to expand capabilities for battlespace awareness and other applications. SMI data exploitation efforts are complementary to, and enhance, the exploitation capabilities delivered by the PoR and inform future PoR exploitation efforts. SMI will develop tools and algorithms to enable users to apply OPIR data to support their mission needs. Data exploitation efforts also evaluate tools for C2, mission management, and MDP for risk reduction to evolve the PoR ground system to an open architecture that could support PoR and other future satellites and payload alternatives. SMI ground system development activities seek to demonstrate the performance of an evolved ground system architecture capable of supporting multi-satellite, multi-payload, multi-mission management and data processing for any infrared payload to achieve lower operating costs with enhanced net-centric and service oriented features along with a flexible expansion capability that was not designed into the current PoR ground system. ***FY 2019 Plans:*** Continue to provide enhanced ground segment capability and tools for C2, data collection, mission processing, and data dissemination to enhance mission resiliency and data exploitation of SBIRS and other OPIR data. Continue to collaborate with Intelligence Community (IC) and MDA to enhance Joint OPIR Ground (JOG) study initiatives. Complete building and expansion of data exploitation lab capability into its final location and support experimentation, technology maturity and evolution of exploitation algorithms. Continue development and expansion of a Battlespace Awareness real-time capability and center that will integrate			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657009 / *Space Mod Initiative*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
applications and services matured in the data exploitation government lab. Develop and demonstrate the performance of an evolved ground system architecture to support multi-satellite, multi-payload, multi-mission management and data processing for any infrared payload with enhanced net-centric and service oriented features along with a flexible expansion capability. Incorporate results from WFOV payload calibration into WFOV MDP software. Develop and test WFOV calibration algorithm. Begin preparation for WFOV on-orbit calibration support. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2019 funds transferred from PE 1206441F.			
Accomplishments/Planned Programs Subtotals	-	-	186.556

C. 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
• SPAF 01 Line 13: *MSSBIR: SBIR High (Space)*	355.114	1,113.429	138.397	-	138.397	136.552	113.065	8.188	8.340	Continuing	Continuing

Remarks

D. Acquisition Strategy

The program office will use a variety of acquisition approaches to execute various concept studies, technology maturation efforts, testbed/prototype demonstrations,and data exploitation initiatives and projects. The program office will collaborate with appropriate contracting agencies to support each individual effort. Data exploitation efforts in the laboratory and the Battlespace Awareness center will leverage existing external contracts, as well as new internal competitive contracts. Activities, such as SBIRS obsolescence and affordability enhancements to the existing satellite design, will leverage existing Program of Record contracts. Technology maturation and component prototyping and/or qualification could leverage existing contracts; in fact many are planned in collaboration with Air Force Research Lab (AFRL) and other government agencies. Where practical, other efforts could be competed. Federally Funded Research and Development Center (FFRDC) and Systems Engineering and Technical Assistance (SETA) contractors will also be used to conduct and support studies. New technology, replacement components, and system designs will be acquired with government data rights to the maximum extent to allow their incorporation into any future OPIR satellite production or system development. Contracting partnerships with other agencies will also be used to study, develop, demonstrate and prove emerging capabilities.

E. 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 / 5	R-1 Program Element (Number/Name) PE 1206442F / *Evolved SBIRS*	Project (Number/Name) 657009 / *Space Mod Initiative*	

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
Demonstrations	Various	Various : Various	-	-		-		53.915	Dec 2018	-		53.915	Continuing	Continuing	-
Technology Maturation	Various	Various : Various	-	-		-		57.631	Dec 2018	-		57.631	Continuing	Continuing	-
Data Exploitation	Various	Various : Various	-	-		-		59.843	Nov 2017	-		59.843	Continuing	Continuing	-
Enterprise SE&I	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
Enterprise Ground Services (EGS)	Various	MITRE Corp, NRL : Various	-	-		-		-		-		-	Continuing	Continuing	-
Technical Mission Analysis & Enterprise SE&I	RO	Aerospace : El Segundo, CA	-	-		-		4.126	Dec 2018	-		4.126	Continuing	Continuing	-
		Subtotal	-	-		-		175.515		-		175.515	Continuing	Continuing	N/A

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
FFRDC	Various	Various : Various	-	-		-		4.853	Oct 2018	-		4.853	Continuing	Continuing	4.583
A & AS	Various	Various : Various	-	-		-		1.757	Sep 2019	-		1.757	Continuing	Continuing	-
Other Support	Various	Various : Various	-	-		-		4.431	Oct 2018	-		4.431	Continuing	Continuing	-
		Subtotal	-	-		-		11.041		-		11.041	Continuing	Continuing	N/A

	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	-	-		0.000		186.556		-		186.556	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657009 / *Space Mod Initiative*

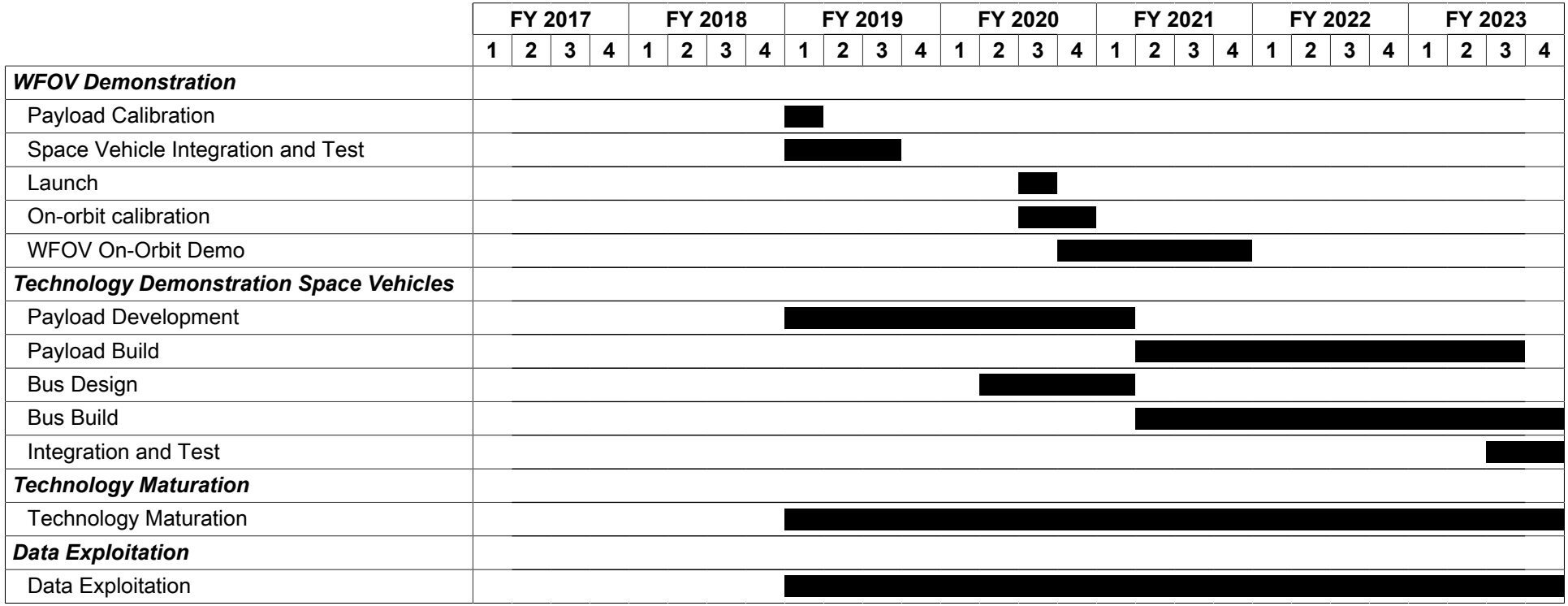

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657009 / *Space Mod Initiative*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
WFOV Demonstration				
Payload Calibration	1	2019	1	2019
Space Vehicle Integration and Test	1	2019	3	2019
Launch	3	2020	3	2020
On-orbit calibration	3	2020	4	2020
WFOV On-Orbit Demo	4	2020	4	2021
Technology Demonstration Space Vehicles				
Payload Development	1	2019	1	2021
Payload Build	2	2021	3	2023
Bus Design	2	2020	1	2021
Bus Build	2	2021	4	2023
Integration and Test	3	2023	4	2023
Technology Maturation				
Technology Maturation	1	2019	4	2023
Data Exploitation				
Data Exploitation	1	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / *Evolved SBIRS*	Project (Number/Name) 657106 / *EVOLVED SBIRS*	

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
657106: *EVOLVED SBIRS*	-	0.000	71.018	257.865	0.000	257.865	181.468	145.843	270.514	300.058	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: N42

A. Mission Description and Budget Item Justification

Next-Gen OPIR-Ground (Project 657106): The Future Operational Resilient Ground Evolution (FORGE) will consist of Command and Control (C2) migration to EGS, modernization of Mission Data Processing MDP, and required development/upgrades to Remote Ground Stations (RGS) to meet AFSPC guidance on the current and future space domain demands. The FORGE effort will implement an open framework for MDP and migration of C2 satellite operations to integrate with EGS. FORGE and EGS efforts will provide the flexibility to integrate new MDP capabilities and more efficiently allow the system to meet evolving warfighter needs. The Next-Gen OPIR ground includes risk reduction efforts to enable cyber enhancements for the PoR and Next-Gen OPIR ground systems. EGS infrastructure modernization efforts will introduce Telemetry, Tracking and Command (TT&C) systems and ground control automation.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Next-Gen OPIR - Ground	0.000	71.018	257.865
Description: Infrastructure modernization and implementation of a Government owned open framework for MDP and migration for C2 of satellite operations onto common platform.			
FY 2018 Plans: Begin infrastructure modernization of FORGE and EGS. The FORGE effort will implement a Government owned open framework for MDP and migrate C2 of satellite operations onto a common platform, EGS. FORGE and EGS platforms provide enhanced flexibility and scalability which will allow for more efficient integration of new mission data processing and C2 capabilities, standardized C2 interfaces across multiple space missions, a resilient cyber defense, and a system that is prepared to meet evolving user and warfighter needs. Begin risk reduction phase and engage industry in maturing payload design that meet new missile warning requirements balancing affordability, capability, and resiliency requirements. The risk reduction phase is intended to develop a Preliminary Design Review (PDR) level design, plan for integration onto EGS, perform ground-based demonstrations, and will reduce risk for optical resilience hardware, intrinsically-hardened FPAs, multispectral and resilient processing algorithms, affordable pointing mirrors and space processors. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. These activities may include, but are not limited studies, program office support, studies, technical analysis, prototyping, etc.			
FY 2019 Plans: Complete development of C2 capabilities and transition two SBIRS HEO payloads to EGS. Continue risk reduction phase of FORGE MDP with framework prototype and begin MDP application provider prototype. Initial demonstration of the framework prototype with subset of mission applications. These efforts provide initial open architecture capabilities, standardized interfaces			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657106 / *EVOLVED SBIRS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
across multiple space missions, a resilient cyber defense, and a system that is prepared to meet evolving user and warfighter needs. MDP which began in FY 2018 will ramp up starting in FY2019. Begin risk reduction efforts to modify current ground to enable Next-Gen OPIR system, accelerate FORGE activities, and implement cyber modernization for enterprise ground. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. These activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increased compared to FY 2018 by $186.847M. Justification for this increase is described in plans above.			
Accomplishments/Planned Programs Subtotals	0.000	71.018	257.865

C. 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
• RDTE 05 PE 1206441F: *Space Based Infrared System (SBIRS) High EMD*	-	16.547	-	-	-	-	-	-	-	0.000	16.547

Remarks

D. Acquisition Strategy

Utilize existing Space and Missile Systems Center (SMC) contracts to transition SBIRS C2 satellite operations to EGS. Compete a MDP framework provider and MDP applications. EGS infrastructure modernization and FORGE MDP will introduce competition into OPIR ground systems with an emphasis to on-ramp to EGS as soon as practical.

E. 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 / 5	R-1 Program Element (Number/Name) PE 1206442F / *Evolved SBIRS*	Project (Number/Name) 657106 / *EVOLVED SBIRS*	

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
Next-Gen OPIR-Ground	TBD	TBD : TBD	-	-		57.959	Mar 2018	232.290		-		232.290	Continuing	Continuing	-
Enterprise SE&I	C/CPAF	Analytical Sciences Corp. : Andover, MA	-	-		2.137	Dec 2017	8.346	Dec 2018	-		8.346	Continuing	Continuing	-
Technical Mission Analysis	Various	Aerospace Corporation : El Segundo, CA	-	-		4.369	Oct 2017	2.428	Oct 2018	-		2.428	Continuing	Continuing	-
		Subtotal	-	-		64.465		243.064		-		243.064	Continuing	Continuing	N/A

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
FFRDC	Various	Aerospace Corporation : El Segundo, CA	-	-		2.573	Oct 2017	1.430	Oct 2018	-		1.430	Continuing	Continuing	-
A&AS	Various	Various : Various	-	-		2.168	Dec 2017	7.976	Dec 2018	-		7.976	Continuing	Continuing	-
Other Support	Various	Various : Various	-	-		1.812	Oct 2017	5.395	Oct 2018	-		5.395	Continuing	Continuing	-
		Subtotal	-	-		6.553		14.801		-		14.801	Continuing	Continuing	N/A

	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
Project Cost Totals	-	-		71.018		257.865		-		257.865	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657106 / *EVOLVED SBIRS*

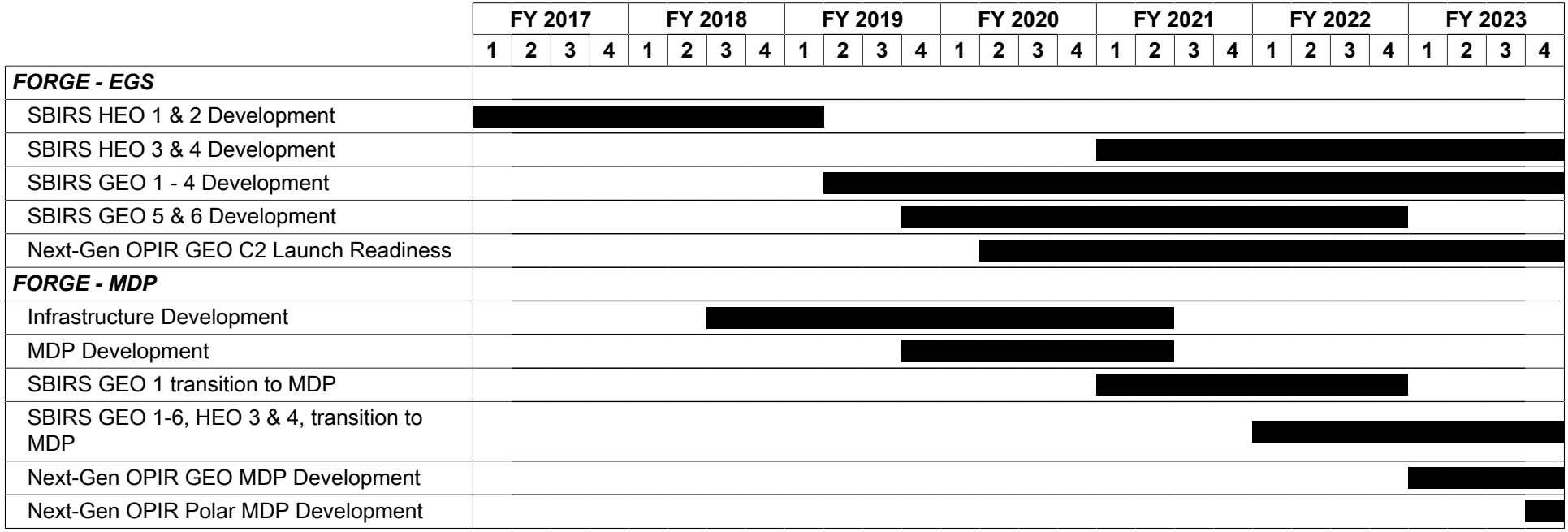

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657106 / *EVOLVED SBIRS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
FORGE - EGS				
SBIRS HEO 1 & 2 Development	1	2017	1	2019
SBIRS HEO 3 & 4 Development	1	2021	4	2023
SBIRS GEO 1 - 4 Development	2	2019	4	2023
SBIRS GEO 5 & 6 Development	4	2019	4	2022
Next-Gen OPIR GEO C2 Launch Readiness	2	2020	4	2023
FORGE - MDP				
Infrastructure Development	3	2018	2	2021
MDP Development	4	2019	2	2021
SBIRS GEO 1 transition to MDP	1	2021	4	2022
SBIRS GEO 1-6, HEO 3 & 4, transition to MDP	1	2022	4	2023
Next-Gen OPIR GEO MDP Development	1	2023	4	2023
Next-Gen OPIR Polar MDP Development	4	2023	4	2023

Note

Next-Gen GEO Launch Readiness, SBIRS GEO 2-6 HEO 3&4 transition to MDP, Next-Gen GEO 1-3 MDP Development, and Next-Gen Polar MDP Development are continuing past 2023.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / *Evolved SBIRS*	Project (Number/Name) 657120 / *Evolved SBIRS Space*	

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
657120: *Evolved SBIRS Space*	-	0.000	0.000	198.705	0.000	198.705	524.259	1,137.532	1,786.568	1,493.335	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Created new Project 657120 Evolved SBIRS Space for transparency between efforts.

A. Mission Description and Budget Item Justification

3. Next-Gen OPIR-Space (Project 657120): The primary mission is to provide initial missile warning of a ballistic missile attack on the US, its deployed forces and its allies. Next-Gen OPIR-Space enhances detection and improves reporting of intercontinental ballistic missile launches, submarine launched ballistic missile launches, and tactical ballistic missile launches. Development consists of the Next-Gen OPIR Polar and Geostationary Earth Orbit (GEO) missile warning satellites with new payloads in a highly resilient bus, providing real-time persistent global infrared coverage to meet validated requirements based on guidance from Air Force Space Command (AFSPC) on current and future space domain demands.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Next-Gen OPIR-Space	-	-	198.705
Description: Development of the Next-Gen OPIR Polar and Geostationary Earth Orbit (GEO) missile warning satellites with a proven bus, new hardened sensors, and auxiliary payloads for increased resilience. The space segment will consist of GEO and Polar satellites in a resilient architecture, providing real time persistent global infrared coverage. Note: FY2018 funding for Next-Gen OPIR-Space is included in Project 657106 in PEs 1206441F ($4.100M) and 1206442F ($8.050M). ***FY 2019 Plans:*** Acquire Next-Gen OPIR GEO and Polar satellites. Continue maturing payload design for satellite systems that meet new missile warning requirements balancing affability, capability, and resiliency requirements. Develop a PDR-level design and initiate detailed design in preparation for CDR, risk reduction and purchase of flight components. Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. These activities may include, but are not limited to studies, program office support, studies, technical analysis, prototyping etc. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increased compared to FY 2018 by $186.555M. FY2018 funds are in Project 657106 in PEs 1206441F and 1206442F.			
Accomplishments/Planned Programs Subtotals	-	-	198.705

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657120 / *Evolved SBIRS Space*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

OPIR Enterprise system acquisition will satisfy global strategic Missile Warning coverage for both the GEO and Polar orbits.

E. 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 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657120 / *Evolved SBIRS Space*

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
Next-Gen OPIR - Space	TBD	TBD: TBD : TBD	-	-		-		177.333		-		177.333	Continuing	Continuing	-
Enterprise SE&I	Various	Various : Various	-	-		-		7.120		-		7.120	Continuing	Continuing	-
Technical Mission Analysis	Various	Aerospace Corp. : El Segundo, CA	-	-		-		2.071		-		2.071	Continuing	Continuing	-
		Subtotal	-	-		-		186.524		-		186.524	Continuing	Continuing	N/A

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
FFRDC	Various	Aerospace Corp. : El Segundo, CA	-	-		-		1.220		-		1.220	Continuing	Continuing	-
A&AS	Various	Various : Various	-	-		-		6.804		-		6.804	Continuing	Continuing	-
Other Support	Various	Various : Various	-	-		-		4.157		-		4.157	Continuing	Continuing	-
		Subtotal	-	-		-		12.181		-		12.181	Continuing	Continuing	N/A

	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	-	-		0.000		198.705		-		198.705	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657120 / *Evolved SBIRS Space*

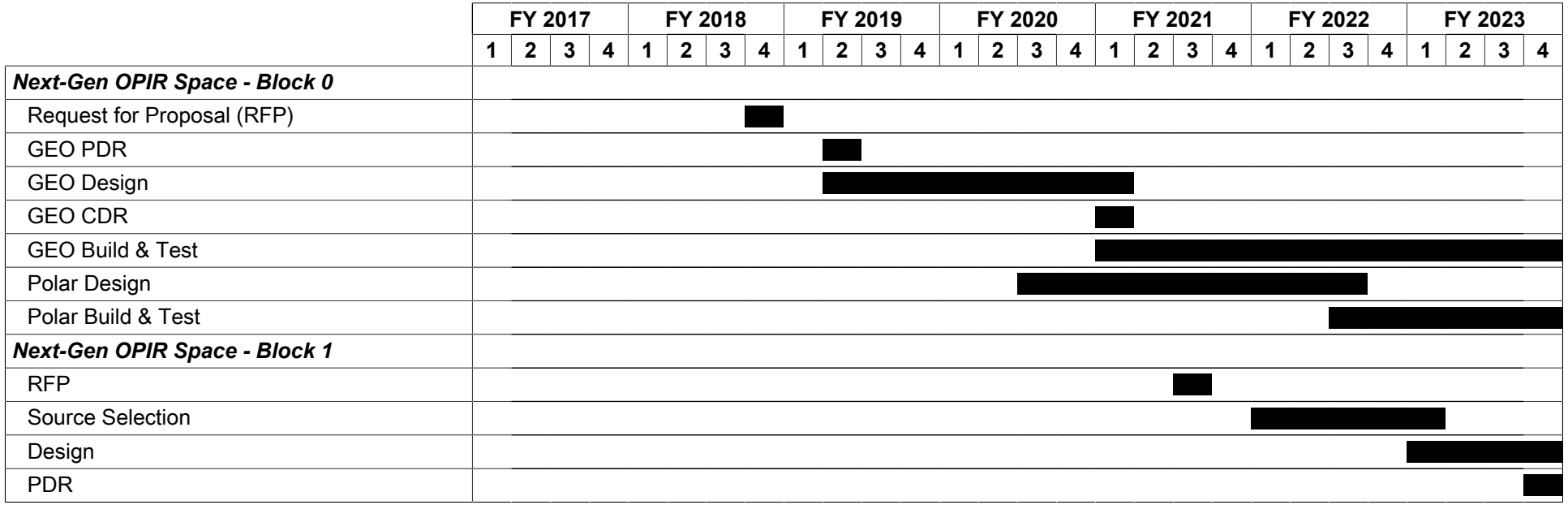

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 1206442F / *Evolved SBIRS*	**Project (Number/Name)** 657120 / *Evolved SBIRS Space*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Next-Gen OPIR Space - Block 0				
Request for Proposal (RFP)	4	2018	4	2018
GEO PDR	2	2019	2	2019
GEO Design	2	2019	1	2021
GEO CDR	1	2021	1	2021
GEO Build & Test	1	2021	4	2023
Polar Design	3	2020	3	2022
Polar Build & Test	3	2022	4	2023
Next-Gen OPIR Space - Block 1				
RFP	3	2021	3	2021
Source Selection	1	2022	1	2023
Design	1	2023	4	2023
PDR	4	2023	4	2023

Note

Next-Gen OPIR efforts continue past 2023.