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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	736.389	1,470.278	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
657009: <i>Space Mod Initiative</i>	-	152.432	205.723	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
657106: <i>Next-Gen OPIR Ground</i>	-	144.297	264.768	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
657120: <i>Next-Gen OPIR Space, Block 0 GEO</i>	-	403.481	892.383	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
657121: <i>Next-Gen OPIR Space, Block 0 Polar</i>	-	36.179	107.404	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206442F, Next Generation OPIR efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206442SF, Next Generation OPIR from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

The Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) RDT&E FY 2021 budget justification exhibits describe the Next-Gen OPIR Space, Ground, and Space Modernization Initiative (SMI) programs.

1. Next-Gen OPIR Space Modernization Initiative (SMI) (Project 657009): SMI supports Next-Gen OPIR by assessing and demonstrating new technologies better enabling the detection of emerging global missile threats, material obsolescence, designing 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 space and ground architecture enhancements. SMI includes studies and risk reduction activities to evolve the current Program of Record (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, Technology Maturation and Data Exploitation. The Demonstrations mature and demonstrate technologies with ground and on-orbit prototypes. Demonstrations advance system performance and algorithms for tactical and strategic applications to enhance PoR capabilities. Finally, demonstrations reduce program risks for future OPIR systems, whether new systems or evolutions of the current PoR. Technology Maturation assesses and addresses needs to support resiliency of PoR assets and future architectures that must respond to an 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): Next-Gen OPIR Ground, also known as Future Operationally Resilient Ground Evolution (FORGE), will consist of Command and Control (C2) migration to Air Force Space Command's (AFSPC) Enterprise Ground Services (EGS), modernization of Mission Data Processing (MDP) to implement an open framework, and required development and/or upgrades to Relay Ground Stations (RGS) to meet AFSPC guidance on the current and future space

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<p>domain demands. FORGE and EGS efforts combined will provide the flexibility and scalability to integrate new satellites, sensors and capabilities more rapidly and efficiently in order to meet evolving threats and warfighter needs. The Next-Gen OPIR ground efforts enable cyber enhancements for both space and ground systems. EGS will introduce common ground services such as Telemetry, Tracking and Command (TT&C), mission management, and automation. To support initial Next-Gen OPIR Space satellite launches without driving risks into the FORGE development schedule, the program will establish a risk reduction ground Next-Gen OPIR Interim Operations (NIO) capability based on a limited SBIRS Block 20 solution that can be utilized if FORGE becomes delayed.</p> <p>3. Next-Gen OPIR Space: Is a transition from the legacy SBIRS program. Next-Gen OPIR implements the direction of the Joint Requirements Oversight Council Memorandum (JROCM) 130-17, dated 21 December 2017, by developing the next generation of strategically survivable space-based missile warning OPIR platforms in both GEO and Polar orbits. This program will deliver improved core missile warning capabilities that are more survivable against emerging threats. The full Next-Gen OPIR constellation will consist of a minimum of GEO and Polar satellites in sufficient number to meet global warning coverage with no exploitable holes (5 GEO + 2 Polar) plus required backup and attrition and reconstitution reserve. The Air Force intends to acquire Next-Gen systems in block procurements. The Block 0 acquisition strategy consists of three GEO and two Polar satellites. The first GEO satellite is required no later than FY 2025 and the first Polar satellite is required in FY2027. All five Block 0 satellites need to be on orbit by FY2029. Follow-on blocks will be addressed in future acquisition strategies. Next-Gen OPIR Space, Block 0 Geosynchronous Earth Orbit (GEO)(NGG) (Project 657120): The Program Office intends to acquire the NGG capability in two contract actions. Phase 1 was awarded in August 2018 and encompasses requirements analysis, design/development, critical path flight hardware procurement, and risk reduction efforts leading to a System CDR. Phase 2 will be awarded in FY2021 for the manufacturing, assembly, system integration and test, launch and early on-orbit test through the delivery of NGG satellites 1-3 for operational acceptance of each space vehicle.</p> <p>Next-Gen OPIR Space, Block 0 Polar (NGP) (Project 657121): The Program Office intends to acquire the NGP capability in three contract actions. Phase 0 awarded in June 2018, encompassing system and payload requirements analysis and risk reduction efforts leading to a System Requirements Review. Phase 1 will be awarded for design and development, critical path flight hardware procurement, and risk reduction efforts leading to a System CDR. Phase 2 will be awarded for the manufacturing, assembly, integration and test, and delivery of NGP satellites 1&2.</p> <p>Next-Gen OPIR Space, Block 1 (Project 657122): The Air Force plans to acquire subsequent blocks in a competitive environment. The Block 1 satellites will be based on the Enterprise OPIR Capability Development Document (CDD), validated by the Joint Requirements Oversight Council (JROC) in May 2019. The Next Gen OPIR Block 1 program acquisition will begin in FY 2023 in time to deliver its first satellite by FY 2030.</p> <p>Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) is transforming the organization and implementation of space acquisition to an enterprise approach, maximizing innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver Next-Gen OPIR 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.</p>		

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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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	643.126	1,395.278	1,989.520	0.000	1,989.520
Current President's Budget	736.389	1,470.278	0.000	0.000	0.000
Total Adjustments	93.263	75.000	-1,989.520	0.000	-1,989.520
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	75.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	93.263	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-1,989.520	0.000	-1,989.520

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 657120: *Next-Gen OPIR Space, Block 0 GEO*

Congressional Add: *Congressional Add*

Congressional Add Subtotals for Project: 657120

Congressional Add Totals for all Projects

	FY 2019	FY 2020
	0.000	75.000
	0.000	75.000
	0.000	75.000

Change Summary Explanation

FY 2019: +\$93.263M to fund Next-Gen OPIR Space, Block 0 GEO to support 2025 launch timeline of first SV.

FY 2020: +\$75M Congressional plus-up to support Next-Gen OPIR Space, Block 0 GEO to support 2025 launch timeline of first SV.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>				Project (Number/Name) 657009 / <i>Space Mod Initiative</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
657009: <i>Space Mod Initiative</i>	-	152.432	205.723	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206442F, Next Generation OPIR efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206442SF, Next Generation OPIR from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

Next-Generation Overhead Persistent Infrared (OPIR) Space Modernization Initiative (SMI) (Project 657009): SMI supports Next-Gen OPIR by assessing and demonstrating new technologies to better enable detection of emerging global missile threats and awareness of material obsolescence. Additionally, SMI supports space and ground design efforts focused on delivering affordable capabilities, maximizing the effectiveness of existing system data products. SMI funds engineering activities to reduce both production and future system costs through manufacturing improvements, producibility enhancements, and technology insertion. SMI will also mature potential technology upgrades at the component and system level for space and ground architecture enhancements. SMI includes studies and risk reduction activities to evolve the current SBIRS Program of Record (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, Technology Maturation and Data Exploitation. The Demonstrations mature and demonstrate technologies with ground and on-orbit prototypes. Demonstrations advance system performance and algorithms for tactical and strategic applications to enhance PoR capabilities. Finally, demonstrations reduce program risks for future OPIR systems, whether new systems or evolutions of the current PoR. Technology Maturation assesses and addresses needs to support resiliency of PoR assets and future architectures that must respond to an evolving threat environment. Data Exploitation enables access to OPIR data sources to expand technical intelligence products, battlespace awareness processing, and data dissemination tools to support warfighters and other data users.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Demonstrations	105.600	113.838	0.000	-	0.000
Description: Demonstrations mature and demonstrate OPIR technologies with 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 Mission Data Processing (MDP) algorithms for tactical and strategic applications which are critical efforts to enhance PoR capabilities and to reduce program risks for future OPIR systems.					
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. WFOV is ready for launch in FY 2021. Collection of on-orbit WFOV data is critical to develop algorithms to					

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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>process large data sets generated by emerging large format focal planes and reduce risk for 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 will integrate, test, and launch a prototype WFOV payload with a government-owned free-flyer spacecraft. 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.</p> <p>The Block 1 Prototype (space vehicle) is under development and will be responsive to emerging missile types and threats to the current missile warning architecture as well as evolving threats to the enterprise. The Block 1 Prototype will inform future OPIR architecture to include those achieved by the Space Force, Missile Defense Agency (MDA), and other mission partners. The Block 1 Prototype has a Class-C mission assurance with a 3-5 year designed mission life. The Block 1 Prototype is targeting an initial launch capability beginning in 2025. The technology demonstrations will incorporate resiliency capabilities while advancing the state of the art performance technology. The demonstrations will focus on the rapid advancement, technology insertion, and launch of future generations of missile warning technologies. 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.</p> <p>FY 2020 Plans: Continue support of WFOV Space Vehicle maintenance and storage. Complete any remaining integrated WFOV Space Vehicle end-to-end test and maintenance. Continue Systems Engineering, Integration and Test (SEIT) activities including pre-launch preparations and mission operations planning. Finalize launch service integration campaign. Block 1 Prototype will hold a System Requirements Review and execute option for up to five contractors culminating in a tailored Preliminary Design Review (PDR). The Block 1 Prototype effort will continue to mature the ground integration plan. This will entail development of engineering models for resiliency ground demonstration in a sensor test bed and procurement of long lead items. Additionally, program office and other related support activities (studies, technical analysis, prototyping, etc.) will be continued.</p> <p>FY 2021 Base Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A					
<p>Title: Technology Maturation</p> <p>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 CONOPS for the OPIR mission. 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. Mature technologies including algorithms, Focal Plane Arrays (FPA), optical filters, on-board processors, auxiliary resiliency payloads, and other payload components for future missile warning satellites, and reconstitution capabilities. Develop modeling and simulation (M&S) capabilities, and engineering model prototypes for hardware/software integration and testing. These efforts will reduce risk and mature technologies applicable to future systems and architectures. Additionally, develop a 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 validate/verify requirements and ensure technical maturity for next-gen payload technologies as well as threat mitigation components and techniques.</p> <p>FY 2020 Plans: Continue prototyping resilient hardware and maturing critical technologies that include large format FPAs, resilient FPAs, resilient processing algorithms, pointing mirrors, threat sensors, and processors for earliest integration into Next-Gen OPIR or similar programs. 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 Next-Gen OPIR satellites. Continue to develop system resiliency and advanced technology concepts via ground and on-orbit demonstrations to validate performance, develop CONOPS, and prove enhanced system capabilities. Continue the integration of sensor test bed components and resiliency tests in sensor ground test bed. Begin maturation of sensor and bus modularity concepts.</p> <p>FY 2021 Base Plans: N/A</p> <p>FY 2021 OCO Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>	10.053	32.118	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force **Date:** February 2020

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A					
<p>Title: Data Exploitation</p> <p>Description: Data exploitation efforts will exploit existing OPIR data sources including Defense Support Program (DSP), SBIRS Highly Elliptical Orbit (HEO), SBIRS GEO Scanner, SBIRS GEO Starer, prototypes, and other sources. Efforts will exploit data through 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 prototypes. 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 to reduce risk. Data exploitation efforts evolve the PoR ground system to an open architecture that could support PoR and other future satellite alternatives. SMI ground system development activities seek to demonstrate the performance of an evolved ground system architecture capable of supporting multiple satellites, payloads, and missions through management and data processing. These efforts seek to lower operating costs with enhanced net-centric and service oriented features with a new flexible expansion capability. Data exploitation efforts support demonstration and prototype architecture planning and experimentation.</p> <p>FY 2020 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. Support experimentation, technology maturity, and evolution of exploitation algorithms. Continue development and expansion of a Battlespace Awareness real-time capability in the OPIR Battlespace Awareness Center (OBAC). Integrate applications and services matured in the data exploitation government lab. Continue to develop, expand, and manage the common open framework architecture of the data exploitation lab and real-time OBAC capability. Support development of experimental operations and additional uses of the program of record data in the OBAC. Develop prototype processes for managing an open framework architecture. Develop applications for the OBAC and transition those processes to Future Operationally Resilient Ground Evolution (FORGE). Develop and demonstrate the performance of a Government owned open and extensible evolved ground system architecture to support multiple satellites, payloads, and missions. Demonstrate data processing for any infrared payload with enhanced net-centric and service oriented features with a flexible expansion</p>	36.779	59.767	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
capability. Incorporate results from WFOV payload calibration into WFOV MDP software. Develop and test WFOV calibration algorithms and execute the WFOV on-orbit calibration. Support demonstration and prototype architecture planning and experimentation.					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	152.432	205.723	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• SPAF 01 Line 13: <i>MSSBIR: SBIR High (Space)</i>	108.397	233.952	-	-	-	-	-	-	-	-	Continuing Continuing
• RDTE 05 1206441F: <i>Space Based Infrared System (SBIRS) High EMD</i>	60.565	-	-	-	-	-	-	-	-	0.000	60.565

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. Broad Agency Announcements (BAAs) and Other Transaction Authorities are planned in collaboration with Air Force Research Lab (AFRL) and other government agencies. Where practical, other efforts are competed. An SMC BAA will be used to acquire and mature high priority technology items. Federally Funded Research and Development Center (FFRDC), University Affiliated Research Centers (UARCs), 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, allowing incorporation into future OPIR satellite production or system development. Contracting partnerships with other agencies will also be used to study, develop, demonstrate, and prove emerging capabilities. Funding in execution years will be

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
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realigned within the Next-Gen OPIR program element to respond to execution requirements. To accelerate contracting actions and program execution, a local SMC contract vehicle will be utilized for the OPIR Battlespace Awareness Center (OBAC) and government lab services.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / Next Generation OPIR	Project (Number/Name) 657009 / Space Mod Initiative
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Demonstrations	Various	Various : Various	-	67.451	Dec 2018	91.796	Jan 2020	0.000		-		0.000	Continuing	Continuing	-
Technology Maturation	Various	Various : Various	-	10.053	Jan 2019	32.118	Jan 2020	0.000		-		0.000	Continuing	Continuing	-
Data Exploitation	Various	Various : Various	-	36.779	Jan 2019	59.767	Jan 2020	0.000		-		0.000	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace : El Segundo, CA	-	8.493	Oct 2018	8.095	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	122.776		191.776		0.000		-		0.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
FFRDC	Various	Various : Various	-	4.565	Dec 2018	5.018	Dec 2019	0.000		-		0.000	Continuing	Continuing	-
A&AS	Various	Various : Various	-	3.820	Feb 2019	2.371	Jan 2020	0.000		-		0.000	Continuing	Continuing	-
Other Support	Various	Various : Various	-	21.271	Jan 2019	6.558	Jan 2020	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	29.656		13.947		0.000		-		0.000	Continuing	Continuing	N/A

Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
-	152.432	205.723	0.000	-	0.000	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force **Date:** February 2020

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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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

<i>Demonstrations - WFOV Testbed</i>	
Payload Calibration	
Space Vehicle Integration & Test	
<i>Demonstrations - Block 1 Prototype</i>	
Development	
<i>Technology Maturation</i>	
BAA White Papers & Proposed Review	
BAA Awards (annual calls)	
Architecture Studies	
Component design & test	
<i>Data Exploitation</i>	
BAA Follow-on	
Government Lab & OBAC Support Services	

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657009 / <i>Space Mod Initiative</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Demonstrations - WFOV Testbed</i>				
Payload Calibration	1	2019	3	2019
Space Vehicle Integration & Test	1	2019	3	2019
<i>Demonstrations - Block 1 Prototype</i>				
Development	3	2019	4	2020
<i>Technology Maturation</i>				
BAA White Papers & Proposed Review	1	2019	2	2019
BAA Awards (annual calls)	2	2020	4	2020
Architecture Studies	2	2020	3	2020
Component design & test	1	2019	4	2020
<i>Data Exploitation</i>				
BAA Follow-on	1	2019	4	2020
Government Lab & OBAC Support Services	4	2019	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>				Project (Number/Name) 657106 / <i>Next-Gen OPIR Ground</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
657106: <i>Next-Gen OPIR Ground</i>	-	144.297	264.768	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206442F, Next Generation OPIR efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206442SF, Next Generation OPIR from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

Next-Gen OPIR Ground (Project 657106): Next-Gen OPIR Ground, also known as Future Operationally Resilient Ground Evolution (FORGE), will consist of Command and Control (C2) migration to US Space Force (USSF) HQ's Enterprise Ground Services (EGS), modernization of Mission Data Processing (MDP) to implement an open framework, and required development and/or upgrades to Relay Ground Stations (RGS) to meet USSF HQ guidance on the current and future space domain demands. FORGE and EGS efforts combined will provide the flexibility and scalability to integrate new satellites, sensors and capabilities more rapidly and efficiently in order to meet evolving threats and warfighter needs. The Next-Gen OPIR ground efforts enable cyber enhancements for both space and ground systems. EGS will introduce common ground services such as Telemetry, Tracking, and Command (TT&C); mission management; and automation. To support initial Next-Gen OPIR Space satellite launches without driving risks into the FORGE development schedule, the program will establish a risk reduction ground Next-Gen OPIR Interim Operations (NIO) capability based on a limited Space Based Infrared System (SBIRS) Block 20 solution.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Next-Gen OPIR Ground	144.297	264.768	0.000	0.000	0.000
Description: Infrastructure modernization and implementation of a Government owned open framework for MDP, migration for C2 of satellite operations onto EGS, and required development and/or upgrades to Relay Ground Stations (RGS).					
FY 2020 Plans: Award competitive MDP Applications Provider (MDPAP) prototypes that will utilize the FORGE MDP Applications Framework (MDPAF). Downselect MDPAF prototype contractors and award a single Other Transaction (OT) development contract. Continue work on first Geosynchronous Earth Orbit (GEO) C2 transition to EGS. Continue work on Next-Gen GEO ground software development for integration into EGS and FORGE MDP. Assess need for continued development of Next-Gen Interim Operations (NIO) risk reduction effort. Continue accelerated FORGE activity for RGS design and build out. 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 2021 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657106 / <i>Next-Gen OPIR Ground</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A					
<i>FY 2021 OCO Plans:</i>					
N/A					
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i>					
N/A					
Accomplishments/Planned Programs Subtotals	144.297	264.768	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Next Gen OPIR Ground program has been declared a Section 804 Rapid Prototype effort under the 2016 National Defense Authorization Act (NDAA), effective December 2019. Up to this point, FORGE has utilized existing Space and Missile Systems Center (SMC) contracts to transition SBIRS C2 satellite operations to EGS. SMC intends to compete a MDP framework provider and MDP applications provider via Other Transaction Authority (OTA). 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. NIO is being acquired as part of the Next-Gen GEO Block 0 contract. RGS(s) will be developed utilizing a combination of existing and future contracts using competitive processes whenever possible.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / Next Generation OPIR	Project (Number/Name) 657106 / Next-Gen OPIR Ground
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Next-Gen OPIR Ground	Various	Various : Various	-	104.385	Oct 2018	224.998	Oct 2019	-		-		-	Continuing	Continuing	-
FORGE-EGS/C2	TBD	TBD : TBD	-	-		-		0.000		-		0.000	Continuing	Continuing	-
FORGE - MDP	TBD	TBD : TBD	-	-		-		0.000		-		0.000	Continuing	Continuing	-
Next Gen Interim Operations (NIO) (Risk Reduction Option)	TBD	TBD : TBD	-	-		-		0.000		-		0.000	Continuing	Continuing	-
Relay Ground Stations (RGS)	TBD	TBD : TBD	-	-		-		0.000		-		0.000	Continuing	Continuing	-
Enterprise SE&I	C/CPAF	Engility Corp. : Andover, MA	-	9.168	Nov 2018	6.000	Nov 2019	0.000		-		0.000	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corporation : El Segundo, CA	-	9.453	Jan 2019	8.306	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	123.006		239.304		0.000		-		0.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
FFRDC	RO	Aerospace Corporation : El Segundo, CA	-	3.113	Jan 2019	5.481	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
A&AS	Various	Various : Various	-	13.021	Feb 2019	14.688	Feb 2020	0.000		-		0.000	Continuing	Continuing	-
Other Support	Various	Various : Various	-	5.157		5.295	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	21.291		25.464		0.000		-		0.000	Continuing	Continuing	N/A

Project Cost Totals	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
	-	144.297	264.768	0.000	-	0.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force	Date: February 2020
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Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657106 / <i>Next-Gen OPIR Ground</i>
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	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
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Remarks	
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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657106 / <i>Next-Gen OPIR Ground</i>
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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

FORGE - EGS/C2	
SBIRS HEO 1 & 2 Development	
1 SBIRS GEO on EGS	
Next-Gen OPIR GEO	
FORGE - MDP	
Competitive Prototype Framework Development	
Next-Gen OPIR GEO MDP Development Sensor Specific Processing (SSP) and Verification & Validation (V&V)	
Competitive Prototype Applications Provider	
Follow-on Prototype Framework Development	
Next-Gen Interim Operations (NIO) (Risk Reduction Option)	
NIO Development	
Relay Ground Stations (RGS)	
RGS Development	

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657106 / <i>Next-Gen OPIR Ground</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>FORGE - EGS/C2</i>				
SBIRS HEO 1 & 2 Development	1	2019	2	2020
1 SBIRS GEO on EGS	3	2020	4	2020
Next-Gen OPIR GEO	1	2019	4	2020
<i>FORGE - MDP</i>				
Competitive Prototype Framework Development	1	2019	3	2020
Next-Gen OPIR GEO MDP Development Sensor Specific Processing (SSP) and Verification & Validation (V&V)	2	2019	4	2020
Competitive Prototype Applications Provider	3	2020	4	2020
Follow-on Prototype Framework Development	3	2020	4	2020
<i>Next-Gen Interim Operations (NIO) (Risk Reduction Option)</i>				
NIO Development	1	2019	4	2020
<i>Relay Ground Stations (RGS)</i>				
RGS Development	3	2020	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 1206442F / Next Generation OPIR				Project (Number/Name) 657120 / Next-Gen OPIR Space, Block 0 GEO			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
657120: Next-Gen OPIR Space, Block 0 GEO	-	403.481	892.383	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206442F, Next Generation OPIR efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206442SF, Next Generation OPIR from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) Space Block 0 Geosynchronous Earth Orbit (GEO) (Project 657120): The primary mission is to provide initial missile warning of a ballistic missile attack on the US, deployed forces and allies. The Next-Gen OPIR GEO (NGG) missile warning satellites enhance detection and improve reporting of intercontinental ballistic missile launches, submarine ballistic missile launches, and tactical ballistic missile launches. Development consists of new payloads in a highly resilient bus, providing real-time persistent global infrared coverage to meet validated Joint Requirements Oversight Council (JROC) requirements on current and future space domain demands.

The Program Office intends to acquire the NGG capability in two contract actions. Phase 1 awarded in August 2018 encompasses requirements analysis, design/development, critical path flight hardware procurement, and risk reduction efforts leading to a System Critical Design Review (CDR). Phase 2 will be awarded in FY 2021 for the manufacturing, assembly, system integration and test, launch, and early on-orbit test through operational acceptance of NGG satellites 1-3.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Next-Gen OPIR Space, Block 0 GEO	403.481	817.383	0.000	0.000	0.000
Description: Development of the Next-Gen OPIR GEO missile warning satellites with a proven bus, new hardened sensors, and auxiliary payloads for increased resilience. The space segment for GEO missile warning satellites consist of a resilient architecture providing real time persistent global equatorial infrared coverage. The first GEO satellite is required in FY 2025.					
FY 2020 Plans: Will continue to perform requirements analysis, design/development, critical path flight hardware procurement, and risk reduction efforts leading to a System CDR for GEO satellites. Continue maturing payload design and resiliency related re-design of the Lockheed Martin Space (LMS) A2100 Tech Refresh Space Vehicle (SV). Mature the Preliminary Design Review level design into a detailed design for a SV CDR and System CDR by FY2021. Reduce risks and purchase the remaining critical flight components. Rapidly respond to implement					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / Next Generation OPIR	Project (Number/Name) 657120 / Next-Gen OPIR Space, Block 0 GEO

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
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 2021 Base Plans: N/A FY 2021 OCO Plans: N/A FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	403.481	817.383	0.000	0.000	0.000

	FY 2019	FY 2020
Congressional Add: Congressional Add FY 2019 Accomplishments: N/A FY 2020 Plans: FY 2020 Congressional Add of \$75M supports Block 0 GEO effort to deliver first Satellite Vehicle by 2025. Specific efforts are provided in Next-Gen OPIR Space, Block 0 GEO Major Thrust.	0.000	75.000
Congressional Adds Subtotals	0.000	75.000

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
The Space Force intends to acquire Next-Gen systems in block developments to deliver the required constellation. The first block, Block 0, consists of 3 Next-Gen GEO and 2 Next-Gen Polar satellites. The Next-Gen OPIR Space program has been declared a Section 804 Rapid Prototype effort under the 2016 National Defense Authorization Act (NDAA). The first GEO satellite is required by FY 2025 and the first Polar satellite is required in FY 2027. All five Block 0 satellites need to be on orbit by FY 2029. The program office awarded two sole source contracts (one to a GEO prime and one to a Polar prime) under the authority of two Justification & Authorization documents. Next-Gen GEO Phase 1 was awarded in FY 2018, encompassing requirements analysis, design/development, critical path flight hardware procurement, and risk reduction efforts leading to a System Critical Design Review for SV #1. Next-Gen GEO Phase 2 will be awarded in FY 2021 as a modification to the Phase 1 contract. This will include material buys for SV #2 and #3, as well as complete the manufacturing, assembly, system integration and test, launch, and early on-orbit test through the delivery of GEOs 1-3 for operational acceptance of each space vehicle. The Space Force plans to acquire subsequent blocks in a competitive

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657120 / <i>Next-Gen OPIR Space, Block 0 GEO</i>

environment. The Block 1 satellites will be based on the Missile Warning and Missile Defense OPIR Capability Development Document (CDD), validated by the Joint Requirements Oversight Council (JROC) in May 2019. Funding in execution years will be realigned within the Next-Gen OPIR program element to respond to execution requirements.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force												Date: February 2020			
Appropriation/Budget Activity 3600 / 5						R-1 Program Element (Number/Name) PE 1206442F / Next Generation OPIR				Project (Number/Name) 657120 / Next-Gen OPIR Space, Block 0 GEO					
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Next-Gen OPIR Space, Block 0 GEO	SS/CPIF	Lockheed Martin : Sunnyvale, CA	-	372.272	Oct 2018	841.700	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Enterprise SE&I	C/CPAF	Engility Corp. : El Segundo, CA	-	5.672	Nov 2018	8.491	Nov 2019	0.000		-		0.000	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corp. : El Segundo, CA	-	7.695	Jan 2019	9.699	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	385.639		859.890		0.000		-		0.000	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	Aerospace Corp. : El Segundo, CA	-	2.534	Oct 2018	3.194	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
A&AS	Various	Various : Various	-	10.441	Feb 2019	12.374	Feb 2020	0.000		-		0.000	Continuing	Continuing	-
Other Support	Various	Various : Various	-	4.867	Oct 2018	16.925	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	17.842		32.493		0.000		-		0.000	Continuing	Continuing	N/A
Project Cost Totals			-	403.481		892.383		0.000		-		0.000	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657120 / <i>Next-Gen OPIR Space, Block 0 GEO</i>

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Phase 1																												
Bus Development																												
SRR																												
SV PDR																												
SV 1 Critical Path Flight Hardware																												
Payload Development																												
Payload PDR																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657120 / <i>Next-Gen OPIR Space, Block 0 GEO</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Phase 1				
Bus Development	1	2019	4	2020
SRR	2	2019	2	2019
SV PDR	4	2019	4	2019
SV 1 Critical Path Flight Hardware	1	2020	4	2020
Payload Development	1	2019	4	2020
Payload PDR	2	2020	2	2020

Note

Next-Gen OPIR Space, Block 0 GEO efforts continue past 2020.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 1206442F / Next Generation OPIR				Project (Number/Name) 657121 / Next-Gen OPIR Space, Block 0 Polar			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
657121: Next-Gen OPIR Space, Block 0 Polar	-	36.179	107.404	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206442F, Next Generation OPIR efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206442SF, Next Generation OPIR from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

Next-Generation Overhead Persistent Infrared (OPIR) Space, Block 0 Polar (NGP) (Project 657121): 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 missile warning satellites with new payloads in a highly resilient bus, providing real-time persistent global infrared coverage to meet validated Joint Requirements Oversight Council (JROC) requirements on current and future space domain demands.

The Program Office intends to acquire the NGP capability in three contract actions. Phase 0 awarded in June 2018, encompasses system requirements analysis and risk reduction efforts leading to a System Requirements Review (SRR). Phase 1 will be awarded for design and development, critical path flight hardware procurement, and risk reduction efforts leading to a System Critical Design Review (CDR). Phase 2 will be awarded for the manufacturing, assembly, integration and test, and early on-orbit test, through operational acceptance of NGP satellites 1 and 2.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: Next-Gen OPIR Space, Block 0 Polar	36.179	107.404	0.000	0.000	0.000
Description: Development of the Next-Gen OPIR Polar missile warning satellites using a proven bus with modifications, auxiliary payloads for improved resiliency, and new hardened sensors. The Polar space segment will consist of two Next-Gen OPIR Polar satellites in a resilient architecture, providing real time persistent infrared coverage of the northern hemisphere.					
FY 2020 Plans: Continue maturing payload and bus requirements for satellite systems that meet new missile warning requirements balancing affordability, capability, and resiliency requirements. Conduct SRR and begin preliminary design in preparation for Preliminary Design Review. Award follow-on contract for design, long lead parts procurement, development, and risk reduction efforts leading to system CDR. Rapidly respond to incorporate					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657121 / <i>Next-Gen OPIR Space, Block 0 Polar</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
system resiliency and situational awareness requirements 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 2021 Base Plans: N/A FY 2021 OCO Plans: N/A FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	36.179	107.404	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Space Force intends to acquire Next-Gen systems in block developments to deliver the required constellation. The first block, Block 0, consists of three Next-Gen Geosynchronous Earth Orbit (GEO) and two Next-Gen Polar satellites. The Next-Gen OPIR Space program has been declared a Section 804 Rapid Prototype effort under the 2016 National Defense Authorization Act (NDAA). The first GEO satellite is required by FY2025, and the first Polar satellite is required in FY2027. All five Block 0 satellites need to be on orbit by FY2029. The program office awarded two sole source contracts (one to a GEO prime and one to a Polar prime) under the authority of two Justification & Authorization documents. The Next-Gen Polar Phase 0 was awarded in FY 2018, consisting of requirements development and culminates in a FY 2020 SRR. Phase 1 will be awarded in FY 2020, encompassing requirements review, design, development, critical path flight hardware procurement, and risk reduction efforts leading to a System CDR for Next-Gen Polar Satellite Vehicles (SV) 1 and 2. Phase 2 will be awarded in FY 2022, encompassing build, integration, test, launch, and transition to operations for Next-Gen Polar SVs 1 and 2. The Space Force plans to acquire subsequent blocks in a competitive environment. The Block 1 satellites will be based on the Missile Warning and Missile Defense OPIR Capability Development Document (CDD), validated by the Joint Requirements Oversight Council (JROC) in May 2019. Funding in execution years will be realigned within the Next-Gen OPIR program element to respond to execution requirements.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force **Date:** February 2020

Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / Next Generation OPIR	Project (Number/Name) 657121 / Next-Gen OPIR Space, Block 0 Polar
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
Next-Gen OPIR Space, Block 0 Polar	SS/CPAF	Northrop Grumman : Redondo Beach, CA	-	25.710	Oct 2018	91.124	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Enterprise SE&I	C/CPAF	Engility Corp. : El Segundo, CA	-	1.441	Nov 2018	2.674	Nov 2019	0.000		-		0.000	Continuing	Continuing	-
Technical Mission Analysis	RO	Aerospace Corp. : El Segundo, CA	-	4.123	Jan 2019	4.718	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	31.274		98.516		0.000		-		0.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPAF	Not specified. : TBD	-	-		-		-		-		-	Continuing	Continuing	-
FFRDC	RO	Aerospace Corp. : El Segundo, CA	-	1.358	Oct 2018	1.554	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
A&AS	Various	Various : Various	-	2.335	Feb 2019	5.186	Feb 2020	0.000		-		0.000	Continuing	Continuing	-
Other Support	Various	Various : Various	-	1.212	Oct 2018	2.148	Oct 2019	0.000		-		0.000	Continuing	Continuing	-
Subtotal			-	4.905		8.888		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	36.179	107.404	0.000	-	0.000	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657121 / <i>Next-Gen OPIR Space, Block 0 Polar</i>

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Phase 0																												
Requirements Development & Analysis	████████████████																											
SRR						██																						
Phase 1																												
Phase 1 ATP						██																						
Payload & Bus Development							████████																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 1206442F / <i>Next Generation OPIR</i>	Project (Number/Name) 657121 / <i>Next-Gen OPIR Space, Block 0 Polar</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Phase 0				
Requirements Development & Analysis	1	2019	3	2020
SRR	2	2020	2	2020
Phase 1				
Phase 1 ATP	2	2020	2	2020
Payload & Bus Development	3	2020	4	2020

Note

Next-Gen OPIR Polar efforts continue past 2025