Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force											Date: February 2020	
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1203940SF / *Space Situation Awareness Operations*							
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	-	0.000	0.000	41.897	0.000	41.897	51.977	16.061	19.637	0.000	Continuing	Continuing
65A037: *Ground Based Optical Sensor System (GBOSS)*	-	0.000	0.000	41.897	0.000	41.897	51.977	16.061	19.637	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2021, PE 1203940F, Space Situation Awareness Operations, Project 65A037, Ground Based Optical Sensor System (GBOSS) efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1203940SF, Space Situation Awareness Operations, Project 65A037, Ground Based Optical Sensor System (GBOSS) from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

Space Situational Awareness (SSA) is knowledge of all aspects of space related to operations. As the foundation for space control, SSA encompasses surveillance of all space objects and activities; detailed surveillance of specific space assets; monitoring space environmental conditions; monitoring cooperative space assets; gathering indications and warning on adversary space operations; and conducting integrated command, control, communications, processing, analysis, dissemination, and archiving activities. This program element fields, upgrades, operationalizes, operates and maintains Space Force sensors and information integration capabilities within the SSA network while companion program element 1206425SF, Space Situational Awareness Systems, develops new network sensors and improved information integration capabilities across the network. Funds also support efforts such as engineering studies and analyses, architectural engineering studies, trade studies, technology needs forecasting, modernization initiatives, systems engineering, system development, and test & evaluation, and may include prototyping and technology demonstration. Activities funded in this program element (1203940SF) focus on surveillance of objects in earth orbit to aid tasks including satellite tracking; space object identification; tracking and cataloging; satellite attack warning; notification of satellite flyovers to U.S. forces; space treaty monitoring; and technical intelligence gathering.

The FY 2021 funding request was reduced by $13.784 million to account for the availability of prior year execution balances.

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 re-purpose capabilities.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Ground Based Optical Sensor System (GBOSS) capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force	Date: February 2020
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1203940SF *I Space Situation Awareness Operations*

This program is in Budget Activity 05, 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	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	41.897	0.000	41.897
Total Adjustments	0.000	0.000	41.897	0.000	41.897
• 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	41.897	0.000	41.897

Change Summary Explanation

FY 2021: +$41.897M; funds starting in FY 2021 were transferred from RDT&E, Air Force to RDT&E, Space Force.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Title: Ground Based Optical Sensor System (GBOSS)	0.000	0.000	41.897

Description: GBOSS provides global ground based optical sensor capability for Space Situational Awareness (SSA). GBOSS improves sensitivity, search rate, tracking of non-cooperative launches, precise tagging of clustered objects, and detection of closely spaced dim objects. This effort includes fielding GBOSS capabilities in optimal global locations, upgrading existing Ground-based Electro-Optical Deep Space Surveillance (GEODSS) sensors to improve sensitivity and search rates, and may acquire new advanced technology sensor(s) to improve global electro-optical sensor resilience and persistence. The effort will coordinate with Combined Space Operations Center (CSpOC), National Space Defense Center (NSDC), and National Air and Space Intelligence Center (NASIC) efforts to ensure enterprise data fusion and dissemination supporting Enterprise Space Battle Management Command, and Control (ESBMC2).

FY 2020 Plans:

N/A

FY 2021 Plans:

Complete GBOSS Technology Maturation and Risk Reduction (TMRR) and initiate Engineering Manufacturing Development (EMD). Complete design through Critical Design Review (CDR) (including System Requirements Review (SRR) and Preliminary

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Air Force	Date: February 2020
Appropriation/Budget Activity 3620F: *Research, Development, Test & Evaluation, Space Force I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 1203940SF *I Space Situation Awareness Operations*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021
Design Review (PDR). Initiate facility preparation for two overseas sites and for modifications to one US site. Post CDR, initiate software and hardware development. Rapidly respond and implement system resiliency and situational awareness necessary to operate in the contested space domain. RDT&E funding is required to support this transformation and enable Space Superiority end-to-end integration activities such as, but not limited to, program office support, studies, technical analysis, experimentation, prototyping, architectural development, systems engineering, demonstrations, testing, command and control integration, mission partner integration, and space test/combat range events. ***FY 2020 to FY 2021 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	0.000	0.000	41.897

D. Other Program Funding Summary ($ in Millions)

N/A

Remarks

E. Acquisition Strategy

Program established as an FY 2018 new start to address ground-based optical SSA gaps and shortfalls in supporting the Space Warfighting Construct (SWC). The acquisition strategy approved by AFPEO/SP in March 2018 accelerates the development and fielding of the solution, minimizing the time to address the requirements in light of current and emerging threats. Initial technology maturation and risk reduction will be executed using existing DoD, IC, and lab contracts. TMRR and EMD effort will be executed on a new contract awarded through full and open competition. The approved acquisition strategy supports fielding Initial Operational Capability (IOC) in the European theater in 2023 and Final Operational Capability (FOC) of the global capability in 2024.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force			Date: February 2020
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awareness Operations*	**Project (Number/Name)** 65A037 / *Ground Based Optical Sensor System (GBOSS)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS design, development and life extension	Various	Multiple : Colorado Springs, CO	-	-		-		30.565	Mar 2021	-		30.565	Continuing	Continuing	-
GBOSS Technical Mission Analysis	C/CPIF	NASA/JPL : Pasadena, CA	-	-		-		6.019	Nov 2020	-		6.019	Continuing	Continuing	-
		Subtotal	-	-		-		36.584		-		36.584	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Multiple: Various : Various	-	-		-		2.567	May 2021	-		2.567	Continuing	Continuing	-
FFRDC	Various	Multiple: Various : Various	-	-		-		2.696	Apr 2021	-		2.696	Continuing	Continuing	-
Other Support	C/CPAF	Various: Various : Various	-	-		-		0.050	Nov 2020	-		0.050	Continuing	Continuing	-
		Subtotal	-	-		-		5.313		-		5.313	Continuing	Continuing	N/A

	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		41.897		-		41.897	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awareness Operations*	**Project (Number/Name)** 65A037 / *Ground Based Optical Sensor System (GBOSS)*

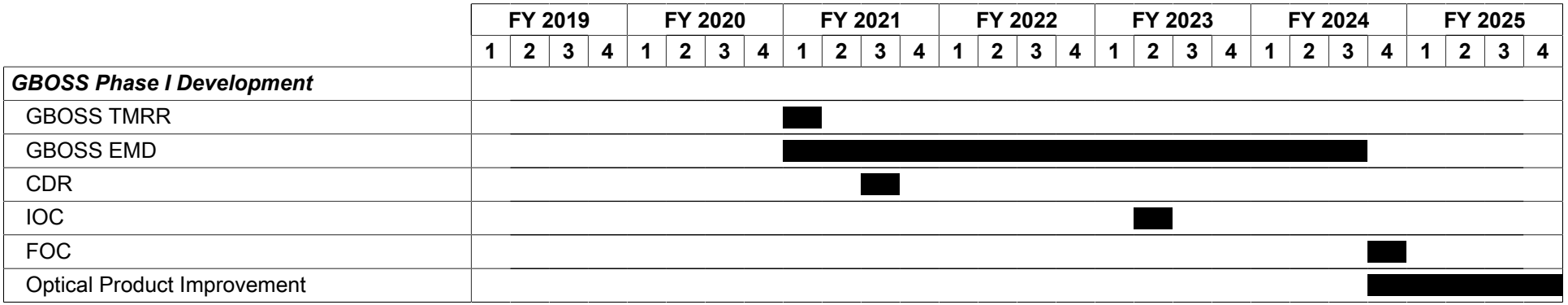

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3620F / 5	**R-1 Program Element (Number/Name)** PE 1203940SF / *Space Situation Awareness Operations*	**Project (Number/Name)** 65A037 / *Ground Based Optical Sensor System (GBOSS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GBOSS Phase I Development				
GBOSS TMRR	1	2021	1	2021
GBOSS EMD	1	2021	3	2024
CDR	3	2021	3	2021
IOC	2	2023	2	2023
FOC	4	2024	4	2024
Optical Product Improvement	4	2024	4	2025