Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force											Date: May 2017	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203173F / *Space and Missile Test and Evaluation Center*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	-	3.490	3.989	25.051	0.000	25.051	61.563	33.893	3.959	4.040	Continuing	Continuing
67A014: *R&D Space and Missile Operations*	-	3.490	3.989	25.051	0.000	25.051	61.563	33.893	3.959	4.040	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018, PE 0305173F, Space and Missile Test and Evaluation Center efforts were transferred to PE 1203173F, Space and Missile Test and Evaluation Center due to the creation of a new Major Force Program for Space. FY2016 and FY2017 funding is now documented in the exhibits for PE 1203173F.

A. Mission Description and Budget Item Justification

The Research and Development Space and Missile Operations (RDSMO) program, executed by the Advanced Systems and Development Directorate at Kirtland AFB, NM, conducts space and missile Research and Developmental Test and Evaluation (RDT&E) and Initial Operational Test and Evaluation (IOT&E) in support of experimental, demonstration, and operational satellites. The program develops, acquires, and operates satellite command and control (C2) and fixed/deployable telemetry, tracking, and commanding (TT&C) antenna systems in support of AF and DoD missions. The RDSMO program is responsible for the design, development, integration, testing, sustainment and operations of the Multi-Mission Satellite Operations Center (MMSOC) C2 systems installed in the RDT&E Support Complex (RSC) at Kirtland AFB, NM and Schriever AFB, CO.

In FY2018, this Program Element contains the Enterprise Ground Service (EGS) as part of the evolving Space Warfighter Construct (SWC) in response to the Space Enterprise Vision (SEV). MMSOC capability will transition to become the EGS C2 product line. The EGS C2 product line will perform technology maturation, experiments, prototyping and operational mission transition for increased commonality and resiliency in space program ground systems.

The main objective of the EGS is to provide a robust enterprise ground architecture for Air Force space systems. In FY 2018, EGS includes efforts such as systems engineering, integration and test efforts, standards and interface development, architecture development, enhanced cybersecurity development and implementation, prototype demonstrations, C2 data center development at three space operations sites and operational mission transition support.

The main objective of the MMSOC Development is to develop the capability to rapidly support R&D and operational systems and to transition R&D space vehicle technology with residual military utility to operational status for immediate warfighter support. MMSOC is a multiple mission operation system that uses standard software to (1) perform satellite C2 in support of launch requirements; (2) develop and test tactics, techniques, procedures and concepts to conduct satellite operations; (3) provide a satellite C2 incremental block evolution resource for RDT&E of new systems and concepts; and (4) deliver operational flexibility for new and currently flying assigned satellites. A secondary objective of MMSOC is to provide a foundational C2 platform and product line for the EGS effort to build upon and to meet the evolving initiatives of the SWC.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	3.152	3.989	3.955	0.000	3.955
Current President's Budget	3.490	3.989	25.051	0.000	25.051
Total Adjustments	0.338	0.000	21.096	0.000	21.096
• 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	0.338	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	21.096	0.000	21.096

Change Summary Explanation

FY 2018: $21.096M increase to fund the Enterprise Ground Service (EGS) in a single PE.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: MMSOC Development	3.490	3.589	4.026
Description: Multi-Mission Satellite Operations Center (MMSOC) development/integration/test.			
FY 2016 Accomplishments: Provided capability to AFSPC for reduced cost of operations through use of MMSOC architecture by delivering MMSOC 2.1 as the initial EGS C2 product line capability for AFSPC. Continued to support operations of multiple satellites and enhance automation capability. Continued program office support and related support activities such as, but not limited to, mission support, special studies, Systems Engineering and Technical Assistance (SETA), Federally Funded Research and Development Centers (FFRDC), etc.			
FY 2017 Plans: Continue providing C2 product line capability to AFSPC for reduced cost of operations and maintenance through evolution of MMSOC architecture and automated processes. Refine and continue to support operations of multiple satellites and enhance automation capability. Continue program office support and related support activities such as, but not limited to, mission support, special studies, SETA, FFRDC, etc.			
FY 2018 Plans: Continue providing capability to AFSPC for reduced cost of operations and maintenance through evolution of MMSOC C2 architecture and automated processes to support the objectives of the EGS and SWC. Refine and continue to support operations			

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
of multiple satellites and enhance automation capability. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc.			
Title: Enterprise Ground Services (EGS) ***Description:*** Enterprise Ground Services (EGS) is envisioned to provide a robust enterprise ground architecture for Air Force space systems, which leverages mission commonality and automation to reduce sustainment costs and re-focus manpower on warfighting capabilities. In addition, EGS will enable a near-real-time common operating picture of enterprise-wide tactical health, status, indications, and warnings for Air Force satellites. The end-state will be a modern technical infrastructure which is cyber-secure and resilient against the Advanced Persistent Threat and employs streamlined architecting, acquisition, and operational processes. Through early architecture studies and prototyping, the government will establish clear ownership of the technical baseline as the EGS effort evolves through development. This effort provides focus and expertise for the development, test, certification and enforcement of standards and interfaces for all AFSPC satellite ground systems to enable transition planning for legacy ground systems, new capability demonstrations, and systems acquisition leading to an enterprise ground architecture for Air Force space systems. ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** Continue to leverage the MMSOC C2 product line as a key enabler to evolve the EGS capability across the Command. Provide the initial C2 capability to support the Operationally Responsive Space (ORS) program at both RSC locations. ***FY 2018 Plans:*** Continue to develop the initial prototype capability for a robust enterprise ground architecture. Continue developing the programmatic, technical, and architectural roadmap to enable the phased transition of mission partners to EGS. EGS effort specifically includes development of the EGS C2 data center, prototype demonstrations with the Space Based Infrared System (SBIRS) Highly Elliptical Orbit (HEO) payloads 1-4, cybersecurity development and implementation, standards and interface development, integration and test of mission unique software, and integration of common applications and services. Continue program office and other related support activities that may include, but are not limited to studies, technical analysis, etc.	0.000	0.400	21.025
Accomplishments/Planned Programs Subtotals	3.490	3.989	25.051

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force	Date: May 2017
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D. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPAF BA03: 834010: *General Information Technology*	1.435	1.977	1.964	0.000	1.964	1.876	1.909	1.944	1.981	Continuing	Continuing

Remarks

Due to the creation of a new Major Force Program for Space, the OPAF funding listed above from FY 2016 to FY 2017 was originally budgeted in the PE 0305173F. Funding listed above for this effort from FY 2018 to FY 2022 is budgeted in PE 1203173F.

E. Acquisition Strategy

The Air Force uses the competitively awarded Engineering, Development, and Sustainment (EDS) Contract, managed by Space and Missile Systems Center (SMC), Advanced Systems and Development Directorate, to modernize and sustain MMSOC.

EGS leverages a multitude of contracts and other government agencies. Engineering and architecture support will be obtained from FFRDC (i.e. Aerospace and MITRE) and Air Force Space and Missile Systems Center competitively awarded SETA contracts. Developmental Test & Evaluation Support will be obtained from the 46 Test Squadron. Technology development and maturation will be obtained from Air Force Research Laboratory (AFRL) Small Business Innovative Research (SBIR) initiatives. Cybersecurity support will be obtained from Air Force Space Command 50th Space Wing, 50th Network Operations Group. Applications and services support will be obtained from external government agencies such as NASA Goddard Missions Services Evolution Center (GMSEC) and Naval Research Lab (NRL).

F. Performance Metrics

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

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space and Missile Operations*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering, Development, and Sustainment (EDS) Follow-on Contract (MMSOC)	C/CPAF	Lockheed Martin : Santa Maria, CA	-	1.147	Oct 2015	1.569	Oct 2016	1.200	Oct 2017	0.000		1.200	Continuing	Continuing	-
Naval Research Lab	MIPR	Naval Research Lab : Washington, DC	-	1.150	Oct 2015	0.750	Oct 2016	1.200	Oct 2017	0.000		1.200	Continuing	Continuing	-
Service Bus Architecture Standards	MIPR	NASA Goddard : Greenbelt, MD	-	0.000	Oct 2015	0.000	Oct 2016	0.050	Oct 2017	0.000		0.050	Continuing	Continuing	-
Information Assurance (MMSOC)	Various	Various : TBD	-	0.230	Oct 2015	0.115	Oct 2016	0.115	Oct 2017	0.000		0.115	Continuing	Continuing	-
Enterprise Ground Services (EGS)	Various	Various : TBD	-	0.000		0.400	Jan 2017	21.025	Oct 2017	0.000		21.025	Continuing	Continuing	-
		Subtotal	-	2.527		2.834		23.590		0.000		23.590	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test and Engineering Contract (STEC) (MMSOC)	C/CPAF	LINQUEST : Kirtland, AFB, NM	-	0.600	Oct 2015	0.496	Oct 2016	0.442	Oct 2017	0.000		0.442	Continuing	Continuing	-
		Subtotal	-	0.600		0.496		0.442		0.000		0.442	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 1203173F / *Space and Missile Test and Evaluation Center*	Project (Number/Name) 67A014 / *R&D Space and Missile Operations*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS	Various	Various : TBD	-	0.363	Oct 2015	0.659	Oct 2016	1.019	Oct 2017	0.000		1.019	Continuing	Continuing	-
		Subtotal	-	0.363		0.659		1.019		0.000		1.019	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.490		3.989		25.051		0.000		25.051	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space and Missile Operations*

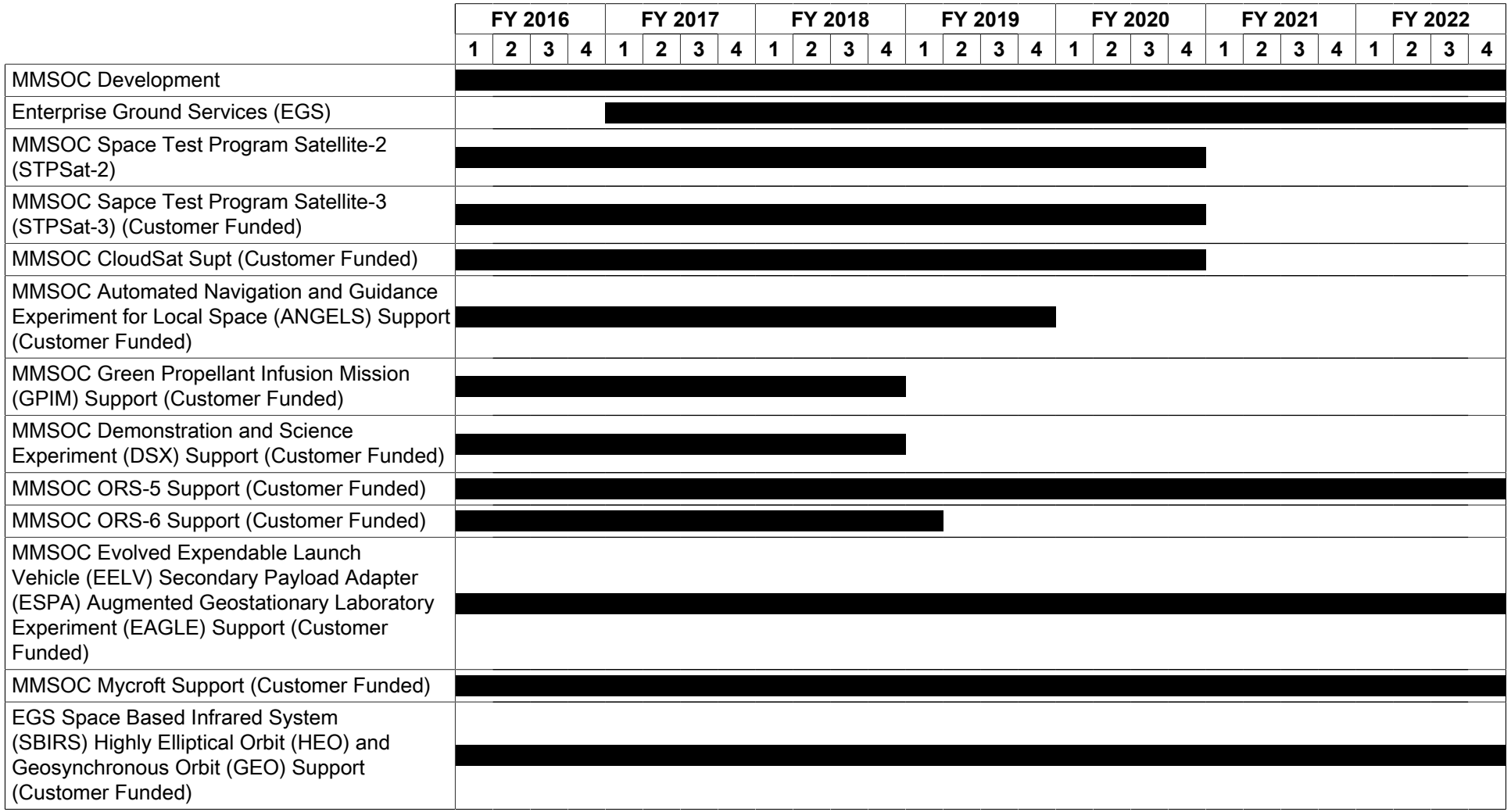

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space and Missile Operations*

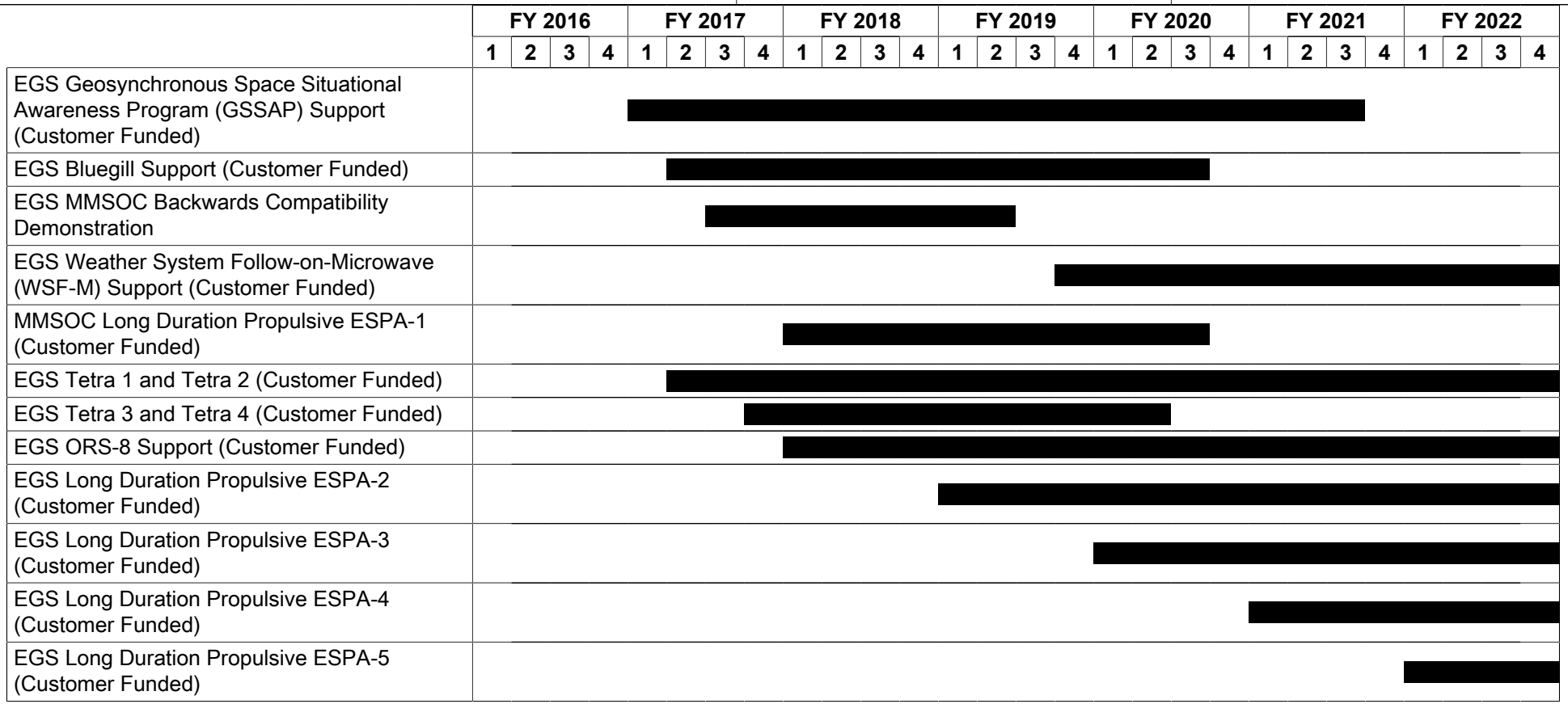

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space and Missile Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MMSOC Development	1	2016	4	2022
Enterprise Ground Services (EGS)	1	2017	4	2022
MMSOC Space Test Program Satellite-2 (STPSat-2)	1	2016	4	2020
MMSOC Sapce Test Program Satellite-3 (STPSat-3) (Customer Funded)	1	2016	4	2020
MMSOC CloudSat Supt (Customer Funded)	1	2016	4	2020
MMSOC Automated Navigation and Guidance Experiment for Local Space (ANGELS) Support (Customer Funded)	1	2016	4	2019
MMSOC Green Propellant Infusion Mission (GPIM) Support (Customer Funded)	1	2016	4	2018
MMSOC Demonstration and Science Experiment (DSX) Support (Customer Funded)	1	2016	4	2018
MMSOC ORS-5 Support (Customer Funded)	1	2016	4	2022
MMSOC ORS-6 Support (Customer Funded)	1	2016	1	2019
MMSOC Evolved Expendable Launch Vehicle (EELV) Secondary Payload Adapter (ESPA) Augmented Geostationary Laboratory Experiment (EAGLE) Support (Customer Funded)	1	2016	4	2022
MMSOC Mycroft Support (Customer Funded)	1	2016	4	2022
EGS Space Based Infrared System (SBIRS) Highly Elliptical Orbit (HEO) and Geosynchronous Orbit (GEO) Support (Customer Funded)	1	2016	4	2022
EGS Geosynchronous Space Situational Awareness Program (GSSAP) Support (Customer Funded)	1	2017	3	2021
EGS Bluegill Support (Customer Funded)	2	2017	3	2020
EGS MMSOC Backwards Compatibility Demonstration	3	2017	2	2019
EGS Weather System Follow-on-Microwave (WSF-M) Support (Customer Funded)	4	2019	4	2022
MMSOC Long Duration Propulsive ESPA-1 (Customer Funded)	1	2018	3	2020

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 1203173F / *Space and Missile Test and Evaluation Center*	**Project (Number/Name)** 67A014 / *R&D Space and Missile Operations*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
EGS Tetra 1 and Tetra 2 (Customer Funded)	2	2017	4	2022
EGS Tetra 3 and Tetra 4 (Customer Funded)	4	2017	2	2020
EGS ORS-8 Support (Customer Funded)	1	2018	4	2022
EGS Long Duration Propulsive ESPA-2 (Customer Funded)	1	2019	4	2022
EGS Long Duration Propulsive ESPA-3 (Customer Funded)	1	2020	4	2022
EGS Long Duration Propulsive ESPA-4 (Customer Funded)	1	2021	4	2022
EGS Long Duration Propulsive ESPA-5 (Customer Funded)	1	2022	4	2022

Note

Note: The attached schedule reflects RDSMO support to the customer funded missions and may not directly align with customer program office schedules.

Continue to leverage the MMSOC C2 product-line as a key enabler to evolve the EGS capability across the Command. Deliver the initial service capability in support of the AFSPCs Operationally Responsive Space program at both KAFB and SAFB.