# Department of Defense Fiscal Year (FY) 2020 Budget Estimates

March 2019



# **Space Development Agency**

Defense-Wide Justification Book Volume 5 of 5

Research, Development, Test & Evaluation, Defense-Wide

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Space Development Agency • Budget Estimates FY 2020 • RDT&E Program

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Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Mar 2019

Appropriation

FY 2018 FY 2019 FY 2019 FY 2019 (Base + OCO) Base Enacted OCO Enacted Total Enacted

Research, Development, Test & Eval, DW

# Department of Defense FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

FY 2020

05 Mar 2019

105,000

			OCO for				
Appropriation	FY 2020	FY 2020 OCO for Base Requirements	~	FY 2020 Total	FY 2020 Total		
appropriation	Base	-	Costs	000	(Base + OCO)		
Research, Development, Test & Eval, DW	105,000				105,000		

105,000

R-120PB: FY 2020 President's Budget (Published Version), as of March 5, 2019 at 08:24:53

# Department of Defense FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

05 Mar 2019

Summary Recap of Budget Activities

FY 2018 FY 2019 FY 2019 FY 2019 (Base + OCO) Base Enacted OCO Enacted Total Enacted

Advanced Technology Development

Advanced Component Development And Prototypes

Total Research, Development, Test & Evaluation

Summary Recap of FYDP Programs

Space

# Department of Defense FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

FY 2020

05 Mar 2019

	OCO for				
	TIL 0000	FY 2020	Direct War	FY 2020	FY 2020
Summary Recap of Budget Activities	FY 2020 Base	OCO for Base Requirements	and Enduring Costs	Total OCO	Total (Base + OCO)
Advanced Technology Development	20,000				20,000
Advanced Component Development And Prototypes	85,000				85,000
Total Research, Development, Test & Evaluation	105,000				105,000
Summary Recap of FYDP Programs					
Space	105,000				105,000
Total Research, Development, Test & Evaluation	105,000				105,000

R-120PB: FY 2020 President's Budget (Published Version), as of March 5, 2019 at 08:24:53

# Defense-Wide FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

05 Mar 2019

Summary Recap of Budget Activities

FY 2018 FY 2019 FY 2019 FY 2019
(Base + OCO) Base Enacted OCO Enacted Total Enacted

Advanced Technology Development

Advanced Component Development And Prototypes

Total Research, Development, Test & Evaluation

Summary Recap of FYDP Programs

Space

# Defense-Wide FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

05 Mar 2019

FY 2020 OCO for

Summary Recap of Budget Activities	FY 2020 Base	FY 2020 OCO for Base Requirements	Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Advanced Technology Development	20,000				20,000
Advanced Component Development And Prototypes	85,000				85,000
Total Research, Development, Test & Evaluation	105,000				105,000
Summary Recap of FYDP Programs					
Space	105,000				105,000
Total Research, Development, Test & Evaluation	105,000				105,000

Defense-Wide
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

05 Mar 2019

Appropriation

FY 2018 FY 2019 FY 2019 FY 2019 (Base + OCO) Base Enacted OCO Enacted Total Enacted

Space Development Agency

# Defense-Wide FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

05 Mar 2019

FY 2020 OCO for

			OCO LOI		
		FY 2020	Direct War	FY 2020	FY 2020
	FY 2020	OCO for Base	and Enduring	Total	Total
Appropriation	Base	Requirements	Costs	oco	(Base + OCO)
Space Development Agency	105,000				105,000
Total Research, Development, Test & Evaluation	105,000				105,000

# Defense-Wide FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

05 Mar 2019

Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 e Total Enacted c	
69		Space Science and Technology Research and Development	03				U	
	Advanc	ed Technology Development						
120		Space Technology Development and Prototyping	04				U	
	Advanc	ed Component Development And Proto	types		*********			
Tota:	l Research,	Development, Test & Eval, DW		******				

R-120PB: FY 2020 President's Budget (Published Version), as of March 5, 2019 at 08:24:53

### Defense-Wide FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget

Total Obligational Authority (Dollars in Thousands)

Appropriation: 0400D Research, Development, Test & Eval, DW

Total Research, Development, Test & Eval, DW

FY 2020 OCO for Program FY 2020 Direct War FY 2020 S FY 2020 Line Element FY 2020 OCO for Base and Enduring Total Total е No Number OCO Item Act Base Requirements Costs (Base + OCO) c -------------...... ------------20,000 69 1206310SDA Space Science and Technology 03 20,000 U Research and Development -------Advanced Technology Development 20,000 20,000 120 1206410SDA Space Technology Development and 85,000 85,000 U Prototyping -----...... Advanced Component Development And Prototypes 85,000 85,000 -----\_\_\_\_\_

105,000

R-120PB: FY 2020 President's Budget (Published Version), as of March 5, 2019 at 08:24:53

05 Mar 2019

105,000

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# Space Development Agency FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

05 Mar 2019

Appropriation: 0400D Research, Development, Test & Eval, DW

Program Line Element No Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	S e l c
_	ace Science and Technology search and Development	03					U
Advanced Technol	logy Development						
_	ace Technology Development and obtotyping	04					U
Advanced Compone	ent Development And Prototypes		*****	*******			
Total Space Develop	oment Agency						

R-120PB: FY 2020 President's Budget (Published Version), as of March 5, 2019 at 08:24:53

# Space Development Agency FY 2020 President's Budget Exhibit R-1 FY 2020 President's Budget Total Obligational Authority (Dollars in Thousands)

FY 2020

05 Mar 2019

Appropriation: 0400D Research, Development, Test & Eval, DW

						OCO for			
	Program				FY 2020	Direct War	FY 2020	FY 2020	S
Line	Element			FY 2020	OCO for Base	and Enduring	Total	Total	е
No	Number	Item	Act	Base	Requirements	Costs	oco	(Base + OCO)	C
**		***							-
69	-	Science and Technology rch and Development	03	20,000				20,000	U
A	dvanced Technology	y Development		20,000				20,000	
120	-	Technology Development and	04	85,000				85,000	U
A	dvanced Component	Development And Prototypes		85,000				85,000	
Tota	l Space Developmen	nt Agency		105,000				105,000	

R-120PB: FY 2020 President's Budget (Published Version), as of March 5, 2019 at 08:24:53

Space Development Agency • Budget Estimates FY 2020 • RDT&E Program

# **Program Element Table of Contents (by Budget Activity then Line Item Number)**

### Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	y Program Element Number	Program Element Title	Page
69	03	1206310SDA	Space Science and Technology Research and Development	5 - 1

## Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Page	Program Element Title	Activity Program Element Number	Budget A	Line #
Volume 5 - 5	Space Technology Development and Prototyping	1206410SDA	04	120

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# **Program Element Table of Contents (Alphabetically by Program Element Title)**

Program Element Title	Program Element Number	Line #	BA Page
Space Science and Technology Research and Development	1206310SDA	69	03Volume 5 - 1
Space Technology Development and Prototyping	1206410SDA	120	04Volume 5 - 5



Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Space Development Agency

Appropriation/Budget Activity R-1 P

0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3:

Advanced Technology Development (ATD)

R-1 Program Element (Number/Name)

PE 1206310SDA I Space Science and Technology Research and Development

Date: March 2019

COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	20.000	-	20.000	0.000	0.000	0.000	0.000	Continuing	Continuing
032: Proliferated Low Earth Orbit (pLEO) Sensor Technology	0.000	0.000	0.000	20.000	-	20.000	0.000	0.000	0.000	0.000	Continuing	Continuing

#### Note

This is a new program element in FY 2020.

#### A. Mission Description and Budget Item Justification

The Space Development Agency (SDA) is established to develop the next generation space architecture to enable U.S. military operations to be responsive to emerging multi-domain threats against our national security. To achieve that goal, the SDA will help inform the Department's decision to develop and implement a proliferated architecture enabled by lower cost, commercially-derived spacecraft and routine space access, shift the Department to a development organization focused on experimentation, prototyping, and accelerated fielding, and change the Department to a concentrated, decoupled structure to generate speed. The SDA will manage, direct, and execute the development of the space capabilities in accordance with DoD's Space Vision and field space capabilities at speed and scale, with the following goals:

- bold breakthroughs designed to obsolesce our competitors,
- technology maturation and systems engineering,
- lean engineering, manufacturing, and support,
- industrial base expansion; streamlined development and acquisition process, and
- increased acquisition cooperation with the National Reconnaissance Office (NRO).

The SDA will rapidly deploy critical elements of the next-generation space capabilities, initially focusing on these essential capabilities:

- Persistent global surveillance for advanced missile targeting,
- Indications, warnings, targeting, and tracking for defense against advanced missile threats,
- Alternate position, navigation, and timing (PNT) for a GPS-denied environment,
- Global and near-real time space situational awareness,
- Development of a deterrent capability,
- Responsive, resilient, common ground-based space support infrastructure (e.g., ground stations and launch capability),
- Cross-domain, networked, node-independent battle management command, control, and communications (BMC3), including nuclear command, control, and communications (NC3), and,
- Highly-scaled, low-latency, persistent, artificial intelligence-enable global surveillance.

The establishment of a communications and data transport layer in Low Earth Orbit (LEO) is essential to developing a new, responsive space architecture, and will be SDA's primary initial focus. The SDA will heavily leverage DARPA's Blackjack program (PE 0603287E) and its plan to demonstrate a 20-satellite constellation to

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Space Development Agency

Appropriation/Budget Activity

R-1 Program Element (Number/Name)

0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)

PE 1206310SDA / Space Science and Technology Research and Development

Date: March 2019

build this transport layer. The SDA will develop an initial wedge of sub-constellations on this transport layer to provide additional capabilities, such as advanced missile warning.

This program element funds efforts to develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) communications and data transport layer and its subconstellations in support of the DoD Space Vision.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	20.000	-	20.000
Total Adjustments	0.000	0.000	20.000	-	20.000
<ul> <li>Congressional General Reductions</li> </ul>	-	-			
<ul> <li>Congressional Directed Reductions</li> </ul>	-	-			
<ul> <li>Congressional Rescissions</li> </ul>	-	-			
<ul> <li>Congressional Adds</li> </ul>	-	-			
<ul> <li>Congressional Directed Transfers</li> </ul>	-	-			
<ul> <li>Reprogrammings</li> </ul>	-	-			
SBIR/STTR Transfer	-	-			
FY 2020 Program Start	-	-	20.000	-	20.000

# **Change Summary Explanation**

This is a new start in FY 2020.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Space Development Agency  Date: March 2019												
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 1206310SDA / Space Science and Technology Research and Development				Project (Number/Name) 032 I Proliferated Low Earth Orbit (pLEO) Sensor Technology							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
032: Proliferated Low Earth Orbit (pLEO) Sensor Technology	0.000	0.000	0.000	20.000	-	20.000	0.000	0.000	0.000	0.000	Continuing	Continuing

#### Note

This is a new start in FY 2020.

#### A. Mission Description and Budget Item Justification

The Space Science and Technology Research and Development will develop and demonstrate the next generation sensor technologies to support future prototyping efforts to deliver the eight capabilities outlined in the DoD Space Vision. This effort will develop and demonstrate lower size, weight, power, and cost (SWAP-C) sensors for national security space missions.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Title: Proliferated Low Earth Orbit (pLEO) Sensor Technology	0.000	-	20.000
<b>Description:</b> This effort will demonstrate LEO sensor technologies on an initial wedge of sub-constellations on the data transport layer architecture to enable other national security space missions such as global surveillance for advanced missile targeting; indications, warnings, targeting, and tracking for defense against advanced missile threats; alternate position, navigation, and timing (PNT) services for Global Positioning System (GPS) denied environments; deterrent capabilities; and other national security space missions.			
FY 2020 Plans: - Conduct trade studies and feasibility assessments of different sensor modalities to perform national security space missions Conduct Preliminary Design Review (PDR) of selected sensor payload(s).			
FY 2019 to FY 2020 Increase/Decrease Statement: The increase is due to establishment of this line in FY 2020.			
Accomplishments/Planned Programs Subtotals	0.000	-	20.000

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2020 S	Space Development Agency	Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 1206310SDA / Space Science and Technology Research and Development	Project (Number/Name) 032 I Proliferated Low Earth Orbit (pLEO) Sensor Technology
D. Acquisition Strategy Partners for these activities may include in-house resear Research and Development Centers, and University Affi	rch centers, small businesses, large defense contractors, commer iliated Research Centers.	cial space providers, Federally Funded
E. Performance Metrics		
	s. Each effort will include measures identified in the managemen	t approach and Statement of Work (SOW). Th
activities will be monitored against schedules and delive	rables as stated in the initiative's management approach.	

PE 1206310SDA: *Space Science and Technology Research an...* Space Development Agency

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Space Development Agency

Appropriation/Budget Activity

R-1 Program Element (Number/Name)

0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)

PE 1206410SDA / Space Technology Development and Prototyping

Date: March 2019

COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	85.000	-	85.000	80.000	105.000	115.000	140.000	Continuing	Continuing
033: Transport Layer Architecture and Standards	-	0.000	0.000	15.000	-	15.000	15.000	15.000	15.000	15.000	Continuing	Continuing
034: Space Situational Awareness and Launch	-	0.000	0.000	10.000	-	10.000	25.000	50.000	50.000	50.000	Continuing	Continuing
039: Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration	-	0.000	0.000	30.000	-	30.000	40.000	40.000	50.000	75.000	Continuing	Continuing
191: Space-Based Interceptors	-	0.000	0.000	15.000	-	15.000	0.000	0.000	0.000	0.000	Continuing	Continuing
193: Space-Based Discrimination	-	0.000	0.000	15.000	-	15.000	0.000	0.000	0.000	0.000	Continuing	Continuing

#### Note

This is a new program element in FY 2020.

### A. Mission Description and Budget Item Justification

The Space Development Agency (SDA) is established to develop the next generation space architecture to enable U.S. military operations to be responsive to emerging multi-domain threats against our national security. To achieve that goal, the SDA will help inform the Department's decision to develop and implement a proliferated architecture enabled by lower-cost, commercially-derived spacecraft and routine space access, shift the Department to a development organization focused on experimentation, prototyping, and accelerated fielding, and change the Department to a concentrated, decoupled structure to generate speed. The SDA will manage, direct, and execute the development of the space capabilities in accordance with DoD's Space Vision and field space capabilities at speed and scale, with the following goals:

- bold breakthroughs designed to obsolesce our competitors,
- technology maturation and systems engineering,
- lean engineering, manufacturing, and support,
- industrial base expansion; streamlined development and acquisition process, and
- increased acquisition cooperation with the National Reconnaissance Office (NRO).

The SDA will rapidly deploy critical elements of the next-generation space capabilities, initially focusing on these essential capabilities:

- · Persistent global surveillance for advanced missile targeting,
- Indications, warnings, targeting, and tracking for defense against advanced missile threats,
- Alternate position, navigation, and timing (PNT) for a GPS-denied environment,

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Space Development Agency

Appropriation/Budget Activity

R-1 Program Element (Number/Name)

0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)

PE 1206410SDA / Space Technology Development and Prototyping

Date: March 2019

- Global and near-real time space situational awareness,
- · Development of a deterrent capability
- Responsive, resilient, common ground-based space support infrastructure (e.g., ground stations and launch capability),
- Cross-domain, networked, node-independent battle management command, control, and communications (BMC3), including nuclear command, control, and communications (NC3), and
- Highly-scaled, low-latency, persistent, artificial intelligence-enable global surveillance.

The establishment of a communications and data transport layer in Low Earth Orbit (LEO) is essential to developing a new, responsive space architecture, and will be SDA's primary initial focus. The SDA will heavily leverage DARPA's Blackjack program (PE 0603287E) and its plan to demonstrate a 20-satellite constellation to build this transport layer. The SDA will develop an initial wedge of sub-constellations on this transport layer to provide additional capabilities, such as advanced missile warning.

This program element funds efforts to develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) communications and data transport layer and its subconstellations in support of the DoD Space Vision.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	85.000	-	85.000
Total Adjustments	0.000	0.000	85.000	-	85.000
<ul> <li>Congressional General Reductions</li> </ul>	-	-			
<ul> <li>Congressional Directed Reductions</li> </ul>	-	-			
<ul> <li>Congressional Rescissions</li> </ul>	-	-			
Congressional Adds	-	-			
<ul> <li>Congressional Directed Transfers</li> </ul>	-	-			
Reprogrammings	-	-			
SBIR/STTR Transfer	-	-			
FY 2020 Program Start	-	-	85.000	-	85.000

## **Change Summary Explanation**

This is a new start in FY 2020.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Space Development Agency  Date: March 2019												
Appropriation/Budget Activity 0400 / 4	PE 1206410SDA I Space Technology 03				Project (Number/Name) 033 I Transport Layer Architecture and Standards							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
033: Transport Layer Architecture and Standards	-	0.000	0.000	15.000	-	15.000	15.000	15.000	15.000	15.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

#### Note

This is a new start in FY 2020.

#### A. Mission Description and Budget Item Justification

The Space Technology Development and Prototyping effort will develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) communications and data transport layer and its sub-constellations to provide the eight capabilities outlined in the DoD Space Vision. The SDA will rapidly develop and field the next generation space architecture that will enable the US to deploy space capabilities that out-pace adversarial threats. This architecture is underpinned by a communications and data transport layer, which will reside on a proliferated small satellite constellation in Low Earth Orbit (LEO). The Transport Layer will support the transfer of data between the space segment of the next generation space architecture, to potentially include

payloads co-hosted with the Transport Layer or other non-collocated space elements, and the ground, to include ground support infrastructure and very large numbers of users/subscribers. The Transport Layer will provide the "connective tissue" for the next generation space architecture.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Transport Layer Architecture and Standards	0.000	0.000	15.000	0.000	15.000
<b>Description:</b> Develop and demonstrate a prototype a resilient and unified military communications and data transport layer, enabled by a proliferated Low Earth Orbit (pLEO) architecture. This effort will demonstrate capability to provide very low latency (low or high bandwidth) communications and data between any two points on the globe to enable mission-agnostic battle management, command, control, and communications (BMC3). This effort will leverage technologies developed under the DARPA Blackjack program and, wherever feasible, leverage commercial industry plans to provide broadband internet access from space to form the foundation of the transport layer architecture.					
<b>FY 2019 Plans:</b> N/A					
FY 2020 Base Plans: - Conduct Preliminary Design Review (PDR) for user terminal system.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Space Development Ag		Date: March 2019	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (N	umber/Name)
0400 / 4	PE 1206410SDA I Space Technology	033 <i>I Trans</i>	sport Layer Architecture and
	Development and Prototyping	Standards	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Develop interface and messaging standards for data transport layer architecture.					
FY 2020 OCO Plans: N/A					
FY 2019 to FY 2020 Increase/Decrease Statement: This program is a new start in FY 2020.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	15.000	0.000	15.000

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

N/A

#### Remarks

N/A

### D. Acquisition Strategy

Partners for these activities may include in-house research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

#### **E. Performance Metrics**

Performance metrics will be specific to each of the efforts. Each effort will include measures identified in the management approach and Statement of Work (SOW). The activities will be monitored against schedules and deliverables as stated in the initiative's management approach.

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Exhibit R-3, RDT&E	Project Co	ost Analysis: PB 2	2020 Spac	e Develo	pment A	gency						Date:	March 20	)19	
Appropriation/Budg 0400 / 4	et Activity	1				PE 120	6410SDA	ement (No Al Space d Prototyp	Technolo	•			r/ <b>Name)</b> ayer Arch	itecture a	nd
Product Developme	nt (\$ in Mi	illions)		FY 2	2018	FY 2	2019	FY 2 Bas			2020 CO	FY 2020 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
TBD	C/TBD	TBD : TBD	0.000	0.000		0.000		12.000		0.000		12.000	Continuing	Continuing	Continuin
												40.000	O 11 1		
		Subtotal	0.000	0.000		0.000		12.000		0.000		12.000	Continuing	Continuing	N/A
Management Servic	es (\$ in M		0.000	0.000 FY 2	2018	0.000 FY 2		12.000 FY 2 Ba		FY 2	2020 CO	12.000 FY 2020 Total	Continuing	Continuing	N/ <i>i</i>
Management Servic	es (\$ in M  Contract Method & Type		0.000 Prior Years		2018 Award Date			FY 2		FY 2	2020	FY 2020	Cost To Complete	Total Cost	Target Value of
	Contract Method	illions) Performing	Prior	FY 2	Award	FY 2	2019 Award Date	FY 2 Ba	se Award	FY 2	2020 CO Award	FY 2020 Total	Cost To	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	illions)  Performing Activity & Location	Prior Years	FY 2	Award	FY 2	2019 Award Date	FY 2 Bas Cost	se Award	FY 2 OC Cost	2020 CO Award	FY 2020 Total Cost 3.000	Cost To Complete	Total Cost Continuing	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location TBD : TBD	Prior Years 0.000	FY 2  Cost  0.000	Award Date	FY 2  Cost  0.000	Award Date	FY 2 Ba Cost	Award Date	Cost 0.000 0.000	2020 CO Award	FY 2020 Total Cost 3.000	Cost To Complete Continuing	Total Cost Continuing	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 S	pac	e D	evel	opm	ent .	Ager	псу															Dat	te: M	arch	າ 20	19		
Appropriation/Budget Activity 0400 / 4								PE	1206	6410	m Ele SDA nt and	IS,	рас	e Te	chno				033	•	rans	sport	oer/N t Lay		•	tectı	ıre a	nd
		FY	201	B		FY	2019	•		FY	2020			FY 2	2021	<u> </u>		FY 2	2022	2		FY	2023	3	$\overline{}$	FY:	2024	1
	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
Transport Layer Architecture and Standards																												
Conduct Preliminary Design Review (PDR) for user terminal system.																												
Develop interface and messaging standards for data transport layer architecture.																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Space Development Agenda	су		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping	• •	umber/Name) sport Layer Architecture and

# Schedule Details

	St	art	Eı	nd
Events by Sub Project	Quarter	Year	Quarter	Year
Transport Layer Architecture and Standards				
Conduct Preliminary Design Review (PDR) for user terminal system.	1	2020	4	2021
Develop interface and messaging standards for data transport layer architecture.	1	2020	4	2021

Exhibit R-2A, RDT&E Project Ju	ıstification	: PB 2020 S	Space Deve	lopment Ag	ency					Date: Marc	ch 2019	
Appropriation/Budget Activity 0400 / 4					PE 120641		it (Number/ ace Techno totyping	•	Project (N 034 / Spac Launch		ne) al Awarenes	s and
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
034: Space Situational Awareness and Launch	-	0.000	0.000	10.000	-	10.000	25.000	50.000	50.000	50.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

#### Note

This is a new start in FY 2020.

#### A. Mission Description and Budget Item Justification

The Space Technology Development and Prototyping effort will develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) communications and data transport layer and its sub-constellations to provide the eight capabilities outlined in the DoD Space Vision. Developing and fielding a pLEO space architecture will significantly improve U.S. resilience posture in space. The Space Situational Awareness (SSA) and Launch project will further support this vision of enhanced resilience. Global and near real-time SSA will provide a detailed understanding of the space order of battle and a responsive launch capability to enable rapid constitution or replenishment of space capabilities.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Space Situational Awareness and Launch	0.000	0.000	10.000	0.000	10.000
<b>Description:</b> Working with commercial providers, develop and demonstrate enhanced space situational awareness (SSA) and small-to-medium launch service access to provide SSA on large numbers of small satellites in LEO, including tracking, orbit determination, orbital state and uncertainty propagation, conjunction prediction, and collision avoidance. This effort will leverage existing Government and commercial tools and approaches to extend capabilities for a pLEO environment. In addition, this effort will identify and contract for launch of small-to-medium size payloads, to demonstrate responsive constitution and replenishment.					
<b>FY 2019 Plans:</b> N/A					
FY 2020 Base Plans:  - Conduct trade studies of existing space traffic management capabilities and approaches for pLEO applications.  - Conduct trade studies of small-to-medium payload launch service providers and ability to responsively support pLEO constitution and replenishment.					
FY 2020 OCO Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Space Development Ag	Date: March 2019	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping	umber/Name) e Situational Awareness and

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A FY 2019 to FY 2020 Increase/Decrease Statement:					
This program is a new start in FY 2020.  Accomplishments/Planned Programs Subtotals	0.000	0.000	10.000	0.000	10.000

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

N/A

#### **Remarks**

N/A

#### **D. Acquisition Strategy**

Partners for these activities may include in-house research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

#### E. Performance Metrics

Performance metrics will be specific to each of the efforts. Each effort will include measures identified in the management approach and Statement of Work (SOW). The activities will be monitored against schedules and deliverables as stated in the initiative's management approach.

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Exhibit R-3, RDT&E	Project Co	ost Analysis: PB 2	020 Spac	e Develo	pment A	gency						Date:	March 20	)19	
Appropriation/Budg 0400 / 4	et Activity	1				PE 120	6410SDA	ement (Nu I Space d Prototyp	Technolo		_	(Number pace Situa	•	vareness a	and
Product Developme	nt (\$ in Mi	illions)		FY 2	018	FY 2	019	FY 2 Bas		FY 2		FY 2020 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	Total Cost	Target Value of Contract
TBD	C/TBD	TBD : TBD	0.000	0.000		0.000		8.000		0.000		8.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		8.000		0.000		8.000	Continuing	Continuing	N/A
Management Servic	es (\$ in M	illions)		FY 2	018	FY 2	019	FY 2 Bas		FY 2		FY 2020 Total			
Management Servic	es (\$ in M  Contract  Method & Type	illions)  Performing Activity & Location	Prior Years	FY 2	018 Award Date		019 Award Date					FY 2020	Cost To	Total Cost	Target Value of
	Contract Method	Performing	_		Award	FY 2	Award	Bas	se Award	00	O Award	FY 2020 Total	Complete		Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Years	Cost	Award	FY 2	Award	Bas Cost	se Award	Cost	O Award	FY 2020 Total Cost	Complete Continuing	Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	<b>Years</b> 0.000	<b>Cost</b> 0.000	Award Date	FY 2  Cost  0.000	Award Date	Cost 2.000	Award Date	Cost 0.000	Award Date	FY 2020 Total Cost	Complete Continuing	Cost Continuing Continuing Total	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 S	pac	e De	evelo	opm	ent	Ager	псу															Dat	e: M	arch	າ 20	19		
Appropriation/Budget Activity 0400 / 4								PΕ	1206	3410	m Ele OSDA nt an	IS	рас	е Те	chn			1	034	•	p ac		oer/N tuatio		•	aren	ess	and
		FY	2018	8		FY	2019	9		FY	2020			FY	2021	<u> </u>		FY	202	2		FY	2023	3		FY	2024	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	1	2	3	4
Space Situational Awareness and Launch							·			,				,														
Conduct trade studies of existing space traffic management capabilities and approaches																												
Conduct trade studies of small-to-medium size payload																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Space Development Agend	су		Date: March 2019
1	` ` `	, ,	umber/Name) e Situational Awareness and

	St	art	Eı	nd
Events by Sub Project	Quarter	Year	Quarter	Year
Space Situational Awareness and Launch				
Conduct trade studies of existing space traffic management capabilities and approaches	1	2020	4	2021
Conduct trade studies of small-to-medium size payload	1	2020	4	2021

Exhibit R-2A, RDT&E Project Ju	stification	: PB 2020 S	Space Deve	lopment Ag	ency					Date: Marc	ch 2019	
Appropriation/Budget Activity 0400 / 4					PE 120641	am Elemen 10SDA / Spa ent and Pro	ace Techno	•	039 I Prolif		ne) Earth Orbit nd Integratio	
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
039: Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration	-	0.000	0.000	30.000	-	30.000	40.000	40.000	50.000	75.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

#### **Note**

This is a new start in FY 2020.

## A. Mission Description and Budget Item Justification

The pLEO Missile Warning (MW) Ground Integration project will enable a persistent global surveillance capability, enabled by a pLEO data communications transport layer, that will provide indications, warnings, targeting, and tracking to support the defeat of advanced missile threats.

B. Accomplishments/Planned Programs (\$ in Millions)			FY 2020	FY 2020	FY 2020
	FY 2018	FY 2019	Base	oco	Total
Title: pLEO Missile Warning Ground Integration	0.000	0.000	30.000	0.000	30.000
<b>Description:</b> Develop and demonstrate a prototype MW ground infrastructure compatible with a proliferated Low Earth Orbit (pLEO) sensor infrastructure. This effort will focus on integrating MW technologies and on-orbit residual capability in the form of sensors, command and control software, and data products demonstrated by DARPA's Blackjack program, and any follow-on MW prototyping efforts, into a MW ground support infrastructure. To the maximum extent possible, this effort will leverage commercial approaches for pLEO constellation management while maximizing support for the legacy MW ground segment. The development will be a phased approach to transition current command and control to a new, consolidated Battle Management, Command, Control, and Communications (BMC3) infrastructure consistent with the DoD Space Vision.					
<b>FY 2019 Plans:</b> N/A					
FY 2020 Base Plans: - Examine current MW ground segment and conduct trade studies of alternative approaches - Conduct Preliminary Design Review of MW ground infrastructure					
FY 2020 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Space Development Ag	ency		Date: March 2019
Appropriation/Budget Activity	Project (N	umber/Name)	
0400 / 4	PE 1206410SDA / Space Technology	039 I Prolit	ferated Low Earth Orbit (pLEO)
	Development and Prototyping	Missile Wa	arning Ground Integration

B. Accomplishments/Planned Programs (\$ in Millions)  N/A		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 to FY 2020 Increase/Decrease Statement: This program is a new start in FY 2020.						
Acc	complishments/Planned Programs Subtotals	0.000	0.000	30.000	0.000	30.000

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

N/A

#### Remarks

N/A

### **D. Acquisition Strategy**

Partners for these activities may include in-house research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

### E. Performance Metrics

Performance metrics will be specific to each of the efforts. Each effort will include measures identified in the management approach and Statement of Work (SOW). The activities will be monitored against schedules and deliverables as stated in the initiative's management approach.

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Exhibit R-3, RDT&E	Project C	ost Analysis: PB 2	020 Spac	e Develo	pment A	gency						Date:	March 20	)19	
Appropriation/Budge 0400 / 4	et Activity	1				PE 120	6410SDA	ement (N A / Space d Prototyp	Technolo	•	039 <i>I Pi</i>	(Number roliferated Warning (	Low Eart		
Product Developme	nt (\$ in Mi	illions)		FY 2	:018	FY 2	2019	FY 2 Ba		FY 2		FY 2020 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	Total Cost	Target Value of Contract
TBD	C/TBD	TBD : TBD	0.000	0.000		0.000		24.000		0.000		24.000	Continuing	Continuing	Continuin
		Subtotal	0.000	0.000		0.000		24.000		0.000		24.000	Continuing	Continuing	N/A
Management Service	es (\$ in M	illions)		FY 2	018	FY 2	2019	FY 2 Ba		FY 2		FY 2020 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
TBD	C/Various	TBD : TBD	0.000	0.000		0.000		6.000		-		6.000	Continuing	Continuing	-
		Subtotal	0.000	0.000		0.000		6.000		-		6.000	Continuing	Continuing	N/A
			Prior Years	FY 2	018	FY 2	2019	FY 2 Ba		FY 2		FY 2020 Total	Cost To	Total Cost	Target Value of Contract
			0.000 30.000 0.000				30.000	Continuing	Continuing	N/A					

Exhibit R-4, RDT&E Schedule Profile: PB 2020 S	Spac	e D	evelo	opm	ent .	Ager	псу															Dat	te: M	arch	1 20°	19		
Appropriation/Budget Activity 0400 / 4								PΕ	1206	6410	m Ele SDA nt an	I S	pac	е Те	chn				039	9 I P	rolif	erate	<b>er/N</b> ed Lo g Gro	ow E	Ēart∤			
FY 2018 FY							2019	9 FY 2020			FY 2021 FY 2					2022			FY 2023			FY 2024		<u> </u>				
	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
Missile Warning Technology			,			,															,							
Examine current MW ground segment and conduct trade studies of alternative																												
Conduct Preliminary Design Review of MW ground infrastructure																												

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Space Development Agend	су		Date: March 2019
Appropriation/Budget Activity 0400 / 4	PE 1206410SDA / Space Technology	039 I Prolif	umber/Name) ferated Low Earth Orbit (pLEO) rrning Ground Integration

	St	art	Eı	nd
Events by Sub Project	Quarter	Year	Quarter	Year
Missile Warning Technology				
Examine current MW ground segment and conduct trade studies of alternative	1	2020	4	2021
Conduct Preliminary Design Review of MW ground infrastructure	1	2020	4	2021

Exhibit R-2A, RDT&E Project Ju	stification	: PB 2020 S	Space Devel	opment Ag	ency					Date: Marc	ch 2019			
Appropriation/Budget Activity 0400 / 4					PE 120641	am Elemen 10SDA / Spa ent and Pro	ace Technol		(Number/Name) pace-Based Interceptors					
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost		
191: Space-Based Interceptors	-	0.000	0.000	15.000	-	15.000	0.000	0.000	0.000	0.000	Continuing	Continuing		
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-				

#### Note

This is a new start in FY 2020.

### A. Mission Description and Budget Item Justification

The Space Technology Development and Prototyping effort will develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) communications and data transport layer and its sub-constellations to provide the eight capabilities outlined in the DoD Space Vision. Developing and fielding a pLEO space architecture will significantly improve U.S. resilience posture in space. This effort is focused on developing a government reference architecture for a space-based kinetic interceptor layer for boost-phase defense.

B. Accomplishments/Planned Programs (\$ in Millions)			FY 2020	FY 2020	FY 2020
	FY 2018	FY 2019	Base	oco	Total
Title: Space-Based Interceptor Assessment	0.000	_	15.000	-	15.000
<b>Description:</b> The SDA, under the leadership of the Under Secretary of Defense for Research and Engineering and in coordination with the Missile Defense Agency, Joint Staff, Air Force, and Director, Cost Assessment and Program Evaluation, will execute a Space-Based Interceptor assessment.					
FY 2020 Base Plans: The space-based interceptor assessment entails developing a government reference architecture for a space-based kinetic interceptor layer for boost-phase defense. These efforts include developing an independent cost estimate and assessment of technical risks, potential countermeasures, and development timelines.					
FY 2019 to FY 2020 Increase/Decrease Statement: This is a new start in FY 2020.					
Accomplishments/Planned Programs Subtotals	0.000	-	15.000	-	15.000

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

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 S	hibit R-2A, RDT&E Project Justification: PB 2020 Space Development Agency									
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206410SDA I Space Technology Development and Prototyping	Project (Number/Name) 191 / Space-Based Interceptors								
	Development and Prototyping									
D. Acquisition Strategy										
Partners for these activities may include in-house resear	rch centers, Federally Funded Research and Development Centers	s, and University Affiliated Research Centers								
E. Performance Metrics										
N/A										
1 1// (										

PE 1206410SDA: *Space Technology Development and Prototy...* Space Development Agency

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Space Development Ag		Date: March 2019	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (N	umber/Name)
0400 / 4	PE 1206410SDA / Space Technology	191 / Spac	ce-Based Interceptors
	Development and Ductot miner		

						Develo	pment an	d Prototy <sub>i</sub>	ping						
Support (\$ in Million	s)			FY 2	2018	FY:	2019	FY 2 Ba	2020 ise		2020 CO	FY 2020 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	Total Cost	Target Value of Contract
Space-Based Interceptor Assessment	TBD	TBD : TBD	-	-		-		15.000		-		15.000	Continuing	Continuing	-
		Subtotal	-	-		-		15.000		-		15.000	Continuing	Continuing	N/A
			Prior Years	FY 2	2018	FY:	2019	FY 2 Ba	2020 ise		2020 CO	FY 2020 Total	Cost To	Total Cost	Target Value of Contract
		Project Cost Totals	_	-		0.000		15.000		_		15.000	Continuino	Continuina	N/A

Exhibit R-4, RDT&E Schedule Profile: PB 202	0 Spa	се Г	Ĵеν	/elc	pm	ner	nt A	ge	ncy	/																	Di	ate:	Mai	rch	201	9		
Appropriation/Budget Activity 0400 / 4									, , ,										•	lumber/Name) ce-Based Interceptors														
		F١	<b>′</b> 2	018	3	$\top$	F	-Y	20	19			FY	202	20			FY	202	<u>.</u>			FY	202	2		F	Y 20	23	$\neg$		FY 2	202	4
	1	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
					1															- 1	- 1		_	_	- 1									
Space-Based Interceptor															-						-													

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Space Development Agend	Date: March 2019		
, · · · · · · · · · · · · · · · · · · ·	, ,	, ,	umber/Name) ce-Based Interceptors

	St	art	End			
Events by Sub Project	Quarter	Year	Quarter	Year		
Space-Based Interceptor						
Space-Based Interceptor Assessment	1	2020	4	2021		

Exhibit R-2A, RDT&E Project Ju	ustification	: PB 2020 S	Space Deve	lopment Ag	ency					Date: Marc	ch 2019	
Appropriation/Budget Activity 0400 / 4					PE 120641	<b>am Elemen</b> 10SDA / Spa ent and Pro	ace Techno	Number/Name) ce-Based Discrimination				
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
193: Space-Based Discrimination	-	0.000	0.000	15.000	-	15.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

#### **Note**

This is a new start in FY 2020.

### A. Mission Description and Budget Item Justification

The Space Technology Development and Prototyping effort will develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) communications and data transport layer and its sub-constellations to provide the eight capabilities outlined in the DoD Space Vision. Developing and fielding a pLEO space architecture will significantly improve U.S. resilience posture in space. This effort is focused on developing a government reference architecture for a space-based discrimination layer for missile defense.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Space-Based Discrimination Assessment	0.000	-	15.000	-	15.000
<b>Description:</b> The SDA, under the leadership of the Under Secretary of Defense for Research and Engineering and in coordination with the Missile Defense Agency, Joint Staff, Air Force, and Director, Cost Assessment and Program Evaluation, will execute a Space-Based Discrimination assessment.					
FY 2020 Base Plans: The Space-Based Discrimination assessment entails developing a government reference architecture for a space-based discrimination layer for missile defense. These efforts include developing an independent cost estimate and assessment of technical risks, potential countermeasures, and development timelines.					
FY 2019 to FY 2020 Increase/Decrease Statement: This is a new start in FY 2020.					
Accomplishments/Planned Programs Subtotals	0.000	-	15.000	-	15.000

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

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Space Development Ag	gency		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206410SDA I Space Technology Development and Prototyping		umber/Name) e-Based Discrimination
D. Acquisition Strategy		1	
Partners for these activities may include in-house research centers, Federally	Funded Research and Development Centers,	and Univers	ity Affiliated Research Centers.
E. Performance Metrics			
N/A			

PE 1206410SDA: Space Technology Development and Prototy... Space Development Agency

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Date: March 2019 Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Space Development Agency Appropriation/Budget Activity R-1 Program Element (Number/Name) Project (Number/Name) 0400 / 4

PE 1206410SDA / Space Technology Development and Prototyping

193 / Space-Based Discrimination

Support (\$ in Millions	s)			FY 2	2018	FY 2019		FY 2 Ba			2020 CO	FY 2020 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	Total Cost	Target Value of Contract
Space-Based Discrimination Assessment	TBD	TBD : TBD	-	-		-		15.000		-		15.000	Continuing	Continuing	-
		Subtotal	-	-		-		15.000		-		15.000	Continuing	Continuing	N/A
															Target

	Prior Years	FY	2018	FY 2	:019	FY 2 Bas	 FY 2020 OCO	FY 2020 Total	Cost To	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		15.000	-	15.000	Continuing	Continuing	N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Space Development Agency											Date: March 2019																
Appropriation/Budget Activity 0400 / 4		, , ,									roject (Number/Name) 93 / Space-Based Discrimination																
		FY 2018			FY 2019				FY 2020				FY 2021				FY	2022		FY 2023			FY 2024		024	_	
				•									•		<b>4</b> I			LVLL	•		FY 2	'023			FY 2	<b>U</b> 24	
	1	2	3	4	1	2		4	1	2	3	4	1		3 4	1	2	1	4	1		3	4	1	PY 2	3	4
Space-Based Discrimination	1		3	4	1			4	1		3	4	1			1		1	4	1			4	1			4

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Space Development Agend	Date: March 2019		
, · · · · · · · · · · · · · · · · · · ·	, ,		umber/Name) ce-Based Discrimination

	St	art	End			
Events by Sub Project	Quarter	Year	Quarter	Year		
Space-Based Discrimination						
Space-Based Discrimination Assessment	1	2020	4	2021		

