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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Space Development Agency **Date:** February 2020

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</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	0.000	0.000	75.000	215.994	0.000	215.994	681.898	834.891	1,465.559	1,465.342	Continuing	Continuing
033: <i>Transport Layer Architecture and Standards</i>	0.000	0.000	15.000	14.891	-	14.891	14.962	14.959	15.037	15.343	Continuing	Continuing
034: <i>Space Situational Awareness and Launch</i>	0.000	0.000	10.000	24.740	-	24.740	49.771	49.751	49.985	51.003	Continuing	Continuing
039: <i>Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration</i>	0.000	0.000	30.000	39.709	-	39.709	39.899	49.864	75.185	76.716	Continuing	Continuing
191: <i>Space-Based Interceptors</i>	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
193: <i>Space-Based Discrimination</i>	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
196: <i>Space Technology Development</i>	-	0.000	0.000	136.654	-	136.654	577.266	720.317	1,325.352	1,322.280	Continuing	Continuing

**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, mass-produced 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 out-pace 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,

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- 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), and
- Highly-scaled, low-latency, persistent, artificial intelligence-enable global surveillance.

The establishment of a 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 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 sub-constellations in support of the DoD Space Vision.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	0.000	85.000	80.000	0.000	80.000
Current President's Budget	0.000	75.000	215.994	0.000	215.994
Total Adjustments	0.000	-10.000	135.994	0.000	135.994
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-10.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Space Technology Development	0.000	0.000	136.654	0.000	136.654
• Economic Adjustment	0.000	0.000	-0.078	-	-0.078
• Fiscal Guidance Program Adjustment	-	-	-0.582	-	-0.582

**Change Summary Explanation**

Funding was added to SDA program line to develop system designs, perform on-orbit risk reduction demonstrations, and deliver National Defense Strategy Architecture capability. This activity will result in on-orbit implementation of the NDSA.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Space Development Agency **Date:** February 2020

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 033 / <i>Transport Layer Architecture and Standards</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
033: <i>Transport Layer Architecture and Standards</i>	0.000	0.000	15.000	14.891	-	14.891	14.962	14.959	15.037	15.343	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**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) 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 common satellite buses, common interfaces between payloads to the bus, and common data interfaces and standards. The SDA will develop these standards for high power and lower power buses. SDA will develop standard interfaces across these two classes of satellite buses. SDA, in collaboration with other Space Stakeholders, will develop communication standards, and a ground architecture including user equipment that supports satellites utilizing these standardized products.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Transport Layer Architecture and Standards	0.000	15.000	14.891	0.000	14.891
<b>Description:</b> Develop and demonstrate prototypes that enable a resilient and unified military data transport layer and sensor capabilities, enabling a proliferated Low Earth Orbit (pLEO) architecture. This effort will define and deliver the architectures and standards necessary to rapidly prototype and field new satellite capabilities at LEO.					
<b>FY 2020 Plans:</b> - Develop interface and messaging standards for data transport layer architecture and bus interfaces.					
<b>FY 2021 Base Plans:</b> - Perform technology demonstration to test and demonstrate interface and messaging technologies.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Slight reduction in funding due to “unsubstantiated growth”.					
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	15.000	14.891	0.000	14.891

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

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 033 / <i>Transport Layer Architecture and Standards</i>

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

**Remarks**

N/A

**D. Acquisition Strategy**


Partners for these activities may include the Missile Defense Agency, DoD research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, and University Affiliated Research Centers.



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 033 / <i>Transport Layer Architecture and Standards</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

<b><i>Transport Layer Architecture and Standards</i></b>	
Develop interface and messaging standards for data transport layer architecture.	

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 033 / <i>Transport Layer Architecture and Standards</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Transport Layer Architecture and Standards</i></b>				
Develop interface and messaging standards for data transport layer architecture.	2	2020	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Space Development Agency										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 0400 / 4					<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / Space Technology Development and Prototyping				<b>Project (Number/Name)</b> 034 / Space Situational Awareness and Launch			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
034: Space Situational Awareness and Launch	0.000	0.000	10.000	24.740	-	24.740	49.771	49.751	49.985	51.003	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**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) 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 needed to enable rapid constitution or replenishment of space capabilities.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Space Situational Awareness and Launch	0.000	10.000	24.740	0.000	24.740
<b>Description:</b> Working with commercial providers, develop and demonstrate enhanced space situational awareness (SSA) and small-to-medium launch service access. 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 2020 Plans:</b> - Conduct trade studies of existing SSA 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.					
<b>FY 2021 Base Plans:</b> - Identify launch opportunities for Space Transport Layer demonstration					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Initial assessment is expected to feed into our planning technology demonstrations.					
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	10.000	24.740	0.000	24.740

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 034 / <i>Space Situational Awareness and Launch</i>

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

N/A

**Remarks**

N/A

**D. Acquisition Strategy**

Partners for these activities may include Space and Missile Systems Center, DoD research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, and University Affiliated Research Centers.





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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 034 / <i>Space Situational Awareness and Launch</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Space Situational Awareness and Launch</i></b>				
Conduct trade studies of existing space situational awareness capabilities and approaches	2	2020	4	2021
Conduct trade studies of small-to-medium size payload	3	2020	4	2021

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Space Development Agency **Date:** February 2020

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / Space Technology Development and Prototyping	<b>Project (Number/Name)</b> 039 / Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration
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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
039: Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration	0.000	0.000	30.000	39.709	-	39.709	39.899	49.864	75.185	76.716	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The pLEO Payload and 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> pLEO Missile Warning Ground Integration	0.000	30.000	39.709	0.000	39.709
<b>Description:</b> Develop and demonstrate payload prototypes compatible with a proliferated Low Earth Orbit (pLEO) architecture. This effort will focus on developing and demonstrating sensors for beyond line of sight targeting, space-to-space data links, space-to-tactical data links, and advanced missile warning capabilities. On-orbit demonstrations will be tied to existing mission specific ground infrastructure, when it exists. Ground infrastructure will be linked or developed to support payload integration and data processing.					
<b>FY 2020 Plans:</b> - Develop advanced missile warning sensor and develop ground architecture to support					
<b>FY 2021 Base Plans:</b> - Integrate, test, and launch advanced missile warning phenomenology experiment					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The increase in FY 2021 is to support technology demonstrations.					
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	30.000	39.709	0.000	39.709

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

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 039 / <i>Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration</i>

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

**Remarks**

N/A

**D. Acquisition Strategy**

Partners for these activities may include Missile Defense Agency, DoD research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, and University Affiliated Research Centers.



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Space Development Agency			<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 039 / <i>Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration</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

<b><i>Missile Warning Technology</i></b>	
Examine current MW ground segment and conduct trade studies of alternative	████████████████████
Conduct Preliminary Design Review of MW ground infrastructure	████████████████████

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 039 / <i>Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Missile Warning Technology</i></b>				
Examine current MW ground segment and conduct trade studies of alternative	2	2020	4	2021
Conduct Preliminary Design Review of MW ground infrastructure	2	2020	4	2021

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Space Development Agency **Date:** February 2020

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 191 / <i>Space-Based Interceptors</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
191: <i>Space-Based Interceptors</i>	0.000	0.000	15.000	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**

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 the battle management software, infrastructure, and test capabilities to ensure maximum utility of pLEO hardware. This effort supports on-board space data processing, data ingest and fusion of legacy, current, and future space-based capabilities.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Space-Based Interceptor Assessment	-	15.000	0.000	0.000	0.000
<b>Description:</b> The SDA will develop software to support Battle Management Command, Control, and Communications that optimizes use of fielded space, ground, and user hardware, minimizes required communication bandwidths, and supports tactical users.					
<b>FY 2020 Plans:</b> The initial capabilities of the hardware architecture will be designed and specified to support a space-based operating system. Development of a ground based Hardware In The Loop laboratory for validation and verification will commence.					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> This effort is not funded in FY 2021.					
<b>Accomplishments/Planned Programs Subtotals</b>	-	15.000	0.000	0.000	0.000

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

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 191 / <i>Space-Based Interceptors</i>

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

**Remarks**

**D. Acquisition Strategy**

Partners for these activities may include DoD research centers, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Space Development Agency</b>												<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 0400 / 4				<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>					<b>Project (Number/Name)</b> 191 / <i>Space-Based Interceptors</i>						
<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Space-Based Interceptor Assessment	TBD	TBD : TBD	-	-		15.000		0.000		0.000		0.000	Continuing	Continuing	-
<b>Subtotal</b>			-	-		15.000		0.000		0.000		0.000	Continuing	Continuing	N/A
			<b>Prior Years</b>	<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			-	-		15.000		0.000		0.000		0.000	Continuing	Continuing	N/A
<b>Remarks</b>															

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 191 / <i>Space-Based Interceptors</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

<b><i>Space-Based Interceptor</i></b>	
Space-Based Interceptor Assessment	████████████████████

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 191 / <i>Space-Based Interceptors</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Space-Based Interceptor</i></b>				
Space-Based Interceptor Assessment	3	2020	4	2021

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Space Development Agency **Date:** February 2020

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / Space Technology Development and Prototyping	<b>Project (Number/Name)</b> 193 / Space-Based Discrimination
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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
193: Space-Based Discrimination	0.000	0.000	5.000	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**

The Space Technology Development and Prototyping effort will develop and demonstrate a prototype proliferated Low Earth Orbit (pLEO) 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Space-Based Discrimination Assessment	-	5.000	0.000	0.000	0.000
<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.					
<b>FY 2020 Plans:</b> 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.					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> This effort is not funded in FY 2021.					
<b>Accomplishments/Planned Programs Subtotals</b>	-	5.000	0.000	0.000	0.000

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

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 193 / <i>Space-Based Discrimination</i>

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

**Remarks**

**D. Acquisition Strategy**

Partners for these activities may include DoD research centers, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Space Development Agency</b>												<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 0400 / 4				<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>					<b>Project (Number/Name)</b> 193 / <i>Space-Based Discrimination</i>						
<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Space-Based Discrimination Assessment	TBD	TBD : TBD	-	-		5.000		0.000		0.000		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			-	-		5.000		0.000		0.000		0.000	Continuing	Continuing	N/A
			<b>Prior Years</b>	<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			-	-		5.000		0.000		0.000		0.000	Continuing	Continuing	N/A
<b>Remarks</b>															



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 193 / <i>Space-Based Discrimination</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Space-Based Discrimination</i></b>				
Space-Based Discrimination Assessment	3	2020	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Space Development Agency										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 0400 / 4					<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>				<b>Project (Number/Name)</b> 196 / <i>Space Technology Development</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
196: <i>Space Technology Development</i>	-	0.000	0.000	136.654	-	136.654	577.266	720.317	1,325.352	1,322.280	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The Space Development Agency (SDA) is developing and fielding next generation space capabilities enabled by proliferation and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department space needs, including low-latency tactical communication, beyond line of sight targeting, and advanced missile tracking. SDA will orchestrate the rapid development and fielding of the National Defense Space Architecture (NDSA), a resilient military sensing and data transport capability via a proliferated space architecture in low-earth orbit.

This program element funds the space technology development and prototyping activity to deliver a resilient military sensing and data transport capability via a proliferated space architecture to US joint warfighting forces in two-year tranches, beginning as early as FY22. These capabilities including a low-latency mesh network data transport layer; advanced missile tracking layer; global surveillance and surface moving target custody layer; low-latency sensor tasking, command and control, and data dissemination layer; alternate position, navigation, and timing layer; enhanced space situational awareness and deterrence layer; and common ground segment and launch services layer.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Space Technology Development	0.000	0.000	136.654	0.000	136.654
<b>Description:</b> Space technology development and prototyping of a resilient military sensing and data transport capability via a proliferated space architecture in LEO.					
<b>FY 2020 Plans:</b> N/A					
<b>FY 2021 Base Plans:</b> - Design and begin development of Transport Layer Tranche 0 capability - Design and begin development of wide field-of-view infrared payload with sensitivity sufficient to detect advance missile threats - Design and begin development of software to perform multi-INT data fusion for targeting support - Design, develop, and test hardware-in-the-loop facility to support architecture interoperability testing and validation					
<b>FY 2021 OCO Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 196 / <i>Space Technology Development</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
N/A					
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> The increase in FY 2021 is to support technology development.					
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	0.000	136.654	0.000	136.654

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

**Remarks**

**D. Acquisition Strategy**

Partners for these activities may include Missile Defense Agency, Space and Missile Systems Center, DoD research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, University Affiliated Research Centers, and the Missile Defense Agency.

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Space Development Agency</b>												<b>Date:</b> February 2020			
<b>Appropriation/Budget Activity</b> 0400 / 4				<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>					<b>Project (Number/Name)</b> 196 / <i>Space Technology Development</i>						
<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Space Technology Development	C/TBD	TBD : TBD	-	-		-		136.654		0.000		136.654	Continuing	Continuing	N/A
<b>Subtotal</b>			-	-		-		136.654		0.000		136.654	Continuing	Continuing	N/A
			<b>Prior Years</b>	<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			-	-		0.000		136.654		0.000		136.654	Continuing	Continuing	N/A
<b>Remarks</b>															

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 196 / <i>Space Technology Development</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

<b><i>Risk Reduction Transport Demos</i></b>	
Design and begin development Transport Tranche 0	████████████████████
<b><i>Risk Reduction Tracking Demos</i></b>	
Design and begin development of Tracking Tranche 0	████████████████████
<b><i>Risk Reduction Data Fusion Demos</i></b>	
Design and begin development of multi-INT data fusion software	████████████████████
<b><i>Hardware-in-the-loop Capability Development</i></b>	
Design and begin development of hardware-in-the-loop capability	████████████████████

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Space Development Agency		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206410SDA / <i>Space Technology Development and Prototyping</i>	<b>Project (Number/Name)</b> 196 / <i>Space Technology Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Risk Reduction Transport Demos</i></b>				
Design and begin development Transport Tranche 0	2	2020	4	2021
<b><i>Risk Reduction Tracking Demos</i></b>				
Design and begin development of Tracking Tranche 0	2	2020	4	2021
<b><i>Risk Reduction Data Fusion Demos</i></b>				
Design and begin development of multi-INT data fusion software	2	2020	4	2021
<b><i>Hardware-in-the-loop Capability Development</i></b>				
Design and begin development of hardware-in-the-loop capability	2	2020	4	2021