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**Department of Defense
Fiscal Year (FY) 2022 Budget Estimates**

May 2021



Space Development Agency

Defense-Wide Justification Book Volume 5 of 5

Research, Development, Test & Evaluation, Defense-Wide

Revised as of June 7, 2021:

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Footnotes

FY 2020 Actuals

Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).

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Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

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Department of Defense
 FY 2022 President's Budget
 Exhibit R-1 FY 2022 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2021

| Appropriation ----- | FY 2020 Actual* | FY 2021 Enacted** | FY 2022 Request |
|--|--------------------|----------------------|--------------------|
| ----- | ----- | ----- | ----- |
| Research, Development, Test & Eval, DW | 95,217 | 267,116 | 808,817 |
| Total Research, Development, Test & Evaluation | 95,217 | 267,116 | 808,817 |

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Department of Defense
 FY 2022 President's Budget
 Exhibit R-1 FY 2022 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2021

| Summary Recap of Budget Activities ----- | FY 2020 Actual* | FY 2021 Enacted** | FY 2022 Request |
|--|--------------------|----------------------|--------------------|
| ----- | ----- | ----- | ----- |
| Advanced Technology Development | 20,001 | 72,422 | 172,638 |
| Advanced Component Development & Prototypes | 75,216 | 194,694 | 636,179 |
| Total Research, Development, Test & Evaluation | 95,217 | 267,116 | 808,817 |
| Summary Recap of FYDP Programs ----- | | | |
| Space | 95,217 | 267,116 | 808,817 |
| Total Research, Development, Test & Evaluation | 95,217 | 267,116 | 808,817 |

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FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

04 May 2021

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Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

04 May 2021

| Appropriation ----- | FY 2020 Actual* | FY 2021 Enacted** | FY 2022 Request |
|--|--------------------|----------------------|--------------------|
| ----- | ----- | ----- | ----- |
| Space Development Agency | 95,217 | 267,116 | 808,817 |
| Total Research, Development, Test & Evaluation | 95,217 | 267,116 | 808,817 |

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FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

04 May 2021

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

| Line | Program | Element | Item | Act | FY 2020 Actual* | FY 2021 Enacted** | FY 2022 Request | S e c |
|--|------------|---|-------|-----|--------------------|----------------------|--------------------|-------------|
| -- | ----- | ----- | ----- | --- | ----- | ----- | ----- | - |
| 73 | 1206310SDA | Space Science and Technology Research and Development | | 03 | 20,001 | 72,422 | 172,638 | U |
| | | Advanced Technology Development | | | 20,001 | 72,422 | 172,638 | |
| 124 | 1206410SDA | Space Technology Development and Prototyping | | 04 | 75,216 | 194,694 | 636,179 | U |
| | | Advanced Component Development & Prototypes | | | 75,216 | 194,694 | 636,179 | |
| Total Research, Development, Test & Eval, DW | | | | | 95,217 | 267,116 | 808,817 | |

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Space Development Agency
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

04 May 2021

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

| Line | Program | Element | Item | Act | FY 2020 Actual* | FY 2021 Enacted** | FY 2022 Request | S e c |
|--------------------------------|------------|---|-------|-----|--------------------|----------------------|--------------------|-------------|
| -- | ----- | ----- | ----- | --- | ----- | ----- | ----- | - |
| 73 | 1206310SDA | Space Science and Technology Research and Development | | 03 | 20,001 | 72,422 | 172,638 | U |
| | | Advanced Technology Development | | | 20,001 | 72,422 | 172,638 | |
| 124 | 1206410SDA | Space Technology Development and Prototyping | | 04 | 75,216 | 194,694 | 636,179 | U |
| | | Advanced Component Development & Prototypes | | | 75,216 | 194,694 | 636,179 | |
| Total Space Development Agency | | | | | 95,217 | 267,116 | 808,817 | |

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

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Space Development Agency **Date:** May 2021

| | |
|---|---|
| Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD) | R-1 Program Element (Number/Name) PE 1206310SDA / Space Science and Technology Research and Development |
|---|---|

| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
|--|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element | 0.000 | 20.001 | 72.422 | 172.638 | 0.000 | 172.638 | - | - | - | - | - | - |
| 012: Space Development Agency R&E | 0.000 | 0.000 | 72.422 | 172.638 | 0.000 | 172.638 | - | - | - | - | - | - |
| 032: Proliferated Low Earth Orbit (pLEO) Sensor Technology | 0.000 | 16.533 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| 197: SDA Disruptive Development - SBIR | 0.000 | 3.040 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| 198: SDA Disruptive Investigation - STTR | 0.000 | 0.428 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |

Note

Two new Projects (197 and 198) were created to house the Space Development Agency (SDA)'s Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding, respectively. Starting in FY 2021, the funds allocated for SBIR and STTR efforts will be in a new Program Element (PE), 0605502SDA.

In accordance with the William M. (Mac) Thornberry National Defense Authorization Act (NDAA) for FY 2021, effective on October 1, 2022, SDA will be an element of the U.S. Space Force (USSF), and report to Assistant Secretary of the Air Force (ASAF) for Space Acquisition and Integration (ASAF/SA&I) with respect to acquisition decisions and directly to the Chief of Space Operations with respect to requirements decisions, personnel decisions, and any other matter not covered by ASAF/SA&I. Funding in FY 2023 and out has been transferred to a new PE under the USSF, 1206310SF.

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including low-latency tactical communication, beyond-line-of-sight targeting, and advanced missile tracking. Specifically, SDA will demonstrate and field persistent, resilient capabilities needed to be responsive to emerging multi-domain threats against the U.S. national interest. SDA is responsible for the overall programmatic development and execution of a National Defense Space Architecture (NDSA). In coordination with other DoD Space stakeholders, SDA will drive the development of space capabilities to achieve the DoD Space Vision and reduce overlap and inefficiency. SDA will expand the DoD's space warfighting capability and foster growth in the U.S. space industrial base, by developing enhanced government-commercial relationships and international collaborations with key allies and partners.

While SDA is not responsible for building and fielding all capabilities within the NDSA, the Agency is responsible for orchestrating and architecting the NDSA and ensuring capability delivery to the warfighter following a spiral development approach. SDA is building and fielding the Transport Layer, a proliferated constellation of

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Space Development Agency | Date: May 2021 |
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| | |
|---|--|
| Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i> | R-1 Program Element (Number/Name) PE 1206310SDA / <i>Space Science and Technology Research and Development</i> |
|---|--|

satellites to provide low-latency, high-volume data to the warfighter. This transport layer will provide the space-based data transport backbone for the Combined Joint All-Domain Command and Control (C-JADC2).

The establishment of a proliferated data transport layer is essential to developing a new and responsive space architecture. SDA will integrate additional constellations with this transport layer to provide multiple warfighting capabilities, such as advanced missile warning, custody of time critical targets, and alternative position, navigation and timing (PNT).

This program element funds efforts to develop and demonstrate a prototype proliferated communications and data transport layer and other capability layers in support of the National Defense Strategy.

| B. Program Change Summary (\$ in Millions) | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 20.000 | 72.422 | 187.638 | 0.000 | 187.638 |
| Current President's Budget | 20.001 | 72.422 | 172.638 | 0.000 | 172.638 |
| Total Adjustments | 0.001 | 0.000 | -15.000 | 0.000 | -15.000 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Transfer to MDA PE 1206895C | - | - | -15.000 | 0.000 | -15.000 |
| • Program Adjustment | 0.001 | - | - | - | - |

Change Summary Explanation

The \$15.000 million reduction in FY 2022 reflects a transfer to fund the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) program under the Missile Defense Agency (MDA) Program Element (PE) 1206895C. This transfer of funds impacts the Optical Intersatellite Link (OISL) interoperability testing and tracking demonstration plans increasing schedule and technical risk of the Transport and Tracking Tranche 0 effort.

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
|---|-------------|---------|---------|--------------|--|---------------|---------|---------|---|----------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 3 | | | | | R-1 Program Element (Number/Name) PE 1206310SDA / Space Science and Technology Research and Development | | | | Project (Number/Name) 012 / Space Development Agency R&E | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 012: Space Development Agency R&E | 0.000 | 0.000 | 72.422 | 172.638 | 0.000 | 172.638 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

Note

Funding for FY 2023 and future years has been transferred to a new Program Element (PE) under the U.S. Space Force (USSF), 1206310SF.

A. Mission Description and Budget Item Justification

The Space Development Agency (SDA) is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, 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 research and development activity to deliver capabilities to U.S. joint warfighting forces in two-year tranches, beginning as early as FY 2022, including performing trade studies, technical analyses, or modeling and simulation; identifying and maturing enabling technologies; defining and conducting risk reduction demonstrations, prototyping hardware or software systems; and exploring novel concept for future warfighting capabilities.

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

| | FY 2020 | FY 2021 | FY 2022 |
|--|----------------|----------------|----------------|
| Title: Space Development Agency R&E | 0.000 | 72.422 | 172.638 |
| Description: Research and development activities to support development, demonstration, and fielding of a resilient military sensing and data transport capability via a proliferated space architecture in Low Earth Orbit (LEO). | | | |
| FY 2021 Plans: | | | |
| <ul style="list-style-type: none"> - Design, develop, and demonstrate space-to-space optical crosslink data exchange in LEO. - Design and begin development of a wide field-of-view sensor payload for advanced missile tracking experiment. - Conduct requirements review for multi-intelligence (multi-INT), multiple modalities of sensing data fusion algorithms. - In partnership with other DoD mission partners, begin design and development of operationally-relevant hosted payload candidates for demonstration and validation by SDA-developed tranches. | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 1206310SDA / <i>Space Science and Technology Research and Development</i> | Project (Number/Name) 012 / <i>Space Development Agency R&E</i> | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2020 | FY 2021 |
| <p>- Successful development of Tranche 1 of the NDSA will require advancement of multiple system and mission payload technologies, including high-speed on-orbit mesh networking, tactical data link terminals, optical intersatellite links, and space-based processors.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Demonstrate alternate position, navigation, and timing orbit and clock software. - Perform ground-based processing of missile tracking scene data collected in FY 2021. - Develop and conduct ground-based demonstration of multi-intelligence data fusion algorithms on flight-like systems and in flight-like environments. - Develop algorithms for integrated battle management, command, control, and communications (BMC3) applications. - Complete trade studies and technical analyses for Tranche 1 capabilities. <p>FY 2021 to FY 2022 Increase/Decrease Statement:</p> <p>The increase in FY 2022 is required to invest in the development of an increasingly broad set of technologies (including alternative navigation solutions, advanced missile tracking, multi-INT fusion algorithms, and integrated battle management algorithms) that are critical to delivering a robust initial warfighting capability in the NDSA. Note that this project line includes a \$15.000 million transfer to MDA, which will impact the Optical Intersatellite Link (OISL) interoperability testing and tracking demonstration plans increasing schedule and technical risk of the Transport and Tracking Tranche 0 effort.</p> | | | |
| Accomplishments/Planned Programs Subtotals | | 0.000 | 72.422 |
| C. Other Program Funding Summary (\$ in Millions) | | | |
| N/A | | | |
| Remarks | | | |
| N/A | | | |
| D. Acquisition Strategy | | | |
| <p>Partners for these activities may include DoD research centers, small businesses, large defense contractors, commercial space providers, Federally Funded Research and Development Centers, University Affiliated Research Centers, Missile Defense Agency (MDA), Space and Missile Systems Center (SMC), and Defense Advanced Research Projects Agency (DARPA). SDA is also a transition partner for technology developers who want to conduct on-orbit demonstration and experimentation.</p> | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400 / 3 | | | | | R-1 Program Element (Number/Name) PE 1206310SDA / Space Science and Technology Research and Development | | | | Project (Number/Name) 032 / Proliferated Low Earth Orbit (pLEO) Sensor Technology | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 032: Proliferated Low Earth Orbit (pLEO) Sensor Technology | 0.000 | 16.533 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |
| A. Mission Description and Budget Item Justification | | | | | | | | | | | | |
| The Proliferated Low Earth Orbit (pLEO) Sensor Technology effort will develop and demonstrate a prototype pLEO data transport layer and other capability layers to provide the eight capabilities outlined in the Department of Defense (DoD) Space Vision. The Space Development Agency (SDA) will rapidly develop and field the next generation space architecture that will enable the U.S. to deploy space capabilities that out-pace adversarial threats. This architecture is underpinned by a 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 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 2020 | FY 2021 | FY 2022 | |
| Title: Proliferated Low Earth Orbit (pLEO) Sensor Technology | | | | | | | | | 16.533 | 0.000 | 0.000 | |
| Description: Develop and demonstrate a resilient and unified military data transport layer, enabled by a pLEO architecture. This effort will demonstrate capability to provide very low-latency (low or high bandwidth) 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 Defense Advanced Research Projects Agency (DARPA) Blackjack program and, wherever feasible, leverage commercial industry approaches to provide broadband internet access from space to form the foundation of the transport layer architecture. Some accomplishments with FY 2020 funding include the following efforts: - Demonstrating and characterizing space-to-space, space-to-air, and space-to-ground optical intersatellite link (OISL) performance with two spacecraft in LEO. The spacecraft are expected to launch in FY 2021. - Conducting a series of in-flight communications demonstrations with OISL. - Developing a spacecraft equipped with Link 16 transmit and receiving capabilities enabling beyond-line-of-sight Link 16 connectivity to various assets in theater. This is the first demonstration of a space-based Link 16 terminal and serves an important risk reduction role in preparing to proliferate tactical data link connectivity in the National Defense Space Architecture (NDSA). | | | | | | | | | | | | |
| FY 2021 Plans: N/A | | | | | | | | | | | | |
| FY 2022 Plans: | | | | | | | | | | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 | |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 1206310SDA / <i>Space Science and Technology Research and Development</i> | Project (Number/Name) 032 / <i>Proliferated Low Earth Orbit (pLEO) Sensor Technology</i> | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2020 | FY 2021 |
| N/A | | | |
| FY 2021 to FY 2022 Increase/Decrease Statement: N/A. Funding for this project ended in FY 2020. | | | |
| Accomplishments/Planned Programs Subtotals | | 16.533 | 0.000 |
| C. Other Program Funding Summary (\$ in Millions) N/A | | | |
| Remarks | | | |
| D. Acquisition Strategy Partners for these activities included DoD research centers, commercial space providers, Federally Funded Research and Development Centers, and large defense contractors. | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400 / 3 | | | | | R-1 Program Element (Number/Name) PE 1206310SDA / <i>Space Science and Technology Research and Development</i> | | | | Project (Number/Name) 197 / <i>SDA Disruptive Development - SBIR</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 197: <i>SDA Disruptive Development - SBIR</i> | 0.000 | 3.040 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |
| Note This is a new Project created to manage and execute the Space Development Agency (SDA)'s Small Business Innovation Research (SBIR) funding. | | | | | | | | | | | | |
| A. Mission Description and Budget Item Justification With the emergence of many capable small businesses within the space industrial base, SDA leverages the SBIR program to invest in the development and demonstration of technologies supporting modernization of our national defense space capabilities. This program includes investments in such technologies as advanced space-based communications, sensing, data fusion, and battle management capabilities. | | | | | | | | | | | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | | | | | | | | FY 2020 | FY 2021 | FY 2022 | |
| Title: SDA Disruptive Development - SBIR Description: This project funds small business research and development activities providing analysis products and enabling technologies and capabilities for the National Defense Space Architecture (NDSA). In FY 2020, SDA made a SBIR award to further Optical Intersatellite Links (OISL) development, risk reduction and experimentation. FY 2021 SBIR topics include optical intersatellite links (OISLs); L-band Electronically Steered Array (ESA) antennas; Mesh Networking Technologies and Routers; Crypto Module; target recognition and acquisition in complex environments; and space-based environmental monitoring (SBEM) sensor. FY 2021 Plans: N/A FY 2022 Plans: N/A | | | | | | | | | 3.040 | 0.000 | 0.000 | |
| Accomplishments/Planned Programs Subtotals | | | | | | | | | 3.040 | 0.000 | 0.000 | |
| C. Other Program Funding Summary (\$ in Millions) N/A Remarks | | | | | | | | | | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 3 | R-1 Program Element (Number/Name) PE 1206310SDA / Space Science and Technology Research and Development | Project (Number/Name) 197 / SDA Disruptive Development - SBIR |

D. Acquisition Strategy

Partners for these activities include small businesses.

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400 / 3 | | | | | R-1 Program Element (Number/Name) PE 1206310SDA / <i>Space Science and Technology Research and Development</i> | | | | Project (Number/Name) 198 / <i>SDA Disruptive Investigation - STTR</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 198: <i>SDA Disruptive Investigation - STTR</i> | 0.000 | 0.428 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |
| Note This is a new Project created to manage and execute the Space Development Agency (SDA)'s Small Business Technology Transfer (STTR) funding. | | | | | | | | | | | | |
| A. Mission Description and Budget Item Justification SDA leverages STTR funds to support the collaborative development of defense space technologies by small businesses partnering with U.S. research institutions. By supporting such partnerships between emerging technology development companies and leading research organizations, SDA will help to foster the growth of a stronger, more integrated space industrial base while addressing our nation's greatest technical challenges in space. | | | | | | | | | | | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | | | | | | | | | FY 2020 | FY 2021 | FY 2022 |
| Title: SDA Disruptive Investigation - STTR Description: This project supports collaborative research and development activities by small businesses and research institutions providing enabling technologies and capabilities for the National Defense Space Architecture (NDSA). In FY 2021 STTR topics include Mesh Networking Technologies and Routers; Crypto Module; target recognition and acquisition in complex environments; and space-based environmental monitoring (SBEM) sensor. FY 2021 Plans: N/A FY 2022 Plans: N/A | | | | | | | | | | 0.428 | 0.000 | 0.000 |
| Accomplishments/Planned Programs Subtotals | | | | | | | | | | 0.428 | 0.000 | 0.000 |
| C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy Partners for these activities include small businesses teamed with a non-profit research institution. | | | | | | | | | | | | |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Space Development Agency | Date: May 2021 |
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| Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P) | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping |
|---|--|

| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
|---|----------------|---------|---------|-----------------|----------------|------------------|---------|---------|---------|---------|---------------------|---------------|
| Total Program Element | 0.000 | 75.216 | 194.694 | 636.179 | 0.000 | 636.179 | - | - | - | - | - | - |
| 001: Transport | 0.000 | 0.000 | 0.000 | 260.481 | 0.000 | 260.481 | - | - | - | - | - | - |
| 002: Sensing | 0.000 | 0.000 | 0.000 | 287.112 | 0.000 | 287.112 | - | - | - | - | - | - |
| 003: Integration and Battle Management | 0.000 | 0.000 | 0.000 | 88.586 | 0.000 | 88.586 | - | - | - | - | - | - |
| 033: Transport Layer Architecture and Standards | 0.000 | 15.000 | 14.891 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| 034: Space Situational Awareness and Launch | 0.000 | 10.000 | 24.740 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| 039: Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration | 0.000 | 30.216 | 39.709 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| 191: Space-Based Interceptors | 0.000 | 15.000 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| 193: Space-Based Discrimination | 0.000 | 5.000 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| 196: Space Technology Development | 0.000 | 0.000 | 115.354 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |

Note

In accordance with the William M. (Mac) Thornberry National Defense Authorization Act (NDAA) for FY 2021, effective on October 1, 2022, the Space Development Agency (SDA) will be an element of the U.S. Space Force (USSF), and report to Assistant Secretary of the Air Force (ASAF) for Space Acquisition and Integration (ASAF/SA&I) with respect to acquisition decisions and directly to the Chief of Space Operations with respect to requirements decisions, personnel decisions, and any other matter not covered by ASAF/SA&I.

A. Mission Description and Budget Item Justification

SDA is responsible for developing and demonstrating 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, SDA will help inform the Department of Defense (DoD)'s decision to develop and implement a proliferated architecture enabled by lower-cost, mass-produced spacecraft and routine space access; shift the DoD to a development organization focused on experimentation, prototyping, and accelerated fielding. SDA will manage, direct, and execute the development of the space capabilities for the joint warfighter in accordance with DoD's Space Vision and field space capabilities at speed and scale, with the following goals:

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Space Development Agency | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P) | | R-1 Program Element (Number/Name) PE 1206410SDA I Space Technology Development and Prototyping | | | | |
| <ul style="list-style-type: none">• 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). <p>SDA will rapidly deploy critical elements of next-generation space capabilities, initially focusing on these essential capabilities:</p> <ul style="list-style-type: none">• 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,• 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-enabled global surveillance. <p>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 within the National Defense Space Architecture (NDSA). SDA will develop an initial set of sub-constellations on this Transport Layer to provide additional capabilities, such as advanced missile warning.</p> <p>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.</p> | | | | | | |
| B. Program Change Summary (\$ in Millions) | | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total |
| Previous President's Budget | | 75.000 | 215.994 | 681.898 | 0.000 | 681.898 |
| Current President's Budget | | 75.216 | 194.694 | 636.179 | 0.000 | 636.179 |
| Total Adjustments | | 0.216 | -21.300 | -45.719 | 0.000 | -45.719 |
| • Congressional General Reductions | | - | - | | | |
| • Congressional Directed Reductions | | - | -11.300 | | | |
| • Congressional Rescissions | | - | - | | | |
| • Congressional Adds | | - | - | | | |
| • Congressional Directed Transfers | | - | -10.000 | | | |
| • Reprogrammings | | 0.216 | - | | | |
| • SBIR/STTR Transfer | | - | - | | | |
| • Program Adjustment | | - | - | -10.719 | - | -10.719 |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Space Development Agency | | | | Date: May 2021 | |
| Appropriation/Budget Activity | | | R-1 Program Element (Number/Name) | | |
| 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P) | | | PE 1206410SDA / Space Technology Development and Prototyping | | |
| • Transfer to MDA PE 1206895C | | | - | - | -35.000 |
| | | | | | -35.000 |
| Change Summary Explanation | | | | | |
| FY 2021 Directed Reduction in the amount of \$11.300 million was for unjustified launch costs. The \$10.000 million Directed Transfer moved funding to the Missile Defense Agency (MDA) for the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) program. The FY 2022 Economic Assumption / Inflation Adjustment is an adjustment for non-pay, non-fuel purchases based on the revised Gross Domestic Product (GDP) rates provided by the Office of Management and Budget. The \$35.000 million reduction in FY 2022 reflects a transfer to fund the HBTSS program under the MDA Program Element (PE) 1206895C. This transfer of funds impacts the Optical Intersatellite Link (OISL) interoperability testing and tracking demonstration plans increasing schedule and technical risk of the Transport and Tracking Tranche 0 effort. | | | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|--|----------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 001 / Transport | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 001: Transport | 0.000 | 0.000 | 0.000 | 260.481 | 0.000 | 260.481 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |
| Note | | | | | | | | | | | | |
| Funding was realigned from Project 033 (Transport Layer Architecture and Standards) and Project 196 (Space Technology Development) into this new project code (Project 001) to continue the development and fielding of the National Defense Space Architecture (NDSA). This project code was established to better align budget exhibits with the current Space Development Agency (SDA) construct. Funding in FY 2023 and future years has been transferred to a new Program Element (PE) under the U.S. Space Force (USSF), 1206410SF. | | | | | | | | | | | | |
| A. Mission Description and Budget Item Justification | | | | | | | | | | | | |
| SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including low-latency tactical communication enabling 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 LEO. This program element funds the development and demonstration of space technologies to deliver low-latency data transport and alternate position, navigation, and timing capabilities to U.S. joint warfighting forces in two-year tranches, beginning as early as FY 2022. | | | | | | | | | | | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | | | | | | | | FY 2020 | FY 2021 | FY 2022 | |
| Title: Transport | | | | | | | | | 0.000 | 0.000 | 260.481 | |
| Description: Develop and demonstrate prototypes that enable a resilient and unified military data transport layer, sensor capabilities, and alternate position, navigation, and timing (APNT) capabilities enabled by a proliferated Low Earth Orbit (pLEO) architecture. This effort will define, demonstrate, and deliver the architectures and standards necessary to rapidly prototype and field new satellite capabilities in LEO. | | | | | | | | | | | | |
| FY 2021 Plans: N/A | | | | | | | | | | | | |
| FY 2022 Plans: - Develop plans for and begin development of enabling technologies for initial Transport warfighting capability. - Develop 20 Transport Tranche 0 space vehicles. - Complete Tranche 0 interoperability verification testing at Government hardware-in-the-loop (HWIL) test facility. - Conduct flight missions for initial tranche operations. - Develop plans for Tranche 0 capstone demonstrations. | | | | | | | | | | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 | |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 001 / <i>Transport</i> | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2020 | FY 2021 |
| <ul style="list-style-type: none"> - Launch Transport Tranche 0 satellites. - Develop plans for follow-on tranche capabilities. <p><i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> Funding was realigned from Project 033 (Transport Layer Architecture and Standards) and Project 196 (Space Technology Development) into this new project code to continue the development and fielding of the National Defense Space Architecture (NDSA), particularly with Transport activities. The increase will fund Tranche 0 capabilities and follow-on tranche development efforts. Note that this project line includes a \$35.000 million transfer to MDA, which will impact the Optical Intersatellite Link (OISL) interoperability testing and tracking demonstration plans increasing schedule and technical risk of the Transport and Tracking Tranche 0 effort.</p> | | | |
| Accomplishments/Planned Programs Subtotals | | 0.000 | 0.000 |
| C. Other Program Funding Summary (\$ in Millions) | | | |
| N/A | | | |
| Remarks | | | |
| D. Acquisition Strategy | | | |
| Partners for these activities may include Missile Defense Agency (MDA), Space and Missile Systems Center (SMC), DoD Combatant Commands, 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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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
|---|------------------------|--|-------------|---------|------------|---|------------|--------------|------------|--|------------|----------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 001 / Transport | | | | | |
| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Transport Tranche 0 | C/FFP | Lockheed Martin : Littleton, CO | 0.000 | 0.000 | | 0.000 | | 120.027 | | 0.000 | | 120.027 | - | - | - |
| Transport Tranche 0 | C/FFP | York Space Systems : Denver, CO | 0.000 | 0.000 | | 0.000 | | 57.174 | | 0.000 | | 57.174 | - | - | - |
| Multi-Domain Agile Navigation and Timing Network Automation (MANNA) Tranche 0 | C/BA | Naval Research Laboratory (NRL) : Washington, DC | 0.000 | 0.000 | | 0.000 | | 0.150 | | 0.000 | | 0.150 | - | - | - |
| Launch Tranche 0 | C/CS | SpaceX : Hawthorne, CA | 0.000 | 0.000 | | 0.000 | | 83.130 | | 0.000 | | 83.130 | - | - | - |
| Subtotal | | | 0.000 | 0.000 | | 0.000 | | 260.481 | | 0.000 | | 260.481 | - | - | N/A |
| | | | Prior Years | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 0.000 | | 0.000 | | 260.481 | | 0.000 | | 260.481 | - | - | N/A |
| Remarks | | | | | | | | | | | | | | | |

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| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | Project (Number/Name) 001 / <i>Transport</i> | | | |

| | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| <i>Transport</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete the development of Transport Tranche 0 space vehicles. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Launch and early operations of Tranche 0 Transport satellites. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Begin planning activities for follow-on tranche Transport Layer capabilities. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 001 / <i>Transport</i> | |

Schedule Details

| Events by Sub Project | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>Transport</i> | | | | |
| Complete the development of Transport Tranche 0 space vehicles. | 1 | 2022 | 4 | 2022 |
| Launch and early operations of Tranche 0 Transport satellites. | 3 | 2022 | 4 | 2023 |
| Begin planning activities for follow-on tranche Transport Layer capabilities. | 1 | 2022 | 4 | 2023 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|--|----------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 002 / Sensing | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 002: Sensing | 0.000 | 0.000 | 0.000 | 287.112 | 0.000 | 287.112 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

Note

Funding was realigned from Project 039 (Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration) and Project 196 (Space Technology Development) into this new project code (Project 002) to continue the development and fielding of the National Defense Space Architecture (NDSA). This project code was established to better align budget exhibits with the current Space Development Agency (SDA) construct. Funding in FY 2023 and future years has been transferred to a new Program Element (PE) under the U.S. Space Force (USSF), 1206410SF.

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including advanced missile tracking and global surveillance enabling beyond-line-of-sight targeting. 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 LEO. This program element funds the development and demonstration of space technologies to deliver advanced missile tracking, global surveillance and surface moving target custody, and enhanced space domain awareness and deterrence capabilities to U.S. joint warfighting forces in two-year tranches, beginning as early as FY 2022.

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

| | FY 2020 | FY 2021 | FY 2022 |
|---|----------------|----------------|----------------|
| Title: Sensing | 0.000 | 0.000 | 287.112 |
| Description: 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 to enable enhanced space domain awareness, and leveraging small-to-medium launch service access to demonstrate responsive constitution and replenishment. 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. | | | |
| FY 2021 Plans: N/A | | | |
| FY 2022 Plans: - Develop Tracking Tranche 0 comprised of up to eight Wide Field of View (WFOV) Overhead Persistent Infrared (OPIR) satellites. | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 | |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 002 / <i>Sensing</i> | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2020 | FY 2021 |
| <ul style="list-style-type: none"> - Integrate Tracking space vehicles with one another and with Transport space vehicles to enable low-latency transport of advanced missile tracking data. - Launch Tracking Tranche 0 satellites. - Demonstrate the performance of the OPIR payloads to detect dim targets with stressing background scenes. - Demonstrate capability to transfer data from tracking layer to existing Joint OPIR Ground (JOG) in standardized formats. - Develop and conduct ground-based demonstration of multi-intelligence (multi-INT) data fusion algorithms on flight-like systems and in flight-like environments; validate on orbit via Transport Tranche 0 to maximum extent possible. <p><i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> Funding was realigned from Project 039 (Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration) and Project 196 (Space Technology Development) into this new project code (Project 002) to continue the development and fielding of the National Defense Space Architecture (NDSA). The increase will fund the ramp-up of Tranche 0 Sensing activities and follow-on tranche development efforts.</p> | | | |
| Accomplishments/Planned Programs Subtotals | | 0.000 | 0.000 |
| C. Other Program Funding Summary (\$ in Millions) | | | |
| N/A | | | |
| Remarks | | | |
| D. Acquisition Strategy | | | |
| Partners for these activities may include Missile Defense Agency (MDA), Space and Missile Systems Center (SMC), DoD Combatant Commands, 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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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | | Project (Number/Name) 002 / Sensing | | | | |
| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Tracking Tranche 0 | C/FFP | L3Harris : Palm Bay, FL | 0.000 | 0.000 | | 0.000 | | 130.157 | | 0.000 | | 130.157 | - | - | - |
| Tracking Tranche 0 | C/FFP | SpaceX : Hawthorne, CA | 0.000 | 0.000 | | 0.000 | | 99.947 | | 0.000 | | 99.947 | - | - | - |
| Tranche 1 | C/TBD | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 57.008 | | 0.000 | | 57.008 | - | - | - |
| Subtotal | | | 0.000 | 0.000 | | 0.000 | | 287.112 | | 0.000 | | 287.112 | - | - | N/A |
| | | | Prior Years | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 0.000 | | 0.000 | | 287.112 | | 0.000 | | 287.112 | - | - | N/A |
| Remarks | | | | | | | | | | | | | | | |

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| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | | | Project (Number/Name) 002 / <i>Sensing</i> | | | |

| | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 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 |
| Sensing | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete the development of Tracking Tranche 0 space vehicles and integrate with Transport Layer. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Launch and early operations of Tranche 0 Tracking satellites. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Begin planning activities for follow-on tranche capabilities. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop multi-INT data fusion and dissemination algorithms. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 002 / <i>Sensing</i> | |

Schedule Details

| Events by Sub Project | Start | | End | |
|---|----------------|-------------|----------------|-------------|
| | Quarter | Year | Quarter | Year |
| <i>Sensing</i> | | | | |
| Complete the development of Tracking Tranche 0 space vehicles and integrate with Transport Layer. | 1 | 2022 | 4 | 2022 |
| Launch and early operations of Tranche 0 Tracking satellites. | 3 | 2022 | 4 | 2023 |
| Begin planning activities for follow-on tranche capabilities. | 1 | 2022 | 4 | 2023 |
| Develop multi-INT data fusion and dissemination algorithms. | 1 | 2022 | 4 | 2023 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|--|----------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 003 / Integration and Battle Management | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 003: Integration and Battle Management | 0.000 | 0.000 | 0.000 | 88.586 | 0.000 | 88.586 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

Note

Funding was realigned from Project 034 (Space Situational Awareness and Launch) and Project 196 (Space Technology Development) into this new project code (Project 003) to continue the development and fielding of the National Defense Space Architecture (NDSA). This project code was established to better align budget exhibits with the current Space Development Agency (SDA) construct. Funding in FY 2023 and future years has been transferred to a new Program Element (PE) under the U.S. Space Force (USSF), 1206410SF.

A. Mission Description and Budget Item Justification

SDA is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. SDA is developing capabilities to address a wide range of Department of Defense (DoD) space needs as stated in the National Defense Strategy and DoD Space Vision, including space-based battle management and a ground support infrastructure. 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 LEO. This program element funds the development and demonstration of space technologies to deliver space-based command and control, tasking, mission processing and dissemination capabilities, as well as an integrated, resilient network of ground support capabilities, to U.S. joint warfighting forces in two-year tranches, beginning as early as FY 2022.

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

| | FY 2020 | FY 2021 | FY 2022 |
|---|----------------|----------------|----------------|
| Title: Integration and Battle Management | 0.000 | 0.000 | 88.586 |
| Description: Deliver capabilities to U.S. joint warfighting forces in two-year enhanced capability tranches, beginning as early as FY 2022. Products include but are not limited to performing trade studies, technical analyses, or modeling and simulation; identifying and maturing enabling technologies; defining and conducting ground-based and on-orbit risk reduction demonstrations, prototyping hardware or software systems; and exploring novel concepts for future warfighting capabilities augmented by a resilient proliferated Low Earth Orbit (pLEO) satellite architecture. | | | |
| FY 2021 Plans: N/A | | | |
| FY 2022 Plans: - Conduct hardware-in-the-loop operations to validate Battle Management solutions. - Prepare Naval Research Laboratory's Blossom Point ground station for Tranche 0 satellite operations. | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 | |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 003 / <i>Integration and Battle Management</i> | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2020 | FY 2021 |
| <ul style="list-style-type: none"> - Complete validation and verification of the Government-owned hardware-in-the-loop testbed capability. - Establish initial SDA ground capability and prepare for Tranche 0 satellite operations. - Launch Tranche 0 satellites. - Develop plans for follow-on tranche capabilities. <p><i>FY 2021 to FY 2022 Increase/Decrease Statement:</i> Funding was realigned from Project 034 (Space Situational Awareness and Launch) and Project 196 (Space Technology Development) into this new project code (Project 003) to continue the development and fielding of the National Defense Space Architecture (NDSA). The increase will fund the ramp-up of Tranche 0 integration and battle management activities and follow-on tranche development efforts.</p> | | | |
| Accomplishments/Planned Programs Subtotals | | 0.000 | 0.000 |
| C. Other Program Funding Summary (\$ in Millions) | | | |
| N/A | | | |
| Remarks | | | |
| D. Acquisition Strategy | | | |
| Partners for these activities may include Missile Defense Agency (MDA), Space and Missile Systems Center (SMC), DoD Combatant Commands, 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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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
|--|------------------------|--|-------------|---------|------------|---|------------|--------------|------------|--|------------|----------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 003 / Integration and Battle Management | | | | | |
| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Mission Systems Engineering and Integration (MSE&I) Tranche 0 | C/FFP | Perspecta : Chantilly, VA | 0.000 | 0.000 | | 0.000 | | 10.066 | | 0.000 | | 10.066 | - | - | - |
| Integration/Support Tranche 0 | C/BA | Naval Research Laboratory (NRL) : Washington, DC | 0.000 | 0.000 | | 0.000 | | 10.200 | | 0.000 | | 10.200 | - | - | - |
| Launch Tranche 0 | C/FFP | SpaceX : Hawthorne, CA | 0.000 | 0.000 | | 0.000 | | 51.287 | | 0.000 | | 51.287 | - | - | - |
| Tranche 1 | C/TBD | TBD : TBD | 0.000 | 0.000 | | 0.000 | | 17.033 | | 0.000 | | 17.033 | - | - | - |
| Subtotal | | | 0.000 | 0.000 | | 0.000 | | 88.586 | | 0.000 | | 88.586 | - | - | N/A |
| | | | Prior Years | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 0.000 | | 0.000 | | 88.586 | | 0.000 | | 88.586 | - | - | N/A |
| Remarks | | | | | | | | | | | | | | | |

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|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|
| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | | | Project (Number/Name) 003 / <i>Integration and Battle Management</i> | | | |

| | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|--|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| <i>Integration and Battle Management</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete the development of an initial battle management architecture. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Complete the development of Tranche 0 ground support infrastructure. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Manage Tranche 0 constellation operations. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Begin planning activities for follow-on tranche capabilities. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 003 / <i>Integration and Battle Management</i> | |

Schedule Details

| Events by Sub Project | Start | | End | |
|--|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>Integration and Battle Management</i> | | | | |
| Complete the development of an initial battle management architecture. | 1 | 2022 | 4 | 2023 |
| Complete the development of Tranche 0 ground support infrastructure. | 1 | 2022 | 4 | 2023 |
| Manage Tranche 0 constellation operations. | 1 | 2022 | 4 | 2023 |
| Begin planning activities for follow-on tranche capabilities. | 1 | 2022 | 4 | 2023 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|---|----------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 033 / Transport Layer Architecture and Standards | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 033: Transport Layer Architecture and Standards | 0.000 | 15.000 | 14.891 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

Note

Funding in FY 2022 is transferred to the new Transport Project 001. Funding in FY 2023 and future years has been transferred to a new Program Element (PE) under the U.S. Space Force (USSF), 1206410SF.

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 Department of Defense (DoD) Space Vision. The Space Development Agency (SDA) will rapidly develop and field the next generation space architecture that will enable the U.S. to deploy space capabilities that out-pace adversarial threats. This architecture is underpinned by common satellite buses, common interfaces between payloads and buses, and common data interfaces and standards. 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 2020 | FY 2021 | FY 2022 |
|---|----------------|----------------|----------------|
| Title: Transport Layer Architecture and Standards | 15.000 | 14.891 | 0.000 |
| Description: Develop and demonstrate prototypes that enable a resilient and unified military data transport layer and sensor capabilities, enabling a pLEO architecture. This effort will define and deliver the architectures and standards necessary to rapidly prototype and field new satellite capabilities in Low Earth Orbit (LEO). | | | |
| FY 2021 Plans: - Perform technology development and in-flight demonstrations to test and demonstrate optical intersatellite link technologies. | | | |
| FY 2022 Plans: N/A | | | |
| FY 2021 to FY 2022 Increase/Decrease Statement: Funding in FY 2022 is transferred to the new Transport Project, 001. | | | |
| Accomplishments/Planned Programs Subtotals | 15.000 | 14.891 | 0.000 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 033 / <i>Transport Layer Architecture and Standards</i> |
| <p><u>C. Other Program Funding Summary (\$ in Millions)</u> N/A</p> <p><u>Remarks</u> N/A</p> <p><u>D. Acquisition Strategy</u> Partners for these activities include DoD research centers, large defense contractors, and commercial space providers.</p> | | |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
|--|------------------------|--|-------------|---------|------------|---|------------|--------------|------------|---|------------|----------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 033 / Transport Layer Architecture and Standards | | | | | |
| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Transport Tranche 0 | C/FFP | York Space Systems : Denver, CO | 0.000 | 6.264 | Aug 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| MANDRAKE 2 | C/FFP | Lockheed Martin : Sunnyvale, CO | 0.000 | 1.900 | Jul 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Optical Intersatellite Links (OISL) | SS/FFP | General Atomics : San Diego, CA | 0.000 | 5.490 | Jun 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Multi-Domain Agile Navigation and Timing Network Automation (MANNA) | MIPR | Naval Research Laboratory : Washington, DC | 0.000 | 1.346 | Jun 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Transport Tranche 0 | C/FFP | Lockheed Martin : Littleton, CO | 0.000 | 0.000 | | 5.750 | Feb 2021 | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Transport Tranche 1 | C/FFP | TBD : TBD | 0.000 | 0.000 | | 9.141 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Subtotal | | | 0.000 | 15.000 | | 14.891 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |
| | | | Prior Years | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 15.000 | | 14.891 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |
| Remarks | | | | | | | | | | | | | | | |

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|---|--|--|--|--|---|--|--|---|--|----------------|--|--|
| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | Project (Number/Name) 033 / Transport Layer Architecture and Standards | | | | |

| | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| <i>Transport Layer Architecture and Standards</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Enable an initial deployment of the space architecture. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop and perform on-orbit demonstration of optical intersatellite links (OISL). | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Link the early builds of the space based data Transport Layer to ground systems via optical communications. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 033 / <i>Transport Layer Architecture and Standards</i> |

Schedule Details

| Events by Sub Project | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>Transport Layer Architecture and Standards</i> | | | | |
| Enable an initial deployment of the space architecture. | 4 | 2020 | 4 | 2021 |
| Develop and perform on-orbit demonstration of optical intersatellite links (OISL). | 3 | 2020 | 4 | 2021 |
| Link the early builds of the space based data Transport Layer to ground systems via optical communications. | 3 | 2020 | 4 | 2021 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|---|----------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 034 / Space Situational Awareness and Launch | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 034: Space Situational Awareness and Launch | 0.000 | 10.000 | 24.740 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |
| Note | | | | | | | | | | | | |
| Funding in FY 2022 is transferred to the new Integration and Battle Management Project, 003. Funding in FY 2023 and future years has been transferred to a new Program Element (PE) under the U.S. Space Force (USSF), 1206410SF. | | | | | | | | | | | | |
| 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 Department of Defense (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) | | | | | | | | | FY 2020 | FY 2021 | FY 2022 | |
| Title: Space Situational Awareness and Launch | | | | | | | | | 10.000 | 24.740 | 0.000 | |
| Description: Develop transport layer to provide critical data transfer capabilities, such as dissemination of space situational awareness data. In addition, this effort will identify and contract for launch of small-to-medium size payloads, to demonstrate responsive constitution and replenishment. | | | | | | | | | | | | |
| FY 2021 Plans: | | | | | | | | | | | | |
| - Identify launch opportunities for Space Transport Layer demonstration. | | | | | | | | | | | | |
| - Design and develop initial pLEO data transport capabilities. | | | | | | | | | | | | |
| - Improve architecture resilience by developing advanced beyond-line-of-sight communications systems. | | | | | | | | | | | | |
| - Develop deep space surveillance plans. | | | | | | | | | | | | |
| FY 2022 Plans: | | | | | | | | | | | | |
| N/A | | | | | | | | | | | | |
| FY 2021 to FY 2022 Increase/Decrease Statement: | | | | | | | | | | | | |
| Funding in FY 2022 is transferred to the new Integration and Battle Management Project, 003. | | | | | | | | | | | | |
| Accomplishments/Planned Programs Subtotals | | | | | | | | | 10.000 | 24.740 | 0.000 | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 034 / <i>Space Situational Awareness and Launch</i> |
| <u>C. Other Program Funding Summary (\$ in Millions)</u> N/A <u>Remarks</u> N/A <u>D. Acquisition Strategy</u> Partners for these activities include commercial space providers and Federally Funded Research and Development Centers. | | |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
|--|------------------------|---------------------------------------|-------------|---------|------------|---|------------|--------------|------------|---|------------|----------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 034 / Space Situational Awareness and Launch | | | | | |
| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Transport Tranche 0 | C/FFP | York Space Systems : Denver, CO | 0.000 | 9.600 | Aug 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Battle Management Command, Control, and Communication (BMC3) Tasks | FFRDC | CMU/SEI : Pittsburgh, PA | 0.000 | 0.400 | Jul 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Integration Tranche 0 | MIPR | NRL : Washington, DC | 0.000 | 0.000 | | 2.554 | Oct 2020 | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Launch Tranche 0 | C/FFP | SpaceX : Hawthorne, CA | 0.000 | 0.000 | | 4.207 | Dec 2020 | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Tranche 1 | C/Various | TBD : TBD | 0.000 | 0.000 | | 15.763 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Laser Interconnect and Communications System (LINCS) Rideshare Integration | C/IDIQ | Perspecta Engineering : Chantilly, VA | 0.000 | 0.000 | | 1.788 | Feb 2021 | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Launch Tranche 0 Options | Option/ FFP | SpaceX : Hawthorne, CA | 0.000 | 0.000 | | 0.425 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Subtotal | | | 0.000 | 10.000 | | 24.737 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |
| Management Services (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Interest Payment | MIPR | WHS : Washington, DC | 0.000 | 0.000 | | 0.003 | Nov 2020 | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Subtotal | | | 0.000 | 0.000 | | 0.003 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |
| | | | Prior Years | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 10.000 | | 24.740 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | Project (Number/Name) 034 / Space Situational Awareness and Launch | | | | |
| | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract | |
| Remarks | | | | | | | | | | |

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| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | | | Project (Number/Name) 034 / <i>Space Situational Awareness and Launch</i> | | | |

| | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|--|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| <i>Space Situational Awareness and Launch</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop initial Transport Layer capability, ultimately enabling space situational awareness development and dissemination. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extend Transport Layer capabilities with advanced beyond line of sight communications techniques. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 034 / <i>Space Situational Awareness and Launch</i> | |

Schedule Details

| Events by Sub Project | Start | | End | |
|--|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>Space Situational Awareness and Launch</i> | | | | |
| Develop initial Transport Layer capability, ultimately enabling space situational awareness development and dissemination. | 4 | 2020 | 2 | 2022 |
| Extend Transport Layer capabilities with advanced beyond line of sight communications techniques. | 3 | 2021 | 2 | 2022 |

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|--|-------------|---------|---------|--------------|---|---------------|---------|---------|---|----------------|------------------|------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 039 / Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 039: Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration | 0.000 | 30.216 | 39.709 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |
| Note Funding in FY 2022 is transferred to the new Sensing Project, 002. Funding in FY 2023 and future years has been transferred to a new Program Element (PE) under the U.S. Space Force (USSF), 1206410SF. | | | | | | | | | | | | |
| A. Mission Description and Budget Item Justification The proliferated Low Earth Orbit (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 2020 | FY 2021 | FY 2022 | |
| Title: pLEO Missile Warning Ground Integration | | | | | | | | | 30.216 | 39.709 | 0.000 | |
| Description: Develop and demonstrate payload prototypes compatible with a 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. | | | | | | | | | | | | |
| FY 2021 Plans: - Develop multi-band wide field of view (WFOV) overhead persistent infrared (OPIR) payload to evaluate OPIR detection and tracking methods from Low Earth Orbit (LEO). - Integrate payload with satellite bus, launch satellite, and conduct tracking experiments in LEO. - Develop medium field of view (MFOV) OPIR experiment to reduce technical risk of hybrid WFOV/MFOV missile tracking architecture. | | | | | | | | | | | | |
| FY 2022 Plans: N/A | | | | | | | | | | | | |
| FY 2021 to FY 2022 Increase/Decrease Statement: Funding in FY 2022 is transferred to the new Sensing Project, 002. | | | | | | | | | | | | |
| Accomplishments/Planned Programs Subtotals | | | | | | | | | 30.216 | 39.709 | 0.000 | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 039 / <i>Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration</i> |
| C. Other Program Funding Summary (\$ in Millions) N/A | | |
| Remarks N/A | | |
| D. Acquisition Strategy Partners for these activities include Department of Defense (DoD) research centers, large defense contractors, and commercial space providers. | | |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
|--|------------------------|-----------------------------------|-------------|---------|------------|---|------------|--------------|------------|---|------------|----------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 039 / Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration | | | | | |
| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Transport Tranche 0 | C/FFP | York Space Systems : Denver, CO | 0.000 | 0.302 | Aug 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Tracking Tranche 0 | C/FFP | L3Harris : Melbourne, FL | 0.000 | 4.240 | Sep 2020 | 19.214 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Tracking Tranche 0 | C/FFP | SpaceX : Hawthorne, CA | 0.000 | 4.906 | Sep 2020 | 19.505 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Support Tranche 0 | C/FFP | Space X : Hawthorne, CA | 0.000 | 1.053 | Dec 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Transport Tranche 0 | C/CPFF | Lockheed Martin : Littleton, CO | 0.000 | 0.808 | Mar 2021 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Payload Mods & Flight Units | C/FFP | Collins Aerospace : Danbury, CT | 0.000 | 1.380 | Mar 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Multi-Band OPIR Payload (MBOP) | SS/CR | Collins Aerospace : Danbury, CT | 0.000 | 5.148 | May 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Prototype Infrared Payload (PIRPL) | SS/CPFF | Northrop Grumman : Huntsville, AL | 0.000 | 3.811 | Jun 2020 | 0.794 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| MQ9 Integration | C/TBD | General Atomics : San Diego, CA | 0.000 | 6.002 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Commercial Tranche 0 Optical Intersatellite Links (OISL) Demo | C/TBD | Capella : San Francisco, CA | 0.000 | 2.466 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| MANDRAKE 2 | C/FFP | Lockheed Martin : Sunnydale, CA | 0.000 | 0.100 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Transport Tranche 1 | C/TBD | TBD : TBD | 0.000 | 0.000 | | 0.196 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Subtotal | | | 0.000 | 30.216 | | 39.709 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |
| | | | Prior Years | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 30.216 | | 39.709 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |
| Remarks | | | | | | | | | | | | | | | |

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| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | | | Project (Number/Name) 039 / <i>Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration</i> | | | |

| | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|--|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| <i>Missile Warning Technology</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop a multi-band wide field of view experimental OPIR payload. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop experimental satellite bus and integrate OPIR payload. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop medium field of view OPIR experiment. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Design and develop Tranche 0 missile tracking satellites informed by tracking experiments. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 039 / <i>Proliferated Low Earth Orbit (pLEO) Missile Warning Ground Integration</i> | |

Schedule Details

| Events by Sub Project | Start | | End | |
|--|----------------|-------------|----------------|-------------|
| | Quarter | Year | Quarter | Year |
| <i>Missile Warning Technology</i> | | | | |
| Develop a multi-band wide field of view experimental OPIR payload. | 3 | 2020 | 2 | 2022 |
| Develop experimental satellite bus and integrate OPIR payload. | 4 | 2020 | 2 | 2022 |
| Develop medium field of view OPIR experiment. | 3 | 2020 | 3 | 2021 |
| Design and develop Tranche 0 missile tracking satellites informed by tracking experiments. | 1 | 2021 | 2 | 2022 |

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|--|--------------------|----------------|----------------|---------------------|---|----------------------|----------------|----------------|---|-----------------------|-------------------------|-------------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | Project (Number/Name) 191 / <i>Space-Based Interceptors</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 191: <i>Space-Based Interceptors</i> | 0.000 | 15.000 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |
| A. Mission Description and Budget Item Justification <p>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 Department of Defense (DoD) Space Vision. Developing and fielding a pLEO space architecture will significantly improve U.S. resilience posture in space. This effort focused on developing the battle management software, infrastructure, and test capabilities to ensure maximum utility of pLEO hardware. This effort supported on-board space data processing, data ingest and fusion of legacy, current, and future space-based capabilities.</p> | | | | | | | | | | | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | | | | | | | | FY 2020 | FY 2021 | FY 2022 | |
| Title: Space-Based Interceptor Assessment Description: Developed 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. FY 2021 Plans: N/A FY 2022 Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: While funding for this Project code ended in FY 2020, the work initiated in this Project code continues in FY 2021 under Project codes 039 and 196. This work initiated the development of the Transport Layer, and initial OPIR background measurement payload development for missile targeting data dissemination. | | | | | | | | | 15.000 | 0.000 | 0.000 | |
| Accomplishments/Planned Programs Subtotals | | | | | | | | | 15.000 | 0.000 | 0.000 | |
| C. Other Program Funding Summary (\$ in Millions) N/A Remarks | | | | | | | | | | | | |
| D. Acquisition Strategy Partners for these activities included large defense contractors. | | | | | | | | | | | | |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | Project (Number/Name) 191 / <i>Space-Based Interceptors</i> | | | |

| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Transport Tranche 0 | C/FFP | Lockheed Martin : Littleton, CO | 0.000 | 11.200 | Aug 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Transport Tranche 0 | C/FFP | York : Denver, CO | 0.000 | 0.217 | Aug 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Prototype Infrared Payload (PIRPL) | SS/FFP | Northrop Grumman : Huntsville, AL | 0.000 | 3.583 | Oct 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Subtotal | | | 0.000 | 15.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |

| | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
|----------------------------|--------------------|----------------|----------------|---------------------|--------------------|----------------------|-------------------------|-------------------|---------------------------------|
| Project Cost Totals | 0.000 | 15.000 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | N/A |

Remarks

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|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|---|--|--|--|
| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | | | Project (Number/Name) 191 / <i>Space-Based Interceptors</i> | | | |

| FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <i>Space-Based Interceptor</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop medium field of view OPIR experiment enabling advanced missile detection and tracking. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop initial data transport capabilities enabling the dissemination of missile targeting data. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 191 / <i>Space-Based Interceptors</i> |

Schedule Details

| Events by Sub Project | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>Space-Based Interceptor</i> | | | | |
| Develop medium field of view OPIR experiment enabling advanced missile detection and tracking. | 3 | 2020 | 3 | 2021 |
| Develop initial data transport capabilities enabling the dissemination of missile targeting data. | 4 | 2020 | 4 | 2021 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | Project (Number/Name) 193 / <i>Space-Based Discrimination</i> | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 193: <i>Space-Based Discrimination</i> | 0.000 | 5.000 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| 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 Department of Defense (DoD) Space Vision. Developing and fielding a pLEO space architecture will significantly improve U.S. resilience posture in space. | | | | | | | | | | | | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | | | | | | | | FY 2020 | FY 2021 | FY 2022 | |
| Title: Space-Based Discrimination Assessment Description: Design and demonstrate initial data transport capabilities in a pLEO architecture to enable future dissemination of advanced missile warning and tracking data to tactical users. FY 2021 Plans: N/A FY 2022 Plans: N/A FY 2021 to FY 2022 Increase/Decrease Statement: While funding for this Project code ended in FY 2020, the work initiated in this Project code continues in FY 2021 under Project code 196. This work initiated the development of the Transport Layer for data dissemination. | | | | | | | | | 5.000 | 0.000 | 0.000 | |
| Accomplishments/Planned Programs Subtotals | | | | | | | | | 5.000 | 0.000 | 0.000 | |
| C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy Partners for these activities included large defense contractors. | | | | | | | | | | | | |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | Project (Number/Name) 193 / <i>Space-Based Discrimination</i> | | |

| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Transport Tranche 0 | C/FFP | Lockheed Martin : Littleton, CO | 0.000 | 5.000 | Aug 2020 | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Subtotal | | | 0.000 | 5.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |

| | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
|----------------------------|--------------------|----------------|----------------|---------------------|--------------------|----------------------|-------------------------|-------------------|---------------------------------|
| Project Cost Totals | 0.000 | 5.000 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | N/A |

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| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | | Date: May 2021 | | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | | | Project (Number/Name) 193 / Space-Based Discrimination | | | |

| | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 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-Based Discrimination | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop initial data transport capabilities enabling the dissemination of missile targeting data. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 193 / <i>Space-Based Discrimination</i> | |

Schedule Details

| Events by Sub Project | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>Space-Based Discrimination</i> | | | | |
| Develop initial data transport capabilities enabling the dissemination of missile targeting data. | 4 | 2020 | 4 | 2021 |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | | | | | | | | | Date: May 2021 | | |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|---|----------------|------------------|------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 196 / Space Technology Development | | | |
| COST (\$ in Millions) | Prior Years | FY 2020 | FY 2021 | FY 2022 Base | FY 2022 OCO | FY 2022 Total | FY 2023 | FY 2024 | FY 2025 | FY 2026 | Cost To Complete | Total Cost |
| 196: Space Technology Development | 0.000 | 0.000 | 115.354 | 0.000 | 0.000 | 0.000 | - | - | - | - | - | - |
| Quantity of RDT&E Articles | - | - | - | - | - | - | - | - | - | - | | |

Note

Funding in FY 2022 is transferred to the new Transport, Sensing, and Integration and Battle Management Project codes.

A. Mission Description and Budget Item Justification

The Space Development Agency (SDA) is developing and demonstrating next generation space capabilities for the joint warfighter enabled by proliferation of satellites in Low Earth Orbit (LEO) and a new acquisition model utilizing rapid spiral development. The SDA is developing capabilities to address a wide range of Department space needs as stated in the National Defense Strategy and Department of Defense (DoD) Space Vision, 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 U.S. joint warfighting forces in two-year tranches, beginning as early as FY 2022. 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)

| | FY 2020 | FY 2021 | FY 2022 |
|--|----------------|----------------|----------------|
| Title: Space Technology Development | 0.000 | 115.354 | 0.000 |
| Description: Space technology development and prototyping of a resilient military sensing and data transport capability via a proliferated space architecture in Low Earth Orbit (LEO). | | | |
| FY 2021 Plans: | | | |
| - 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 ground support infrastructure and integration with space constellation to support Tranche 0 mission operations. | | | |
| - Design, develop, and test hardware-in-the-loop facility to support architecture interoperability testing and validation. | | | |
| FY 2022 Plans: | | | |

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| Exhibit R-2A, RDT&E Project Justification: PB 2022 Space Development Agency | | Date: May 2021 | |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 196 / <i>Space Technology Development</i> | |
| B. Accomplishments/Planned Programs (\$ in Millions) | | FY 2020 | FY 2021 |
| N/A | | | |
| FY 2021 to FY 2022 Increase/Decrease Statement: Funding in FY 2022 is transferred to the new Transport, Sensing, and Integration and Battle Management Project codes. | | | |
| Accomplishments/Planned Programs Subtotals | | 0.000 | 115.354 |
| C. Other Program Funding Summary (\$ in Millions) | | | |
| N/A | | | |
| Remarks | | | |
| D. Acquisition Strategy Partners for these activities may include Missile Defense Agency (MDA), Space and Missile Systems Center (SMC), DoD Combatant Commands, 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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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Space Development Agency | | | | | | | | | | | | Date: May 2021 | | | |
|--|------------------------|---|-------------|---------|------------|---|------------|--------------|------------|---|------------|----------------|------------------|------------|--------------------------|
| Appropriation/Budget Activity 0400 / 4 | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / Space Technology Development and Prototyping | | | | Project (Number/Name) 196 / Space Technology Development | | | | | |
| Product Development (\$ in Millions) | | | | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 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 |
| Transport Tranche 0 | C/FFP | Lockheed Martin : Littleton, CO | 0.000 | 0.000 | | 43.390 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Transport Tranche 0 | C/FFP | York Space Systems, LLC : Denver, CO | 0.000 | 0.000 | | 19.986 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Tracking Tranche 0 | C/FFP | SpaceX : Hawthorne, CA | 0.000 | 0.000 | | 9.900 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Tracking Tranche 0 | C/FFP | L3Harris : Palm Bay, FL | 0.000 | 0.000 | | 19.440 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Mission Systems Engineering and Integration (MSE&I) | C/CPFF | Perspecta Engineering Inc : Chantilly, VA | 0.000 | 0.000 | | 11.357 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Launch Tranche 0 | C/CPFF | SpaceX : Hawthorne, CA | 0.000 | 0.000 | | 4.500 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Transport Tranche 1 | C/FFP | TBD : TBD | 0.000 | 0.000 | | 6.781 | | 0.000 | | 0.000 | | 0.000 | - | - | - |
| Subtotal | | | 0.000 | 0.000 | | 115.354 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |
| | | | Prior Years | FY 2020 | | FY 2021 | | FY 2022 Base | | FY 2022 OCO | | FY 2022 Total | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals | | | 0.000 | 0.000 | | 115.354 | | 0.000 | | 0.000 | | 0.000 | - | - | N/A |
| Remarks | | | | | | | | | | | | | | | |

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|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|---|--|--|--|
| Exhibit R-4, RDT&E Schedule Profile: PB 2022 Space Development Agency | | | | | | | | | | | | | | | | Date: May 2021 | | | |
| Appropriation/Budget Activity 0400 / 4 | | | | | | | | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | | | | | | | | Project (Number/Name) 196 / <i>Space Technology Development</i> | | | |

| | FY 2020 | | | | FY 2021 | | | | FY 2022 | | | | FY 2023 | | | | FY 2024 | | | | FY 2025 | | | | FY 2026 | | | |
|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|---------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| <i>Space Technology Development</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop Tranche 0 data transport capabilities. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop hardware in the loop test facility supporting Tranche 0 capability development. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Develop and integrate Tranche 0 ground support infrastructure. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Exhibit R-4A, RDT&E Schedule Details: PB 2022 Space Development Agency | | | Date: May 2021 |
| Appropriation/Budget Activity 0400 / 4 | R-1 Program Element (Number/Name) PE 1206410SDA / <i>Space Technology Development and Prototyping</i> | Project (Number/Name) 196 / <i>Space Technology Development</i> | |

Schedule Details

| Events by Sub Project | Start | | End | |
|---|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>Space Technology Development</i> | | | | |
| Develop Tranche 0 data transport capabilities. | 1 | 2021 | 4 | 2022 |
| Develop hardware in the loop test facility supporting Tranche 0 capability development. | 1 | 2021 | 4 | 2022 |
| Develop and integrate Tranche 0 ground support infrastructure. | 1 | 2021 | 4 | 2022 |

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