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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Air Force **Date:** February 2020

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	413.938	905.000	1,044.089	0.000	1,044.089	1,542.654	1,706.882	1,264.547	2,073.802	Continuing	Continuing
646007: <i>AS 2030 Air Dominance Technologies (ADT)</i>	-	402.791	905.000	1,044.089	0.000	1,044.089	1,542.654	1,706.882	1,264.547	2,073.802	Continuing	Continuing
646203: <i>Air Dominance Air-to-Air Weapon</i>	-	11.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

**Note**

FY19 is the last year of BPAC 646203 funding. It supports Strategic Planning Choices activity through FY20.

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

Next Generation Air Dominance (NGAD) is a family of capabilities enabling Air Superiority for the Joint Force in the most challenging operational environments. The program matures technology and reduces risk through prototyping activities and demonstration efforts. Key NGAD attributes include enhancements in survivability, lethality, and persistence across a range of military operations. The NGAD program is directed by Joint Requirements Oversight Council Memorandum (JROCM) 043-13 and CSAF approved Air Superiority Enterprise Capability Collaboration Team (ECCT) Flight Plan. Program activities will also include the pursuit of open architecture solutions including Open Mission Standards (OMS) and Universal Control Interface (UCI) standards management and preplanned product improvements. Funding provides program management support, operational concept exploration, technology studies, multi-domain integration assessments, operational and system architecture development, maturation and risk reduction of air superiority related technologies, including weapons systems and integrated system concept development and demonstration.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver NGAD weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

NGAD civilian pay is executed in PE 020711F.

This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.

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<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>
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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	429.610	1,000.000	1,046.000	0.000	1,046.000
Current President's Budget	413.938	905.000	1,044.089	0.000	1,044.089
Total Adjustments	-15.672	-95.000	-1.911	0.000	-1.911
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-95.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-15.672	0.000			
• Other Adjustments	0.000	0.000	-1.911	0.000	-1.911

**Change Summary Explanation**

FY19: -\$15.672M for Small Business Innovative Research (SBIR)

FY20: -\$95.000M Congressional Mark due to cost-risk associated with development profile

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Air Force										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>				<b>Project (Number/Name)</b> 646007 / <i>AS 2030 Air Dominance Technologies (ADT)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
646007: <i>AS 2030 Air Dominance Technologies (ADT)</i>	-	402.791	905.000	1,044.089	0.000	1,044.089	1,542.654	1,706.882	1,264.547	2,073.802	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Next Generation Air Dominance (NGAD) is a family of capabilities enabling Air Superiority for the Joint Force in the most challenging operational environments. The PE matures technology and reduces risk through prototyping activities and demonstration efforts. Key NGAD attributes include enhancements in survivability, lethality, and persistence across a range of military operations. The NGAD program is directed by Joint Requirements Oversight Council Memorandum (JROCM) 043-13 and CSAF approved Air Superiority Enterprise Capability Collaboration Team (ECCT) Flight Plan. Program activities will also include the pursuit of open architecture solutions including Open Mission Standards (OMS) and Universal Control Interface (UCI) standards management and preplanned product improvements. Funding provides program management support, operational concept exploration, technology studies, multi-domain integration assessments, operational and system architecture development, maturation and risk reduction of air superiority related technologies, including weapons systems and integrated system concept development and demonstration.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver NGAD weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

NGAD civilian pay is executed in PE 020711F.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 2030+ Air Dominance	402.791	905.000	1,044.089
<p><b>Description:</b> The 2030+ Air Dominance (AD) candidate concepts consist of operational analyses, threat studies and technology candidate assessments and prototyping to identify operational concepts and technologies that improve persistence, survivability, lethality, connectivity, interoperability and affordability in 2030 and beyond. These efforts will provide for contractors to conduct analyses, identify technology candidates and perform concept refinement. Furthermore, studies are required to develop operational/system architectures to include family of systems and system of systems. In addition, technical risk reduction activities will be performed to include experimentation, integration and building demonstrative prototypes.</p> <p>The 2030+ AD working groups methodically assessed candidate concepts using USAF directives and guidance. Resulting concepts informed the NGAD Analysis of Alternatives (AoA), which was completed in 2019. Ongoing studies are conducted to refine system concepts and operational/system architectures incorporating family of systems and system of systems that may be</p>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Air Force		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>	<b>Project (Number/Name)</b> 646007 / <i>AS 2030 Air Dominance Technologies (ADT)</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>required to inform and support strategic choices. In addition, technical risk reduction studies concerning technology integration, operational and system trade space utilizing preliminary data from AD concept development have resulted in multiple activities and engagements to inform strategic USAF experimentation and prototyping efforts. Finally, technical overviews were presented to the Air Force - Scientific Advisory Board (AF-SAB) and other senior leaders.</p> <p><b>FY 2020 Plans:</b> NGAD continues to conduct analyses, identify technology candidates and perform concept refinements. Also continuing the studies required to develop operational/system architectures to include family of systems and system of systems. Technical risk reduction activities continue to include experimentation, integration and building demonstrative prototypes. Program activities also includes the pursuit of open architecture solutions.</p> <p><b>FY 2021 Plans:</b> NGAD will continue to conduct analyses, identify technology candidates and perform concept refinements. Studies required to develop operational/system architectures to include family of systems and system of systems will also mature. Technical risk reduction activities will continue to be performed to include experimentation, integration and building demonstrative prototypes. Program activities will include the pursuit of open architecture solutions.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding increased due to program increasing technology maturation, risk reduction activities, and hardware prototyping efforts</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	402.791	905.000	1,044.089

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 04 0207110F/646203: <i>Air Dominance Air-to-Air Weapon</i>	11.147	0.000	0.000	-	0.000	0.000	0.000	-	-	Continuing	Continuing

**Remarks**  
FY19 is the last year of BPAC 646203 funding. It supports Strategic Planning Choices activity through FY20.

**D. Acquisition Strategy**  
The Next Generation Air Dominance acquisition strategy is based on top-down, multi-domain capabilities development planning and oversight framework. Cross-functional teams will conduct analysis, demonstrations, and experiments to quantify the operational value of alternative concepts and technologies to provide solutions to current and future air superiority capability gaps.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / Next Generation Air Dominance	<b>Project (Number/Name)</b> 646007 / AS 2030 Air Dominance Technologies (ADT)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGAD Research/ Development Efforts	Various	Various : Various	-	385.780		876.238		1,010.898		-		1,010.898	Continuing	Continuing	-
<b>Subtotal</b>			-	385.780		876.238		1,010.898		-		1,010.898	Continuing	Continuing	N/A

**Remarks**  
Contractual specifics are not available at this level of security classification.

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
NGAD Acquisition Support	Various	Various : Various	-	17.011		28.762		33.191		-		33.191	Continuing	Continuing	-
<b>Subtotal</b>			-	17.011		28.762		33.191		-		33.191	Continuing	Continuing	N/A

**Remarks**  
Includes civ pay beginning in FY18

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
<b>Project Cost Totals</b>		-	402.791	905.000	1,044.089	-	1,044.089	Continuing	Continuing	N/A

**Remarks**  
Details of contract data are not shown because of the level of security classification.

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2021 Air Force</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>	<b>Project (Number/Name)</b> 646007 / <i>AS 2030 Air Dominance Technologies (ADT)</i>

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
<b>AS 2030 Air Dominance Technologies (ADT)</b>																													
Analysis of Alternatives	■																												
Concept Exploration	■																												
Integration Studies	■																												
Technology Risk Reduction / Prototyping	■																												
FY21 Strategic Planning Choices Presented	■																												
FY22 Strategic Planning Choices Presented					■																								
FY23 Strategic Planning Choices Presented									■																				
FY24 Strategic Planning Choices Presented													■																
FY25 Strategic Planning Choices Presented																	■												
FY26 Strategic Planning Choices Presented																					■								
FY27 Strategic Planning Choices Presented																									■				

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Air Force		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>	<b>Project (Number/Name)</b> 646007 / <i>AS 2030 Air Dominance Technologies (ADT)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>AS 2030 Air Dominance Technologies (ADT)</b>				
Analysis of Alternatives	1	2019	3	2019
Concept Exploration	1	2019	4	2025
Integration Studies	1	2019	4	2025
Technology Risk Reduction / Prototyping	1	2019	4	2025
FY21 Strategic Planning Choices Presented	1	2019	1	2019
FY22 Strategic Planning Choices Presented	1	2020	1	2020
FY23 Strategic Planning Choices Presented	1	2021	1	2021
FY24 Strategic Planning Choices Presented	1	2022	1	2022
FY25 Strategic Planning Choices Presented	1	2023	1	2023
FY26 Strategic Planning Choices Presented	1	2024	1	2024
FY27 Strategic Planning Choices Presented	1	2025	1	2025

**Note**

The NGAD Analysis of Alternatives (AoA) was completed in 2019.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Air Force										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0207110F / Next Generation Air Dominance				<b>Project (Number/Name)</b> 646203 / Air Dominance Air-to-Air Weapon			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
646203: Air Dominance Air-to-Air Weapon	-	11.147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Next Generation Air Dominance (NGAD) is a family of capabilities enabling Air Superiority for the Joint Force in the most challenging operational environments. The PE matures technology and reduces risk through prototyping activities and demonstration efforts. Key NGAD attributes include enhancements in survivability, lethality, and persistence across a range of military operations. The NGAD program is directed by Joint Requirements Oversight Council Memorandum (JROCM) 043-13 and CSAF approved Air Superiority Enterprise Capability Collaboration Team (ECCT) Flight Plan. Program activities will also include the pursuit of open architecture solutions including Open Mission Standards (OMS) and Universal Control Interface (UCI) standards management and preplanned product improvements. Funding provides program management support, operational concept exploration, technology studies, multi-domain integration assessments, operational and system architecture development, maturation and risk reduction of air superiority related technologies, including weapons systems and integrated system concept development and demonstration.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> AS2030 Weapons	11.147	0.000	0.000
<b>Description:</b> The 2030+ Air Dominance Weapon Systems candidate concepts will develop, refine and integrate technologies into evolving threat scenarios and environments. Funding supports studies that refine system concepts and operational/system architectures to include family of systems and system of systems are required in support of the strategic choices and technical risk reduction activities that include but not limited to experimentation, integration and building demonstrative prototypes.			
<b>FY 2020 Plans:</b> N/A			
<b>FY 2021 Plans:</b> N/A			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> N/A			
<b>Accomplishments/Planned Programs Subtotals</b>	11.147	0.000	0.000



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Air Force		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>	<b>Project (Number/Name)</b> 646203 / <i>Air Dominance Air-to-Air Weapon</i>

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 04 0207110F/646007: 2030+ AIR DOMINANCE AOS	402.791	905.000	1,044.089	-	1,044.089	1,542.654	1,706.882	1,264.547	2,073.802	Continuing	Continuing

**Remarks**

N/A

**D. Acquisition Strategy**

The Next Generation Air Dominance Air-to-Air Weapon acquisition strategy is based on top-down, multi-domain capabilities development planning and oversight framework. Cross-functional teams will conduct analysis, demonstrations, and experiments to quantify the operational value of alternative concepts and technologies to provide solutions to current and future air superiority capability gaps.

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Air Force</b>											<b>Date:</b> February 2020				
<b>Appropriation/Budget Activity</b> 3600 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0207110F / Next Generation Air Dominance						<b>Project (Number/Name)</b> 646203 / Air Dominance Air-to-Air Weapon				

<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Research/Development Efforts	Various	Various : Various	-	11.147		-		-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	11.147		-		-		-		-	Continuing	Continuing	N/A

**Remarks**  
Contractual specifics are not available at this level of security classification.

	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	-	11.147	0.000	-	-	-	Continuing	Continuing	N/A

**Remarks**  
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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Air Force		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>	<b>Project (Number/Name)</b> 646203 / <i>Air Dominance Air-to-Air Weapon</i>

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b><i>Air Dominance Air-to-Air Weapon</i></b>																												
Analysis of Alternatives																												
Concept Exploration																												
Integration Studies																												
Technical Risk Reduction																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Air Force		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 3600 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0207110F / <i>Next Generation Air Dominance</i>	<b>Project (Number/Name)</b> 646203 / <i>Air Dominance Air-to-Air Weapon</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Air Dominance Air-to-Air Weapon</i></b>				
Analysis of Alternatives	1	2019	3	2019
Concept Exploration	1	2019	4	2019
Integration Studies	1	2019	4	2019
Technical Risk Reduction	1	2019	4	2019

**Note**

- FY19 is last year of BPAC 646203 funding. It supports Strategic Planning Choices activity through FY20
- The NGAD Analysis of Alternatives (AoA) was completed in 2019.