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

Appropriation/Budget Activity 3620F: <i>Research, Development, Test & Evaluation, Space Force I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1206853SF / <i>National Security Space Launch Program (SPACE) - EMD</i>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	0.000	560.978	0.000	560.978	287.258	221.585	87.173	53.381	Continuing	Continuing
650006: <i>Next Generation Launch System Investment</i>	0.000	0.000	0.000	560.978	0.000	560.978	287.258	221.585	87.173	53.381	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Program MDAP/MAIS Code: 176

A. Mission Description and Budget Item Justification

In FY 2021, PE 1206853F, National Security Space Launch Program (SPACE) - EMD efforts were transferred to Appropriation 3620, Research, Development, Test & Evaluation, Space Force, PE 1206853SF, National Security Space Launch Program (SPACE) - EMD from Appropriation 3600, Budget Activity 05 due to the creation of a new Appropriation for Space Force.

The National Security Space Launch (NSSL) program provides a space launch service that satisfies the government's National Launch Forecast (NLF) requirements to place National Security Space (NSS) space vehicles on orbit. NSSL is a launch service, not a weapon system, which is primarily funded with production funds.

This program, started late FY 2014, funds research and development activities and related studies, to include, but not limited to, items necessary to invest in new and/or upgraded launch systems and associated launch facilities to meet NSS launch needs leveraging domestic commercial launch providers. The RDT&E program will also fund continued research and development activities, mission manifest capability development & future studies for emerging NSS launch needs. These efforts will inform for future launch service development initiatives in order to continue sustained industry competition for Phase 3 starting in FY 2025 and future procurements.

The Space Force is investing in Launch Service Agreement (LSA) public-private partnerships for the development of new and/or upgraded domestic launch systems with commercial launch service providers. The anticipated result is two domestic, commercial launch service providers that will meet all current NSS launch requirements. In addition, the Space Force is continuing a technical maturation program to address the highest risks for rocket propulsion system (RPS) and LSA development. Development of the required RPSs have continued under the LSA public-private partnerships. Future development to capitalize on new technology and innovations developed by industry may continue to utilize public-private partnerships. The Space Force will also be leveraging opportunities to integrate Department of Defense payloads on to launch services procured commercially or by other Government agencies (i.e. NASA) where excess margin is available.

Space acquisition must respond with speed and agility to emerging adversary threats. Space and Missile Systems Center (SMC) is transforming the organization and implementation of space acquisition to an enterprise approach, maximizing innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or re-purpose capabilities.

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This program element may include necessary civilian pay expenses required to manage, execute, and deliver NSSL system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 1206392SF and 1206398SF.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	560.978	0.000	560.978
Total Adjustments	0.000	0.000	560.978	0.000	560.978
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	560.978	0.000	560.978

Change Summary Explanation

FY 2021: +\$560.978M; funds starting in FY 2021 were transferred from RDT&E, Air Force to RDT&E, Space Force.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>Title: Rocket Propulsion System Development</p> <p>Description: Invest in domestic rocket propulsion systems (RPS) under the Launch Service Agreement Other Transaction Authority (OTA) agreements. This investment enables the transition from the use of non-Allied space launch engines to domestic rocket propulsion systems. Continue to execute a single RPS OTA agreement utilizing a public-private partnership.</p> <p>FY 2020 Plans: N/A</p> <p>FY 2021 Plans: Continuing to execute public-private partnership for an industry upper stage engine common to multiple launch service providers, ensuring a domestic, cost-effective solution. The FY 2021 funding decrease is due to a RPS reduction from seven programmatic milestones in FY 2020 to three programmatic milestones in FY 2021.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>	0.000	0.000	5.136

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
N/A			
Title: Launch Service Agreement Description: Invest in providers of domestic Launch Services. This investment enables the transition from the use of non-Allied space launch engines to commercial launch services that also meet NSS needs. Execute Other Transaction Authority (OTA) agreements to develop various industry solutions utilizing public-private partnerships. Continued the technical maturation and risk reduction activities in support of Launch Service OTAs. FY 2020 Plans: N/A FY 2021 Plans: Continue investments with public-private partnerships with domestic launch providers for the development of new launch systems or upgrades to existing launch systems. This investment is intended to meet NSS launch needs by leveraging 2 domestic, commercial launch providers. This investment includes RPS and associated technical maturation and risk reduction activities. Activities may include, but are not limited to, program office support, studies, technical analysis, prototyping, etc. LSA profile is based on the CY 2020 award of Phase 2 with LSA efforts continuing with two service providers. Until the Phase 2 award, the LSA funding cannot be broken out by provider due to the competitive nature of this acquisition strategy. Future development to capitalize on new technology and innovations developed by commercial space may continue to utilize public-private partnerships. The program was increased to properly execute the LSAs based on milestone projections. FY 2020 to FY 2021 Increase/Decrease Statement: N/A	0.000	0.000	555.842
Accomplishments/Planned Programs Subtotals	0.000	0.000	560.978

D. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• SPAF 01 Line Item MSEELV: <i>Evolved Expendable Launch Veh (Space)</i>	787.646	1,237.635	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2,025.281
• SPAF 01 Line Item <i>MSEELC: Evolved Expendable Launch Capability</i>	615.081	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	615.081
• SPSF 01 NSSL00: NSSL	-	-	1,043.171	-	1,043.171	1,394.270	1,436.978	1,688.279	1,898.687	13,411.619	20,873.004

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D. 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>
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Remarks

E. Acquisition Strategy

The Department intends to pursue a strategy to competitively invest in two or more domestic launch providers' development of new launch systems or upgrades to existing systems for future NSS launch services. This shared investment approach may also leverage commitments to a portion of the planned launch services (between FY 2020 and FY 2025) to decrease the required up front Government investment.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3620F / 5				PE 1206853SF / National Security Space Launch Program (SPACE) - EMD				650006 / Next Generation Launch System Investment							
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Aerojet Rocketdyne OTA	C/Various	Aerojet Rocketdyne : Canoga Park, CA	-	-		-		5.136	Nov 2020	-		5.136	0.000	5.136	-
FFRDC Mission Assurance	SS/CPAF	Aerospace : El Segundo, CA	-	-		-		32.689	Nov 2020	-		32.689	9.966	42.655	-
Launch Enterprise System Engineering and Integration	C/FP	Various : Various	-	-		-		20.480	Mar 2021	-		20.480	8.828	29.308	-
Launch Service Agreement (Including the Rocket Propulsion System)	C/TBD	TBD : TBD	-	-		-		477.265	Dec 2020	-		477.265	577.671	1,054.936	-
Subtotal			-	-		-		535.570		-		535.570	596.465	1,132.035	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Organic Civilian Support	Reqn	DOD : El Segundo, CA	-	-		-		2.019	Oct 2020	-		2.019	8.673	10.692	15.628
Subtotal			-	-		-		2.019		-		2.019	8.673	10.692	N/A
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
FFRDC	SS/CPAF	Aerospace : El Segundo, CA	-	-		-		2.147	Nov 2020	-		2.147	4.225	6.372	5.263
Advisory and Assistance Services	Various	Various : Various	-	-		-		6.717	Dec 2020	-		6.717	26.446	33.163	15.258
Other Support	Various	Various : Various	-	-		-		14.525	Nov 2020	-		14.525	13.588	28.113	1.254
Subtotal			-	-		-		23.389		-		23.389	44.259	67.648	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206853SF / <i>National Security Space Launch Program (SPACE) - EMD</i>	Project (Number/Name) 650006 / <i>Next Generation Launch System Investment</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
<i>Rocket Propulsion System (RPS) Development</i>																												
Aerojet Rocketdyne OTA																												
<i>Launch Service Agreement (LSA)</i>																												
Blue Origin OTA																												
Northrop Grumman OTA																												
United Launch Services OTA																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3620F / 5	R-1 Program Element (Number/Name) PE 1206853SF / <i>National Security Space Launch Program (SPACE) - EMD</i>	Project (Number/Name) 650006 / <i>Next Generation Launch System Investment</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Rocket Propulsion System (RPS) Development</i>				
Aerojet Rocketdyne OTA	1	2021	4	2021
<i>Launch Service Agreement (LSA)</i>				
Blue Origin OTA	1	2021	1	2025
Northrop Grumman OTA	1	2021	2	2025
United Launch Services OTA	1	2021	3	2025