Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force											Date: February 2018	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	-	378.126	840.650	1,186.075	0.000	1,186.075	923.367	635.288	129.651	128.980	Continuing	Continuing
643608: *Advanced Engine Dev*	-	0.000	0.000	790.355	0.000	790.355	588.442	449.657	0.000	0.000	Continuing	Continuing
645345: *Hypersonics Prototyping*	-	0.000	0.000	258.058	0.000	258.058	201.485	61.537	2.978	0.000	Continuing	Continuing
645350: *Experimentation*	-	90.447	95.613	87.205	0.000	87.205	86.762	86.720	88.522	90.135	Continuing	Continuing
645351: *Prototyping*	-	287.679	745.037	50.457	0.000	50.457	46.678	37.374	38.151	38.845	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Technology Transition Program provides funding to demonstrate, prototype, and experiment with technologies and concepts to enable or accelerate their transition to acquisition programs and/or operational use. The Technology Transition Program addresses the gap between initial technology or concept development and demonstration, and successful acquisition and operational capability implementation. Experimentation explores new concepts and their applications in potential future operating environments within a system-of-systems context. Prototyping enables integration and demonstration of emerging technologies as a bridge between the laboratory and the warfighter. The Technology Transition Program allows acquisition program managers (the capability developers) and warfighters (the capability recipients and end users) to prototype, integrate, and demonstrate candidate technologies and assess them in an operational environment in partnership with Program Executive Officers, schoolhouses, simulation facilities, and development planning organizations.

In addition, this program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

For FY 2019, Project 645351, Prototyping, was split into Project 645351, Prototyping; Project 645345, Hypersonics Prototyping; and Project 643608, Advanced Engine Development to provide increased transparency to Congress on prototyping activities within PE 0604858F, Technology Transition Program.

This program 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	349.304	840.650	877.002	0.000	877.002
Current President's Budget	378.126	840.650	1,186.075	0.000	1,186.075
Total Adjustments	28.822	0.000	309.073	0.000	309.073
• Congressional General Reductions	-0.310	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	38.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	6.800	0.000			
• SBIR/STTR Transfer	-13.668	0.000			
• Other Adjustments	-2.000	0.000	309.073	0.000	309.073

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 645350: *Experimentation*		
Congressional Add: *Program Increase - Alternative Energy Research*	19.290	0.000
Congressional Add: *Program Increase - Counter Electronics High Powered Microwave Advanced Missile*	5.787	0.000
Congressional Add: *Program Increase - Logistics Technologies*	11.574	0.000
Congressional Add Subtotals for Project: 645350	36.651	0.000
Congressional Add Totals for all Projects	36.651	0.000

Change Summary Explanation

Reprogramming increase of $6.8 million in FY 2017 for acceleration of Hypersonics Prototyping effort.

Other adjustment decrease of $2.0 million in FY 2017 because FY 2017 Request for Additional Appropriations (RAA) for Hypersonics Prototyping was not appropriated.

Increase in FY 2019 for Hypersonic Prototyping and Adaptive Engine efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 643608 / *Advanced Engine Dev*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
643608: *Advanced Engine Dev*	-	0.000	0.000	790.355	0.000	790.355	588.442	449.657	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Engine Development project enables demonstration of advanced turbine engine prototypes. The main effort in this project is the Adaptive Engine Transition Program, which is maturing fuel efficient adaptive engine component technologies and reducing associated risk in preparation for next-generation propulsion system development for multiple combat aircraft applications. Adaptive engine technology enables next generation combat aircraft capabilities by combining the efficiency of high bypass turbofans used by commercial airlines with the performance demanded of military fighter engines. This technology has undergone initial development under the auspices of the Air Force Research Laboratory through the Adaptive Engine Technology and Adaptive Engine Technology Demonstrator programs.

Project 643608, Advanced Engine Development is new for FY 2019. Previous to FY 2019, the entirety of work under this project was reported in Project 645351, Prototyping, under the Adaptive Engine Transition Program effort in PE 0604858F, Tech Transition Program. This is administrative realignment to provide increase transparency to Congress and not a new start.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Adaptive Engine Transition Program	0.000	0.000	790.355	0.000	790.355
Description: The Adaptive Engine Transition Program (AETP) will design and manufacture multiple flight-weight adaptive engine prototypes, complete component rig assessments, characterize materials, and inform manufacturing process improvements. By producing flight-weight prototypes, the program will demonstrate adaptive engine technology can be scaled to meet military fighter engine size requirements, while ensuring appropriate manufacturing- and technology-readiness levels. By performing sea-level, altitude, and durability assessments across multiple power settings, the prototype engines will demonstrate fuel efficiency increases, thrust increases, and new component technologies. These assessments will provide data to quantify the capability and reduce risk in areas such as thermal capacity, reliability, and supportability, among others.					
FY 2018 Plans: For FY 2017 and FY 2018, this work is performed under Project 645351, Prototyping, Adaptive Engine Transition Program effort.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 643608 / *Advanced Engine Dev*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue detailed design activities. Continue component rig activities. Continue technology, affordability, and sustainability studies. Begin first engine fabrication. Begin additional airframe integration efforts. More details can be provided in an appropriate forum. ***FY 2019 OCO Plans:*** Not Applicable. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increased compared to FY 2018 by $790.355 million. Justification for this increase is due to moving this effort from Project 645351, Prototyping, to Project 643608, Advanced Engine Development.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	790.355	0.000	790.355

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

In FY 2017 and FY 2018, the work for Advanced Engine Development was performed under Project 645351, Prototyping.

D. Acquisition Strategy

For Adaptive Engine Transition Program, the Air Force has awarded two limited source, cost plus incentive fee contracts to General Electric and Pratt & Whitney due to their unique qualifications to design a high performance, flight-weight adaptive turbine engine in the thrust class for AETP. Incentive categories include engine weight, performance factors, and maintainability and supportability, with specific metrics for each area incentivized. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Propulsion Directorate, Wright-Patterson Air Force Base, Ohio.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 643608 / *Advanced Engine Dev*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Adaptive Engine Transition Program - GE	C/CPIF	GE : Evendale, OH	-	0.000		0.000		396.768	Oct 2018	-		396.768	Continuing	Continuing	-
Adaptive Engine Transition Program - PW	C/CPIF	PW : East Hartford, CT	-	0.000		0.000		389.687	Oct 2018	-		389.687	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		786.455		-		786.455	Continuing	Continuing	N/A

Remarks

In FY 2017 and FY 2018, Adaptive Engine Transition Program data is reported under Project 645351, Prototyping.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Adaptive Engine Transition Program - Program Management Support	Various	Various : TBD	-	0.000		0.000		3.900	Dec 2018	-		3.900	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		3.900		-		3.900	Continuing	Continuing	N/A

Remarks

In FY 2017 and FY 2018, Adaptive Engine Transition Program data is reported under Project 645351, Prototyping.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		790.355		-		790.355	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 643608 / *Advanced Engine Dev*

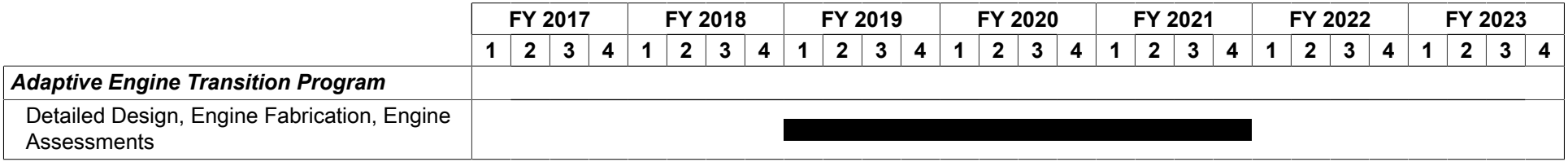

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 643608 / *Advanced Engine Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Adaptive Engine Transition Program				
Detailed Design, Engine Fabrication, Engine Assessments	1	2019	4	2021

Note

In FY 2017 and FY 2018, Adaptive Engine Transition Program schedule is reported under Project 645351, Prototyping.

The Adaptive Engine Transition Program consists of three phases: detailed design, engine fabrication, and engine assessments.

Program deliverables include: military adaptive engine detailed design parameters and models, multiple engine sets of hardware (plus spare parts), matured technologies, major rig assessment data (controls, combustor, etc.), program reviews, and technology, affordability and sustainability studies.

Additional details can be provided in the appropriate forum.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645345 / *Hypersonics Prototyping*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
645345: *Hypersonics Prototyping*	-	0.000	0.000	258.058	0.000	258.058	201.485	61.537	2.978	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Hypersonic Prototyping project enables integration and demonstration of emerging hypersonic technologies in an operational or operational-like environment to capitalize on successful laboratory hypersonic research and development efforts with high warfighter priority. Integration and demonstration of hypersonic prototypes also allows leadership to make informed strategy and resource decisions based for future programs on the results of such hypersonic prototype demonstrations.

Hypersonic Prototyping enables a key linkage between research and development in the lab and fielding advanced technologies to the warfighter. Under this project, Air-Launched Rapid response Weapon (ARRW) and Hypersonic Conventional Strike Weapon (HCSW) will accelerate the technology transfer of hypersonic technologies to enable a responsive, long range strike capability.

Project 645345, Hypersonics Prototyping, is new for FY 2019. In FY 2018, the entirety of this project was previously reported in Project 645351, Prototyping, under the Lifecycle Prototyping effort. In FY 2017, this work was reported in Project 645350, Experimentation (named Transition Prioritization in FY 2017) under the Experimentation and Prototyping effort. This is administrative realignment to provide increase transparency to Congress and not a new start.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Air Launched Rapid response Weapon (ARRW)	0.000	0.000	168.730	0.000	168.730
Description: Integrates Air Force and DARPA enabled system technologies into a prototype that will demonstrate the viability of this concept to be fielded as a long range prompt strike capability. ARRW will design, develop, manufacture, and test, a number of prototype vehicles to inform decisions concerning ARRW acquisition and production.					
FY 2018 Plans: In FY 2018, this work is performed under the Lifecycle Prototyping effort in Project 645351, Prototyping. In FY 2017, this work was performed under the Experimentation and Prototyping effort in Project 645350, Experimentation (named Transition Prioritization in FY 2017).					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645345 / *Hypersonics Prototyping*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue with ARRW design activities and complete the critical design review. Construction and test of the booster test article. ***FY 2019 OCO Plans:*** Not Applicable ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increased compared to FY 2018 by $168.730 million. Justification for this increase is due to moving this effort from Project 645351, Prototyping, Lifecycle Prototyping effort.					
Title: Hypersonic Conventional Strike Weapon (HCSW) ***Description:*** Integrates Air Force enabled system technologies into a prototype that will demonstrate the viability of this concept to be fielded as a long range prompt strike capability. HCSW will design, develop, manufacture, and test, a number of prototype vehicles to inform decisions concerning HCSW acquisition and production. ***FY 2018 Plans:*** In FY 2018, this work is performed under the Lifecycle Prototyping effort in Project 645351, Prototyping. In FY 2017, this work was performed under the Experimentation and Prototyping effort in Project 645350, Experimentation (named Transition Prioritization in FY 2017). ***FY 2019 Base Plans:*** Continue program office support, analysis, technical risk reduction, development and integration for the Hypersonic Conventional Strike Weapon and its enabling technologies through Preliminary Design Review (PDR). ***FY 2019 OCO Plans:*** Not Applicable ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increased compared to FY 2018 by $89.328 million. Justification for this increase is due to moving this effort from Project 645351, Prototyping, Lifecycle Prototyping effort.	0.000	0.000	89.328	0.000	89.328
Accomplishments/Planned Programs Subtotals	0.000	0.000	258.058	0.000	258.058

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645345 / *Hypersonics Prototyping*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

ARRW - The Air Force applied funding to an existing DARPA other transaction authority contract to Lockheed Martin in order to leverage the synergistic efforts ongoing in the Tactical Boost Glide technology demonstration. The cost type contract incentives schedule through milestone payments. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Armament Directorate, Eglin AFB FL.

HCSW - The Air Force is conducting a limited source competition for the rapid development of a hypersonic, conventional air-launched, stand-off weapon. An IDIQ contract will be awarded to a single offeror to develop/test all elements of the end-to-end system, integration with existing bomber/fighter Aircraft, all respective operations/mission planning and sustainment efforts, to include operational safety, suitability, and effectiveness. Contract award is anticipated in the second quarter of FY 2018. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Armament Directorate, Eglin AFB FL.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645345 / *Hypersonics Prototyping*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARRW - DARPA OTA	SS/FFP	LMCO:Various : TBD	-	0.000		0.000		132.535	Jan 2019	-		132.535	Continuing	Continuing	-
ARRW - Mission Planning	MIPR	Various : TBD	-	0.000		0.000		1.000	Mar 2019	-		1.000	Continuing	Continuing	-
HCSW - Hypersonic program office support, analysis, technical risk reduction, development and integration	Various	Various : TBD	-	0.000		0.000		84.338	Apr 2019	-		84.338	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		217.873		-		217.873	Continuing	Continuing	N/A

Remarks

In FY 2017, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645350, Experimentation (called Transition Prioritization in FY 2017). In FY 2018, Hypersonics Prototyping data is reported under Project 645351, Prototyping.

ARRW - This effort is part of the DARPA Other Transaction Authority (OTA) contract.
HCSW - IDIQ Contract is estimated to be awarded in March 2018

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARRW - Government Test	Various	Multiple : TBD	-	0.000		0.000		30.380	Oct 2018	-		30.380	Continuing	Continuing	-
HCSW - Government test support . Includes flight test equipment, targets, 96 Test Wing and range suppot, and aircraft integration test.	Various	96 TW, Eglin AFB, FL : TBD	-	0.000		0.000		2.500	Mar 2019	-		2.500	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		32.880		-		32.880	Continuing	Continuing	N/A

Remarks

In FY 2017, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645350, Experimentation (called Transition Prioritization in FY 2017). In FY 2018, Hypersonics Prototyping data is reported under Project 645351, Prototyping.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645345 / *Hypersonics Prototyping*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARRW - Program Management Administration	Various	Multiple : TBD	-	0.000		0.000		4.805	Oct 2018	-		4.805	Continuing	Continuing	-
HCSW - Program Management Administration (PMA)	Various	Various : TBD	-	0.000		0.000		2.500	Mar 2019	-		2.500	Continuing	Continuing	-
		Subtotal	-	0.000		0.000		7.305		-		7.305	Continuing	Continuing	N/A

Remarks

In FY 2017, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645350, Experimentation (called Transition Prioritization in FY 2017). In FY 2018, Hypersonics Prototyping data is reported under Project 645351, Prototyping.

ARRW & HCSW - Includes A&AS support requirements plus TDY, office and office supplies. FY 2017 and FY 2018 are not full support staffs. FY 2019 is full staffing.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.000		0.000		258.058		-		258.058	Continuing	Continuing	N/A

Remarks

Additional details on the two Hypersonics prototyping concepts can be provided in the appropriate forum.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645345 / *Hypersonics Prototyping*

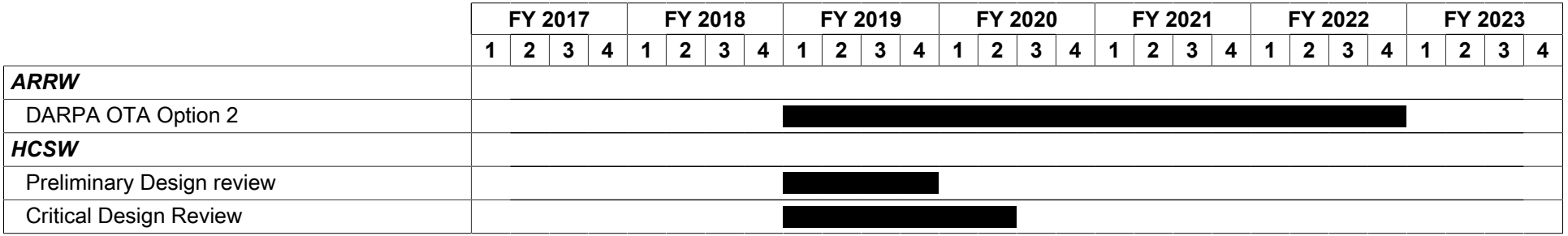

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645345 / *Hypersonics Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ARRW				
DARPA OTA Option 2	1	2019	4	2022
HCSW				
Preliminary Design review	1	2019	4	2019
Critical Design Review	1	2019	2	2020

Note

In FY 2017, schedules for Hypersonics Prototyping (ARRW and HCSW) are reported under Project 645350, Experimentation (called Transition Prioritization in FY 2017). In FY 2018, the schedules are reported under Project 645351, Prototyping.

Further schedule details can be provided in the appropriate forum.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645350 / *Experimentation*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
645350: *Experimentation*	-	90.447	95.613	87.205	0.000	87.205	86.762	86.720	88.522	90.135	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Experimentation project funds experimentation campaigns to explore new concepts and their applications in potential future operating environments within a system-of-systems context. Concepts and enabling technologies such as artificial intelligence, machine learning, directed energy weapons and multi-domain operations hold great promise, yet their transition to acquisition programs and fielded capabilities is typically hampered due to uncertainties regarding their military application and organizational implications. Implementing successful transition approaches for complex and widely applicable concepts requires a comprehensive and coordinated campaign of learning. Experimentation campaigns enable organizational learning through the methodical and systematic application of experimentation and supporting analysis. Experimentation campaigns are centered on an operational level warfighting concept to provide context for assessment, and use wargaming, simulation, and field experimentation to evolve, refine, and validate the warfighting concept leading to solid, evidentiary-based materiel and non-materiel capability development approaches with associated recommendations. Experimentation campaigns improve the effectiveness of operations by developing concepts and generating new information to address challenging threats of the future which aids the fielding of advanced technologies by providing the credible evidence decision makers need to make sound strategic decisions and investment choices. Experimentation campaigns are directed by the Air Force Capability Development Council to ensure funding supports the highest Air Force priorities. Further details can be provided in the appropriate forum.

In FY 2017, this project was named Transition Prioritization and included both Experimentation and Prototyping activities. In FY 2018, this project was renamed to Experimentation, and Prototyping activities such as Hypersonics Prototyping were transferred from this project to Project 645351, Prototyping, Lifecycle Prototyping effort.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Sustainment Technology Transition	0.368	0.000	0.000	0.000	0.000
Description: Product support and sustainment technologies.					
FY 2018 Plans: In FY 2018 and beyond, this effort will be accomplished under Project 645351, Prototyping, Lifecycle Prototyping effort.					
FY 2019 Base Plans: Not applicable.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645350 / *Experimentation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Not applicable. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Not applicable.					
Title: Experimentation Campaigns ***Description:*** Execution of experimentation campaigns to explore promising concepts and enabling technologies. Activities may include facilitated workshops, wargaming, modeling and simulation, and virtual and hardware prototyping to enable experimentation campaigns. In FY 2017, this effort was called Experimentation and Prototyping and included Prototyping demonstrations such as Hypersonics Prototyping. In FY 2018, this effort was renamed to Experimentation Campaigns, and prototyping work was transferred to Project 645351, Prototyping, Lifecycle Prototyping effort. ***FY 2018 Plans:*** Conduct experimentation campaigns to advance multi-domain operations and other high priority areas, as directed by the Air Force Capability Development Council. ***FY 2019 Base Plans:*** Continue experimentation campaigns to advance multi-domain operations and other high priority areas, as directed by the Air Force Capability Development Council. Further details can be provided in the appropriate forum. ***FY 2019 OCO Plans:*** Not applicable. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 decreased compared to FY 2018 by $8.408 million. This decrease is due to Light Attack Experimentation ending in FY 2018.	53.428	95.613	87.205	0.000	87.205
Accomplishments/Planned Programs Subtotals	53.796	95.613	87.205	0.000	87.205

	FY 2017	FY 2018
Congressional Add: Program Increase - Alternative Energy Research	19.290	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645350 / *Experimentation*

	FY 2017	FY 2018
FY 2017 Accomplishments: Conducted Congressionally-directed effort. ***FY 2018 Plans:*** Not applicable.		
Congressional Add: Program Increase - Counter Electronics High Powered Microwave Advanced Missile ***FY 2017 Accomplishments:*** Conducted Congressionally-directed effort. ***FY 2018 Plans:*** Not applicable.	5.787	0.000
Congressional Add: Program Increase - Logistics Technologies ***FY 2017 Accomplishments:*** Conducted Congressionally-directed effort. ***FY 2018 Plans:*** Not applicable.	11.574	0.000
Congressional Adds Subtotals	36.651	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Experimentation campaigns will aid the fielding of advanced technologies by providing the credible evidence decision makers need to make sound strategic decisions and investment choices, to provide the warfighter with advanced capabilities. The Air Force Capability Development Council directs experimentation campaigns. The Air Force Strategic Development Planning and Experimentation office manages and executes each experimentation campaign. Contracting strategies vary based on the activities of each campaign.

For Hypersonic Prototyping ARRW and HCSW efforts, please reference the Acquisition Strategy in Projects 645351, Prototyping, and 645345, Hypersonics Prototyping.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645350 / *Experimentation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sustainment Technology Transition	SS/FFP	Lockheed Martin : Various	-	0.368	Jul 2017	0.000		0.000		-		0.000	Continuing	Continuing	-
Experimentation Campaigns	C/Various	Various : Various	-	43.429	Feb 2017	95.613	Feb 2018	87.205	Feb 2019	-		87.205	Continuing	Continuing	-
Hypersonics Prototyping - ARRW DARPA OTA	SS/FFP	Lockheed Martin : Various	-	5.000	Jul 2017	0.000		0.000		-		0.000	Continuing	Continuing	-
Hypersonics Prototyping - ARRW Mission Planning	MIPR	Various : Various	-	0.710	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	-
Hypersonics Prototyping - HCSW Hypersonic program office support, analysis, technical risk reduction, development and integration	Various	Various : Various	-	1.135	Jul 2017	0.000		0.000		-		0.000	Continuing	Continuing	-
Congressional Add - Alternative Energy	C/CPAF	Various : Various	-	19.290	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	-
Congressional Add - Logistics Technologies	C/CPAF	TBD : TBD	-	11.574	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	-
Congressional Add - Counter Electronics High Powered Microwave Advanced Missile	C/CPAF	TBD : TBD	-	5.787	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	87.293		95.613		87.205		-		87.205	Continuing	Continuing	N/A

Remarks

For FY 2018 and beyond, Sustainment Technology Transition data will be reported under Project 645351, Prototyping.

In FY 2018, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645351, Prototyping. For FY 2019 and beyond, Hypersonics Prototyping efforts will be reported under Project 645345, Hypersonics Prototyping.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645350 / *Experimentation*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hypersonic Prototyping - ARRW Government Test	C/Various	Multiple : TBD	-	0.515	Oct 2017	0.000		0.000		-		0.000	Continuing	Continuing	-
Hypersonic Prototyping - HCSW Government test support . Includes flight test equipment, targets, 96 Test Wing and range suppot, and aircraft integration test.	Various	96 TW, Eglin AFB, FL : TBD	-	0.075	Mar 2017	0.000		0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	0.590		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

In FY 2018, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645351, Prototyping. For FY 2019 and beyond, Hypersonics Prototyping efforts will be reported under Project 645345, Hypersonics Prototyping.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hypersonic Prototyping - ARRW Program Management Administration	C/Various	Multiple : TBD	-	1.775	Sep 2017	0.000		0.000		-		0.000	Continuing	Continuing	-
Hypersonic Prototyping - HCSW Program management Administration	Various	Multiple : TBD	-	0.789	Mar 2017	0.000		0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	2.564		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Further budget details can be provided in the appropriate forum.

In FY 2018, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645351, Prototyping. For FY 2019 and beyond, Hypersonics Prototyping efforts will be reported under Project 645345, Hypersonics Prototyping.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645350 / *Experimentation*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	90.447		95.613		87.205		-		87.205	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645350 / *Experimentation*

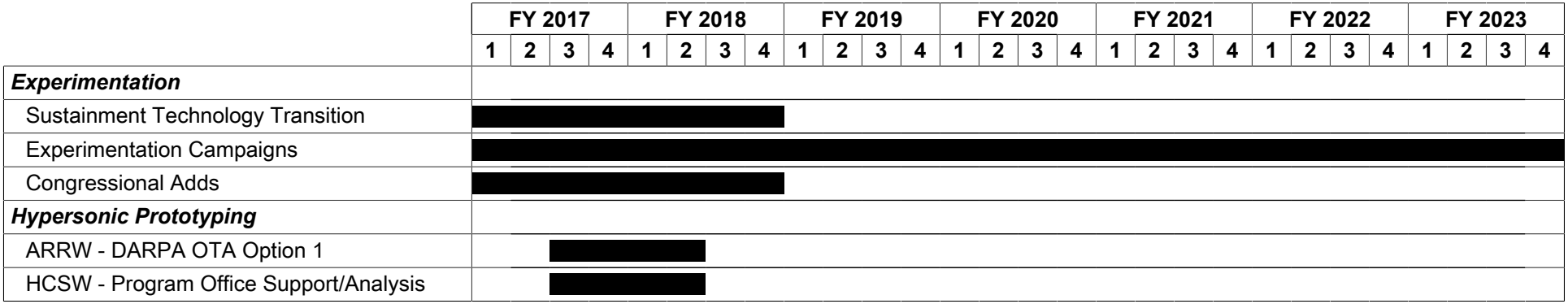

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645350 / *Experimentation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Experimentation				
Sustainment Technology Transition	1	2017	4	2018
Experimentation Campaigns	1	2017	4	2023
Congressional Adds	1	2017	4	2018
Hypersonic Prototyping				
ARRW - DARPA OTA Option 1	3	2017	2	2018
HCSW - Program Office Support/Analysis	3	2017	2	2018

Note

For FY 2018 and beyond, Sustainment Technology Transition schedule will be reported under Project 645351, Prototyping, Lifecycle Prototyping effort.

In FY 2018, schedules for Hypersonics Prototyping (ARRW and HCSW) are reported under Project 645351, Prototyping. For FY 2019 and beyond, the schedules will be reported under Project 645345, Hypersonics Prototyping.

Further schedule details regarding individual experimentation campaigns or Hypersonics Prototyping can be provided in the appropriate forum.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645351 / *Prototyping*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
645351: *Prototyping*	-	287.679	745.037	50.457	0.000	50.457	46.678	37.374	38.151	38.845	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2017, Prototyping activities were reported under Project 645350, Experimentation (named Transition Prioritization in FY 2017).

A. Mission Description and Budget Item Justification

The Prototyping project enables integration and demonstration of emerging technologies in an operational or operational-like environment in order to capitalize on successful laboratory research and development efforts with high warfighter priority. Integration and demonstration of prototypes also allows leadership to make informed strategy and resource decisions based on the results of such prototype demonstrations. Prototyping efforts funded from this Project will aim to capitalize on various emerging warfighter technology areas such as cyber weapons, novel aircraft technology, or directed energy weapons.

Prototyping enables a key linkage between research and development in the lab and fielding advanced technologies to the warfighter. Under this project, the Adaptive Engine Transition Program will serve as a model prototyping effort to reestablish the Air Force's experimentation and prototyping culture. The Adaptive Engine Transition Program is maturing fuel-efficient, adaptive-cycle engine technologies and demonstrating flight-weight, prototype adaptive engines. In addition, the Spectral Halo, Space Internet Prototyping, and Low Cost Attritable Aircraft Technology efforts will build upon proof of concept work completed at the Air Force Research Lab. This project will also support other prototyping efforts in the future, enabling similar emerging technology transitions.

For FY 2019, Project 645351, Prototyping, was split into Project 645351, Prototyping; Project 645345, Hypersonics Prototyping; and Project 643608, Advanced Engine Development to provide increased transparency to Congress on prototyping activities within PE 0604858F, Technology Transition Program. This is an administrative only adjustment and not a new start.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Adaptive Engine Transition Program	287.679	592.851	0.000	0.000	0.000
Description: The Adaptive Engine Transition Program (AETP) will design and manufacture multiple flight-weight adaptive engine prototypes, complete component rig assessments, characterize materials, and inform manufacturing process improvements. By producing flight-weight prototypes, the program will demonstrate adaptive engine technology can be scaled to meet military fighter engine size requirements, while ensuring appropriate manufacturing- and technology-readiness levels. By performing sea-level, altitude, and durability assessments across multiple power settings, the prototype engines will demonstrate fuel efficiency increases, thrust increases, and new component technologies. These assessments will provide data to quantify the capability and reduce risk in areas such as thermal capacity, reliability, and supportability, among others.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continue detailed design activities. Continue component rig activities. Continue technology, affordability, and sustainability studies. Conduct AETP Air Superiority 2030+ study. More details can be provided in an appropriate forum. ***FY 2019 Base Plans:*** For FY 2019 and beyond, this effort will be reported under Project 643608, Advanced Engine Development. ***FY 2019 OCO Plans:*** Not applicable. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 decreased compared to FY 2018 by $592.851 million. Justification for this decrease is due to the transfer of entire Adaptive Engine Transition Program effort to Project 643608, Advanced Engine Development.					
Title: Lifecycle Prototyping ***Description:*** Lifecycle prototyping, product support and sustainment technologies. ***FY 2018 Plans:*** Conduct hypersonics prototyping efforts to mature critical enabling technologies required to facilitate successful operations and delivery of effects across the hypersonic regime. Initiate Spectral Halo Pod prototyping effort to enhance exploratory concept which will advance a capability to be used by multi-generation aircraft and also employ multiple domains to disrupt, degrade, and collapse adversarial capabilities. Initiate low cost design and manufacturing of low-cost attritable aircraft technology. Begin flight testing and demonstration of low-cost attritable aircraft prototype with representative payloads and subsystems. May add additional prototyping activities for emerging technologies based on Department guidance. Continue to develop product support and sustainment technologies to support the warfighter and reduce sustainment costs. In FY 2017, Lifecycle Prototyping activities were performed under Project 645350, Experimentation (called Transition Prioritization in FY 2017), Experimentation and Prototyping and Sustainment Technology Transition efforts. ***FY 2019 Base Plans:*** Continue Spectral Halo Pod prototyping effort to enable multi-generation aircraft to employ multiple domain effects to disrupt, degrade, and collapse adversarial targets. Continue design and manufacturing of the low-cost attritable aircraft prototype with representative payloads and subsystems. Continue to develop product support	0.000	152.186	50.457	0.000	50.457

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
and sustainment technologies to support the warfighter and reduce sustainment costs. Initiate space internet prototyping effort to enable broad connectivity across multiple platforms. May add additional prototyping activities for emerging technologies based on Department guidance. For FY 2019 and beyond, Hypersonics Prototyping work in this effort will be performed under Project 645345, Hypersonics Prototyping, to provide increased transparency to Congress. ***FY 2019 OCO Plans:*** Not applicable. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 decreased compared to FY 2018 by $101.729 million. Justification for this decrease is due to Hypersonics Prototyping activities being transferred to Project 645345, Hypersonics Prototyping.					
Accomplishments/Planned Programs Subtotals	287.679	745.037	50.457	0.000	50.457

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

For the Adaptive Engine Transition Program, the Air Force has awarded two limited source, cost plus incentive fee contracts to General Electric and Pratt & Whitney due to their unique qualifications to design a high performance, flight-weight adaptive turbine engine in the thrust class for AETP. Incentive categories include engine weight, performance factors, and maintainability and supportability, with specific metrics for each area incentivized. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Propulsion Directorate, Wright-Patterson Air Force Base, Ohio.

For Spectral Halo, the Air Force will award funds fourth quarter FY 2018 to existing cost plus type contracts with Herrick Technology Laboratories, Inc (MD), Northeast Information Discovery, Inc (NY), Advanced Geolocation Solutions, Inc (VA), and Mitre, (MA).

For Low Cost Attritable Aircraft Technology, the Air Force will leverage the Defense Innovation Unit Experimental Other Transactional Authority to award a Firm Fixed Price Contract to a to-be-determined contractor, awarding funds in the fourth quarter of FY 2018.

For Lifecycle Prototyping efforts such Space Internet Prototyping beginning in FY 2019, the acquisition strategies are under development.

Miscellaneous emerging prototyping will be based on guidance from Department leadership.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

Hypersonic Prototyping ARRW - The Air Force applied funding to an existing DARPA other transaction authority contract to Lockheed Martin in order to leverage the synergistic efforts ongoing in the Tactical Boost Glide technology demonstration. The cost type contract incentives schedule through milestone payments. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Armament Directorate, Eglin AFB FL.

Hypersonic Prototyping HCSW - The Air Force is conducting a limited source competition for the rapid development of a hypersonic, conventional air-launched, stand-off weapon. An IDIQ contract will be awarded to a single offeror to develop/test all elements of the end-to-end system, integration with existing bomber/fighter Aircraft, all respective operations/mission planning and sustainment efforts, to include operational safety, suitability, and effectiveness. Contract award is anticipated in second quarter FY 2018. The government agency responsible for managing this program is the Air Force Life Cycle Management Center, Armament Directorate, Eglin AFB FL.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Adaptive Engine Transition Program - GE	C/CPIF	GE : Evendale, OH	-	138.622	Oct 2016	314.425	Oct 2017	0.000		-		0.000	Continuing	Continuing	-
Adaptive Engine Transition Program - PW	C/CPIF	PW : East Hartford, CT	-	148.000	Oct 2016	277.426	Oct 2017	0.000		-		0.000	Continuing	Continuing	-
Hypersonics Prototyping - ARRW DARPA OTA	SS/FFP	Lockheed Martin : Various	-	0.000		35.000	Jan 2018	0.000		-		0.000	Continuing	Continuing	-
Hypersonics Prototyping - ARRW Mission Planning	MIPR	Various : TBD	-	0.000		1.300	Mar 2018	0.000		-		0.000	Continuing	Continuing	-
Hypersonics Prototyping - HCSW Hypersonic program office support, analysis, technical risk reduction, development and integration	Various	TBD : TBD	-	0.000		41.489	Apr 2018	0.000		-		0.000	Continuing	Continuing	-
Spectral Halo Pod Prototyping	TBD	TBD : TBD	-	0.000		50.000	Jan 2018	26.000	Jan 2019	-		26.000	Continuing	Continuing	-
Low-Cost Attritable Aircraft Technology Prototyping	TBD	TBD : TBD	-	0.000		12.186	Jan 2018	12.319	Jan 2019	-		12.319	Continuing	Continuing	-
Space Internet Prototyping	TBD	TBD : TBD	-	0.000		0.000		12.138	Dec 2019	-		12.138	Continuing	Continuing	-
		Subtotal	-	286.622		731.826		50.457		-		50.457	Continuing	Continuing	N/A

Remarks

In FY 2017, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645350, Experimentation (called Transition Prioritization in FY 2017). For FY 2019 and beyond, Hypersonics Prototyping data will be reported under Project 645345, Hypersonics Prototyping.

For FY 2019 and beyond, Adaptive Engine Transition Program data is reported under Project 643608, Advanced Engine Development.

Hypersonic Prototyping - ARRW This effort is part of the DARPA Other Transaction Authority contract.
Hypersonic Prototyping - HCSW IDIQ, Estimated Award Date March 2018

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hypersonics Prototyping - ARRW Government Test	C/Various	Multiple : TBD	-	0.000		6.060	Dec 2018	0.000		-		0.000	Continuing	Continuing	-
Hypersonics Prototyping - HCSW Government test support . Includes flight test equipment, targets, 96 Test Wing and range support, and aircraft integration test.	Various	96 TW, Eglin AFB, FL : TBD	-	0.000		1.110	Mar 2018	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	0.000		7.170		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

In FY 2017, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645350, Experimentation (called Transition Prioritization in FY 2017). For FY 2019 and beyond, Hypersonics Prototyping data will be reported under Project 645345, Hypersonics Prototyping.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Adaptive Engine Program Management Support	Various	Various : TBD	-	1.057	Dec 2016	1.000	Dec 2017	0.000		-		0.000	Continuing	Continuing	-
Hypersonics Prototyping - ARRW Program Management Administration	C/Various	Not specified. : TBD	-	0.000		2.640	Nov 2018	0.000		-		0.000	Continuing	Continuing	-
Hypersonics Prototyping - HCSW Program Management Administration	Various	Various : TBD	-	0.000		2.401	May 2018	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	1.057		6.041		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Program Management Support for the Adaptive Engine Transition Program for FY 2019 and beyond is reported under Project 643608, Advanced Engine Development.

Hypersonics Prototyping - Includes A&AS support requirements plus TDY, office and office supplies. FY 2017 and FY 2018 are not full support staffs. FY 2019 is full staffing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Air Force			Date: February 2018
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0604858F / *Tech Transition Program*	Project (Number/Name) 645351 / *Prototyping*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

In FY 2017, Hypersonics Prototyping (ARRW and HCSW) data is reported under Project 645350, Experimentation (called Transition Prioritization in FY 2017). For FY 2019 and beyond, Hypersonics Prototyping data will be reported under Project 645345, Hypersonics Prototyping.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	287.679		745.037		50.457		-		50.457	Continuing	Continuing	N/A

Remarks

Additional details, including Adaptive Engine, Spectral Halo, low-cost attritable aircraft technology, space internet prototyping, Hypersonics, and other emerging prototyping efforts, can be provided in the appropriate forum.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

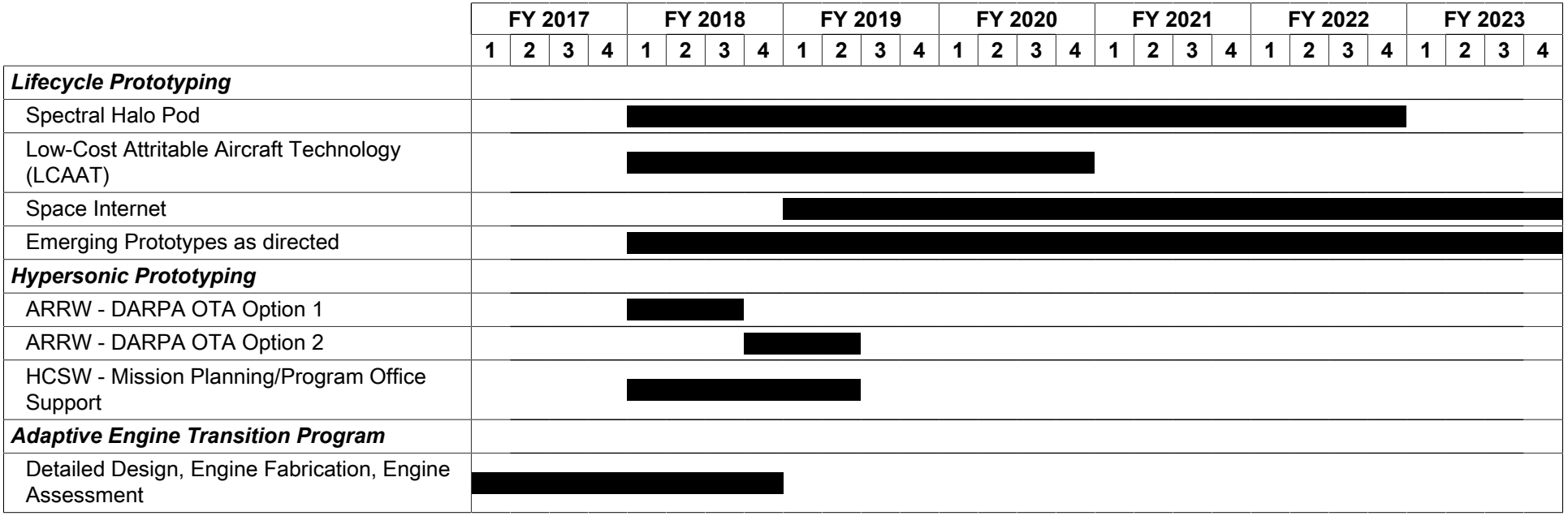

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Air Force		Date: February 2018
Appropriation/Budget Activity 3600 / 4	**R-1 Program Element (Number/Name)** PE 0604858F / *Tech Transition Program*	**Project (Number/Name)** 645351 / *Prototyping*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Lifecycle Prototyping				
Spectral Halo Pod	1	2018	4	2022
Low-Cost Attritable Aircraft Technology (LCAAT)	1	2018	4	2020
Space Internet	1	2019	4	2023
Emerging Prototypes as directed	1	2018	4	2023
Hypersonic Prototyping				
ARRW - DARPA OTA Option 1	1	2018	3	2018
ARRW - DARPA OTA Option 2	4	2018	2	2019
HCSW - Mission Planning/Program Office Support	1	2018	2	2019
Adaptive Engine Transition Program				
Detailed Design, Engine Fabrication, Engine Assessment	1	2017	4	2018

Note

In FY 2017, Hypersonics Prototyping schedules for ARRW and HCSW are reported under Project 645350, Experimentation (called Transition Prioritization in FY 2017). For FY 2019 and beyond, the schedules are reported under Project 645345, Hypersonics Prototyping.

For FY 2019 and beyond, Adaptive Engine Transition Program schedule is reported under Project 643608, Advanced Engine Development.

The Adaptive Engine Transition Program consists of three phases: detailed design, engine fabrication, and engine assessments. Program deliverables include: military adaptive engine detailed design parameters and models, multiple engine sets of hardware (plus spare parts), matured technologies, major rig assessment data (controls, combustor, etc.), program reviews, and technology, affordability and sustainability studies.

Additional details, including Adaptive Engine, Spectral Halo, low-cost attritable aircraft technology, space internet prototyping, Hypersonics, and other emerging prototyping efforts, can be provided in the appropriate forum.