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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305111F / <i>Weather Service</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	34.292	36.573	26.228	0.000	26.228	-	-	-	-	-	-
672738: <i>Weather Service</i>	-	34.292	36.573	26.228	0.000	26.228	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This budget activity funds the operational development necessary to acquire, sustain, and modernize Air Force Weather Service (AFWS) capabilities in support of the 2018 National Defense Strategy's (NDS) three lines of effort. To improve readiness for a more lethal force, AFWS provides timely, accurate, resilient, and relevant environmental information to enable global battlespace situational awareness for Air Force (AF), Army, Special Operations Forces (SOF), Space Force (USSF), combatant commands, the Intelligence Community (IC), and other government agencies. AFWS provides climate impacts and assessments, as well as space and terrestrial weather sensing, forecasting, and weather analytic capabilities, at home station and deployed, in order to deliver critical environmental intelligence in support of decision makers to gain the asymmetric advantage during the full spectrum of air and space combat operations. AFWS decreases the risk to mission and risk to force by increasing the lethality, effectiveness, and survivability of Department of Defense (DoD) weapon systems. To strengthen alliances and partnerships, AFWS development efforts integrate DoD, government agency, commercial, and international partner environmental data with AFWS information system equipment for processing, storing, exploiting, and disseminating multi-domain weather information for analysis, forecasting, mission integration, and greater interoperability. To ensure greater performance and affordability for the Department of the AF, AFWS sensors and information systems are being modernized through improvements to architecture and system efficiency, cybersecurity, joint all-domain command and control (JADC2) and sensing grid integration, migration to cloud computing, artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, delivery, and integration practices. The AF Weather Enterprise digital transformation and cloud migration effort modernizes key capabilities providing the military advantage to accurately predict environmental impacts optimizing mission planning, targeting, weaponeering, mission execution, battle damage assessment, and space systems operations.

AFWS aligns activities under four capability areas: Weather Data Collection, Weather Data Analysis and Dissemination, Weather Forecasting, and Product Tailoring/Warfighter Applications (PTWA). This alignment ensures an integrated and systems-oriented approach to program management decisions. Of these four capability areas, three (Weather Data Analysis and Dissemination, Weather Forecasting, and PTWA) are addressed by APPN 3600, BA 07, PE 0305111F, Project 672738 - Weather Service. Effective FY 2021, a portion of the APPN 3600 funding and activities from Weather Data Analysis and Dissemination and Weather Forecasting are migrated to the PTWA capability area to better address development of applications, software, command and control (C2) system integration, and web interfaces that directly impact the warfighter within the Weather Application Rapid Production (WARPspeed) program of record. In FY 2021, WDA Increment 5 and WARPspeed programs of record were approved as Software Acquisition Pathway Programs and are considering the potential for conversion of funding to APPN 3600, BA 08, as part of a pilot to better align funding with this new designation. By FY 2023, a portion of the APPN 3600 funding and activities from AF PE 0305111F, Project 672738, Weather Service, will be transferred to the USSF PE 1203940SF, Space Situational Awareness Operations, in order to align current AF ground-based space sensing projects to the USSF.

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<p>1. Weather Data Analysis and Dissemination provides a cybersecure cloud computing-based Continuous Integration/Continuous Delivery (CI/CD) environment for software development and deployment; large-scale environmental data ingest, processing, and product generation; the machine-to-machine dissemination of specific, mission-tailored weather data on-demand to support warfighter operations; and weapon system interoperability, rapidly integrating into C2 nodes and shortening the Combatant Commander kill chain. The Weather Data Analysis and Dissemination capability area includes activities for Weather Data Analysis Increment 4 (WDA Inc 4) and its follow-on, Weather Data Analysis Increment 5 (WDA Inc 5).</p> <p>2. Weather Forecasting provides global and regional advanced scientific numerical weather and climate prediction capabilities for automated, high-resolution forecast products supporting mission planning and execution with an emphasis on clouds, theater scale weather, aerosol/chemical constituents, hydrology, machine learning, and space environmental characterization. Weather Forecasting includes activities for Numerical Weather Modeling (NWM) and Space Weather Analysis and Forecast System (SWAFS). By FY 2023, the SWAFS portion of the APPN 3600 funding and activities from AF PE 0305111F, Weather Service, will be transferred to the USSF PE 1203940SF, Space Situational Awareness Operations.</p> <p>3. Product Tailoring Warfighter Applications (PTWA) provides software applications that provide and enhance environmental intelligence to support rapid warfighter decision-making. PTWA includes the program, Weather Applications Rapid Production (WARPspeed), which is a suite of software applications developed and delivered across multiple security classification levels and encompasses weather workflow tools and decision aids used to tailor terrestrial and space environmental information, which include both Forecaster-in-the-Loop (FITL) and automated machine-to-machine processes enhanced by AI/ML. WARPspeed leverages the Weather Data Analysis Increment 5 (WDA Inc 5) cloud computing, data processing, and CI/CD platforms to rapidly develop, deliver, and sustain software capabilities, whether deployed into the AF Weather Virtual Private Cloud (AFW-VPC) or to warfighter processing nodes at the edge. The PTWA program Joint Environmental Toolkit (JET) subsumed several software and web development efforts previously aligned under the Weather Data Analysis and Dissemination capability area in FY 2021 and was renamed to WARPspeed. PTWA and WARPspeed also now include Weather Services - Live, Virtual, Constructive (WS-LVC) and the machine learning Global Synthetic Weather Radar (GSWR) capabilities, which were previously aligned under Weather Forecasting. The WARPspeed program of record is not a new start.</p> <p>Activities include research and analysis to support current program planning. Management Service costs include Federally Funded Research and Development Centers (FFRDC) and Advisory and Assistance Service (A&AS).</p> <p>This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, SEC 240-D.</p> <p>This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.</p>		

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B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	35.461	23.640	27.507	0.000	27.507
Current President's Budget	34.292	36.573	26.228	0.000	26.228
Total Adjustments	-1.169	12.933	-1.279	0.000	-1.279
• Congressional General Reductions	0.000	-0.067			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	13.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-1.169	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-1.279	0.000	-1.279

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 672738: *Weather Service*

Congressional Add: *Commercial Weather Data Pilot (CWDP) Program*

Congressional Add: *Research on Atmospheric Rivers*

Congressional Add: *Enhanced Weather Prediction*

Congressional Add Subtotals for Project: 672738

Congressional Add Totals for all Projects

	FY 2020	FY 2021
	4.817	10.000
	1.963	3.000
	2.890	-
	9.670	13.000
	9.670	13.000

Change Summary Explanation

FY20: \$1.169M reprogrammed at end of FY20 to account for actuals.

FY21: \$0.067M reduction due to undistributed congressional general reduction and \$13M program increase due to congressional adds for Commercial Weather Data Pilot (\$10M) and Atmospheric Rivers (\$3M).

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

	FY 2020	FY 2021	FY 2022
Title: Weather Data Analysis Increment 4 (WDA Inc 4)	6.307	0.000	0.000
Description: WDA Inc 4 provides a net-centric infrastructure that assimilates worldwide sources of atmospheric and space environment data and produces decision-quality information for warfighters.			
FY 2021 Plans:			

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
N/A				
FY 2022 Plans: N/A				
Title: Weather Data Analysis Increment 5 (WDA Inc 5)		3.400	0.736	1.801
Description: WDA Inc 5 institutes a cloud computing-based platform enabling a transition from agile development to a CI/CD pipeline for software development and deployment efforts which will enable rapid updates to functionality and security measures. The WDA Inc 5 cloud computing platform will also provide an enterprise big data analytics capability and AI/ML platform, as well as supporting and funding development and deployment of web services, data management, platform monitoring, application on-boarding, and platform user management. Finally, the program will provide both classified and unclassified cloud computing platforms that communicate directly with C2 customers.				
FY 2021 Plans: - FY 2021 funding in WDA Inc 5 will support AI/ML platform integration and development improvements to the AFW-VPC platform.				
FY 2022 Plans: - FY 2022 funding will support the CI/CD pipeline modernization for weather software and applications and will further AI/ML platform integration and new data integration to the AFW-VPC platform.				
FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 increased compared to FY2021. Funding increased due to CI/CD pipeline modernization for weather software and applications, AI/ML platform modernization, and new data integration into the AFW-VPC platform.				
Title: Numerical Weather Modeling (NWM)		12.092	8.894	10.510
Description: The NWM program will transition High Performance Computing (HPC) System 11 into operations early in FY 2021, and expand and enhance the computing capability to begin supporting machine learning development. NWM also provides data and products used to issue advisories and warnings for DoD resource protection. NWM integrates with the Air Force Weather Weapon System's Weather Data Analysis (WDA) Inc 4 and Inc 5 processing centers to analyze and predict weather phenomena.				
FY 2021 Plans: - Complete integration and transition of hydrology streamflow model into operations. - Continue Land Information System (LIS) enhancement and integration and field an annual update. - Continue meteorological satellite (METSAT) integration and exploitation efforts for cloud forecasting applications through the Cloud Analysis and Forecast project. - Continue explicit cloud data assimilation (DA) and modeling collaboration and development activities.				

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<ul style="list-style-type: none"> - Begin seasonal-to-sub-seasonal forecast capability development and field initial drought warning prediction capability. - Begin dust forecasting improvement efforts in collaboration with RDT&E partners to include the UK Met Office, and US Army Cold Region Research and Engineering Laboratory (CRREL). - Continue Oak Ridge National Laboratory (ORNL) RDT&E collaboration tasks, focusing on model code optimization and hydrology prediction capabilities. <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Continue METSAT exploitation and integration efforts for cloud forecasting applications. - Continue terrain modeling enhancement and integration, which includes hydrology streamflow capability and seasonal-to-sub-seasonal forecast capability development. - Continue ORNL RDT&E collaboration tasks, focusing on model code optimization and hydrology prediction capabilities. - Continue Explicit Modeled Cloud data assimilation collaboration and development activities. <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 increased compared to FY 2021. Funding increased due to improvements to Cloud Depiction and Forecasting System II (CDFS II) for additional meteorological satellite launches, as well as increased RDT&E for hydrology and seasonal-to-sub-seasonal forecasting.</p>				
<p>Title: Weather Applications Rapid Production (WARPspeed)</p> <p>Description: WARPspeed develops and delivers a suite of software applications across multiple security classification levels to provide and enhance environmental intelligence to support rapid warfighter decision making. Major software developments include: the Enterprise Environmental Platform (E2P), Mission Services, Global Synthetic Weather Radar (GSWR), weather C2 visualization plug-ins and integration, and other forecast and climatology applications.</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Enhance Mission Services, to include the continued development of Severe Parameter Impact Request Engine (SPIRE), which is a cloud-native and provider-agnostic application programming interface (API) request engine, built to handle the many facets of impact services. - Develop weather C2 visualization plug-ins to integrate weather data and software applications with various C2 systems and for use in the Expeditionary Weather (ExMET) program to provide remote and weather processing and display capabilities at the edge. - Integrate GSWR into the AFW-VPC and improve machine learning algorithms, improving overall GSWR performance and accuracy. 		0.000	9.844	9.555

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>- Enhance applications to enable rapid streaming and local data-cache capabilities for forecast and climatology data hosted in the AFW-VPC.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Develop E2P which will provide a single front entry point into the Air Force Weather Enterprise for all html-based access capabilities for environmental content and services on all classification enclaves. - Continue to enhance Mission Services, to include the continued development of SPIRE. - Continue to develop weather C2 visualization plug-ins to integrate weather data and software applications with various C2 systems. <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 funding increased compared to FY 2021. Funding increased due to additional planned development and integration of software applications under the program of record WARPspeed.</p>				
<p>Title: Space Weather Analysis and Forecast System (SWAFS)</p> <p>Description: SWAFS is a software suite of 47 models/applications to ingest, process, and store space environmental data, run space environmental models to specify and forecast the near-earth environment, and run space effects characterization applications. SWAFS products support various operations including: spacecraft tracking and health, early warning and theater warning radar support, Global Positioning System (GPS) and satellite communication (SATCOM) user support, IC support, and high altitude and space flight support. SWAFS's current main thrust is working to deliver the magnetospheric Energetic Charged Particle Hazard Assessment System (ECP HAS) that is designed to inform satellite operators of hazards and the impacts to their spacecraft and will provide warfighters with the environmental awareness to safely sustain their respective orbits and missions.</p> <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Begin transition of four of five components of the hazard assessment system to a cloud infrastructure. This phase of the ECP HAS will provide warfighters with a modern user interface to determine the hazards to space vehicles. - Begin integration of a cloud-ready ionospheric assimilation model. This model will support warfighters with cloud-hosted, enhanced characterization of the ionospheric impacts to DoD and IC systems. - Continue program office and other related support activities that may include, but are not limited to, studies, technical analysis, prototyping, etc. <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Complete transition of four of five components of the hazard assessment system to a cloud infrastructure. This phase of the ECP HAS will provide warfighters with a modern user interface to determine the hazards to space vehicles at low-earth orbit (LEO) and GPS satellites' altitudes. 		2.279	4.099	4.362

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>- Begin transition of the final component of the hazard assessment system to a cloud infrastructure. This phase of the ECP HAS will provide the warfighter with the final of four physics models to specify the hazards to space vehicles in geostationary and highly-elliptical orbits.</p> <p>- Begin integration of a cloud-ready ionospheric assimilation model. This model will support warfighters with cloud-hosted, enhanced characterization of the ionospheric impacts to DoD and IC systems.</p> <p>- Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, prototyping, etc.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 increased compared to FY 2021. Funding increased due to the completion of BA 04 RDT&E work in PE 0604002F, AF Weather Service Research, and an increase in BA 07 RDT&E work in PE 0305111F, Weather Service, to integrate the final SWAFS-ECP HAS application and components.</p>				
<p>Title: Weather Services-Live, Virtual Constructive (WS-LVC)</p> <p>Description: WS-LVC provides DoD Modeling and Simulation users a correlated and realistic natural environment. Tailorable scenarios are used to create specific effects for the warfighter.</p> <p>FY 2021 Plans: N/A</p> <p>FY 2022 Plans: N/A</p>		0.544	0.000	0.000
Accomplishments/Planned Programs Subtotals		24.622	23.573	26.228
		FY 2020	FY 2021	
<p>Congressional Add: Commercial Weather Data Pilot (CWDP) Program</p> <p>FY 2020 Accomplishments: - Validate and calibrate passive microwave data and other supporting activities, enabling the future operational use of commercial constellations.</p> <p>- Establish a baseline prototype network of commercial ground sites with deployed instrumentation to observe the equatorial scintillation space environment and report data in near-real-time for ingestion into DoD data assimilative scintillation tools.</p>		4.817	10.000	

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		FY 2020	FY 2021
<p>- Initiate the creation of a AF development and testing capability inside a commercial cloud environment.</p> <p>FY 2021 Plans: - Review all new Broad Agency Announcement (BAA) white papers and request proposals, while working with NWS and USSF to ensure cost savings and mitigation of redundancy through data sharing agreements between government/DoD agencies.</p> <p>- Award 3 to 4 new contracts from new BAA, subject to change based on number of white paper submissions.</p> <p>- Provide stakeholders' interim and final reports from contracts with PlanetiQ and GeoOptics which end in FY21.</p> <p>- Efforts will include exploring how commercial weather data can be used to fill in environmental sensing for data sparse regions, such as the Arctic and polar regions.</p> <p>- Commercial weather data will also be examined for the potential to be integrated into and used as training data for future weather applications utilizing machine learning/artificial intelligence.</p>			
<p>Congressional Add: Research on Atmospheric Rivers</p> <p>FY 2020 Accomplishments: - Fund dropsondes in support of AF Reserve Hurricane Hunters' research on atmospheric rivers.</p> <p>- Conduct RDT&E activities to improve modeling capability of atmospheric rivers.</p> <p>FY 2021 Plans: - Review all new BAA white papers and request proposals.</p> <p>- Support AF Reserve Hurricane Hunters' RDT&E efforts for Atmospheric River dropsonde observations and reconnaissance flights.</p> <p>- Incrementally fund the second year of the Improving Predictions of Atmospheric Rivers project and build upon research efforts begun in FY20 to forecast improvements of landfall location and intensity of Atmospheric Rivers, as well as their associated heavy flooding threats and potential landslide impacts.</p> <p>- Award additional Atmospheric Rivers and associated enhanced weather RDT&E tasks, to include areas of research such as Hurricane Hunter dropsonde and classified data assimilation, coupled modeling, and model blending development through quantification of impacts of increased observations on model performance.</p>		1.963	3.000
<p>Congressional Add: Enhanced Weather Prediction</p> <p>FY 2020 Accomplishments: - Fund collaborative research with community partners to enhance weather prediction capabilities such as modeling, data assimilation, validation, verification, AI/ML modeling, product development, and post-processing.</p>		2.890	-
Congressional Adds Subtotals		9.670	13.000

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D. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• OPAF 03 Line Item 833070: <i>Weather Observation Forecast</i>	31.447	33.021	32.376	-	32.376	-	-	-	-	-	-
• RDTE 04 0604002F: <i>Air Force Weather Services Research</i>	0.747	2.234	0.986	-	0.986	-	-	-	-	-	-

Remarks

E. Acquisition Strategy

AF Weather is adopting a CI/CD approach to delivering capabilities rapidly and routinely using multiple contracts to support a family of systems through development fielding and sustainment.

Cost Plus contracts are utilized for software development and sustainment and Fixed Firm Price contracts for Commercial-off-the-shelf (COTS) systems and Contract Logistics Support (CLS) efforts. Pre-competed General Services Administration (GSA) and Defense MicroElectronics Activity (DMEA) contract vehicles are leveraged when appropriate, and competitive and small-business awards are favored.

The Air Force Program Executive Officer for Digital (AFPEO Digital) and the Air Force Program Executive Officer for Space (AFPEO SP) are the PEOs for the AFWS. AFPEO Digital manages the ground-based atmospheric sensing and data analysis, atmospheric forecast systems, and PTWA. AFPEO SP manages the ground-based segments of space environment collection platforms as well as SWAFS. Both the AFPEO Digital and AFPEO SP are their respective program's Milestone Decision Authority (MDA), unless delegated.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305111F / <i>Weather Service</i>	Project (Number/Name) 672738 / <i>Weather Service</i>
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
WDA 1, Develop centralized web service capability (WDA Inc 4 (4D))	C/CPIF	Northrop Grumman : Bellevue, NE	-	2.959	Dec 2019	-		-		-		-	-	-	-
WDA, Develop web service, big data analytics, and ML/AI platform capabilities (WDA-Inc 5)	C/CPAF	NextGen Federal Systems : Morgantown, WV	-	3.400	Nov 2019	0.736	Nov 2020	1.801	Nov 2021	-		1.801	-	-	-
WDA 2, Development and integration of weather analysis software (Inc 4 AFW-WEBS)	C/CPFF	Raytheon : Long Beach, CA	-	1.689	Mar 2020	-		-		-		-	-	-	-
WARPspeed (E2P, Mission Services, GSWR)	Various	Various : Various	-	-		8.372	May 2021	8.099	Jan 2022	-		8.099	-	-	-
Commercial Weather Pilot Program	C/FFP	Various : Various	-	4.817	Feb 2021	10.000	Jun 2021	-		-		-	-	-	-
Research on Atmospheric Rivers	Various	Various : Various	-	1.963	Feb 2021	3.000	Jun 2021	-		-		-	-	-	-
Enhanced Weather Prediction	Various	Various : Various	-	2.890	Feb 2021	-		-		-		-	-	-	-
NWM 1 - Perform software enhancements to the mesoscale production model	MIPR	NCAR : Boulder, CO	-	0.668	Feb 2020	0.701	Mar 2021	-		-		-	-	-	-
NWM 2 - Improve land information system (LIS) application, providing earth surface boundary characterization for numerical modeling	Reqn	NASA : Greenbelt, MD	-	2.528	Feb 2020	2.462	Jan 2021	-		-		-	-	-	-
NWM - Develop and improve data assimilation techniques, system/ software optimization, and expanded system ingest/	Various	Various : Various	-	7.685	Jan 2020	4.342	May 2021	8.704	Jan 2022	-		8.704	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Air Force **Date:** May 2021

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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
integration for enhanced modeling capabilities															
WS-LVC	C/CPIF	Northrop Grumman : Bellevue, NE	-	0.544	Apr 2020	-		-		-		-	-	-	-
SWAFS Magnetospheric Energized Charged Particle (ECP) Hazard Assessment System (HAS) Model Integration	PO	AFRL : Annapolis, MD	-	1.779	Oct 2019	3.181	Jan 2021	3.656	Jan 2022	-		3.656	-	-	-
SWAFS Cloud Transition Prep	C/FFP	Perspecta : Herndon, VA	-	-		0.418	Oct 2020	-		-		-	-	-	-
Subtotal			-	30.922		33.212		22.260		-		22.260	-	-	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
46th TS/JITC AFLCMC	WR	46 TS : Offutt AFB, NE	-	0.413	Jan 2020	0.581	Nov 2020	0.408	Nov 2021	-		0.408	-	-	-
Subtotal			-	0.413		0.581		0.408		-		0.408	-	-	N/A

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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			
Program Management Administration AFLCMC	C/CPFF	AFLCMC : Hanscom AFB, MA	-	2.457	Oct 2019	2.280	Oct 2020	2.854	Oct 2021	-		2.854	-	-	-
FFRDC SMC	RO	Aerospace Corp : El Segundo, CA	-	0.500	Jan 2020	0.500	Jan 2021	0.706	Jan 2022	-		0.706	-	-	-
Subtotal			-	2.957		2.780		3.560		-		3.560	-	-	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2022 Air Force **Date: May 2021**

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

<i>Weather Service</i>	
Weather Data Analysis Inc 4 Build D Deliveries	
Weather Data Analysis Inc 5 Build A Deliveries	
WARPspeed	
Numerical Weather Modeling Deliveries	
Live, Virtual, and Constructive Deliveries	
Weather Data Analysis Inc 5 Build B Deliveries	
SWAFS- Energetic Charged Particle Hazard Assessment model (ECP HAS) Integration	
SWAFS Cloud Transition Prep	

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Air Force **Date:** May 2021

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0305111F / <i>Weather Service</i>	Project (Number/Name) 672738 / <i>Weather Service</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Weather Service</i>				
Weather Data Analysis Inc 4 Build D Deliveries	1	2020	1	2021
Weather Data Analysis Inc 5 Build A Deliveries	3	2020	1	2024
WARPspeed	1	2021	4	2024
Numerical Weather Modeling Deliveries	1	2020	4	2026
Live, Virtual, and Constructive Deliveries	1	2020	4	2020
Weather Data Analysis Inc 5 Build B Deliveries	3	2023	4	2025
SWAFS- Energetic Charged Particle Hazard Assessment model (ECP HAS) Integration	1	2020	4	2024
SWAFS Cloud Transition Prep	1	2020	4	2021