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

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 0208006F / <i>Mission Planning Systems</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	61.164	71.465	91.768	0.000	91.768	93.950	97.363	97.397	92.301	Continuing	Continuing
675302: <i>Precision Aerial Delivery Systems (PADS)</i>	0.000	9.032	7.021	3.084	0.000	3.084	1.893	1.927	1.960	1.997	Continuing	Continuing
675380: <i>Mission Planning Systems (MPS) Modernization</i>	0.000	52.132	64.444	88.684	0.000	88.684	92.057	95.436	95.437	90.304	Continuing	Continuing

Program MDAP/MAIS Code: 509

Note

- MPS software is a layered software, designed with open architected standards and modular construction. The core of the MPS software is the Framework software (FW) used by all MPS platforms and the Navy. Common Components are distinct services that are used by a select number of platforms. An example would be weapon specific capability that fighters share. The Unique Planning Component (UPC) is the platform specific software and associated software (install etc.) that is delivered to the users in the form of a mission planning environment. Traditionally, the MPS Systems Program Office allocates FW funding to other Platform Operational Flight program (OFP) development programs. Beginning in FY20, FW is a separate program code within the MPS Modernization BPAC.

- As part of MPS Modernization, the Mission Planning program is updating the current JMPS architecture with an Open Mission Systems architecture to improve system extensibility, expand the suite of services to meet operational requirements for the warfighter, improve the user interface and overall user experience, improve system performance, and address security vulnerabilities and cybersecurity mandates. MPS is also transitioning its software development processes to incorporate best practice Agile DevOps methodologies which will speed the development and delivery of capabilities to the user as well as improve our ability to address changing threats and cybersecurity requirements. This transition is likely to drive changes in organizational and programmatic structures in the future to align with the Agile DevOps processes and practices. As we integrate the agile development methodology, some program office organizational restructuring into Agile Release Trains (ARTs) will be required. This is expected to commence in the FY21 timeframe.

A. Mission Description and Budget Item Justification

Mission planning involves the creation of a flight plan based on multiple inputs including threats, targets, terrain, weather, aircraft performance capability, and configuration. It is an essential task that must be completed prior to any fixed- or rotary wing aircraft sortie. The planner must have the ability to plan weapon, cargo, passenger, and/or fuel delivery, calculate fuel requirements, and assess the route based on known enemy threat location and type. Mission planners must be able to optimize and de-conflict flight routes with other aircraft; review, print, and brief the plan; download pertinent flight information to on-board aircraft avionics; and, conduct dynamic/in-flight re-planning as applicable.

The Mission Planning Systems (MPS) program is a collaborative program with the Navy to leverage technical solutions and business practices for most Department of Defense (DoD) platforms. It provides automated mission planning tools and support for fixed- and rotary wing aircraft and guided munitions. It replaces two closed architecture legacy mission planning systems (UNIX-based MPS (UNIX-MPS) and the PC-based Portable Flight Planning Software (PFPS)), with a single multi-

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service, open architecture system, frequently referred to as the Joint Mission Planning System (JMPS). MPS will compress the mission planning cycle by providing an improved integrated planning environment, reducing the time required to respond to changing situations and urgent needs such as striking time sensitive/critical targets and conducting combat search and rescue. MPS products have the potential to support all DoD fixed-wing and rotary wing aircraft and are shared with the selected programs in the Navy. MPS delivers significant benefits to command and control performance by enhancing information superiority for the warfighter and by providing unique capabilities in support of both precision engagement and dominant maneuver.

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

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.

B. Program Change Summary (\$ in Millions)	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>
Previous President's Budget	63.074	71.465	91.934	0.000	91.934
Current President's Budget	61.164	71.465	91.768	0.000	91.768
Total Adjustments	-1.910	0.000	-0.166	0.000	-0.166
• 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	-1.910	0.000			
• Other Adjustments	0.000	0.000	-0.166	0.000	-0.166

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>				Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</i>			
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
675302: <i>Precision Aerial Delivery Systems (PADS)</i>	0.000	9.032	7.021	3.084	0.000	3.084	1.893	1.927	1.960	1.997	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission planning involves the creation of a flight plan based on multiple inputs including threats, targets, terrain, weather, aircraft performance capability, and configuration. It is an essential task that must be completed prior to any fixed- or rotary wing aircraft sortie. The planner must have the ability to plan weapon, cargo, passenger, and/or fuel delivery, calculate fuel requirement and assess the route based on known enemy threat location and type. Mission planners must be able to optimize and de-conflict flight routes with other aircraft; review, print and brief the plan; download pertinent flight information to on-board aircraft avionics; and, conduct dynamic/in-flight re-planning as applicable.

This project continues the development of a Joint Precision Airdrop System-Mission Planner (JPADS-MP) capability in conjunction with the Army. JPADS provides a planning capability for DoD airdrop requirements. It is the primary airdrop mission planning system for all ballistic airdrop missions as well as precision guided airdrops that are required when the mission profile or surface-to-air threat assessment warrants a high-altitude and/ or standoff precision delivery. It enables high-altitude, precise airdrop delivery to forward ground forces, while mitigating surface-to-air threats, reducing risk of exposure to Improvised Explosive Devices (IEDs) and insurgent attack on ground convoys. JPADS allows the warfighter to consider weather, terrain, aircraft capabilities, threat, and other data to accurately deliver payloads to U.S. and other friendly forces.

Consolidated Airdrop Tool (CAT) is the key JPADS-MP software deliverable. It will increase the accuracy of airdrop mission planning by improving aircraft, payload, and chute specific calculations along with weather analysis visualization tools specifically adapted for airdrop. Future initiatives are designated to achieve automation of airdrop planning and execution to reduce task saturation in the cockpit and support Air Mobility Command's (AMC) objective of moving to a two-man cockpit. These efforts include the ability to automatically receive and use real-time winds in any location, calculation of a release point and airdrop in a single pass, the ability to conduct real-time objective area analysis to calculate probable damage estimates and execute dynamic re-tasking, the ability to conduct post-drop assessments, and the implementation of new technologies (e.g. Service Oriented Architecture (SOA) Touch Screen environment).

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.

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

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>Title: JPADS-MP Phase I</p> <p>Description: Continues development of a JPADS capability for precise, high altitude delivery of material to forward ground forces.</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> - Continue agile development of increased JPADS capability. The goal of quarterly releases are targeted, although specific fielding dates will be worked with the Using Command based on Operational Tempo. Capabilities - Provide precision and conventional airdrop capabilities including but not limited to, Airdrop Damage Estimate (ADE), 3D Hazard and obstruction data for guided delivery system navigation, automation for aircrew in-flight airdrop workflow, Extracted Container Delivery Systems (ExCDS), data services to multiple mission planning devices, and calculations to maximize payload impact success on drop zones. - Continue development of CAT v7.0 (incorporating capabilities from MAJCOM prioritization requirements) <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Continue the agile development of increased JPADS capability via a new contract for the additional capabilities as directed by the MAJCOM, Navy and other DoD users. This development is for the continued tablet capabilities along with potential C-130 and C-17 data exchange of airdrop weather, navigation and flight performance information. - Will continue the refinement of precision and conventional airdrop capabilities including but not limited to, Airdrop Damage Estimate (ADE), 3D Hazard and obstruction data for guided delivery system navigation, automation for aircrew in-flight airdrop workflow, Extracted Container Delivery Systems (ExCDS), data services to multiple mission planning devices, and calculations to maximize payload impact success on drop zones <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p> <ul style="list-style-type: none"> - FY21 total requirement for JPADS is \$9.915M. The requested increase is due to incorporation of additional capabilities into the airdrop system. 	9.032	7.021	3.084
Accomplishments/Planned Programs Subtotals	9.032	7.021	3.084

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 Line Item 833170: <i>Mission Planning Systems</i>	12.092	14.508	15.149	-	15.149	14.892	15.710	17.979	18.308	Continuing	Continuing

Remarks

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D. Acquisition Strategy

The MPS PADS efforts are developed and fielded using a variety of contracting instruments. Efforts to accomplish activities such as SAFe Agile software development methodology, systems engineering and integration, training, and support are completed using competitively awarded contracts (e.g. Cost Plus Award Fee (CPAF), Fixed Price (FP)).

Program Management Administration (PMA) contracts are awarded competitively and consist of various types of contracts at various locations. MITRE, a Federally Funded Research and Development Center (FFRDC) contractor, provides technical support via a no fee for service contract. Other efforts are accomplished using Purchase Orders (PO) and Military Interdepartmental Purchase Requests (MIPR).

For the efforts listed above, the Air Force Life Cycle Management Center at Hanscom AFB (AFLCMC/HB) is the Contracting Authority and provides Contracts, Legal, and Comptroller Support.

Air Force Program Executive Officer (PEO) for Digital (AFPEO/BM) is the PEO and Milestone Decision Authority (MDA) for the PADS program.

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

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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	C/CPFF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Software Development	C/CPFI	Various : Various	0.000	5.492	Nov 2018	5.115	Nov 2019	1.873	Nov 2020	-		1.873	Continuing	Continuing	-
Systems Engineering and Integration	C/CPAF	Leidos, Inc. : Reston, VA	0.000	1.651	Jan 2019	0.870	Jan 2020	0.175	Jan 2021	-		0.175	Continuing	Continuing	-
Subtotal			0.000	7.143		5.985		2.048		-		2.048	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Support	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Cost Estimating	C/T&M	Quantech Services : Lexington, MA	0.000	0.011	Nov 2018	0.015	Nov 2019	0.016	Nov 2020	-		0.016	Continuing	Continuing	-
Subtotal			0.000	0.011		0.015		0.016		-		0.016	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Responsible Test Organization (RTO)	PO	96CTG: Eglin AFB, FL : TBD	0.000	0.364	Dec 2018	0.370	Dec 2019	0.350	Dec 2020	-		0.350	Continuing	Continuing	-
Type I Training	C/FP	Spiral Solutions & Technologies : Bellevue, NE	0.000	-		-		-		-		-	0.000	0.000	-
Subtotal			0.000	0.364		0.370		0.350		-		0.350	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</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>Precision Aerial Delivery Systems (PADS)</i>																												
JPADS-MP Rel 7+ CAT Agile Development, Integration, Test, and Release					██████████																							
JPADS-MP Rel 8+ CAT Agile Development, Integration, Test and Release									██████████																			
JPADS-MP Rel 9-14+ CAT Agile Development, Integration, Test and Release													██															

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675302 / <i>Precision Aerial Delivery Systems (PADS)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Precision Aerial Delivery Systems (PADS)</i>				
JPADS-MP Rel 7+ CAT Agile Development, Integration, Test, and Release	1	2020	4	2020
JPADS-MP Rel 8+ CAT Agile Development, Integration, Test and Release	1	2021	4	2021
JPADS-MP Rel 9-14+ CAT Agile Development, Integration, Test and Release	1	2022	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>				Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>			
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
675380: <i>Mission Planning Systems (MPS) Modernization</i>	0.000	52.132	64.444	88.684	0.000	88.684	92.057	95.436	95.437	90.304	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission planning involves the creation of a flight plan based on multiple inputs including threats, targets, terrain, weather, aircraft performance capability, and configuration. It is an essential task that must be completed prior to any fixed- or rotary wing aircraft sortie. The planner must have the ability to plan weapon, cargo, passenger, and/or fuel delivery, calculate fuel requirements, and assess the route based on known enemy threat location and type. Mission planners must be able to optimize and de-conflict flight routes with other aircraft; review, print and brief the plan; download pertinent flight information to on-board aircraft avionics; and, conduct dynamic/in-flight re-planning as applicable. This project focuses on modernizing MPS to support Combat Air Forces (CAF) and Mobility Air Forces (MAF), including the development, test and sustainment of Mission Planning Environments (MPEs) to support the B-1, C-5, C-17, C-130, HC-130, EC-130, E-3, E-8, F-15, , F-22A, KC-10, KC-46, KC-135, RC-135, HH-60 other platforms, Framework (FW) and all Common Component (CCs) software tools for mission requirements. Activities also include studies and analysis to support both current program planning and execution and future program planning. MPS Modernization efforts are as follows:

1) CAF MPS Modernization: These development efforts modernize CAF Mission Planning Environments (MPEs). The modernization effort will provide new and improved mission planning capability for individual Operational Flight Program (OFF) requirements, such as new weapons, avionics upgrades, communications systems, etc. The OFFs requiring MPE updates under the CAF modernization effort include, but are not limited to, B-1 (Sustainment Blocks 15, 16, 16a, 17, 17a and 18), F-15 (Suites 7, 8, 9, 9.1 and 9.2) and F-22 Increments 3.2B, update Release One, Release Two, and Release Three. CAF modernization also includes updates to mission planning capabilities supporting associated weapons including, but not limited to, Small Diameter Bomb (SDB-II), Joint Direct Attack Munitions (JDAM) and the Joint Air-to-Surface Standoff Missile (JASSM). Finally, CAF modernization will address required improvements to CAF related JMPS MPE CCs, including Weapon Planning Software (WPS), Electronic Warfare CC (EWCC), GPS Crypto (including GPS M-code), Weather CC, etc. CAF MPE Modernization includes, but is not limited to, the following platform efforts:

a. F-15 Modernization Phase II & III: This modernization program consists of multiple software development efforts driven by OFF updates for F-15 Suites 7,8,9,9.1, and 9.2. Suite 7-9 MPE capabilities include, but are not limited to, Data Transfer Device (DTD) improvements, updates for new features in weapons such as Joint Direct Attack Munition (JDAM), Small Diameter Bomb I and II (SDB I and II), AIM-9X, AIM-120D, and Network Enable Weapon support elements (e.g. key handling, weapon data link and Link 16). It will also include enhancements to the synthetic aperture radar planning tool (SAR-PT) and the global area reference tool as well as radar modernization updates (e.g. combat identification, radar planning tool enhancements). Development efforts for F-15 Suite 8 include, but are not limited to, integration of B61 Life Extension Program (LEP), feature updates for several weapons, and the expansion of Link-16 messages sets. F-15 Suite 9 MPE will include a variety of updates and enhancements for weapons and aircraft systems to include, but are not limited to, Eagle Passive Active Warning Survivability System (EPAWSS), a new Advanced Dual Core Process II (ADCP-II) computer as well as Digital Transfer Device/Modules (DTD/DTM) modernization.

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<p>b. F-22 Modernization Phase I: The F-22 Modernization program includes OFP-driven software updates v13.1, v14.0, v14.1, and v14.2. These enhancements include, but are not limited to, the addition of improved capabilities for the AIM-9X and AIM-120D, the incorporation of additional electronic protection tasks, combat identification improvements, addition of an Inter-flight Data Link Gateway, Mode 5 IFF and Combat ID updates, Link 16 updates, and incorporation of the synthetic aperture radar planning tool. Additionally, other new and emerging OFP-generated requirements will be addressed as identified by the operational user(s). Other Common Component (CC) updates will also be completed as required.</p> <p>c. B-1 Modernization Phase I: The B-1 Modernization program includes OFP-driven software updates for Releases 7.0, 8.0, 9.0, and 11.0. It will incrementally update the platform MPE and provide updates to the aircraft mission capabilities, including adding sensor anywhere on tactical display, updating threat range rings and route re-planning capabilities, improving Air Coordination Order (ACO) file loading and the memory utilization in the onboard avionics updates. Additionally, it will migrate the B-1 MPE to a native 64-bit environment and utilize Mission Planning Data Service Layers (MPDSL) to modernize the software architecture.</p> <p>d. The platform efforts include work associated with updates to the framework and associated services. Beginning in FY20 the Framework will be broken out as a separate program with a separate funding line.</p> <p>2) MAF MPS Modernization: These development efforts modernize MAF MPEs for the KC-46 aircraft as well as all Air Mobility Command platforms initially fielded under MPS Increment 5. The modernization effort will provide new and improved mission planning capability for individual Operational Flight Program (OFP), Global C2, and AMC fuel efficiency requirements.</p> <p>3) The SMACC Modernization Program includes development, testing, and fielding of MP software for the E-3 DRAGON, E-3/E-8, RC-135 and EC-130. Combat Search and Rescue (CSAR) is providing a new JMPS capability to the HH-60G and MC/HC-130 aircraft. The follow-on versions continue that development.</p> <p>4) MAF Modernization effort builds upon the fielded E-8 MPE to provide new and improved mission planning capabilities for the MAF fleet (e.g. C-5, C-130, KC-10, etc.) as required to meet OFP, fuel efficiency, and global planning net-centric requirements. It includes, but is not limited to, enhanced capabilities to accommodate avionics upgrades, improved communications systems, interfaces with command and control systems, new parachutes, etc. for various MAF platforms. Development efforts also include, but are not limited to, integrating improvements to MAF related Common Components (CCs). Examples of these CCs include, but are not limited to, MAF tools, such as Assault Zone CC and the Air Refueling Tool (ART) CC. CSAR Release 1.1 program began in FY17 modernizing the efforts begun with the CSAR products developed in MPS Inc 5. The CSAR effort will continue modernization via agile development for evolving CSAR requirements.</p> <p>5) Mobility Air Forces Automated Flight Planning Service (MAFPS) Phase Two began in FY17. This effort modernizes the MAFPS products developed in Increment 5. This effort completes the development of a centralized/net-centric global mobility flight planning capability, which will provide significant fuel savings through automated flight route, airspeed, and altitude optimization utilizing aircraft performance, air traffic management, weather, and other data. Additional development includes streamlining the support structure for flight planning to reduce mission planning and execution time while maximizing the time available for enroute aircrew support. Also a , Web-based Global Flight Planning (Web-GFP) modernizes a second MAFPS client, the Global Flight Planning Common Component (GFPCC) which integrates into the Global Mobility Mission Planning Environment (GM MPE) aimed at Unit-level mission and flight planning operations. This client enables GM MPE users with access to the same MAFPS capabilities in order to facilitate fuel and cost efficiencies across the MAF.</p>		

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6) In FY20 the MPS Framework will be established as an independent Program of Record (anticipated as an ACAT III). MPS Framework will be used as a one year pathfinder effort that represents the basic corefunctions of the JMPS software. It rides on SDC compliant Windows OS. The basic services that all programs use (Falconview, Data Load, Route construction, flight planning etc.) are included in the MPS Framework architecture. The Navy utilizes the same basic core MPS Framework software. The funding for the MPS Framework has historically been accomplished through an allocation to the platform mission planning budgets. The programs were based upon the platform OFPs and the fielded software packages (mission planning environments). The program office will segregate MPS Framework for future oversight. MPS FW Framework will be an agile development effort based on services developed in a common development environment. Beginning with the FY21 efforts, MPS Framework will become Core Mission Planning (CMP). This will be a follow-on Program of Record continuing the efforts of MPS Framework.

Test, Training, and Certification: Continues all MPS-related integration, test, and certification activities for all CAF and MAF platforms.

Program Support: Continues all program office management operations and support activities to ensure the timely development, testing, and delivery of mission planning systems to the warfighter.

The platform efforts include work associated with updates to the Framework and associated services.

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

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.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: F-15 Modernization Phase II and III	5.387	8.113	10.406
Description: Continues the modernization of previously fielded F-15 Mission Planning Environments (MPEs) to enable efficient use of new and improved capabilities being developed in platform Operational Flight Programs (OFPs).			
FY 2020 Plans: - Field v5.0 - Field v6.0 - Begin development of v6.1			
FY 2021 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
- Will complete FQT, DT/OT and Field v6.1				
FY 2020 to FY 2021 Increase/Decrease Statement: Increase due to beginning of development of 6.1 in FY20				
Title: F-22 Modernization Phase I and II		7.296	8.690	10.900
Description: Continues the modernization of previously fielded F-22 MPEs to enable efficient use of new and improved capabilities being developed in the OFPs.				
FY 2020 Plans: - Field v14.0 - Will complete FQT of v14.1 - Will complete DT of v14.1 - Will begin development for v14.2				
FY 2021 Plans: - Will continue development of v14.2 - Complete FQT of v14.2 - Complete DT of v14.2 - Begin development of v14.3				
FY 2020 to FY 2021 Increase/Decrease Statement: There is an increase from FY20 to FY21 budgets due to a projected new contract award in FY21				
Title: B-1 Modernization Phase I and II		10.050	10.634	10.104
Description: Continues the modernization of previously fielded B-1 MPEs to enable efficient use of new and improved capabilities being developed in the OFPs.				
FY 2020 Plans: - Continue/complete development of B-1 Rel 11.0 in support of B-1 SB18 OFP requirements.				
FY 2021 Plans: - Field B-1 Rel 11.0 in support of B-1 SB18 OFP requirements. - Begin development of B-1 Rel 12.0 in support of B-1 SB19 OFP requirements.				
FY 2020 to FY 2021 Increase/Decrease Statement:				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Slight decrease from FY20 to FY21				
<p>Title: MAF Modernization</p> <p>Description: Continues the development, testing, and fielding of the Agile Global Mobility (AGM) effort for the modernization of the JMPS Mission Planning Environment (MPE) for the C-5, C-17, C-130, KC-10, KC 135 and KC-46 to account for changes in aircraft operational flight profiles and Global Command and Control Changes.</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> - Continue development of AGM for modernized capabilities. Integration/development, testing, and release will be conducted concurrently via agile development with multiple Program Increments (PIs). Each of the PIs provide full and/or interim capabilities made available to the using command for fielding. The goal of quarterly releases are targeted, although specific fielding dates will be worked with Air Mobility Command based on Operational Tempo. The initial release with a Minimum Viable Capability release (MVCR) is projected for Jun 2020. <p>FY 2021 Plans:</p> <ul style="list-style-type: none"> - Will continue development of follow on AGM releases for modernized capabilities. Integration/development, testing, and release will be conducted concurrently via agile development with multiple Program Increments (PIs). Each of the PIs provide full and/or interim capabilities made available to the using command for fielding. <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p> <p>Increase due to continued required modernization for the mobility platforms including absorption of the KC-46 into AGM modernization effort.</p>		11.721	15.892	21.533
<p>Title: Special Mission ACC (SMACC)</p> <p>Description: Continues the modernization of previously fielded mission planning software environments for the E-3, E-8, E-4, EC-130, and RC-135. In addition, continues modernization efforts for the Inc 5 follow on for SMACC CSAR and continued modernization for SMACC Combat Search and Rescue (CSAR) component for the HH-60 helicopters and the HC-130J.</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> - Fielding decision of RC-135 V3.4 - Release Recommendation for E-3/E-8 V2.2 - Continue modernization of the E-3 Dragon and EC-130 - Continuation of CSAR-PK modernization <p>FY 2021 Plans:</p>		16.336	16.713	19.390

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>CSAR efforts continue with implementation of evolving capabilities identified during the FY 2020 requirement process. SMACC aircraft will complete the migration from waterfall to agile development with the goal of quarterly releases of capabilities.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: The increase is due to completion of development for the SMACC RC-135, E-3 Dragon, E-3/E-8 as well as the continued modernization of the SMACC CSAR.</p>				
<p>Title: MPS Framework (FW)</p> <p>Description: MPS Framework is the set of core Mission Planning services that all platforms and common capabilities utilize. It is the bottom layer of the software architecture. It provides the core services such as utilized by both MAF and CAF platforms. MPS FW includes the interfaces required to be integrated into the various platforms and weapons systems as well as addresses data access, services, integrity and real-time operational communication development streamlining sortie generations. Services being developed include Local Points, Mission Folders, and Moving Map.</p> <p>FY 2020 Plans: MPS FW will be classified as a program of record. The MPS FW program will be an agile development effort with service capability releases versus the traditional waterfall major framework releases. Planned services include UCI route management and Mission Planning Parametrics (MPP) as well as efforts to improve quality, security, and automation of data supplied to mission planning systems. FY20 efforts will be aligned under the SAFe Agile construct specifically the Core Mission Planning Agile Release Train (ART).</p> <p>FY 2021 Plans: Will establish a follow-on program of record, known as Core Mission Planning (CMP) at the conclusion of the FY20 Pathfinder development effort. CMP will continue development of services, modernizing from legacy development to micro-services in an Open Mission Systems/Service Oriented Architecture environment and improving quality, security, and automation of data supplied to mission planning systems.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding was realigned to support Framework effort. This is not a New Start.</p>		0.000	4.402	16.322
<p>Title: MAF Automated Flight Planning Service (MAFPS)Phase II</p> <p>Description: Develops a centralized/net-centric global mobility flight planning capability, which will provide significant fuel savings through automated flight route, airspeed, and altitude optimization utilizing aircraft performance, air traffic management, weather, and other data. The Web-based Global Flight Planning (Web-GFP) portion modernizes a second MAFPS client enabling GM MPE users with access to the same MAFPS capabilities in order to facilitate fuel and cost efficiencies across the MAF.</p>		1.342	0.000	0.029

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<i>FY 2020 Plans:</i> Program will be in sustainment with no more development funding required.			
<i>FY 2021 Plans:</i> Program will be in sustainment with no more development funding required.			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> The decrease reflects the end of development and fielding for the Web-GFP. Moved to sustainment.			
Accomplishments/Planned Programs Subtotals	52.132	64.444	88.684

C. 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
• OPAF 03 Line Item 833170: <i>Mission Planning Systems</i>	8.291	9.300	9.935	-	9.935	9.783	10.583	10.133	10.319	Continuing	Continuing

Remarks

D. Acquisition Strategy

MPS Modernization consists of multiple capability upgrades across multiple platforms that are developed and fielded using a variety of contracting instruments. The Air Force Life Cycle Management Center at Hanscom AFB AFLCMC/HB competitively awarded multiple (Indefinite Delivery/Indefinite Quantities) (ID/IQ) contracts for software development. Currently there are five (5) contractors, one of which is Small Business set aside, who are qualified sources. Each Delivery Order (DO) is competed among the five contractors. Efforts to accomplish program activities such as software development, systems engineering and integration, training, and support are competitively awarded using a variety of contract types (e.g. Cost Plus Award Fee (CPAF), Fixed Price (FP), and Fixed Price Incentive Fee (FPIF)). Program Management Administration (PMA) contracts are awarded competitively and consist of various types of contracts at various locations. Mitre, a Federally Funded Research and Development Center (FFRDC) contractor provides technical support on a no fee for service contract. Other efforts are accomplished via Purchase Orders (PO) and Military Interdepartmental Purchase Requests (MIPR). For the efforts listed above, the Air Force Life Cycle Management Center at Hanscom AFB (AFLCMC/HB) provides the program management, contracts, legal, and financial management support. The Air Force Program Executive Officer (PEO) for Digital (AFPEO/HB) is the Milestone Decision Authority (MDA) for all MPS Modernization projects. 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.

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>
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Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Mission Planning Software Development (MPEC II)	C/Various	Various : Various	0.000	10.698	Nov 2018	16.075	Nov 2019	23.146	Nov 2020	-		23.146	Continuing	Continuing	-
A-10 Modernization	PO	Organic : Hill AFB, UT	0.000	-		-		-		-		-	0.000	0.000	-
F-16 Modernization	PO	Organic : Hill AFB, UT	0.000	-		-		-		-		-	0.000	0.000	-
EC-130H Modernization	PO	Organic : Robins AFB, GA	0.000	1.121	Jan 2019	0.775	Jan 2020	0.850	Jan 2021	-		0.850	Continuing	Continuing	-
F-22 MilCloud SIL	MIPR	GSA : Washington, DC	0.000	-		-		-		-		-	0.000	0.000	-
MAF AMC Transition Tools	MIPR	AMCOM : Redstone Arsenal, AL	0.000	-		-		-		-		-	0.000	0.000	-
SMACC CSAR Tools	MIPR	Various : Various	0.000	0.563	Jan 2019	0.514	Jan 2020	0.529	Jan 2021	-		0.529	Continuing	Continuing	-
Systems Engineering and Integration	C/CPAF	Leidos, Inc. : Reston, VA	0.000	9.637	Jan 2019	10.178	Jan 2020	10.484	Jan 2021	-		10.484	Continuing	Continuing	-
Framework	C/FPIF	Northrop Grumman : Herndon, VA	0.000	6.907	Jan 2019	10.479	Jan 2020	15.490	Jan 2021	-		15.490	Continuing	Continuing	-
Common Components	C/Various	Various : Various	0.000	6.333	Nov 2018	8.046	Nov 2019	15.395	Nov 2020	-		15.395	Continuing	Continuing	-
Subtotal			0.000	35.259		46.067		65.894		-		65.894	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Support	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Software Engineering	C/T&M	SEI : Pittsburgh, PA	0.000	0.055	Jul 2019	-		-		-		-	0.000	0.055	0.080
Cost Estimating	C/T&M	Tecolote Inc : Goleta, CA	0.000	0.079	Nov 2018	0.140	Nov 2019	0.145	Nov 2020	-		0.145	Continuing	Continuing	-
Subtotal			0.000	0.134		0.140		0.145		-		0.145	Continuing	Continuing	N/A

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

Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>
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Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test and Evaluation	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Responsible Test Organization (RTO)	PO	96CTG : Eglin AFB, FL	0.000	4.115	Dec 2018	4.126	Dec 2019	4.511	Dec 2020	-		4.511	Continuing	Continuing	-
Certification and Accreditation	MIPR	JITC : Fort Huachuca, AZ	0.000	0.089	Feb 2019	0.089	Feb 2020	0.092	Feb 2021	-		0.092	Continuing	Continuing	-
Type I Training	C/FP	Summit Technologies Inc : Winter Park, FL	0.000	0.903	Jul 2019	1.545	Jul 2020	1.825	Jul 2021	-		1.825	Continuing	Continuing	-
Field Representative Hardware	C/Various	Various : Various	0.000	0.300	Nov 2018	0.302	Nov 2019	0.374	Nov 2020	-		0.374	Continuing	Continuing	-
Subtotal			0.000	5.407		6.062		6.802		-		6.802	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Management Services	C/CPAF	Not specified. : TBD	0.000	-		-		-		-		-	0.000	0.000	-
Engineering and Technical Support	RO	MITRE Corp : Bedford, MA	0.000	3.310	Oct 2018	3.254	Oct 2018	3.702	Oct 2020	-		3.702	Continuing	Continuing	-
Program Management Administration	Various	Various : Various	0.000	8.022	Nov 2018	8.921	Nov 2019	12.141	Nov 2020	-		12.141	Continuing	Continuing	-
Subtotal			0.000	11.332		12.175		15.843		-		15.843	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	52.132	64.444	88.684	-	88.684	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</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

Mission Planning Systems (MPS) Modernization	
F-15 v4.2 Fielding	■
F-15 v5.0 Fielding	■
F-15 v6.0 Fielding	■
F-15 v6.1 Fielding	■
F-22 v13.1 Fielding	■
F-22 v14.0 Fielding	■
F-22 v14.1 Fielding	■
F-22 v14.2 Fielding	■
B-1 Release 11 Fielding	■
CAF Modernization Continued Integration, Test, and Fielding	■
MAF Modernization continued Integration, Test, and Fielding	■
SMACC E-3/E8 Release 2.2 Fielding	■
SMACC EC-130H Release 2.3-2.7 Fielding	■
SMACC EC-130H Release 2.1 Fielding	■
SMACC EC-130H Release 3.0 Fielding	■
SMACC EC-130H Release 3.1-3.6 Fielding	■
SMACC E-3 DRAGON Release 3.1 Fielding	■
SMACCE-3 DRAGON Release 3.2-3.5 Fielding	■
SMACC RC-135 Release 3.4 Fielding	■
SMACC RC-135 Release 3.5 Fielding	■

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Mission Planning Systems (MPS) Modernization</i>				
F-15 v4.2 Fielding	1	2019	1	2019
F-15 v5.0 Fielding	2	2020	2	2020
F-15 v6.0 Fielding	3	2020	4	2020
F-15 v6.1 Fielding	3	2021	3	2021
F-22 v13.1 Fielding	4	2019	4	2019
F-22 v14.0 Fielding	2	2020	2	2020
F-22 v14.1 Fielding	2	2021	2	2021
F-22 v14.2 Fielding	2	2022	2	2022
B-1 Release 11 Fielding	3	2021	3	2021
CAF Modernization Continued Integration, Test, and Fielding	3	2020	4	2024
MAF Modernization continued Integration, Test, and Fielding	1	2020	4	2025
SMACC E-3/E8 Release 2.2 Fielding	4	2020	4	2020
SMACC EC-130H Release 2.3-2.7 Fielding	1	2022	4	2025
SMACC EC-130H Release 2.1 Fielding	3	2020	3	2020
SMACC EC-130H Release 3.0 Fielding	2	2021	2	2021
SMACC EC-130H Release 3.1-3.6 Fielding	1	2022	4	2025
SMACC E-3 DRAGON Release 3.1 Fielding	4	2020	4	2020
SMACCE-3 DRAGON Release 3.2-3.5 Fielding	1	2022	4	2025
SMACC RC-135 Release 3.4 Fielding	2	2020	3	2020
SMACC RC-135 Release 3.5 Fielding	3	2021	3	2021
SMACC RC-135 Release 3.6-4.0 Fielding	1	2022	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0208006F / <i>Mission Planning Systems</i>	Project (Number/Name) 675380 / <i>Mission Planning Systems (MPS) Modernization</i>

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CSAR-Pedro King (HH-60G/HC-130J) Rel 1.1.7-2.0	1	2020	4	2020
CSAR-Pedro King(HH-60G/HC-130J) Rel 2.0+	1	2021	4	2021
CSAR-Pedro King(HH-60G/HC-130j) Rel 2.1-3.2+	1	2022	4	2025
Agile Global Mobility (AGM) Rel 1.0.400-2.0	2	2020	4	2020
Agile Global Mobility (AGM) Rel 3.0-3.4	1	2021	4	2021
Agile Global Mobility (AGM) 4.0-8.0	1	2022	4	2025
MAFPS Release 2 Fielding	2	2019	2	2019
MAFPS Rel 2 Web-GFP Agile Development, Integration, Test, and Release	4	2019	3	2021