REDAC / NAS Ops

Review of FY 2022 Proposed Portfolio

Weather Technology in the Cockpit Program (WTIC)

BLI Number: A12.c

Gary Pokodner, WTIC Program Manager, ANG-C61 March 24,2020



Weather Technology in the Cockpit (WTIC) - Program Description

- Research projects to develop, verify, and validate requirements for incorporation into Minimum Weather Service (MinWxSvc) standards
- The MinWxSvc is defined as:
 - Minimum cockpit meteorological (MET) information
 - Minimum performance standards (e.g. accuracy) of the MET information
 - Minimum information rendering standards
 - Enhanced weather training
 - Minimum cockpit technology capability recommendations





WTIC Program Budget line – A12c

• What are the benefits to the FAA

- Enhanced safety by resolving/reducing adverse-weather safety risks before they result in an accident/incident
- Enhanced NAS efficiency and increased capacity resulting from consistent and predictable pilot adverse weather decision making due to established cockpit minimum weather service(s)
 - Reduced emissions due to enhanced efficiency
 - Reduction in flight delays
 - Enhanced flight routing in and around adverse weather
- Enhanced safety resulting from the resolution of pilot METtraining shortfalls





WTIC Program Budget line – A12c

- What determines program success
 - Number of standards released incorporating WTIC MinWxSvc recommendations
 - Number of transitions of WTIC MinWxSvc recommendations into commercial products or operations
 - Number of transitions of WTIC training materials to use in courses, textbooks, guidance, Wings Credit Courses, FAA pilot exam questions, and commercial training products
 - Number of MinWxSvc recommendations incorporated by pilots and other stakeholders into practice, guidance, or endorsements by representative groups such as Aircraft Owners and Pilots Association (AOPA), Air Line Pilots Association (ALPA), and National Association of Flight Instructors (NAFI)



WTIC Program – REDAC Finding and Recommendation

- **Finding**: The introductory portions of the WTIC briefing to the subcommittee provided a solid list of stakeholders (Government, industry, academia, standards setting organizations) and metrics for program success. However, the process through which these foundational elements determine the particular projects that are being pursued currently, and planned for the outyears, is not clear. The particular research efforts briefed to the subcommittee seem disjoint and it is not clear how they contribute to the strategic goals of the program.
- **Recommendation:** The WTIC program should develop an end-to-end strategic plan and brief this to the subcommittee at the spring 2020 meeting. This should augment the existing material on stakeholders and metrics with a clearer statement of desired program outcomes, a process for optimizing the research projects selected for funding to achieve these outcomes, and a stronger explanation of why the projects briefed to the subcommittee are important to this strategy. Furthermore, the program should document the specific weather translation activities and probabilistic analysis to be able to clearly convey and set expectations for the users on the weather products for them to make informed decisions.
- FAA Response Summary Will present WTIC artifacts and briefing in response to REDAC recommendation at the spring meeting. Need clarification on last sentence in recommendation since WTIC has never done weather translation activities and has not done any probabilistic analysis projects recently.



WTIC Program – High Level Response to REDAC Recommendation

- WTIC Program Management Artifacts
 - MS Project program schedule showing estimated schedule, phases, cost, and final goal/product
 - Gaps database tracking status of gaps identified by WTIC research and stakeholders (approximately 42 gaps currently tracked)
 - Scoping Meeting Briefing and Minutes Present potential projects to FAA management for preliminary concurrence on research (projects by year)
 - Program Level Agreement (PLA) FAA program/project plan based on scoping meeting. PLA approval releases funds to program office to execute projects
 - REDAC Findings and Recommendations on research prioritization and project content
 - Contractor project management and/or research plans by project
 - Track outreach article, books, papers, etc.



WTIC Multi-Year Plan FY19+





WTIC Response - Gap Tracking -Example 1-

Identified Gap: Lack of objective turbulence information in the cockpit

ap #		Gap Identification			Gap Resolution	Application / Outreach Input Spons		Input Sponsor / O	utput Beneficiary	Future Research (if necessary)
G	Gap	Research Activity	Shortfall	Current / Past Research	Research Reference Document	How Research Being Used	Outreach	Participant / Sponsor	Stakeholder(s)	Required Research
	Lack of objective turbulence information in the cockpit	Operator input NTSB Safetu	NAS Inefficiency	NCAR Tactical Turbulence and Tech Transfer	NCAR WTIC Tactical Turbulence HOTL1-2 Summary Report (November 15, 2015)	Publically available EDR viewer application being used by industry	Web-application	•AVS •AFS	•AVS •AFS	Transition of Tactical Turbulence Tech Transfer package
		Recommendation •VTIC Mid-Term ConOps	Operational Inefficiency	MIT Adverse Weather-Alerting EDR Uplink Demonstration and	Massachusetts Institute of Technology Lincoln Laboratory, Cockpit Vx Notification HITL Study Final Report (March 22, 2016)	Publically available EDR algorithm Tools Transfer pools ago	Turbulence workshops /	Delta Airlines NCAB	 Airlines BTCA 	•GTGN ingest of ADS-B turbulence output
		Development •RTCA SC-206	Part 121 Safety Hazard / Risk	Tech Transfer EDR Quantification of Benefits	FAA/Delta Eddy Dissipation Rate (EDR) & Graphical Turbulence Guidance Viewer Uplink Demonstration and Evaluation, Final Report (September 2014)	Boeing selling EDR as option in ACMS package	Trade / FAA magazine articles	-WJHTC/NIEC -Industry	Boeing Comm Providers	
					EDR Uplink Quantitative Benefits Analysis: Final Report (December 9, 2014)	•RTCA Standard DO-370 published		- Government	-NCAR	
1				evelopment) ADS-B Turbulence (Shark Tank)	CONCEPT OF OPERATIONS for the Weather Technology in the Cockpit (WTIC) Program (April 15, 2014)					
					WTIC Oceanic Shortfall Analsyses Final Report (January 2017) Shortfall Analysis of Weather Information in Oceanic Airspace, SE2020 - Task Order 0047 (September 30, 2015)	-				
					DO-370: Guidelines for In Situ Eddy Dissipation Rate (EDR) Algorithm Performance (December 2017) ADS-B Turbulence Trade Study Final Report (Phase I)	-				



WTIC Response - Gap Tracking -Example 1-

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-	Gap	Research Activity	Shortfall	Current / Past Research	Research Reference Document	
	Lack of objective turbulence	Operator input NTSB Safety Recommendation	NAS Inefficiency	NCAR Tactical Turbulence and Tech Transfer	NCAR WTIC Tactical Turbulence HOTL1-2 Summary Report (November 15, 2015)	
1		•WTIC Mid-Term ConOps Development	Operational Inefficiency	MIT Adverse Weather-Alerting EDR Uplink Demonstration and Tech	Massachusetts Institute of Technology Lincoln Laboratory, Cockpit Wx Notification HITL Study Final Report (March 22, 2016)	
		●RTCA SC-206	Part 121 Safety Hazard / Risk	Transfer •EDR Quantification of Benefits •WTIC Mid-Term ConOps •Oceanic Shortfall	FAA/Delta Eddy Dissipation Rate (EDR) & Graphical Turbulence Guidance Viewer Uplink Demonstration and Evaluation, Final Report (September 2014)	
					EDR Uplink Quantitative Benefits Analysis: Final Report (December 9, 2014)	
				ADS-B Turbulence (Shark Tank)	CONCEPT OF OPERATIONS for the Weather Technology in the Cockpit (WTIC) Program (April 15, 2014)	
					WTIC Oceanic Shortfall Analsyses Final Report (January 2017) Shortfall Analysis of Weather Information in Oceanic Airspace, SE2020 - Task Order 0047 (September 30, 2015) DO-370: Guidelines for In Situ Eddy Dissipation Rate (EDR) Algorithm Performance (December 2017) ADS-B Turbulence Trade Study Final Report (Phase I)	



WTIC Response - Gap Tracking -Example 1-

Identified Gap: Lack of objective turbulence information in the cockpit

Gap #	Application / Outread	n	Input Sponsor / O	Future Research (if necessary)	
-	How Research Being Used	Outreach	Participant / Sponsor	Stakeholder(s)	Required Research
1	 Publically available EDR viewer application being used by industry Publically available EDR algorithm Tech Transfer package Boeing selling EDR as option in ACMS package RTCA Standard DO-370 published 	Web-application Turbulence workshops / Trade / FAA magazine articles	• AVS • AFS • Delta Airlines • NCAR • WJHTC / NIEC • Industry • Government	 AVS AFS Airlines RTCA Boeing Comm Providers NCAR 	 Transition of Tactical Turbulence Tech Transfer package GTGN ingest of ADS-B turbulence output



WTIC Response - Gap Tracking -Example 2-

Identified Gap: Pilot applicants taking written knowledge certification examinations can fail all weather questions but still pass the examinations

a de	Gap Identification			Gap Resolution	Application / Outreach		Input Sponsor / Output Beneficiary		Future Research (if necessary)	
9	Gap	Research Activity	Shortfall	Current / Past Research	Research Reference Document	How Research Being Used	Outreach	Participant / Sponsor	Stakeholder(s)	Required Research
Pilot a	applicants taking written	PEGASAS Phase I	Gå Safatu Hazard / Rick	PEGASAS A-D, Phase I	PEGASAS Project A , Quantifying Causality, Phase I Final Report Volumes 1	 Educate pilots on application features 	FAA FAAST site	 VJHTC 	 AFS-600 	 Effectiveness of self-briefing
knowl	vledge certification	ERAU - Pilot Training	GA Safetgi lazardi hisk	ERAU Pilot Training	& 2 (January 2015)	 Pilot weather knowledge questions 		 AFS 	 Academia 	versus Flight Service weather brief
exami	ninations can fail all	Regirements		ERAU Test Question	PEGASAS Project B, Unexpected Transition from VFR to IMC, Phase I	provided to AFS-600 for incorporation into	Aviation Publications	•ERAU	FAASTeam Website	
weath	her questions but still pass			development	Final Report (December 22, 2014)	bank of pilot exam questions		•PEGASAS	•NAFI	
the ex	warninations. (4.1.3.8) (9)			ERAU NEXRAD Course	PEGASAS Project C, GA Weather Alerting, Phase I Final Report (March 31,	 Training posted to FAASTeam website 	Academia website	•AOPA	AOPA	
				 PEGASAS Experiential Education 	2015)	 Training posted to NAFI website 			 Web Manuals 	
0.5				Module Development	PEGASAS Project D, GA MET Information Optimization Phase I Final	 NAFI mentor live sessions / podcasts 	Fly-Ins		 Textbooks/Aviation Book 	
20				 PEGASAS Augmented Reality 	Report (December 31, 2014)	 WeatherXplore application (augmented 				
				 ERAU YouTube Videos 		reality)	Mentor Live			
					ERAU 100 Test Questions delivered to AFS-630 - FINAL REPORT	Latency training modules (Academia and				
					https://www.faasafety.gov/gslac/ALC/course_content.aspx?pf=1&preview=tr	FAAST stej				
					ue&clD=434					
					https://www.wmich.edu/offcampus/faa-demo/latency/story.html					
					https://wmich.edu/offcampus/visibility-estimation/story_html5.html					



WTIC Response - Gap Tracking -Example 2-

Identified Gap: Pilot applicants taking written knowledge certification examinations can fail all weather questions but still pass the examinations

Gap #		Gap Identification		Gap Resolution		
-	Gap	Research Activity	Shortfall	Current / Past Research	Research Reference Document	
	Pilot applicants taking written knowledge certification examinations	PEGASAS Phase I ERAU - Pilot Training Regirements	GA Safety Hazard / Risk	PEGASAS A-D, Phase I ERAU Pilot Training	PEGASAS Project A , Quantifying Causality, Phase I Final Report Volumes 1 & 2 (January 2015)	
	can fail all weather questions but still pass the examinations. (4.1.3.8) (9)			ERAU Test Question development ERAU NEXRAD Course	PEGASAS Project B, Unexpected Transition from VFR to IMC, Phase I Final Report (December 22, 2014)	
				PEGASAS Experiential Education Module Development	PEGASAS Project C, GA Weather Alerting, Phase I Final Report (March 31, 2015)	
25				 PEGASAS Augmented Reality ERAU YouTube Videos 	PEGASAS Project D, GA MET Information Optimization Phase I Final Report (December 31, 2014)	
					ERAU 100 Test Questions delivered to AFS-630 - FINAL REPORT	
					https://www.faasafety.gov/gslac/ALC/course_content.aspx?pf=1&preview=true&cID=43 4	
					https://www.wmich.edu/offcampus/faa-demo/latency/story.html https://wmich.edu/offcampus/visibility-estimation/story_html5.html	



WTIC Response - Gap Tracking -Example 2-

Identified Gap: Pilot applicants taking written knowledge certification examinations can fail all weather questions but still pass the examinations

# deg	Application / Outreac	h	Input Sponsor / C	Future Research (if necessary)	
	How Research Being Used	Outreach	Participant / Sponsor	Stakeholder(s)	Required Research
25	•Educate pilots on application features •Pilot weather knowledge questions provided to AFS- 600 for incorporation into bank of pilot exam questions •Training posted to FAASTeam website •Training posted to NAFI website •NAFI mentor live sessions / podcasts •WeatherXplore application (augmented reality) •Latency training modules (Academia and FAAST site)	FAA FAAST site Aviation Publications Academia website Fly-Ins Mentor Live	•WJHTC •AFS •ERAU •PEGASAS •AOPA	•AFS-600 •Academia •FAASTeam Website •NAFI •AOPA •Web Manuals •Textbooks/Aviation Book	• Effectiveness of self-briefing versus Flight Service weather brief





WTIC Response – Plan Snipets

PLA Snipet

05.00.00 Self-Briefing Knowledge Assessment

This milestone is a follow on from FY17 MS09. The assessment will evaluate whether pilots achieve the same level of weather knowledge by self-briefing as from a Flight Service Specialist, and if not, identify the gaps.

05.01.00 Final Report on Self-Briefing Assessment

This deliverable is a final report that will detail the assessment procedures used and the results of the assessment. Details in the final report will include the self-briefing system(s) and voice briefing methods that were used to replicate real pre-flight briefings. The report will also detail the scenarios chosen for assessment and the methods/questions used to evaluate pilot understanding from the two briefing methods. The final report will also contain the assessment results, results analyses, and recommendations based on the findings.

Contractor Project Plan Snipet

- Research Questions/Technical Approach
 - The following is a non-exhaustive list of technical issues that need to be addressed in this effort
 - 1. Characterization of the ADS-B IVV parameter. IVV is a calculated, as opposed to measured, parameter. It is derived typically from a combination of inertial vertical



WTIC Response – Outreach/Transition Tracking



Participate in Cockpit Weather Display Training at AirVenture



 The FAA has begun research to help answer that question and measure the present effectiveness of "VFR not recommended." The agency's <u>Weather Technology in the Cockpit</u> (WTIC) program has made this research a priority as the FAA prepares to award its Future Flight Service Program contract in 2018. AOPA believes that making a decision about the usefulness of "VFR not recommended" should be a top-priority task for the FAA's flight service.

Avionics and Air Traffic Seminars and Events

There are several avionics-focused trainings, events and panel discussions occurring next at AirVenture this year. Here are some of that you may find interesting.

Cockpit Weather Display Training

An ongoing feature at AirVenture will be "The Partnership for the Enhancement of GA Safety, Accessibility, and Sustainability (PEGASAS) Weather Information Latency Demonstrator (WILD)" located in the Pilot Proficiency Center. The project is one of 20 under the PEGASAS umbrella and aims to address the number of weather-related accidents in general aviation, 80% of which are fatal, according to EAA.

Pilots will be able to fly the WILD simulator, which provides a demonstration of how information on some of the most common cockpit weather displays are delayed in comparison to actual airspace conditions. The FAA is looking to use the findings of the PEGASAS "Weather Technology in the Cockpit (WTIC) project" to define minimum weather service standards and developing educational and technological solutions that will help improve safety for general aviation pilots



WTIC Program / BLI Number: A12.c - Overview Capabilities -Stakeholders

Government

- FAA
 - Flight Standards Service
 - o Test questions AFS-630
 - o NEXRAD Online Course AFS-850
 - o ASRS report AFS-430
 - Aircraft Certification
 - Small Aircraft Directorate
 - Office of Aviation Safety
 - Human Factors Research & Engineering
 - William J. Hughes Technical Center(WJHTC)
 - Civil Aerospace Medical Institute (CAMI)
 - Future Flight Services
- NASA Ames
- NTSB
- NCAR

Airlines

- Delta
- United
- American

Publishers

Routledge

Academia

- Embry-Riddle Aeronautical University
- Florida Institute of Technology
- Georgia Institute of Technology
- Iowa State University
- Purdue University
- Texas A&M University
- The Ohio State University
- University of Oklahoma
- Western Michigan University
- Virginia Tech

Professional Societies

- AOPA
- GAMA
- RTCA
- ALPA
- Others (via GAJSC)
- NAFI

Industry

- Lockheed Martin (via PEGASAS)
- Frasca (via PEGASAS)
- Mindstar Aviation (via PEGASAS)
- Fly8Ma (vis PEGASAS)
- WebManuals (via PEGASAS)
- Aspen Avionics (via PEGASAS)



Remote Oceanic Meteorological Information Operational (ROMIO):

- Received final report documenting the research, analysis, and findings of the WTIC Electronic Flight Bag Meteorological Software Applications Project including architecture details to enable transition to operational status.
- Received Volume 2 of the benefits analysis report detailing additional interim results based on 18,236 flights crossing the Inter-Tropical Convergence Zone from May 2018 to August 2019. Report highlights included:
 - ROMIO provides10 minutes of additional time to plan weather deviations when compared to using weather radar
 - Results show the annual fuel consumption saving for the analyzed flights is approximately 6.8 million pounds

WTIC Program



Functionality and appearance of ROMIO application



ADS-B Turbulence Study (Shark Tank Project):

- Received final report and final briefing on trade study (Phase 1)
 - Extremely positive results in obtaining turbulence observations that are more accurate than PIREPs and closer to in situ Eddy Dissipation Rate (EDR)
 - Presented results at American Meteorological Society Annual Meeting
 - Potential for over 100,000 aircraft reporting turbulence observations compared to 1400 a/c reporting in situ EDR and 1200 turbulence PIREPs/day
 - Aircraft side of implementation is free
- Began efforts to award Phase 2
 - Refine algorithms
 - Improve capability to filter out aircraft maneuvers
 - Use larger data set
 - Assess potential for enhancing GTG-Nowcast

Nulling NEXRAD Latency:

- Assessment plan and associated software completed
- CAMI began preparations for demonstration and analyses. Nulling technique and demonstration software provided to CAMI

WTIC Program



Developed signal processing methods to address:

- Sampling rate (1/2-1 sec) and quantization (64 ft/min) of vertical rate
- Maneuver contamination in vertical rate
- Developed scaling algorithm to give EDR from vertical rate.
- Verification/Development using:
 - Wind/vehicle simulation (737-800)
 - High-rate, in-service aircraft data (737-800)
 - Real-world ADS-B reports

Potential to Reduce Precipitous Terrain Restrictions

- Completed kickoff meeting on research to reduce Precipitous Terrain restrictions for instrument approaches
- Accepted research plan. Objective is to determine if current restrictions can be relaxed if weather conditions are incorporated into "precipitous terrain algorithms," currently restrictions are static
 - Primary focus of research is to evaluate the meteorological conditions leading to adverse "Precipitous Terrain effects" at one or more selected "hot spot" airports

Aviation Safety Reporting System (ASRS)

 Received final report from NASA on detailed call backs to pilots on ASRS reports related to weather. Report provides some insight into gaps, but the long duration of the study limits usefulness of the final report

ADS-B auto AIREPS and semi-auto PIREPS

 Initiated study of the capability to use ADS-B to downlink automated AIREPs and semi-automated PIREPs to support the development of an RTCA standard



Automating Visual Flight Rules (VFR) Not Recommended (VNR)

- Continued research to develop criteria to automate VNR issuance for Future Flight Services to support their efforts to automate more services including VNR
- Developed and coded weather scenarios to identify thresholds by weather products/information that are clearly VNR or VFR. For initial recommendations, "marginal conditions" will include recommendation to call Flight Services
- Significant work completed to identify objective criteria that can be clearly conveyed to pilots to enable adjustments for personal minimas and aircraft types
- Example: What are recommended parameters for a VNR decision when dealing with METARS alone?





General Aviation Projects Summary

- Augmented Reality:
 - Continued development of mini-course videos using augmented reality with partnership with FLY8MA ground schools
 - "Engaging the Next Generation of Aviation Professionals" published and includes chapter on WTIC augmented reality as a teaching tool
 - Partnered with Aspen Aviation to use augmented reality with a selected instruction booklet to explain uses and limitations of weather information provided by the selected system
- Helicopter Gap Analysis Project:
 - Interview question set developed and began distribution/solicitation
 - Pilot of N72EX was setup to be one of the PEGASAS interviews. Due to Kobe accident and ongoing NTSB investigation, looking for alternative tour/taxi company
- Updating tasks for L3Harris on crowd sourcing wind information using wind socks
 and cameras based on preliminary NTSB findings on older accident



Anticipated Research in FY21

Planned Research Activities and Expected Research Products

- Assessment of utility of pilot self-briefing versus Flight Service Station (FSS) weather briefing
 - Comparison of performance of GA pilots conducting self-briefing versus pilots using FSS for pre-flight weather briefings for flight in CONUS
 - Weather scenarios and performance measures adaptable for subsequent studies
 - Recommendations for self briefing system designs, instructions for self-briefings, and pilot training for using self-briefings
- Phase 3 for ADS-B Turbulence (Shark Tank) project
 - Assessment using live ADS-B feed and algorithms from Phase 2/3
- Automating VNR issuance follow-on
 - Additional recommendations for thresholds for VNR/VFR



Anticipated Research in FY21

Planned Research Activities and Expected Research Products

- Follow-on helicopter project to finish gap analyses and begin on gap resolutions
 - Final report detailing cockpit weather-related gaps
 - Develop plan to resolve selected gaps
- Follow-on augmented reality to incorporate 3-D imagery and update WeatherXplore app
 - Augmented reality training aides that incorporate 3-D imagery
 - Updated version of WeatherXplore application based on Beta testing with Aspen Aviation instruction manual
- Develop transition plans for Tactical Turbulence and ROMIO
 - Transition plans to incorporate the Tactical Turbulence notification and ROMIO into operations based on the completed technical transfer packages



Anticipated Research in FY21

Planned Research Activities and Expected Research Products

- Crowd Sourcing
 - Develop tech transfer package and transition plan for crowd sourced visibility
 - Develop MinWxSvc recommendations to produce wind information using crowd sourcing with cameras and wind socks
 - Demonstration of capability to produce ceiling information using crowd sourcing
 - Develop approach and demonstration plan for crowd sourcing cockpit weather information
- ADS-B Automated AIREPs and semi-automated PIREPs follow-on
 - Follow on research and final report providing recommendations to RTCA on using ADS-B to downlink AIREPs/PIREPs for inclusion in updated ADS-B standard





Emerging FY22 Focal Areas

- Develop Minimum Weather Service (MinWxSvc) recommendations and associated implementation options to enable safer adverse weather avoidance decisions for aircraft operating in regions without approved weather observation systems
- Develop MinWxSvc recommendations and associated implementation options to enable optimized adverse weather avoidance decisions that result in minimized gaseous emissions and maximized safety and passenger comfort
- Develop MinWxSvc training and pilot Wx test questions for pilots of new entrant aircraft





WTIC Part 121/135 MinWxSvc

Research Requirement

Develop Part 121/135 MinWxSvc recommendations for cockpit weather information and technology.
Sponsored by ANG-C6, ALPA, AFS, industry, airlines, NextGen
POC: Gary Pokodner, ANG-C61, 202-267-2786
Products:
ADS-B Turbulence technical transfer package and transition plan
MinWxSvc recommendations to resolve selected gaps from FY20/21 Industry Perspective study

FY 2022 Planned Research

- Develop transition path for ADS-B Turbulence (Shark Tank)
- Develop resolutions to gaps identified in Industry Perspective research and produce MinWxSvc recommendations for Phase 1 resolutions

Out Year Funding Requirements

FY20	FY21	FY22	
\$0.8 M	\$0.8 M	\$0.3 M	

WTIC Program



Outputs/Outcomes

WTIC Part 91 MinWxSvc

Research Requirement

- Develop Part 91 MinWxSvc recommendations for cockpit weather information and technology.
- Sponsored by ANG-C6, AOPA, AFS, industry, NAFI, Alaska and other remote areas
- POC: Gary Pokodner, ANG-C61, 202-267-2786

Outputs/Outcomes

Products:

- Final set of MinWxSvc recommendations for VNR automation
- MinWxSvc recommendations to resolve selected cockpit weather related gaps for helicopters
- Final MinWxSvc recommendations to enhance
 PIREP submittals from GA
- Preliminary options to resolve issues/gaps with online and application self-briefing systems

FY 2022 Planned Research

- Develop threshold recommendations for VNR automation for more complex and marginal weather conditions
- Develop resolutions to selected cockpit weather gaps identified for helicopter operations
- Develop MinWxSvc recommendations to enhance PIREP accuracy and quantity using voice recognition, auto-population, and prepopulation
- Research architecture improvements to resolve gaps self-briefing apps and online to enhance pilot weather situational awareness

Out Year Funding Requirements

FY20	FY21	FY22		
\$0.8 M	\$0.8 M	\$0.3 M		

