FAA Pilot Report (PIREP) System Modernization – FY23 Update

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FY23 Highlights

- Published 3rd version of the FAA PIREP Modernization Strategic Plan (PMSP)
- Engaged with key FAA stakeholder offices
- Refined algorithms developed to generate PIREP Airspace of Interest polygons for PIREP Smart Solicitation
- Improved speech processing algorithms to analyze air traffic controller – pilot radio comms and create Synthetic PIREPs

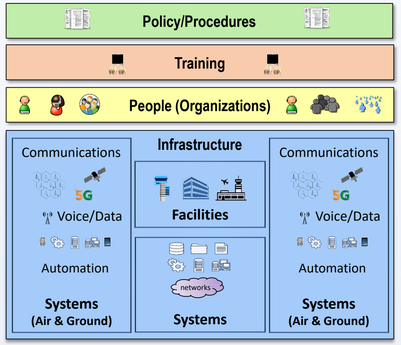
Key References

National Transportation Safety Board (NTSB), "Improving Pilot Weather Report Submission and Dissemination to Benefit Safety in the National Airspace System (NTSB/SIR-17/02 PB2017-101424)," NTSB, Washington, DC 2017.

Federal Aviation Administration Pilot Report (PIREP) Modernization Strategic Plan, Office of Aviation Weather & Aeronautical Services (AJM-33), v 0.3 Sept 29, 2023

R. Avjian, et al, "Pilot Report (PIREP) Modernization Stakeholder Engagement and Tech Demo Results" (MP230666), Sept 2023, The MITRE Corporation, McLean, VA, 2020

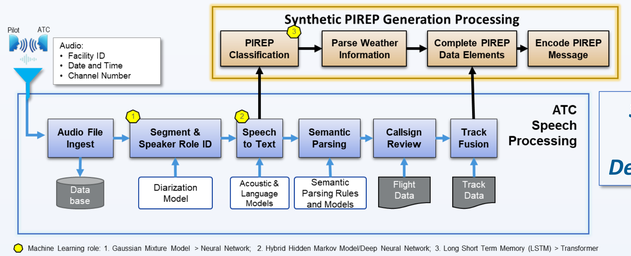
PIREP Ecosystem



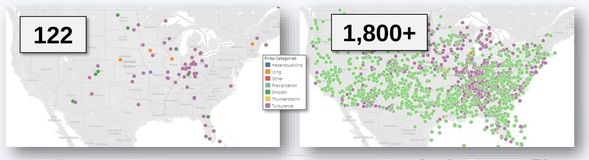
PIREP Modernization Driving Principles

Policy/Procedures	Human, Manual →	Automated, Smart Solicitation
Training	FAA-developed →	FAA & Industry-developed
Organizations	Multiple, uncoordinated →	Consolidated, centrally managed
Infrastructure	FAA-centric →	Govt-industry Collaboration
	Unbalanced Comms →	Ubiquitous Comms (e.g., 5G, satcom)
	Multiple PIREP Repositories →	Cloud-based repository
	Selective, unique access →	Universal access
Research & Development	Multiple, uncoordinated FAA-funded →	Collaborative, Coordinated Govt/Industry funded

MITRE PIREP-Related Research and Development



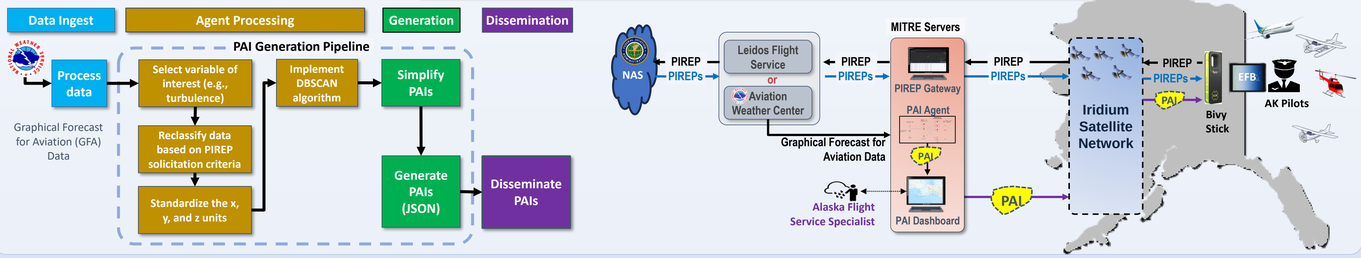
Synthetic PIREPs™ Development



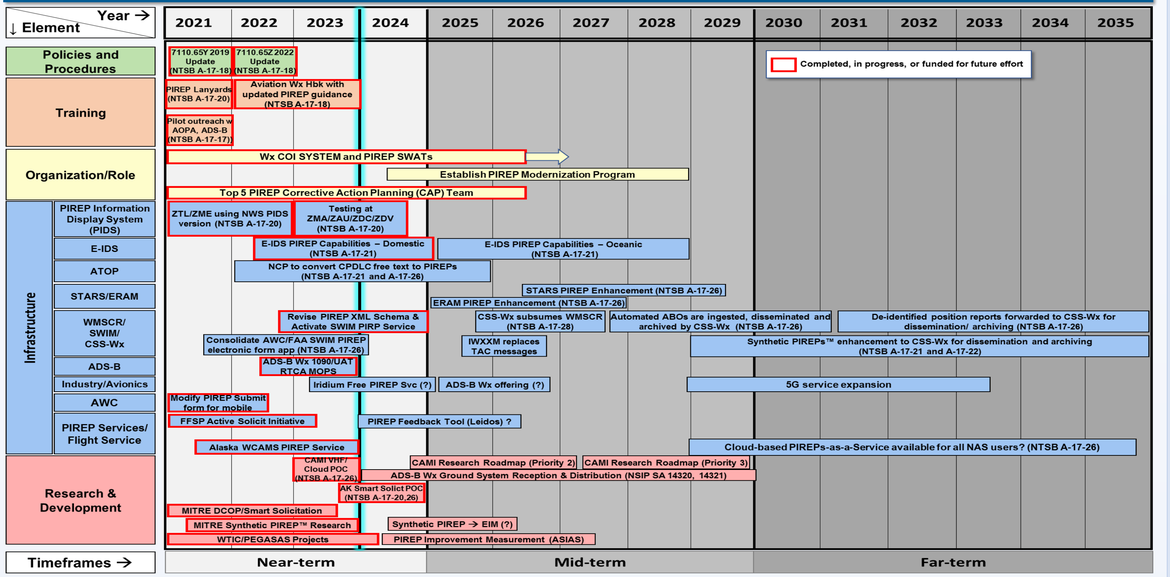
Synthetic PIREPs™ **generated from Controller-Pilot Voice Communications, can produce an Order of Magnitude more PIREPs than current system and can be realized without controllers or pilots doing anything different from today**

See Paper 7.1. Airspace of Interest Generation for Pilot Report Smart Solicitation
Tuesday, 1/30/24, 1:45 pm, Room 317

PIREP Smart Solicitation and Submission – Alaska Demonstration



PIREP Modernization Roadmap



Goal	Goal Description	Strategic Plan Objective	Activities	NTSB SIR Recds	NAS EA/RESPONSIBLE ORG	Timeframe	Element
1	Encourage pilots to submit more PIREPs (at all times of the day) - increasing the **number** of PIREPs by 60% (for all times of the day)	O.1.1 Establish FAA PIREP program	A.1 Develop FAA-wide PIREP Modernization Strategic Plan and Roadmap	Multiple	AJM-333; OCS Base Funding	NEAR	Organization
			A.2 Establish a PIREP Modernization Program, most likely in AJM-33, to manage, coordinate and execute the strategies, implementation and research activities contained in the PMSP.	Multiple	Not funded	NEAR	Organization
			A.3 Update the EA Weather Infrastructure Roadmap to include all PIREP modernization activities, funded and non-funded, under a "PIREP Modernization" timeline.	Multiple	ANG-B	NEAR	Organization
		O.1.2 Expand the number and type of airborne platforms than can submit PIREPs	A.4 Complete ABO deployment consistent with AJM-33 Strategic Plan for an agency-wide AirObs approach covering all air vehicles (e.g., UAS, HALE, etc.). See AJM-33 Evolution Plan, Weather Strategy #3, "Evolution of Airborne-based Observations "	A-17-26	AJM-33 Evolution Plan, Weather Strategy #3	FAR	Policies & Procedures
		O.1.3 Participate with industry to produce course materials educating pilots on the importance of PIREPs.	A.5 Collaborate with AOPA to encourage pilots to file more PIREPs. Reported as completed Jan2021 by AJI-15 in PIREP Top 5 CAP. See https://www.aopa.org/news-and-media/all-news/2022/february/pilot/aopa-action-february-2022	A-17-17	AJI-15 (per Top 5 CAP reports from 2021 and 2022)	COMPLETED	Training
			A.6 Collaborate on a continuous basis with pilot groups & organizations (e.g., ALPA, AOPA, EAA, etc.) to encourage pilots to file more PIREPs.	A-17-17	AJI-15	ONGOING	
		O.1.4 Improve Air Traffic Controller awareness of PIREP solicitation requirements	A.7 Install PIREP Information Display (PID) equipment and begin testing at designated facilities (ZMA, ZAU, ZDV, ZHU and ZDC). ZTL and ZME currently using NWS version of PID.	A-17-20	AIT-22/AJI-151 (not a NAS program)	NEAR	Infrastructure
			A.8 E-IDS PIREP Solicitation Indicator, processes METARs for conditions meeting FAA 7110.65 PIREP solicitation criteria	A-17-20	AJM-223 (Active)	NEAR	Infrastructure
2	Increase the **accuracy** of submitted PIREPs (by pilots, FSS or ATC) by TBD%	O.2.1 Implement ADS-B Wx ground processing Infrastructure to process PIREPs submitted via ADS-B Wx	A.9 Consider upgrading ADS-B ground system to receive, process and disseminate ADS-B Wx messages	A-17-26	NSIP SA #14320, 14321	MID	Infrastructure
		O.2.2 Enhance automation to improve the **accuracy** of PIREPs entered by either by air traffic controllers or Flight Service Specialists by TBD%	A.10 Implement capability for E-IDS to automatically populate the PIREP five mandatory fields (type, time, aircraft type, position and altitude) in the PIREP entry form	A-17-22	Wx COI System SWAT PS-41b	MID	Infrastructure
			A.11 Integrate PIREPs (i.e., UUA) into ATC ground automation tactical situation displays for on-demand display (enroute, terminal, oceanic)	A-17-20	Wx COI System SWAT PS-41a	MID	Infrastructure
			A.17 Implement PIREP Smart Solicitation capability (FAA)	A-17-20, 26	NSIP SA #1282 OC 5 FY24 Base (AJM-33)	NEAR	R&D
		O.2.3 Ensure the format and order guidance when collecting PIREPs is consistent	A.12 Wx COI PIREP SWAT PS-40 is assessing a proposal to include Braking Action reports as a new field in the PIREP message and is consistent with the recent guidance update in JO 7110.65 and JO 7110.10 recently updated by AJV-P3 (reported by AJV-P3 as completed August 2022 in PIREP Top 5 CAP)	A-17-23, 25	Wx COI PIREP SWAT	ONGOING	Policies & Procedures
3	Decrease the **time to submit (enter)** PIREPs (by pilot, FSS or ATC)	O.3.1 Decrease time to **submit** a PIREP by ATC and pilots including the use of intelligent automation (AI/ML) by 50% (TBD)	A.13 Fund research to develop Synthetic PIREP generation using AI/ML-based speech processing technology	A-17-26	NSIP SA #1200 (AJM-33)	NEAR	R&D
			A.14 Deploy synthetic PIREP technology to Mission Essential Operating Environment (ME-OE) when available	A-17-26	AJM-333	MID	Infrastructure
			A.15 Investigate use of 122.0 MHz for PIREP submissions (re: CAMI One Frequency proof-of-concept)	A-17-26	AAM-500, CAMI (not in NSIP)	NEAR	R&D
			A.16 E-IDS PIREP Entry Form to ease the entry of PIREP information for the air traffic controller	A-17-22	AJM-223 (Active)	NEAR	Infrastructure
			A.17 Implement PIREP Smart Solicitation capability (FAA)	A-17-20, 26	NSIP SA #1282 OC 5 FY24 Base (AJM-33)	NEAR	R&D
			A.10 Implement capability for E-IDS to automatically populate the PIREP five mandatory fields (type, time, aircraft type, position and altitude) in the PIREP entry form	A-17-22	Wx COI System SWAT PS-41b	MID	Infrastructure
			A.11 Integrate PIREPs (i.e., UUA) into ATC ground automation tactical situation displays for on-demand display (enroute, terminal, oceanic)	A-17-20, 26	Wx COI System SWAT PS-41a	MID	Infrastructure
		O.3.2 Integrate PIREP software in airborne systems to **reduce** pilot-ATC comms by 60% (TBD)	A.17 Implement PIREP Smart Solicitation capability (FAA)	A-17-20, 26	NSIP SA #1282 OC 5 FY24 Base (AJM-33)	NEAR	R&D
		O.3.3 Introduce airborne technology to reduce reliance on pilot-ATC communication	A.18 Fund research in PIREP Interface and Hands-Minimized (WTIC, PEGASAS)	A-17--26	SA-1281 (ANG-C61)	COMPLETED	R&D
			A.17 Implement PIREP Smart Solicitation Capability (Industry)	A-17-20, 26	Exists Now	NEAR	Infrastructure
4	Increase the **speed** of PIREP Dissemination	O.4.1 Improve the process for PIREP dissemination and automate where possible	A.19 Ensure complete and accurate PIREP process model	A-17-16	Included in PMSP Version 0.1 (2019) OC5 Base 2019 (AJM-33)	COMPLETED	R&D
			A.20 Define a standard XML schema for PIREPs and re-establish "Submit PIREP SWIM Service"	A-17-22	WMSCR-SWIM Technical Change (AJM-33)	NEAR	Infrastructure
		O.4.2 Enhance ground automation to **reduce** the amount of manual entry of PIREPs by air traffic controllers by TBD%	A.10 Implement capability for E-IDS to automatically populate the PIREP five mandatory fields (type, time, aircraft type, position and altitude) in the PIREP entry form	A-17-22	System SWAT PS-41b	MID	Infrastructure
			A.11 Integrate PIREPs (i.e., UUA) into ATC ground automation tactical situation displays for on-demand display (enroute, terminal, oceanic)	A-17-20, 26	Wx COI System SWAT PS-41a	MID	Infrastructure
			A.21 Determine latencies between systems to identify opportunities for improved data transfer times	not addressed	Not Funded	MID	R&D
			A.22 Develop model and simulation of dissemination process to assist data collection for latency testing and improvement (follows 5.2.1)	not addressed	Not Funded	MID	
5	Establish PIREP **archive** for minimum of one year	O.5.1 Develop online capability with secure storage of PIREP data	A.23 Ensure identity assurance and accessibility	not addressed	Wx Enhancement 1	MID	R&D
			A.24 Deploy secure cloud-based storage service within the Mission Support Operating Environment (MS-OE)	A-17-28	Wx Enhancement 1	MID	Infrastructure

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