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Pilot Reports (PIREPs) End-User (Pilots and Controllers) Focus Groups

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16. Abstract The objective of the focus groups was to improve stakeholder understanding of the deficiencies in the PIREP submission and dissemination process and to develop a research road map that will inform end-to-end solutions targeted at increasing the number of PIREPs, quality of PIREPs, distribution and accessibility of PIREPs. The focus groups were in support of the ATO's Top 5 Corrective Action Plan for PIREP Solicitation and Dissemination Strategy 5 that is managed through the Safety & Technical Training/Safety Performance Monitoring Team (AJI-313). These tasks were completed in light of the PIREP's system modernization plans managed through the Aviation Weather & Aero Services Programs Group/Aviation Weather Dissemination (AJM-33).					
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Table of Contents

Table of Contents	iv
List of Acronyms	v
Introduction.....	1
Background.....	2
Method	3
Participants.....	3
Procedure	4
Results.....	5
Group 1 Questions	6
Group 2 Questions	9
Group 3 Questions	11
Group 4 Questions	15
Group 5 Questions	17
Group 6 Questions	24
Group 7 Questions	30
Conclusion	36
References.....	38
Appendix A.....	A-1
Appendix B.....	B-1
Appendix C.....	C-1
Appendix D.....	D-1
Appendix E.....	E-1
Appendix F.....	F-1
Appendix G.....	G-1
Appendix H.....	H-1

List of Acronyms

Acronym	Definition
ACARS	Aircraft Communications Addressing and Reporting System
ADS-B	Automatic Dependent Surveillance-Broadcast
AFB	Air Force Base
AGL	Above Ground Level
AIREP	Aircraft Report
AIRMET	Airmen's Meteorological Information
AOPA	Aircraft Owners and Pilots Association
ARINC	Aeronautical Radio, Inc.
ASOS	Automated Surface Observing Systems
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
ATO	Air Traffic Organization
AVS	Aviation Safety
AWOS	Automated Weather Observing Systems
CAMI	Civil Aero Medical Institute
CAVU	Ceiling and Visibility Unlimited
CFI	Certified Flight Instructor
CFII	Certified Flight Instrument Instructor
CPDLC	Controller Pilot Data Link Communications
DME	Distance Measuring Equipment
EFB	Electronic Flight Bag
FAA	Federal Aviation Administration
FBO	Fixed-base Operator
FO	First Officer
GA	General Aviation
GPS	Global Positioning System
IFR	Instrument Flight Rules
METAR	Meteorological Aerodrome Report
NAT	North Atlantic Track
NATCA	National Air Traffic Controllers Association
NDB	Non-Directional Beacon
NOAA	National Oceanic and Atmospheric Administration
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board
OASIS	Operational and Supportability Implementation System ...
PIREP	Pilot Report
PPL	Private Pilot License
R&D	Research and Development
RWY	Runway
SIGMET	Significant Meteorological Information
TAPS	Turbulence Auto PIREP System

TIS-B	Traffic Information Services – Broadcast
TRACON	Terminal Radar Approach Control
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR	Very High Frequency Omni-Directional Range
WINGS	Pilot Proficiency Award Program
WSI	Weather Services International

Introduction

In June of 2020, the FAA Aviation Safety (AVS) Aerospace Human Factors Research Division at the Civil Aero Medical Institute (CAMI), the Air Traffic Organization (ATO), and the MITRE Corporation hosted a PIREPs Summit that provided an opportunity for PIREPs users and stakeholders to share information about how PIREPs solicitation, submission, and dissemination processes could be improved to support user needs. Prior to the summit, the AVS Aerospace Human Factors Research Division conducted a series of focus groups.

The focus groups and summit were in support of the ATO's Top 5 Corrective Action Plan for PIREP Solicitation and Dissemination Strategy 5 that is managed through the Safety & Technical Training/Safety Performance Monitoring Team (AJI-313). These tasks were completed in light of the PIREP's system modernization plans managed through the Aviation Weather & Aero Services Programs Group/Aviation Weather Dissemination (AJM-33).

The objective of both the focus groups and summit was to improve stakeholder understanding of the deficiencies in the PIREP submission and dissemination process and to develop a research road map that will inform end-to-end solutions targeted at increasing the number of PIREPs, quality of PIREPs, distribution and accessibility of PIREPs. By conducting focus groups with end user populations (pilots and air traffic controllers), valuable feedback was obtained addressing some of the following questions:

Why are pilots providing relatively few PIREPs? Where are the deficiencies in the submission process? Are the deficiencies due to the current format or medium? Are they due to current avionics limitations? Are they due to the current submission process? Are they due to the lack of a timely feedback process?

Why are air traffic controllers not consistently soliciting and/or correctly inputting PIREPs? Is it due to task saturation? Is it due to protocol/process/work flow? Is it due to the current format/submission form design?

Background

After a long investigation, the National Transportation Safety Board (NTSB) identified deficiencies in the handling of PIREP information that resulted in delays, errors, and data losses. Released in the spring of 2017, the NTSB's special investigation report included safety recommendations to the Federal Aviation Administration addressing two broad categories of issues that reduce the effectiveness of PIREPs: submission issues and dissemination issues. The report addressed submission deficiencies by stating that pilots are providing relatively few PIREPs, particularly during good or as-forecasted conditions, and air traffic controllers are not consistently soliciting PIREPs during weather conditions that mandate such services.

According to the NTSB report, the dissemination problems are associated with the ATC, Flight Service stations, or company personnel handling PIREPs introducing delays and errors, or even failure, to distribute the information. In addition, the board identified ongoing issues with procedural inefficiencies or noncompliance, low task prioritization of PIREPs processing, data-entry errors, and problems with data-entry interfaces including the lack of current automation functions for PIREPs within NextGen platforms. Proprietary practices where PIREPs are not shared in the NAS were identified as a serious issue as well.

The NTSB recommendations focused on pilot, flight instructor, Flight Service personnel, and air traffic controllers' training and education to help them better understand the essential role their efforts play in prevention of accidents. The board also underlined the role technology plays in increasing the efficiency of that training, as well as, PIREP solicitation, gathering, and dissemination. The board's recommended course content should include scenario-based training using real-world examples to illustrate the value of both fair-weather and adverse-weather PIREPs, explain how meteorologists use PIREPs to verify and revise aviation weather forecasts, models and advisory products to improve safety in the National Airspace System (NAS).

The NTSB's recommendations to the FAA included reviewing the process by which federal and contract flight service station specialists receive verbal pilot weather reports. This NTSB's recommendation was aimed at simplified and systematized procedures to reduce the amount of time the specialists take to gather the necessary information from pilots.

To begin addressing these deficiencies, the ATO enlisted the help of multiple lines of business within the FAA and user communities outside the FAA. The "FY20 Top 5: PIREP Solicitation/Dissemination CAP" consists of the following five strategies intended to address PIREP solicitation and dissemination issues:

- Strategy #1: Encourage pilots to file more PIREPs.
- Strategy #2: Improve automation capabilities with regard to PIREP solicitation, entry, and dissemination.
- Strategy #3: Improve knowledge of PIREP processes, tools, and system impacts through ATC training and education.
- Strategy #4: Align policy and procedures to provide consistent and sufficient guidance on PIREP solicitation and dissemination.
- **Strategy #5:** Improve understanding of the deficiencies in the PIREP submission and dissemination process.

FAA Aviation Safety's (AVS's) Aerospace Human Factors Research Division at CAMI partnered with the ATO to address **Strategy #5**. The feedback from six focus groups conducted in May of 2020 is presented in this document.

Method

Participants

Ten general aviation pilots, twenty-one air transport pilots, five regional aviation pilots, and twelve air traffic controllers/flight service specialists participated in six focus groups. There were eight participants in each group: six were pilots and two were controllers/flight service specialists. However, many of the controllers/flight service specialists were pilots, as well. The participants' background and expertise were very diverse, including military and civil aviation service, with tenures spanning from only a couple of years and a couple of hundred flight hours to 35+ years with thousands of flight hours. All air traffic controllers who participated had 30+ years of experience in the full spectrum of ATC positions.

Procedure

Due to the COVID-19 pandemic, the focus groups were conducted online, via GoToMeeting videoconferencing and each lasted approximately two hours. The participants were asked to sign in via an Internet connection using both audio and video. The discussions were moderated by the Principal Investigator for this project, and were structured around understanding the deficiencies in the PIREP submission and dissemination processes as identified in the NTSB special investigation report. An open and honest dialog about the issues associated with PIREPs and potential solutions to those issues as seen through the eyes of the end user populations – pilots and controllers – was encouraged.

At the beginning of each focus group session, participants introduced themselves and shared information about their expertise and career experience. **Appendix A** contains a transcription of participants' introductions. Although participants were attending an event traditionally conducted face-to-face, "going around the room" virtually led to an almost immediate sense of fellowship between participants that greatly facilitated the rest of the discussions.

The discussion was structured as follows:

- Each slide of the moderator's presentation contained thematically grouped questions directed to either the participating pilots, controllers, or both (Figure 1)
- The screen-sharing function of the GoToMeeting platform was used to present each slide for all participants to see on their devices (e.g., personal computers, tablets and smart phones).

The trouble with declining number of PIREPs

- **Why do you think the number of PIREPs has been on decline?**
- **Pilots respond:**
 - Where are the deficiencies in the submission process?
 - Are they due to current the format/medium?
 - Are they due to current avionics limitations?
 - Are they due to the current submission process?

Federal Aviation Administration 5

Figure 1. Example of a thematic group of questions.

If a participant wished to contribute to the discussion, they raised their hand to the camera. The moderator either gave them the virtual floor immediately or acknowledged the request and requested that they wait until it was their turn to speak. All sessions were recorded and the audio later transcribed. The audio transcriptions of the participants' answers can be found in **Appendices B to H**. Each appendix contains a transcription of all the participants' answers to one of the groups of questions in chronological order. All personally identifiable information was removed from the transcripts including participant names, employer names, affiliation, etc.

Results

The feedback from each thematic group of questions is summarized in the sections below. These summaries echo the answers to the specific questions as well as new issues raised during the discussion. To ensure that participants were given multiple opportunities to share their

views throughout each session, a certain amount of redundancy was built in the different question groups.

Group 1 Questions

Why do you think the number of PIREPs has been on decline?

Pilots were requested to respond to the following questions:

- *Where are the deficiencies in the submission process?*
- *Are they due to current the format/medium?*
- *Are they due to current avionics limitations?*
- *Are they due to the current submission process?*

The answers to **Group 1 Questions** confirmed the existing perception within the aviation community that deficiencies in the submission process, from the pilots' point of view, are a combination of outdated format, differences in avionics equipment capabilities between different types of operations (e.g., general aviation vs. air transport) and a cumbersome submission process. The majority of pilots view the PIREPs submission as a *very informal* voice exchange with an air traffic controller rather than a formal process of filing a report. In simple terms, pilots described the PIREP submission process as starting with a request coming from a controller or Flight Service specialist. In response, pilots convey what they see outside via an informal voice radio communication. Pilots repeatedly stated that they never follow any particular format per se. Furthermore, when pilots give reports to their company dispatch, they also do not use any particular format and simply give a brief ARINC Addressing and Reporting System (ACARS) message. For example, if the ceiling forecast in the pre-flight briefing paperwork was for 2,000 feet, and it is at 1400 feet, the pilots would convey that difference to dispatch.

The majority of pilots participating in the focus groups were unaware of any formal process of submission and most of them indicated that they had never filled out a “proper” or “official” PIREP, except possibly in flight school. They stressed the fact that most of the times when they are asked to give a report, they are busy looking at the instruments, flying an approach, arrival, etc. They see PIREPs as a lower priority task that is more of a process of

sharing with ATC/Flight Service of what they are seeing outside, at their discretion, and when they are not task saturated.

A full transcription of the answers to **Group 1 Questions** can be found in **Appendix B**. Listed below are selected participant quotes:

“Most of the time we're not really concerned with PIREPs unless they are relevant to our current flight or conditions that we're in.”

“The last thing you want to do is go through a bunch of codes and slashes and fill out a form.”

“...not really concerned with anything other than probably turbulence or winds.”

“Things are busy. Radios are congested. And really ... I'm not really paying attention to tops and bases. Unless I'm asked specifically to give information on that. Like if we're coming down, can you give a tops report and we're already in it, I'm like, I could give you a guess when we entered it. But I can't really tell you exactly. I mean give you a bases report when we come out of it. You know temperature and icing if their present. Most of the time we're not really concerned with PIREPs unless their relevant to our current flight or conditions that we're in.”

“...with technology now, even in my helicopter, I've got almost every bit of weather information I could want right there at my fingertips. And we do put a lot of weight into the PIREP as far wind shear and things like that on short final. But other than that I think we're really almost moving to where we're more dependency on avionics than we are each other.”

“...if we're busy, the controllers are busy too. So a lot of times if we don't have time or it's not asked. We don't have time to present it to the controller. Even then the frequencies are jammed up because the FAA's got overlapping frequencies and everybody's talking over each other. So there's quite a few problems with the submission process just in that, if you're trying to do it by radio. I mean trying to submit something from dispatch [laugh] yeah right.”

“...we always talk about aviate, navigate and communicate, right? So PIREPs would fit down at the communicate level. So in terms of what a pilot needs to do, you know, to be effective and safe. It's the farthest thing down the list. And then on top of that the communicate would be talking to controllers and everything else that you have to do. So I mean, I just think the normal priority that we have established sets the first reason.”

“...we'll just pass it along to controller and assume that the controller is going to put it in the system.”

“...to do that within the ACARS system requires you know shifting your focus away from primary flight displays and going kind of heads down into your ACARS. Punching it, if you have to go find the page. In the 737, I think [Participant] will concur with this. In the

737 that's a, you're 5 or 6 buttons away from that page. So this is not at the tip of your finger. And then you have to you know on a non-qwerty keypad right, just a straight alphabetically order keypad. Which is a little bit clumsy. So it's a workload thing. I mean it's going to take time out of doing other things. So it's not easy to do. It's much easier to report it on the radio. Now you're taken that same workload and putting it onto another person that's doing a whole bunch of other stuff that we don't know. So I always would prefer as a pilot to hand it off verbally to a controller because I don't have to do that big multi step process that I was just describing. Because it's cumbersome.”

“Yeah I'd say PIREPs aren't declining. It's the formal PIREPs that are declining that's what we're all talking about. It's just a matter of communication back and forth ... So I think formal PIREPs aren't given very often. But just informal, hey, this is what we got. What's going on with the plane 30 miles in front of us? We do that daily.”

During the **Group 1 Questions** discussion, the pilots brought up an issue about reporting turbulence automatically based on Apple iPad sensors used on the flight deck. The quotes below illustrate the different, and at times opposing, attitudes different pilots had regarding the accuracy of this method of “measuring” turbulence. The utility and usability of such technology would be debatable, unless such an automatic sensor is designed, tested and evaluated to provide a “reading” equivalent to the subjective human perception about the magnitude of the same phenomenon (e.g., turbulence).

“These are actually not connected to the airplane per se. They're on our iPads. And this one actually will give you a graphic. You do the program on. And then it will automatically detect turbulence in the airplane. And transmit it through the internet connection on the airplane to other airplanes, to other people that have the iPads. And then you can see actually a track where an airplane has flown across whatever the distance it is and whatever area, where its color coded based on whether it's been smooth. Or there's been any kind of turbulence or chop. Or anything along the way. The one thing I will say about that is, it's actually very good in real time. The only thing is it tends to slightly inflate the turbulence that we're feeling in the airplane. Which is you know if you think about it you'd rather have it that way then the other way. So we have those things.”

“It's just that on that WSI app I know you look at your route of flight and there's a little icon. You can click on and it'll tell if its light turbulence, moderate turbulence, severe turbulence all that stuff. And the only thing I'd add is it's automated so it comes from what the plane expects. And I found that when a plane auto reports light turbulence it's what we'd normally call more like moderate turbulence. It's a little more.”

“All I know is that if see a light turbulence TAP report that's usually when we're going to have the flight attendant sit down. Because it's going to be the point where it's bumpy enough to be dangerous to them. We don't definitely want passengers up and stuff that it'd be dangerous, when there's a light turbulence. Normally light turbulence for us, that's you know alright, we can still let them work in the back. We'll keep the seat belt sign on.

But when the TAP's report light it's getting more into the dangerous air. Where it's not going to seriously injury anybody. But it can knock someone off their feet. And we're going to have everybody sit down for that. So it's not real, it doesn't match up with what a human would expect and what the computer on the plane thinks."

"Thinking about this from both angles. Both as being a controller receiving it and both as a pilot given it. As far as giving the turbulence I'm pretty quick at it. I agree with [Participant]. What we consider light turbulence is really more of a chop or something like that. Where I can only imagine what the automation is doing. I learned real quickly that severe turbulence is something that we don't want to report because it requires a maintenance check after we do it. I don't say severe anymore."

Group 2 Questions

Why do you think the number of PIREPs has been on decline?

Pilots were requested to respond to the following questions:

- *Are the pilots putting in way more information than they're getting back, and are losing interest in the system?*
 - *Is it due to task saturation?*
 - *Is it due to a lack of timely feedback or dissemination back to the cockpit?*

The answers to **Group 2 Questions** supported the perception that PIREPs are a lower priority task for pilots. While the pilot participants echoed how much they appreciate a PIREP, they also made it clear how much they do not appreciate being asked to provide one during critical phases of flight when the task saturation is high.

According to the pilot participants, while the widespread use and availability of weather information on a variety of new platforms, applications and devices makes the PIREPs seem less relevant mostly due to the significant time delay between PIREP submission and dissemination; it has not diminished their importance for aviation safety.

Pilots gave multiple examples highlighting the wide availability of new weather applications and display technologies that are capable of presenting all weather products graphically, including PIREPs, on devices such as iPads, as well as on flight deck displays. Such

applications and technologies are in stark contrast with the traditionally textual shorthand used for weather reporting including for PIREPs.

Furthermore, the pilots were concerned that the significant time delay between PIREP submission and dissemination significantly contributes to the perception that there is not much of a return on investing the time to input information into a “cumbersome” and “outdated” system. Especially, given that the information is already “old” by the time it is disseminated.

Lastly, the pilots pointed out that, especially on large air transport airplanes, the avionics is capable for sending automatic PIREPs/AIREPs. This allows multiple reports to be sent to the ground frequently, automatically, along the entire flight route and without pilot involvement. However, pilots also highlighted the important limitations of AIREPs. These limitations include the lack of information identifying the direct human perception/observation of phenomena such as turbulence or icing. Preserving the human element inherent in PIREPs was emphasized throughout each focus group session.

A full transcription of the answers to Group 2 Questions can be found in Appendix C. Listed below are selected participant quotes:

“Well I think that part of the issue is ... the controller asking during task saturation points. If somebody is coming through down to minimums. The last thing on their mind is oh well I need to remember where my bases are or I need to remember this. They are trying to land an aircraft safely After they land you can ask them and you are going to get four different answers. Because they were so saturated with doing their job at the time. That they weren't thinking about giving information.”

“The reason I do not file more is not due to task saturation. Because normally an IFR flights once in cruise mode, you're just there, you're kind of monitoring everything so you've got time. If there's time on frequency it's usually not a problem. Again it's more of an issue of trying to get flight service to answer. Finding the VOR you need. In terms of feedback one of the coolest things ever is when you put a PIREP in and then 10 minutes later it shows up on your EFB... But that happens maybe 1 in 10 times. Will I see my PIREP before I land? And so, it doesn't happen very often, I don't know what that is but it's probably 10 maybe 20% of the time that I see a PIREP an hour, hour and a half after I've uploaded it.”

“So from the Part 61 and training world. I feel like approach, or whoever I'm talking to never really cares about what I'm saying. So for me, flying in the GA world, knowing

where the bases and tops are is important to me. Because if I'm on the ground looking to see if I want to go fly or not. And someone reports a PIREP that the clouds are low or higher than forecast. Or that are reporting on the METAR. Then that will help determine if I'm going to go or not. So I'll be flying into OK City and I'll be talking to approach and I'll say, tops 6500. Bases 2000. Or whatever they maybe. And I feel like approach whenever they're replying say roger or whatever. They don't really care. And I feel like it's not going anywhere. And so as a pilot, I feel discouraged to submit them if I feel like they aren't going to be beneficial to anybody. Or get entered into the system. Because the jets coming in after me that are on the frequency already aren't going to care if the bases are at 2,000. But a little Piper coming out of David Jay Perry might, that might make a difference for them whether they're going to fly or not. So I think the biggest thing for me is, is feeling that the PIREPs that I submit aren't going anywhere. And they're just getting thrown in the trash before they can do any good.”

“...it just frankly it doesn't matter all that much. I mean it's certainly nice to know in terms of ride reports and things but it's just not something we need or have a lot of use for and then so that turns into not really participating much since we're not using it. It's really not on the top of our brain. And we're not thinking about submitting them for others who certainly could benefit from it. Just like you said the loss of interest maybe because that information is coming from other places. Or it's just not relevant to your type of flying. Again, I realize that sounds selfish and it probably is. But I think there's probably a lot of that.”

“I don't think a PIREP really would give you a good representation when you're right in the thick of bad weather. It is great for en-route but as far as instantaneous information to make a decision on where you're going, I don't know that it's that pertinent. I don't know if they can do it that quick or not.”

“I am thinking that it's possible that, we now have so much access to weather with WSI, en-route and now we've got radar. We've got... so much great information. A lot more than we did in the past. So that might be a reason why some pilots might not think to give a PIREP. The other thing that I thought was like, I fly the A320 and I do know that we have TAPS that are automatically being reported. So am I, maybe pilots are less likely to give a pilot report for turbulence knowing that we do have an automatic TAPS report.”

Group 3 Questions

Why do you think the number of PIREPs has been on decline?

Pilots were requested to respond to the following questions:

- *Why are air traffic controllers not consistently soliciting and/or correctly inputting PIREPs?*
 - *Is it due to task prioritization?*
 - *Is it due to task saturation?*
 - *Is it due to protocol/process/work flow?*

- *Is it due to the current format/submission form design?*

The answers to **Group 3 Questions** further solidified the perception on the part of both end-user populations (pilots and controllers) that soliciting, submitting, capturing and disseminating PIREPs is not a priority for either pilots or controllers. Task saturation, lack of standardization, and outdated format and technology used were identified as major contributors to such perception. Controllers were convinced that only “official” PIREPs are on decline. They stressed that lack of staffing was one of the main reasons for the perceived decline.

A full transcription of the answers to **Group 3 Questions** can be found in **Appendix D**. Listed below are selected participant quotes:

“The coordination only takes sometimes seconds. But it is seconds sometimes you don't have when you're separating airplanes.”

“Also the forms ... no one knows a lot of these acronyms. The forms aren't very human friendly let's say.”

“I think the official PIREPs are probably on decline. But we solicit PIREPs all the time. The process is once we get the PIREP we have to write it down. Pass it to our weather. Then our weathers supposed to put it in the system, whatever system they put it in. Which I don't know it goes where ever. And then that information is disseminated that way. But once the information gets to weather, I feel a lot of times, they just set it to the side and they don't even put it in the system. Especially on days when the weather's pretty bad.”

“Okay, so for task prioritization yes. Because often times especially in en-route environment now you're working by yourself on a sector. So you're much less apt to put in a PIREP especially if it's only affecting your sector. Because again, you're going to brief the next controller on the phenomena. And you're telling the pilots as you talk to them. So it's why am I also going to put in a PIREP in the airspace that I have. Now if I'm working over in approach control for an example, and there's icing or tops of course things like that. And I get a PIREP. That PIREP I will put in because now for example if [Participant]'s working approach control under me, I'm given him information he needs. But if it's just you know specific to my sector I'm much less apt to put in a PIREP.... With the protocol you know when there are times that we are required to put in PIREPs, yes we do. But if it's just informational and again if it's just my sector, I'm probably not going to put in a PIREP. But I am going to tell the pilots as they check in. And I am going to tell the controller that relieves me here are the ride conditions. Here's winds. Whatever needs to be disseminated.”

“And it's real antiquated you know disseminating the PIREPs, very antiquated. But more often than not occasionally you'll get some guy unsolicited in clear weather, he wants to give me the winds aloft. I had a guy give me the winds aloft all the way down from 3000

feet. I was about 10 calls behind after he shut up. And I'm not, I don't mean any offense to the pilot, but I didn't even ask for that. It was some guy, I guess he felt like chatting awhile. But you want it short and sweet. And shorter and sweeter as possible. I mean, I just want 1 or 2 words like. Light chop/smooth. Or breaking action, good/fair. Because we're so busy at some of the facilities that we don't have time to listen to everybody. Because we're too busy working airplanes."

"I would say in many cases it's duty prioritization. Because as a controller it's drilled in your head like you said earlier, separate them. First and foremost separate them. And if you've got 10 to 15 aircraft on frequency and you don't have a lot of time to solicit but the basic information. Like I will ask you, you know, say flight conditions. And I'm expecting to get it back a very concise answer, you know. Light icing at 8500 or whatever. But what happens 90% of the times is our pilot friend, and I don't mean this in any disrespectful way whatsoever. But like to talk on the radio too. And before you know it as a controller you are so behind especially if you're working approach control and you're trying to get guys on the localizer and the whole nine yards. I get 4 calls behind, I'm in a world of hurt. I've got to really hustle for a few mins to get things back under control. And it's just a matter of what we want the information of course. Because is definitely helpful. But we want it in a concise of manner as possible. Because we do not want to take up time on the frequency. And then like everyone has already mentioned to, the FAA rules for soliciting PIREPs are antiquated. And because they're antiquated a lot of people will do just the bare minimum. And the bare minimum is under certain conditions you solicit a minimum of 1 per hour. Which really doesn't help the pilots much at all. I don't think."

"...when we got to talking about official and unofficial [PIREPs]. Here's the actual event that's taken place. The arrival. The departure.... when you have a wind shear alert - you get an alert. You issue the alert right away. Minus 10 knots or whatever it is. And that's very pertinent information that pilots pass onto controllers. And tower controllers make every effort to pass that information to the pilots that follow on the approaches."

"We're using PIREPs as a tool that informs the guy behind the guy that we're talking to. We don't usually take time to write it out. Because we don't have that time. Especially in low altitude approach control environment. We don't have time enough to barely write down aircraft identities. So, we don't have time to be writing down weather sequencing. So we'll ask that question. And hopefully it's been transmitted on that frequency so the following pilot knows what to expect when I talk to him. But I mean, you know I think that PIREPs really as far as being disseminated like that, I think when we got rid of flight service station is when we actually started to see that change. Because in the controller environment we really don't have that kind of time. I mean we're pretty much busy. High altitude, they are, the center controllers they'll have more time to talk to a pilot about what he's encountering because they don't have anything to do, right. We stay 10,000 feet and below. We don't have time enough to talk to you very long. And going back to what [Participant] was saying. I'm surprised that a tower controller would argue about weather. But because usually controllers just except it and move on. But like what [Participant] was saying that he's given a pilot report. Most of the time we don't have time to listen to that. We really don't. Because I'm trying to get whatever I can to be able to help the following aircraft. But I don't have enough time to sit there and hold a full blown conversation with you about it, right. You tell me what you're going through the

chop plus/minus, that's good enough for me. And then I'm going to ask the next pilot did you get what the proceeding aircraft just said? And he'll say yes I got that. And we usually work from there. But really I'm almost surprised other than when maybe [Participant] can relate to this. Other than when we're working flight data and a controller might ask you to put in a PIREP that he's gotten. Other than that we don't do PIREPs like that."

"Flight Service usually gives, that was pretty much what they did was. Other than taken pilot reports, PIREPs or keeping up with NOTAMs. And doing flight stuff with pilots. High altitude center controllers have a little bit more time because they're not pressed for time. Their separation is usually many miles apart. Where the closer you get to the ground we start off with 3 miles. When we normally we might start off with 5 miles going down to 3 miles. And we're trying to get that down to a 1 1/2 mile on the final if we can at the most. But we use PIREPs and pilot information about weather on a real time basis. Not the whole around. Sort of like what [Participant] said. If you tell me that you got chop now. That might not exist 10 minutes from now. So I'm using that on a real time basis as I'm talking to airplanes. And again it all depends on my priority. My 1st priority is separating airplanes. My 2nd priority is, I mean my 1st priority would be an emergency, separating airplanes. And where PIREPs fall on from there is, you ask 10 different controllers, you'll get 10 different answers."

"You mentioned the flight service stations the way they used to be. You could talk to them and pass PIREPs onto them. And now they've consolidated all these flight service stations into a couple of units and they reduced personnel. So sometimes you can't get through with pertinent information with time enough to present a PIREP anymore. Flight service used to take that role on. Now they don't do it anymore."

"I worked in a TRACON environment like I said in [city] and [city]. And it didn't seem like some of the extraneous stuff the pilots really needed. They needed to know where the severe weather was. How they can avoid it. And at the smoothest ride down. All the other stuff didn't seem to matter much. And it didn't matter to me at all, in terms of getting them where they had to go safely. My first duty was to get them on the ground as safely and as smoothly as possible. So I didn't really, I just didn't care much about, you know, obviously I don't care anything about icing at 20 or 30,000 feet. And when the weather was the worst, I was my absolute busiest. And so it was just not a big priority of me unless it was relevant right at the time of airplanes going into what was, what I considered, or what they considered to be terrible weather. So I don't know just reading your slide here is it the process, the protocol, I don't, I just don't, I don't think any of that stuff is really important to be honest with you. And I will agree with what somebody said yesterday like you said, they said it's not that the frequency has gone down. It's just the formal PIREPs"

"Well I was just going to say that you know if it's going into the system, it's going into the flight service station. If you're actually flying in the terminal area or you know getting close to the terminal area, I mean, there's really no time or anyway for pilots to start bringing that up. We'll rely on our dispatch to give us a heads up. Because they're going to focus it towards us. Or like talking to [Participant] and [Participant] we'll be relying on the controller over the VHF radio to tell us what's going on. I mean nobody would, I

don't think any pilot would sit there and go into the ACARS system try to bring up PIREPs in a textual format, while they're in that kind of environment. It just doesn't work. It's not safe. It would be a, and then as everybody has said what's the value, how old is this? By the time I got sorted down what it is, I probably traveled 20 miles.”

“The majority of the airlines rely more on their dispatch than they do on PIREPs. Because they're not going to call flight service on the available flight service frequency in the area. Because they're too busy and they can get the information from their dispatch faster than they can from flight service. And again the next level is getting the information directly from the controller in the sector they're working, that they're talking to. I know having worked [city] center, I'm working high altitude feeding the corner post. I'm going to brief them, let the guys know, let the aircraft know what is going on. Hey we're deviating to the right up here about 20 miles for weather. Deviate as necessary when able direct to Blue Ridge or direct this fix. And again, they're getting a better presentation on their weather radar than what I'm seeing on the scope. It's getting better now with the newer radars. But again, they still get the best presentation off their display in the cockpit.”

Group 4 Questions

Errors & Delays in PIREP Distribution

Pilots were requested to respond to the following questions:

- *Why ATC, FSS, or company personnel who handle PIREPs introduce delays and errors or even fail to distribute the information?*
 - *Is it due to procedural inefficiencies or noncompliance?*
 - *Is it due to low task prioritization of PIREP processing?*
 - *Is it due to the lack of awareness of the importance of PIREPs?*
 - *Is it due to problems with data-entry interfaces?*
 - *Is it due to proprietary practices (companies protect information from competitors)?*

The answers to **Group 4 Questions** further echoed the notion that minimal/reduced staffing or lack of trained and qualified staff (“data person”, “weather person”, “controller’s assistant”, etc.) are significant contributors to errors and delays in entry and dissemination. All participants agreed that pilots and controllers are well aware of the importance of PIREPs. However, they also stressed an immediate need for a major system overhaul. Furthermore, they suggested that until such system-wide overhaul is completed; trained, qualified, and most

importantly dedicated personnel whose job is exclusively the timely and error-free entry and dissemination of PIREPs, would be necessary.

A full transcription of the answers to **Group 4 Questions** can be found in **Appendix E**.

Listed below are selected participant quotes:

“We had air traffic assistants back in the 90's. They were a lot of furloughed pilots and things like that. But they were real handy. But once we got rid of them. Nobody wants to staff data because there's somebody back there pulling strips for departures. Because you're not going to pull a controller off a busy position that you need to put them on data.”

“The system to me is broken. It's not really a system it's just a lot of information thrown out there and hopefully you can do the best you can with it. And I think the pilots like they just said they talk to themselves and they talk to the pilots especially in the terminal area, I mean, the controllers. And they give them up-to-date weather right on the spot or up-to-date PIREPs and stuff. It takes too long for the information to get through the system. If it ever gets through the system.”

“I think you were talking about several people calling several other people that they call this guy. And then this guy's got to call this other guy just to submit a piece of information that could be vital stuff in our flight operation. It definitely sounds like you have a lot of [unintelligible], talking to a lot of other [unintelligible]. Where submitting it through various mediums just to, you know, get that information to us. ... So it definitely sounds like you have a lot of people talking to a lot of other people about a simple piece of information. We know that the more receivers that information goes through, by the time it gets to us it may not even be the same information.”

“Because and not really the key going back to the usefulness or the purpose of the flight service station that we had. But flight service stations were the best friends that general aviation pilots had. Because they were always in constant contact with flight service. Even when they weren't in constant contact with approach control or tower control. They were always monitoring 122.1 at that time. So as far as today and I believe that, and especially in the big facilities. We use PIREPs as a tool, as I said before. It's what's going on right now, what's going to be happening within the next 5 minutes. It's not looking beyond that and I don't care what happened before that. Because I'm watching weather or whatever situation is going on right now, that is going to best help me serve the pilots that are in my area at that time. And really that's basically the way that controllers have to think now a days. Because we can't worry about what was and we try to look at what's coming but we're dealing with the what is right now. And that's our priority.”

“Yeah I was just going to say that most airports, I mean, busy airports that have an ATIS, I mean any hazardous weather or anything that's really critical to flight information that's usually included on the ATIS in a NOTAM anyway. I mean, when controllers basically use PIREPs for a real time information that is referencing what I'm doing right

now and for the airplanes that I'm working. Other than that I mean we have an ATIS for the hazardous weather. If someone reports that on takeoff that they lost plus or minus 10-knots, 20-knots. That is automatically put on the ATIS within the airport. So anybody coming in that area should have that broadcast.”

Group 5 Questions

Pilots were requested to respond to the following questions:

- *What are viable solutions to modernize the means information is passed back to the aircraft?*
 - *How best to present it in the cockpit?*
 - *What are the factors affecting the geographical placement and temporal display of the PIREPs?*
- *How can these deficiencies be mitigated and eliminated by design?*
- *How can the end-to-end PIREP process be optimized in terms of efficiency and effectiveness?*
- *How can the potential for human error in the submission process be minimized by design?*

At a higher level, the answers to **Group 5 Questions** highlighted the need for:

- a) improved user interface design and overall user experience by eliminating the antiquated forms and format, simplifying the process of submission and dissemination, and
- b) sensible use of automation and new technologies and the need for a hybrid solution involving both automation and human input.

In addition, and at a more applied level, the answers were driven by participants' experience with already existing smart technologies and applications such as Google Waze, ForeFlight, etc. They suggested that transferring similar (e.g., Waze) functionality to the flight deck would significantly improve the user experience and ultimately minimize errors, increase the number and improve the quality of PIREPs. Furthermore, improving the user interface by allowing the use of plain language and free text was seen as the most effective way to improve the efficiency and effectiveness of the system as a whole. There were participants who cautioned against too much technology, as well. They believed that simply hiring trained and qualified data-entry personnel would be a good near-term solution.

A full transcription of the answers to **Group 5 Questions** can be found in **Appendix F**. Listed below are selected participant quotes:

“... there is an awful lot of things that can be automated from the get go. That the airplane, as far as my operation, having ACARS. There is a lot of stuff on the form that goes out the window with a button. Because the airplane knows all that information already. Such as altitude, type of airplane, time stamp and all that stuff. So it will be much easier to categorize the PIREPs. Now there is only 2 types. I mean that's like kind of silly. I don't understand origin and non-origin. Well I understand what the nature is but why isn't a turbulence report? Why isn't a visibility PIREP? Why isn't it an icing PIREP? There is no categories for PIREPs except urgent and non-urgent. Which is kind of like goofy. The other thing is we, as pilots, have no way to tell you what the visibility is exactly. I don't have a way. My eye doesn't tell me. I either see the runway or I don't see the runway. Now it might be regarding cloud coverage. I might be in a spot that isn't scatter and the guy 3 miles to the East of me might be in a solid layer. So when he goes down to that he's kind of like, really hard for me to see now. I can tell if I'm getting ice and what type. I can tell you if I'm getting chop or if I'm getting turbulence. Now that also changes because the chop that a 757 feels in front of me, it's not the same that I'm going to feel in my 145. Because just of pure physics. It's a heavy airplane. Harder to displace. It's going to be different. So all the perceptiveness when you're trying to help general aviation, 121 should be separated from general aviation because a lot of the stuff that we do doesn't apply to them and these are the people that needs the most help because they have the less amount of tools. So it's a lot of the stuff. Like automation would help big time. Automation would help big time here. There is a lot of the stuff that goes out of the form immediately with the push of a button. Importance, like I mean, how relevant a PIREP is.”

“I think that with the coming of ADS-B, I think that's going to allow the pilots to talk to one another a little bit more. So I think it's next year the ADS-B is pretty much going to be nationwide next year or the year after. But with that, with the ability for pilots to communicate with one another cockpit to cockpit and let each other know what their flight conditions are. I think that will pretty much eliminate as far as the controllers need for PIREPs. Other than like I said, on a need to know basis. And what we're doing, dealing with at the present time.”

“I've put some thought in some of things that you're looking for in your study here. As far as a system, [Participant] mentioned we used WSI as well. That's my real time information as long as my internet connections working in the airplane and it's extremely valuable. Again, we talk about flight service stations going away and things like that. That's because today I don't need to look at a hand drawn weather chart. Try to figure it out. Then I'm dependent on the PIREPs that are given me up to date more accurate information than this weather chart that was drawn by the weather service guy, six hours ago. Now it's all real time. When I give a PIREP I'm trying to update the most current information that's different from what I've been told or what I'm seeing right now. So that the person behind me, the aircraft, behind me can use it or the controller can use it. If I were in the airplane and there was an easy way for me to open something up and I could put in the cloud tops let's say of that thunderstorm. And now that goes to everybody else. But that has to be integrated with every weather system. Every company. You know whatever their using. But I can give it turbulence, hey we just picked up moderate turbulence here. Well if I could type that in real quick on my iPad and that updated

everybody's weather system, whatever their using. Now it's not dependent on the controller relaying it to every single airplane that's about to enter his airspace. The guy that's 80 to 100 miles behind me can see it without even asking and the controller having to relay it. But I don't know. That's a big leap there."

"... the 121 world, we need an ACARS submission form. Or on or JEP app we need submission form. As far as formal PIREPs go. With the formal PIREPs I think you just take the controllers out of it. And then with the informal PIREPs that's where the controllers are going to play a part. And then also the, if we do have a submission form we also need to have the Wi-Fi or a satellite connection to be able to receive those reports that are submitted. And the FAA needs to communicate the need for these reports. Like if they want the reports so bad that needs to be the initiative the FAA tries to roll out and say hey we need these reports. Please fill out as many as you possibly can."

"I was just going to say that it seems like one of the common problems that keeps coming up is the fact that everything has to go through flight service. That seems to be the big hang up. And it's difficult to get a hold of them. Takes too long to talk to them. It seems like that's a big trouble point. But then they're also the solution to what you brought up before if it's a private thing ForeFlight/Garmin/WSI well that's just going to be for subscribers. Or if airlines develop their own technology they're not going to want to share it. And flight service well that's the public good free for everyone. But it's also the problem. So somehow that needs to be worked out where the public good has the technology or is updated with what other people are developing."

"My thought was much of what he just mentioned to you but if you look at ForeFlight. Which I don't know if you can see but I have up here. It gives you imagery. It gives you a bunch of different formats to look at different things that are going on. If you had the option of PIREPs there that were pertinent, that purged itself, that would be really super helpful to disseminate that information in several places.... When flight service went, became privatized to Lockheed Martin. There was a real, real slow down in the flight service people. People couldn't get flight plans. They started filing through ForeFlight. A lot of other places. They looked for alternatives because flight service for a couple of years there just could not get the job done. And I think what happened is a lot of pilots just kind of disregarded flight service after that. It was too much of a hassle. You've heard [Participant] talk about it up there. That their hard to get a hold of and [Participant]. It's better now. But I think they lost a lot of customers support and usage. Because they just weren't getting the job down there for a while."

"I will say, there's probably a reason for this, but I've always wondered why there isn't just a, you know, we used to have flight watch at 122.0 and they took that way. I've wondered why there's not just one frequency. Because the only way I can find that frequency is I'll follow, I'll find an airport on ForeFlight. I'll highlight it. I'll look under the frequency tab to see what, you know, is it Jonesboro radio, McAlister radio and what that frequency is. And it's different then it is you know 200 miles the other way. Well I've always wondered why we can't just have one frequency for those guys and there's probably a reason I just don't know."

"...I didn't like flight service when it just had a single frequency because you would get calls from a hundred of miles away sometimes. And it was always crowded. And it was

difficult to get on which is why I would always call from the specific VOR's because usually nobody was on there. I think that maybe it, it's a single frequency, you're going to get calls from hundreds of miles around to the same one. Because at 35,000 feet you can see quite a ways."

"...you've got the WSI thing right? It would be, I think, the focal point here not to give the controller more things but maybe something from the center. If those PIREPs are those just the audio VHF PIREPs were put into a system whereas we were talking about let's say, potentially about turbulence or something, right. So a guy puts in a PIREP for turbulence and it's available through a means like WSI, right. And pilots would get that automatically. And possibly it could be an addition to the ADS-B stuff for general aviation people. And then automatically let's say it's a turbulence PIREP. So it starts a 15 minute fade out. So after 15 minutes if a controller doesn't put in another one when [Participant]'s or you know somebody's [Participant]'s Airbus is coming through there, he doesn't refresh that PIREP it stays off. I mean it seems like the focal point here would be to have the controller put it in and have it displayed graphically for the pilots. Either via ADS-B, WSI is another means. You know something like that. Obviously, the GA guys wouldn't benefit because missing Wi-Fi. But through ADS-B. And then it would actually be meaningful. Real time. It would be graphic. You could see your relative position to where things are going, right. Instead of trying to figure it all out."

"All of these little gray things at least in ForeFlight are what the pilots look at. And for me as a general aviation pilot it is so much more useful to see it in this format in a graphical way. Then it is to say off the [airport] VOR 293 radial 15 DME, whatever. If I'm flying in the soup the last thing I want to do is be calculating where I am. Where that DME is. Where that radio is. It takes, having it graphically like this, takes all of the guess work out of it. And I can say, oh if I'm going, if I'm final for RWY 36 at [airport]. This PIREP is going to be very beneficial to me. And so having it graphically somehow whether it be in an application like ForeFlight. Or through the [TIS-B] that we have with ADS-B on our GPS's in the cockpit. I think that's extremely beneficial to increase your situational awareness and make the process a lot easier. And task saturate you a lot less."

"... in terms in of when you're getting ready to start an arrival, right. You obviously going to see radar information. See it on WSI. I mean you look at it. I look at it. Everybody, [Participant]'s looking at it right. But also having more of what the controllers getting. Those real time things, as opposed, to this formalized PIREP thing. If you had a guy sitting there that was saying hey, you know, United 1234 reporting whatever. He could just hit the tag up on the screen, because you have the current position, right. Now it's even more accurate with ADS-B. And then they can just pull in whatever the small thing. They've got the aircraft type. They've got the aircraft position. They got the date. The time. And all of it's turbulence. Boom, end of discussion. And it automatically would feed into something that you could see. So when you're getting ready to start the arrival you would look down at that. You'd say oh wow man looks like we're going to get hammered on the diamond coming into San Fran going over the Cascades or something, right. So I mean that's the only thing I was saying that would be nice. I think there's a lot of information that [Participant] eluded to that goes in his head, that if he doesn't pass it onto the new controller sitting down. You guys all know, when we check

in, a guy goes I just sat down. I'll talk to the next guy, I'll find out. I don't know. So that's all I was saying. And then after 30 minutes some of that stuff could fade off if it wasn't refreshed. So starting the arrival I'd know what's going on. I'd need my heads up, I'd say cool. It's going to be clear sailing or it's not going to be. And then we would at least capture more of that incremental data that's getting lost. Which would show up on the ADS-B stuff that [Participant] was showing us, right.”

“I think in terms of, in this day and age the popularity of iPads and electronic flight bags and what not. Definitely the PIREP needs to be displayed on a map display so that a glance you can tell where it's situated. And I mean there are a variety of ways of displaying it. That's a whole other conversation. In terms of the timeliness factor I guess the problem I've experienced isn't necessarily been the PIREPs are delayed getting to me. In some cases in fact they're taken away too soon. That is for a while I think flight service was actually with holding them if they were more than an hour old. And again there are multiple uses of pilot reports. I mean if I'm in-flight at the moment obviously I want something that's current. If I'm sitting in my office trying to figure out to go flying today or whether I can go flying tomorrow. Being able to look back and the weather service allows us to filter pilot reports back to 24 hours. That's probably the limit of anything I can anticipate needing. But I certainly want to be able to see you know over 6 hours ago, what conditions were doing in certain areas. In part because that maybe the only data available. So knowing what was going on a few hours ago versus knowing nothing is very helpful information.”

“The only thing I can think of as [Participant] said is to increase staffing. And also make it somewhat simpler. Because again, we're told to separate. And not necessarily disseminate. And we got to change the focus to get everything kind of under control.”

*“But again, we're getting real time PIREPs. ... Very, very important and that's the braking action. So at [airline]and probably most airlines at the top of descent or sometime in the descent we're going to brief the approach right with the other pilot. And that's the time that we talk about the approach and the runway conditions. What kind of auto brakes we're going to be using. And so when we do that, we look at the ATIS, right. So we're looking first at the ATIS. And now we've got this Jepp Pro program, most of us are, we're not tuning into the ATIS to listen. We're downloading it on our app. I think it would be really, really great if we could get those braking action reports on the ATIS. I remember and I still do it today. That we're on the approach frequency and let's say I'm the pilot not flying. And I'll say I'm off the radio for a bit because I'm on Tower listening to the airplanes landing in let's say icy or snowy conditions. And I'm listening to the PIREPs being reported on tower. They're not being reported on approach. But those are very, very important if not the most important PIREPs. So if we could get them to us much earlier than waiting until we get on tower. Such as maybe through the ATIS system.
“*

“Sure just real quick and not to beat up on the Waze thing. But some smart person at Waze and they probably work for Google now. But has figured out a way to filter those reports and decide what is useful for the driver. As their going from A to B on their route. And it'll tell you when traffic's ahead. It'll tell you when there's a wreck. Or a cop, or whatever. Well I think that same principle can probably be applied. Because like

[Participant] was saying. You know part of my preflight routine is I go in and I put in the origin/destination airports. And then the routes will pop up and you can populate the entire route. And WSI, it is a great program but it's almost like information overload if you let it be. And so it has ways where you can like set, there's like preset filters and so I have one that's called turbulence. Where is just gives me turbulence PIREPs and the TAPS reports. And then the WSI kind of has a propriety turbulence deal that I bring up. And then I have another one that's called weather where you can bring up thunderstorms and stuff. But you know I guess what I'm getting at is, there's so much information we almost need and it probably comes from focus groups like this. But someone that can decide what is important to pass to us when. And is able to push those alerts either through WSI. Or you know if you're talking general aviation the ADS-B or something like that. So that the end user gets it in a format that's useful. Either plain English or something that's close to it. And it's timely. And it's also, you have to think about whether it's appropriate. Because sometimes if you're below 10,000 feet on a approach especially into somewhere, so we'll use [city] as an example. We get a lot of PIREPs going into [airport]. And the controllers there are great passing from center to approach to tower. Because the weather there changes so rapidly and there's so much that goes on there. Well if you're below 10,000 feet in [city], you know, you're 5,000 feet from touchdown. You don't want to know if there's light turbulence in the area. But you do want to know if there's wind shear on the field. So you know, those are all decisions that a program, if we're using a technological solution, would have to make in order to provide those timely updates to pilots. Otherwise, I think the controllers do a good job of just passing them to us you know as the system works now."

"... if the design is right to begin with, controllers will be a lot more willing to share that, if it's easy and if it's not cumbersome old fashioned form. If there is a way to optimize your workload to a point where it's not going to be extra work that you have to do in order to submit a PIREP. I believe that the technology can help a lot. In addition to awareness and training about the importance of it. I think it's not one or the other I think they're both from the top down the importance. Also creative use of technology. Like vast technologies that can capture the information without having to use really structured form. Because the form itself, any form, is making the human being [unintelligible] error. If it is more app design such that can reflect the human nature to use plain text, plain language and not exactly you know standard phraseology. How many of use standard phraseology? I mean you're supposed to but when you think about it listening to the chatter, I mean, there is everything but standard phraseology. They train you, they train you, they train you again almost nobody uses it. There is a reason and that's just the nature of the human, you know, part of the human condition. The more we design it such that it reflects the nature. And I'm one of those kind of [unintelligible] type that I am on a quest to educate people, hey we need to design such that it is natural to the human not having to specifically train them in and impose something to them that is not coming natural to them. Go ahead [Participant]. I'm preaching to the choir I know."

"I'm not too sure with this voice recognition that's going to fly in the 121 world. For privacy issues. A lot of people are concerned about being monitored while we're up there on the flight deck. I think most pilots would be fine with a drop down menu but I think you'll get a lot of push back from the Unions and the 121 pilots for the FAA to have

access to our EFB's and be able to hear. You know access to the camera and the microphone.”

“From what I can remember my training covered PIREPs mostly for, and I’m kind of sad to this I guess, for the oral exam. So just kind of going over what are they? You know, why are they useful? When would you maybe submit one? But I can't say that it was ever simulated or practiced. Or like gone into any more depth than that in training. And that does actually have to do with maybe that I trained at a pilot controlled field. Those students who are training at maybe a [controlled, uncontrolled] airfield might get a different training I'm not sure. But there is a more I think a relaxed feel around PIREPs and it was a little bit more in the background for the students at Princeton Airport. And maybe that has something to do with it. So I can't speak for those students. But from my experience that's kind of where it's at.”

“Yeah frankly there's not much in the way of education about them. I mean in like private ground, they go through it. We've got like a [task sit] at [university name] for 141. You know interpreting them. But just the basic ones. Nothing with any sort of complicated short hand really. And then it's pretty much that's it. After private ground I never did a PIREP until I asked the instructor to do one and demonstrate it for me. Because I had never actually seen one in practice. And still with 250 hours or so in the program I've been 2 total. Both because I asked the instructor to demonstrate. And that's the extent. I mean it's probably more than most of the people in the program are getting. So it's very bare bones.”

“I'm right along the same lines what [Participant] was describing. I think it wasn't, I mean, I can't remember off the top of head now. But it was a similar situation where the instructor said he wanted to fill out, you want to submit a PIREP to flight service? And I looked at him and said what? So there's very little pertaining to my background and [Participant] just kind of verified as well. There's little initial instruction on it. I think the reason for that is because the system is outdated. And we rely on other weather products to help paint our complete picture here..... And the way that this system is organized makes it very archaic. I think that's the reason why a lot of students are coming out of these days. And even when I went through the training it's archaic and we don't really touch upon on it because there are other weather resources/weather platforms that could give us a more complete picture. But I think truly because of the archaisms of the way the information is submitted and presented. Even with a few of the examples that I looked up online before this meeting took place. I had to go in and look up what a few of the symbols even meant. So, I mean, because of the outdated system the outdated information that the way it's submitted I think that there's definitely a factor there.”

“... by the color delineation you can tell whether it's something you want to click on and read. Or whether it's something that's not pertinent to your flight category. So that would be excellent.”

“I like what you're saying there but I do believe that all of us controllers and pilots are all very visual oriented. I doubt there's very many of us that want to read a report and try to disseminate whether there's turbulence or there's what or who it was. The ForeFlight app is much like a lot of the others but it'll, you can pick, you know, you pick your different layers of what you want to look at. So if I were flying at altitude and I was Part

121 and I'm at you know 22 to 32,000 feet if I could select those altitudes and if there was a pilot report and I'm sure they'd have to time out after a certain amount of time. But if I could look on there and there was moderate turbulence and it had a circle with a T in it that was yellow. And if it was severe turbulence it'd be a circle with an S in it. And it popped up just like VFR and IFR show up on a ForeFlight map you would get your reports now. If you wanted to slew over and click on it to get the actual information you could but you know that's already being done. I just know we're visual. Like if I looked at a map and I see a bunch of magenta and pink looking colors or blue I know its IFR marginal VFR. “

“I would say it's not either this or that. It should be a hybrid of those two. Yeah I think the technology has improved in the airplanes. The avionics. I think it's great that information can be passed along. TAPS I find is of, it's you know, it has utility but it's pretty limited utility. Because I think that TAPS reports are very understated as [Participant] mentioned earlier. But I use [airport] as the example because of the weather there is so nutty... you know you might hear, they might be reporting winds down the runway at 9-knots. But then, a controller will pass to you, hey A320 that just landed. Reported a gain and loss of 20-knots of airspeed at 500 feet. Well that's crucial. I mean that's huge. Or whatever it is. Turbulence PIREP or whatever. So I think that it shouldn't really be one or the other. I think it should be a hybrid approach. As [Participant] mentioned those reports that are passed to you in a time crucial and when your workload is just really high. Or just super important. I don't think that can be stated enough.”

“So it's really got to be a voice report. Because like [Participant] also said. When we're taken off or we're on approach in a landing phase. We don't have that app up and we're not going to use it. In fact, I don't think we're allowed to use it. I certainly wouldn't be using it. So really someone on the ground has to be relaying that stuff via voice. And I think, you know, that would be the best way so that your general aviation traffic, everybody gets the same information as it is pertinent to them. So hopefully we can have that available as a situational awareness tool for us that have the Wi-Fi equipment on our airplane. But really the critical information's got to be passed by voice. Probably via the air traffic controller.”

“I was interested in something that both [Participant] and [Participant] said. [Participant] said that the airplane tells on them everywhere, you know everything, every switch he flips. Everything is recorded. Wouldn't it be great if the technology could record those things that are pertinent to flight information like PIREPs or icing? Or wind shear. Or low bases or whatever. And could transmit that data to controllers on their screen so it can say that [Participant]'s plane said that this was that. This is what's happening at this particular point and space. And then it would take out the need for education or probably a PIREP because it would be directly given to the controller. And so that I could disseminate to the pilots, I'm looking at my scope. It seems like you could take the human element completely out of it with the technology that we have today.”

Group 6 Questions

Pilots were requested to respond to the following questions:

- *In addition to design solutions, what is the best way to educate/train pilots in order to improve the quality and quantity of PIREPs?*
- *In addition to design solutions, what is the best way to educate/train controllers in order to improve the quality and quantity of PIREPs?*
- *In addition to design solutions, what is the best way to educate/train controllers in order to minimize inaccurate or incomplete PIREPs?*

Towards the second half of each focus group session, the discussion became even more energized and participants took the opportunity to go back and forth and reiterate their feedback on topics/questions covered earlier in the discussion. This was to be expected, as with time, participants also became more comfortable and open to share thoughts as well as relate them to what was already said.

The responses to Group 6 Questions identified the necessity for stronger FAA leadership in:

- a) overhauling and modernizing the outdated system by focusing on design simplification and process streamlining,
- b) training and cross training of pilots and controllers,
- c) standardization of training requirements for both pilots and controllers, and
- d) standardization of work processes for controllers.

A full transcription of the answers to **Group 6 Questions** can be found in **Appendix G**.

Listed below are selected participant quotes:

“I think it's going to have to come from the top of the FAA to re-emphasize the training that goes along with dissemination of these PIREPs. Why they're important? And how to put them into the computer that is available to them...The emphasis has to come from the top and then filter down the 1st line supervisors. And have them plug in coordinators to the positions so that they can take the information. Put it in the right format and disseminate it through the network that is available to them. But it's got to start at the top and it's got to become an initiative, it's going to have to be followed up by the floor supervisors and the controllers”.

“Well it's going to be a pilot entering it through technology, through some kind of app or whatever. Then it's, you know, it would be easy to do, fill in the blanks. Not all blanks required. But you know the ride, the icing, the weather, whatever. But if it's going to voice one whether it be calling flight service or a controller trying to relay to flight service. It should be the option of just the, you know, free-text speech sort of speak. Not

have to be a specific format. A much shorter conversation to get that information around.”

“Yeah I think it's definitely not a one size fits all. I think we need to automate where we can. And especially the more sophisticated airplanes that can feedback a more constant stream of data. Now unfortunately that's often the higher flying airplanes. And we need data as much in the mid and lower sections of the atmosphere as we do at 30,000 feet. So I think and [Participant]'s touched on at least on one approach to being able to do that. Which we should certainly explore. But I think in addition to and in parallel to whatever automated systems that we can pursue. We, I mean hopefully, actually some of this automation will free up time on radio frequencies, for either controllers or flight service specialists, to be able to have a little bit more time to take other reports. And to that end and again this is focusing on flight service now not on ATC. I think one of the things that's needed there is for ATC, or is for flight service, to actually have some basis for knowing and asking, making an intelligent request for a pilot report. As opposed to a generic, when I open my flight plan saying pilot reports are requested along your route of flight. Which means they need some sort of information for themselves to be able to say, hey we need a report between these two points. Who do we have flying in that area? And now can be queried on a basis that would be most useful to the system. As opposed to a generic request. But again that's something that needs to be designed.”

“No one or few people think they [PIREPs] have value so it's kind of overcoming that barrier of entry, right. And so I think one that we could do to help kind of promote that is find case studies where PIREPs saved a life. And so kind of the opposite or even use Delta 191 as an example of a time that PIREPs really could have saved a lot of people's lives. And so show some positive and negatives outcomes of not or using PIREPs. To help get the public onboard. To the conversation, I don't want to say the uphill challenge but set activation energy that will take to get that to a wide level across the industry.”

“I think you'd have to have the human touch. I believe it was [Participant] who stated at the mid altitude type strata. Because approach control in say for instance in Tulsa we work 15,000 feet to the ground. And some of the most important PIREPs we took besides bases and tops. It was always icing. And you always wanted to disseminate, make sure disseminated those. Also the FAA to kind of change the rules a little bit on liability. Because a lot of times pilots will ask you for things that technically, we're not really trained to provide that service. For instance, vectors around weather. Or areas of known icing. Or something like that. Because we don't have the equipment that really shows us specifically what's there. I mean we don't if it's real. Whether it's a false echo. Or whatever. And the FAA will refuse to provide us legal protection. If I tell a guy to turn 20 degrees right, vector around weather and it runs smack into something. They're not going to protect me in court. And so I'm not willing to hang my career on the line trying to do more than I'm qualified to do.”

“I'll make two observations there. I have a 30-ish year old son that a year ago finished his private pilot training in [state]. And at no time during his primary flight trying, did he or his instructor file a pilot report in any of their time aloft. They pulled pilot reports, they analyzed them for their use. But they did not file any pilot reports. So I think part of the reluctance on pilots is you know if you're really aren't kind of trained on that as well,

and I don't mean the academic training. I mean the actually pick up the mic and file one. And get comfortable to doing that. And primary flight training I think that's a big deficiency. The other thing that I think is important here and I don't think I appreciated this until I sat through that NTSB session on PIREPs a couple of years ago. Is I certainly know about my only use of pilot reports to figure out whether to fly and in flight. I wasn't as aware that the weather forecasters are also looking at those pilot reports. And at times adjusting their forecast based on pilot reports. Much less that academic researchers 3 or 4 years after the pilot report was filed maybe pulling that data and using it to run against forecast models that they're trying to develop to give us better products. So I think that much more needs to be done to help people understand the broader spectrum of uses the pilot reports serve beyond just our immediate tactical use at the moment.”

“... then from a controllers stand point what it does is, it takes me out of the loop of having to put PIREPs in. If the pilots have the ability to put them in and then there's someone out there who's judging where it needs to be disseminated. Then now that's time I don't have to take off the frequency. And as [Participant] said, often times for us, it's okay I'm separating airplanes. And that's priority one. Disseminating weather is a little lower and now if I don't have to push that out there, that gives me more time, to do my job. So it would be a beautiful thing. If there was some type of interface that allowed the pilots to put them in themselves and then also pass them along. Now I'm still as a controller when you check in, I'm going to tell you the weather. I'm going to tell you what to expect along your route of flight. If I know something, if there are, conditions that are going to affect you. But not having to put it in the system does make it a lot easier for me.”

“Well to reduce errors we need to take as many different hands out of the actual dissemination of the PIREP as possible, that's one thing. Two. Again I know that you want to keep the human element in but if you could eliminate humans as much as possible I think it would be a better system. If airplanes that are going through actual phenomenon could transmit that to different sources. And so then errors are eliminated. There's no need for education. I mean we are so technology advanced with everything else we do except for our aviation system in certain areas. I mean still uses very old technology. I just think we need to get up-to-date, up to speed with the technology. And it exists. You just showed us all. Obviously you're going to use them if it helps your traffic flow. If there is something that is eminent like right now that I could pass onto everybody else that is in my scope I would be able to do that. But I just think we need to advance technology.”

“Improving the quality of the PIREPs is going to be a function of everything we've talked about... Less paperwork. Less, you know, better information with less superfluous stuff that you don't need to put in there. As far as training controllers, I mean, we're under pretty rigorous training demands. I mean the FAA can implement anything they want. And say alright, during your training process you'll go through this pilot report training program. You can also make it mandatory that they have, you've got to in certain facilities you have an assistant or D-side. A person there that, you know, you can test them with getting several PIREPs per hour. It all can be done. It just needs to be integrated a lot more user friendly way is what I would say.”

“Years ago and I don't know what we're doing FAA-wise now for cross-training. And when I say cross training, years ago Southwest airlines had a program where they took all of their people and ran them through a class where they had the flight attendants there. They had the gate agents. They had the pilots. And everybody got to play a different role as to who was under what pressure to do what. And we put controllers over there and went through some of those classes at [airport] for that. And [airline] had a program ... Where we had meetings, like once a month. To discuss issues between controllers and pilots. What was going on? What could the FAA do help [airline], help [airline] or help any of the airlines. And different regions were meeting wherever the airlines were based. So I think some cross-training we had the general aviation program also. People would come into the centers to see what goes on and how things [unintelligible] and what we could do help them. So when we talk about education we need to cross all the barriers with each of the different groups. To try to get the best education for everybody. Controllers, pilots, general aviation pilots, or whatever Commercial side that you're doing.”

“What I was saying about all the 9 or 10 fields that there is in the PIREP. I think that training should be more focused on 1) the importance of the PIREPs. So what [Participant] said maybe implementing this to show how important they are. But also not showing it as a complicated process. Focus more on the simplicity. You can just simply say tops are at I don't know 5,000. Or bottoms are 2,000. Focusing more on the simplicity of just telling ATC what you're seeing rather than having the pilot think that they have to calculate their position. Or their location. And their altitude at the time. And the aircraft type. And just focusing on, you know, how its more simple than we think it is. Learning about other people so including [unintelligible]. Right here in this focus group I've learned a lot [unintelligible]. I think most pilots don't have no idea of what's going on when we talk about weather. And what ATC does with our weather information. So including in training part of the perspective of what happens on the other side can help pilots understand the whole system. And I think that would contribute more with PIREPs.”

“I think a lot of comes down to what type of programs are you using. The 61 versus 91. Versus the 141. And until it's added as a specific task and private pilot level. But I can't even remember seeing a question in any exam I've ever taken regarding PIREPs.... until you put that as a required task into testing and training, it's going to get glazed over.”

“I wish we had the ability to disseminate PIREPs as we get them. Because there have been certain situations on the local at [airport] one time, departure reported a 40-knot drop on departure. Wind shear on the West side. The controller over there didn't pass it on to the controller on the East side. And then this guy on the East side took off and got the same thing. There was no coordinator involved. She's busy. She doesn't have time to call whoever he/she maybe working on the other side. But there's a lot of times when pilots expect you to put the information out. And I ask for them all day long when it comes to wind shear, breaking action or icing. And the main thing is when you do disseminate one, it's so important to put the type of aircraft. And icing type and intensity. And the temperature when icing is occurring. We don't have, we never had the staffing to do that. I mean you just did the best you can putting it out there. And I wish we could do

better. But that's not stressed for our training. I don't know about you [Participant] but they never stressed PIREPs for us."

"Well the only way PIREPs were stressed to us make sure you got the minimum when they were required. And unless there was something very strange going on as far as convective weather. That was the only thing we were really taught. It's sad but it's true."

"I just wanted to add this real quick. My son was working on his PPL, he's trying to solo ... So I grabbed his pilot handbook and looked up PIREPs. And he's got 1 page on pilot weather reports under the aviation weather services chapter/study guide. And just kind of talks about the element codes and when to give them I guess. But it's just 1 page. I just thought I'd throw that out."

"... As far as 7110.65 getting the requirements and their first priority being separation of traffic. Which you're not usually the only one working in the tower and so that information that comes in should be passed to somebody else to get the work put into the system. I think, to me, controllers know their job and they that realize PIREPs are important. But I think it depends like [Participant] is saying as far as it being their priorities to do these. I think there's other people in, you're never usually working by yourself, there's always someone that can help you. But I just think it's not maybe it's not reiterated enough about PIREPs. And it's really not a focus. I think the fact that when, before it was moved from flight service all controllers knew all they had to do was call the flight service station and pass a PIREP and it would get put into the system correctly. Now that's not an option for them. They have to do it themselves. And I don't know that they have the ability, or even the knowledge, or want to put those PIREPs into the system. So I think the training of it, the requirements are already in the 7110. Both the 65 and .10 for flight service people. It's in both of those orders. And as far as what their duties and responsibilities are. And so it just has to be reiterated that this is important. And I think maybe we iterate it. When you're saying training I don't know and if training is necessary then so be it. Then train everyone. And then after you've trained them all then you make it a requirement. This is what you're supposed to be doing. There's no excuse after that. As far as design solutions, again, I'm still hearing you know that some folks think the form is antiquated. The equipment's not needed. Everything is automated. But you know PIREPs usually pop up where you put them. If you put them up in the right format, they're going to show up in the right place, where they can be useful. They're not going to pop up all over the entire group. They're only going to pop up in an area that you put them into the system. Using a NAV aid or whatever equipment that you put in and place around them. So there not something that everyone would be getting. They don't apply to everyone. If you're flying 30,000 feet the PIREPs at 5,000 feet don't apply to you. So I just think that it has to be understood and put in correctly. I just think that there should be either if it's going to a priority for the FAA to want these things to happen they need to make sure people are properly trained and it's required. If you don't make it a requirement it's not going to happen. So, you know, nobody wants to do additional work but if this a requirement of what I'm supposed to be doing we do it. I don't know if a re-design is necessary. I think if you want to put into give the pilots the ability to put their own in, that's fine. But if it comes through the FAA then we know it's supposed to be done a certain way. And that's the part that needs to be reiterated in training. So that, everything is done using a computer these days anyway. Doesn't take but a couple of

keystrokes. And if you couldn't do it using the keystrokes then back in the day we used to have to use UA and use it. [Put in an identifier / unintelligible] and everything that goes along with it to put it into the service [unintelligible] program. So there's ways of getting the thing done. But I do think it has to be that training has to be redone and people have to know that this is important and its part of their duties and I think it would get better.”

“The problem has gotten to be that the duties have been removed from flight service, most of them. And now they've been put into the terminal option or the center option. The duties of putting PIREPs in, are now told, to be done at the center or the tower. The tower and approach controllers supposed to contact the flight data at the center to put the PIREPs in. That's the issue now. Flight data doesn't do PIREPs unless it comes through inflight or unless it's completed during a briefing. If a pilot asking for a briefing, so that's the only way. So if you're doing a pilot weather briefing, you're not going to get PIREPs unless someone gives it to you. If you're working a radio position or an inflight position you can receive a PIREP. From a pilot if the pilot comes to your frequency. Otherwise the PIREPs are going to the center or their going to approach control. The approach control now as the responsibility to contact the center to put the PIREP in. If the center get it, the center is supposed to put it in. So what I'm saying and what I'm hearing from the flight service side of the house is that the requirements have been removed from them to put the PIREPs into the system. So even though you say that there not, you know, you can't require them to do it, you can require them because it's a part of their duties. But if you removed it from their duties and you're now saying you can't do these duties any longer it has done by an FAAer unless it comes in over the radio. You just crippled them as far as being able to take PIREPs and put PIREPs into the system. So that's the difference. So center and approach controls are the only place that PIREPs are going now. Unless you're working the inflight position. And the FAA has caused this. According to what I'm getting from the flight service side is it looks as though their duties are being totally removed so that eventually flight service can close up. Because it's contracted out. So little by little the duties that they were doing are being removed and transferred back into the FAA side of the house. So FAA wants to do what they want to do on that side of the house and that's an FAA issue. Where I think the training side now has to be given to the approach/tower/center and said this is what you will do and you shall do this. That's where the issue is from what I'm seeing.”

Group 7 Questions

Pilots were requested to respond to the following questions:

- What is in your opinion a good direction(s) for R&D in terms of introducing new technologies in the PIREP system?
- Please identify at least two important benefits from introducing these new technologies
- Please identify at least two important issues with from introducing these new technologies

At the end of each focus group, the participants were asked to suggest future research and development (R&D) activities that would facilitate the introduction of new technologies in the PIREP system. They were encouraged to identify important benefits and potential drawbacks associated with such technologies.

The majority of suggestions were centered on the following characteristics of a simplified PIREP user interface:

- a) It is a synergistic combination of automation and human input;
- b) It is graphical;
- c) It is streamlined and easy to use;
- d) Makes it possible to submit a PIREP directly and near real-time to weather portals;
- e) Uses plain language and free text;
- f) Takes advantage of multiple input modalities (e.g., voice input) and technologies and applications matured by the industries inside (ForeFlight) and outside (e.g., Google Waze) the aviation domain;
- g) Allows the entry of “incomplete” or ”special” PIREPs that address only one weather phenomenon;
- h) Utilizes artificial intelligence, machine learning and natural language processing;
- i) Controllers’ interface includes graphical depiction of weather and PIREPs.

A full transcription of the answers to Group 7 Questions can be found in **Appendix H**. Listed below are selected participant quotes:

“A good direction's going to be the user or easier interface to submit the PIREP. We agreed that you know in talking through flight service is too cumbersome. Going through the controller is you know puts more work load on them. And doesn't necessarily get to where it needs to go. So whether it's something on an iPad or whatever device. Pre-filled in to make it as simple as possible. And as minimum amount of heads down time. But if it's you know right there on the airplane and you're just submitting whatever information you need to add to it and then it's going to the right people in a timely fashion. The benefits obviously if it's easier to do you get more submissions. This of course the costs and making it universal. And then again anytime you're adding more heads down time to the pilot there's a potential risk there. So that would have to be considered as well.”

“In terms of pilot education I would say you should talk to some of the online and paper magazines. Like IFR magazines is one of my favorite ones. AOPA. Av Web. These are all that things that pilots read to keep up to date. If there was an emphasis on filing PIREPs and an explanation of what good PIREPs did for the weather forecasting community I think that would really help. Also bi-annual reviews if it was a point of emphasis to talk about PIREPs and why it's important to file them and what good their use that would be good to. In terms of the take a ways. I would 2nd the call for something simple. Text space. Drop down menus.”

“We've talked about older pilots are not very comfortable with technology. Making it simple enough for them to use. Making it simple enough for people who speak English as a 2nd language to use. I think that's an important part of it, yes. So it's perfect that you're looking at it.”

“I just want to say from a research standpoint as you guys move forward just remember that flying is a human endeavor. And that PIREPs are inherently subjective to try to utilize technology to enhance the PIREP system is great. However, you have to kind of realize when you try to automate something that's inherently subjective and human. Could change the thing from something that's not, that goes from something that's useful. Where experienced of an aviator going through a certain ride condition is passed on subjectively to aviators behind them. That maybe you don't change that thing to something that's not wanted. Or not useful. Or not trusted by pilots just based on our subjectivity. Needs to be emphasized to, start with the major operators. Along with all of the GA stuff as well. And FAA being the controlling agency could bring everybody together at the same table and make this thing collaborative effort, where it's needed. And that's the only person, or that's the only entity that can lead this thing. Unlike an airline or small operators. Or even up North Alaska. If everybody starts participating I think we'd get a better understanding of the PIREPS and get better data points. But FAA's got to be the leader in this case.”

Yeah I've got a couple of questions. Obviously the research and develop needs to continue forward into some of these automated PIREP systems. But we're also kind of at a point where there is a lot of technology that exists. But we haven't implemented one probably because of funding. But I mean also to, I know our controllers get hammered a lot and it's not on them at all. You know you hear them clicking these 1970 keyboards. Or the fact they're having to stop go offline and pick up a telephone to communicate information to another controller. Because we can't even bring technologies into their lap. That allows them to give us simple you know touch the screen and flip a little bit of information to their controllers sitting next to them, without going offline on a telephone. So we've got to bring up our capabilities to what technologies we already have. That we just haven't been willing to pay for. But as far as the benefits obviously awareness and safety, anytime you get new information available is an increase. Decrease at the end of the day is one it costs to train. And that's the other side of it, is there's a cost to everything.”

“We've been talking about the fact that pilots now have iPads or other devices that they can take with them in the cockpit that enable us to see what's going on. So even if you're

GA if you have an iPad with ForeFlight on it you can do your flight planning, and you can do all that on there. It's been a while since I used it. So I don't know how advanced the capabilities are. Although I'm sure they've continued to improve it through time. So I'm wondering instead of spending money on whole new systems for air traffic controllers and flight service stations. Where you have everything hardwired. Is anybody looking at doing something similar in that particular arena, like we're doing with pilots in the cockpit?"

"Yeah I guess especially based on how difficult it is you know for the controllers to have time and what their primary task is. It looks to me like pursuing perhaps a couple of lines in the automated. One is the apps that would allow us to put things in through our flight bags and of course the communication section of that, getting that back to Earth is still an issue. But as [Participant]'s pointed out some of the outfits like spider tracks. Or others that are using the Iridium satellite system probably would make that possible today. And by the time you get his developed we may have Wi-Fi everywhere. And also in parallel to that I think this whole voice, the notion of actually being able to make a voice pilot report that is in some fashion automated might also get by. But the biggest thing I think is we shouldn't put all of our eggs in a single basket. The Part 121 world needs one set of solutions. That Part 135 and Part 91 are liable to need some different systems just because of the different operating environments that we're living in."

"...it's not going to be a priority for the FAA unless somebody gives a PIREP for like a wind shear or something like that. And it's not passed on. And then somebody crashes. Like after Delta 191, that's when we got the terminal Doppler weather radar at DFW. They're not going to spend the money."

"Okay technology, the newest technology and I love what I believe it was [Participant] said about the Waze app. I use and [Participant] this is one you might like for updated weather. There's an app called FBO Link. And as a corporate guy I'm able to, again if Wi-Fi's working, I'm able to bring up the weather the exact digital ATIS that's ahead of me. The problem is that's good for digital ATIS's but when you're looking at ASOS's and METAR, which I can also bring up. I'm not going to get any NOTAM information, or PIREP information or anything like that. Maybe there'd be a way that an app that simple could be upgraded or software updated. Where it can provide that data to the corporate and the private pilots that are out there flying around. So I see that as a big positive. I definitely see any kind of automation that takes pressure off of people helping [Participant] as a controller. Anything that takes that one less thing, it's still not going to take updated information which is what [Participant]'s going to say. As far as you know the instance. You know here's what's happening on final. Or you know we just got a wind shear. Obviously that's something that controllers are mandated by regs to do that and provide that information. As far as the negative sides of this obviously costs. Anything automated is going to add a cost somewhere. And you know the private sector, well everybody's going to complain about it. But basically it's really going to affect the GA guys and the private sectors. More so than the commercial end of it. It's going to affect them but it won't be as well accepted. And another one, I guess the learning curve would probably be the other side of it. You know I know from both being a controller and as a pilot and I would actually write in a PIREP format, short hand. So from a controller

stand point in speed I could do it much faster in that short hand. But I had to take the time to learn it initially.”

“The direction that I think they should go is to just utilize the technology advances of the last century. You know it seems like we're pretty far behind. And then smart workload practices to increase the quality and the quantity of submissions. And by that I mean there are so many barriers to submitting them into the system right now. That I feel like that they could really do a lot to kind of break those barriers down. And I think when you do that, it's going to naturally increase things. Instead of saying hey you guys need to submit more PIREPs. Just let the system kind of work and I think people will. Benefits of that I think is you'll get more PIREPs. And there's a potential safety benefit to that. Obviously since you're going to have better information. Issues with that is too much information becomes a distraction. And then like [Participant] said there's a cost and I'll use ADS-B as an example. Implementation of ADS-B is a huge cost to be borne by both private pilots and by the airlines. They hate it. Which is why they're so far behind. And then private pilots, old timers like me and people who aren't familiar with the technology. As these things go that direction they're going to be kind of left behind as far as like a training aspect goes.”

“I wasn't aware of the avionics of the airplane being able to pass that information back. That's great. So I would say just using the technology that we already have to also input information into the system. But it's still never going to replace actually asking a pilot what they're experiencing in the air. But I think it's a good direction. From a benefit stand point as a controller you're taken a task off my plate and you're now given me more frequency time because I'm not having to solicit these PIREPs. Costs is going to be a huge issue. And then also just information overload. So as long as it's a program that has that ability to kind of filter that information so that you're not inundated with PIREPs. Because then you become numb to them. You know I think it's just finding a happy medium in there. But I think it's a good direction that you're taken right now.”

“I think you know the biggest place for R&D is to updating/automate our abilities to submit PIREP information from everyone. With that flexibility to add [personalized] info. Like you said, smooth as frog's hair or whatever like that. It's kind of nice to not have to have just boxes to check. But if you want something specific that you can add in there that can be passed along and be relevant that'd be good. You know because that'd remove the middle man. And that middle man basically takes up time and adds task loading to everybody involved. So kind of automating it would be useful. But at the same time for the R&D when you automate stuff you're going to get a lot of information overload. So there needs to be a lot of research into combining, prioritizing, filtering all that information from the forecast, the observations, the PIREPs. The TAPS that come from the airplane. You know if you can kind of combine all those and get kind of a best juice, most relevant information out to folks. That's where I think the R&D should go, is taken all that information that we have, combining it and then filtering it into something useful. The benefits I think would be timely and relevant planning for a pilot. If we can see it on our thing we can look ahead. And if we see 200-miles ahead that there's weather or turbulence that we can avoid. We can start putting that submission in so that we're not overloading the air traffic controller. He can work us in with traffic, when it's most

convenient for them and we're happy, they're happy. And then obviously a modernized dissemination information. You get those PIREPs in your ACARS. They're really difficult to read and you have to kind of go out of your way to understand exactly what it's telling you. So a lot of those do get ignored. The issues obviously we've said, I've said information overload a lot. And I think that's a huge issue with a lot of information comes, you know, the tendency to ignore it because you're overloaded with too much stuff. And like [Participant] has said several times the technology is limited to our ability to connect. Or like [Participant] said our ability to reference it. If we're busy, we're not going to reference the information on our iPad. It's great. It might have good stuff for us but if we're not looking at it, it does us no good. That's the kind of two issues I see with it I think a good direction would be, one for identifying how the technology in 2020 now can help us in the cockpit. And the problem with that for one is the technology ranges in the different cockpits. finding a way to utilize the technology. To streamline and get up the communication, the information that we can use in a good amount of time. I think that would be a direction of trying to find a simplest way of communicating this through the technology to our aircraft. Two important benefits would be real time for one. And the second benefit I think kind of underlying is finding a way for like me, [Participant] and [Participant] to talk to each other. Maybe not voice to voice but you know if [Participant] submits a PIREP and I'm talking about in here, real time. Not talking to flight service. Not to talking through or looking at dispatch release or something like that. I think a direction to me just personally would be just trying to streamline the communication in the air in real time. What got me thinking about this was when you brought up the page about the AIRMET. If there's a 78 going through a NAT route above Greenland. how can I have access to that same information without asking the ATC? Or without getting in touch with that pilot in the meantime? Or as we're coming into approach if a guy goes around and I haven't talked to approach control yet. Is there any technology or any real time information where I can access the folder or somewhere through data link? Where you know last two aircraft have gone miss or something like that. Could ATC type that into a new streamline piece of technology where it talks to my aircraft? And I'm just kind of spit balling out right now. But I think the dissemination of information and the timeliness of it, would be a direction that I would recommend the R&D to go. The issues through it would be if it's coming from ATC, you guys are doing a lot, obviously in the terminal area along with the en-route area. But I'd be willing to guess that you guys are probably busier with specific tasks in the terminal area. And issue could be if we have to rely on that, that's one other thing that these guys have to do. You can train on it all you want. But if you're handling several aircraft and I am seeing conditions with a front moving through, I mean, there's a lot of things that you guys are looking at. That's different then what we're looking at. We're looking at one airplane. You guys are looking at fourteen/fifteen. So the issue would be task saturation of course. And the other issue would just be the timeliness of it. I mean if I get an ACARS saying that you know [Participant] went around and we're at the gate with the [GV running] that doesn't really mean anything to me because we got in. Sorry [Participant] you diverted. Let's just go home, we're getting there for sure. But I think there's a timeliness as a catch 22 and a two-sided of a coin there but that's what I feel the direction, me personally, that R&D can take it."

“...ensuring that reports can go in and come back right away to pilots. Because with PIREPs it's an instantaneous report and it does not do me a lot of good. Especially when I'm already flying. I'd like to have, even a half hour old PIREP. It doesn't really tell me what's going on. And whenever I'm trying to pick my way around weather in a plane that doesn't have radar or anything to tell me anything instantaneous. That's the best that I can get. So having something that isn't going through a million steps to go in and come back out to pilots is going to be crucial. Especially for the GA pilots.”

Conclusion

The main objective of the focus groups was to improve stakeholder understanding of the deficiencies in the PIREP system from the standpoint of the end-user populations – pilots and controllers. Notwithstanding the different ways these two populations interact with the system, the purpose of the focus groups was also to identify their shared experiences while participating in the system. During the discussions, pilots and controllers demonstrated their appreciation of the PIREPs significance for aviation safety and stressed the importance of PIREPs during all phases of flight and across the full spectrum of flight operations.

At the highest level, the issue of what constitutes a PIREP was very prominent during the discussions. More specifically, both pilots and controllers were genuinely surprised to hear that PIREPs were on decline and their feedback was remarkably consistent in that only what they called “official” PIREPs might be on decline. While controllers soliciting PIREPs or pilots filing PIREPs was not seen as a high priority task by either group of users, they were convinced that it is successfully accomplished in an informal manner, in real time, consistently and continuously by the use of voice radio communications between pilots and controllers. This very organic process of solicitation and immediate dissemination of weather information allows pilots and controllers to maintain a common awareness of the weather in the area and along the flight path.

Presently, the most contended and error-prone portion of the PIREP system was identified as the official entry/encoding of the information into the system that is currently in place for aviation weather product dissemination. The consensus among controller participants was that this bottleneck exists because of the lack of trained and qualified support personnel whose sole job is to complete this task in a timely manner without introducing errors, and it is the main reason for the perceived decline in quality and quantity of PIREPs. Furthermore, according to the controllers, in the past when dedicated personnel conducted the encoding /data-

entry task, many of the PIREP issues associated with errors and delays in dissemination did not exist.

One risk mitigating solution for this issue was recommended in the NTSB PIREP special investigation report as follows:

“Provide a reliable means of electronically accepting pilot weather reports directly from all users who are eligible to submit reports, and ensure that the system has the capacity to accept and make available all such reports to the National Airspace System” (National Transportation Safety Board, 2017).

Following is a summary of some of the many PIREP system improvement ideas proposed by the focus group participants:

- a) New and novel user interfaces and input modalities allowing for direct, near real-time, error-free entry of the information by qualified users,
- b) Utilization of datalink communications such as CPDLC,
- c) Dedicated, well-trained and qualified staff equipped with technology that supports easy-to-use and error-free entry of information,
- d) Utilization of artificial intelligence/machine learning, multi-modal input/output and natural language processing of the pilot-controller voice communications in lieu of the current information encoding/entry solutions,
- e) Implementation of a hybrid human-machine interface that allows automation to fill out known parameters such as aircraft type and GPS position while preserving the human elements of the current system such as first-hand observations and perceptions of magnitude of weather phenomena, and
- f) Continued education and training for pilots and controllers about the importance of PIREPs for aviation safety.

The results from the six PIREP end-user focus groups conducted by the AVS Aerospace Human Factors Research Division at CAMI strongly correlate with the NTSB’s special investigation report findings. Ultimately, the successful outcome of the PIREP system modernization will depend on how well this end-user feedback is incorporated into the PIREP system modernization road map under the leadership of the Federal Aviation Administration.

References

National Transportation Safety Board. (2017). *Improving pilot weather report submission and dissemination to benefit safety in the national airspace system* (Special Investigation Report No. NTSB/SIR-17/02 PB2017-101424).

Appendix A
“Going Around the Room”
(Participant Introductions)

Focus Group	Audio Transcription
1	My name is [Participant] in aviation industry for nearly 40 years. I started in the military. Then when I became in the FAA, I started at [city]. And from there went down to the [place]. And then I finished up my career in [city]. And from [city] after I retired as a controller I worked both in [city] as a contractor and also in [state] as a contractor. So I mean I just, I actually just finished. I'm glad to be back home finally.
1	I spent 27 years in [city] as a controller. Both in the Tower Cab and in the TRACON. Then I retired in 2010 and moved to [city]. I spent from here, I spent 2 years going back and forth to the Academy there in Oklahoma. I taught advanced radar techniques in the radar training facility there. Then I returned back here to [city] about a year after the [city] Air Traffic Control Tower opened. I landed a job there at [city] in a contract tower. And have been there for the past going on 7 years now. So I've been involved with that. I've also, I have a flight instructor, a multi-engine instructor. I worked with in simulators with recurrent training center that opened a spot down here in [city]. And I worked there for a couple of year. Given recurrent training, instrument training mostly to pilot's down here on simulators. So I'm familiar with both sides of the equation and I hope to be able to contribute.
1	Hey [Participant]. My name is [Participant]. I'm a pilot currently for [name] airlines. I'm a captain on the Embraer 145. Starting flying in '08. In [airline] academy now it has changed names, like three times since. Became an instructor there in the middle of '09 and taught there for about 2 years. This is my third airline. I went to [name] airlines. Flew there for about 1 1/2. Then moved to [name] airlines. Flew for them for about 4 1/2 years. And I've been with [airline] for 2 years. And that's about it. And I live in [city] right now near [city]. About 40 mins from [city].
1	Good morning. I started my aviation career a little over 20 years ago in the Marine Corps as a maintainer. And then started flight training about 20 years ago. I'm dual rated. Helicopters, airplanes, CFII both. All that good stuff. I fly full time now for the [city] Police Department. I fly their helicopters. I also do part-time instruction, airplanes. So all mine's pretty much from the pilot side. And then I am an Adjunct Professor at [name] University, specializing in aircraft accident investigation and safety management systems.
1	Well another [city] guy but I'm the [university name] guy instead. Went to [university name]. Was an instructor there. Got my Masters. And was a professor there briefly. Then I've been doing, spent 5 years working at [university name]. And then I've been a corporate pilot ever since then. Manage Part 91 flight department with a Citation Sovereign and a Citation 5.
1	Hey good morning. My name is [Participant] I've been flying something for a little over 20 years now. Started out in the Army both fixed and rotary wing. Did Medivac operations. VIP operations out of the Pentagon. Did Military reconnaissance. And now as I've exited the Army this is my first 121 company. So that's where we're at.

Focus Group	Audio Transcription
1	<p>Hey good morning everybody. Yeah [Participant], I also live here in the [city] area. I started flying in '93 with the Air Force. Spent 20 years with them flying Lear 35's and C141's, cargo aircraft. Retired in 2013. Did about a year of instructing up in [city]. Came back to [state]. Flew with the US Marshals Service here at [airport] for almost a year. Flew with the FAA at Flight Inspections, flight check, on the airport NAV aides and facilities for 2 years. And then for the last 2 years I have been flying with [name] Airlines. Also an [university name] graduate, so we're well represented here today.</p>
	<p>I'm a Captain on the 737 at [name] Airlines. I've been flying for 16 years or so. I've been with [airline] almost 5 years. Done everything from flight instructing. Medivac charter. Private charter. Been with [airline] and now [airline]. That's about it.</p>
2	<p>I'm [Participant]. I was Air Traffic Controller for 30 years. All in Terminal. I work at [city] TRACON and Tower. And ended my career in [city] TRACON and Tower.</p>
2	<p>My names [Participant] I'm a pilot. I've been a pilot for 25 years. I have a commercial license but I do only private flying for me and my family.</p>
2	<p>Okay I'm a pilot also but I've been an air traffic, well I'm retired now but I was an air traffic controller for 28 years. Worked at [city] airport. And then here at [city] TRACON. I'm a private pilot. Commercial helicopter pilot. Fixed wing pilot. And not a lot of hours, maybe 1800 hours something like that.</p>
2	<p>Good morning. I'm a pilot I fly 121. I've been doing 121 flying for 19 years. GA before that for about 5 years. And a lot of time in [city] so I'm sure I talked to [Participant] a couple of times.</p>
2	<p>I actually started out my career as a controller. I worked VFR Tower at [AFB]. Got hired by the [place] in 1978. So I'm dating myself. Came to [city] in '79 to start Terminal school and long story short, ended up doing many other things and I'm a CFII. I work mostly at [city]. But I free-lance all over town. So about 1800 hours and that's pretty much it for me.</p>
2	<p>I'm been flying, yeah I've been flying Part 121 for about 25 years. I was in the military prior to that. I've also flown, ran a corporate flight department for several years.</p>
2	<p>My name is [Participant]. I've been flying for about 20 years and 135, corporate 91. The last two years have been 121.</p>
2	<p>Hey how you doing. About 22 years of flying for me. I did 20 in the Air Force. The last 3 of which were working with the FAA doing flight check there in [city]. And just lasted 2 years doing commercial aviation.</p>

Focus Group	Audio Transcription
3	<p>Thank you. Good morning everybody. I'm talking to you from beautiful [state]. I'm about 5 hours south of [unintelligible]. And I am, been retired now from the FAA. I've spent nearly 50 years in aviation. I'm 72 years old. I started in my 20's in the Navy. Ended up in [state] because of the Navy from [city]. Worked in the Tower. Worked for [unintelligible] when they were building A7's and Air Tower after I got out of the military. Went to work for the FAA at [city] center. Spent 30 years at [city] center. Part of that time I was in the Southwest region for 5 years in quality assurance department. Working on different projects there. Worked with [Researcher] from [university name], [city] Nasa Research Center down there on some cockpit resource management projects. And I've been contracting since then. I've worked at Shepard Air Force as a contractor, involved in aviation. And then in [country]. And when I first went to [country] we were just working the traffic and it was air traffic in the 1930's and in the states because it was all non radar in the center environment. I do have a CTO. I am a pilot. Got about 1700 hours of the commercial multiple instrument ticket. But unfortunately, haven't flown in quite a while because it's gotten too expensive to do it on your own. And in the last part of [country] the last 3 1/2 years I was in [country] we were training [country] controllers. And I was in the center environment. Spent 2 years in [country] as a Tower manager in [city]. And then back to [city]. So got about 13 years in [country] off and on.</p>
3	<p>Hello everyone. I'm [Participant]. I'm a pilot. I've been a pilot since the late 90's. Military primarily. I was an active duty Marine for 24 years. I retired from the Marine Corps in 2015. And I started flying a Part 121 with [name] Airlines. I've got about 6500 hours total I think. I'm up here in [state].</p>
3	<p>Hi, I'm [Participant]. I'm an old guy, 64 years old. My flight instructors were Orville and Wilbur Wright. I kind of got into flying back in '79. Did a lot of private pilot flying stuff like that. I started a 135. And then got on with [airline]. And [airline]. And [Participant] I guess we're buddies because we merged with [airline]. I did 12 1/2 years as a first officer on a 737. Made it over to the left seat of the Airbus. And of course we all know what's going on right now [Participant]. So we'll see how the card drops and you know. Luckiest guy in the world, I've had a lot of fun opportunities. And flying's been one of them.</p>
3	<p>Good morning guys and lady. [Participant] out of, live in [city] currently. Just moving to [state] that's why I'm in the truck right now but. Started my flying career in the military as well. Similar to [Participant]. 1999 is when I went through pilot training. Retired in 2016. Started flying for [name] Airlines Part 121. I've been flying for those guys coming up on 4 years. Roughly 7,000 hours in the airplane. So it's kind of my background and my back story.</p>
3	<p>Yes hello guys. My name is [Participant]. I'm probably one of the newest around here. I started flying 2 years ago. I'm now a CFI. [university name]. And just starting to build my hours. I hopefully get into the airlines as soon as this crisis world-wide is over.</p>

Focus Group	Audio Transcription
3	Correct. So legally it's [Participant]. But my parents have called me [Participant] since I was born. Why? You'll have to ask them, I don't know. But I started flying in 2015 Part 61 in [city]. Got my private down there. I came to [university name] in 2017. Did some Part 141 work there. Progressed now through the flight instructor program where I've been hired on with them this winter. As well as teaching the UAS, drone course online, that we're launching tomorrow. Which is pretty exciting.
3	I am currently a pilot for [name] Airlines. Total time 10,000+. I have, I'm a holder of foreign A/B license. I did that at the beginning of my career, probably 20 years ago almost now. And I'm also the holder of CFI ratings. Ground instructor ratings. I instructed for a while. And currently flying the Airbus for [airline].
4	So I started flying in 1985. I flew in the Navy and the Navy Reserve for 19 years. And I've flown some GA. I mentioned earlier when we were talking before it started that I worked at a University. I was actually running a University aviation program. So I have some GA flying there. Not a lot, although I was there 8 years, it really wasn't my job to fly. But I did a little bit there. And I've been flying Part 121 since 2015. I'm currently flying, well supposed to be flying, a 737.
4	Hi my name is [Participant]. [airline] originally now [airline]. But started the career after college in general aviation. Constructing and charter flying from Cessna 150 all the way up to Cessna 402. And flew [airline], ATR's for [airline]. And the 727, DC9, 320, 330 and now the 350.
4	Hi, yeah I've been flying, started when I was about 16. Joined the National Guard. I was actually a mechanic on helicopters for a number of years. And then through college. And then also flight training in the military. Flew Apaches, Kiowa warriors, Cobras. And then went into their fixed wing programs with King Air, Citation up to the Gulfstream. Through that time with the guard I was a legislative representative focusing on aviation aspects that impacted the guard both Air Force and Army. And then now with [name] Airline for about 4 years flying the 737.
4	Hi. I started flying about 2007/2008. I went to [university name]. I graduated 2013. Did the whole CFI thing and then some aerial survey work after that. I'm currently at [airline] flew the Dash 8 and then captain on the 145 now.
4	I've been flying since 1978. I spent almost 30 years working at the [university name]. Working on satellite remote sensing, which was the excuse to learn to fly to collect data. Since then I fly a Cessna 185. And 2 aerial data collection. In addition to using it for travel.
4	Yeah I've been flying since 1986. I started out as a ramp rat as a kid at my local airport, hanging out there. So they finally started paying me with flights instead of money. It was cheaper for them to do that at that time. And I thought that was a better deal. Went to [university name]. Got all my ratings and certificates there. Mechanic and pilot. Spent some time flight instructing. Spent some time in South America doing Humanitarian type flights in and out of the jungles of South America. Then came to Alaska in '95. And have been flying here in Alaska doing off airport, primarily in a M7 Maule floats with ski's. And then a Cessna 206 on wheels year around.

Focus Group	Audio Transcription
4	Well my name is [Participant]. I worked in Air Force, I was an approach controller at [city]. My first facility for the FAA was [city]. I've worked in the tower and the approach control. Then I also worked at [city]. And I finished my career at [airport].
5	Yeah I'm with [name] Airlines. I'm based in [city]. Started out in [city] on the Super 80. And been here with [airline] for about 6 years. I'm not sure what more you want other than that.
5	I started out in the military as an air traffic controller. I did that for about 8 years. Then I went to flight school. Flew 217's in the Air Force. Then retired out of that. Went into the FAA. Was in the FAA as an Air Traffic Safety Inspector. And then went on to be aviation safety inspector. And then finally got picked up by [airline].
5	Hi, I'm [Participant]. [City]. Was an Optometrist prior to all this aviation stuff. Ended up joining the Army, in my early 30's after 9/11. Flew Chinooks and other fixed wing platforms in the Army. And then I've been bouncing around in the civilian sector for a while. Most recently [airline] for the last couple of years.
5	Okay I am [Participant], [Participant] down in [city]. 35 years air traffic controller. I retired back in 2011. I've been flying airplanes since 1985. Currently flying a Falcon 2000 for a company which is a 135 operation. That's about it. Nice and quiet like everyone else right now. But I'm still flying so I can't complain.
5	I'm sorry, I spent my entire career as a Terminal controller. I retired out of [city]. I worked [city], [city], [city], where I spent the bulk of my career. And then I retired out of [city] TRACON.
5	[Participant] I have unlike all of you, amazing people, I've just been a pilot. I started flying in the early 80's. I went to the commuters. I've been with [name] Airlines since January of '92. So that's 28 years.
5	I am a private pilot. I've had my license I guess for almost 3 years now but still pretty low hours. And yeah I've been flying for a long time, I grew up flying. But I've only been a private pilot now for about 3 years. Just small 152's, 172's most of my experience in.
5	Good morning. Yes [Participant] was a controller for 28 years. Spent my entire career in [city] Center en-route. Retired in 2016. Went out to the Academy and taught en-route in 2017. Worked for [company name] 2018 as a requirement specialist. 2019 went back out to the Academy taught Basics and en-route again. And right now I'm a training specialist at [city] Center. But right now waiting to come back to work.
5	Hi I'm [Participant]. I've been a pilot for about 20 years. 15 in the military in the Navy flying the E6B. And then I've been at [name] Airlines for almost 6 years. Currently live in [city] but I'm from [city]. So that's kind of close to [university name].
5	Hey I've been flying about like [Participant] about 20 years. I did 13 in the military flying KC-135's which is the old Boeing 707 airframe. And then decided to get out and come back to [city]. It's just where my family and my wife's family's from. And I got picked up by [airline]. And I've been flying for them for about 5 years now.
6	Good morning my name is [Participant]. How long have you been a pilot? It's been awhile. I fly 135. I used to fly 121, 91 and that'd be about it, I guess.

Focus Group	Audio Transcription
6	I'm a captain at a regional 121 carrier now. I flew 135 out of [city] before this. Professionally about 5 years. I was actually a dispatch before that, and before that I was a maintenance intern.
6	Good morning, my name is [Participant] everybody call me [Participant]. I joined the Air Force in 1980 and then air traffic controller every since. Been all over the world. Worked for, after I retired after 23 years in the Air Force, I worked for [city] air traffic control. Worked in [country] for like 7 years. And I work for the Air Force now as a controller at [name] Air Force Base. And I'll be retiring in 7 months.
6	I'm first officer for [airline] flying 737 right now. Previously retired Navy. Flew P3's and Metro liners in the Navy. And then defense contractor flying King Airs.
6	Okay, hi. I've been an air traffic controller for over 40 years. I was in the Air Force as an air traffic controller. I joined the FAA during the strike in 1982. I've been a controller in all three options. At the center, at a tower approach, as well as in the flight service station. I ran national training for the FAA as the national air traffic manager of training. Running all the programs even flight deck. I developed a flight deck program for the FAA as well as all the training that goes on at the Academy. I had oversight over the Academy. I retired in 2019 as supervisor program manager.
6	Hi, I'm [Participant]. I guess I'm the young one here. I'm still a student at [university name] in the flight program, commercial pilot working on my CFI. And most of my flying is ferry flying for a guy, a program out in [city].

Appendix B
Group 1 Questions
Transcription of Participants Responses

Focus Group	Audio Transcription
1	<p>This is [Participant], I guess I'll start. As far as, you know, I would say in my year and a half with the airlines I have submitted very few formal PIREPs. But it's a constant two-way conversation with air traffic control. Every time we check in with air traffic control we're asking what the rides are. What's up ahead in their sector? If it's not automatically given to us from air traffic control. You know quite often on departure, on arrival they'll ask what conditions are a ride as its changing. I think it's a constant conversation. So from a formal standpoint let me tell you, it's very rare. But from a practical standpoint, it's constant.</p>
1	<p>So I would say it's kind of like a combination of all. I was looking into it yesterday and a little bit and I would say it's outdated. The form kind of like outdated. It's a little bit cumbersome with the coding's. See most of the PIREPs I give before, it's like a very informal situation with the traffic controller. They just request pilot report and, you know, you tell them what you see outside. But you don't follow any format per se. You know when you give reports to the company talking to dispatch you also don't give him any formats you just tell them a brief ACARS message. And say hey you know you said on your paperwork that the ceilings here were at 2,000 feet and they are like 1400 feet. But there is no formality as far as I'm concerned in the whole time I've been flying. I mean I don't think I've ever filled out a proper PIREP in the whole time I've been flying. Maybe in flight school. Other than that it's been like really informal. And most of the times when you give this reports you're like so busy looking at the instruments. And you're shooting an approach. Or you're doing an arrival. And the last thing you want to do is go through a bunch of codes and slash and fill out a form. It's kind of more like whenever I have a chance I'll let you know what I'm seeing out here. That's like my two cents about it.</p>
1	<p>Yeah so I mean. I agree with [Participant]. You know at the high altitude environment which is where we spend most of our time. We're not really concerned with anything other than probably turbulence or winds. And anything that's urgent or relevant to our flight. And then like [Participant] said when it's actually significant like when we're down low. Things are busy. Radios are congested. And really, I mean, I'm not really paying attention to tops and bases. Unless I'm asked specifically to give information on that. Like if we're coming down, can you give a tops report and we're already in it, I'm like, I could give you a guess when we entered it. But I can't really tell you exactly. I mean give you a bases report when we come out of it. You know temperature and icing if their present. Most of the time we're not really concerned with PIREPs unless their relevant to our current flight or conditions that we're in.</p>

Focus Group	Audio Transcription
1	Well I found a different perspective on it. Both airplane and helicopter are a little different. So there's been several times where I'm like [Participant] I don't know if I've ever formally filled out a PIREP and sent it in. It's more informal like controllers asking questions. And I'll hear a controller at night and that's predominately when I fly. Ask when the airliners come in, hey can you give me tops and bases? And I'll just take it upon myself, I can fly up there and hover right at the base, and give them an exact AGL/NSL whatever their wanting. So we don't mind doing that. But I think that with technology now, even in my helicopter, I've got almost every bit of weather information I could want right there at my fingertips. And we do put a lot of weight into the PIREP as far wind shear and things like that on short final. But other than that I think we're really almost moving to where we're more dependency on avionics then we are each other.
1	I mean a lot of this kind of echo's what's already been said. Current medium and format, the website is cumbersome. You know that, that's nothing news. That's any government website is just, it's 1960's.
1	Avionics limitation for 121 environment, that's really nothing. I mean we've got everything we want. The submission process here and I think [Participant] touched on it. As well as some of the other guys did. The time to ask, for us anyway, we're doing this over and over. We fly multiple legs a day. The time to ask us what the tops and bases were, were not as you switching us over to departure control. You know if you want me to pay attention to something, ask me before I take off. Hey, pass along bases reports. Some controllers are getting better at that. Now the apparent problem with this is if we're busy, the controllers are busy too. So a lot of times if we don't have time or it's not asked. We don't have time to present it to the controller. Even then the frequencies are jammed up because the FAA's got overlapping frequencies and everybody's talking over each other. So there's quite a few problems with the submission process just in that, if you're trying to do it by radio. I mean trying to submit something from dispatch [laugh] yeah right. That would be my 2 1/2 cents worth on it.
1	Yeah I'd have to agree with everybody else. I haven't given a formal PIREP since either I was a student or instructing and having a student do one. Talking to controllers given everything that everyone else as talked about tops/bases, any icing. The most part all we care about is the turbulence and keeping the ride smooth for passengers. I think the submission system is outdated. Kind of like the NOTAM system. It needs completely refurb to make it more useful.

Focus Group	Audio Transcription
1	<p>As I looked a little bit at this last night, probably like some of the other guys did. I agree with everything they said earlier. That when you ask me for a PIREP, I know the informal process. In the Air Force there was a formal process because when I started flying 27 years ago. We didn't have an iPad. We didn't have real time information. There were a lot of time that you would submit a PIREP at altitude. The informal process where a controller asks me for bases/tops, winds or visibility yeah we do that all time. So does the FAA consider that a PIREP today? As far as the form goes, no. I don't know that I've ever filled a form out and submitted that to anyone. But I think PIREPs are still occurring in that informal process, in my mind. Whether that's en-route where I get a turbulence report, a tops report for a thunderstorm, mountain wave turbulence. You know pilots are still given that information. But a lot of it yeah, we all have real time information with our iPads in the cockpit today. And then when I come in for the approach or the arrival, whether it's the approach controller or the tower controllers that are asking for reports. I think we see that all the time. But an actual form submitted with the detailed information that's on the form now, I haven't done that, seen that if ever.</p>
2	<p>I try to make it a habit of doing it on cross country's especially with students. Three things. First of all I find them a great training device. Great training opportunity. Talking to Flight Service is like half way between using the radio for a non-controlled airfield but talking, and not talking to ATC. It's kind of a more friendly environment and my students basically fear two things. If your crosswind landings and talking to ATC. So I try to incorporate that but, um, and I use them on IFR flying if I'm on an extended cross country 2 1/2, 3 1/2 hours. Many times just out of boredom I will call them up, you know, get a pass from center and call these guys up. They do appreciate them and they are helpful. So that's just my feedback on that.</p>
2	<p>I can tell you from the 121 world if there is a deficiency I would say it's due to the avionics limitations. I mean we started using CPDLC. And I believe inside the CPDLC function through the ACARS we had the ability to set a report. For a typical 121 pilot, you know, talking to Flight Service we don't have time. And a lot of us probably don't remember how to do it. We're probably more scared then the student pilot talking to ATC to try and call out Flight Service and give a PIREP. We interact mostly with the controllers. I as a pilot assume if I tell an Atlanta controller that, you know, we have moderate icing in the decent he's going to fill out the, he or she's going to fill out that PIREP for us using the right format. So it's kind of as a pilot, I'm not concerned about the format because I know ATC does it for me. But it would be nice with the CPDLC to the FAA to increase the ability for us to just send a message to the center controllers as opposed to interrupting them. Because we know their busy. And I'm sure they deal with you know, pilots we're a rare breed. One guy thinks its light turbulence, the next guys calling it moderate chop. So it can really get confusing. You know what's your tolerance level with the icing? Do you consider it to be moderate? So the PIREPs are subjective at best. But it would be nice to have a format where we could just send it to them via ACARS. And alleviate having to bust up a radio frequency, you know.</p>

Focus Group	Audio Transcription
2	<p>Okay. Yeah as [Participant] was saying from the pilot aspect from the Avionics and the corporate jets all that stuff is just or laid onto the screens there. You can get all that data. You know it's all just uploaded. And then even in the 121 world in the 73, we have our EFB's that have all that. We have access to WSI. All that data's there. So I mean like as far as every time we check into an ATC center we get a ride report. They usually give us the update. They give us that real time data right then and it seems to be peer-to-peer almost as opposed to the work around. We're sending it in and then coming back to some other, to some other source as an opposed to so and so just saying hey, you're going to experience icing between 14 and 16 in the decent.</p>
2	<p>I was a CFI at point yeah. But I mean, its, and when you're supposed to do it if you encounter something that's not forecasted so for a big strategic view of your route when you're doing, when a captain's doing a preflight briefing or something like that, yeah absolutely, if there was turbulence that wasn't supposed to be there. You're supposed to report that and what not. But again, I'd be surprised if they didn't tell us that when we checked on with that sector. So yeah, that's all I got.</p>
2	<p>So I try to file a PIREP at least once a flight. I take a lot of 2 to 3 hour flights. And I use them extensively for my IFR flight planning and when I'm in the air using ForeFlight to look at the PIREP reports. I don't remember exactly the format from my training days. But I remember all of the parts that I need to send in so when I call flight service I'm basically giving them all the parts. I'm not sure if I give them in the right order. But they usually [have parts]. That's not a problem for me. The biggest problem I think is if you're on an IFR plan and the controllers busy its difficult sometimes to call up and ask for a few minutes to go off frequency and file a report. And another part of that is the, getting a hold of flight service from a VOR which is normally what I do. You know that doesn't always work. They don't always answer. Even on the frequencies that they're supposed to receive and send on. I don't always get an answer. So I maybe try two or three sometimes before I'll get an answer. And then sometimes you have to transmit at one frequency and listen on the VOR frequency. So it's, that could be simpler to do. And then my last, I guess complaint would be, I have satellite weather - I have all the forecasts. I can see everything. But every time I call up for a PIREP that want to know where I'm going and they want to give me an update on the weather that I don't need. And I need to get back on frequency. And so it would be nice if you call up and say I've got a PIREP for you, they take the PIREP, they say anything else you say no. You go back, it would take about half the time then it does right now.</p>
2	<p>Yeah I know they're trying to be helpful. So it's not like I want to, I want to get up and get after them. Because they're just trying to help. But I don't need to know about the segment or precipitation I'm here I can see it. So that's my biggest complaint about the submission process. Is it's more cumbersome then it needs to be.</p>

Focus Group	Audio Transcription
2	<p>I'd agree with a lot of the other points. Particularly with the 121 pilots. The idea of calling flight service is a thought that it probably rarely if ever comes up. It's the back and forth communication with the controllers. That's sort of the, I guess, the informal PIREP seems to get the job done. And anything more urgent like somebody mentioned we had just sort of assume it's going to get passed on down the line wherever it should go. The idea of having CPDLC to submit a PIREP certainly would be a good one. Particularly with the format thing, it's kind of like I think [Participant] was saying we know there's some specific format on how you're supposed to submit a PIREP. I'm kind of motivated to submit one but I don't really remember what that format is and I don't want to look like an idiot. So I forget it, I'll just move on. Probably not even getting around to doing it. Yes you know from our perspective we're getting the information we need and passing it on, at least we think we are through the controllers and flight services. It's one of those things you remember and not really sure how to do it if you really need to.</p>
2	<p>Alright. They were talking about, you know, let's say if we're in a TRACON environment and you're working somebody into a arrival sequence. We do give the information to the pilots especially I remember many times, especially here in Oklahoma you're working through a line of weather. You've got a gap. You're trying to work people through in/out the same gap. You know trying to avoid all the weather. As far as passing information to a controller, you know, I've got 10, 12, 15 airplanes we're working through weather. There's no way I can punch up, I have a direct line to flight service and I can punch in, but if I remember, I mean the forms used to sit there. 12 or 13 items. I know it starts with ceiling below 5,000 and its turbulence and wind. And thunderstorms, that type of stuff. You know I get the different reports on icing, light or greater if I remember right. But it's not something that a TRACON controller which is normally where a lot of the weather is. I mean I know, the guys who are flying commercial are up above for turbulence. But when you get down low and get into the weather, they don't have time. They're listening to us and we don't have time to call it in because we're working all them trying to get them through the weather. So it's kind of a catch 22. It's just, it's time pertinent thing, it's very difficult.</p>
3	<p>Well I was going to say we always talk about aviate, navigate and communicate, right? So PIREPs would fit down at the communicate level. So in terms of what a pilot needs to do, you know, to be effective and safe. It's the farthest thing down the list. And then on top of that the communicate would be talking to controllers and everything else that you have to do. So I mean, I just think the normal priority that we have established sets the first reason. Because I think the pilot monkey is busy doing a lot of things, you know, before that.</p>
3	<p>Airbus now back to 737 probably.</p>
3	<p>Yeah. We had it on the 73, you know, I think though with just in terms of workload and paying attention to what's going on I think a lot of times, you know, we'll just pass it along to controller and assume that the controller is going to put it in the system. But again, I can't speak for [Participant] but it'd be a function of how busy he is, right?</p>

Focus Group	Audio Transcription
3	Correct.
3	Correct.
3	<p>Sorry about that. I was just going to give you a break [Participant]. And just to walk through it. But to do that within the ACARS system requires you know shifting your focus away from primary flight displays and going kind of heads down into your ACARS. Punching it, if you have to go find the page. In the 737, I think [Participant] will concur with this. In the 737 that's a, you're 5 or 6 buttons away from that page. So this is not at the tip of your finger. And then you have to you know on a non-qwerty keypad right, just a straight alphabetically order keypad. Which is a little bit clumsy. So it's a workload thing. I mean it's going to take time out of doing other things. So it's not easy to do. It's much easier to report it on the radio. But now you're taken that same workload and putting it onto another person that's doing a whole bunch of other stuff that we don't know. So I always would prefer as a pilot to hand it off verbally to a controller because I don't have to do that big multi step process that I was just describing. Because it's cumbersome.</p>
3	<p>If I'm submitting a PIREP and if I wanted to make sure that the controller receives it, I haven't taught to proceed it by the words PIREP. Otherwise the controller and of course [Participant] can chime in. I have been taught that otherwise the controller can take it or leave it. If we use the word PIREP on the radio, then I was told that the controller is obligated to record it as such. That's one opinion or one comment. The second comment is it tends to be, it seems to, when PIREPs count the most is when both pilots and controllers are busy dodging weather or doing something that, their busy. Both of them. And of course PIREPs help pilots in real time. So sometimes by the time you have time to submit a PIREP, you know, you left the conditions you know 20 or 30 minutes later. Everybody is aware that there is weather. So I think it's a workload issue many times.</p>
3	<p>Yeah I was just going to chime in [Participant] kind of touched on that. But what [Participant] was saying too. It's based off workload and management right. So the crews it's a little bit more relaxed and there's probably more time to do the PIREPs and give those. You know I think we don't do it enough right. So I mean [unintelligible]. It's kind of one of things we probably ought to do it more often but, um, you know we kind of do it. And then I think, aren't the airplanes kind of starting to set up where they give their own PIREPs back to some ground control and then the disseminate appropriately?</p>
3	<p>I guess my question for [Participant] is to, you know, down low in the lower environments you know we're busy. And they'll always prep us with you know on roll-out when you have time can you give us conditions on final. What the ceiling was or whatever. But again I don't know how much information they want. Usually they want tops and bottoms. But I don't know you know if I pass it to tower do they pass it to departure and arrival control, who passes it to center? I don't know how far it goes out throughout the system. Or is it just for the tower's specific knowledge [unintelligible] minimums. There's some open questions for [Participant]. And I'm sure he'll address all those soon. Workload management has a key play in that to me.</p>

**Focus
Group****Audio Transcription**

- 3 Alright. From my standpoint being a pilot and because of automation. We get wrapped up with it makes it a lot easier to disseminate with the automation. But with just like with the pilots trying to find it. You've taken that workload and put additional on the pilot on the co-pilot in the cockpit. Who takes his focus away from flying the airplane and watching for traffic. Into trying to type something into a computer screen that's not a reference point that's easy to get to. From the controllers standpoint when a PIREP is passed to us, in the center environment, the manual control or D-side. And I don't know if most of you guys have been through a center or not. But normally they try to staff a position with 2 people. Sometimes that's not possible. Right now, I'm sure they're not doing it because of the amount of traffic that has cut back. But that assistant or D-side controller or manual control that works with the radar guy next to him. Has the access to be able to put that information right into a computer. That disseminates a PIREP based on the severity of the PIREP. Within a 100 mile radius of the occurrence, where that PIREP came from. In a terminal environment, it's transmitted. They've got to go to a different computer and enter it. And so the controller normally would probably give it to a supervisor in the Terminal environment. Who enters it in the computer? And it goes within a 50 mile radius of the terminal environment. And again being, trying to be timely, and I used to work the [city] the corner post system when I was at [city] center. When the weather's the worst and you need the PIREPs. Most of them never get out of the sector because you're talking to the pilots on the airplane that are coming into your sector and disseminating that information. And we used to give it then to supervisor who gave it to a national weather service guy who put it into the computer and it got disseminated. So the time somebody came into my sector let's say coming from [city]. Coming in at that time it was [city]. You might be in the sector for 20 minutes before you ever even knew a PIREP existed for that sector. And so there, sometimes there just not timely. When you need the information, the best information, it's going to be pilot talking to the controller and getting the information that's happening right there in that sector, at that time. I can tell you about information that happened 20 minutes ago but it doesn't, it's not timely. And I don't know that there's an easy way to do correct that. And again it's a workload thing. Because if you're busy working one the arrival sectors into [airport] and they all have their flow times that their traffic is heavy. And it's just a workload issue where you can't get that information in there and get it disseminated fast enough.
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Focus Group	Audio Transcription
3	<p>So [Participant] explained that this process on the controller side. So when a pilot submits a PIREP and he knows a lot more about the process. He knows a lot more than us pilots know, or definitely more than I know about the process. About the specifics of how long it takes for information in a PIREP to actually get to pilots that are dealing with whatever it may be. Whether it's ride or weather. But I think, like I know intuitively, that it takes a while. Even though I don't know the process really well. And I think pilots probably have that same intuition. So we kind of, we went into like the time and availability thing. But really, I think I have a bias about submitting a PIREP knowing that it might not be useful at that time. You know when it finally does get to those crews behind me. Unless they're on the frequency and I'm doing this verbally, sometimes I'll say it over the radio for the benefit of people that are in that sector on that frequency that I know are behind me. [Maybe we're not] line up to go to [airport] or something on an arrival. But I do still have a bias toward, is this really going to be worth me doing right now. Taken things away from pilot duties to try to get this activated within this system that this both cumbersome for me to do. And then it's a little, you know, there's a time lag and everything. And I think that maybe if I submit less PIREPs then I should, it's probably, it could be because of that bias not thinking it will be useful at the time. Just on my intuition.</p>
4	<p>Yep, I can start. Okay so let's talk history here for a little bit. If you don't mind just entertain me for a couple of minutes here. If you know this PIREP along with, I don't want to bring it in too much, but the terminal forecast as well as the airport forecast and the weather. It's antiquated from the FAA side. Because they are using acronyms and/or using short hand. Because in the old days the computers were not powerful enough to have the data available. And because of that they use their short hand. Which is fine, but in today's world, it's irrelevant. You know data's so cheap in a sense and that needs to be a little more user friendly I believe. And the same thing with the PIREP, needs to become much more user friendly for it be viable going forward. And as I explain when this environment where, [airline]'s case for example as I said we're coming up with our own PIREPs for our people to use. In much more efficiently then when FAA's involved in a sense. And I'm not saying FAA's bad. I'm just saying that there is your problem right there.</p>
4	<p>And that's my point.</p>
4	<p>Yeah one of the things that I've noted about it and coming to the data point being so cheap kind of hits to it. We've got a lot of tools available to us on the weather end. That's why you know the flight service stations have come pretty much obsolete. You know so we're looking at weather charts whether it be from a Jeppesen. Or WSI. Or whatever format that you're using with where you're working. That we're getting a lot of that data right in front of us in visual format that's, you know, in some cases that will include PIREPs. Sometimes it doesn't. But we're using a lot of that data right there as opposed to the PIREP system. So it reduces, some of the need for it. Even though that PIREP can easily be immediately important in certain environments. But we're getting a lot the data outside of the ATC system.</p>

Focus Group	Audio Transcription
4	<p>Now if I'm experiencing like a moderate to severe and I haven't seen it on any chart that I have. Yeah, immediately I'm going to report that as PIREP to whatever controller I'm with at that moment. Give them my location. Which they should have it right in front of the screen. And if it happened behind me, I'll adjust that location and the time and what I experienced. And what aircraft I'm in. Which there again, they should have that.</p>
4	<p>Alright so here's the way it works. Yesterday, I'll give you yesterday's flight. We were coming back from [overseas] back to [city], yesterday. We hit turbulence probably, I don't know, 3 hours into it. I was in the bunk, unfortunately, but what happens automatically without any input from the pilot itself. Data that's being generating by the airplane is sent directly to the company. And the company using that data can see that the aircraft is experiencing turbulence, on its own. So it will put data points along the route and/or the map where the turbulence is. And based on that and the weather pattern it will predict where the turbulence is going to be. This really, it's not as something yesterday, made it into an app. But it really started at Northwest Airlines. Back in the 60's they developed an internal, what they call a TP charge. Which is turbulence plot charge. And those were created manually by meteorologist along with the pilot inputs. But since then we've moved into technology where the new airbuses and even the Boeings generate so much data and send it back to the company. Then the company is utilizing this data to forecast where it's going to be going forward. And that is really useful tool. Because as I said, it presents it back to the pilots on their iPad in the cockpit. So you can see what's going to happen here. And it's almost a live feedback.</p>
4	<p>You can discriminate between a heading of 180 and 182 for example. A 2 degree off. You can discriminate that [small of a difference]. It's the same data that's being fed back to the company. So the company knows. They can tell me when something goes wrong with my system on the airplane before I even know about it, you know. So that's really interesting that they get that feedback. And we get the feedback right back, saying okay this the problem you're going to have. Or in this case turbulence. Or you know weather associated with it or what not. And I'll get you that information the person to contact to talk more in detail. Because to them I'm just an end user. There's more people involved that are on the other side where they're actually putting all the stuff together.</p>

Focus Group	Audio Transcription
4	<p>Just a couple of things. Just to kind of back up the previous comments. So we have an app at [airline] that does a couple of things. It presents the weather. Which you can see all, I fly Domestic pretty primarily, so you can see all across the country and at least in North America. I don't know how it works on other fleets. I suspect it does the same thing world-wide. But it gives us a visual presentation of all the weather. Another thing that this particular app does and I have to say it does not generate it very well. But it's similar to what [Participant] is talking about that [airline] has. Where it will actually give us a both an overlook view of where predicted turbulence is. And it will give us a vertical view of it also. Sometimes it works. Sometimes it doesn't. But at least it gives us something to start with. I think his name was [Participant] mentioned about calling in turbulence in particular when you run into it and it's not predicted. So we obviously do that. I think that's pretty common. You hear that on the radio a lot. And then there's one other program that we're experimenting with. It's actually only on 2 of our fleets. I know it's on the 737. And it might be on one of the other ones. These are actually not connected to the airplane per se. They're on our iPads. And this one actually will give you a graphic. You do the program on. And then it will automatically detect turbulence in the airplane. And transmit it through the internet connection on the airplane to other airplanes, to other people that have the iPads. And then you can see actually a track where an airplane has flown across whatever the distance it is and whatever area, where its color coded based on whether it's been smooth. Or there's been any kind of turbulence or chop. Or anything along the way. The one thing I will say about that is, it's actually very good in real time. The only thing is it tends to slightly inflate the turbulence that we're feeling in the airplane. Which is you know if you think about it you'd rather have it that way then the other way. So we have those things.</p>
4	<p>Okay, I'll go. I guess before I start talking I'm kind of curious [Participant] and [Participant] does your company systems get data back to the FAA so non-company aircraft can have access to that?</p>
4	<p>This is [Participant] speaking. I don't believe it goes back to the FAA. I could be wrong on that. And that's why once we get done with this today sometime, I'll find the right person and I'll forward it to [Moderator] and see what she can do with that stuff, talk with that person.</p>
4	<p>To answer the question, I'm pretty sure, almost positive that the first app I talked about does not communicate with the FAA. The other one could because I believe it's an off the shelf app.</p>
4	<p>Sky Path.</p>
4	<p>Because I can see tracks for aircraft when I have it on. I can see tracks for aircraft pretty much anywhere. And they're at all different kind of altitudes. So I suspect that they're just not [airline] aircraft. But just other people who have the app and are using it. But at this point I think an experiment for [airline] to see if it actually works. In my opinion, I think it works really well.</p>
4	<p>P A T H</p>

Focus Group	Audio Transcription
4	<p>I can tell you what happens up here in Alaska. We had a 121 carrier going out to the villages and they filed for chapter 11, as a result of the pandemic here. But most of what happens in Alaska is 135. And then there's Part 91 folks like [Participant] and myself. The 135 operators have their own discreet company frequency that they're talking amongst themselves. And the dispatchers will get some of that data. But most of the data is being shared intercompany out remote areas. And unless you know somebody for that company where they have given you the super-secret frequency, you don't know what they're talking about. You don't know what the weather's going to be when you try to get into [city]. And they're not telling flight service. And it's a competition thing like you guys have mentioned. If they can get it in and their competitor can't well they make the money and their competitor doesn't. The Part 91 guys like [Participant] and myself are out there trying to figure out, hey you know, I know there's a scheduled flight that goes out there every morning. Can somebody talk to them and get an idea of what's happening. So a lot of us have been able to figure out those frequencies. They've been shared with us even though the company sometimes don't appreciate that. But to be able to talk to the guys while we're out there doing the same thing. You're comment in the previous slide about the avionics limitations. I can tell you from my perspective I think the advancement of avionics in general aviation aircraft has been one of the coffin nails for PIREPs. Because now with an iPad and a ADS-B receiver I can get so much more weather information today, then I could even 5 years ago. And so I'm not talking to flight service, asking if there was somebody out there because I've already got some data on it now. I don't have all the data. I probably should be asking for pilot reports and giving pilot reports but it gives people a false sense of security. Because they've got more than they used to have so they think those are better. Well that are in some respects but they're not as they could be if we were still sharing PIREPs like we used to. And that's all.</p>
5	<p>I'm thinking that it's possible that, we now have so much access to weather with WSI, en-route and now we've got radar. We've got, we just have so much great information. A lot more than we did in the past. So that might be a reason why some pilots might not think to give a PIREP. The other thing that I thought was like, I fly the A320 and I do know that we have TAPS that are automatically being reported. So am I, maybe pilots are less likely to give a pilot report for turbulence knowing that we do have an automatic TAPS report. Those two things.</p>
5	<p>I'm sorry this is [Participant]. Just at [airline] we've got a flight operation bulletin. Its 3 pages long. And it talks about TAPS, turbulence, auto PIREPs. And it goes through and talks about how some 321's have it. It's an auto reporting. It spits out what the aircraft is currently experiencing. So it talks about 73, 757, 767 and Triple 7's all have this. And it says the TAPS of that report is an appropriate source of ride turbulence quality, to communicate expected inflight conditions to the flight crew. So that's in our bulletin. It goes into way more depth than that. Every 30 to 45 minutes is how it reports out. But it just kind of gives you an overview of how the program works. I hope that helps.</p>

Focus Group	Audio Transcription
5	I'm not sure. I know WSI. As [Participant] talked about WSI. The program we have on our iPads. Which if you're in a Wi-Fi equipped aircraft you can view, you know, fairly near time reports. So where ever WSI gathers that information, I'm not sure.
5	I don't know. I'll look at WSI while we're talking. Just to see if they talk about where they get the information from or if they publish it. I don't know if it's a public domain or not, I'm not sure.
5	No. As always if I would have kept quiet he would have said exactly what I was thinking of. It's just that on that WSI app I know you look at your route of flight and there's a little icon. You can click on and it'll tell if its light turbulence, moderate turbulence, severe turbulence all that stuff. And the only thing I'd add is it's automated so it comes from what the plane expects. And I found that when a plane auto reports light turbulence it's what we'd normally call more like moderate turbulence. It's a little more.
5	No, I don't think so. All I know is that if see a light turbulence TAP report that's usually when we're going to have the flight attendant sit down. Because it's going to be the point where it's bumpy enough to be dangerous to them. We don't definitely want passengers up and stuff that it'd be dangerous, when there's a light turbulence. Normally light turbulence for us, that's you know alright, we can still let them work in the back. We'll keep the seat belt sign on. But when the TAP's report light it's getting more into the dangerous air. Where it's not going to seriously injury anybody. But it can knock someone off their feet. And we're going to have everybody sit down for that. So it's not real, it doesn't match up with what a human would expect and what the computer on the plane thinks.

Focus Group	Audio Transcription
5	<p>Thinking about this from both angles. Both as being a controller receiving it and both as a pilot given it. As far as giving the turbulence I'm pretty quick at it. I agree with [Participant]. What we consider light turbulence is really more of a chop or something like that. Where I can only imagine what the automation is doing. I learned real quickly that severe turbulence is something that we don't want to report because it requires a maintenance check after we do it. I don't say severe anymore. But as far as passing PIREPs, I'm probably one of the worst pilots for that. Because I give it all the time. I check in given reports and stuff. Because I know how important it is to everybody out there. Now the controller in me, knows the truth of what happens. The truth of that is that I don't know how many times I have been so busy I get a PIREP and I quickly jot it down on a note. But I'm busy separating airplanes. So how long that note will sit there before I get it passed, is something that I know has been a big problem. And I'm talking about in very busy facilities. I've worked some really busy places. And I just remember that many times, not just myself but a lot of guys, you'll get these PIREPs. You'll jot it down. Or you'll get it but it goes away really quickly if you're trying to remember it. Because you're busy separating airplanes. I came in during the strike of '81. So actually a little bit before that. So a lot of times controllers we were working positions where we're basically covering what 3 people should have or more. There were times where I was covering 5 different frequencies. Just because there was no staffing. So PIREPs probably took a little bit less of a priority in my thoughts for the day, I mean for the moment. But I do agree they are important. When I could pass them, I'd pass them. I know every pilot on this thing has heard, hey I'm on a land-line. Well that was one of the landline calls that I would do to flight service. What they're doing now I don't know. I don't know if the staffing's gotten a little bit better. Or if it's still in the same situation. So as I look at it from both different angles those will help a little bit. The other thing to keep in mind, giving a PIREP to a controller in New York City is a whole lot different than giving a PIREP to a controller in Oklahoma City. And that may have a little bit to do with it too. Some guys are a little bit more fearful of talking to the controllers in New York versus the one in Oklahoma.</p>
6	<p>What I have to say about that is with the modern equipment you hardly know a PIREP is needed. Because you have that information. At least in my flight deck and all the electronics I have onboard. Like he said the constant back and forth information. We hear that and it complies with the information we have. So for us to report, you know, the use of the PIREP part of it, it's kind of double. You know like mountain wave, we've got that information already. Icing and all that. So it's when the other airlines or pilots talk about it we just nod our heads, yeah, that's right, that's right. And for us to report an issue we're usually at altitudes because of my flying, where 90% of the other pilots are not. So if we have mountain waves at 45,000 we don't report it for the very simple reason, I don't know what the guys down in the lower altitude, if it has any effect on them. So that's why we don't, we personally think it's for us, not so much. Thank you.</p>

Focus Group	Audio Transcription
6	<p>I agree with both of the guys. The up-to-date real time communication that we have with air traffic control. I think [Participant] mentioned this but we don't hear it on a frequency. We pass that information on to the second information and if we're picking up ice the type, the temperature. Cloud bases. Visibility on the approach. Things like that. The way that I've always thought about is that the actual submission process takes significantly longer than me just telling, you know, [Participant] or [Participant] you know hey bases 500-mile visibility. And that's what he'll give the next aircraft that's behind me. The constant communication I think is where the information is so vital. The actual submission process, I haven't actually submitted a formal PIREP. I don't even remember the last time I actually did that. I see what the dispatch release says. And see what the guys in the center building tell me. So as long as we get that information especially if it's in real time, especially if we're number two on the approach and a guy goes around saying you know we lost it at about a mile. I'm not going to wait to see what my ACARS says as we're coming in at 150-knots. But 1,000 feet off the ground I'm going to rely on that information that's passed to us timely. I think the biggest knock with the submission process for the PIREPs, it just, it takes time to go through the whole process. To get that into our flight deck. I'll tell you right now with my flight deck does not have the avionics that [Participant]'s probably has. And really the only way we can is through the ACARS or through [Participant] or [Participant]. So that's kind of my two cents on it.</p>
6	<p>Yeah I mean even with my plane which is going half the speed on approach than the rest of the guys are. It's a time thing. Whenever I care about PIREPs, I mean, it's mostly going to be on approaches, close to the ground. That's when I'm most worried about it. And air traffic controls talking to a million guys at once going in. I'm trying to concentrate on what I'm doing. I don't really have time to go through like a formal process to submitting this PIREP. Whenever I'm in like a critical state of flight.</p>
6	<p>Okay I was just talking from a controller's perspective about PIREPs and I'm agreeing with them. That the stuff they get the real time is a lot better than the stuff they'd be receiving over the process of email but through the system. But the system is so redundant it takes forever to get a PIREP through the system. At [airport] we got military and a joint with the FAA and we've got two systems that don't work together. Which probably a lot of other airports are the same way. Plus we have to call our weather system. Have to put it in. And then our weather system has to get it from the guys in the tower. And then we get it from the pilots. And there can be a lot of inaccuracy done during that whole process. So it's kind of redundant. The best thing for them is to listen over the frequency and then talk to each other.</p>

Appendix C
Group 2 Questions
Transcription of Participants Responses

**Focus
Group****Audio Transcription**

1 I just want to go back to the submission process. Like if we had a way too automatically or electronically submit a PIREP. Kind of similar to how we can, can ACARS a position report. I mean that would definitely be a lot easier and faster than trying to give it to a controller. I mean unless they ask for it, their typically uninterested. Like if I come up and say hey I got a PIREP for you. They're like, uh, okay. So if there is a way to electronically do it. I think you would see a lot more for sure.

1 So I would say that the PIREPs for me, as a 121 airline pilot, would be extremely important. Because for me the best way to know how the ride's going to be, is to ask the guy 40 miles or 30 miles ahead. And if that guys not reporting, you know, some people make fun of [airline] airlines a smooth ride and all that stuff. But I like that their consistent on reporting and telling people, hey what's going on around here. When the dispatcher gives me a flight release and I look it and I know that it's going to be very low minimums in the airport. My best source of information is the pilot reports. So I want to know, I want to call physically if I could call the tower and say hey, how many airplanes have you gotten in? What are their true reports? So now with that being said. Do we get more information? Or are we getting back where we invest in the PIREPs? Really it doesn't matter if it is relevant to the operation. There is people that would give you a PIREP when like, clear skies and no wind. I say oh, I have a PIREP. Well you know, I don't know, maybe you're in training but that's crazy. Now when I'm busy I don't want to know anything about PIREPs. Because I want to land and get the job done safely. I don't want to report because you're busy. Now after the fact, if they ask for it, if I remember. Because I tell you what, I don't know many pilots that have a great long term memory. Like my memory is super short. Like I can memorize and regurgitate stuff hours. But then a week later I'll be like, I don't know what you're talking about. So I might know exactly what the ceilings were but 30 seconds later I'd be like no I don't know if they were 2,000 or 1,500 I don't remember. So it's kind of like the timing of the request is very important. The side to ratios is very important. And it's crazy how much of the stuff goes missing in action. Like stuff that should be reported, like a gain or loss, talking about wind shear on approach. A lot of people don't report that, you know what I'm saying.

**Focus
Group****Audio Transcription**

- 1 Well I think that part of the issue is like everybody's kind of chimed in on is, is the controller asking during task saturation points. If somebody's coming down to minimums. The last thing on their mind is oh well I need to remember where my bases are or I need to remember this. Their trying to land an aircraft safely and I think kind of what [Participant] said. That's the last thing on their mind. After they land you can even ask them and you're going to get four different answers. Because they were so saturated with doing their job at the time. That they weren't thinking about given information. At the same sense they love it when the pilot ahead of them gives that information. So it's kind of a double edged sword in that way. What I've seen over my time here in [city]. We have great controllers and they're always training. So it gives us a different environment there. But there's times that they are so busy where you want to give a PIREP. But you don't want to break in for a 5 minute dissertation on what the bases and ceilings and everything else is. When they've got 4 people in the pattern and 2 heavy's on final, etc. And then sometimes it's the, yeah okay I didn't ask for that, let's move on. So I think it's just the reality of when we're asking for those PIREPs you're trying to get a guy 500, 800, 1,000 feet off the deck to tell you what it's like. And he's just trying to get down to where he can see the airport. So I think it's a little bit of that. And I think it's a little bit of we don't when exactly, should we give the controller a PIREP even though they didn't ask for it? And do you want the whole spill? Or sometimes [air traffic\unintelligible] will come in wind shear 50-knots at a thousand feet. Very simple but not everything that's requested on a standard PIREP.
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Focus Group	Audio Transcription
1	<p>I've got two examples ongoing and this is recent examples that speak to these 3 points on the slide here. And I will say it's definitely task saturation on both ends of the spectrum with the controllers. And it's attempting to submit good information at appropriate times and disseminating that information where it's usable. The end of the runway aircraft takes off in front. Now no other weather reports. No tower reports. No wind shear system activation. Nothing, would be, believed to be a bad day. Just some low ceilings. Airplane takes off out in front makes the statement before they switch over to departure. Hey, we had wind shear system caution on takeoff. No other information, nothing. Didn't see a dang thing. Controller then quarry. Nothing else was said. A query was made to the air traffic control, hey, was there any other information with that? Could there be information? Nope. Wind shear caution was reported on takeoff, clear for takeoff. Have a nice day. Alright. Well with no other information you know what are you going to do. Sit there and go well maybe I can wait. Yeah but absolutely nothing in the reports. Nothing on the information that I had in front of me. Nothing said, hey, it's really ugly out there. Aircraft have system activations that are wrong, a lot. Our aircraft do that quite often. So what you takeoff and find is severe turbulence takeoff. That was not reported. Nor was it disseminated. Another time where it was an issue of, I'm not sure if it was task saturation on the ground. But putting in information and not getting back what you thought you were going to get back. Is submitting a PIREP to a tower, prior to approach. And having that tower argue with you of what you were telling them. I mean, I gave them a full report, a PIREP of what weather conditions was experiencing on the way down. Because departure and arrival asked for it. Now as I make that report to the tower. The tower argues with me with what I'm telling them. That's one of the issues.</p>
1	<p>Yeah I'd say PIREPs aren't declining. It's the formal PIREPs that are declining that's what we're all talking about. It's just a matter of communication back and forth. Once we shut the cockpit door. We're done. Our flights over with. Who cares about the next plane coming in? So I think formal PIREPs aren't given very often. But just informal, hey, this is what we got. What's going on with the plane 30 miles in front of us? We do that daily.</p>
1	<p>Yeah I agree with exactly what [Participant] just said. I feel like pilots are talking to controllers routinely en-route and on approach informally. With things that are maybe slightly different then what the weather brief said. Or just so the next guy in front and behind have some idea what they're experiencing right now. I think that happens all time.</p>

**Focus
Group****Audio Transcription**

- 2 I agree with what [Participant] just said. It's time consuming. But at the same time that form that he's talking about is sitting there right there where you're working. And not everything on that form needs to be filled out at every single time. So if icing is what's important or if turbulence is more important or pertinent at that time that's what you jot down, if you have time to jot it down. And then you give that to some other person to give it to flight service to put it in the system. So the actual controller from my experience is not the one that actually put it in, he takes it down and uses it to get people through holes or weather and things like that. But he's not actually inputting in the system. You don't have time to do it anyway. The other thing is, like again, I just want to reiterate when you're given that information that you think as a pilot is pertinent to the controller, he's taken that to give it to the guy that's coming behind you because you're already experiencing what you're experiencing. The guy that's coming behind you so that he knows what exactly you're doing. Because it may look like we're taken you through something that's horrible but we're doing it because the last few people who have went that way, said it was a successful route.
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- 2 Yeah I agree. I think on the commercial side are those guys flying 121, uh, you know just comes down to you know, ease of sending in the information. I mean certainly we see some of it on WSI. And I'll look at it along the way and take advantage of what other people's PIREPs have said. Mainly looking at turbulence and what have you at altitude. You know and just seeing what's going on down below. But you know with CPDLC or an interface on an EFB since that seems like what everybody's doing now would make it a lot easier. You know we're not carrying around paper anymore where I just grab the flight information handbook next to me and I think it used to be on the back cover or just inside one of the covers. Here's my format and here I go. I mean since we've gone to the EFB even on the military side whatever it's been 10 years ago. I mean nobody got that ready access and honestly I probably have never looked for it on my EFB to see if the company provides that for me to find it. So you know, just making an easier way to transmit the information. And then like [Participant] and [Participant] are saying, you know, quite often I'll try to figure out whose ahead of me and when they make a report I go okay, I got to go through that. Or you know and just kind of listen up on the radio, so you're kind of pulling in your own information even if they forget to relay it to you. But all in all I think maybe just an easier way to transmit the information in. That will get reflected on a system like WSI where you can, you know, you can zoom in and see what you're interested in.
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- 2 I'd have to say I've never had trouble with the format because no matter what I'm reporting I've never had anybody complain that I didn't include anything, put in the wrong order. They're just happy to have them so I've never gotten any complaints about, I wouldn't consider the format to really be an issue. Flight service doesn't seem to mind one way or another.
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**Focus
Group****Audio Transcription**

- 2 So, I don't know I mean I do use PIREPs a lot. And that's why I try to put back into the system. It's frustrating that there's not more of them. Especially top reports because I'm in the 210, I've got [unintelligible] ice but I still don't like flying in ice. So it would be nice if there were more. I don't mind putting in what I do and getting back what I do. The reason I don't file more is not due to task saturation. Because normally an IFR flights, once in you're in cruise mode, you're just there, you're kind of monitoring everything so you've got time. If there's time on frequency it's usually not a problem. Again it's more of an issue of trying to get flight service to answer. Finding the VOR you need. In terms of feedback one of the coolest things ever is when you put a PIREP in and then 10 minutes later it shows up on your EFB. And that's really cool. But that happens maybe 1 in 10 times. Will I see my PIREP before I land? And so, it doesn't happen very often, I don't know what that is but it's probably 10 maybe 20% of the time that I see a PIREP an hour, hour and a half after I've uploaded it. So I don't think there is an issue there. I don't know where that issue lies.
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- 2 I was just going to say and this is I realize is going to sound almost very selfish in a way but you know for the 121 flying most of the PIREPs just aren't relevant. I mean we're going anyway and unless it's something urgent, um, severe turbulence or icing, it just frankly it doesn't matter all that much. I mean it's certainly nice to know in terms of ride reports and things but it's just not something we need or have a lot of use for and then so that turns into not really participating much since we're not using it. It's really not on the top of our brain. And we're not thinking about submitting them for others who certainly could benefit from it. Just like you said the loss of interest maybe because that information is coming from other places. Or it's just not relevant to your type of flying. Again, I realize that sounds selfish and it probably is. But I think there's probably a lot of that.
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**Focus
Group****Audio Transcription**

- 2 I agree with exactly what he's saying. I'm a fixed wing pilot also. And I travel out to [city], I fly a Lancair so we're at 10, 11, 12,000 feet and I remember many times you pass the, you go through [city] there you've got the pass. And that's famous for low level wind turbulence through the pass there and you know I rely on pilot reports. I try to give them. You can give them a lot better and I know several people mentioned it especially [Participant], you know, you can do it when you're en-route and traveling. And you do rely on them as far as turbulence, winds. A lot of that stuff going on especially for VFR pilots but the guys who are flying commercial like he's talking about their up above most of that unless its severe and that's going to show up on SIGMETs and AIRMETs and all that. You know you go into ForeFlight which I use for my gathering of information normally. That's all there, it's all marked out. Easily readable. You know but when you get down into nasty weather and you're trying to work into an approach control. Going offline to get a pilot report that's probably not the same as it was 5 minutes ago because you've got, you live in [city], you know how the weather moves through here 40 to 50 miles an hour, its constantly changing. I don't think a PIREP really would give you a good representation when you're right in the thick of bad weather. It is great for en-route but as far as instantaneous information to make a decision on where you're going is. I don't know that it's that pertinent. I don't know if they can do it that quick or not.
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- 2 Yeah I agree with what [Participant] said. From the 121 perspective I mean, the airlines in general have evolved so much and it's starting to embrace the technology. As a commercial pilot a 121 pilot I have a dispatcher, a meteorologist, and 700 company airplanes in the air at the same time. So again these reports are subjective. So as a 737 pilot I would rather hear from another 737 guy. Is it really moderate turbulence? Is it really severe? You know and again the only things that we're really concerned about are icing and turbulence. And mountain wave if you're going that direction. The rest of it is irrelevant. So I just feel like the airlines have kind of taken that step and we've put it in our own back yard. And we're just dealing directly with our dispatches and our meteorologists and other pilots.
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**Focus
Group****Audio Transcription**

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As I'm listening to the 91 guys talk about how they utilize pilot reports. Make me think about from a preflight stand point. Where you're getting your weather packet. And you're downloading it and you're looking at it as like a strategic view. We get weather packets. And we do review that kind of stuff. The subjective nature of as I think [Participant] said or [Participant] that you get a pilot report of like moderate to severe turbulence. Well that pings on everybody's radar. Because that's, you've got to avoid that. Now you're looking to see what type of aircraft that was. And how high they were. And then, like okay, now you have to make that judgment call whether you're going to you know ignore that or make you know, so then you take on that responsibility. Okay that was somebody in a Cherokee saying it was severe turbulence, well okay, that's not relevant to us but. And then you see almost like a traffic everybody shift, you know, the whole, I mean the ATC guys can say this better. As one report comes in and everybody's like okay, well I guess we're all going this way now because somebody said that was, everybody was a little rougher and then. But the, the other aspect was the peer-to-peer where the 121 guys are talking about just, soon they're going to get that information, but for the GA guys if in those moments where those PIREPs are the most pertinent and that information is the most important you're also task saturated as well. You're, now you're in the icing, you want to know how far this icing goes. All the weather data would have shown you that stuff prior to your departure most likely anything big. But those things are like oh my gosh what do I need to do? Where is that information coming from? I agree that's just going to come straight from me TC. They're like yeah, we just had a plane come through there, you're going to break out at 500 feet. Are you going to be down in your EFB looking for a PIREP to pull that out. Or are you going to ask ATC, hey was there anybody PIREPs, and they're like no but the last person who flew through this sector just said that will end in 5 minutes. And you're like oh okay. So the same information gets passed along but it's real time and it's also affect you in a way that you're going to be able to simulate it during a more higher workload moment.

Focus Group	Audio Transcription
3	<p>Fantastic. Alright. So from the Part 61 and training world. I feel like approach, or whoever, I'm talking to never really cares about what I'm saying. So for me, flying in the GA world, knowing where the bases and tops are of just a decent cloud [unintelligible] is important to me. Because if I'm on the ground looking to see if I want to go fly or not. And someone reports a PIREP that the clouds are low or higher than forecast. Or that are reporting on the METAR. Then that will help determine if I'm going to go or not. So I'll be flying into Oak City and I'll be talking to approach and I'll say, tops 6500. Bases 2000. Or whatever they maybe. And I feel like approach whenever they're replying say roger or whatever. They don't really care. And I feel like it's not going anywhere. And so as a pilot, I feel discouraged to submit them if I feel like they aren't going to be beneficial to anybody. Or get entered into the system. Because the jets coming in after me that are on the frequency already aren't going to care if the bases are at 2,000. But a little Piper coming out of David Jay Perry might, that might make a difference for them whether they're going to fly or not. So I think the biggest thing for me is, is feeling that the PIREPs that I submit aren't going anywhere. And they're just getting thrown in the trash before they can do any good.</p>
3	<p>Okay from [Participant]'s standpoint and also for [Participant]. As a controller, working a sector, I want your PIREPs, okay. Because whether it's, whether you think it's getting disseminated beyond right there or not, or who it's going to affect coming in. It affects me because I can say, let's say [Participant] inbound over, coming into DFW. Coming in at the time Blue Ridge. Hey I got moderate turbulence at 20,000 descending down through. I want to be able to tell my other arrival's that are coming in so and so encountered moderate turbulence between 20,000 and 16,000 on the descent. That's going to allow him to configure his airplane correctly for the best ride to get down through that. Power settings, etc. From [Participant]'s standpoint, I want to know about the, again about tops and bottoms. Because I can't tell you how many times I've got general aviation pilots caught in weather. I need to know the tops. I need to know there's holes here or whatever. While you might feel that without getting disseminated any further. Or we have the, the controller may not be as responsive to your report as you think he should be. The information is used to be, to let everybody know what is happening. So I want to know the tops are 10,000 feet over here. And I got some guy caught on top of it at 12,000 who's a VFR only pilot. And I'm trying to find a place to get him into an airport. Or get him down through weather or through the clouds. So it, the information's important. Again, how it's disseminated and whether it gets passed to the sector. That is a, it's just like, is the pilot going to make the report? Is the controller think it's significant enough to pass it on? I guarantee you if it says, severe weather. Extreme turbulence or something like that. They're required to do it. And, it's important. So it gets disseminated. And even if it takes longer to get disseminated from the airlines standpoint you're thinking it's not going to help anybody coming behind you. Because it takes too long to get disseminated. That control that's working that position, it helps him to pass the information to traffic behind you.</p>

Focus Group	Audio Transcription
3	<p>Yes I just wanted to talk a little bit about what [Participant] said. But from the training world just coming out of it. I think that we're not taught how we should handle PIREPS. Because in ground school you're taught a PIREP and I don't know like all the 9-10 steps you need to include in your information when submitting a PIREP. And then as a pilot that you're just a student, you're starting to fly and like you've said already aviate, navigate, communicate. It's the last of your priorities. But as I've come along in my training I've had several incidences with [city] approach. Where they actually asked me just, what are the tops? What are the bases? And just saying one piece of information is enough for them you know. You don't, as a student, they teach you that you have to go through, what type of aircraft? Where you're at? What time? And really as a pilot you don't have the time to think about all of that. So I've had a lot of incidences where just controllers ask me okay, when did you breakout when you were doing your instrument approach? Or something like that. And I've heard the controller just tell the next plane behind me, okay, the previous plane broke out at I don't know, a 1,000 feet above minimum. Something like that. And my instrument instructor actually was the one who encouraged me to do just saying a little bit about what the weather, of course if it's relevant. But just telling ATC when you're broke out on your instrument approach for example, that's a good, enough information for a controller to know.</p>
3	<p>Just like [Participant] mentioned I don't think PIREPs that are something that are going to go more like official. Where you're just going to record all that information. Because it just takes a lot of time. And in aviation especially when there's weather that's when you have the least time. But it's something more like word to mouth information. Just letting all the controller, all the pilots in the area will know. And then its knowledge the controller can use himself to vector traffic around weather or things like that.</p>
3	<p>I was just going to ask [Participant] that, you know, sometimes we'll be going Trans Con and you'll be getting your kidney stones rattled loose and you're checking in with the next sector and the controller. You know you'll say, 'hey. how's the ride?' and they'll say. 'well, I just kind of sat down.' So when a controller comes into briefing to replace another guy. I mean obviously it's important that you know the airplanes, what's going on the screen that sends you the airplanes. But what's the requirement to pass along ride reports or stuff from the one controller to the next controller that's seating down? Like for break time.</p>

**Focus
Group****Audio Transcription**

- 3 When the controller takes over a sector. We have a check list that we go, that we're supposed to go through. And one of the issues is PIREPS, weather reports. And of course you talk about traffic. And invariably trying to get into a sector, you're trying to get, this happens probably more at shift change time than any time. But you're trying to get in there. The sectors busy. You're working one of the arrival fixes into [airport] during the push, time for shift change. And somebody forgets something. Or they try to get it there and okay, I got it. They're watching the traffic. But they don't get all the information about the ride reports. Or tops. Or bottoms. And stuff like that. They see the traffic. They know whose going to what altitudes. But they don't have the report. Maybe that the controller that they're relieving didn't give it to them. He should have asked. Again, there's a checklist they're supposed to follow. It's in our point 65 that we use.
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- 3 Oh okay. Reference what [Participant] just said a few moments ago. We will normally do a 15 minute pre-brief prior to going up as far as the tower is concerned. Prior to going up and assuming the position. So we are aware of all the weather information. The status of the runway. Traffic in the area and so forth. So if there is a current PIREP that information is going to be given to us prior to going up and assuming the position up there. So we're going to have all of that information right then and there. From a controller standpoint and a pilot standpoint to me common sense would dictate that if the weather is bad. If I'm assuming a position regardless of whether or not I just got the PIREP information during the pre-brief. When I get into position and if I'm clearing an aircraft for takeoff or whatever the case may be. If the weather is bad, I'm going to ask for information regarding that pilot's flight, if it is an arrival aircraft. Or if it's a departing aircraft, ask him to give me a PIREP as soon as possible once he gets airborne. Requesting the flight visibility. Requesting the tops and the bottoms of the cloud. And as soon as I get that information then I'm going to forward it to the weather station so that they can put it out. Then I'm going to inform any other aircraft inbound or outbound about that information that I just got.
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Focus Group	Audio Transcription
4	<p>Yeah I'd like to add to that. And of course the cases [Participant] and I are talking about are in Alaska. Which we realize is a special subset of the national airspace system. But number 1 you've got to be within range of a radio transmitter to talk to. In our case flight service. Most of the areas we're flying don't have radar. Therefore, ATC isn't really in the busy of providing VFR flight following because they can't see us. But then pilots have to offer the pilot reports. And I suspect that for some of the reasons [Participant]'s identified is part of why. If you feel like you have a situational awareness because you can see weather on your iPad. You're maybe less inclined to call and offer information. I'll also add that flight service, the last few years, flight service has been making an effort to solicit flight plans or pilot reports but it's pretty much been when you've opened a flight plan and you're still 5 minutes away from your departure point. Not in the middle of a route. I can't think of the last time I was actually solicited for a pilot report somewhere meaningful. And I think that's an issue. And then finally flight service has to capture the information accurately. And a few days ago I filed a pilot report 13 miles south of the [city] airport. And it was filed as a pilot report 13 miles south of the NDB. So those are just a few of the issues involved in making this system work.</p>
4	<p>Kind of segue into what [Participant] just said. You know, I think part of the reason the PIREPs are not as [unintelligible] because I don't believe. Look I've been flying for about 30 years. I can remember the controllers asking for PIREPs much more in the past than these days. Lot less request for the tops. Or winds and altitude. Or turbulence. Or any of that. Prodding the pilots to give them the information. You've seen less and less as time as progressed forward, I can see that. And I don't know if that plays into it. That's why the PIREPs have become less responsive. But along with it what I was just talking about earlier. This flight weather viewer that we have, well we have the data so we don't need to ask for it from a controller in a sense. So there's a little bit of disconnect there. So there's multiple things playing into this whole thing. Where the asking, the ask is not there. So there's no response. And there's no response because we got the data already so we don't need it you know. So it's a, I don't know. It's a multiple, multifaceted issue problem, whatever you want to call it.</p>
4	<p>I was going to piggyback again on what you said earlier [Participant] and I really like what you just said. There is a lot of communication going on with regard to the weather. I think it's primarily the things that you just mentioned though. It seems to focus almost entirely, at least in our Part 121 on two things. Turbulence and icing. And the other thing that you mentioned before it's actually not unusual for instance, flying out of [city] if there's any kind of weather for the departure controller to ask you for bottoms and tops. And then a lot of different locations if there's weather going through major airports if you're on approach the tower will ask you for, you know, where were the bottoms? Where did you break out? That sort of thing. So those things happen in real time all the time.</p>

Focus Group	Audio Transcription
4	Well what I was saying was you know you're right. It's in real time data. One of the things that we were taught in training and this is being harped on pretty much across the fleet at [airline] at least. Is that if you want to report whether it be turbulence or you know speed fluctuations, whatever. You have to actually tell the controller a PIREP. Because if you don't say PIREP it really doesn't show up as a PIREP quote unquote. So if we have a loss of airspeed on takeoff for example due to microburst or whatever it doesn't matter. Unless you say PIREP, they might disseminate it to local aircraft or the aircraft that is about to go through the same area. But it won't show up as a PIREP unless you absolutely mention PIREP. And that might be some of the issues as well.
4	Yeah it's the same kind of piggy back to what their saying. I think that official/non-official is a big caveat in all of this. Because even, not just beyond the turbulence and the icing. But even coming in on approach in lower ceilings. You know we'll give that information to the tower and usually within minutes I'll notice that it pops up in another report for that field. Instead of just the hourly. So it's getting out there I just don't think it's in that form of a formal PIREP that's popping up in places.
4	Yeah I guess piggy backing off what these guys said. I feel like I'm slightly at a disadvantage behind a regional and plus I'm fleet. That does not have Wi-Fi at all or NDSB or anything like that. We have to get all of our information on the ground first from Jepps, WSI or dispatch. And then once we're in the air we're kind of on our own with ATC or dispatch I would say. So I feel like I do try and give reports when we can. Also being at a regional definitely task saturated. Having shorter flights. Versus coast to coast, you know stuff like that. So we're much busier compared I guess a major you know. So trying to takeoff and set up stuff like that as we're getting our data out. I feel like ATC is pretty good about, if there is issues out there with other guys, pass the word along. Things like that.
5	So as an en-route controller one of the things that we did we didn't always put the PIREPs in the system. But we were always cognitive of telling the pilots okay here's what you can expect. You know so one of the things I tried to do was if I had chop or turbulence. Or whatever condition I had, I'm going to tell you when you check in because that's when I have your attention. So if I can tell you checking in, okay, you're going to experience light to moderate chops for the next hundred miles. It's going to smooth out after that. If you need to get higher you need to go up to maybe flight level 360. Or go down to an altitude. So I can give you all the information in one shot. Rather than you as a pilot asking me well how are the rides? Okay well when does it slow down? Well what altitudes are better? And like I said we don't always put them in the system but if I was being relieved I told the next controller okay here's what the conditions are. Here's where it improves. Or those type of things. So yeah times we were kind of lax about putting them in the system. But we always made sure we shared the information.

**Focus
Group****Audio Transcription**

- 5 Yeah I mean I think you kind of hit the nail on the head. A lot of it is just one like going back in my flying career and grant it a lot of this has to do with having military experience. On longer flights especially, we would be in contact with flight service and people like that. And they often would request PIREPs. Even if the conditions were okay. And so the only time that we really, now, flying in 121 the only time we really need PIREPS I feel like they're getting to us. Either in a time critical situation, just verbally from controllers. Or from other aircraft on the same frequency. Or in a non-time critical situation a good one is going over the front range a lot of times. You'll get mountain wave PIREPs. And those are being disseminated, generally at Southwest I know, to us by dispatch. And then sometimes controllers. And then also by the weather program. A lot of times we'll look at the route. We'll get a new route from mountain wave and we'll look at the pilot reports. I will say that overall I think that the problem with the system is that there's so many barriers involved with the legacy PIREP system. One is they are kind of hard to read, if you actually look at it. Like a lot of times dispatchers will send them to us and it's encoded. Kind of like a METAR would be. And I think we can get the general gist of them. But I don't, without looking at a book, I couldn't tell you what the exact verbiage, what it all means. And the other one is it's all just so workload dependent. Like putting it in. Well just telling a controller for a pilot. Or putting it into the ACARS is very workload dependent. And the ACARS is terrible for the, or the interface is terrible for communicating. And then getting it disseminating. That's all workload dependent on the controllers and the dispatchers. And then also, sometimes as pilots, we just don't have time to respond to a ACARS. Or we're not listening as well we could be to the radio because we're task saturated. So I think a lot of it does have to do with task saturation and workload being barriers to inputting and disseminating. And then receiving.
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- 6 This is [Participant]. I guess, when you say the declining number of PIREPs, I'll counter that and say I don't think there is. I think there's an incredibly greater number of PIREPs. There's maybe a less number of formal PIREPs. But it's been a constant conversation. You can't get on a center frequency and not hear PIREPs. You know, I would imagine even right now even when no one's flying, it's probably still constant PIREPs. No, when we do give, you know in the few times that we have given a formal type PIREP will do it through ACARS and let the dispatcher feed it into the system. That keeps our dispatchers in the loop. As well as the task saturation with the people that have the time to do it.
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- 6 I don't know where they send it. I mean they're tied into all the different networks. I know they're tied into the FAA networks. Honestly, when I fly in general aviation, I would give a PIREP to a flight service station. I don't know what they did with it. You know it was just some guy on the other side of the radio. So it's just another guy on the other side of the keyboard instead of a radio now. I don't know where it went ever. In addition to that I've got three different programs on my EFB and my weather radar. You know, I mean, I'm pretty well saturated in weather information.
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**Focus
Group****Audio Transcription**

- 6 For this particular slide are the pilots putting in way more information then they're getting back, not really. I agree with what [Participant] said. We're getting in the information or we can always ask for the information and ATC tells us what we're looking for. Not really task saturation. Up in route, up in cruise our tasks are less then what we have to do for the approach and landing. I think the biggest point in this one is that 3rd bullet point. The timely feedback dissemination back to the cockpit. So by the time it goes through the formal process with the submission. I'm pretty sure our dispatcher goes, if I remember right, goes to the FAA website and submits it formally. If they're not sleeping. By the time that information gets back to, even a pilot, you know [Participant]'s 300-miles behind me and I give a report of light turbulence and icing. By the time he gets in that area that I am, I mean that information may not even be valid. So I think the timeliness of it has a backer, absolutely. To me operating my aircraft is currently in space. And with [Participant] behind [Participant], I mean [Participant] may give an update to a PIREP. And then by the time [Participant] gets there, it's not even the same information that what [Participant] gave. So I think the timeliness plays a role here. That's where I think ATC comes in clutch in this scenario. Giving us real world information and that point and time where our airplane is. Like I said for the amount of pay I'll trust the guys where I'm over the ground at that point and time. Instead of submitted report that's 4 hours old about weather that's probably not even there anymore.
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- 6 The time thing is exactly the problem. At one point I was at a pretty high altitude I think 28 climbing. And you would not believe passed a balloon that they usually tie on top of McDonald's and stuff like that. It zoomed right by us. My eyes are big so I reported it to the controller. Obviously everybody's that's on the radio just like he said, everybody listens. [Unintelligible] reporting that balloon. And needless to say everybody wants to know where I was, I press present position gave the report and the controller took over from there. I'm thinking if he had to make an official report out of that one. By the time they put it together I think the balloon will be at the moon somewhere. So that is my two cents.
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Appendix D
Group 3 Questions
Transcription of Participants Responses

**Focus
Group****Audio Transcription**

- 1 First I got to go back to [Participant] thinking, oh my gosh, there is actually a tower that argues with a pilot who's disseminating information about their current weather? And somebody's going to say no? That's not right. No, you're not right. I never heard that before that astounds me. The second part is I think that when we got to talking about official and unofficial. And that is the actually event that's taken place. The arrival. The departure. In [city] when you have a wind shear alert you get an alert. You issue the alert right away. Minus 10 knots or whatever it is. And that's very pertinent information that pilots pass onto controllers. And tower controllers make every effort to pass that information to the pilots that follow on the approaches.
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- 1 Not in any format. It's very real time information because in 5 minutes that wind shear may not be there. It's not going to be a factor anymore. You'll get a couple of guys that will report wind shear. You issue that for 15 minutes or so. Then you stop hearing those reports and you stop getting those alerts and it's not significant anymore. So the very real time, real events that are necessary, turbulence that comes down. Coming to descent in the arrival format. Any turbulence you bump into is usually passed along by, we're descending out of one zero thousand and it's smooth. Or we're descending out of one zero thousand we got a moderate chop. And that's easy to pass on to the guy that you talked to next on the arrival. That's very useful and pertinent information. And I think that's being, I'd like to think it's still being done on a routine basis as it was when I worked in arrival and the tower. That these wind shears and these turbulence that are reported are passed along. But I will at the same time say that there is some guys that work that are not adapted keeping that information flow going. They might issue it to a couple guys and then it falls by the waist side. Because their priority has changed. They have become saturated with handoffs, spacing and putting airplanes where they need to be. And this light chop is not as important anymore as it was a couple of minutes ago.
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**Focus
Group****Audio Transcription**

- 1 Well in the busy terminal areas part of the problem is as we've talked about it is that task saturation. You don't get full reports from pilots when you are busy and the weather is a significant factor. But if you're talking about reports that are useful for instance, there's a big difference between pilot reports that general aviation is going to use for their flight planning. And getting information about icing, bases, tops and what the various weather actually is at terminal areas. And what is real time information that the commercial carriers and needing and is necessary for them to operate in their environment. As far as getting an official PIREP when I get a PIREP in the tower. Most of what I solicit is base and tops. So I have to go into, I get the information. I scribble it down as best I can on a pad that the pilots have given. Based on the best that they can do. Scattered, broken, overcast and then when I have an opportunity I go back to a computer. The FAA computer via the ASRS site and put in a PIREP as best I can following that form. And that is a very cumbersome, time consuming process that I have to leave or pass onto somebody. Which we don't have anybody else a lot of the time. The information I've got to format that information based on what the form wants. Then you do it right because the form kicks it back if it's not. And if frustration doesn't set in before I wad the whole piece of up and throw it in trash. Then I might get this passed on so that somebody in GA can use it. Either to flight plan or to know what the real conditions are. Because if you're working with AWOS or ASOS, you guys probably know that, some of that information is not actual depiction of what the actual weather is. That ASOS form out there may have a little cloud, a little fog over it. Ground fog over it. And now you're reporting 0-0 when you can see, you know, when it's CAVU. Just a little patchy fog on the ground it happens to be sitting on the AWOS station.
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1 Well you know I think it's a matter of priorities. We have a matter of priorities as controllers. And what we do is. We use PIREPs as a tool. If I'm vectoring somebody trying to get through weather, weather hold I'm going to be constantly asking him for information. But the information I'm asking him isn't being transmitted to all the pilots that are following him. And so, we use that we don't take time to write it down. But just say that I have [Participant] on approach. Followed by [Moderator]. Followed by [Participant]. Well what [Participant] is telling me, I'm hoping [Participant] is getting also. So that the weather's not going to change that much by the time that he gets there. If it does. Then I'm going to ask him for a report that hopefully will help [Participant] when he gets there. But since weather's a constantly moving thing on radar for us as controllers. It's never stationary. We're using PIREPs as a tool that informs the guy behind the guy that we're talking to. We don't usually take time to write it out. Because we don't have that time. Especially in low altitude approach control environment. We don't have time enough to barely write down aircraft identities. So we don't have time to be writing down weather sequencing. So we'll ask that question. And hopefully it's been transmitted on that frequency so the following pilot knows what to expect when I talk to him. But I mean, you know I think that PIREPs really as far as being disseminated like that, I think when we got rid of flight service station is when we actually started to see that change. Because in the controller environment we really don't have that kind of time. I mean we're pretty much busy. High altitude, they are, the center controllers they'll have more time to talk to a pilot about what he's encountering because they don't have anything to do, right. We stay 10,000 feet and below. We don't have time enough to talk to you very long. And going back to what [Participant] was saying. I'm surprised that a tower controller would argue about weather. But because usually controllers just except it and move on. But like what [Participant] was saying that he's given a pilot report. Most of the time we don't have time to listen to that. We really don't. Because I'm trying to get whatever I can to be able to help the following aircraft. But I don't have enough time to sit there and hold a full blown conversation with you about it, right. You tell me what you're going through the chop plus/minus, that's good enough for me. And then I'm going to ask the next pilot did you get what the proceeding aircraft just said? And he'll say yes I got that. And we usually work from there. But really I'm almost surprised other than when maybe [Participant] can relate to this. Other than when we're working flight data and a controller might ask you to put in a PIREP that he's gotten. Other than that we don't do PIREPs like that.

**Focus
Group****Audio Transcription**

- 1 Flight Service usually gives, that was pretty much what they did was. Other than taken pilot reports, PIREPs or keeping up with NOTAMs. And doing flight stuff with pilots. High altitude center controllers have a little bit more time because they're not pressed for time. Their separation is usually many miles apart. Where the closer you get to the ground we start off with 3 miles. When we normally we might start off with 5 miles going down to 3 miles. And we're trying to get that down to a 1 1/2 mile on the final if we can at the most. But we use PIREPs and pilot information about weather on a real time basis. Not the whole around. Sort of like what [Participant] said. If you tell me that you got chop now. That might not exist 10 minutes from now. So I'm using that on a real time basis as I'm talking to airplanes. And again it all depends on my priority. My 1st priority is separating airplanes. My 2nd priority is, I mean my 1st priority would be an emergency, separating airplanes. And where PIREPs fall on from there is, you ask 10 different controllers, you'll get 10 different answers.
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- 1 You mentioned the flight service stations the way they used to be. You could talk to them and pass PIREPs onto them. And now they've consolidated all these flight service stations into a couple of units and they reduced personnel. So sometimes you can't get through with pertinent information with time enough to present a PIREP anymore. Flight service used to take that role on. Now they don't do it anymore. It's all done, you're interaction with flight service has become...
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- 1 Well that's about it. I'm surprised that you commercial carriers don't use the ACARS to pass PIREPs along to take the place of what flight service used to do. And general aviation is just stuck with attempting to contact a flight service station that has time to take the information.
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**Focus
Group****Audio Transcription**

- 2 Kind of like [Participant] said. It's not so much, well for one is, the timeliness of it. If I'm soliciting pilot reports you know in less busy times. I don't mind, that's great. You know if the guys are coming in and it's not super busy and we're getting some icing reports on final. We normally do call over to flight service and let them know that we're getting you know, moderate icing below 3,000 feet breaking out at about 1,000 feet. If there is severe turbulence or if there's a wind shear especially in Oklahoma. Descending out of ten, these guys are getting moderate to severe turbulence. Reported by multiple aircraft, that type thing. Other than that when it comes, like I mentioned earlier, when it comes to weather phenomena such as thunderstorms, it's so rapidly changing. You know it'd be really nice when you're talking about automation and AI, you know, it's already there on our phones. I imagine most of us use weather apps on our phone. And like today my phone buzzed and a little print up says, rain beginning in 20 minutes. It's dead on. It's pouring rain right now. So I'd love to be as a controller working that traffic and [Participant] or [Participant] or whatever says hey we're getting moderate turbulence on final. If I could slew out there with my slew ball click on that airplane, hit moderate turbulence space, 2,000 feet enter then if that went somewhere that, that would go to their systems where they could see it. And the next guy that comes in there just like when you're driving your car or you're getting into weather, it predicts your track and says hey, moderate turbulence in 5 miles reported by, that would be excellent. So that's my thought on it.
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- 2 That would be awesome if you could do something like that. That would be awesome if you could tap in and do something like that. Where I wouldn't have to repeat time and time again when the guys come over to me. Again I worked in a TRACON environment like I said in [city] and [city]. And the, it didn't seem like some of the extraneous stuff the pilots really needed. They needed to know where the severe weather was. How can they avoid it? And at the smoothest ride down. All the other stuff didn't seem to matter much. And it didn't matter to me at all, in terms of getting them where they had to go safely. My first duty was to get them on the ground as safely and as smoothly as possible. So I didn't really, I just didn't care much about, you know, obviously I don't care anything about icing at 20 or 30,000 feet. And when the weather was the worst, I was my absolute busiest. And so it was just not a big priority of me unless it was relevant right at the time of airplanes going into what was, what I considered, or what they considered to be terrible weather. So I don't know just reading your slide here is it the process, the protocol, I don't, I just don't, I don't think any of that stuff is really important to be honest with you. And I will agree with what somebody said yesterday like you said, they said it's not that the frequency has gone down. It's just the formal PIREP is probably not so much. I don't know much more I can add to that, to it than that.
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Focus Group	Audio Transcription
2	I will say that I'm more likely to file a pilot report if the weather is different than forecast. Or if it's bad. Because lots of ceilings. If it's a blue sky day and its clearing up 1,000 I usually don't bother. And I don't know if that's the, if it's useful for them to know that it's just as it was forecast. Or if it's just a waste of time. Because I mean there's no restrictions to visibility or anything. So it would be nice to have some guidance as to when it would be useful for the forecasters to have a pilot report.
2	I think so and if it was easier to do. And pilots understood how important it was to weather forecasting. There might, they might submit more of them.
3	We utilize the same format that the pilots will use on their checklist. We'll pass the information that we got from that pilot verbatim. The time and the exact information that he gave it. The exact way that he gave it to us. That is the exact way that we'll pass it to the weather station. Depending on our workload also, if we're extremely busy and being in the tower and having only a 5 mile radius and me being from a military background and dealing mostly with that, we have a lot more complex operations going on. Because we've got jets in the pattern that's going 200 and 300 miles an hour. And to have 7 or 8 of those, going that fast and keeping them inside of that 5 mile circle, doing you know VFR or IFR conditions. Or whatever the case may be. That requires a lot of time and concentration. So if we are departing an aircraft and there is say for instance, bad information to the West or whatever that they may encounter. We will ask them once they get in that area do pass that information directly to the weather station. So they will pass the PIREP directly to the weather reporting station.
3	Yes. And they will put that information out right way, depending on, you know how bad it is, in a special report. So that information is going to come out right away.
3	Well I was just going to say that you know if it's going into the system, it's going into the flight service station. If you're actually flying in the terminal area or you know getting close to the terminal area, I mean, there's really no time or anyway for pilots to start bringing that up. We'll rely on our dispatch to give us a heads up. Because they're going to focus it towards us. Or like talking to [Participant] and [Participant] we'll be relying on the controller over the VHF radio to tell us what's going on. I mean nobody would, I don't think any pilot would sit there and go into the ACARS system try to bring up PIREPs in a textual format, while they're in that kind of environment. It just doesn't work. It's not safe. It would be a, and then as everybody has said what's the value, how old is this? By the time I got sorted down what it is, I probably traveled 20 miles.
3	That's why I'm saying being proactive on both the pilot and the controllers part. Looking at the severity of the weather. If I were a pilot and I know that I'm going to be encountering weather because the biggest majority of you guys if you're flying commercial or whatever the case maybe unlike maybe a Cessna or something. You're going to have weather equipment inside or weather radar inside your aircraft. So you know what you're coming into prior to getting into it. So as I say it, being proactive, I would inquire you know for a PIREP and stuff. Ask the controller do we have a current PIREP or whatever. Or as being a controller I would ask for a PIREP.

Focus Group	Audio Transcription
3	To touch on what [Participant] said. He made a comment that probably should have been made before now. The weather presentations that we get on ATC radar, those radars were made for separating aircraft. They're not for weather observation. We get, I will say that the equipment has gotten better over the years but the best picture we can get of the weather is coming from the pilots and their weather radar. With what their seeing, they can tell us what they're seeing. It may correspond and correlate what we're seeing but our radar is made for separating, not for weather.
3	The majority of the airlines rely more on their dispatch then they do on PIREPs. Because they're not going to call flight service on the available flight service frequency in the area. Because they're too busy and they can get the information from their dispatch faster than they can from flight service. And again the next level is getting the information directly from the controller in the sector they're working, that they're talking to. I know having worked [city] center, I'm working high altitude feeding the corner post. I'm going to brief them, let the guys know, let the aircraft know what is going on. Hey we're deviating to the right up here about 20 miles for weather. Deviate as necessary when able direct to [city] or direct this fix. And again, they're getting a better presentation on their weather radar then what I'm seeing on the scope. It's getting better now with the newer radars. But again, they still get the best presentation off their display in the cockpit.
4	Yeah so your next slide, I was just kind of reading through it a little bit. But you know one of things that we're running into that suck, you know, task saturation is definitely not there. This whole CPDLC across the country that will help immensely regarding this thing. There will be less traffic on the radio. And because of that you should be able to present more PIREPs and solicit more information. Because the normal stuff will be taken care of when the CPDLC stuff. So that will help I think if anything.
4	Well thanks [Participant]. I would say in many cases its duty prioritization. Because as a controller it's drilled in your head like you said earlier, separate them. First and foremost separate them. And if you've got 10 to 15 aircraft on frequency and you don't have a lot of time to solicit but the basic information. Like I will ask you, you know, say flight conditions. And I'm expecting to get it back a very concise answer, you know. Light icing at 8500 or whatever. But what happens 90% of the times is our pilot friend, and I don't mean this in any disrespectful way whatsoever. But like to talk on the radio too. And before you know it as a controller you are so behind especially if you're working approach control and you're trying to get guys on the localizer and the whole nine yards. I get 4 calls behind, I'm in a world of hurt. I've got to really hustle for a few mins to get things back under control. And it's just a matter of what we want the information of course. Because is definitely helpful. But we want it in a concise of manner as possible. Because we do not want to take up time on the frequency. And then like everyone has already mentioned to, the FAA rules for soliciting PIREPs are antiquated. And because they're antiquated a lot of people will do just the bare minimum. And the bare minimum is under certain conditions you solicit a minimum of 1 per hour. Which really doesn't help the pilots much at all. I don't think.

Focus Group	Audio Transcription
4	<p>And the main thing we wanted at [city] the weather it gets marginal. We wanted a bases report. Because it's very important because it costs more money to go to simultaneous ILS's at [airport]. That requires 2 more controllers. And to go to simultaneous ILS's that means we can't run visuals. So if it's marginal weather the main thing we wanted to know was when did you break out? That way we would know we have to go to ILS. And going to the ILS means it costs pilots more miles. It costs us more workload. But until then you had say everybody's not on a visual. Like if you come in from the West side you've got to stay 3 miles away from the other guy's localizer. Unless you're on a visual approach because the runways are so close together. And also we would always solicit PIREPs like in thunderstorms. It's like [Participant] said they call you back with a tops report. If you get a bases report somebody call you back from departure with a tops report.</p>
4	<p>I would tell "data."</p>
4	<p>And it's real antiquated you know disseminating the PIREPs, very antiquated. But more often than not occasionally you'll get some guy unsolicited in clear weather, he wants to give me the winds aloft. I had a guy give me the winds aloft all the way down from 3000 feet. I was about 10 calls behind after he shut up. And I'm not, I don't mean any offense to the pilot, but I didn't even ask for that. It was some guy, I guess he felt like chatting awhile. But you want it short and sweet. And shorter and sweeter as possible. I mean, I just want 1 or 2 words like. Light chop/smooth. Or breaking action, good/fair. Because we're so busy at some of the facilities that we don't have time to listen to everybody. Because we're too busy working airplanes.</p>
5	<p>Yeah I'm sorry. I'm agreeing with [Participant] and [Participant]. I think the biggest thing is the task saturation. I mean when you need the PIREP the most, is when it's most difficult to give it. And you know the airspace has gotten a lot busier. And hopefully it'll get back to that. I know it's not real busy right now. But my thought is when I drive I have a little app called Waze. And in that Waze app you can report a police officer. You can report something on a road. You can report a stopped vehicle. And it's real easy with the press of a button. And you know, we're using a 3rd party software like WSI or ForeFlight. Or any of those things. And I think instead of submitting it to a controller who has to call. Or even sending a text message. Which is cumbersome to our dispatch that takes a little while. I think it'd be really nice if we could get those 3rd party software's where I just push a button. And I say hey it's bumpy here. Or it is thunderstorms, or whatever. And then it'd go in and everybody else could see it instantly without having to have so many middle men in the process. That was my comment.</p>

**Focus
Group**

Audio Transcription

- 5 Okay, so for task prioritization yes. Because often times especially in en-route environment now you're working by yourself on a sector. So you're much less apt to put in a PIREP especially if it's only affecting your sector. Because again, you're going to brief the next controller on the phenomena. And you're telling the pilots as you talk to them. So it's why am I also going to put in a PIREP in the airspace that I have. Now if I'm working over in approach control for an example, and there's icing or tops of course things like that. And I get a PIREP. That PIREP I will put in because now for example if [Participant]'s working approach control under me, I'm given him information he needs. But if it's just you know specific to my sector I'm much less apt to put in a PIREP. Also the forms as you touched on, no one knows a lot of these acronyms. The forms aren't very human friendly let's say. And it just becomes, and also if you're getting the same report over and over again continue to put in PIREPs. When again, its information that I'm going to share, is just, it's not counterproductive. With the protocol you know when there are times that we are required to put in PIREPs, yes we do. But if it's just informational and again it's just my sector, I'm probably not going to put in a PIREP. But I am going to tell the pilots as they check in. And I am going to tell the controller that relieves me here are the ride conditions. Here's winds. Whatever needs to be disseminated.
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**Focus
Group****Audio Transcription**

- 5 I'm shaking my head. [Participant]'s nailed it. He's exactly right. I left that out of my earlier comments. If it's affecting my immediate moment, I make the decision to, I'm going to give every pilot that checks in, hey, we got turbulence. Hey, we got icing. Hey, we got his. And I think as a controller I'm making a conscious decision of which PIREPs important to pass and which ones not. Looking back at it, you know, sometimes if I was bored I'd pass the most ridiculous PIREPs. But are they ridiculous to me at the time, they might have been. But being a pilot and a controller I know how important they are now. But as far as the instant once, hey I'm getting turbulence in my area. Yeah that's probably, in my case, a lot smaller than what [Participant] was dealing with. I would deal with a 60-mile circle. And then just a portion of that circle would be mine. Where he would deal with hundreds of miles. So something that he would see is turbulence in an area, especially the mountain wave he was talking about, that would be far more important. So I as a controller probably failed a little bit there by not passing along a lot more data. However, like [Participant] mentioned, I did tell the guys when they checked into me. And I would brief the guy, you know, the guy that relieved me for that sector for the next session the exact same thing. The coordination only takes sometimes seconds. But it's seconds sometimes you don't have when you're separating airplanes. Especially in the terminal environment. I'm thinking like a final controller that's the last one who's working to sequence aircraft to the runway and such. That's just an excuse I guess for the amount of how many airplanes you're working. The form itself and I don't even know if they still have it, [Participant], but maybe you can say something on that. When I was there we had a form, a PIREP form which really half the time they were there half of the time they weren't. Let's just say more than half the time they weren't there so you just use a white piece of paper. But the pad itself had all those codes in it. And you would just hand write what you were given moderate turbulence or whatever. Then you'd hand that like to a supervisor or another controller to pass along. Or if you had time, you would just do it. But that's kind of gone away. My flight service days, I did flight service for a little while. And back then someone mentioned it. We would always ask for PIREPs. Always, always, always. A lot of that was because as a flight service station individual you're not nowhere near as busy as the controller was. So you had time to put that in. And really that was our job. Get that weather out there. Get those PIREPs out there. So I think that's about it.
- 6 I think a lot of it for us the PIREPs the task prioritization. A lot of times PIREPs are put on the back burner. If we're busy, yeah, you're probably not going to get the PIREPs like you should be getting them. And more of the process in the work floor with us put their work flow with us being working with the military a lot. But we work with the FAA. We pass PIREPs. But once we pass the PIREPs, we don't know where it goes to. And we don't know if it's Wichita approach which is 6 miles from us. We don't know if their getting the PIREPs or not. And the equipment between the two facilities, they don't work together. They're not compatible. I think that might be a lot of the problems with getting a lot of the PIREPs to the right people because equipment, they don't work together. And a lot of stuff is outdated. Antiquated equipment. That needs to be updated.
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Focus Group	Audio Transcription
6	I think the official PIREPs probably on decline. But we solicit PIREPs all the time. The process is we solicit PIREPs. Once we get the PIREP we have to write it down. Pass it to our weather. Then our weathers supposed to put it in the system, whatever system they put it in. Which I don't know it goes where ever. And then that information is disseminated that way. But once the information gets to weather, I feel a lot of times, they just set it to the side and they don't even put it in the system. Especially on days when the weathers pretty bad. For the pilots request a lot of PIREPs. These guys they're really interested in PIREPs. It seems like a lot of pilots here once you give them a PIREP or two. They seem to blow you off and they don't seem like they really care about the PIREPs.
6	It's military weather. We have our own weather guys. And we as a limited weather controller, I mean weather observers in the tower, we can only pass it to the weather. And then they have to I guess approve or disapprove what we're telling them. And then they disseminate it to all the systems that they have.
6	The civil FAA system we don't really talk to those guys that often. I'm working a control tower here, not a radar. [Participant] would probably know more about the radar units how they pass weather on. But they very seldom talk to each other about the two facilities and stuff. So most of the stuff we do, we do it directly with the pilot. Or like you said indirectly through the system. Or through our weather.
6	No we get on the telephone and we call them.
6	We have a direct line to the weather person we call them direct.
6	Yeah there's a lot. I'm listening to both sides. And if I may, I'd like to go into what I know about it. First of all it sounds like there's a misunderstanding maybe of PIREPs. Because I'm hearing that PIREPs some of the pilots are saying they hear PIREPs all the time as far as one to the other. There getting their information basically listening on the radio. And they're getting real time information is what I'm hearing. When you talk about PIREPs you're talking about, when I hear PIREPs, I look at the system and what the system calls for. And then in the federal government it's 55TTIW. Which is ceilings below 5,000 feet. Visibly less than a mile. Visibility less than 5 miles. Winds, turbulence, etc. That's when pilot reports are supposed to be requested. That's the requirement that the FAA has. In a VFR tower it's used a lot more as far as when people are taken off, they want to know the base. Can they fly VFR? If the clouds are broken. If it's overcast, whatever the case maybe. Pilots really need that information. When it's turbulence out there they really need that information. I think what I'm hearing though is the pilots rely on the SIGMETs and the AIRMETs that are out there. And they're basically looking for information or hearing the information. And basically trying to determine whether or not it's going to be valid for them. When they get to where they're going to be depending on where it's supposed to be. When I look at the...

**Focus
Group**

Audio Transcription

- 6 No I would say SIGMETs and AIRMETs are, frankly, they're somewhat worthless. They're rarely accurate or representational of what we're going to encounter and we're going to go more or less anyways. Unless it's a severe turbulence area or something like that. You know we're going to press through it and then we're going to take the ride reports from the people in front of us. And possibly deviate as we have to from there. But that's not, you know, I mean it's something that we look at it. But no, when we say we're getting constant feedback. It's constant feedback from the controllers and the planes in front of us.
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6 And I understood that. I understood that's what you were saying. But what I'm saying is the FAA has a requirement to do PIREPs. Not necessarily what you guys listen to, what you take. If there worthless or not there's a forecast out for it. We have a requirement to basically make sure that information provided. If we have those people contacting us. Part of the problem right now is that pilots are getting their briefings all over the place. As opposed to having one fixed place to get briefing or to get pilot information. You guys may get it from your operation center. Pilots are getting it over hand held information. Their own information. Their briefing themselves. And so the request for PIREP reports that used to come out are not necessarily going out now. And I've been in all options so I understand what you're saying as far as what's used and what's not. We're talking about the FAA's requirement and that's what I was going with. And what goes into what we do as opposed to what you're supposed to be getting. And so when I look at that and I'm listening to what the problems are. I've contacted some of my friends that are still working at flight service as well as tower to prep myself for this meeting. To try to get some real life information that's okay for what's supposedly going on. Part of the issue is that there is no set place to put PIREPs at least that's what we're hearing right now from all the people that's talking, right. You guys are all basically saying you don't really know how it's being put in? How it's being used? If it's even being used. Who gets it? With flight service, it used to be that flight service was basically dissemination points of all flight PIREPs, mostly. Center, Tower and approach control facilities had the abilities to put in PIREPs. They don't do it much anymore. They try to pass it on. The FAA going to flight service recently has taken some of those responsibilities away from flight service. So if someone calls the flight service now with a PIREP that they got from some pilot that's flying around. And let's say its McConnell Air Force Base calling flight service in their area. They're going to be told to contact the center now as opposed to flight service putting that PIREP into the system. PIREPs can only be put in by the flight service now becomes over the inflight frequency. Or it's provided to somebody, or somebody's providing a PIREP during a briefing. So if you call me up and you say. 'Okay, I just landed here at Wichita and I'm about to takeoff, and on my arrival into Wichita, I found out that blah, blah, blah was happening. Ceilings were whatever. I got a rough ride.' Whatever the case may be. They're going to put it in. But otherwise they're not allowed to do it anymore since duties are being taken away from flight service. Center is usually not very well prepped or understanding what their responsibilities are because they still call flight service and try to get stuff put into the system. So it's a really mixed up system is what I'm hearing from the controllers that are really out there working right now. They're not really understanding what goes where and who's supposed to be doing what.

Appendix E
Group 4 Questions
Transcription of Participants Responses

**Focus
Group****Audio Transcription**

- 1 Well [Participant] let me give a quick answer here. Again I don't think that a lot of controllers who aren't pilots appreciate a pilots flight planning that goes into where the bases are. What the tops are. Where the icing levels are. And those are all real time information that PIREPs can help paint a picture of what is actually out there in the weather so you can plan effectively. And I don't think a lot of controllers recognize the importance of disseminating the information they do pick up into the PIREP form. So it can get disseminated so it can be used for flight planning by GA pilots. Because the commercial pilots their going to go anyway it doesn't really, it's not that pertinent to them. But is pertinent to the GA population.
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- 1 And once again I think that, it's not the air traffic controllers as much, it was the duty of the flight service station. Once those duties were kind of marked down. They didn't automatically transfer it to the approach controls or the towers. The responsibility that flight service had they weren't adopted by the air traffic controllers after we got rid of the flight service station. We continued to do business as usual. And unfortunately that is one area that we lag. Because when we got rid of flight service as we knew it then. The pilots no longer had someone to talk to that would disseminate those PIREPs. Take the time to listen to those PIREPs or even take the time to ask the pilots all about the weather along their flights. The controllers now, especially the approach controllers, we're only concerned with 40 miles in. The towers only concerned with 5 miles out. So those responsibilities, we're only asking what is going within that airspace there. And that we're disseminating to everybody else that's arriving to that airspace. But like you say it doesn't do, let's just say we have guys over flying they're in bad weather or whatever and we're not talking to them. We would never know. I could be working surface to 4,000. [Participant] could be working 5,000-10,000 and he's experiencing weather that I'm not experiencing below that. And he wouldn't tell me. He's only going to disseminate that to the airplanes he's working. I mean so we have a disconnect there. But also, it's the priority list. My priority is emergencies. Separating airplanes. After that is whatever comes. You know first come first serve. And so that is the way the controllers look at it. And again we use PIREPs as a tool to help me with this aircraft. But also to help with the succeeding aircraft that are following him and also on the same frequency. So that I don't have to keep repeating that information.
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**Focus
Group****Audio Transcription**

- 2 I'm sorry I thought [Participant] was talking there. I think it is a priority of duties and honestly PIREPs are way down our list. I mean, it falls way under, you know, separating VFR aircrafts. I think it's an educational type effort that's going to be part of what you're, I'm assuming, going to do. The importance of PIREPs. I think, and my thoughts since you're asking is, I think it could be streamlined. You could have a specific PIREP without going to a thirteen item check list. And if I call the flight service guy there happy to talk to you, they love talking to other controllers, but I don't have the time to go through 13 checklists when I've got other people calling me, saying Tulsa approach this is so and so. We're here, we're there. It really is, becomes a pain. I hate to say it that way but it's just like, well I don't have time to call flight service. Soon as I do someone's going to call me needing services. And unfortunately when you're busy and when stuff's going on is when you really do need to be getting that information out. That's why like these guys who are flying Part 121 and I guess 91. You get traffic in there on final. You're working people. I'll get a report from let's say a [airline] pilot and a 73. Tell me okay we got a ride through there. I'll go right back to the guy behind him and say [airline] so and so [airline] 73 ahead say he's getting a good ride. I'm taken you through the same spot and I'll say roger. And the guy behind him you tell him the same thing, it's done in a matter of seconds rather than a 13 you know part check list that has to go to flight service and then I know darn well that those guys I'm talking to aren't going to be checking the flight service to find out what their rides like on my frequency, while we're working through the situation.
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- 2 Well I just wanted to add in just like [Participant] said he's so low on the priority list especially when they're needed, when the weather's at its worst. I don't really have time to reach out to flight service to give them this long list of things that they're asking for. I've been on some flights as well and you know, with the FAM flight thing and I've never seen, not one time did I see a pilot. Or maybe I wasn't aware. But I never saw a pilot get some kind of thing off the ACARS that said it was the PIREP that was in a crucial situation where they needed it right then. I just never saw it. And when they looked below 10,000 feet they were so busy I don't think they would look at it if they could. It seemed like their priority was to fly the aircraft. And just like our priority was to get them on the ground safely. You just didn't have time for it. I think it's just a time issue. When I read your question here when it says, you know, why is it not accurate or timely? Well it's as accurate as we can get it. And it's timely as our priorities allow.
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**Focus
Group****Audio Transcription**

- 2 Well a couple of other things I wanted to bring up. I mean PIREPs are being given it's just not in the official format like everybody has been saying. If I, first of all, if flight service answers the radio and that's a great big if. And I think everybody agrees with that. Because the frequencies are so different depending on which part of the country you are. And you have to look for those frequencies. First of all they don't know who you are. Number one they don't know where you came from. Where you're going. What altitude you are. How long it's going to take you to get there. And if you have to give them all that first. The controller, it's much easier for me to tell center even in my [aircraft]. 11-5. I've got a smooth ride. The over cast layer is ending right where I am. That's easy. But to get off frequency. Get someone to answer after 3 or 4 tries. Then given that whole litany of where I am. Who I am. Where I'm going. Everything. And then it goes to the whole system it gets [bogged] out. Secondly, outside of my primary training I have several instrument students. They all have their own aircraft and I'm 64 1/2 and all these guys except for one is older than me. They're flying [aircraft] and I'm telling you I spend half of my time helping them with two words, Garmin and ForeFlight. Because they really struggle with them. Some of them, and I'm talking, we're talking guys with 600-700 hours in the same airplane. All they can do is go to their lake house. They press direct K enter. And that's it. That's all they know how to do. And you add other things onto that. It's just kind of like, at the end of the list so.
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- 2 I just wanted to add on that you know from listening to the different people and the different aspects. And then listening to you describe the system. It never occurred to me how funnel this system was. And how, maybe it comes from a time when aviation, you know, when you need to snip that through the proper channels in order for that to be an approved piece of information that we're going to disseminate out, you know, to the rest of the pilots. Versus thinking about the questions that I've been asked by Tower. Or versus the information that I give out to ATC, it's very specific to, I feel like when ATC asks me a question. It's to get information for a problem that they're having or that there foreseeing. They want to know are the bases lower. Hey when did you break out? When did you pick up the lights? When did you have the stuff? Because they're running. Their thinking about what they need to get ahead of. Is it, you know, they're problem solving or their looking ahead. Their chain thinking. Then conversely the information that I'll ask for or that I'll give, is in the same box where hey this, you know, the next person on final that's 5 miles behind is going to want that information. Because I would like to have that information. And it doesn't have time to go through all that stuff. This is what we had to let that person know. And as [Participant] was saying it just instantly boom, boom, boom. And they apply to everybody that's coming down the pipe as well.
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- 3 I really can't speak from flight service station standpoint because I'm not familiar with how they work. So I don't have any input for that.
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Focus Group	Audio Transcription
3	Yeah you know again from my charter pilot days and used to do it early on in the 73, if you were flying, they used to have a frequency inflight service, you know, I think it was 122.0 for flight watch. And you'd call them and tell them where you are or the altitude. And then they'd give you a high altitude flight watch frequency and you could get this nice weather and stuff. You could make a pilot report. But you know from the standpoint it's interesting that the FAA is saying a lot of people aren't using PIREPs and that. Well you did away with the flight watch system, which was a focused controller, or weather specialist that you'd be talking to. And I believe that was in the center, wasn't it [Participant] I don't remember?
3	The centers have national weather service aviation people attached to them. And of course I'm going to go back to the old days not quite with the flags yet but, uh, when we got a PIREP we gave it to the supervisor. Who took it up to the front to the weather guy to put the PIREP in. Some of you guys will probably remember in Delta 191 crash at DFW August of '85. There was a PIREP for the weather. The weather guy in the center was on break. There was only 1 guy. He went to the restroom. It never got disseminated about the thunderstorm or wind shear at DFW on the North side of the airport. There are the flight watch program was prior to everything being so automated. And it was like you said [Participant] there was a frequency for high altitude and for low altitude in the area that you were in. They'd give you the frequency for that area to talk to somebody to give you and update for the general area you were in. But I don't know if they're doing that anymore with the fact that everything's so automated. And the dispatch, dispatchers that are working with the airlines are given that information.
3	I was just going to add to it. I used to use it all the time. And on low it always 122.0. And at a certain time they started closing the window at like 10 o'clock at night local time they lost the flight watch guy. But I think he was a weather guy that was actually in the center area. And then like I say if you would call them on 22.0 at high altitudes then they would give you a specific high altitude frequency. And it was really great. But then they said they did away with it.
3	The frequency for that, the weather guy, there was a weather guy in the center but he disseminated that to flight service. That flight watch program was run by the flight service people.
3	I mean it was the FAA but it was flight service. Of course that's all, flight service stations are all contracted out right now.
3	Yeah. Well I mean, it was a good system but you know, again like we're all talking about, the real time aspect of it is a real problem. And [Participant] I would ask you one last question. I'm sorry. When you do get these PIREPs from the pilot and they're basically stored in your head, in essence, you're doing stuff right?
3	Correct.
3	You're not having any visual thing to remember it by, right?
3	Correct.
3	Okay.

Focus Group	Audio Transcription
3	<p>I have a couple of comments. Earlier someone was using the word proactivity, being proactive. I'm saying this because I know that you're recording this you may later restudy this. One thing that I read from a very experienced pilot he put out there. It doesn't help necessarily everything in the process but it helps pilots on the frequency already. I think many of us have been through the experience with being with center or approach control. And somebody says moderate turbulence, you know, they might say [airline] 3096 moderate turbulence. And of course only the pilots and the controller knows where that guy is. And then 3 guys afterwards chime in and say hey, where was that guy? Where was that guy? I mean the frequency. So I'm trying to get into the habit of if I'm going to call center or approach and report moderate turbulence I immediately say my altitude and my position relative to a fix that everybody is familiar with. To prevent 2 or 3 guys to use the frequency worried about where that SA. That's one comment. My second comment is lesser contributing factor in PIREPs I think into the dissemination and putting them out there is probably a human factors issue. When I have been in the left seat as well as in the right seat for those who fly multi crew, multi member crews sometimes the other guy looks at you funny when you want to report something. And in some cases it's because the pilot is less talkative. In some cases, you can have an airplane of a pilot that is flying amongst airliners that you have a Cessna 310 flying in the center, he might feel a little stupid reporting you know light to moderate turbulence because he knows the other guys, the bigger guys will be like oh yeah it's a Cessna 310 and so maybe a little bit of education and promoting how this helps other pilots. Pilots of all types of aircraft and operations would go a long ways to revive the effectiveness of the PIREP.</p>
4	<p>And also a lot of times the position that was tasked with dissemination as far as outside the facility would be a "data" position. And because of staffing the data position wouldn't be staffed. I mean if everybody who's plugged in is working airplanes you don't have a data. Which means you've got to do it. And again you get 4 or 5 calls behind and there you go, you're off and running.</p>
4	<p>That's generally one of the worst controllers.</p>
4	<p>Yeah, really. Nobody liked working "data" until they figure out that I'm actually sitting here not working real hard and making a lot of money for it. And then "data" starts to get a lot better.</p>
4	<p>If you get yanked off a busy position and thrown on "data", you're in trouble. Because that means you're screwing up.</p>
4	<p>[Participant] I don't know about you. But we're given a PIREP instead of working airplanes and made a mistake in separation. Because we're disseminating weather. Our head would be on a platter.</p>
4	<p>True.</p>
4	<p>Well the traffic in general as gone up. So I could see why the task saturation for the controllers, controlling more than normal aircraft. I could see that, that being a problem with the pilot.</p>

**Focus
Group****Audio Transcription**

- 4 Sure. No what I'm saying is you know with the controllers and more and more aircraft unlike what's been going on for the last couple of months with this pandemic. You know aircraft numbers have gone up in general. And that being said, that gives them more task saturation and less time to solicit PIREPs in a sense. So the important thing is keeping them on track. Keeping them on localizer. Keeping them turning at the right position. That's become more important than the PIREPs. And I can appreciate that. But at the same token you're losing a lot of information because you're not getting the PIREPs. So it's a vicious circle in a sense. You're not getting enough data because you're too busy. You're too busy to get the PIREPs. Well the information doesn't go back. So it becomes a problem that needs to be addressed and you know I don't have a solution. Because like I said I'm just a pilot. I don't know anything else. But I'm sure somebody out there, maybe you, can come up with a solution for this stuff.
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- 5 Probably true. You know like I may hear a portion of what was said. Or I remember a portion of what was said while I'm working the airplanes. So moderate turbulence with icing which is the important of that. Well you know moderate icing is a whole lot more important than that moderate turbulence. So I'm going to make sure that gets pushed out. And over a period of time of given this. Hopefully I was given both, but maybe in my mind I was pushing the icing because that's ten times more important than the turbulence. So when it finally got down to the briefing which could be 30 to 45 minutes later. I'm given oh by the way there's moderate icing out here and occasional turbulence reports. I didn't say moderate. I said occasional turbulence reports. So it's two different, it has the same meaning, but it doesn't have the same meaning. So maybe that's what happened.
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- 5 To the relieving controller is what we're talking about. It's what [Participant] was mentioning. So like if I work my airplanes for an hour - hour and a half at the end of that another controller would come in behind me. So I'm going to brief him on everything. I'm going to look at all the airplanes that I have. I'm going to tell him about all the sequencing I'm doing. Where everybody's going. And I'm going to tell them about the PIREPs. Hopefully if I've done well I've got a note pad next to me and I've kept notes all along with each one of these items that I've been experiencing. And a time frame say like, 15 minutes ago or 20 minutes ago, I got moderate turbulence in this area. You know and a lot of times fortunately we're right there so I can point to the scope and say we're getting it this area. Or at a certain altitude or something like that. When we did pass PIREPs to flight service we would hit the button. Now you got to remember sometimes flight service would pick up immediately. Sometimes they wouldn't. Now that flight service isn't there anymore, you know, the passing along a little bit, it's just a little bit different. It's putting it in the system.
-
- 5 Okay so from an en-route standpoint when we do get PIREPs either we have the form or as [Participant] says sometimes you just jot down the information on paper. You would either give it to your supervisor if you have a D-Side. You know the D-Side puts it in for you. Years ago when we still had A-Side, you'd give it to your A-Side and they would take it up to the weather.
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Focus Group	Audio Transcription
5	<p>D-Side would be an associate controller. So you have a radar controller who's actually working the radar. And then you may have an associate controller who is what we call your radar assistant or we'd say D-Side. Okay so often times they would write them up. And either give them to the sup or to someone else that could take the information either to the watch desk or to the weather department. Who then put in the PIREPs. So we didn't as controllers in en-route physically put in a PIREP. They would be given to someone else to do.</p>
5	<p>Terminal side we'd actually put it into the computer. We had a data guy, we called him I think flight data. We had a flight data person so what I would do is I would usually hand him a note and then he would put it into the flight data system. Which is basically a computer where your flight plans and all that goes in there so he can actually type it in. That was after flight service. Before flight service disappeared we had the option of both. We could call flight service and let them do it, which would probably be a lot more detailed. Or we could do it and I'm trying to remember the coding in my head as we go. Now a days, at least when I was in there, I worked [city]. And when [city]s gets busy with [company] aircraft. There was no time. I mean you didn't have time to just slide over and type all of this stuff in the computer. It sounds like you do but you really don't. You've heard these controllers that are talking a mile a minute. So like [Participant] was saying we'd hand them to the supervisor. We'd hand them to somebody that's not doing something. Working [company] I was on a mid-shift for 14 years. There was nobody to hand it to. So what would end up happening is we would pass along to the pilots who were there right then. And if we got a breather we would go put it in. But that could be 20-30 minutes after the event. So that's almost at the point, is it really even worth putting it in. And I think we made decisions back then, I can't believe I'm about to say this but I think I made a decision to go get coffee instead. That's terrible to say but, unless it was really highly pertinent like a severe/moderate or something like that. Or icing. Or turbulence. Those of course we would immediately put in or we would tell somebody. Because that's highly important. But a basic temperature or winds or something like that probably wouldn't be uploaded as fast as it probably should have been under normal circumstances. So you have the two options. You can go to the flight service and let them upload it. Or you have the data guy in the room. And on those shifts I was just talking about there was no data guy in the room. It was just the controllers.</p>
6	<p>Okay so what I'm finding out is there's also inconsistencies in the PIREPs. Everyone's making decisions about what needs to be put into the system and what doesn't. Okay where as if you send it to one centralized point. They know what the requirements are to put the PIREPs into the system. But now if you send it to a center, they might be too busy. They may not forward that PIREP or they might not even put it in the system at all. So I'm really trying to talk about when I talk about PIREPs, I'm talking about PIREPs that are received and put into the system. Not necessarily PIREPs that are going from controller to pilot in the sky. Where the controller knows the route that the pilot is flying and saying okay, you're ceilings are here and here. And you probably turn left and cut this way to get your best ride.</p>

**Focus
Group****Audio Transcription**

That's not what I'm referring to. I'm talking about, we're talking about entering it into the system. That's what my conversation is about, okay. And so the job task itself has been removed from flight service. And disseminated over a group of controllers, approach control towers and centers. That may not understand the real requirements for PIREPs. Unless in their opinion there's a need. If it's clear outside and see forever but there's turbulence, they may have that information. But is it going to be bogus. Can it be briefed? Can you pick it up as a pilot when you're doing your own self briefing? Those are the issues that I've been hearing from the people in the field. It formats itself. I've heard, while we were talking that, pilots their format is different. Airline format is different. Military format is different. The equipment is different. That's a problem as far as when you're trying to have a system that's supposed to be of assistance. If you'll start looking at when PIREPs and issues starting occurring probably with these PIREPs getting into the system. It's when they went from having flight service stations to going to contract point service stations which was 2006. Okay there was real no problems with PIREPs up until now, until 2006 till now. When 2006 when the flight service station were consolidated into private contract with one of the contract companies its now Leido's, it's now Leido's but it used to be it wasn't Raytheon, it was the one with the L. Lockheed Martin had it. And that's when duties started being reversed. And started being taken away as they try to basically figure out a way to outsource the flight service. And I was a part of all that training and all that information. Because I was at headquarters geek. I was one of the big people in headquarters that did the service stuff. So I really know that, that's when your problems were started. So I don't really know that, I think with flight service station they're required to do certain things. They're required in briefings to ask for PIREPs, if those conditions exist. They're required in their duties to put the PIREPs into the system. Everyone was required to put flight plans into the system. Now only controllers can put flight plans into the system. Not flight data specialists because they now removed duties and now they have flight data specialists only in the flight service station. We're now instructed to tell these people to contact the center. For the center to put the PIREPs into the system. So there's a mix up as far as who's supposed to be doing what. And if that starts happening, the controllers are not going to take as much value in the PIREPs. Because it's not going to be anything that's really that important to them. As long as the information is there and they understand it. And they might brief it to the next controller that takes that position. But they may not put it into the system. With the FAA system if the PIREPs put into the system, within 30 seconds, you will see that PIREP pop up in an area that it's supposed to pop up in. With the airline system from what I'm understanding. Airlines can even put flight plans in using lat/longs. I'm sorry PIREPs. I keep calling them flight plans. But they use lat/longs, which is, some people are doing that now. How does that help controllers? How does it help other pilots unless they understand those lat/longs? So format and all the things that are going into the system at this point is what I'm being told is really the biggest problem. So that the way the FAA has restructured their PIREP usage, the format and whose allowed to do what. I think those are some of the biggest problems. And just the field for the controllers on

Focus Group	Audio Transcription
1	<p>both sides of the fence from the flight service through the FAA side and through the contract side. When they are told you're not supposed to be calling me for this information. You're supposed to be doing it yourself. Or you're supposed to do this. That's where the problem comes in. So there's a lot of that from what my notes are telling me and what I've gotten. And I'll shut down for a second for other people to talk.</p>
1	<p>If I'm working a position, if I'm going to pass a PIREP that's going to be disseminated by the AWOS or whatever. Then I've got to call a data person and give him what I just gotten from that pilot. Now by the time he puts that in, disseminates that and gets it in, that weather might have changed already. So it's no longer good. Because we're dealing with real time situation in the area that their responsible for. So if I'm working final, I'm only concerned with the 15-mile final that I'm worried about. I'm not worried about anything else. So I'm soliciting pilot reports for weather that might be affecting on final. But I'm not worrying about my feeder. I'm not worried about departure. I'm not worried about flights flying over. Those things I'm not worried about it. I'm only worried about my position on responsibility. And getting a PIREP from a pilot that's in my area of responsibility that's going to transmit that to other pilots that are either in my area or coming into my area.</p>
1	<p>We have a computer. The FAA computer in the tower that we can use to enter the information and it gets disseminated through the facilities through the ASRS program. As far as getting pertinent information via PIREPs in a terminal facility and even in the center facility you do a need a flight data person who is familiar with the inputs to put the information into the system. But you're not going to get that because their trying to keep the number of personnel down. As opposed to hiring somebody that is familiar with the format and can put information into them quickly. That's disseminated to them by the radar controllers that are getting the information from the pilots as far as that goes. Because you have to be familiar format to get it to read correctly and maybe the information would not be, the errors wouldn't be in the geographical information. That might not be pertinent to the pilots picking up or discern what is pertinent to them.</p>
1	<p>I was just saying I agree with [Participant]. Because at one time we had data aides that did that. We have people that were trained specifically for that job. But I mean once they started cutting back on the personnel. Most of the controllers hate that position anyway. And it's not that they're familiar with it or that they work it enough to be expert when they can go in and just type it like that. Most controllers if they have to insert a PIREP. We have to grab the format and make sure that we're doing it right. And unfortunately by the time we usually get it in its no longer pertinent.</p>
2	<p>Yeah I was going to say the technology is out there. I mean WSI started the TAPS program. And that's an automatic generated pilot report that comes off the, what the aircraft senses. So we get TAPS reports all the time where we can see this plane had this kind of turbulence. So the technology is there to do this stuff to do a one button push.</p>
2	<p>TAPS.</p>

Focus Group	Audio Transcription
2	<p>Yeah it's a Turbulence Automated PIREP. Now the planes have to be equipped for it but most, you know, you're new corporate aircraft. And I would say all of 121 flying probably have that. So it senses. I mean like, you know, our dispatchers know everything that we're doing. Every switch we're touching. Everything we're doing. The airplane tells on us all the time. So when we hit turbulence, it sends a report to WSI. So we can look at our, on our EFB's at we can either turn TAPS on or off. Sometimes you turn it off, or you turn it on and they scare you. Because they're everywhere. Because it shows light turbulence, moderate turbulence. So you can disseminate that information. The technology is there it just seems like it's in the private industry. Yeah they cost money but they cost savings for airlines that's there because of the maintenance they had to do when they hit severe turbulence. So they saw the benefit in it.</p>
2	<p>So I've done quite a bit of programmer especially with forms. And for me it would make sense to have the PIREP form be something I can access on ForeFlight. Fill out the boxes. And then just hit a transmit and have it go out through my ASD-out. I mean that something's that would be far more useful for me and quicker. But not require voice recognition or speech technology of any kind. But it could just be a form that's got your 13 boxes. You fill in the ones that you know. You hit transmit and goes out on your next ASDB, probably guess. That makes the most sense to me.</p>
2	<p>Yeah. But it doesn't have to be ForeFlight. It can be a Garmin pro pilot. Or it could be anything.</p>
2	<p>Right, right. So but that would be a way to get more people who do subscribe to this. Because I don't know anybody who doesn't fly without some sort of Garmin subscription. That would be a way to get it out quickly and easily.</p>
3	<p>Yeah I'll speak more again towards the GA side. I love all of the 121 experiences. A lot of experiences of the smaller GA pilots are going to be a little bit different. Whether it be, whether we have 1 radio in the airplane. So it would be hard to switch over to a flight watch and talk. And give reports if you're trying to be controlled and get into an airport IFR. Other things like that are limitations of smaller airplanes. I think that it's important to look at this not only from a large airliner protective but also from that smaller GA perspective. And I think [Participant] just dropped off the video. But I was also going to bring up the Delta 191 accident. I just did that for one of my final presentations for my crew resource management class. I was going to talk through that but [Participant] already got through that. Just want to make sure that we're looking at ways to reduce the cumbersome aspect of submitting PIREPs. Not having to change frequencies as much, if possible. And really making that easier. At least up here in the [city], and the altitudes that we fly at. We have [airport] radio which is about 20-ish miles over to our East. Is where the RCO is for that. And it's sometimes a challenge to talk to them. I mean, it's a running joke with instructors at [university name] that oh how many times did you have to call [city] radio before you could hear them today? So I think there's an operational limitation about the availability of flight service. As well as the usefulness for smaller aircraft that might find it more challenging to take time to them as well.</p>

Focus Group	Audio Transcription
3	Because a lot of my experiences basically surrounded by the military and stuff. I can't speak from the input of the information the data input. As I said, we are, we mostly get the information the PIREP information from the pilot. And we pass that information straight on to the weather station. Who will, you know, input that information into their system for the pilots to be aware of.
4	[Unintelligible] is going to have minimum staffing, minimum staffing.
4	You had very little experience using them, unless you had to. Or unless you were the data person for the day.
4	I've never been to a flight service station.
4	I've seen the OASIS interface that flight service here in Alaska uses. If I've seen the PIREPs submission form on there I don't specifically remember it but I do know they're working with Harris to try to improve some of that interface. The comments earlier when we first got started, you know, the format and it's older than all of us. And it's very antiquated.
4	That was the first thing I said, this thing is too antiquated they need to be brought into 21st century in a sense.
4	It probably is. I mean I don't know the details of it. I mean at one point I was a chief pilot in [city]. So I have some access to some of the information but the right person to talk to, I would not be the person to talk to regarding that. Yeah I can get you the right person and I will. But you're absolutely correct the company has invested money in developing the app in-house that works for us. And because of that I think they might be a little more reluctant to share it. I think they'll be okay to talk to you about it. But I think they'll be reluctant to share the data. But you know like I said it's one of those things where unfortunately and this is interesting to me because I was in college in the late 80's. I graduated in the early 90's there from college. And you know I have visited several flight service stations back in the day. Now granted their not around anymore. But I find it interesting that people in this focus group that have not seen a flight service station. I find that very interesting. Or haven't taken the time to go look at one even, see what they do over there you know. I mean I flew general aviation back in the day. I charted a cargo operation in the middle of the night stuff. So I was involved in quite heavily with the flight service. Filing flight plans or what not. But it's interesting because of the reduction in staffing because more and more is being pushed towards the computers or internet in a sense. It has diminished the human input in the stuff that is needed.
5	Yes, yes definitely. Definitely needs to be modernized. And [Participant] had a good point earlier. Using technology like the stuff they do with Waze where pilots can actually put in PIREPs. They go to a 3rd party. They get them in the system. Now I will say this from a controller's standpoint, the negative of that is if I'm just getting inundated with PIREPs all day, I'm going to stop looking at them. Unless it's something that I think is severe. So I mean there's a risk reward with that also.

Focus Group	Audio Transcription
5	I just turned it off but actual in our manual it says that if we give a PIREP to dispatch that they're required to submit to ATC. So I don't think that we're onboard with keeping that close hold. In fact I think there, it's a requirement for our dispatch or weather folks if we have a PIREP to actually submit it to whoever is appropriate. And I hope that's going down, I think it is because we hear lots of reports from other airlines as well. We get reports that [airline] or [airline] jet had moderate turbulence over the mountains, and we get that. So I think we're sharing it.
5	Of course the most important PIREPs that we get, as pilots, I think are the ones that are being given to us by the controllers in real time.
6	No I completely agree with him. The system to me is broken. It's not really a system it's just a lot of information thrown out there and hopefully you can do the best you can with it. And I think the pilots like they just said they talk to themselves and they talk to the pilots especially in the terminal area, I mean, the controllers. And they give them up-to-date weather right on the spot or up-to-date PIREPs and stuff. It takes too long for the information to get through the system. If it ever gets through the system.
6	Hearing this from the other side of the operations aside from the pilots from the ATC standpoint. I didn't know that, I think you were talking about several people calling other people that they call this guy. And then this guy's got to call this guy just to submit a piece of information that could be vital stuff in our flight operation. It definitely sounds like you have a lot of [unintelligible], talking to a lot of other [unintelligible]. Where submitting it through various mediums just to, you know, get that information to us. I mean it does sound like the processes. I had no idea before you started talking about it that, that is the process that's currently going on. So it definitely sounds like you have a lot of people talking to a lot of other people about a simple piece of information. We know that more the receivers that, that information goes through, by the time it gets to us it may not even be the same information.
6	Yeah that happened here in November 5, 2013. We had, I think, it was the Cessna. I don't know if you guys remember it was a preacher from California and his pilot. The information they got was inaccurate. Because by the time it got through the system, I guess they didn't get the information about the icing or whatever it was and they ended up crashing. That's the thing that's my biggest concern is, like I said, too many layers. They need to get all of that out there and just go direct. I don't know the answer but something needs to be done to get all the layers to get the information out of the way.
6	I'd like to say that airlines used to contact flight service when they got something that was relative we'll say. I think now that there's only three flight service facilities in the United States that are covering the entire United States except for in Alaska. Which has FAA flight service people.
6	Yeah. But when you're looking at this you're now requiring, probably weather briefers, to basically know an area that covers I'd say central United States or the Western United States and now that they've moved the Western United States into the Central United States. The pilots that cover out of Fort Worth area have to do everything from the Mississippi River westward, okay. So they don't know all those

states. They don't know all those mountains. They're supposed to be briefed on those things. But they're supposed to take these PIREPs if it's called in from the air, only. Or if it's, you know, but they're not taken it otherwise. So the system itself that used to be valid, is no longer valid. As far as for the different airlines if they do have a way of putting the PIREPs in, I don't know that they could be used by everyone in the system, okay. I don't believe everyone can get those if they put it into a system that's not universal link into the FAA, the NATS. And so if it's not listed in that or put in that particular capacity, it's not available to everyone. And with people doing their own briefings, that's another problem. Because inflight service when they brief you, the last thing is pilot weather reports are requested. It doesn't say even though there's a requirement when you're supposed to ask it, everybody's learned to say that because they don't get dinked if they didn't say it and the weather was bad. So it's not a problem to add it at the end of your briefing either way whether the weathers good or not. Because you always want pilot weather reports. If they don't say it and the weather has you know the 55TTIW. Which is ceilings below a thousand. Visibilities less than 5. Thunderstorms, turbulence, and low level wind shears. This now makes it into, they could be, receive remedial training or even lose their job if somebody crashes. So timeliness of the PIREPs are really the problem. And listening to everyone hear they didn't know, you know, there's different knowledge or understanding what a PIREP does. And whether or not it's needed and all those things. And I think with those type of thoughts extend through the pilot community well imagine through the controller community when they're split up and there's different options of air traffic. And different needs. And people are only concentrating in the terminal option or the tower option of separating aircraft and making sure people are not getting close enough together. And give vectoring people through storms and getting them around them and turbulence and all those things. But a lot of that information does come the pilot. A lot of its not shared. You get into my airspace, I know because I'm working that sector what to do. But everybody else may not know. And when you come on my frequency as a pilot I might tell you, you know, something along line of a smooth ride throughout your entire flight. I've seen pilots reported about 30-miles west of blah, blah, blah. You know we're going to give you that information as a whole, for all the pilots out there. And so you guys are now looking for it, right? And that's where I think, you know, there's just a breakdown as far as who does what. And knowing each other's job like they used to do back in the day. Everybody knew what everybody else was getting and why it was necessary. I don't know if that's the case anymore.

Appendix F
Group 5 Questions
Transcription of Participants Responses

**Focus
Group****Audio Transcription**

1 It's been very interesting to hear from very experienced air traffic controllers. Their perspective you know from the information we give and the information we expect to receive. So now we as pilots understand that controllers are extremely busy, which as we are. Sometimes even more. But the thing with the whole PIREP thing. It all depends on time and procedure. It's not the same when you give a PIREP in [city] and you're getting a PIREP in National Airport in Washington. Altitudes change, time change and the flow change. So it's very complicated. Now regarding the submission of a PIREP. Like I mean there is an awful lot of things that can be automated from the get go. That the airplane, as far as my operation, having ACARS. There is a lot of stuff on the form that goes out the window with a button. Because the airplane knows all that information already. Such as altitude, type of airplane, time stamp and all that stuff. So it will be much easier to categorize the PIREPs. Now there is only 2 types. I mean that's like kind of silly. I don't understand origin and non-origin. Well I understand what the nature is but why isn't a turbulence report? Why isn't a visibility PIREP? Why isn't it an icing PIREP? There is no categories for PIREPs except urgent and non-urgent. Which is kind of like goofy. The other thing is we, as pilots, have no way to tell you what the visibility is exactly. I don't have a way. My eye doesn't tell me. I either see the runway or I don't see the runway. Now it might be regarding cloud coverage. I might be in a spot that isn't scatter and the guy 3 miles to the East of me might be in a solid layer. So when he goes down to that he's kind of like, really hard for me to see now. I can tell if I'm getting ice and what type. I can tell you if I'm getting chop or if I'm getting turbulence. Now that also changes because the chop that a 757 feels in front of me, it's not the same that I'm going to feel in my 145. Because just of pure physics. It's a heavy airplane. Harder to displace. It's going to be different. So all the perceptive when you're trying to help general aviation, 121 should be separated from general aviation because a lot of the stuff that we do doesn't apply to them and these are the people that needs the most help because they have the less amount of tools. So it's a lot of the stuff. Like automation would help big time. Automation would help big time here. There is a lot of the stuff that goes out of the form immediately with the push of a button. Importance, like I mean, how relevant a PIREP is. People in Daytona Beach getting PIREPs from the student pilots for Embry-Riddle telling you that they have 20 miles and no wind. That's good for practice but it's not relevant and the type of the PIREP. For me that would be more important because I can go on my WSI weather brief. We have a really nice app and I can go and look at the PIREPs that matter to me. I want to see ice in the winter and I want to see thunderstorms in the summer. Other than that for me if I had to shoot a CAT II. I try to shoot a CAT II. If I go miss, go miss. We try like one of the controllers said. We go because we got to go. 121 goes. I didn't know that this was going to be a lot deeper then it looked at the beginning. But it goes much deeper. There is a lot more tread to cover because this is pretty interesting. This is extremely important to get information from more pilots.

**Focus
Group****Audio Transcription**

- 1 I want to jump back a little bit about the declining PIREPs just everything everybody's been talking about with flight safety. And you were talking about Alaska and how there's more there. And we're talking about airliners and their going to go no matter what. I think part of it is the GA aviation is dying. If you're in a 737, you're going no matter what. If you're in a private jet, you're going, but you care a little more because your passengers are going to gripe and you're going to have to listen to them. If you're in a 421 you care more than a private jet because it's going to affect you more. If you're in a IFR 172 it's going to affect you more than a 421. And if you're VFR single engine plane that's when you really care about PIREPs the most and there's a whole lot less of those out there then there were 20 years ago. So the people that actually care about PIREPs other than extremely bad weather, the people that really care, are not flying anymore. That's part of the issue.
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- 1 And we talk about Alaska there's a lot more of that going on then there is the rest of the states.
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- 1 Yes I was just going to kind of agree with [Participant]. Because and not really the key going back to the usefulness or the purpose of the flight service station that we had. But flight service stations were the best friends that general aviation pilots had. Because they were always in constant contact with flight service. Even when they weren't in constant contact with approach control or tower control. They were always monitoring 122.1 at that time. So as far as today and I believe that, and especially in the big facilities. We use PIREPs as a tool, as I said before. It's what's going on right now, what's going to be happening within the next 5 minutes. It's not looking beyond that and I don't care what happened before that. Because I'm watching weather or whatever situation is going on right now, that is going to best help me serve the pilots that are in my area at that time. And really that's basically the way that controllers have to think now a days. Because we can't worry about what was and we try to look at what's coming, but we're dealing with the what is right now. And that's our priority.
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- 1 With the PIREPs? I think that with the coming of ADS-B, I think that's going to allow the pilots to talk to one another a little bit more. So I think it's next year the ADS-B is pretty much going to be nationwide next year or the year after. But with that, with the ability for pilots to communicate with one another cockpit to cockpit and let each other know what their flight conditions are. I think that will pretty much eliminate as far as the controllers need for PIREPs. Other than like I said, on a need to know basis. And what we're doing, dealing with at the present time.
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Focus Group	Audio Transcription
1	<p>I think the discussion's really good. You know I don't disagree with anything the folks are saying. I've put some thought in some of things that you're looking for in your study here. As far as a system, [Participant] mentioned we used WSI as well. That's my real time information as long as my internet connections working in the airplane and it's extremely valuable. Again we talk about flight service stations going away and things like that. That's because today I don't need to look at a hand drawn weather chart. Try to figure it out. And then I'm dependent on the PIREPs that are given me up to date more accurate information then this weather chart that was drawn by the weather service guy, six hours ago. Now it's all real time. When I give a PIREP I'm trying to update the most current information that's different from what I've been told or what I'm seeing right now. So that the person behind me, the aircraft, behind me can use it or the controller can use it. If I were in the airplane and there was an easy way for me to open something up and I could put in the cloud tops let's say of that thunderstorm. And now that goes to everybody else. But that has to be integrated with every weather system. Every company. You know whatever their using. But I can give it turbulence, hey we just picked up moderate turbulence here. Well if I could type that in real quick on my iPad and that updated everybody's weather system, whatever their using. Now it's not dependent on the controller relaying it to every single airplane that's about to enter his airspace. The guy that's 80 to 100 miles behind me can see it without even asking and the controller having to relay it. But I don't know. That's a big leap there.</p>
1	<p>I've been in the government long enough that if the government designs an IT system it's probably not going to be very good.</p>
1	<p>Yeah I think basically what [Participant] was saying. We need the, you know, the 121 world, we need an ACARS submission form. Or on or JEP app we need submission form. As far as formal PIREPs go. With the formal PIREPs I think you just take the controllers out of it. And then with the informal PIREPs that's where the controllers are going to play a part. And then also the, if we do have a submission form we also need to have the Wi-Fi or a satellite connection to be able to receive those reports that are submitted. And the FAA needs to communicate the need for these reports. Like if they want the reports so bad that needs to be the initiative the FAA tries to roll out and say hey we need these reports. Please fill out as many as you possibly can.</p>
1	<p>Yeah I was just going to say that most airports, I mean, busy airports that have an ATIS, I mean any hazardous weather or anything that's really critical to flight information that's usually included on the ATIS in a NOTAM anyway. I mean, when controllers basically use PIREPs for a real time information that is referencing what I'm doing right now and for the airplanes that I'm working. Other than that I mean we have an ATIS for the hazardous weather. If someone reports that on takeoff that they lost plus or minus 10-knots, 20-knots. That is automatically put on the ATIS within the airport. So anybody coming in that area should have that broadcast.</p>

**Focus
Group****Audio Transcription**

- 2 I was just going to say that it seems like one of the common problems that keeps coming up is the fact that everything has to go through flight service. That seems to be the big hang up. And it's difficult to get a hold of them. Takes too long to talk to them. It seems like that's a big trouble point. But then they're also the solution to what you brought up before if it's a private thing ForeFlight/Garmin/WSI well that's just going to be for subscribers. Or if airlines develop their own technology they're not going to want to share it. And flight service well that's the public good free for everyone. But it's also the problem. So somehow that needs to be worked out where the public good has the technology or is updated with what other people are developing. I don't have a solution to that but.
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- 2 My thought was much of what he just mentioned to you but if you look at ForeFlight. Which I don't know if you can see but I have up here. It gives you imagery. It gives you a bunch of different formats to look at different things that are going on. If you had the option of PIREPs there that were pertinent, that purged itself, that would be really super helpful to disseminate that information in several places. But being a helicopter pilot a lot of time, you know we talk about this being antiquated but you live and die on pilot reports. Especially if it's marginal VFR. The helicopter I fly is not instrument equipped. So I am flying low level. A lot of times from [city] to [city]. Dropping off business people. I mean we're all familiar with what happened with Kobe Bryant. Pilot reports when it comes to low level flying, whether an airport is now VFR, marginal VFR, got an IFR. I did solicit those as a controller when we were in marginal VFR conditions. Soon as a pilot was switched over to approach or I gave him a clearance tell him to contact Unicom or whatever. I would always solicit how's your seeing. Can you see the airport? I said do you mind calling back with a base report? We did do that when time permitted. And I think that's real critical. Especially for the Part 91 pilots that are just going in and out of small fields. Traveling low level. You know we're kind of harshen on the PIREPs but they are really pertinent to guys like me that are flying around. I need to know what if that place has gone VFR. Like okay, if it's VFR now, I can make Cushion from here no problem. I've got an alternate if I need it. That's all part of, you know, especially for 91 that's all part of your daily planning on how you get somewhere. So I don't think it's not necessary. I mean I don't think there's other means. But I think all of us, I don't know, I mean I'm older than some of you, but, or a lot of you. When flight service went, became privatized to Lockheed Martin. There was a real, real slow down in the flight service people. People couldn't get flight plans. They started filing through ForeFlight. A lot of other places. They looked for alternatives because flight service for a couple of years there just could not get the job done. And I think what happened is a lot of pilots just kind of disregarded flight service after that. It was too much of a hassle. You've heard [Participant] talk about it up there. That their hard to get a hold of and [Participant]. It's better now. But I think they lost a lot of customers support and usage. Because they just weren't getting the job down there for a while.
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Focus Group	Audio Transcription
2	I will say, there's probably a reason for this, but I've always wondered why there isn't just a, you know, we used to have flight watch at 122.0 and they took that way. I've wondered why there's not just one frequency. Because the only way I can find that frequency is I'll follow, I'll find an airport on ForeFlight. I'll highlight it. I'll look under the frequency tab to see what, you know, is it Jonesboro radio, McAlister radio and what that frequency is. And it's different then it is you know 200 miles the other way. Well I've always wondered why we can't just have one frequency for those guys and there's probably a reason I just don't know.
2	No. But I will say that I didn't like flight service when it just had a single frequency because you would get calls from a hundred of miles away sometimes. And it was always crowded. And it was difficult to get on which is why I would always call from the specific VOR's because usually nobody was on there. I think that maybe it, it's a single frequency, you're going to get calls from hundreds of miles around to the same one. Because at 35,000 feet you can see quite a ways.
2	I don't believe that pilots in Alaska that are giving reports have that poor of situational awareness. So is it data entry that's causing that to be the problem?
2	And then how my, maybe this is my background, but like there are holes in the places where there's nobody given reports or the places where people are flying that, that whether they should fly kind of a deal. So that's just where my mind went. But they're like, yeah.
2	I did a fair amount of flight checkup in Alaska. And you know we'd be doing a 70 mile orbit of an NDB to make sure of its functionality. And I might be the only plane out there, you know, in that whole area. So it's pretty wide opened. And when you're going up to the North Range and stuff it might be you and one other airliner just taken some oilfield workers up there. So it's not uncommon you know unless you're around Anchorage there's just for nobody to be around. So just pretty wide opened and when you drop down next to some of that terrain because we used to do a lot of stuff at a 1,000 to 1,500 feet AGL or lower. You're often outside frequency range of any controller if that you like to talk to so. Pretty wide opened, rugged terrain. It can be interesting I'm sure for them to talk to anybody. You know which is why we're up there checking those NDB's and what not all the time.

Focus Group	Audio Transcription
3	<p>Well I was going to say I mean, [Participant] you've got the WSI thing right? It would be, I think, the focal point here not to give the controller more things but maybe something from the center. If those PIREPs are those just the audio VHF PIREPs were put into a system whereas we were talking about let's say, potentially about turbulence or something, right. So a guy puts in a PIREP for turbulence and it's available through a means like WSI, right. And pilots would get that automatically. And possibly it could be an addition to the ADS-B stuff for general aviation people. And then automatically let's say it's a turbulence PIREP. So it starts a 15 minute fade out. So after 15 minutes if a controller doesn't put in another one when [Participant]'s or you know somebody's [Participant]'s Airbus is coming through there, he doesn't refresh that PIREP it stays off. I mean it seems like the focal point here would be to have the controller put it in and have it displayed graphically for the pilots. Either via ADS-B, WSI is another means. You know something like that. Obviously the GA guys wouldn't benefit because missing Wi-Fi. But through ADS-B. And then it would actually be meaningful. Real time. It would be graphic. You could see your relative position to where things are going, right. Instead of trying to figure it all out.</p>
3	<p>All of these little gray things at least in ForeFlight are what the PIREPs look at. And for me as a general aviation pilot it is so much more useful to see it in this format in a graphical way. Then it is to say off the [airport] VOR 293 radial 15 DME, whatever. If I'm flying in the "soup" the last thing I want to do is be calculating where I am. Where that DME is. Where that radio is. It takes, having it graphically like this, takes all of the guess work out of it. And I can say, oh if I'm going, if I'm final for RWY 36 at [airport]. This PIREP is going to be very beneficial to me. And so having it graphically somehow whether it be in an application like ForeFlight. Or through the [TIS-B] that we have with ADS-B on our GPS's in the cockpit. I think that's extremely beneficial to increase your situational awareness and make the process a lot easier. And task saturate you a lot less.</p>
3	<p>Thank you. I think that some of the discussion on graphical display of PIREPs is good. But I think you have to remember that you need to understand the phase of flight at cruise. It's absolutely permissible to come off primary flight displays. Interact with iPads and information that's coming in on other equipment. But in different, certain other phases of flight, procedures absolutely prohibit pilots from accessing this information in that way. So while I do agree with what [Participant] is saying and what [Participant] is saying about having that stuff is very good. The SOP framework that I know that my carrier operates in is going to be very strict in certain phases of flight. So it's not going to be the answer for everything or every time. So I just wanted to put that out there.</p>
3	<p>[Participant] I have a question for that, kind of going back. What would make it easier and less distracting for you guys? I mean obviously you can't control the SOPs that you're under but how do you access PIREPs live, like when you're on a descent going through 6,000 feet. How would you get a PIREP in that case?</p>

Focus Group	Audio Transcription
3	Verbally would be the primary way from a controller. You're not going to be talking to dispatch and ACARS below, you know, 10,000 feet in a sterile cockpit. Below 18,000 feet you're going to be prohibited from certain use of electronic devices that have other things coming in. So it all depends on the phase of flight. It's a really good question. But you could, I mean, you could map that out. Like okay what is my availability? You know the hierarchy of how I get PIREPs. I can do all sorts of things when I'm at cruise. And the weather's good. But as I get lower and I get more restrictive my SOPs on what I can and can't interact with. Then it goes down to where I'm only going to get something typically verbally from the air traffic controller that I'm talking to at that time.
3	[Participant] I agree. And I'm not advocating you know down low or using PIREPs as opposed to the controller. But in terms in of when you're getting ready to start an arrival, right. You obviously going to see radar information. See it on WSI. I mean you look at it. I look at it. Everybody, [Participant]'s looking at it right. But also having more of what the controllers getting. Those real time things, as opposed, to this formalized PIREP thing. If you had a guy sitting there that was saying hey, you know, United 1234 reporting whatever. He could just hit the tag up on the screen, because you have the current position, right. Now it's even more accurate with ADS-B. And then they can just pull in whatever the small thing. They've got the aircraft type. They've got the aircraft position. They got the date. The time. And all of it's turbulence. Boom, end of discussion. And it automatically would feed into something that you could see. So when you're getting ready to start the arrival you would look down at that. You'd say oh wow man looks like we're going to get hammered on the diamond coming into San Fran going over the Cascades or something, right. So I mean that's the only thing I was saying that would be nice. I think there's a lot of information that [Participant] eluded to that goes in his head, that if he doesn't pass it onto the new controller sitting down. You guys all know, when we check in, a guy goes I just sat down. I'll talk to the next guy, I'll find out. I don't know. So that's all I was saying. And then after 30 minutes some of that stuff could fade off if it wasn't refreshed. So starting the arrival I'd know what's going on. I'd need my heads up, I'd say cool. It's going to be clear sailing or it's not going to be. And then we would at least capture more of that incremental data that's getting lost. Which would show up on the ADS-B stuff that [Participant] was showing us, right.
3	[Participant] I agree exactly with what you're saying [unintelligible]. But I think the point that kind of came into my head especially when you explained this. Like we have the most access to PIREPs when we need them the least. Proactivity aside, right, I'm going to get, I need them. I can be proactive about what's happening on an arrival, what's happening at the airfield. But then when we do start and change the phase of flight we have less access to those PIREPs. So get them when you're at cruise, that's when I can get the most of them is when I really kind of need them the least. Except in preparation for changing the phase of flight.

**Focus
Group****Audio Transcription**

- 3 Yeah I'm saying just from a planning standpoint, right. Just a planning. Get a heads up. And also if a guy like [Participant] let's say he's only making a small flight from let's just say [city] to [city], right. Or Austin to whatever. And he can see these PIREPs on the arrival. You know that maybe proceed weather coming through or proceed weather coming through. He may say, you know, what I made from a planning standpoint I may sit on the ground and go get another hamburger and a cup of coffee before I take off. And let's go back and see what it looks like in 30 minutes. Because it's kind of fading real time that we see what's going on. Whether it's building or getting worse, right. And that's all I'm thinking. Down low, yeah, you got to talk to the guy. The guy's got to say. And plus we're listening to the guy ahead of us getting his kidney stones knocked loose, right. We already know that, he's going screaming you know. And we pretty much know the call signs of the frequency guys that's running ahead, right, we already know oh boy he's ahead, I'm watching him over here. So it's all good.
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- 4 Yeah you've opened a can of worms there and there's many aspects to that. I think in terms of, in this day and age the popularity of iPads and electronic flight bags and what not. Definitely the PIREP needs to be displayed on a map display so that a glance you can tell where it's situated. And I mean there are a variety of ways of displaying it. That's a whole other conversation. In terms of the timeliness factor I guess the problem I've experienced isn't necessarily been the PIREPs are delayed getting to me. In some cases in fact they're taken away too soon. That is for a while I think flight service was actually with holding them if they were more than an hour old. And again there are multiple uses of pilot reports. I mean if I'm in-flight at the moment obviously I want something that's current. If I'm sitting in my office trying to figure out to go flying today or whether I can go flying tomorrow. Being able to look back and the weather service allows us to filter pilot reports back to 24 hours. That's probably the limit of anything I can anticipate needing. But I certainly want to be able to see you know over 6 hours ago, what conditions were doing in certain areas. In part because that maybe the only data available. So knowing what was going on a few hours ago versus knowing nothing is very helpful information.
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**Focus
Group****Audio Transcription**

- 4 Alaska we used to say Alaska is unique. [Participant] and I have kind of stopped saying that because nobody believes us. People have seen the TV shows about Alaska and I can promise you that anything, they're anything but reality shows, that you may see about Alaska. But Alaska is extreme. And so we do have the same types of weather that the rest of the world has. It's just more extreme here. We have great distances that we're flying. Just like everywhere else in the world. I mean we're not going Trans-Oceanic like [Participant] sounds like he does. But we are going across huge vast distances with no data available. There's no service observations for you know sometime a 100 miles plus. And so pilot reports are very important to us because that's our only way of knowing what a weather front is doing and how fast it's moving. And that's why it's important that we can go back 24 hours through the weather service to get some of that data. Flight service has a better radio network than Anchorage Center. So a lot of times we have to open and close and get our clearances for IFR flight. We have to get our clearances through flight service. Alaska is different than the lower 48. Where Leidos is not running flight service here. The FAA is still running flight service in Alaska. And we do have several flight service stations that you can still walk into. Get a briefing. Talk to the pilot, to the specialist who has local/historical real world micro weather knowledge. Just like the old school flight service stations in the lower 48 used to have. And so our relationship with flight service is much different than that of the lower 48. Much, much different. And I can keep going but I'll let [Participant] talk.
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- 4 No, no. It's more than that. But the point is we need almost 200 more to have the same average density that the rest of the country enjoys today. So as [Participant] mentioned that just even the service observations on the ground much less what's going on the air is much more limited. So we're even that much more counting on pilot reports. And in past what I would do is wanting to fly from Fairbanks to Point Barrow or Utqiagvik it's known today. Which is about a 400 mile flight. I knew that there'd be a DC-6 going along that route. So I'd call flight service in Barrow ask them to solicit a pilot report going over the Brooks Range. And probably an hour later there'd be a pilot report in the system. Not at 30,000 where some of you guys fly. But down at 6,000 feet we're I'm going to need to fly. Which would give the missing data points to let me know whether I can make a VFR flight to Barrow on that day. So that was a fairly typical way to try and use the system to try and collect the missing piece of information to be able to know whether it was safe to launch a flight or not. I'll stop there for now.
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- 4 Just to make sure that what [Participant]'s talking about you know he referenced a DC-6. That doesn't mean this was back in the 70's. This is today because DC-6's are still in daily operation here in Alaska. So that's a very current real world use that we do up here.
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Focus Group	Audio Transcription
4	[Participant] you want to go. The FAA don't want to pay for staffing to disseminate PIREPs. Like I said there's nobody on data. And the FAA is going to keep, their working 6 days a week at [airport] now. They're maxed out on overtime. If they can keep somebody from working data they're not going to have somebody there. And it's just a matter of not spending the money. They got rid of air traffic assistance and those were the people that were specifically doing nothing but data.
4	We had air traffic assistants back in the 90's. They were a lot of furloughed pilots and things like that. But they were real handy. But once we got rid of them. Nobody wants to staff data because there's somebody back there pulling strips for departures. Because you're not going to pull a controller off a busy position that you need to put them on data.
4	The only thing I can think of as [Participant] said is to increase staffing. And also make it somewhat simpler. Because again, we're told to separate. And not necessarily disseminate. And we got to change the focus to get everything kind of under control.
5	No. But when you talk about how to improve on the system. There's lots of things that I was thinking about. I think [Participant] might talk about the decoding. But again, we're getting real time PIREPs. There's a few PIREPs that have always annoyed me. Very, very important and that's the braking action. So at American and probably most airlines at the top of descent or sometime in the descent we're going to brief the approach right with the other pilot. And that's the time that we talk about the approach and the runway conditions. What kind of auto brakes we're going to be using. And so when we do that, we look at the ATIS, right. So we're looking first at the ATIS. And now we've got this Jepp Pro program, most of us are, we're not tuning into the ATIS to listen. We're downloading it on our app. I think it would be really, really great if we could get those braking action reports on the ATIS. I remember and I still do it today. That we're on the approach frequency and let's say I'm the pilot not flying. And I'll say I'm off the radio for a bit because I'm on Tower listening to the airplanes landing in let's say icy or snowy conditions. And I'm listening to the PIREPs being reported on tower. They're not being reported on approach. But those are very, very important if not the most important PIREPs. So if we could get them to us much earlier than waiting until we get on tower. Such as maybe through the ATIS system. That's all.

**Focus
Group****Audio Transcription**

- 5 I'm just listening in. I mean there's so much great information and a lot of experience obviously with both the ATC and the pilot side. I got WSI up right now. I'm just kind of, as everybody's talking about this, I'm looking at all the different layers and there's just so much information. Kind of like [Participant] was saying earlier here. Honestly, I look at a lot of things on WSI but there's so much information I kind of only have a few things that I go to all the time. But I'm going into the PIREP section right now and I mean you're talking about viable solutions of modernizing the means. I mean there's already so much information. I don't know how much, technology's going to improve no matter what. But there's already so much information out here. And I love the comment that was made about something similar to the Waze app and everything. To what [Participant] said earlier. With the risk reward I mean, if it's going to be so easy to put the information out there. You're going to filter through, you're only going to look at so much of that information. And to [Participant]'s point to about the most important PIREPs that she's most concerned about coming back from ATC. It seems like a lot of the time I go in and like whatever my route is. Does everybody here all the pilots, everybody uses WSI on their iPad I assume? So I'm sure they put in the start of the trip and the end of the trip. And then whatever flight level you're going to be at. And you look at the forecast, turbulence at those levels and everything like that. A lot of times what I've noticed is, I mean, the time period for some of these sectors. It doesn't seem real accurate a lot of the time. By the time you actually get to that place along the route, it's like well, it says it's supposed to be right about this time period. And of course a lot of it is forecast anyway. But even real time, I mean, the weather just changes so fast. Anyway I'm kind of going off on a tangent right now. Just going back to WSI. There's just so much information and I guess this webinar we're doing right now, is kind of getting me more interested in maybe getting a better understanding of it. And making better use of the great product that's already out there, that you'll have access to.
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- 5 You can deselect anything you don't want to look at. And obviously select the things that you do. So again, I always have PIREPs selected in the background. But now that we're having the conversation I mean, now I realize that I never really, I mean there's all this other stuff that I'm kind of looking at. But the PIREPs I'm not really putting much focus on.
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**Focus
Group****Audio Transcription**

- 5 Sure just real quick and not to beat up on the Waze thing. But some smart person at Waze and they probably work for Google now. But has figured out a way to filter those reports and decide what is useful for the driver. As their going from A to B on their route. And it'll tell you when traffic's ahead. It'll tell you when there's a wreck. Or a cop, or whatever. Well I think that same principle can probably be applied. Because like [Participant] was saying. You know part of my preflight routine is I go in and I put in the origin/destination airports. And then the routes will pop up and you can populate the entire route. And WSI, it is a great program but it's almost like information overload if you let it be. And so it has ways where you can like set, there's like preset filters and so I have one that's called turbulence. Where is just gives me turbulence PIREPs and the TAPS reports. And then the WSI kind of has a propriety turbulence deal that I bring up. And then I have another one that's called weather where you can bring up thunderstorms and stuff. But you know I guess what I'm getting at is, there's so much information we almost need and it probably comes from focus groups like this. But someone that can decide what is important to pass to us when. And is able to push those alerts either through WSI. Or you know if you're talking general aviation the ADS-B or something like that. So that the end user gets it in a format that's useful. Either plain English or something that's close to it. And it's timely. And it's also, you have to think about whether it's appropriate. Because sometimes if you're below 10,000 feet on a approach especially into somewhere, so we'll use [city] as an example. We get a lot of PIREPs going into [city]. And the controllers there are great passing from center to approach to tower. Because the weather there changes so rapidly and there's so much that goes on there. Well if you're below 10,000 feet in [city], you know, you're 5,000 feet from touchdown. You don't want to know if there's light turbulence in the area. But you do want to know if there's wind shear on the field. So you know, those are all decisions that a program, if we're using a technological solution, would have to make in order to provide those timely updates to pilots. Otherwise, I think the controllers do a good job of just passing them to us you know as the system works now.
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- 5 I'm just going to laugh at myself and be brutally honest. But just prior to coming onto the meeting. I did the same thing, oh WSI, I was looking and I have to be honest. I've never actually used the PIREP layer for my preflight. Because I expect to get the big picture with the turbulence, the TAPS, the SIGMETs, the AIRMETs, the radar. I've never used that layer of PIREPs in my preflight planning, for as long as we've had WSI. So I share that with you honestly.
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- 5 No that's so true. And of course I'm sitting here as she was saying, she was asking me questions that I can't answer because I've been out of general aviation for so long. But go ahead [Participant].
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**Focus
Group****Audio Transcription**

- 5 What I was just asking [Participant] was well training has, when I got my private pilot. When I went through the process of getting my license. My training was mostly done on paper maps. And you know calling the weather briefer before a cross country flight. But I think that my year was like one of the last years where people were even using paper maps. I think most students now are using the ForeFlight app and all these apps. And I think rarely going through the steps that I went through getting my license. And so I was just kind of running through our mind, what, I don't actually know what is more accurate. Calling a live weather briefer getting that weather report on the phone. Or looking at my ForeFlight app and looking at those PIREPs. I don't know if maybe some of the people at ATC would know but. Yeah because we're trained to, or at least I was trained to, always call the weather briefer. Because that's most accurate information at the moment. But now people are actually not even blinking an eye and just using their apps.
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- 6 I would caution that. The reason I would is because there's too many people that's had the ability to hack things these days. I don't like that, I think there has to be reportable/accountable person that puts a PIREP in. And that can be traced back. I mean just like the one you mentioned that was in the wrong place in Alaska. There's a timeframe that PIREPs have to be put into the system. Those things have already been identified and have already been used for years. I think there should be a centralized point where PIREP reports should go to. But if you look at that, a lot of controllers especially in the center and approach will tell a pilot, contact flight service. On this particular frequency for that, I'm not going to take it. So if you tell a pilot to get off a frequency if he doesn't have a co-pilot with him, that may not happen. So what I'm saying is the pilot is busy doing a whole lot of other stuff and if they take the time out to give us a PIREP. We're supposed to have that ability to take that PIREP and do something with it. Not make the pilot do it, okay. And that's my opinion of it. I just think there has to be some accountability. There has to be some reinforcement from the management side, on what the expectation is for these. Because if you're not constantly saying, you better get those in the system, and you better do it in so and so time. And I will come around and I'm going to be pulling tapes. Not even looking at the forms that you're supposed to be doing. I'm going to evaluate you as part of your job performance, it's not going to happen. So to me, you know, I think apps and a lot of stuff that we're doing that we think is going to make things simpler, sometimes make things worse. And especially with people that have the ability to cause havoc and to go into systems. I understand you saying something in the cockpit and all those things. Again I can see maybe the pilot having the ability if there's a way to identify the aircraft. But again, they could still be hacked and so that's my concern. I'm not going to say don't do it but I think there's always, already has been a system that was in place. We just quit using the system and now we're trying to re-invent the wheel like we do in everything in the government. The system was there. If you start looking at when the problem started occurring, you can now figure why the problem occurred, in my opinion. And if you start looking at why the problem occurred, what was working before? And why were we not having these problems before? And I think the fact that we've now changed the way we do
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Focus Group	Audio Transcription
6	<p>business as part of allowing letting the worker bees telling us what they want to do. As opposed as to what we require them to do. Is part of the problem as well. Because if you insist this is part of your job function, I think it will get done and it'll get done correctly. Or we need to put a centralized place, in place where these things go and they could be put in. And they could also be checked for accuracy because the people in the other options knows what goes into a PIREP and what it's supposed to look like, okay. So I think if you were in Alaska you understood that because you so that with those people. They know what a PIREP is and there was even a PIREP report form that they had inflight service options, that they wrote that information down on. And as well as the tower too.</p> <p>Hearing what you said I'll go along with it, with the new technology. I just think that if you do use that technology it shouldn't go directly into the system. It should go to some individual to vet that PIREP and make sure that it's in the proper format. And understandable. And if you're going to do something along those lines then there's a position that's set up to look at that. I think that is doable. If you're looking at millennials and the new technology that's out there. Instead of it going directly into the system immediately it needs to go to someone that puts it into the system.</p>
Focus Group	Audio Transcription
1	<p>I might be the outlier in this but I'm a little bit of a weather nerd. Old information is still information to me. If I'm able to show a, pull up a pattern of PIREPs in a certain area during a certain weather phenomena. At least in the 121 environment, a lot of us kind of go to the same places all this time. So if we see a certain PIREP pop up that means we can kind of get in our head that oh something's going on that I'm familiar with. And it's nice that we dispatchers and everything and all this handy little tools. But sometimes our dispatchers are, well, I think some of them are not the greatest. So we have to depend on pilots. We have to depend on ATC. And I understand where ATC gets very busy. I get that a 100%. If there was a way to automate it. Even the controllers like [Participant] was saying yeah you know you got your target that's this big. But again, old information is still information to us. Especially when it comes to planning. Yeah we're going to go in a 121 environment 100%. But sometimes I developed my alternate planning based on what I'm seeing ahead at the time and historical data.</p>
1	<p>I think as far as the automation goes the only way to really make it happen where pilots are going to input more is like [Participant] said doing something through Jeppesen. Through ForeFlight. Through Garmin pilot. And then on top of that needs to be able to be processed through ADS-B because a lot of, especially GA planes, aren't going to have internet connection where they can a) send it; b) receive up-to-date information. So it needs to be through those apps. Because no one's going to want to get on a second app to just input a PIREP. Even if it's easy. It's still a second and then the process. They want to do it through something they already have open it. And it's going to need ADS-B to be able to process it and send it to each other.</p>

Focus Group	Audio Transcription
1	I just wanted to add one thing to that especially what [Participant] was saying. I think that would also depend on location. You know because like in [state name] we have thunderstorms come through every day. You know that's going to happen. But once that thunderstorm passes through we might not have any more weather until tomorrow at the same time. So it was the same down in the islands. We have thunderstorms pass through and then the weather's clear for the next couple days. But when I was in [city] I could understand I could understand what he was saying because then the PIREP for the next 6 hours would be, they would be relevant you know for all day. Or even into the next day. So I think in that case it would all depend on location as far as how long you would need a PIREP.
1	I was just going to ask won't ADS-B take care of that dissemination between cockpits in the future?
1	Are any of the pilot's right there working with ADS-B? I mean actively have ADS-B onboard?
1	Yeah, like most of us probably have ADS-B onboard the plane now. We have to.
1	Yeah. Aren't you all able to disseminate weather to another aircraft what you have seen?
1	No.
1	No, okay.
1	That's going to be kind of carrier limited. For us we don't have flight deck Wi-Fi. We don't have an active ADS-B. We've got ADS-B to the point where the airplane talks to the system. But we don't have interaction with it you know as a pilot. That's going to be a company thing. Yeah right now we don't have any way to interface with our airplanes ADS-B.

**Focus
Group****Audio Transcription**

- 1 Well I think part of the issue that we have to look at here is what information do we need? And where are we getting it from? And how are we disseminating it? We keep talking about PIREPs that come from the pilots and that's one category. But I think another category is aircraft reports. Now grant it in GA information I'm not going to have, my piper warrior's not going to be able to disseminate information. But in the 121 world with the latest and greatest fly by wires and everything else they can disseminate information. The aircraft itself can do it. Taken the pilot and the controller out of the loop. Now grant it we have to realize as pilots that there are errors with that information. Just like there is with ASOS or AWOS. But it is information. And if eventually the pilot would have access to those and go oh well it's reporting this no, I don't agree with that. And then they could put their own statement next to it and send it through that would be great. The other thing that we have to realize is that if you're talking about just PIREPs, we all want the information from the guy at the time, he doesn't have time to give it. So it's how do we do that? And I think that the voice recognition maybe a way to do it. I don't know that there's any easy way to do it. Because you're going to be taken a pilot in a stressful, supposed to be sterile cockpit environment, and asking him to give information to a controller who's in a stressful environment trying to land/separate IFR aircraft. So I actually think there's two different ways they can be addressed. One through automation, that's not necessarily a PIREP. But the FAA will have to change its ways and understand that a PIREP that was designed in 1940 something, is no longer relevant to our technology today. And maybe separate those two things. Because right now if I give a controller a verbal PIREP, is the FAA considering that an incomplete PIREP. And almost like well they're not giving a PIREP. Yeah but I'm given him some good data that he needs for that moment and that could be disseminated to other pilots and controllers on that frequency. So I think that the best way going forward is to actually separate the two. Let automation do what it can do. And then create a second category that is human factors side of it, of what I see and what I believe and what I feel. And a lot of that will actually separate your 121's and your GA's as well.
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- 2 Based on our discussions I think a lot of this is going to come down to industry buying formatting with regards to like you know we've talked about Garmin if you click on your map location you got your dot there. You click on it. You fill out the forms. It does a standardized whether it leaves a field blank or whatever and the data gets transmitted. And then Garmin has to be willing to share that data with like some entity in the FAA whether it'd be some function of flight service. WSI does the same thing. ForeFlight does the same thing. You know there's probably what four or five major programs that are all pulling data from the government anyway for ATIS or digital ATIS or whatever.
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**Focus
Group****Audio Transcription**

- 2 Once they're getting data back. Once everybody buys in and says yeah I'll give data as long as I'm getting data back. You know and then for them it's just a programming requirement to translate that data however they want to their pilot. You know we all see instrument approaches are formatted differently for Jeppesen then NGA and etc. So they can be creative on how they format the data to how their users want it. Somebody has to be the receiver, you know, site say for all that data. And that's probably ultimately going to be some office in the FAA somewhere. You know that's just basically a server that digests the information. Fixes any or rejects any abnormalities and then is a database that those other companies can pull back from.
- 2 So there's two things. One of things that we've been talking about it seems like to me there's really two types of pilot reports. There's the en-route pilot reports where you've got conditions. Then you've got the 13 categories and you go through it. And those are the more standardized ones. And then you've got basically current conditions that you're given via updates from the controllers. So I use PIREPs for flight planning. And basically to keep track of the weather near my destination. But once I start my descents or if I'm in the clouds I'm just talking to the controller, I'm just trying to get bases, tops that sort of thing. And that's something that's really I think you're only going to get verbally. I think the PIREPs your taken time to file them effectively for weather forecasting. For flight planning purposes for other pilots. Those are really nice but those are different then current condition reports that you get from controllers. And it might be nice to differentiate those two somehow so that controllers are not really expected to do PIREPs. They're just going to pass along current conditions. And then you automate the PIREPs, via avionics. And I personally, I've got a Garmin G500 on a 530. I would love to be able to go to my 530. Go to a pilot report page and have it fill in all the information it already knows. It already knows the temperature. It knows the winds. It knows my altitude. It knows my location. And put in the things that it doesn't know. So I could do visibility. Cloud tops. Any other information. And then hit send. And have it transmit out on my ADS-B-out. Because then it would just be done and ADS-B-out is being monitored anyway. So if that interface would become available I would use it all the time. Because that makes it very simple to do. And I would be glad to do that. Multiple times I'm flying.
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Focus Group	Audio Transcription
3	<p>I just want to add one thing to your question. We're talking a lot about getting PIREPs in the air. And before you start the arrival. And on descent from controllers. But one thing I'm going back to more of the GA world. A lot of the use of PIREPs are on the ground before you ever take off. Because for me like today, at least, it was forecast to be marginal to IFR all this morning. And it's clear and a million outside today. And so if I'm sitting on the ground, if I'm sitting at home, and I see a PIREP that says oh the weather is actually clearing up and METAR hasn't reported that yet. Or the METAR's wrong for whatever reason. It'll allow me to better flight plan before I ever go out. And so I think we'd also look at going back to [Participant] and [Participant]'s comment about using it in the sector but not ever not passing it on. I think there's a huge part of that population that would really appreciate it getting passed on. So you can see it on the ground before you ever talk to ATC in the first place and get your planning going.</p>
3	<p>Well I would already say that if you think about it we have about 800,000 pilots in the US. Rather than train all 800,000 pilots on how to input this information, you have the point of contact, right? Now if it's a staffing issue in the centers where you actually need more staffing but then you only have to train a number of people that understand the system completely well, then will be accurate. And you have the automation that already knows the airplane. It knows everything about the aircraft type. And the position. And the time. It seems to me then why not use that as the focal point. Train that individual. And whether you have to staff them and then it would be automatically correct. Position accurate. Time accurate. And you don't have to train 800,000 pilots to do it right, right. Or have some other distracting thing because in [Participant]'s flying, if he's flying single pilot IFR at night, he probably needs to pay more attention than entering some kind of thing on the screen. Unless he has a really good auto pilot, right. But the controller, not to down play [Participant], I mean you're in a chair. You could put another guy next to you that's not going to change your weight and balance and you could get the information into the system correctly, right?</p>
3	<p>Well I think [Participant] did an excellent job saying that out of 10,000 feet we're not going to be allowed to be fiddling around doing that. So the most critical phase of flight. Most accidents are takeoff and landing. They're not en-route crew's problems. So if you want that information how are you going to get the pilots to be doing that when they're actually supposed to be concentrating on everything that's going on, that's required as the workload increases, right. So again, it seems to me, that if pilots are making verbal communications to the controller, you need somebody there doing something with it. Because you can't expect the pilot to do it. And also, I think [Participant] made the comment about he used to fly a lot but general aviation has gotten more and more expensive. So if we put back on the GA people to having to put another piece of equipment in, we just got done with the 2020 ADS-B requirement. Because that won't satisfy, once again, GA costs even more and more to meet the requirements.</p>

Focus Group	Audio Transcription
3	I just wanted to, there's a program that the [airline] pilots have. I think it's called Skypath, [Participant], is that what it's called. Okay so it uses the [accelerometer on the] company issued EFB.
3	I just wanted to know if you knew about that. Because that's something, that's kind of like what's, what you're kind of talking about. For that type of PIREP. Just all PIREPs are not created equal. Ceilings. Where the weather is. All that kind of stuff, you know, being different. But at least that can give you, provided that the technology is accurate with what the accelerometers measuring and everything. I just didn't know if you had known about that because it sounded like you were talking about something similar.
4	I think a lot could be mitigated by design. I mean like everyone's talked about technology is advanced to such a level that we can put out a lot more data with a lot less effort. And if we can just get that into action we'd be in a much better place.
4	So although because our companies until recently had plenty of money to develop these apps. I think some of these though are across different airlines and it's just that their customized for the particular airline. Because I think somebody mentioned WSI earlier. And that's a program we have that does the presentation of all the weather. One thing about that program is it actually displays PIREPs. It doesn't give you the information. It shows you there's one there in a particular location. And then you put your cursor over it. And click on it and it will give you the information on a PIREP. And you can determine if it's germane to your particular to flight because it will tell you the aircraft type. It will tell you the altitude and that sort of thing. So you can decide right away if it's even something that you need to read. So I think at least a big part of the solution is this type of thing that you can use across platforms. And I know it may be on hold now because I'm sure there's a cost involved with it. But there was an effort between [airline] and Jeppesen to integrate that capability so we would only have it on one particular app. Someone mentioned the fact that yeah we have the Wi-Fi which makes it easy. So if you're flying at 30,000 feet it wouldn't necessarily work unless you're airplane has a Wi-Fi connection. But if you're a GA pilot and you're flying at a lower altitude you probably have access to just the norm, except in remote parts of Alaska, you probably have access to the ground, just like you would on your phone to get the information directly on your iPad. So if it was something that was in ForeFlight or some other program that you could access. It's just a matter of getting all the data from one source into a system that it can be disseminated to other sources.
4	So does that system solicit information? Does it ask you for information? Because if it doesn't it should.
4	Yeah just you know we got obviously it sounds especially within some of the larger airlines that there's similar applications. If not that might even be the same application. But they're tailored to each airline. Obviously one the FAA allows us to use that. It's been approved by using the cockpit by the FAA or we couldn't do it. Seems like there'd just be some kind of connection there that's allowing say hey, you're allowed to use it but this data must be shared. But that also seems like you'll require some kind of indemnity from you know from liability.

Focus Group	Audio Transcription
4	Yeah you know I really what [Participant] said segue into it. Really is the companies would be okay to provide data as long as they're not liable if something happens down the road with somebody else. And that will be a key to have them come play ball in a sense.
4	So you know [Participant] and I both use a satellite based tracking platform. It does have some texting capabilities. We've talked to several folks. Is there a way to have fillable forms so that data can just basically a slider bar or something very simple and easy to just be able to transmit that data? There is a way to get it into the AWC. Aviation weather center. To get that online pretty easy. It's hard to get traction to get anybody to develop it. I'm not that smart to do an app. A way to get that to integrate. There is talk of the next generation of ADS-B level 3 to have the ability to send some data back as far as pilot reports. We do have a communication and connectivity problem here in Alaska but, you get outside of the communities cell service drops off very quickly. And you've got vast expanses with no communication capabilities. Some places even you can't talk to flight service. You can't talk to [name] at [city] Center unless you're above 10,000 feet in most places so.
5	Okay to [Participant]'s question from an en-route stand point I'm not sure. I would say you'd probably be better off calling weather and getting a live briefing. I just think you know again you're getting more real time stuff. What I wanted to say earlier as we were talking about ways to automate the system and then something [Participant] said, you know having intelligent artificial intelligence. Using something for example if [Participant], [Participant], [Participant] and [Participant] are on the same route. [Participant]'s out ahead. [Participant] reports a PIREP regarding turbulence, something like that, or ride conditions. That would automatically pass back to [Participant] and to [Participant]. But not to [Participant] who doesn't need it. You know so again we're getting people information that is useful. Because again if you just get all this information. It comes to a point where you just say okay, I'm not reading another one. I'm not reading another one because they're not useful. Those are the type of things we can also look at in terms of efficiency for the system.
5	I have a lot of experience on this both as a controller and as a pilot. I worked in Alaska for 4 years. And without a doubt that was the best PIREP system because it was so crucial to the flying up there. The weather changed continuously it was crazy. I remember that was one of our highest priority set by our bosses. Next to separating airplanes was getting those PIREPs in. But back in those days we still had flight service. So you could actually walk into the flight service as a pilot. Sit down and go hey this is what I just experienced going through the pass.

**Focus
Group****Audio Transcription**

- 5 Right. Well there locations are kind of tough to unless you just happen to be in one of those cities. But it's rare as compared to here in the states, where you call flight service now, I mean not that I do that anymore. But when you call flight service now you don't know where or who you're going to talk to in what part of the country. And you know he's not experiencing the same weather that's out his window. He could be sitting in sunny [state] telling you about how horrible it is in [city, state]. So I think we lost something in that aspect. But not that, that's a PIREP thing. But I agree with you as far as Alaska being you know the PIREPs are so crucial up there.
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- 5 I'm not sure if I'm answering direct to your question. But it kind of goes back all the way back to the slide where you talk about temporal stuff. I mean, I hate to be the guy that keeps hounding on technology. But you know I mean we have all sorts of information in the WSI app. We actually have forecast stuff for weather. We have active weather observations. We have reports from ATC or pilots. And I don't know if like local weather forecasters or anything are involved in that loop anymore or not. But in Alaska certainly they are. You know you've got people that are actually monitoring just the weather. But you know what is 20 minutes old information when you're going to [airport] is kind of old. But something that's 2 hours old when its 1 in the morning over [state] is actually still pretty relevant. So I think you could use some technology to kind of filter out how many reports are we getting. And what's the quality of those reports based on. How many people have been flying over there? How many people been working it? How many people been watching it? And you can basically use technology to kind of make it so that you're only seeing what is really relevant. So that 2 hour old PIREP over [state] you'd still get to see. Whereas something that was 30 minutes old in [airport] is no longer relevant and it's just going to drop out of the system. That way you can just use stuff closer to real time. Real time obviously it varies, depending on where you are. But closer to real time and only see that relevant information for your preflight planning and actually when you're actually flying as well.
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- 5 Yeah sorry. I'm using her as a brain storming tool. No I was kind of just, I mean, obviously I don't have experience with the airlines or anything. But just to what [Participant] was saying. I was just kind of thinking maybe the opposite would be more effective. Having the technology to bring in all of these PIREPs. And the ATC people or the people behind those PIREP reports actually filtering through those. Deciding which ones are most relevant. I don't know what, but that was just kind of a thought.
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- 5 I just had a thought that I can't really get out of my mind here. And that was what you said about getting rid of PIREPs. I mean, is part of the reason why we're doing this, is that?
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**Focus
Group**

Audio Transcription

- 5 Yeah, yeah. Okay good. I mean again I will always go back to those real time PIREPs are the most important. The descending into [city] and the controller says we just picked up moderate chop between 10 and 12 and you're at 14. So like those are the most important, now those real time. And to think that technology, maybe technology can pick up a tremendous amount of information and that's valid and great. I still think though, as a pilot, when we're actively climbing and descending. Landing and taken off. We are not referencing our WSI app. And those are the times that it's imperative that we get those real time PIREPs. Yeah, just to be clear.
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- 6 Yeah I would agree with [Participant]. I mean, it's important to make it more accessible but whenever you're increasing testability. I mean so many people will try to [script] the system just because they think it's funny especially kids. So having someone to vet it, like it can't go straight through the system. And I could understand some like AI stuff with it. But I still think there's need to be a human to double check that because, I mean, inaccurate PIREPs can be super damaging. Super dangerous for pilots. You know if you go somewhere you expect it to be one thing and it's absolutely not that. Having someone to be accountable for that instead of just oh well, you know, [this scenario/unintelligible] program that someone wrote years ago. I'm not super comfortable with that at all.
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- 6 And the way that I look at it is because I'm a pilot in order for me to understand something I need to dumb it down as much as I possibly can. And we basically have a sender and a receiver of information. With the modern technology that's out there now a days with data link. I think if there was a system where, say I wanted to submit something to [Participant] or [Participant] and ACARS it. Light turbulence. 350. Tab. Negative 40. Right. That information is sent to ATC. And then ATC can validate it. Enter it into some type of simplified submission form. And that information with [Participant] behind me on the airway can possibly, grant it, this is all based on the avionics and the technology on each particular flight deck. But finding some way where other pilots can access that same information after it's been validated by ATC. I think that would be the most simple way of looking at a procedure with only 1, 2, 3 steps with a validation process put in place. That we can get the information in a timely, efficient and effective method. So that's the feedback that I have with this. With the apps, I agree, you know, can someone go extreme and put in false information, yeah they can. But an ultra-light guy in [city] given a PIREP is not really going to be applicable to our day to day operations. But the way that I view it is that if we can have a simplified, efficient and effective with a validation piece thrown in there. I think that information would be much more usable to not just us in the seat, but also you know you guys on the other side of the radio as well.
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**Focus
Group****Audio Transcription**

- 6 Yeah I was just going to say I mean I already have a couple of apps that I can put in PIREPs with. I don't know, again, I don't know where they go. I doubt that they're going straight in the national system. But they're filtering through something. As far as formatting, I mean, there are drop menu. They format automatically. I can't not format it correctly. And you know, I don't know, I think right now I could get on the radio with a handheld radio and made that some call sign and make that some PIREP. Who's to know. Maybe the filter is, if there's a flight plan in the system then it lets that PIREP go. I don't know. I'm not, I guess on the other hand, I'm not as concerned about a hacked PIREP. Because I take it just at that. I take it at face value and I'll fly along. I'll be 20-miles behind a plane, you know, similar plane another 737, an Airbus 320 and they'll put in a PIREP of the world's ending can I fly through it? It's smooth. It's not like a PIREP is solving world peace. It's just that. It's one person's opinion at that moment in that place.
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- 6 Yes I just wanted to iterate on the PIREP thing. It's exactly, if it's a time critical information then we have an issue. If it's not time critical then you can have twenty guys vet it, I don't care. But if it's a time critical information that needs to so that the people behind me that's coming to the same situation 5 minutes later. If we have to go through a), b), c) the system is old. That's all I have to say.
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- 6 The only thing I wanted to add was the fact that it appears that there's two thinking's here. IFR pilots they can do what they do. It tells me like IFR pilots, after they're pilots. We're talking VFR pilots which I can see use these PIREPs a lot differently and take that information because they're learning to hopefully become an IFR pilot [unintelligible]. I hear what you're saying about the automated system and changing the UA's to AI or whatever it might be, the PIREPs. The remarks, smooth as frog hair, you could always put that in the remarks section of the PIREP. But as a person that knows what's supposed to be in a PIREP. You're going to have the meat of it as what it's supposed to be. The remarks could be saw a dog 5,000 feet below me. You know what I'm saying. That's a remark that tells everybody how or whatever if you want to put those in. I don't see a problem with anything that you're saying though. Other than the fact that I just want to make sure that as I listen to the conversation and listen to the people that and the pilots especially. I'm listening to what their needs are. And as an IFR pilot they don't have the same need as a VFR pilot. And it looks like we're building things for IFR pilots. The conversation that we're talking about is upper level PIREPs. It's not anything that goes down low where general aviation is using VFR type bases. And that's the only thing I really wanted to point out. That it looked like we were heading in that direction where everything was mostly about being IFR, higher level. Lower or commercial type pilots. Or people that are general aviation that are basically flying IFR at the higher altitudes.
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- 6 Yeah that's exactly what I was going to be hitting on is that everything we've been talking about requires connectivity. So commercial aviation and not forgetting GA. And in that not everybody has that.
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- 6 I would say far be it to argue with the FAA. But I believe it's only required if you're going to fly in Class C or above, correct? There's a lot of guys that don't fly in that airspace that don't have ADS-B.
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**Focus
Group**

Audio Transcription

- 6 And even that is just ADS-B out. We don't need ADS-B in. Even to go into the Charlie so you can give information but you can't get it in. I mean whenever I'm doing ferry flights I have to carry Stratus with me just to get fresh infill onto my screens.
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Appendix G
Group 6 Questions
Transcription of Participants Responses

Focus Group	Audio Transcription
1	I don't see, I mean on the controllers part, we again, they [PIREPs] are useful tools at the time they are needed. But I mean from a controller's perspective I don't need information that's not going to help me or the airplanes that I'm servicing right now. Anything else is just a distraction. I mean it's good to know the importance of it.
1	Yeah I would say that the easiest way to encourage somebody to use a PIREP or to disseminate and speak up. Is just to tell them how inaccurate weather stations and systems are regarding timestamp information. Man I cannot even, it just blows my mind, like when I go to a big airport. I got to [airport] and its showing winds 350 at 10 knots and then the wind saw is 30 degrees off from what the ATIS is showing. And it's not reporting any gust in that is blowing all over the place. The weather is not accurate even in the airports that require accuracy weather. And I don't know if my fellow pilots agree but for me, it's like when I'm doing, I'm on a short final and then I hear somebody on a parallel runway in [airport] saying like wind check. Like, it doesn't matter, it doesn't matter what the wind is because you're in short final and you land in that wind. I mean it's just kind of like goofy how inaccurate the weather is. And if the PIREPs are because my airplane is crappy. But I have wind on my airplane. My airplane can tell me where the wind is coming from. The intensity. And it gives me tools. I have a better picture of the wind that is happening right there 3 mile final then the actual, you know, ATIS on the airport. So the best way to tell the people then. I tell the kids like there is no better information then the actual guy that is riding the horse. Riding the storms. Because the computerized system makes an awful amount of mistakes. And then sometimes the weather for a [unintelligible] in [airport] here, where I'm based at. You're landing RWY 35 and the weather station is not located near RWY 35. So you have a complete different weather then by the river than if you're landing in 27R. So the guys that are actually approaching short final and landed already. Those guys know what really went through, what really happened. Because the weather might not know the actual legit picture of what's going on in that area of the airport.
1	I think it's going to have to come from the top of the FAA to re-emphasize the training that goes along with dissemination of these PIREPs. Why they're important? And how to put them into the computer that is available to them. Whether it be the F-DEP or whether it be a commercial computer. The emphasis has to come from the top and then filter down the 1st line supervisors. And have them plug in coordinators to the positions so that they can take the information. Put it in the right format and disseminate it through the network that's available to them. But it's got to start at the top and it's got to become an initiative, it's going to have to be followed up by the floor supervisors and the controllers.

Focus Group	Audio Transcription
1	<p>Well I mean I agree with you but I also think that if the design is right to begin with, controllers will be a lot more willing to share that, if it's easy and if it's not cumbersome old fashioned form. If there is a way to optimize your workload to a point where it's not going to be extra work that you have to do in order to submit a PIREP. I believe that the technology can help a lot. In addition to awareness and training about the importance of it. I think it's not one or the other I think they're both from the top down the importance. Also creative use of technology. Like vast technologies that can capture the information without having to use really structured form. Because the form itself, any form, is making the human being [unintelligible] error. If it is more app design such that can reflect the human nature to use plain text, plain language and not exactly you know standard phraseology. How many of use standard phraseology? I mean you're supposed to but when you think about it listening to the chatter, I mean, there is everything but standard phraseology. They train you, they train you, they train you again almost nobody uses it. There is a reason and that's just the nature of the human, you know, part of the human condition. The more we design it such that it reflects the nature. And I'm one of those kind of [unintelligible] type that I am on a quest to educate people, hey we need to design such that it is natural to the human not having to specifically train them in and impose something to them that is not coming natural to them. Go ahead [Participant]. I'm preaching to the choir I know.</p>
1	<p>The only thing I was going to say was that anything that involves taking your eyes off the radarscope, off of your instruments, out of windshield, out of the windows in the Tower Cab, those things are not going to go over very well. Because, I mean, controllers and pilots, they're not going to want to take the time to visibly write something that's going to take their attention away from something that is their priority. And their priority with the pilots of course is the aircraft. And with the controllers is with the aircraft that they're working. So asking them to write while their doing the job, I think we should try to come up with a better solution then that one.</p>
2	<p>Like it was mentioned in the beginning the whole hang up over the format of the PIREP. You know the 13 items in this order. If either you know during that training it was like this would be nice however the PIREP is the important part. Just the information tell us what you can. And for every sentence that says this is the right way that you should submit a PIREP. Also have it say but if you don't do it this way it's fine, just give us the information. That could eliminate a lot of that hang up or reluctance to submit them.</p>
2	<p>Well if it's going to be you know a pilot entering it through technology, through some kind of app or whatever. Then it's, you know, it would be easy to do, fill in the blank. Not all blanks required. But you know the ride, the icing, the weather whatever. But if it's going to voice one whether it be calling flight service or a controller trying to relay to flight service. It should be the option of just the, you know, pre-text speech sort of speak. Not have to be a specific format. A much shorter conversation to get that information around.</p>

Focus Group	Audio Transcription
2	I like exactly what he was saying. We're in a technology world now and things are changing. And 5G's coming up. There's going to be a lot more availability of data that's going to be more easily moved, you know, through this type of information. But like you said, if you could pop up a screen and hit. Have it already preloaded just like our ADS-B's are preloaded with all of your airplane information, so that's already there, right. It should know your altitude. And you hit turbulence. And it will say tight, moderate, duration, continuous or just this position whatever. And send. That will take you know 30 seconds maybe to put in a PIREP report. And then you're back to, you're not being distracted from flying. It's just a boom, boom, boom and you're done. I think if it moves that direction you'll see a huge increase in the amount of PIREPs that are put out.
2	When you say reporting it from your phone, I mean, if you're in the aircraft how is that going to be sent out?
2	Okay. I think you know shortening the report and like everyone else has said having a drop down menu. I'm not too sure with this voice recognition that's going to fly in the 121 world. For privacy issues. A lot of people are concerned about being monitored while we're up there on the flight deck. I think most pilots would be fine with a drop down menu but I think you'll get a lot of push back from the Unions and the 121 pilots for the FAA to have access to our EFB's and be able to hear. You know access to the camera and the microphone.
2	Oh that just, what [Participant] was saying and what you were saying about it unless you're a small flight department. I work for some very small flight department, Part 91 outfits that I was the safety officer and was trying to push those initiatives to like hey put those ASAP stuff in guys and let's get that, I mean you have 4 pilots and 2 mechanics. It doesn't take a genius to figure out who screwed what up. So I mean there's a whole other way to approach that.

**Focus
Group****Audio Transcription**

- 2 The only thing I throw my hat in the ring with everybody else is talking about the tab menus. But since this is the longest conversation I've ever had about PIREPs. What is, is all that other information, is that coming from back when they were used to try a build like a, they were using a PIREP to build a weather model. So there was like a weather person that was taken that information in and then hoping to kind of make like okay, this is an actual like relevant piece of information that would create like what the weather's doing versus getting that information? Am I explaining that correctly? Is this system set up for all those, a PIREP with all those information because this was being utilized on a larger scale versus the weather here? Because I've listened to everybody talk about how they've used PIREPs. And especially like [Participant] talking about being a helicopter pilot. When you talk about its one specific thing. I need to know what the ride here, I need to know what icing is. I do this so I get, is the weather going down between these two airports? It's always one thing that it's hinging on. That's why I need to get this information. Because I need to make this decision. It's a very important decision. And I think that's where the tab menu comes into play. But I was just curious if that, all that data that needed because anytime I've given a PIREP on flight service. And I'm like hey this is the information. The icing wasn't supposed to be here and it's moderate icing and its rime and it's at 13,000 feet. And their like okay. Okay, well what's the wind? It's like you don't need to know that, I got to get back to work, you know, kind of deal. But they're like we need that information to fill this form out. That becomes a burden and then I'm not going to do it next time.
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- 3 I have an idea because, I mean you said, of the technologies that we have now just not currently and in our airplane you said in everyday life. So sometimes if I'm really busy and I need to text someone, I just go and dictate to my phone.
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- 3 Could the controllers have some sort of thing, and this is of course, I mean this is going out there. I don't know but you said to speak up to share. What if a pilot were to say PIREP on the frequency and then just give his PIREP and then some sort of automated system receives that information based on the microphone or recording capabilities and immediately puts it on the pipe line for display everywhere. Whether we're talking about controllers screens. ADS-B receivers. iPad's on cockpits. So that the pilot is talking to another pilot directly without having to basis himself more than just pushing the mic on the radio. And then the controller is not other than for the few seconds that this transmission comes in, the controller isn't doing anything else. You know to increase their workload, anyway.
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**Focus
Group****Audio Transcription**

- 3 Kind of going back to what [Participant] said and I'll touch on what [Participant] said a little bit as well. For us we start all our descent planning and our briefing, started, or 50 miles per hour to top a descent. So having a conduit or platform to be able to channel through our airplane we could look at it prior to going down. You know then we'd have all that information briefed and ready to go. Obviously, things change and that's when we'd rely on [Participant] and [Participant] to update us as we get a little closer to the ground. Because obviously we're not going to be down on the MFD updating. But, um, so the platform taken that information and then relaying it would also be good for like, for [Participant]'s there you know, on the ground he could pull up that website and go alright these are all the PIREPs around [place] at this time before I depart. So I like that ideal. And then going back to what [Participant] said, I think it's the critical piece where the AI or a human in that spot. Whether [Participant] or [Participant] can relay that information to somebody and then they put it in the system that goes into the platform where we can all see it at that time. I think that's critical. Then it kind of all goes down to conditions to, right. What raises the hair on the back of my neck, well, or from what I gather controllers necks because anytime I'm coming down through clouds or whatever and there's icing. I almost always get verbal indications prior to that happening from the controller. I don't know if it's because the icing is obviously a severe type of phenomena that can affect us as pilots. But it seems like every time I'm about to encounter icing I always get verbal feedback from the controllers. So it's one of those things to me conditions kind of override when we give out our PIREPs or when controllers are more active [unintelligible]. That's my two cents.
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- 3 Well in my previous life I was a double E controls engineer. And became a real big [unintelligible] robotics and automation. And so the idea was always to try to get some piece of automation or robotics to replace what the human is doing. And so [Participant] did a really good job summarizing the big picture, right. You showed the automatic AIREPs. So it seems like you have a lot of different funnels of airplanes reporting. Sky vector as [Participant] mentioned. Sky path reporting. You know automated systems reporting. But then you get to this last little bit where you need to have that interactive, high speed stuff that's very important which you're talking about you know this AI system to do. But it seems to be if you could actually put a person in place to do that as [Participant] was saying. Then you could actually prove the data path. Prove everybody the system working. And now all you're trying to do is replace that human element there in which one of the centers. Or next to the things with this AI system as [Participant] said. Siri PIREP, right? So I don't think I would want to get so focused on that delivery when you don't have getting the information around from all these different sources that are currently available. In a format that [Participant] can use. As [Participant] can say and [Participant] has said that we can do it before top is implanting and get a better picture of to what's going on. So you have a lot of, you have to break it all into a lot of pieces right. And the last one AI voicing.
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**Focus
Group****Audio Transcription**

- 3 I think part of the problem again like everybody has said. When you need this information it's the time that you're the busiest in the airplane. Busy as a controller on a sector. If you're not real busy and there's information out there. I think from the controller standpoint of course I'm a pilot but if you're real busy everybody's paying attention to everything that's being said. Everybody's got their ear to the grind stone listening to what the controller's saying and listening to the pilot of course and stuff like that. All of a sudden now you're not busy working 2 or 3 airplanes. You might have 6 or 8 airplanes on the frequency but you're only talking to 2 that are really talking about anything. And everybody else is lolly gagging around not paying close enough attention to what's being said. So a lot of times the information is there it's due to lack of attention in some cases.
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- 3 Well and it's the old saying. A picture is worth a thousand words. And everybody I think is focusing on that and saying geez, you know, just take a picture. We see our flight plan. We see our arrival route. We know what's going on. A picture's worth a thousand words and now just give us all the information in a picture.
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- 3 Thank you. Your example of the Alaskan Bush pilots is very fascinating. You realize that the reason they use PIREPs so much is because they need them. It's such a necessity. The technology in their airplanes is very low. And they work together, have to work very well together, to establish a culture where they could get that information to flow through the chain. As weather things, as things are changing. We have a lot more data in our Part 121 aircraft then I even had in the military. On a military we were always on a separate frequency talking to our buddies ahead of us and using that stuff. An informal PIREP system. So perhaps the number of PIREPs even if they're declining in Part 121 could be due to the fact that we do have a whole bunch of other information. And I know that's conceptually a step back from where you're entering into the conversation and I apologize for doing that. But it kind of couches what I'm saying. Perhaps there's an intuition among pilots that are flying in the United States radar control airspace. They have really good weather radars onboard that have a lot of information. More information then we used to have back when the PIREP was invented. And maybe there was some sort of intuition that we have as pilots, particular in 121. Which is putting up a barrier for us entering in information into the PIREPs. Simply because we believe there's redundancy. Or we believe that its information that people are getting from another place what have you. So there could be that. So if you want to overcome that kind of thing, if you're looking to increase data points of PIREPs. Maybe take a look at okay so what kind of information is really the most critical that they're not getting from another platform. Because pilots are somewhat efficient. I talk to my 737 pilots they know that the easiest, quickest way to hit button on the FMC to get the 1 page up. And if there's a guy that they fly with that hits the 2 buttons to get to that same page, that's a 5 minute conversation on how much time you're wasting to hit the button. You've seen it, you've been in.
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**Focus
Group****Audio Transcription**

- 3 So there's these biases and the intuition of pilots. Where we don't want to flood the system with more information if it's redundant. We don't want to do that. So you have to kind of break that down if you want to educate pilots. And then I think self-awareness of biases as well. Even though I know the type of aircraft that's reporting a ride, does the voice sound old and experienced? Or did they sound young and scared? There's different inflection. [Participants]'s kidney stones falling out or getting knocked out is subjective. Because to me I might be, since I flew C130's for so long, I'm not very turbulence averse. But certain pilots are turbulence averse. When you have a PIREP of moderate but it's on my chart, for my subjective seat of the pants, it feels less than moderate. Now I'm going to give a PIREP that I will probably, I will even down play even more. But the next guy that comes through might be turbulent averse. So there's this big swing or oscillation in the subjectivity of it all. But awareness of that, so if we're aware of this for pilots. Or culturally to know more about how this system works. And then also to look at what data is going into the system that's redundant and realizing that pilots don't want to provide redundant data. So that's just my thoughts on ways to overcome some of the mental things from the pilot background.
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- 3 Well I think the FAA has in place, the FAA safety program and the WINGS program. So I would say in general as pilots you know when onboard WSI radar became available to see. You're like, I can be on the other side of the country, coming across the country and say, wow this is really nice. Because I can benefit from this because I can start making a planning change now. And it's the same thing that [Participant] can use if he starts getting more information. So I think the easiest way to look at this is that aviation people are kind of. You're aviate, navigate, and communicate. You're greedy for time. And if somebody shows you something that really has significant benefits people are going to start focusing it. So if you start laying out the intent of the plan. The intent of where we want to go. And participation is going to be improve the big picture. There's platforms and media already available. And as for flight instructors you know a lot of stuff that come back from those kind of become instrumental in flight instructors training and bringing the new pilots onboard and saying that. And the only other thing I was going to mention with the Siri PIREP, I thought it was really good. But I don't think [Participant] would want a bunch of pilots blocking his frequency with Siri PIREP. I think you'd need to have separate frequency on the second COMM to use [unintelligible] PIREPs.
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- 3 And then it would free up his frequency. That's all.
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Focus Group	Audio Transcription
3	<p>One thing I would throw in is that as [Participant] talked about [WINGS credit]. I think that one of the biggest challenges you're going to face is, as [Participant] was talking about. No one or few people think they have value so it's kind of overcoming that barrier of entry, right. And so I think one that we could do to help kind of promote that is find case studies where PIREPs saved a life. And so kind of the opposite or even use Delta 191 as an example of a time that PIREPs really could have saved a lot of people's lives. And so show some positive and negatives outcomes of not or using PIREPs. To help get the public onboard. To the conversation, I don't want to say the uphill challenge but set activation energy that will take to get that to a wide level across the industry.</p>
4	<p>Well if you eliminate some of the middle man quote, unquote. Then I think that might make a difference. To get it more readily available to everyone.</p>
4	<p>Yeah I think it's definitely not a one size fits all. I think we need to automate where we can. And especially the more sophisticated airplanes that can feedback a more constant stream of data. Now unfortunately that's often the higher flying airplanes. And we need data as much in the mid and lower sections of the atmosphere as we do at 30,000 feet. So I think and [Participant]'s touched on at least on one approach to being able to do that. Which we should certainly explore. But I think in addition to and in parallel to whatever automated systems that we can pursue. We, I mean hopefully, actually some of this automation will free up time on radio frequencies, for either controllers or flight service specialists, to be able to have a little bit more time to take other reports. And to that end and again this is focusing on flight service now not on ATC. I think one of the things that's needed there is for ATC, or is for flight service, to actually have some basis for knowing and asking, making an intelligent request for a pilot report. As opposed to a generic, when I open my flight plan saying pilot reports are requested along your route of flight. Which means they need some sort of information for themselves to be able to say, hey we need a report between these two points. Who do we have flying in that area? And now can be queried on a basis that would be most useful to the system. As opposed to a generic request. But again that's something that needs to be designed. And look at where the information would come from to do that. End of tirade.</p>
4	<p>I think that's an excellent point. It would definitely help from ATC because of the staffing issues and the workload issues. The more that we could automate the better off we would be.</p>

Focus Group	Audio Transcription
4	<p>I think you'd have to have the human touch. I believe it was [Participant] who stated at the mid altitude type strata. Because approach control in say for instance in Tulsa we work 15,000 feet to the ground. And some of the most important PIREPs we took besides bases and tops. It was always icing. And you always wanted to disseminate, make sure disseminated those. Also the FAA to kind of change the rules a little bit on liability. Because a lot of times pilots will ask you for things that technically, we're not really trained to provide that service. For instance, vectors around weather. Or areas of known icing. Or something like that. Because we don't have the equipment that really shows us specifically what's there. I mean we don't if it's real. Whether it's a false echo. Or whatever. And the FAA will refuse to provide us legal protection. If I tell a guy to turn 20 degrees right, vector around weather and it runs smack into something. They're not going to protect me in court. And so I'm not willing to hang my career on the line trying to do more then I'm qualified to do.</p>
4	<p>And I agree with him totally. Liability is definitely a big issue overall. Whether it'd be for the controller or the pilot. I can see why the controllers don't want to give specific input regarding some of that stuff. Because, you know, they're going to be held liable. And as he pointed out the FAA's not going to protect him, the government in a sense. So why should he? Why should he go above and beyond trying to help a fellow pilot or a fellow aviator. Because he's not protected. And then goes the same thing for companies. If they're not protected for some reason, I think they'd be very reluctant to share any kind of data.</p>
4	<p>I'll make two observations there. I have a 30-ish year old son that a year ago finished his private pilot training in [state]. And at no time during his primary flight trying, did he or his instructor file a pilot report in any of their time aloft. They pulled pilot reports, they analyzed them for their use. But they did not file any pilot reports. So I think part of the reluctance on pilots is you know if you're really aren't kind of trained on that as well, and I don't mean the academic training. I mean the actually pick up the mic and file one. And get comfortable to doing that. And primary flight training I think that's a big deficiency. The other thing that I think is important here and I don't think I appreciated this until I sat through that NTSB session on PIREPs a couple of years ago. Is I certainly know about my only use of pilot reports to figure out whether to fly and in flight. I wasn't as aware that the weather forecasters are also looking at those pilot reports. And at times adjusting their forecast based on pilot reports. Much less that academic researchers 3 or 4 years after the pilot report was filed maybe pulling that data and using it to run against forecast models that they're trying to develop to give us better products. So I think that much more needs to be done to help people understand the broader spectrum of uses the pilot reports serve beyond just our immediate tactical use at the moment.</p>

**Focus
Group****Audio Transcription**

- 4 So the one implication for that though is it helps if those PIREPs be as complete as possible. So in that regard, if it's only a turbulence report, or if it's only an icing report or something. It's not as useful as a more complete report. Still didn't necessarily have to have every field filled in. But, and that's where I'm noticing a lot of pilot reports that pop up that have, very incomplete information. Which means when somebody's filtering them electronically their not even going to see that pilot report. Because altitude was in the remarks section rather than in the altitude field, for example.
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- 5 Yeah, I mean, [Participant] pretty much said what I wanted to say. I mean, I agree, that there are times where it's absolutely crucial that, you know, you said the two schools of thought currently at the FAA. I would say it's not either this or that. It should be a hybrid of those two. Yeah I think the technology has improved in the airplanes. The avionics. I think it's great that information can be passed along. TAPS I find is of, it's you know, it has utility but it's pretty limited utility. Because I think that TAPS reports are very understated as [Participant] mentioned earlier. But I use Denver as the example because of the weather there is so nutty. And I've never flown in Alaska unfortunately. But [city], you know you might hear, they might be reporting winds down the runway at 9-knots. But then, a controller will pass to you, hey A320 that just landed. Reported a gain and loss of 20-knots of airspeed at 500 feet. Well that's crucial. I mean that's huge. Or whatever it is. Turbulence PIREP or whatever. So I think that it shouldn't really be one or the other. I think it should be a hybrid approach. As [Participant] mentioned those reports that are passed to you in a time crucial and when your workload is just really high. Or just super important. I don't think that can be stated enough.
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- 5 Yeah I think that would be great. Because then from a controllers standpoint what it does is, it takes me out of the loop of having to put PIREPs in. If the pilots have the ability to put them in and then there's someone out there who's judging where it needs to be disseminated. Then now that's time I don't have to take off the frequency. And as [Participant] said, often times for us, it's okay I'm separating airplanes. And that's priority one. Disseminating weather is a little lower and now if I don't have to push that out there, that gives me more time, to do my job. So it would be a beautiful thing. If there was some type of interface that allowed the pilots to put them in themselves and then pass them along. Now I'm still as a controller when you check in, I'm going to tell you the weather. I'm going to tell you what to expect along your route of flight. If I know something, if there are, conditions that are going to affect you. But not having to put it in the system does make it a lot easier for me.
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**Focus
Group****Audio Transcription**

- 5 Saying it, that's pretty much it. Anything that would help automate it for the controllers. That's just one less burden that is on their back you know. So if there's a way to do it and I can't see it unless the pilots are able to enter it. But then how much data can you get. You can end up with pages, pages and pages. Because every pilot in that area, let's just pick a bunch of Cessna's that are flying around in a practice area and they keep reporting alright we got this. We got this. We got this. And each time hey, let's send that end. Let's sent that end. Now you've got 20 or 30 reports of the exact same thing. How can that be filtered out to multiple aircraft that reported this or something? If that could be done automatically boy that would truly be something and the controllers would appreciate it.
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- 5 One of the things, I think it's a great idea. I noticed when you showed that PIREP out I think it was [city] or somewhere out there. It was listed as a UA instead of UUA. With severe turbulence should that have been UUA is one of the things. For those who are in 121 world who have the automation where that comes right to the cockpit. I'm a little bit filtered and I know is it [Participant] I believe. I know she's filtered because she's in a GA airplane. I am only limited to how good the quality of my Wi-Fi is in the airplane. So if I'm going to get automated weather like that it's going to be either Wi-Fi, if the Wi-Fi's out I'm not going to get it. So it's going to have to be done through voice. Or you know obviously before I take off I'll see it. But anything that's real time I'm not going to get unless it's passed right to me from the controller. I bet I haven't called 122.0 in forever. So how is that going to be, how will you take care of that? So for the corporate world's and the private pilot world that's another thought. How are they going to be able to get that real time weather?
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- 5 I'm with you 100% and I'm sure you don't, the air traffic controller side of you doesn't want to hear me pass the buck to somebody else. But I think [Participant] was saying that earlier, is you know I mean we have Wi-Fi limitations in our plane obviously as well. So you really can't rely on that to give you your information. So it's really got to be a voice report. Because like [Participant] also said. When we're taken off or we're on approach in a landing phase. We don't have that app up and we're not going to use it. In fact, I don't think we're allowed to use it. I certainly wouldn't be using it. So really someone on the ground has to be relaying that stuff via voice. And I think, you know, that would be the best way so that your general aviation traffic, everybody gets the same information as it is pertinent to them. So hopefully we can have that available as a situational awareness tool for us that have the Wi-Fi equipment on our airplane. But really the critical information's got to be passed by voice. Probably via the air traffic controller.
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**Focus
Group****Audio Transcription**

- 5 Yeah as a controller, yeah we're going to give you the information. We're not saying, I don't think at any point as a controller I want to say you get all your weather information from your Wi-Fi or something. We're going to give you the information. I think what we're looking at more is just okay how can we get all the information in the system through the PIREPs. But we're never not going to tell you, okay here are the conditions you are flying. Here's what to expect on your approach or something like that. That's our job. But if we cannot have to put that information in the system I think is what [Moderator] is trying to hit at. So that it's still there. So from a research stand point they can get it. Because again, I've got to give you the weather. And I've got to tell you what you're flying in. I'm never not going to do that. I'm not doing my job if I'm doing that. And I'm making my job more difficult by not telling you what's going on. Because then you're going to ask me. And now I lose control of the frequency. So it's to my advantage to tell you as much as I can when I talk to you that first time. That's always been my process. I trained controllers to say when they check in you have their attention. Give them everything you know then. And then let them make the choice they want to make in terms of rides or if they want to change altitudes those type of things. I think we're not talking about taken the buck away from us but just how can we also get the information in the system more efficiently.
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- 5 Just as a side remark and I don't know what made me think of this. But I don't remember if it was [Participant] or [Participant] that worked in Cleveland Center. But their testing right now, they're live testing CPDLC En Route. And as we transitioned to CPDLC En Route, you know, there's times that we won't talk to controllers at all. Our interface is the ACARS which is very clunky. I don't know how clunky the controllers interface is. But that's another barrier to passing those. The both given and passing those reports back and forth at CPDLC En Route.
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- 5 I think from the FAA point their really trying to increase Data Comm. It's just the two centers right now that are currently running Data Comm. And I know they keep trying to [unintelligible] across the U.S. all the centers keep trying to increase staff but right now I think it's two. And it comes up with the training aspect to for the En Route. And then getting the clearance back at the airport before you even leave. Like there's a lot of training issues. And you guys have been kind of touching on this. As far as automating the system or how you're going to get it.
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- 5 From what I can remember my training covered PIREPs mostly for, and I'm kind of sad to this I guess, for the oral exam. So just kind of going over what are they? You know, why are they useful? When would you maybe submit one? But I can't say that it was ever simulated or practiced. Or like gone into any more depth than that in training. And that does actually have to do with maybe that I trained at a pilot controlled field. Those students who are training at maybe a [controlled, uncontrolled] airfield might get a different training I'm not sure. But there is a more I think a relaxed feel around PIREPs and it was a little bit more in the background for the students at Princeton Airport. And maybe that has something to do with it. So I can't speak for those students. But from my experience that's kind of where it's at.
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Focus Group	Audio Transcription
5	<p>Yeah from a controller stand point they're taught about PIREPs in Basics when they're out in Oklahoma City. Basically weather conditions that need to be met. There are certain conditions that require us as controllers to solicit PIREPs. Then we go into the whole decoding of PIREPs. Now once they get into the field in they're actually live training, as a trainer, my thing was always okay, you want to tell the pilots what's going on. Get them the information. One of things we always taught was you know in the morning shift one of the first things you're doing is okay how are the rides? So you can get your rides and all your altitudes. What are the winds at different altitudes? So you have that information. And then if you know that you do have certain meteorological conditions then continually ask pilots what's going on. Let them know what's happening. So again you have control of the frequency rather than the pilot asking you okay how are the rides? Okay well when do they get better? Okay well how are the rides at this altitude? Well what about this altitude? You know if you can tell them that all in one shot you just saved yourself a minute of conversation. Which then gives you more time to separate airplanes. That's how our side of the training goes with it. Now I will admit a lot of en-route controllers, we do get lazy with PIREPs because again, if it's just my sector I'm not going to take the time to put it into the system to get the PIREP that just told me what I have. Not for something that's happening like say in [Participant]'s airspace, yes I'm going to put that PIREP in the system because then I don't have to call [Participant] and tell him hey pilot reported tops at this altitude. Climbing out of what kind of icing at this altitude because he switched him to me as he's climbing in and out. But that's our side of the training with it.</p>
6	<p>A question that I just thought of it is from the data you know how does North America compare to Europe with the quality and quantity of PIREPs out of curiosity?</p>
6	<p>I was just thinking about comparing, I don't have any flying experience in Europe. So I'm not familiar with what mediums they use. What information they use for their PIREPs. I'd be curious to see what solutions they have over there. And compare it to what our current operations, our current systems are here in the U.S. But responding to the slide that's on the page right now. With the design solutions? Best way to educate/train pilots? I think first and foremost be able to streamline the data. Make it easier to become accessible. And to have that information, that doesn't have to go through all the many layers that the ATC guys are talking about. Which like I said before I didn't even know existed. In order to improve the quality and quantity I think streamlining that information and removing at least 23 of the different steps that information has to go through. Would definitely benefit the guys in the seats. And not just, and I'm not just identifying us in the flight levels. That information would be applicable to [Participant] too. And not only with his operations with students that are learning. The way the system operates, so right now we have a lot of doorways where this information can go through. But I think my two cents would be to somehow streamline the information. Make it accessible to all forms of pilots even the ADS-B as a potential solution. I think that would improve the quality and the quantity if we made it easier for that information to be accurate and shared.</p>

**Focus
Group****Audio Transcription**

- 6 Yeah frankly there's not much in the way of education about them. I mean in like private ground, they go through it. We've got like a [task sit] at [university name] for 141. You know interpreting them. But just the basic ones. Nothing with any sort of complicated short hand really. And then it's pretty much that's it. After private ground I never did a PIREP until I asked the instructor to do one and demonstrate it for me. Because I had never actually seen one in practice. And still with 250 hours or so in the program I've been 2 total. Both because I asked the instructor to demonstrate. And that's the extent. I mean it's probably more than most of the people in the program are getting. So it's very bare bones.
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- 6 I'm right along the same lines what [Participant] was describing. I think it wasn't, I mean, I can't remember off the top of head now. But it was a similar situation where the instructor said he wanted to fill out, you want to submit a PIREP to flight service? And I looked at him and said what? So there's very little pertaining to my background and [Participant] just kind of verified as well. There's little initial instruction on it. I think the reason for that is because the system is outdated. And we rely on other weather products to help paint our complete picture here. It's because like you said, just the symbols that are used from 200 something years ago. And the way that this system is organized makes it very archaic. I think that's the reason why a lot of students are coming out of these days. And even when I went through the training it's archaic and we don't really touch upon on it because there are other weather resources/weather platforms that could give us a more complete picture. But I think truly because of the archaisms of the way the information is submitted and presented. Even with a few of the examples that I looked up online before this meeting took place. I had to go in and look up what a few of the symbols even meant. So, I mean, because of the outdated system the outdated information that the way it's submitted I think that there's definitely a factor there.
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Focus Group	Audio Transcription
1	<p>It's like when I was in the military they used to teach us all the time, you know, make the best you can out of what you got. And right now what we've got going on is, is slow but reliable ACARS and we use that all the time. We do have [formats] on the ACARS that simplify [inputs]. So for instance on the in-range I can input with a click of the button what I need for the station for my aircraft. I can tell I hit the in-range and I can say I need that service, I need catering. I need a window [unintelligible] wash with just a touch of a button. It's the same way reporting ground operations. I can issue a report if I'm parking at night and they have not [unintelligible]. Like the ones that aren't lighted, I can report that with a click of the button. I can report if they have ground power or not. That all happens with a click of a button. Designing a little page on the ACARS for us, 121 guys, for the general aviation guys put it into ForeFlight. Put into Garmin. Some that they can use and as soon as they land, reports. Because the general aviation guys generally have a lot shorter legs and the airborne time is shorter than, sometimes, well not me, because I do a lot of little flights. But a lot of general aviation guys they're in the air an hour, hour and a half. So the computer or the iPad can transfer that information via internet really quick. For us, it's instant. Like I can report something with a click of a button if I had that page set up on my ACARS. And that would be a lot more reliable. It'd be faster. And like for me I have an FO, and when the FO is flying, I can just do it on my own. And say like hey, I'm going to report this rime ice. So you know go PIREP. Ice. Rime. What type? Moderate, heavy or light ice whatever. I can have that in a bond and just click on it and if I'm flying I can tell the FO could you please send a PIREP for this ice. And the guy would like be trained on that. And the training would be like 20 minutes. Because everybody knows ACARS already. So it's there. Like the tools are there, it's just like, use them and use what we have for the time being before everything else is improved you know what I'm saying.</p>
1	<p>So you talked about the two important issues that introduce the new technologies would be, I would think, graphically user interface would be one. You'd have to make it simple as you're trying to do to make it usable and in a format that you could disseminate that would be easy to put the information in. And then easy to interpret on the back side. And then once you come up with that you have to take the, all the information would have to be integrated into these various electronic flight bag programs. As well as maybe independent of those electronic flight bags. So you'd have to have access to it in more than one dimension more than WingX. More than the various flight bags. As well as just the online program and interface for GA and whatever they might be using. Perhaps even ADS-B.</p>
1	<p>This is Participant. [Participant] just said what I wanted to say. I said [Participant] said everything I was going to say but it just has to be simple for people to use it. It has to be data that can overlap multiple, multiple systems. But data is data, you know. Where using different data across wide platforms now. But yeah. Simple to enter and simple to interpret.</p>
1	<p>One other thing I mean whatever we do, I mean, the one thing that has always worked in air traffic between pilots and controllers has been standardization. That we don't do something on the East Coast that they don't do on the West Coast.</p>

Focus Group	Audio Transcription
1	I mean its standard. I mean we all work by the same rules but how we do that it may differ. But 3 miles is 3 miles all over the nation. A 1,000 feet is a 1,000 feet all over the nation, you know. So whatever we do I think it needs to be standardized. I mean you can't have somebody on the East Coast using one app. Somebody on the West Coast using another app. Somebody in the South a different app. Because then nobody's really communicating. I mean I don't think that would help anyone.
2	I was interested in something that both [Participant] and [Participant] said. [Participant] said that the airplane tells on them everywhere, you know everything, every switch he flips. Everything is recorded. Wouldn't it be great if the technology could record those things that are pertinent to flight information like PIREPs or icing? Or wind shear. Or low bases or whatever. And could transmit that data to controllers on their screen so it can say that [Participant]'s plane said that this was that. This is what's happening at this particular point and space. And then it would take out the need for education or probably a PIREP because it would be directly given to the controller. And so that I could disseminate to the pilots, I'm looking at my scope. It seems like you could take the human element completely out of it with the technology that we have today.
2	I like what you're saying there but I do believe that all of us controllers and pilots are all very visual oriented. I doubt there's very many of us that want to read a report and try to disseminate whether there's turbulence or there's what or who it was. The ForeFlight app is much like a lot of the others but it'll, you can pick, you know, you pick your different layers of what you want to look at. So if I were flying at altitude and I was Part 121 and I'm at you know 22 to 32,000 feet if I could select those altitudes and if there was a pilot report and I'm sure they'd have to time out after a certain amount of time. But if I could look on there and there was moderate turbulence and it had a circle with a T in it that was yellow. And if it was severe turbulence it'd be a circle with an S in it. And it popped up just like VFR and IFR show up on a ForeFlight map you would get your reports now. If you wanted to slew over and click on it to get the actual information you could but you know that's already being done. I just know we're visual. Like if I looked at a map and I see a bunch of magenta and pink looking colors or blue I know its IFR marginal VFR. Like you're showing there, yes.
2	You're away ahead of me. That's exactly what I was talking about. And if you can see, I think that's what you showed there by the color delineation you can tell whether it's something you want to click on and read. Or whether it's something that's not pertinent to your flight category. So that would be excellent.

Focus Group	Audio Transcription
2	Well to reduce errors we need to take as many different hands out of the actual dissemination of the PIREP as possible, that's one thing. Two. Again I know that you want to keep the human element in but if you could eliminate humans as much as possible I think it would be a better system. If airplanes that are going through actual phenomena could transmit that to different sources. And so then errors are eliminated. There's no need for education. I mean we are so technology advanced with everything else we do except for our aviation system in certain areas. I mean still uses very old technology. I just think we need to get up-to-date, up to speed with the technology. And it exists. You just showed us all. Obviously you're going to use them if it helps your traffic flow. If there is something that is eminent like right now that I could pass onto everybody else that is in my scope I would be able to do that. But I just think we need to advance technology.
2	I agree with [Participant], I mean exactly. Improving the quality of the PIREPs is going to be a function of everything we've talked about. Their more easily disseminated. Less paperwork. Less, you know, better information with less superfluous stuff that you don't need to put in there. As far as training controllers, I mean, we're under pretty rigorous training demands. I mean the FAA can implement anything they want. And say alright, during your training process you'll go through this pilot report training program. You can also make it mandatory that they have, you've got to in certain facilities you have an assistant or D-side. A person there that, you know, you can test them with getting several PIREPs per hour. It all can be done. It just needs to be integrated a lot more user friendly way is what I would say.
3	Years ago and I don't what we're doing FAA-wise now for cross training. And when I say cross training, years ago [airline] had a program where they took all of their people and ran them through a class where they had the flight attendants there. They had the gate agents. They had the pilots. And everybody got to play a different role as to who was under what pressure to do what. And we put controllers over there and went through some of those classes at [airport] for that. And [airline] had a program and I can't remember what the union Where we had meetings, like once a month. To discuss issues between controllers and pilots. What was going on? What could the FAA do help [airline], help [airline] or help any of the airlines. And different regions were meeting wherever the airlines were based. So I think some cross training we had the general aviation program also. People would come into the centers to see what goes on and how things [unintelligible] and what we could do help them. So when we talk about education we need to cross all the barriers with each of the different groups. To try to get the best education for everybody. Controllers, pilots, general aviation pilots, or whatever Commercial side that you're doing.

Focus Group	Audio Transcription
3	<p>What I was saying about all the 9 or 10 fields that there is in the PIREP. I think that training should be more focused on 1) the importance of the PIREPs. So what [Participant] said may be implementing this to show how important they are. But also not showing it as a complicated process. Focus more on the simplicity. You can just simply say tops are at I don't know 5,000. Or bottoms are 2,000. Focusing more on the simplicity of just telling ATC what you're seeing rather than having the pilot think that they have to calculate their position. Or their location. And their altitude at the time. And the aircraft type. And just focusing on, you know, how it's more simple than we think it is. Learning about other people so including [unintelligible]. Right here in this focus group I've learned a lot [unintelligible]. I think most pilots don't have no idea of what's going on when we talk about weather. And what ATC does with our weather information. So including in training part of the perspective of what happens on the other side can help pilots understand the whole system. And I think that would contribute more with PIREPs.</p>
4	<p>I believe that the reading of them was covered. And like I say when I kind of queried them on the deficiency I spotted was an actual experience of filing one on like a cross country or even a local flight.</p>
4	<p>That was at a 141 program not a Part 61. So that's a full long, real, university level flight training scenario.</p>
4	<p>Yeah that almost hit it on. I think a lot of comes down to what type of programs are you using. The 61 versus 91. Versus the 141. And until it's added as a specific task and private pilot level. But I can't even remember seeing a question in any exam I've ever taken regarding PIREPs. But I do recall getting training. But one thing we had along the way and it's a collaboration of comments. What's a light chop versus a medium chop? Is one person's opinion to another. I actually had an instructor once in the simulator sit there and go through and go okay guys here's your light chop. Here's your light turbulence. And man that really opened it. Because me and the captain next to me really started going man, we had a difference in opinion just between us right there. And that was a real good, semi-way to collaborate that opinion. But at the end of the time, until you put that as a required task into testing and training, it's going to get glazed over.</p>
4	<p>I wish we had the ability to disseminate PIREPs as we get them. Because there have been certain situations on the local at [airport] one time, departure reported a 40-knot drop on departure. Wind shear on the West side. The controller over there didn't pass it on to the controller on the East side. And then this guy on the East side took off and got the same thing. There was no coordinator involved. She's busy. She doesn't have time to call whoever he/she maybe working on the other side. But there's a lot of times when pilots expect you to put the information out. And I ask for them all day long when it comes to wind shear, breaking action or icing. And the main thing is when you do disseminate one, it's so important to put the type of aircraft. And icing type and intensity. And the temperature when icing is occurring. We don't have, we never had the staffing to do that. I mean you just did the best you can putting it out there. And I wish we could do better. But that's not stressed for our training. I don't know about you [Participant] but they never stressed PIREPs for us.</p>

**Focus
Group**

Audio Transcription

- Well the only way PIREPs were stressed to us make sure you got the minimum when they were required. And unless there was something very strange going on as far as convective weather. That was the only thing we were really taught. It's sad but it's true.
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- 5 I just wanted to add this real quick. My son was working on his PPL, he's trying to solo on his 16th birthday coming up here pretty soon. Before all of this craziness happened. So I grabbed his pilot handbook and looked up PIREPs. And he's got 1 page on pilot weather reports under the aviation weather services chapter/study guide. And just kind of talks about the element codes and when to give them I guess. But it's just 1 page. I just thought I'd throw that out.
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- 5 Yeah I also saw that by the way. And it's something that I guess I didn't know how important it was. Or maybe how important it can be in my training. Because it wasn't given the kind of light that maybe it needs. But also just to [Participant] and [Participant]'s point about there's sectors that don't exactly know what that means. But it kind of reminded me of maybe how it feels at a pilot controlled airfield you know in a flight school. Where there's a more casual feel around PIREPs where we'll give them to each other. But we just won't officially submit them. So there's been many times where like an instructor goes up with an instrument student and the ceiling is reported at 2,000 feet and students are waiting to see if they can solo around the pattern. So then they give a report of oh no it's a little bit higher like this is totally fine. You guys can go up. Just because we know that information is just for us and it's only going to be mostly useful for us in that small area. Then maybe that has something to do with why it's not actually submitted officially. And we don't go through that process or take that time.
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- 6 My experience with the policy from [name] Air Force Base, I think something should be done in the training process down there for the military pilots. They should be a start there because [unintelligible] information, we get all the information that gets released or they can get the information. But speaking with most of the pilots the IP's down there, the instructor pilots they said they don't even use the regulations so most of the guys don't even know what PIREP is or the process when they get here. And that's part of it to. It's not important to them.
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- 6 [Not] controllers to the pilots from [name] AFB. And then the controllers here we have our priorities. You know our first priority in 7110.65 it's separate aircraft, you know, give traffic information. And the PIREPs are put down at the bottom of the list almost. So that's another issue, with changing of the weather, weather changing on [unintelligible]. Weather getting more important. They might want to look at that issue and try to move PIREPs up the ladder because right now it's at the bottom of the priority list.
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- 6 I agree with [Participant] as far as 7110.65 getting the requirements and their first priority being separation of traffic. Which you're not usually the only one working in the tower and so that information that comes in should be passed to somebody else to get the work put into the system. I think, to me, controllers know their job and they that realize PIREPs are important. But I think it depends like [Participant] is saying as far as it being their priorities to do these. I think there's other people in,
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**Focus
Group****Audio Transcription**

you're never usually working by yourself, there's always someone that can help you. But I just think it's not maybe it's not reiterated enough about PIREPs. And it's really not a focus. I think the fact that when, before it was moved from flight service all controllers knew all they had to do was call the flight service station and pass a PIREP and it would get put into the system correctly. Now that's not an option for them. They have to do it themselves. And I don't know that they have the ability, or even the knowledge, or want to put those PIREPs into the system. So I think the training of it, the requirements are already in the 7110. Both the 65 and .10 for flight service people. It's in both of those orders. And as far as what their duties and responsibilities are. And so it just has to be reiterated that this is important. And I think maybe we iterate it. When you're saying training I don't know and if training is necessary then so be it. Then train everyone. And then after you've trained them all then you make it a requirement. This is what you're supposed to be doing. There's no excuse after that. As far as design solutions, again, I'm still hearing you know that some folks think the form is antiquated. The equipment's not needed. Everything is automated. But you know PIREPs usually pop up where you put them. If you put them up in the right format, they're going to show up in the right place, where they can be useful. They're not going to pop up all over the entire group. They're only going to pop up in an area that you put them into the system. Using a NAV aid or whatever equipment that you put in and place around them. So there not something that everyone would be getting. They don't apply to everyone. If you're flying 30,000 feet the PIREPs at 5,000 feet don't apply to you. So I just think that it has to be understood and put in correctly. I just think that there should be either if it's going to a priority for the FAA to want these things to happen they need to make sure people are properly trained and it's required. If you don't make it a requirement it's not going to happen. So, you know, nobody wants to do additional work but if this a requirement of what I'm supposed to be doing we do it. I don't know if a re-design is necessary. I think if you want to put into give the pilots the ability to put their own in, that's fine. But if it comes through the FAA then we know it's supposed to be done a certain way. And that's the part that needs to be reiterated in training. So that, everything is done using a computer these days anyway. Doesn't take but a couple of keystrokes. And if you couldn't do it using the keystrokes then back in the day we used to have to use UA and use it. [Put in an identifier / unintelligible] and everything that goes along with it to put it into the service [unintelligible] program. So there's ways of getting the thing done. But I do think it has to be that training has to be redone and people have to know that this is important and its part of their duties and I think it would get better.

6 Well in the flight service option, that is a part of their duties.

**Focus
Group****Audio Transcription**

6 I know but they're required to do everything that flight service is supposed to be doing so it's a part of their duties, okay. And so if it has to be reiterated through flight service, I don't know that the problems in flight service as far as putting PIREPs in, from the information I got. The problem has gotten to be that the duties have been removed from flight service, most of them. And now they've been put into the terminal option or the center option. The duties of putting PIREPs in, are now told, to be done at the center or the tower. The tower and approach controllers supposed to contact the flight data at the center to put the PIREPs in. That's the issue now. Flight data doesn't do PIREPs unless it comes through inflight or unless it's completed during a briefing. If a pilot asking for a briefing, so that's the only way. So if you're doing a pilot weather briefing, you're not going to get PIREPs unless someone gives it to you. If you're working a radio position or an inflight position you can receive a PIREP. From a pilot if the pilot comes to your frequency. Otherwise the PIREPs are going to the center or their going to approach control. The approach control now as the responsibility to contact the center to put the PIREP in. If the center get it, the center is supposed to put it in. So what I'm saying and what I'm hearing from the flight service side of the house is that the requirements have been removed from them to put the PIREPs into the system. So even though you say that there not, you know, you can't require them to do it, you can require them because it's a part of their duties. But if you removed it from their duties and you're now saying you can't do these duties any longer it has done by a FAAer unless it comes in over the radio. You just crippled them as far as being able to take PIREPs and put PIREPs into the system. So that's the difference. So center and approach controls are the only place that PIREPs are going now. Unless you're working the inflight position. And the FAA has caused this. According to what I'm getting from the flight service side is it looks as though their duties are being totally removed so that eventually flight service can close up. Because it's contracted out. So little by little the duties that they were doing are being removed and transferred back into the FAA side of the house. So FAA wants to do what they want to do on that side of the house and that's an FAA issue. Where I think the training side now has to be given to the approach/tower/center and said this is what you will do and you shall do this. That's where the issue is from what I'm seeing.

Appendix H
Group 7 Questions
Transcription of Participants Responses

**Focus
Group****Audio Transcription**

- 2 A good direction is going to be easier interface to submit the PIREP. We agreed that you know in talking through flight service is too cumbersome. Going through the controller is you know puts more work load on them. And doesn't necessarily get to where it needs to go. So whether it's something on an iPad or whatever device. Pre-filled in to make it as simple as possible. And as minimum amount of heads down time. But if it's you know right there on the airplane and you're just submitting whatever information you need to add to it and then it's going to the right people in a timely fashion. The benefits obviously, if it's easier to do you get more submissions. This of course the costs and making it universal. And then again anytime you're adding more heads down time to the pilot there's a potential risk there. So that would have to be considered as well.
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- 2 So two things. In terms of pilot education I would say you should talk to some of the online and paper magazines. Like IFR magazines is one of my favorite ones. AOPA. Av Web. These are all that things that pilots read to keep up to date. If there was an emphasis on filing PIREPs and an explanation of what good PIREPs did for the weather forecasting community I think that would really help. Also bi-annual reviews if it was a point of emphasis to talk about PIREPs and why it's important to file them and what good their use that would be good to. In terms of the take a ways. I would 2nd the call for something simple. Text space. Drop down menus. I know AI and speech recognition are still pretty hot and sexy but in the last year to 12 months I don't think those are going to be ready. Unless the speech recognition that my bank uses happens to be particularly bad. Because speech recognition in a noisy environment like an airplane I'm just not sure how effective that would be.
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- 2 But I would say the giant benefit for me would be, be able to get updated data on my destination. That's the biggest thing for me. So once I'm in the air. Once I've decided to take the flight, then the updates on the weather at my destination or near my destination would be the biggest thing that I would love to get out of this being benefit. Because that's the thing you really worry about. Once you launch, you know you're going somewhere. So if you could get rapid updates of that, the weather situation near your destination to me that's a huge benefit. If it's going down quickly then that gives me a lot more time to determine to go to my alternate. Or to go back. Or to change my plans. And that's really where I see the benefits for PIREPs, after flight planning. Flight planning I use them a lot in flight planning just to kind of get a feel for what's going on where I'm going today. But the issues I would say is getting enough people, we've talked about older pilots are not very comfortable with technology. Making it simple enough for them to use. Making it simple enough for people who speak English as a 2nd language to use. I think that's an important part of it, yes. So it's perfect that you're looking at it.
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Focus Group	Audio Transcription
2	<p>I've taught Air Traffic Control at the Academy there where you're at. And I've taught radar and tower. You do have some control of what goes into those programs I believe. I think that the controllers a lot of them aren't pilots. So a good education for them would be the importance of PIREPs. What it is for the pilots. What difference it makes. And if you have a new more dialed in method of getting them and disseminating them. Explain how it can done. That would be very much like you talking about the bi-annual reviews and stuff. Also I think that was a great comment about AOPA magazine. Do some articles about the new, the changes in the PIREP system. And I think if you could, I mean what you showed on that slide thereof, if you had a single point place that took all this information to disseminate it I don't know why like Garmin and whoever it may be, ForeFlight. If they had a central database that was together. That all this was going to. They're going to all what that data. So if you are able to get a single place to get it and then disseminate it to all these people without costs. Just information for all of us. I would think that, that would be 2 important issues that would really make this new technology work.</p>
2	<p>It was exactly what [Participant] was saying. As far as I've been through 121 training recently. And I didn't know it was that important still. I really didn't. I mean like just to explain, to get it out there's some way that this information is still needed and it's relevant. It's important. It's utilized. I think pilots want to help other pilots. And I think they want to help ATC. I think that working relationship is good and they just know that's being helpful, they will do it. And the time and task that you said that, if it was less than, more than 30 seconds they weren't going to be willing to do it. 30 seconds is a lot to do a message on your phone.</p>
3	<p>I think the benefits are going to, speak for themselves. I can't tell you necessarily 2 benefits. I think 2 important issues were introducing these technologies are going to be 1. The cost because the general aviation people are going to be another, you know hey somebody's going to implement like we did with the transponders and all here recently. It's going to cost them more money. The airlines they're funding, taken care of the airlines. And taken care of the aviation side from the commercial side. It's not a big issue for them. And it's a big issue for general aviation person for us to go get new equipment for the airplane. Or additional, the training that they have to pay for out of pocket where it's not affecting the airlines or commercial aviation necessary the same way.</p>
3	<p>Yeah I was just going to kind of echo what [Participant] was saying. Price is going to be an issue for the GA world. One of the things that we talked about earlier was the use of AI. And automated systems. And using certified technology that can do that for you. And that's awesome so those 2 could implement that. But there still needs to be a way for people who can't do that to access the system both to input data in. As well as get that data out. And so I think that moving towards that long term would be great. Possibly using whatever research in development. It maybe to make that cheaper and easier. But I think that in the meantime or even after we implement there still needs to be a way to manually do that. So the GA world can still just say without having to spend a whole bunch more money.</p>

**Focus
Group****Audio Transcription**

- 3 I just want to say from a research standpoint as you guys move forward just remember that flying is a human endeavor. And that PIREPs are inherently subjective to try to utilize technology to enhance the PIREP system is great. However, you have to kind of realize when you try to automate something that's inherently subjective and human. Could change the thing from something that's not, that goes from something that's useful. Where experienced of an aviator going through a certain ride condition is passed on subjectively to aviators behind them. That maybe you don't change that thing to something that's not wanted. Or not useful. Or not trusted by pilots just based on our subjectivity.
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- 3 Well you know as a CFI when you do your CFI renewals, they always mention the hot topics and what we want to convey to our new students. And typically precipitated by aviation circulars, okay. The advisory circulars that will have stuff that they want to include and make changes. So I just went on the FAA safety thing and I went to the advisory circulars. And I typed in PIREPs. And nothing even comes up. So there is a mechanism right there that I think we failed in. And if this is a hot topic I think there needs to be advisory circular so that the flight instructors can include that. And that's the first mechanism. We talked about the WINGS program. Again as another media that gives people credit and because pilots to be, you know, what's in it for me. And here's a great to reach out to all of your general aviation people. We used to have on the 121, we used to allow controllers on the flight deck. They had a program to see what was going on. And I think [Participant] if you would be sitting in the you know, I think [Participant] and [Participant] would say if they were sitting in that jump seat when you were coming into O'Hare or going into Newark and watching this show unfold, I think that would definitely give an eye open experience. Also from the GA standpoint there was WINGS credit given for operation raincheck. And that was where a GA or pilots could go in, I know they started putting that back on, I don't know if they're still doing it. But that was a great way to see what the controllers saw. So if you got the air traffic controllers onboard with the PIREP thing that could be implemented as part of the operation raincheck. And say this is why we really need to do this. And then they would be, you'd have the buy in from the controllers presenting it to the pilots. You'd have the pilot, the controllers in the flight deck seeing what's going on and they could bring it back. And then obviously WINGS and advisory circulars. So that's my suggestion.
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- 3 The flight deck FAM trip program, whatever you want to call it. I think went by the waist side after 9/11. Because of security issues and stuff. There was security there before. But somebody didn't like it and they wanted to get rid of it. I think that happened. I can't tell you how many times I've ridden in the cockpit going places. And it's very educational.
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Focus Group	Audio Transcription
3	<p>What I was going to say, riding in the cockpit. Sitting up there, if you're going into weather and listening to what's going on its interesting to see the whole side show unfold in front you as a controller. And you can see the other end of the thing going on. And sometimes you can say well maybe I shouldn't make that request. Or I could see where, you know, given 5 different heading change. Altitude change. Frequency change. And everything in the midst of everybody else is probably not a great idea. <u>Because then you have to say 3 times again instead of 1 time slowly, right.</u></p>
3	<p>Maybe by the same token this should allow us pilots to come in and sit in their consoles for an hour or two during severe weather event, you know, hitting one of the major cities.</p>
3	<p>With the program that the FAA at Southwest Region or [airline] at the time they used to come over to Ft. Worth Center bring 8 or 10 of them over every time they did upgrades or training. Because we're right across the street from the flight academy. And they used to bring them in. Give them a head set and plug them in and let them sit and watch for an hour or two to see what's going on from that standpoint. <u>So it was a good program. And same with the raincheck program.</u></p>
4	<p>FAA being the controlling agency could bring everybody together at the same table and make this thing collaborative effort, where it's needed. And that's the only person, or that's the only entity that can lead this thing. Unlike an airline or small operators. Or even up North Alaska. If everybody starts participating, I think we'd get a better understanding of the PIREPS and get better data points. But FAA's got to be the leader in this case.</p>
4	<p>Yeah I've got a couple of questions. Obviously the research and develop needs to continue forward into some of these automated PIREP systems. But we're also kind of at a point where there is a lot of technology that exists. But we haven't implemented one probably because of funding. But I mean also to, I know our controllers get hammered a lot and it's not on them at all. You know you hear them clicking these 1970 keyboards. Or the fact they're having to stop go offline and pick up a telephone to communicate information to another controller. Because we can't even bring technologies into their lap. That allows them to give us simple you know touch the screen and flip a little bit of information to their controllers sitting next to them, without going offline on a telephone. So we've got to bring up our capabilities to what technologies we already have. That we just haven't been willing to pay for. But as far as the benefits obviously awareness and safety, anytime you get new information available is an increase. Decrease at the end of the day is one it costs to train. And that's the other side of it, is there's a cost to everything.</p>

Focus Group	Audio Transcription
4	<p>I have, it's sort a question and that is. We've been talking about the fact that pilots now have iPads or other devices that they can take with them in the cockpit that enable us to see what's going on. So even if you're GA if you have an iPad with ForeFlight on it you can do your flight planning, and you can do all that on there. It's been a while since I used it. So I don't know how advanced the capabilities are. Although I'm sure they've continued to improve it through time. So I'm wondering instead of spending money on whole new systems for air traffic controllers and flight service stations. Where you have everything hard wired. Is anybody looking at doing something similar in that particular arena, like we're doing with pilots in the cockpit?</p>
4	<p>Yeah I think pretty much like all the guys were saying before, at least for the 121 side, sounds like everything is going in the right direction. It's just a matter of like the specific company apps sharing that with the FAA. Versus just the specific company itself. Or implementing it into training. I know in my specific training per company, we do AQP. So it was touched on very briefly you know. And then maybe in sims. But it's back to kind of what the controller said its more about just a 1 or 2 word answer. And that's kind of what we were taught, at least, going through my company. So this is where the technology obviously is more beneficial. Because you can get more of a descriptive definition of the PIREP itself without taken up the controller's time I guess. So that seems to be the two biggest issues is, getting more description by taken out less time in that issue as well to get that information out there.</p>
4	<p>Yeah I guess especially based on how difficult it is you know for the controllers to have time and what their primary task is. It looks to me like pursuing perhaps a couple of lines in the automated. One is the apps that would allow us to put things in through our flight bags and of course, the communication section of that, getting that back to Earth is still an issue. But as [Participant]'s pointed out some of the outfits like Spider tracks. Or others that are using the Iridium satellite system probably would make that possible today. And by the time you get his developed we may have Wi-Fi everywhere. And also in parallel to that I think this whole voice, the notion of actually being able to make a voice pilot report that is in some fashion automated might also get by. But the biggest thing I think is we shouldn't put all of our eggs in a single basket. The Part 121 world needs one set of solutions. That Part 135 and Part 91 are liable to need some different systems just because of the different operating environments that we're living in.</p>
4	<p>I don't know that I've got anything new to add to all of that. But just wanted to, I mean, communication getting that information back into the system I think is going to be a pretty big hurdle to get across with this stuff. There's a lot of promise with some of the, you know, ForeFlight keeps getting mentioned. I've talked with folks at ForeFlight and some of their developers. And they'll be oh yeah that's a great idea we'll put that on the list. Well they've got so many other things on their list I don't know how to bump it to the top. There may be some pressure from the NTSB and from you [Moderator] might help with that. I think the capabilities are already there for a lot of this stuff to happen. We've just got to get the right people to get excited like we are about it.</p>

Focus Group	Audio Transcription
4	I whole heartedly agree with everything I've heard so far.
4	It's not going to be a priority for the FAA unless somebody gives a PIREP for like a wind shear or something like that. And it's not passed on. And then somebody crashes. Like after Delta 191, that's when we got the terminal Doppler weather radar at DFW. They're not going to spend the money.
4	That's when they'll find the money for it. That's when it'll become important. But until then, I don't think any controller there has time. I mean we really do not have time at [airport]. If we did, we'd be happy to do it. I didn't mind if there was bad thunderstorms or something like that, I didn't mind letting the pilots talk to themselves. You know because everything's shut down. But the FAA, they don't want us to be given any kind of instructions on stuff like that because they're so afraid of liability.
4	I'm just saying yeah you probably don't want pilots talking to each other on the radio.
4	Because it will never end.
4	I mean like if you're up in the tower and everybody's shut down. I would let one guy, if they're comfortable, you can get on the runway and look at the weather ahead and I would let him talk. And tell everybody what he saw. Because their radars are so much better than ours. All of the equipment they have is basically better than ours. But you know if there's nothing going on and you're in the tower it's not no radar environment when you're in tower. And nobody's taken off I would let somebody get on the runway and tell us what they saw. Because it's more accurate then what I could see.

**Focus
Group****Audio Transcription**

- 5 Okay technology, the newest technology and I love what I believe it was [Participant] said about the Waze app. I use and [Participant] this is one you might like for updated weather. There's an app called FBO Link. And as a corporate guy I'm able to, again if Wi-Fi's working, I'm able to bring up the weather the exact digital ATIS that's ahead of me. The problem is that's good for digital ATIS's but when you're looking at ASOS's and METAR, which I can also bring up. I'm not going to get any NOTAM information, or PIREP information or anything like that. Maybe there'd be a way that an app that simple could be upgraded or software updated. Where it can provide that data to the corporate and the private pilots that are out there flying around. So I see that as a big positive. I definitely see any kind of automation that takes pressure off of people helping [Participant] as a controller. Anything that takes that one less thing, it's still not going to take updated information which is what [Participant]'s going to say. As far as you know the instance. You know here's what's happening on final. Or you know we just got a wind shear. Obviously, that's something that controllers are mandated by regs to do that and provide that information. As far as the negative sides of this obviously costs. Anything automated is going to add a cost somewhere. And you know the private sector, well everybody's going to complain about it. But basically it's really going to affect the GA guys and the private sectors. More so than the commercial end of it. It's going to affect them but it won't be as well accepted. And another one, I guess the learning curve would probably be the other side of it. You know I know from both being a controller and as a pilot and I would actually write in a PIREP format, short hand. So from a controller stand point in speed I could do it much faster in that short hand. But I had to take the time to learn it initially. So learning any kind of new technology's going to [unintelligible]
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- 5 Yeah I would say for takeaways, I mean, the direction that I think they should go is to just utilize the technology advances of the last century. You know it seems like we're pretty far behind. And then smart workload practices to increase the quality and the quantity of submissions. And by that I mean there are so many barriers to submitting them into the system right now. That I feel like that they could really do a lot to kind of break those barriers down. And I think when you do that, it's going to naturally increase things. Instead of saying hey you guys need to submit more PIREPs. Just let the system kind of work and I think people will. Benefits of that I think is you'll get more PIREPs. And there's a potential safety benefit to that. Obviously since you're going to have better information. Issues with that is too much information becomes a distraction. And then like [Participant] said there's a cost and I'll use ADS-B as an example. Implementation of ADS-B is a huge cost to be borne by both private pilots and by the airlines. They hate it. Which is why they're so far behind. And then private pilots, old timers like me and people who aren't familiar with the technology. As these things go that direction they're going to be kind of left behind as far as like a training aspect goes.
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**Focus
Group****Audio Transcription**

- 5 Okay with the question, with the directions we're going right now. I wasn't aware of the avionics of the airplane being able to pass that information back. That's great. So I would say just using the technology that we already have to also input information into the system. But it's still never going to replace actually asking a pilot what they're experiencing in the air. But I think it's a good direction. From a benefit stand point as a controller you're taken a task off my plate and you're now given me more frequency time because I'm not having to solicit these PIREPs. The issues have already been touched on by [Participant] and [Participant]. Costs is going to be a huge issue. And then also just information overload. So as long as it's a program that has that ability to kind of filter that information so that you're not inundated with PIREPs. Because then you become numb to them. You know I think it's just finding a happy medium in there. But I think it's a good direction that you're taken right now.
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- 5 Yeah bouncing off that. I think you know the biggest place for R&D is to updating/automate our abilities to submit PIREP information from everyone. With that flexibility to add [personalized] info. Like you said, smooth as frog's hair or whatever like that. It's kind of nice to not have to have just boxes to check. But if you want something specific that you can add in there that can be passed along and be relevant that'd be good. You know because that'd remove the middle man. And that middle man basically takes up time and adds task loading to everybody involved. So kind of automating it would be useful. But at the same time for the R&D when you automate stuff you're going to get a lot of information overload. So there needs to be a lot of research into combining, prioritizing, filtering all that information from the forecast, the observations, the PIREPs. The TAPS that come from the airplane. You know if you can kind of combine all those and get kind of a best juice, most relevant information out to folks. That's where I think the R&D should go, is taken all that information that we have, combining it and then filtering it into something useful. The benefits I think would be timely and relevant planning for a pilot. If we can see it on our thing we can look ahead. And if we see 200-miles ahead that there's weather or turbulence that we can avoid. We can start putting that submission in so that we're not overloading the air traffic controller. He can work us in with traffic, when it's most convenient for them and we're happy, they're happy. And then obviously a modernized dissemination information. You get those PIREPs in your ACARS. They're really difficult to read and you have to kind of go out of your way to understand exactly what it's telling you. So a lot of those do get ignored. The issues obviously we've said, I've said information overload a lot. And I think that's a huge issue with a lot of information comes, you know, the tendency to ignore it because you're overloaded with too much stuff. And like [Participant] has said several times the technology is limited to our ability to connect. Or like [Participant] said our ability to reference it. If we're busy, we're not going to reference the information on our iPad. It's great. It might have good stuff for us but if we're not looking at it, it does us no good. That's the kind of two issues I see with it.
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Focus Group	Audio Transcription
5	<p>[Participant] that's great all around. One thing about information overload is, look it was just a few years ago that we were doing check revisions with paper, right. And now we've got iPads. And every month there is something new on our iPad that we're learning about. And I just can't tell you how many times over the last year, I was like, whoa that's brilliant. This is amazing, right. Or nope don't want that. So I don't have anything specific to say. Except don't be afraid of information overload. Because we learn how to disseminate it. Something new on the iPad just in the last few months was, we all know about NOTAMs, right. And now we can actually choose the approach for flying and just get those NOTAMs. So just imagine how, if we just bring the technology that's already there use those brainiacs to create those apps. We'll easily be able to filter what we need and want. So I say it's a brilliant time. We're all learning so many new things. Go for it.</p>
5	<p>Use as much technology as you can to get it off the hands of the controllers. But please, the controllers need to be there for us. For those real time moments where we're not looking at our landing app. And we're not looking at our Jepp Flight Deck Pro app.</p>
5	<p>Yeah just excellent points as everybody has been saying. I think a couple of things that I'd like to throw out. I think going forward I really would urge you to include the pilot unions and probably NATCA in this as well.</p>
5	<p>Because it's going to be a training issue of course. And you guys have brought up the information technology overload. You know the possibilities of that. And then the Data Comm office I think would be a great office in the FAA to reach out to and talk with them. Because they run all kinds of different NexGen programs under the Data Comm envelope. And they can probably point you in the right direction on how to try to implement this data usage and where it comes from and where it goes to. Those are my two cents.</p>
5	<p>Well it's kind of hard to expand on what everybody has already said. I mean it's everybody's pretty much said the same thing in a different way over and over again. So I don't want to beat that horse. As far as this question specifically. I would say going back to when you asked [Participant] about how much training did she actually get on PIREPs. Well I mean even in the military and you guys that were prior service military, you can speak to this as well. You know in the flight information handbook the FIH, I mean, yeah we learn that early on. But how much of the information, again, going back to does anybody really have it memorized a UA; a UUA? And going back to I believe it was [Participant] that said earlier. I think [Moderator] you said that one you pulled up in Las Vegas that was supposed to be urgent. But it looked like it was a routine. Because it just said UA. Even though it was severe. I just think that the biggest thing in all of this, there is so much technology like [Participant] just said. And there's so many different applications. I mean WSI. I don't know, does anybody use ForeFlight? I mean that's more, I guess on the civilian side.</p>

**Focus
Group****Audio Transcription**

- 5 And ForeFlight's awesome. But I mean as far as, do you guys at Southwest or American, do you guys use ForeFlight? Or use Jepp Flight Deck Pro? So you know, I guess from a training stand point, you know at United we had a crash course. I think the instructor gave us 1 hour on WSI. And you can only cover so much, maybe it was 2 hours. Whatever it was, I mean it was just so much information. Now it's up to us, going back to [Participant] to all that information. It's up to us to really dig in and really figure out what's going on here. And then the passing of that information back and forth. Going back to lightening the load on ATC. That's huge. And if there is a way just to go, like the ADS-B stuff. You know when people can, you know, I fly 737 and our box is so outdated with the ACARS, it's 2.0. But I mean we see other people and they'll be sending each other messages via ACARS. And they have ADS-B, and they know exactly the call sign and everything else. I just think if we could have some kind of standardized, where we're all pretty much on the same page when it comes to whatever the format. Whatever the application is that we're using. So we're all pretty much on that same page regardless of how much information is out there. And then just again from a training stand point just nuts and bolts from the very beginning so that we all have a very good basic foundation of what's going on. Before we got on this call today, I was just like, you know I mean, it's been a long time since I even looked at the form. So I just pulled it up, this form 7110-2. And it is, I mean it's pretty simple. And it wouldn't take very long at all just to go back and if that was what would help. Just to memorize real quick just to know the abbreviations and go down that check list real quick. So that we all kind of have that foundation I guess. That doesn't really speak exactly to the question on the screen right now. Everybody else has answered that question so effectively. I'm just, as we're going through all of this, this is just kind of my thoughts so.
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- 5 Considering my lesser experience then everyone else. But I guess, I would I guess support the idea more of a hybrid going forward. And researching mostly just how the technology will filter out or how the humans will filter out what's most important and what's not so important. And I guess in terms of general aviation, I was just thinking in my mind, that not everyone has an iPad when their taken their Cessna up and whatever. So for those people who flying around with paper maps, there's not many. But there are people still doing that. Like that automated reporting is crucial. So I think that to just get rid of that completely would be a little bit, yeah, I'm not sure. Or just those general aviation people who are still using paper maps, they just need to catch up. And everybody just needs to be on an iPad. Yeah just that hybrid idea, is what I would kind of lean towards as well.
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- 6 I have a question for [Participant] to. What about uncontrolled airports that have no tower, how do they get information?
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- 6 Very good question. I also found out from the flight service side of the house that they're no longer allowed to give PIREP, as far as given them a clearance to an aircraft on an uncontrolled airport. They have to now contact the center to get that clearance. Where it used to be ATC clears or ATC advises or whatever. That's no longer happening. So the pilot has a responsibility now to make a phone call to the flight data position, or at the center, or the tower to get their own clearance. It's really the, and that's what I'm saying according to, when I made some calls prior to this conversation to try to be more up on what's going on. The feeling is that their duties are being removed from them. And the hopes that pretty sure they're not doing these particular duties and therefore you can close the contract in flight service. Because as you were saying, everything is going to more, pilots are briefed to themselves. They have more digital, more information. Their millennials. They're coming up with wanting to do things on their own. But you know, they can even file their own flight plans now using this system. And so the FAA is causing a problem into themselves that their saying they're trying to fix. But if they just look at how, what we've done inside of the government over the last 15-20, since I've been in. Is we started bringing in a lot of business people so to speak. That had no knowledge of how work was done inside of the government. And we looked at trying to make it faster, better, cheaper. Where air traffic control doesn't work that way. Pilots don't work that way. It's not a better, faster, cheaper type of a situation. There is a system to training air traffic controllers. There's a system to training pilots. But you bring people in with a business knowledge and they believe they can put everything on computer. They believe that they can teach everything distantly. They don't believe in using the ability of what's tried and true. And like I said I ran national air traffic training. I sit in these meetings. I saw us bring in people from airlines that had no understanding of how the FAA worked. And a lot of problems that we've gotten ourselves into is the fact that we brought in private industry to streamline government. Private industry goes into cutting a lot of different things. And then we end up having to go back to what we already had that we knew was tried and true. And then it looks like we're now reinventing the wheel. I'm not saying that you shouldn't try to do things better. I am saying systems that work. If we knew that these systems were working and we didn't have this problem before. And we eliminated general aviation and we're not really talking a lot about general aviation as was, what we're really talking about. Because when you start looking at these services. That you need GA sitting here. Because GA's the one that basically uses this system a lot more than I would say airline pilots, commercial pilots and business pilots. Those guys are flying at the higher level and their looking for more turbulence, icing and stuff like that. Lower stuff is for where we get our accidents and all our other problems with people getting themselves into those problems. So I don't want to keep doing this but I keep finding myself talking too much.
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**Focus
Group****Audio Transcription**

- 6 I was going to say I agree with [Participant] and that I think you need a lot more GA representation. What I'd be interested in from that is you know and [Participant] talked about a little bit early you know using Stratus General aviation in the last 20 years has jumped leaps and bounds in the technology that their flying with. I mean everyone's flying with ForeFlight or some sort of format of that. It has data. What the latency of some of that is I mean. I was in a meeting not too long ago and we're talking about hey be careful with your ForeFlight and STRATUS because it's got a 5 minute lag time. I mean it's remarkable in a 172. Again that's where the real user of this information is going to be getting a benefit.
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- 6 I wanted to give you one more thing. You know when we talk about PIREPs I think we have like a 10 minute window to get them in and they're only good for an hour. So I think when we start talking about PIREPs we really need to look at that it's not that something that stays in your system forever, it drops. It's only you know a timeframe that they are good for and you have a timeframe to get them in. So I do think again, the education part of that has to be we reiterate that to the people that are getting those PIREPs. And making that happen a lot sooner than later.
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- 6 I think a good direction would be, one for identifying how the technology in 2020 now can help us in the cockpit. And the problem with that for one is the technology ranges in the different cockpits. [Participant]'s got technology. [Participant]'s got technology. I've got very old technology in mine to be honest. But finding a way to utilize the technology. To streamline and get up the communication, the information that we can use in a good amount of time. I think that would be a direction of trying to find a simplest way of communicating this through the technology to our aircraft. Two important benefits would be real time for one. And the second benefit I think kind of underlying is finding a way for like me, [Participant] and [Participant] to talk to each other. Maybe not voice to voice but you know if [Participant] submits a PIREP and I'm talking about in here, real time. Not talking to flight service. Not to talking through or looking at dispatch release or something like that. I think a direction to me just personally would be just trying to streamline the communication in the air in real time. What got me thinking about this was when you brought up the page about the AIRMET. If there's a 78 going through a NAT route above Greenland. How can I, one day and my wide body, how can I have access to that same information without asking the ATC? Or without getting in touch with that pilot in the meantime? Or as we're coming into approach if a guy goes around and I haven't talked to approach control yet. Is there any technology or any real time information where I can access the folder or somewhere through data link? Where you know last two aircraft have gone miss or something like that. Could ATC type that into a new streamline piece of technology where it talks to my aircraft? And I'm just kind of spit balling out right now. But I think the dissemination of information and the timeliness of it, would be a direction that I would recommend the R&D to go. The issues through it would be if it's coming from ATC, you guys are doing a lot, obviously in the terminal area along with the en-route area. But I'd be willing to guess that you guys are probably busier with specific tasks in the terminal area. And issue could be if we have to rely on that, that's one other thing that these guys have to do. You can train on it all you want. But if you're handling several aircraft and I am seeing conditions with a front moving through, I mean, there's a lot of things that you guys are looking at. That's different then what we're looking at. We're looking at one airplane. You guys are looking at fourteen/fifteen. So the issue would be task saturation of course. And the other issue would just be the timeliness of it. I mean if I get an ACARS saying that you know [Participant] went around and we're at the gate with the [GV running] that doesn't really mean anything to me because we got in. Sorry [Participant] you diverted. Let's just go home, we're getting there for sure. But I think there's a timeliness as a catch 22 and a two-sided of a coin there but that's what I feel the direction, me personally, that R&D can take it.
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**Focus
Group****Audio Transcription**

- 6 I think [Participant] made the point about the kind of peer-to-peer communication. I think you're going to see that Jeppesen. Because where that's going to come out for guys flying in the flight levels. And I see it in some of the programs that we're using at United. Some that are under development. Their using the iPad in the gyro's or whatever in the iPad to monitor turbulence and that's I think shortly going to be integrated into the Jepp stuff and so you'll get some of the automated stuff. As well as some of the actual human interface stuff. But [Moderator] I think one of the big things that would be key to this is and especially from the GA side. Is what are they looking at a PIREP to be today? 25 years ago when I started flying a PIREP was kind of, God's honest truth and the weather brief was something that kind of went along and gave me an idea. Now as technology and the presentation of everything has progressed. As well as just the meteorology itself has progressed. I kind of look at my briefing as pretty honest and the PIREP is just verification of that.
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- 6 Yeah I think [Participant] hit on a very good thing. I do think though that PIREPs, the problem I think about briefings these days right now looking at this, you don't know where they got them. And how they got them. And if they were accurate. Because who knows, the order requires you to get a briefing before you go flying. Okay. You guys all know you're supposed to be briefed on whatever. The meteorological conditions are prior to going up in your aircraft. You're supposed to be aware of that. So when I hear verification of those things who knows what your briefing really said. You know I think that's part of the problem. I think as controllers we basically are aware of the weather on the route that people are flying, okay. So we know the issues that are going and we know if there is turbulence over a particular area. And a lot of times you guys get that information without even having to ask for it. As soon as you come on frequency we'll say whatever the case may be. So I'm not sure if there's, when I look at the questions, a good direction for R&D. Because I do think that a lot of this stuff is them. I think as far as being able to, if you're talking about automation, it has to be something that verifies there was a briefing that was conducted I would think. And you don't know what they got from the briefing because you don't really know that persons abilities. So I just think, when I look at PIREPs, I'm just really in this particular thing that we're doing it just jumps all over the place for me because I really don't know what it is we're relying trying to get to. I think I understand the use of PIREPs. I understand that maybe there's a way of going into using them in the future. Maybe there's a way of making sure there's a repository that's one central location. Or whatever the case maybe. I think we're looking at all those things. But I think as far as being able to come up with an answer for me, I'd have to kind of know what direction you wanted to go in. I don't have anything other than that.
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- 6 Okay I think that's great. I just keep thinking, I'm kind of old school and I kind of knew what was working. As far as the new technology I think it might have passed me by. So I'm going to sit here and I'm going to yield to the people that are using the newer technologies. I still got an abacus in my room for my calculator.
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**Focus
Group****Audio Transcription**

- 6 I was just going to say I mean there might be a couple of pilots that are going and getting weather from Billy Bob's weather or something like that from a backyard type of station. Guys are getting from NOAA. Their getting them from in-house meteorology. ForeFlight has meteorologists/aerographers. It's professional, pilots are going to professional sites. So I'm not too concerned. I mean conversely when I was in the military and I would get a face to face brief from a qualified meteorologist, some were better than others. But I think by and large that technology has gotten a lot better. The tools they've had. If nothing else the connectivity they've had to share information amongst the meteorological group. Whatever the case maybe the product that's coming out is much better then what it used to be.
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- 6 Yeah the thing about PIREPs is the way they invented PIREPs. Because my exam still in the written form. I didn't use a computer, just to let you know how long it's been. But in the old days the information was not as advanced as it is now and not as instance as it is now. So PIREPs are important in those days. Now a days you can get the information that is very important and in times critical issue can be submitted or received through several technologies. Well that's already there. The old style where you have to write things down, that still works today but if it's not time critical then do the old fashion. Submit it. Go through several waves of process like she said [unintelligible] that's okay. The time critical information with the new technologies there's plenty of ways of doing it. The only difference is whoever is going to accept it.
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- 6 Yeah I think whatever direction we go in and I know you are asking for us to suggest them. But ensuring that reports can go in and come back right away to pilots. Because with PIREPs it's an instantaneous report and it does not do me a lot of good. Especially when I'm already flying. I'd like to have, even a half hour old PIREP. It doesn't really tell me what's going on. And whenever I'm trying to pick my way around weather in a plane that doesn't have radar or anything to tell me anything instantaneous. That's the best that I can get. So having something that isn't going through a million steps to go in and come back out to pilots is going to be crucial. Especially for the GA pilots.
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