Research, Engineering and Development Advisory Committee (REDAC) Subcommittee on Airports

Meeting Minutes

March 8 – 9, 2022

Contents

INTRODUCTION & OVERVIEW

Introduction and Opening Remarks

Presenters: Chris Oswald and Shelley Yak

Time: 8:30 am - 8:58 am

MINUTES:

Introduction:
Chris Oswald welcomed everyone to the Spring 2022 REDAC. Mr. Oswald provided a brief overview of the schedule for the day. He highlighted that Gary Mitchell and Brett Williams will present updates on their respective Concrete Asphalt Research Programs.

Mr. Oswald spoke about the open discussion that will take place on the concept of smart airports.
He acknowledged having Airport Cooperative Research Program (ACRP) as a presenter and thanked them for joining the REDAC session once again.

Mr. Oswald thanked each of the REDAC members and called on them to introduce themselves.

Mr. Oswald gave the floor to Shelley Yak for Opening Remarks.

Opening Remarks:
Ms. Yak is the Director of the William J. Hughes Technical Center, and she is responsible for managing FAA's research and development portfolio.

<u>COVID Updates:</u>
Currently, 500 of 3000 staff are present in-person at the labs. The labs are operational.

The return-to-office is planned in three phases:

- Phase One – April 11: ATO Tech Ops organization
- Phase Two – April 18: Flight Standards, Security and Airports, ATO and ATC Facilities and Engineering and Planning
- Phase Three – April 25: Everyone else

There will be a hybrid situation and the details are still being worked out. Ms. Yak acknowledged it will be necessary to see how things continue to change.

<u>Bipartisan Infrastructure Law (BIL):</u>
BIL provides $25 billion in funding. There is money allocated for airport terminals, airport infrastructure, and air traffic facilities.

<u>Retirement and Departure Announcements:</u>
Ms. Yak reported that there are a lot of departures from FAA at this time. She announced key changes in leadership, including FAA Administrator Steve Dickson's retirement (his replacement has not been announced yet) and Terry Bristol, ATO Chief Operating Officer (her Deputy Tim Arel is acting behind her).

Research opportunities/focus areas:

- Energy and sustainability
- Technology to reduce emissions and noise
- Establishment of a new laboratory at the Tech Center
- Commercial Space
- Unmanned Aircraft Systems (UAS) and Advanced Air Mobility (AAM)

Ms. Yak stressed the importance of "being able to tell a story and make it relatable" and also shared plans for a new fiscal year (FY) 23 line item entitled "Emerging Technology Accelerator" (ETA).

REDAC Membership:

Ms. Yak shared a focus on balancing the REDAC membership across four areas: Industry, Academia, other Government, and Emerging Areas. There are currently about eight representatives on the full REDAC.

Headquarters (HQ) Office of Airports (ARP) Update

Presenter: John Dermody

Time: 9:00 am – 9:15 am

MINUTES:

John Dermody began by introducing his team and providing an overview of his divisions and branches Under "AAS-1":

- There are two new branches: Airport Safety & Operations Division and Safety Policy.
- There are also two branches now on the Airport Engineering side: Airport Design & Construction branch and Airport Data & Airspace branch.
- Approval has just been received to stand up a new division: Airports Emerging Entrants.

Mr. Dermody provided updates on new hires, retirements, and hot topics to include emerging entrants and sustainability. He reiterated that ATR has been researching "greener" pavement since 2015. He also shared that an Industry Day on vertiport design was scheduled for later in March 2022.

Mr. Dermody provided a brief budget update: $41 million including $1.2 million for vertiport research. He anticipates that the FY23 budget will be similar, which is sufficient for the work they need to do.

He also shared that last fall there was a research request for trapezoidal grooves, which will be discussed in more detail during the following REDAC sessions.

Airport Technology Research & Development (ATR) Program Update

Presenter: Dr. Michel Hovan

Time: 9:18 am – 9:34 am

MINUTES:

Michel Hovan began the session by introducing the program team members.

Overview:

- Budget is $41 million which meets program needs
- Organized this REDAC meeting by the five goals of the current administration, rather than by research program area (RPA)
    - Safety
    - Resilience
    - Infrastructure transformation
    - Equitable economic strength
    - Investments and equity & inclusion
- A sub-budget is allocated to each of those areas.

10-year plans:

There are 10-year plans for Safety and for Pavement:

- Pavement: 2030 plan is ready and will soon be shared on the ATR website.
- Safety: The 10 year plan needs to be revised. The aim is to have a draft by next REDAC.

Roadmap:

Dr. Hovan shared the ATR Strategic Roadmap and highlighted a new focus on all things autonomous and data technology integration. He also emphasized the relevance of cybersecurity and emerging entrants.

Dr. Hovan discussed the importance of having the right people to get the job done and announced current vacancies. He mentioned the need to recruit staff with experience in machine learning and artificial intelligence.

Civil Aerospace Medical Institute (CAMI):

ATR has engaged in discussions with CAMI in Oklahoma and at the Tech Center. Dr. Hovan stressed the need to look more closely at the human factor impacts of ATR's research.

- Monthly discussions with Director of CAMI began in November 2021
- Two programs will have more integration with human factors:
    - Paint research
- Wrong surface landing. ATR will work more with CAMI and their Human Factors branch to explore these areas more.

Data/Machine Learning (ML)/Artificial Intelligence (AI):

Dr. Hovan highlighted REDAC sessions that will provide a deep dive into these areas. He emphasized the need to find new ways to use data to improve research.

Review Of Outstanding REDAC Recommendations

Presenter: Jim Patterson

Time: 9:37 am - 9:55 am

MINUTES:

Jim Patterson shared the 109-slide deck that keeps a historical account of previous REDAC recommendations. New recommendations:

- Finding 1 (slides 106-107): Alternative Firefighting Agent Research – reviewed the drafted recommendations.
    - Sarah Hubbard shared that Dane County Airport is performing research on using alternate agents.
    - Justin Barkowski mentioned that the draft MilSpec is out for comment to meet the January 2023 Department of Defense (DoD) deadline.

- Finding 2 (slide 108): Airport Sustainability and Resiliency – reviewed the draft recommendations.
    - Jim Mack (CEMEX) brought up the point of use-based aspects. There needs to be a systemic focus on lifestyle considerations and how systems are designed and put together, instead of just the implementation and waiting until the end of the planning process to consider materials. John Dermody recommended that Navneet Garg meet with him offline to discuss how those considerations are being captured.

Chinita Roundtree-Coleman reported that these recommendations have been approved by the FAA Administrator.

REDAC Membership/Subcommittee Representation

Presenter: Chris Oswald

Time: 10:15 am - 11:03 am

MINUTES:

Chris Oswald hosted an open discussion about REDAC membership and subcommittee representation.

In late February, discussions began on expanding the full REDAC membership to include subject matter experts (SMEs) for expanding portfolio areas related to advanced air mobility (AAM) and future uses of unmanned aircraft systems (UAS). Focus on three areas:

1. Desire to expand and deliver on diversity/equity/inclusion
2. Include more academics
3. Meet needs related to evolving or rapidly advancing new entrants

Mr. Oswald spoke about the need to identify potential candidates who have aviation, new entrants, or academics experience. He asked for thoughts on what the final composition of REDAC should be.

John Dermody responded, speaking first about the full REDAC.: The current full REDAC composition needs to include emerging entrants – more UAS/AAM and more membership from universities and cutting edge/special government employees (from academia). There's a need to look at skill sets and diversity of the membership. If members are on the full REDAC, they need to be on one of the subcommittees, depending on where their skill-set falls. Need to put proposals forward.

Michel Hovan: Added that the current committee is a good composition, but needs new members for:

- AAM/UAS
- Academics
- Data scientists (ML/AI) – someone well-versed in using data
- Sustainability
- "All things autonomous"

More academics will provide "cutting edge" focus. However, it is hard for them to attend because of the "voluntary" nature of the role.

Chinita Roundtree-Coleman shared that REDAC has several academics on the full committee and the subcommittees. To have a fair and balanced committee, they are looking at the following categories:

- Other government agencies
- Universities and research centers
- Associations and consumers

Categories under which they would fall are:

- Representative
- Special government employee (SGE)
- Regular government employee

All SMEs will be required to complete disclosure forms and take an annual training.

Mr. Oswald asked if there is a clear number of seats to fill and was told there are up to 30 members on the full REDAC. The Department of Transportation (DOT) has asked to limit membership to 25. There is a need for 10-12 individuals for Phase 1. Subcommittee can have up to 25 members, so the Airports Subcommittee can expand membership. Names submitted by Dr. Hovan have been pushed forward.

Mr. Oswald asked for assistance filling member seats and suggested that subcommittee members identify:

1. Airports Subcommittee members interested in being a member of the full REDAC
2. Names of people to nominate going forward

Sarah Hubbard is being considered for a nomination, but she wants to understand more about the requirements before proceeding.

Jon Schleifer shared the full REDAC membership framework and the focus on:

- Industry
- Academia

- Emerging areas
- Other government and advisory committees

Mr. Oswald asked for list of role expectations and how many seats are needed.

Mr. Schleifer responded that they would like to increase from eight members to 14-15 members.

Mr. Oswald stated that the names he provided for consideration were informal and that he had not confirmed interest or availability.

Justin Barkowski asked if a formal notice soliciting applications was released similar to other federal advisory committees.

Ms. Roundtree-Coleman shared that REDAC is unique. Since members are external to FAA, there are multiple vehicles to collect names.

Actions:

- Ms. Roundtree-Coleman will share the basic responsibilities for joining the Full REDAC.
- Designated Federal Officers (DFOs) work with the Chairs to collect names for submission to Mr. Dermody and Ms. Yak. Note: There is no requirement to solicit through the Federal Registry Notice.

Mr. Oswald said that he shared approximately five names informally. These are suggested names versus fully vetted candidates. He stated that the subcommittee is soliciting suggestions for outreach to possible candidates.

Mr. Oswald mentioned that there is a short track to finalize nominations before the next full REDAC. However, if the nominees are not approved by the next full REDAC on April 7, 2022 nominees could attend as a member of the public.

Meeting Chat:

From: Justin Barkowski
Just to clarify and sorry if you've already discussed, will there be a formal notice soliciting applications, similar to other FACs?

From Chris Oswald (ACI-NA) to Everyone 11:08 AM
For those interested in REDAC seats, please note that travel is not funded by FAA. The group meets twice year in DC, typically in May/June and October/November. Meetings are 1 day in length. East coasters can usually make the meetings without an overnight; others would need an overnight the day before.

Airport Cooperative Research Program Update (ACRP)

Presenter: Matt Griffin

Time: 11:05 am - 11:18 am

MINUTES:

Matt Griffin provided an overview of FY22 projects, and the ACRP annual research cycle. Research problems statements are due on April 4, 2022, and selections will be finalized in July.

There are two programs managed by the Virginia Space Grant Consortium. It was also noted that there is a need for mentors.

- Graduate Research Award Program on Public Sector Aviation Issues
    - 90 recipients
    - Every year the program funds up to 12 one-year awards of $12,000
    - Final papers are published in the Transportation Research Board's (TRB) Journal, *Transportation Research Record*
- University Design Competition
    - National competition
    - Engages graduate and undergraduate students to consider innovative approaches to address issues relating to airports and the national airspace system (NAS)

Mr. Griffin also spoke about the ACRP Insight Events, which are gatherings of airport industry leaders, subject matter experts, and researchers to discuss emerging topics.

He provided an overview of recent publications issued, highlighted the call for research idea submissions, and announced open positions at ACRP.

Website: https:www.trb.org/ACRP/ACRP.aspx

SAFETY

Overview Of Safety Projects Under Way

Presenter: Ryan King

Time: 11:19 am - 11:35 am

MINUTES:

Ryan King provided an update on the safety program areas. He highlighted the vast scope of airport safety considerations through a word cloud diagram of over 50 items. Before providing an overview of ATR's Research Program Areas (RPAs), Mr. King emphasized that the ability to engage with science keeps evolving.

Overview of the RPAs:
Airport Safety Research falls within the overarching buckets of Safety, Noise, and Environment – with room to develop new buckets as needed.

Visual Guidance updates:

- Visual Guidance Contract: A new support contract has been established just for Visual Guidance, as opposed to the Airport Technology contract that supported a wider umbrella of research. The contract supports five task areas: Airport Lighting & Infrastructure; Airport Surface Markings, Signs & Vehicle Operations; Lighting Innovations & Special Projects; National Airspace System (NAS) Visual Aids; and Operations & Maintenance of Photometric Laboratory.

- EMAS Signage: The project seeks to identify the optimal placement for EMAS signage. A new report will be available at the end of the month on the data that has been collected so far. ATR is collaborating with FedEx and Flight Safety International for access to pilot insights. The FedEx research was delayed due to COVID, but the research findings from ~100 of their pilots will be added to the report as an addendum by April or May.

- Lighted X and WSL: ATR is working to complete the first phase of evaluating runway closer markers – LED vs. Incandescent lights. The second phase focuses on Wrong Surface Landing (WSL) – a study has been established to mitigate WSL events.

Airport Databases:

- Airport Safety Database: Database to manage, categorize, and analyze reported safety incidents from various sources. This project is ongoing.

- Foreign Object Debris (FOD) Database: Repository created to hold FOD data. Getting the database populated relies heavily on the influence of liability. Getting stakeholders to input data is a challenge.

- Wildlife Strike Database: Database to manage, validate, and analyze wildlife strike reports for civilians. The database has accelerated the reporting time down to 14 days for validation; previously it used to take 1-3 months for a strike to be validated and released to the public.

Paint Marking Research: Project assessing the retro-reflectivity of paint marking beads and how they stand up to various environments over time. ATR is completing the PHX Sky Harbor field tests and is continuing to collect readings at Ft. Lauderdale and Atlantic City airports.

Wildlife Research: The research is based on relationships with the U.S. Department of Agriculture (USDA). They look at all the aspects of wildlife management and mitigation research that can be applied to airports, including:

- Avian Perception
- Avian Radar CONOPS
- Translocation
- UAS Applications for Wildlife

Preview of other projects to be briefed during REDAC:
Mr. King announced other Safety projects to be presented during REDAC:

- Solar Lighting for Airports
- UAS Applications on Airports
- Aircraft Rescue and Firefighting

- Airport Planning & Design, including Environment and Noise

Meeting Chat:
From Jeff Sedin + Andrew Sousa (ALPA) to Everyone 11:37 AM
Ryan, do you know if FedEx has started the EMAS study in their sims? By any chance do you have a number of how many simulations have been done through flight safety for the EMAS signage?

Alternative Aircraft Fire Fighting Agent Research Update

Presenter: Keith Bagot

Start Time: 11:35 am – 12:35 pm

MINUTES:

Work on this project began even before the FAA Reauthorization Act of 2018, but the Act established the finish date. Project areas include:

- Testing foam proportioning systems
- Researching and testing AFFF Replacement

Keith Bagot emphasized that foam is no longer deployed on the ground (into the environment) during testing.

AFFF Replacement testing methods:

- Live Fire Testing: protocols used are MIL-F-24385F and ICAO Level C
- Chemical Analysis: ensures there are no PFAS or other contaminants in the replacements being tested

Project Status
<u>AFFF Replacement Test Summary:</u>
The team has been completing as many tests as possible to have the most data available.

- Two baseline fluorinated AFFF tested (1 MilSpec and 1 ICAO Level C)
- 36 FFF have been evaluated
- 500 fires have been completed
    - No FFF have passed MilSpec or ICAO Level C. The FFF options were not design with MilSpec protocols in mind. They are assessing how far the MilSpec bar will need to be moved for a new product to fall within a new standard.

Mr. Bagot reported observations from modifying the test protocol variables. Of note:

- Stationary nozzles take longer to extinguish the fire. New nozzle designs are being developed.
- Jet A is easier to extinguish than unblended gasoline.

<u>Coordination with DoD:</u>
ATR is working closely with the DoD through collaboration with the Strategic Environmental Research and Development Program (SRDEP) and the Environmental Security Technology Certification Program (ESTCP). They also had the opportunity to work with NAVSEA on the development of their FFF MilSpec draft. FAA and DoD also conduct monthly meetings to manage program progress.

Next Steps

- April 2022: Revised FFF MilSpec will be ready for more public distribution. It is currently under governmental review.
- Research for a new FFF will continue, as well as transition planning from legacy AFFF to new FFFs.

Discussion

Q: Chris Oswald: Are you optimistic that there will be a replacement? Plus, the ability to move forward with new standards for fluorine-free?
A: Mr. Bagot: Yes. I don't think we're going to have a direct one-to-one duplicate product. But there are candidates that are performing well, and there are other potentials in the research on the new formulations. So, I am confident we'll have a product at the time they drop the fluorine-free MilSpec. There will be questions around: Where are we in the process; how do we transition the products? All of that is continuing to be worked on.

Q: Mr. Oswald: Regarding the testing in China Lake – is there a way for civil aviation members to participate? Also, in the transition planning block, can we find opportunities to provide some insights or assistance on that front so it's a joint effort between FAA and the airport communities?
A: Mr. Bagot: I can ask about participation at China Lake. For transition planning, yes there will be an appropriate time to have those insights and assistance. I'll defer to John (Dermody) for that process.

Q: Justin Barkowski: To clarify, you're confident we'll find a foam within the outlined timeframe?
A: Mr. Bagot: Yes. As confident as I can be without sharing information that can't be shared at this time.

Q: Mr. Barkowski: How much, if any, cooperation is taking place with EPA?
A: Mr. Bagot: EPA is looped in and John (Dermody) can speak more to that from the HQ standpoint.

Q: Scott Marsh: In the transition plan, are you investigating when these new foams come online and how they affect the current equipment?
A: Mr. Bagot: In all the development and testing, they are doing everything possible to find a product that doesn't interfere with the equipment currently used. For transition planning, we are also still figuring cleanliness standards for the trucks themselves and determining who sets that criteria.

Q: Mr. Marsh: Does any of your research investigate hanger suppression foams?
A: Mr. Bagot: FAA is not testing hanger suppression at this time.

Q: Shailesh Gongal (Massport): Is it fair to say that real-world application is still some time away after meeting the deadline of identifying the right foam?
A: Mr. Bagot: We're working towards having the transition planning and guidance to airports completed by the same time the MilSpec comes out. The actual execution of the transition will involve coordination with HQ and individual airports one at a time. Some states are more aggressive about making the switch.

Mr. Oswald: It will be critical to communicate to policy makers and legislators, particularly at the state and local level, that this transition can't happen overnight. Especially keeping in mind supply chain issues.

Mr. Bagot: Some states have already said they will not sell foam anymore – Maryland, California, Washington, are a few. So, they will not be able to get a supply of legacy AFFF foam because of state legislation. There will be a "rush to the gates" for the replacement.

Q: Al Pollard: So, what happens in Maryland (in regard to the legislation restricting the sale of AFFF)?
A: Mr. Bagot: I don't know because I just learned about this yesterday during a conversation with BWI. There might already be answers about this, but I need to have further conversations.

Emerging Entrants

Presenter: Jonathan Torres

Time: 1:00 pm - 1:32 pm

MINUTES:

The purpose of this project is to provide data to the FAA Office of Airports to help them develop Vertiport guidance.

Project Background

- A Request for Information (RFI) was issued in 2019 seeking information from industry about vertical take-off and landing (VTOL) aircraft design, infrastructure design, concepts of operations, and takeoff & landing profile. The RFI was open from April – October 2019.
    - Nine responses were received but some replies had incomplete information.
    - The industry is still new, *and* in 2019 industry was slow to share data due to intellectual property concerns.
- Due to lack of information from the RFI, the project team had to find other ways to get the information needed.

NASA National Campaign (NC):
ATR provided input for creating a baseline design of landing areas to be used during evaluations. ATR has access to the data collected through the NC – including vehicle performance – to help with the creation of vertiport guidance. ATR has been in constant communication with NASA for the development of vertiport guidance.

FAA-centric Studies:
Because the RFI yielded limited information, FAA designed studies to obtain the data needed.

<u>Vertiport Design Study:</u>

- Started contract in September 2020 with Woolpert. The Literature Review and Gap Analysis have been completed. Data collection from aircraft manufacturers is ongoing.
- Currently, they are identifying sites for modeling and simulation work (which will begin Summer 2022) and data collection.
- Interim design guidance has been issued
    - October 2021: Interim design recommendations presented to AAS-110.
    - March 2022: Draft Engineering Brief shared for public comment at Industry Day on 3/29/2022.
    - September 2022: Final version of Engineering Brief will be issued.

<u>Vertiport Electrical Infrastructure Study:</u> 18-month study in coordination with National Renewable Energy Laboratory (NREL).

- Study examines vertiport charging needs, cybersecurity concerns, and hazards evaluations.

- NREL will deliver two reports to ATR in Spring 2022:
    - Hazard report
    - Cybersecurity report
- The submission of the Final Report might be delayed as NREL has encountered delays receiving data from sites.

Future Studies:

- Hydrogen Infrastructure for Vertiports – ATR will work with NREL to explore the infrastructure required for hydrogen used as a fuel source for VTOL.
- Small-scale Outwash and Downwash Study for Vertiports – ATR issued a Broad Agency Announcement (BAA) to obtain small-scale testing on Vertiports and is reviewing nine submissions.

Discussion

Chris Oswald: Coming back to the membership concept, in addition to the overall full REDAC membership, it might be good to consider ways the Subcommittee might be responsive. Since AAM operations will create a new landscape for airport operators it will be good to expand the subcommittee membership to include expertise from dedicated infrastructure providers.

Completed Evaluations Of UAS Applications

Presenter: Mike DiPilato

Time: 8:30 am – 9:17 am (Rescheduled from Day 1 to Day 2)

MINUTES: Research started in 2018 with $100K budget. The goal is to determine minimum performance specifications.

- There are currently six areas with the newest being FOD Detection added in February 2022.
- Many groups are involved: Six companies, five universities, two government collaborators – Department of Agriculture (USDA), National Wildlife Research Center (NWRC), and National Oceanic and Atmospheric Administration (NOAA), National Geodetic Survey (NGS), and DFW for cooperative agreement for ARFF.
- There are 50-75 personnel supporting this effort.

Six research areas:

1. **Obstruction Analysis** – Conclusion: feasibility for small-UAS (sUAS) for small survey areas. In the future, the plan is to conduct a 18B test above 400'. Final report will be available later this year.
   Q: Chris Oswald: Who can collect the survey data – government only or vendors?
   A: John Dermody said the research will guide the decision.
2. **Pavement Inspection** – Working with FAA SME, Matthew Brynick. Conducted testing at eight airports. Conclusion: Feasible to use sUAS for supplementing inspections. Final report will be available later this year. Plan to conduct more testing on different payloads.
3. **Perimeter Fence line Inspections** – Focused on "public protection" purposes. Conducted testing at four airports, including a larger airport, Cincinnati (CVG), based on REDAC suggestion. Conclusion: sUAS most effective for hard-to-reach locations and good to supplement traditional inspections. Future improvements in autonomous UAS may increase the benefit, but need to consider a Safety Risk

Management (SRM).
Q: John Dermody: In the conclusions, did you specify height / offset?
A: Mr. DiPilato stated that the recommendations will not specify height, but will share variables for testing and offset distances. For Memphis Beyond, we were not able to fly through the approach surfaces. We went through two SRMs but did not pass.

4. **ARFF**
    a. **Live Monitoring** – Testing at ACY and DFW. Integrated sUAS operations in DFW Fire Training Research Center. Working with FAA SME, Keith Bagot. Conclusion: sUAS can provide enhanced situational awareness. Future focus will be on tether research and integrating into a full-scale emergency response exercise.
    b. **Accident Documentation** – National Transportation Safety Board (NTSB) uses this for collecting and documenting data after an incident. Conducted testing at ACY. Also conducted a full-scale test at WMD with small General Aviation aircraft colliding with over 20 different test cards. Will publish an interim report but need to test in more diverse environments. Conclusion: sUAS can provide enhanced situational awareness and preserve evidence at the scene.
5. **Wildlife Hazard/Monitoring** – Working with FAA SME, Wesley Major. Measure bird response to various sUAS platforms. Tested with turkey vultures, gulls, and red-winged black birds. Leveraged strike database. Conclusion: sUAS can be used to disperse birds.
6. **FOD Detection** – Started in February 2022.

Discussion
Chris Oswald shared: This topic is of great interest to the aviation community. Airport operators would be very willing to engage with developing concept of operations.

Q: Shailesh Gongal: In terms of obstruction survey and pavement inspections, are you able to control he number of images to manageable limits so you don't have too many images to process?
A: Mr. DiPilato: The number of images is definitely a concern, however to get good quality data with UAS, we're flying at 400 feet. If we flew higher, the quality of the image will go down. We'll consider this during the next stage of research efforts.

Michel Hovan commented that this technology is still immature. It will probably mature in a few years.

Mr. DiPilato added that they are trying to find the best balance between density of flight lines and data collected. The challenge is to identify what is "good enough" for the airport operators and the FAA ATC.

Mr. Gongal added that different trees have growth patterns that result in new geography. Might be a good test for ML/AI to track. Does it save money for the airports?

Meeting Chat:
From Rachel CTR Seibert to Everyone 09:08 AM
Which publications were the two peer-reviewed articles published in?

From John McGrath to Everyone 09:12 AM
I will check

From Lauren Vitagliano to Everyone 09:17 AM

Shailesh – under Airport Planning RPA, we wrapped up research for a National Tree Growth Database: http://www.airporttech.tc.faa.gov/Products/Airport-Safety-Papers-Publications/Airport-Safety-Detail/ArtMID/3682/ArticleID/2870/National-Tree-Growth-Rate-Database

From Shailesh – Massport to Everyone 09:18 AM
Thank you Lauren

Trapezoidal Grooves Update

Presenter: Jonathan Torres

Start Time: 1:33 pm - 2:05 pm

MINUTES:

The original research request was from 2014 and the purpose was to evaluate the performance of trapezoidal grooving – relative to the FAA standard square grooving – under wet conditions.

Original Research Request:
The original request was to create a test bed at ACY (using runway 4-22) and evaluate the breaking performance of both grooves.

- Evaluate trapezoidal groove performance when the grooves were new.
- Evaluate performance when the grooves were worn.

Limitations:

- Cost of construction: Runway 4-22 already had a different type of groove installed. The project would have required removing the grooves that were already there, installing the grooves needed for testing, and then removing the testing grooves and replacing it with the grooves that were originally there.
- Limited time window: ACY provided a closed window of 60 days for testing.
- Active runway: There were also safety concerns since it was also an active runway.
- Space and Length of runway: Allotted runways space did not meet the measurements required for testing.

The team had to identify a new test method to perform the research.

Current Research Approach:
ATR is working with Rutgers University to develop:

1) laboratory test platform, and
2) finite element-based computer modeling to look at braking performance.

An updated Research Request was provided in December 2021 reflecting the new approach. Research is in two phases:

- Phase 1 – will be completed by the end of March 2022.
    - Developed a Tire-Water-Pavement Interaction Model.
    - Calibrated a tire for the model and tested it at various speeds to identify hydroplaning situations for new and worn tires.

    - Predicted hydroplaning speed after touchdown.
    - For the small-scale laboratory test platform, selected a circular track design with a motor and a loaded tire.
    - The track system allows for testing various groove designs and includes a camera which tracks the water disbursement. Supply chain issues caused delay in parts related to the motor working safely in the test platform.
- Phase 2 – will run for 18 months after the completion of Phase 1.

Mr. Torres reviewed the project next steps which include simulating model tire braking using the lab test platform.

Discussion
Gary Mitchell commented: Trapezoidal grooves are already being put into application and it seems to be equivalent or better than regular grooves, so the research might get left behind.

John Dermody: The research is still necessary because it is used to develop the standards.

Meeting Chat:
From Navneet Garg to Everyone 01:59 PM
Singapore Changi Airport did trapezoidal grooves.

Degraded Braking Friction

Presenter: Michel Hovan (presenting in lieu of Somil Shah)

Start Time: 2:05 pm - 2:30 pm

MINUTES:

The impetus for this research was the 2005 Southwest 737 Midway accident. The National Transportation Safety Board (NTSB) recommended developing procedures to ensure airplane braking. 2011 – 2016 saw a focus on full-scale testing using the 727 test aircraft at ACY. This testing was limited by the speed of the test aircraft and the weather.

A technical working group was formed in 2017 which advised focusing on machine learning (ML) and big data. Takeoff and Landing Performance Assessment (TALPA) is used but it is qualitative. Gap is measured friction information – moving from qualitative vs. quantitative assessment. New approach to use existing data available.

Coordination with MIT and Georgia Tech

- MIT research used AST data with over 8,000 “friction-limited” data points to create a model. Identified that relative humidity was very critical to degraded braking. The model predicts “friction limited” zones based on relative humidity and temperature. Model can be used to influence runway maintenance needs.
- Georgia Tech took data from aircraft manufacturers – over 11,000 data points.

We need a reliable method to measure degraded breaking friction.

- Focus on ground truthing of the models using runway sensors.
- Partner with sister organization using aircraft from Netherlands and perform full scale testing.

RESILIENCE & ADDRESSING CLIMATE CHANGE

Embodied Carbon

Presenter: Dr. Navneet Garg

Start Time: 2:50 pm - 3:10 pm

MINUTES:

Navneet Garg discussed the strategies taken from the document *Destination2025*. Strategies included:

- Improve scientific knowledge of environmental impacts
- Develop effective decision support tools
- Foster research and development
- Develop sustainable airport facilities

Updates from the last REDAC: Three publications released about embodied carbon:

- Memo: OST's Embodied Carbon Working Group developed an action memo to the Secretary of Transportation on embodied carbon. Drafting of the memo began in 2021 and the memo was submitted on 2/28/2022 to S1 by the Deputy Assistant Secretary for Climate Change Policy, DOT. The memo will be sent to the Administrators of different organizations under DOT.
- Press Release: There was recently a White House press release from the White House Council on Environmental Quality. Advises that all agencies should consider consolidating and publishing a repository for key environmental data, building on the existing collaboration through the Federal LCS Commons.
- Environment and Energy Daily Report: Published comments encouraging the administration to buy low carbon asphalt, and to introduce incentive programs for buying low-carbon materials.

Project Focus and Test Results:
The Tech Center is generating performance data for recycled/sustainable materials under aircraft loading. They are determining what kind of properties these materials need to have to go on airport pavements.

- Completed High Temperature Rutting Tests (results shared during last REDAC).
- Fatigue tests are in progress to look at long term cracking potential. Currently following a protocol for conducting aging the pavement for the fatigue tests, which takes about 14 days. They have currently aged all six test lanes.
- A paper summarizing all the test results will be issued fairly soon.

Structural Models:
They also need a Structural Model for the material properties.

- The selection of materials is one step in reducing embodied carbon
- The other step is properly designing your pavement structures. Currently, they are in the process of designing performance-specific specifications.

The first version of this software – PANDA-AP – was delivered recently. Will use if for performance predication and compare it to the pavement test results.

Life Cycle Assessment:

- LCCA: calculates cost over life cycle.
- LCA: calculates environmental impacts, energy use, and finites resource depletion over life cycle. The goal is to tailor this to airport pavements needs. They will develop a simple interface with Federal Commons Portal.
- The University of Davis is creating a web based LCA tool tailored to airport pavement needs. They will focus on FAA first and then plan to shift to Federal Highways Administration (FHWA).

Other Initiatives:
Dr. Garg shared that they are collaborating with French researchers on Reclaimed Asphalt Pavement (RAP) in HMA Mixes and bio binders. ATR will be getting samples of Biophalt (BP) (made from pine sap) to test in the ATR facilities.

Discussion
Q: Gary Mitchell: Is there any thought to look at some of the issues pertaining to embodied carbon on rigid pavements?
A: Dr. Garg: Yes, it's already included in their 10-year research plan and he's happy to discuss further.

Q: Mr. Mitchell: This work is focused on flexible pavement – will there be data regarding rigid pavement?
A: Dr. Garg: We will be looking at concrete and he has been chatting with Jim Mack.
Frank Fee commented to emphasize the need to test the performance in the field.

Airport Environmental Projects & Airport Noise Research Update

(The two sessions were combined and presented on Day 2)

Presenter: Lauren Vitagliano

Start Time: 9:20 am

MINUTES:

Two environmental projects were discussed:

1. Research on Runway Length
   - Two reports published and prototype tool created.
   - Anticipate asking for industry testing this spring or late summer.

2. Resilience at vulnerable airports
   - Developing prioritized, risk-based recommendations to address climate change and severe weather.

Results will be frameworks to guide: (1) airports on how to conduct resiliency assessments (ARAF), and (2) the FAA on how to identify airports at risk and influence the AIP funding.

- Project is five years total.
- Will be performing case studies and outreach.

- Met with the FAA Alaskan Region and may work with SFO.

Three active noise projects:

1. Innovative Methods for Noise Level Reduction Measurement: Looking at the feasibility of two methods (a) using a UAS-based loudspeaker for noise level reduction measurement, and (b) indoor-outdoor (I-O) method for measurement. Developing a software tool to perform measurement. Preliminary findings show that the I-O is simple and requires less data collection. Performing UAS testing in Thompson, TX.
2. Noise Abatement Charting: Pilots need better guidance for compliance with the noise program. Intended outcome is one chart supplement for Noise. Best practices guidance document is in process and will need Industry review. Include in the AC for Part 150.
3. Sleep Study: Quantify the impact of aircraft noise on sleep. Recruiting 400 subjects around 77 airport communities with runway ends that experience the nighttime operations of interest. In September, sent a recruitment survey. Currently, almost 100 subjects enrolled and 40 under enrollment. On track with enrollment and analysis will begin soon.

Three noise projects under consideration:

1. Standardization of Noise Abatement Aircraft Operations: Inconsistent results across the country. Outcome will be standard analysis method to be included in Part 150 policies and procedures.
2. Best practices on communicating Noise to the Public.
3. FAA Influence on Local Land-Use Decision: Via Part 150.

Discussion

Q: Chris Oswald: For the prioritization, in the near term as we look at BIL, resiliency provisions are called out explicitly. How will the priorities be addressed without a clear category? Will there be interim guidance?
A: John Dermody: APP is looking at that.

Q: Mr. Oswald: Any way to expedite the research because of the driver from BIL?
A: Mr. Dermody: They will explore it.

Scott Marsh commented that some of these projects are challenged because of the climate.

Mr. Oswald commented that as the Office of Next Generation creates their roadmap, he expects that Performance Based Navigation (PBN), in coordination with ATC and Part 150, will influence noise mitigation. This is a multi-Line of Business issue. Need to align noise abatement with fly-ability.

Mr. Marsh requested that for Noise Abatement Charting, please include Air Traffic Operations (ATO) staff. Currently experiencing issues getting abatement procedures implemented because of lack of ATC input.

EVALUATION OF SOLAR LIGHTING

Presenter: Ryan King (presenting in lieu of Darian Byrd)

Start Time: 2:33 pm – 2:49 pm

MINUTES:

Ryan King outlined the many benefits of solar lighting, one of the most important being that it gives general aviation (GA) airports that wouldn't otherwise have lighting the opportunity to install the stand alone solar powered lights, instead of the hard-wired infrastructure.

Of course, there are also numerous environmental benefits, and it provides an extra level of safety without requiring fuel. It provides improvements to the airport ecosystem without the cost of a higher carbon footprint.

Background:
ATR is evaluating:

- Suitability and reliability of solar powered lighting systems
- Compliance with safety standards
- Mitigation strategies and optimum siting requirements

Research Request: Evaluate solar lighting systems at five GA airports in diverse geographic regions based on varies solar insolation, ambient temperature range, and snow fall.

Methodology:

1. Select geographic regions
2. Conduct site surveys
3. Select sites
4. Conduct evaluations over a sufficient period of time to allow for seasonal assessment

Research Objectives:

3. Determine compliance with FAA photometrics and reserve battery requirements
4. Assess functionality and durability in various environmental conditions, and outside controlled lab conditions
5. Compare installation and operating costs of decentralized solar airfield devices, and conventionally-powered versions of these devices.

Mr. King provided an overview of the types of components being evaluated. They have acquired components from two different manufacturers – Carmanah and AvLite – for assessment. The components are decentralized, so each fixture has its own solar panel and battery.

Test Sites:
Current sites: Cape May data collection started in February 2021 and it's the prototype location. At the end of last fiscal year, they replicated the test array used in Cape May and installed it at Penn Yan in upstate New York.

Upcoming sites:

- The next step is the test in Arizona (PHX) – a location with lots of solar insolents and hot, dry temperatures.

- Following that, the next location will be in Washington State to test the cloudy, wet environment of the Pacific Northwest.
- The final location is Oklahoma City.
- The PHX and Washington State test are currently being planned and equipment is being procured. The supply chain lag has impacted getting the equipment, so the project team has been proactive about sourcing.

Data Analysis:

- The raw data from the field tests will be combined with temperature sensor, pyranometer, and weather-related data.
- It's expected that the available watt hours of energy available will influence the performance of the devices.
- Final reports will include:
    - Description of each solar-powered lighting device
    - Details for each site location
    - Impacts to the airport
    - Conclusions and recommendations derived from results
    - Cost comparison

Mr. King displayed various images of the testing sites and components being assessed.

TRANSFORMATION OF OUR NATION'S TRANSPORTATION INFRASTRUCTURE

Airport Pavement Technology Program Updates

Presenter: Jeff Gagnon

Start Time: 3:30 pm – 3:40 pm

MINUTES:

Airport Pavement R&D awarded three contracts:

- Two to ARA
- One to GDIT

Seven research areas:

1. In-service pavement roughness
2. Stabilized base requirements
3. Use of state highway specifications
4. Unbound materials
5. Surface treatments
6. Seasonal frost and permafrost
7. P401-403-404 Mix Design

Section 744 Update – Airport Concrete Pavement Technology (ACPT) Program

Presenter: Gary Mitchell

Start Time: 3:40 pm – 3:55 pm

MINUTES:

Gary Mitchell provided a status report for the Airport Concrete Pavement Technology Program (ACPTP). The program seeks to identify pavement issues and problems that could be eligible for funding through ACPTP. They coordinate with FAA and industry.

The role of the Program Coordination Group (PCG) includes: recommend priorities for the research projects, review program findings and make recommendations, and direct course corrections.

PCG members include aviation association, commercial industries, military, and other government organizations.

Program interest: There has been a lot of interest in the program – 5 to 10 submittals on each project with 62 different entities submitting.

Ongoing Activities:

- Alkali silica reaction prevention: 10 proposals received – Contract being prepared with Oregon State University
- Mixture proportioning tools: 9 proposals received – Contract being prepared with Oklahoma State University
- Rapid repair protocols: 6 proposals received – Contract being prepared with Applied Research Associates

Planned Activities:

- Quality acceptance manual
- Rubber removal best practices
- Start Stop practices of Slip-Form Pavers

Website: https://cptechcenter.org/airport-pavements/acptp/

Meeting Chat:
From Navneet Garg to Everyone 03:48 PM
Members of ASCE want to bid on projects and that is the reason they are staying away from the two programs. I am representing ASCE in AAPTP.

Section 744 Update – Airport Asphalt Pavement Technology (AAPT) Program

Presenter: Brett Williams, NAPA (National Asphalt Pavement Association)

Start Time: 3:55 pm – 4:10 pm

MINUTES:

Brett Williams provided an overview of the Airport Asphalt Pavement Technology (AAPT) Program, which seeks to identify airport pavement issues and problems that could be eligible for funding.

- Coordinate FAA and industry efforts to implement technologies and to solve problems identified through the program as important to FAA and industry
- Pursue the technology transfer of new solutions, practices, and recommendations as needed

Mr. Williams provided an information overview for each of the current projects:

- Asphalt Mixture Paving Handbook – 2022 revision
- Guidance on Binder Grade Selection
- Balanced Mix Design: Rutting
- Balanced Mix Design: Cracking
- Mitigation of Delamination and Plastic Flow at Airports
- Improving Performance of Longitudinal Joints in Airfield Asphalt Pavements
- Feasibility of Cold-Central Plant Recycling at Airports

Upcoming projects:

- Use of Recycled Materials in Asphalt Mixes
- Superpave Gyration Levels vs. Marshall
- Project Quality Control Reporting
- Asphalt Mixture Gradation Bands
- Resilient Asphalt Pavements (Mixtures and Structures)

Website: https://www.asphaltpavement.org/expertise/engineering/airports

Autonomous Vehicles At Airports, New efforts

Presenter: Dr. Michel Hovan and Murphy Flynn

Start Time: 4:45 pm – 5:15 pm

MINUTES:

Dr. Michel Hovan began by discussing the ubiquitous nature of Autonomous Vehicles on Airports. These vehicles are being used more frequently across industries and it is important to help shape the narrative and implementation at airports.
The U.S. Air Force (USAF) approached FAA about all things autonomous from the wing down. They identified projects of mutual interest: CCC Architecture, FOD detection/retrieval, lawnmowers, and perimeter patrol.

Recently the Defense Innovation Unit (DIU) joined the conversation. Dr. Hovan mentioned the FOD mitigation

project which is being tested in Yuma, AZ, and also shared that lawnmowers are currently being used at cemeteries and golf courses.

The USAF is the ultimate end-user and purchaser. They can accept more risk than commercial operations. For FAA, the risk level is higher. FAA can provide subject matter expertise and help industry make a commercially viable product. FAA can also offer the ACY to help with testing.

Technical challenges:

1. Building awareness of new technologies that FAA may want to adopt
2. Integrating with a 5G
3. Building confidence of AI

Next steps: FAA will continue working with USAF and DIU. No formal agreement with Air Mobility Command (AMC).

Discussion
Q: Scott Marsh: Where is Aeromax? Is it still on our radar?
A: Chris Oswald: Shared that they are in a multi-year discussion with the Federal Communications Commission (FCC). Need final FCC action on spectrum allocation and licenses. Valuable technology. Need organization like the Radio Technical Commission for Aeronautics (RTCA) to weigh in on the concept of operation.

Mr. Oswald: Track the ACRP work on autonomous vehicles and discuss with Sarah. Also good to check in with Marci Greenberger or Matt Griffith to confirm that the lines of pursuit are not overlapping. Reasons to involve folks outside of the immediate ecosystem. Number of players to bring to the table. Perhaps a small ad-hoc group of industry experts to level set some of the issues. Use opportunities and a lot of issues to address. DoD is focused on this, but they don't have funding yet. Kickstarting it with vendors but funding will come in FY23. Recently used the BAA to investigate/explore; could send a BAA and solicit white papers about what should be developed.

Mr. Oswald said there is a need for a broader discussion about autonomous vehicles beyond the subcommittee. How do we fit these into the portfolio? What are the common standards needed?

Murphy Flynn mentioned a test with Boeing at the Tech Center on Intelligent Taxi using automated communications.

Smart Airports, The future

Presenter: Chris Oswald

Start Time: 11:05 am – 11:25 am

MINUTES:

The topic of Smart Airports will be covered in further detail during the Fall REDAC sessions. This discussion was an open forum hosted by Chris Oswald.

Mr. Oswald shared that new smart concepts are more focused on using ML/AI implementation to improve

performance and reliability for terminal systems. How do we address this new area based on BIL? BIL creates significant expansion of FAA in grant programs which might result in new standards and new research from terminal buildings. Dedicated exercise for the next five years.

Michel Hovan shared that Smart means some level of intelligence – monitoring data to use it to make decisions – more sensor, more analysis. ATR is more focused on the air side versus terminal/ land side – a SMART airport fits under various research areas – Safety, Pavement, Resiliency, Transformation, etc.

Mr. Oswald stated that if we explore this as a project, there needs to be a definition of FAA's role in the concept of SMART airports (advanced sensors, advanced automation). How will this affect airport technology research's focus? Similar to Collaborative Decision-Making framework on the ATC side. What is the federal interest here?

Smart Airports have been discussed in the past at REDAC. The idea was raised to create a recommendation for the Subcommittee to work with the FAA on defining ATR'S involvement in this area:

- Work to define the research roadmap.
- SMART airports are embedded in the multi-modal BIL under transformation.
- Mr. Oswald would like to make a formal recommendation to identify how ATR research should focus in this area.
- Mr. Dermody said it is very broad and not well-defined. DOT has a keen interest in this area.
- Mr. Oswald asked is it worth getting the subcommittee's ideas on how to define SMART versus using a "buzzword."
- Dr. Hovan agreed it would be good define the way SMART airports relates to ATR research. This will provide a baseline and a good next step.
- Idea posed: asking a contractor to produce a 20-page report.

Mr. Dermody said we've been focused on the airfield. But there is now a gap – what are we doing on the land side and the terminal side in terms of equitable access and sustainable. What are areas that we're missing?

Shailesh Gongal shared that Massport collects a lot of data, but how do they make it actionable? And how do they monetize this data? In his mind, SMART comes from having good data that's actionable and quickly available, and also predictive.

Mr. Oswald mentioned that a "digital twin" could give you forecasting related to maintenance. He suspects that FAA will have an increased investment related to managing airports.

Mr. Dermody mentioned that FAA has initiatives in place to look at data management and analysis. What are the gaps that ATR needs to fill in with our research?

Dr. Hovan mentioned the MIT graph related to braking friction as an example of using data in the SMART framework.

Al Pollard shared an ad-hoc definition of a SMART airport that optimizes technology to improve efficiency, safety, security, and the customer experience.

Adam Bouchard shared that there is a lot of usable data that we don't have access to. Their CEO notes they are not optimizing systems.

Meeting Chat:

From Al Pollard - Martin State Airport to Everyone 11:33 AM
SMART AIRPORT – AN AIRPORT THAT OPTIMIZES TECHNOLOGY TO IMPROVE EFFICIENCY, SAFETY, SECURITY, AND THE CUSTOMER EXPERIENCE.

From John Dermody to Everyone 11:34 AM
I would also add "sustainability" and "real-time decision making"

EQUITABLE ECONOMIC STRENGTH & IMPROVING CORE ASSETS

Airport Pavement Design Update – FAA Rigid And Flexible Iterative Elastic Layered Design (Faarfield)

Presenter: Dr. David Brill

Start Time: 9:52 am – 10:25 am

MINUTES:

FAARFIELD 2.0 was released by the FAA in June 2021. It is an entirely updated version of the software for airport thickness and evaluation. FAARFIELD 2.0 supports two Advisory Circulars:

- AC 150/5320-6G – Airport Pavement Design and Evaluation
- AC 150/5335-5D – Standardized Method of Reporting Airport Pavement Strength – PCR

2.0 is the end product of much of the Pavement Test Facility research and development efforts and includes numerous new features and improvements from the previous version (FAARFIELD 1.4).

Program Milestones: The initial storyboard for FAARFIELD began in 2016, and FAARFIELD 1.4 was released in 2017. In 2018, the project plan for FAARFIELD 2.0 was developed, with a Beta Release in 2020.
June 2021 was the big rollout of AC 150/5320-6G and FAARFIELD 2.0

Upcoming Key Dates: AC 150/5335-5D is expected in Spring 2022. It's still in the FAA approval process.

FAARFIELD 2.0 Deep-dive:
Key updates from FAARFIELD version 1.4:

- Modern Graphical User Interface (GUI), which is like what you're used to using in a typical Windows program
- Supports the new ICAO ACR-PCR system
- User-defined Aircraft (UDA) editor
- No change to thickness design requirements in this version

Dr. Brill provided an orientation to FAARFIELD 2.0 organization. The key elements are more or less the same as what has been used for FAARFIELD design for a long time. The only part that is new under Outputs is the PCR. Another new feature is the FAARFIELD Libraries FAASR 3D and ICAO-ACR.

- FAASR3D is the FAA Structural Analysis in 3D.
- The Aircraft Library has been completely updated for FAARFIELD 2.0.

ACR-PCR:

- ACR-PCR is now an official standard. The ICAO Air Navigation Committee (ANC) approved an

amendment to Annex 14 on ACR-PCR in 2020.
- AC 150-5335-5D, which is in final coordination with the FAA, will establish the procedures by which airports will be reporting ACR-PCR, instead of ACN-PCN.

Dr. Brill also reviewed the benefits of FAARFIELD 2.0 for PCR reporting.

Next Steps:
- Integration and data sharing with FAA PAVEAIR via web API
- Additional internet report
- New machine learning (ML) based models for concrete pavement top-down cracking and reflection cracking (asphalt overlays)
- Improved remaining life prediction using PANDO-AP (advanced modeling library)

Discussion
Q: Evanicio Costa: Does the FAA have a plan to roll out the ACR conversion to PCR?
A: Mr. Dermody: Yes, and that ties into what David was describing about why the AC is not out yet. FAA is in the process of completing the roll-out plan. There will be something coming out shortly.

Gary Mitchell commented on the lack of experience in young engineers on how to use this program.

NAPTF and NAPMRC On-Going Projects

Presenter: Jeff Gagnon

Start Time: 10:35 am – 11:00 am

MINUTES:

Construction Cycles – Overview and Objectives
- CC8 – Concrete: Objective is to 1) test PCC overlay, 2) evaluate joint performance, and 3) improve FAARFIELD failure model.
- CC9 – Asphalt: The goal is to measure the effect of geosynthetics. Mr. Gagnon provided a recap of testing start-stop dates from 2021 to present.
- CC10 Concrete: Semi-Accelerated Full Scale Rigid Pavement to test extended pavement life
- CC11 – Asphalt: Evaluate the performance of various materials.

NAPMRC - Two Test Cycles
- Test Cycle 2: French Ovalization Device: Objective is to develop a device to measure the radial strain on existing pavements
- Test Cycle 3: Objectives are RAP in HMA, green technologies, with AAPTP “in-place” recycling, and fibers in HMA

Mr. Gagnon discussed the increase in the cost of pavement materials. Shared cement price index history and asphalt paving mixture price index history showing how it has increased in 2022.

Discussion
Al Pollard commented that the cost increases are very uncertain.

Michel Hovan commented that under the AIP program, ATR's allocations are for one-year obligations. In ATR, we are severely constrained that they receive allocations for the year and need to obligate them within a year.

Chris Oswald: The subcommittee will share the concern around costs with the full REDAC.

Dr. Hovan: Perhaps we can build in an "escalation" clause. Need to discuss with FAA contracts group.

Mr. Oswald: There are limitations on how contingencies can be used. This is a broadly based issue that is beyond the subcommittee. But the subcommittee can identify it as a "threat" and recommend modifications to work scope / focus.

Findings/Recommendations
For the inflationary concerns, Mr. Oswald asked for the wisdom of recommending that ATR perform a worst-case scenario to create a contingency plan to address inflation. Dr. Hovan said it will be good to have recognition about delays.

Mr. Oswald will identify a dedicated observation that the cost escalation for both labor and materials will affect project schedule and scope.

Pavement Laboratory Construction Update

Presenter: Murphy Flynn

Time: 4:13 pm - 4:37 pm

MINUTES:

The new pavement lab has been a topic of discussion for several years now. ATR was looking to increase their laboratory capacity and improve lab capabilities. The current lab does not have asphalt binder testing capability. The new lab has been designed specifically to meet that need, and with that comes some design challenges. The new lab is going to be a premier materials laboratory.

Current lab vs. New lab:

- The current pavement lab is 5,700 square feet. The new lab will double in size to 11,000 square feet.
- The new lab will have a specialized HVAC system
    - The specialized HVAC system is needed to run Binder tests because the fumes cannot be allowed to circulate through the rest of the building.
    - The HVAC requirements have posed design challenges and increased the cost. Mid-design of the project, the OSHA regulations changed creating additional cost that were not part of the original cost estimates.

Murphy Flynn displayed a floorplan of the proposed new laboratory.

Key Project Dates:
Mr. Flynn provided an overview of key project dates, including explanations for when and why project costs

increased along the way.

- 2016: Completed the construction of the research taxiway at Cape May Airport. There was approximately $2 million leftover from the project. That money would have been lost, so they worked with their Contracts Department to have the funds reallocated to another project.
- 2018: Officially tasked with designing the lab. A few months into the project, work was delayed due to conflict with the Contracts Office. There was significant change in management throughout the Contracts Branch and they disagreed with the previous actions to modify the Agreements.
- 2018-2019: Long government furlough

Design cost estimates continued to increase from 2019 to present day. As of December 2021, the new design cost estimate is $11.5 million. As of *today*, the design cost estimate has reached $12.3 million.

Next steps:
Meeting scheduled with FAA Headquarters in the near future to discuss how to approach this. If they decide to move the project forward, a new business case will need to be prepared. There is a very fundamental business case for a new lab and FAA would see payback in a number of years.

Should they move forward, ATR will need help with expanding the business case and submitting a CFO package by late Spring 2022. If not, this will be delayed into the next year.

Mr. Flynn provided an overview of the CFO submission process.

Discussion
Michel Hovan commented that time is running short on this project because they didn't plan for this budget cost. How do we keep pace with inflation? The cost keeps going up.

Q: Chris Oswald: Asked if there is utility on having the subcommittee to provide input on the lab construction update.
A: John Dermody: Yes

Gary Mitchell stated the inflation will not be temporary. He recommends adding a 25 percent contingency.

ENSURING INVESTMENTS MEET RACIAL EQUITY & ECONOMIC INCLUSION GOALS

Subcommittee Findings & Recommendations

Presenter: Chris Oswald

MINUTES:

Chris Oswald presented the two observations that have emerged during this REDAC.

1. Inflation and cost issues
2. Smart Airports

Mr. Oswald called for recommendations from today's presentations (Day 2). He mentioned that a point was raised during REDAC on the subject of Noise and coordinating with Air Traffic. He suggested that Scott March reach out to Lauren Vitagliano to connect on that topic.

Mr. Oswald recommendation for Air Traffic to be involved with Noise Abatement Charting and the Standardization of Noise Abatement aircraft operations. He also recommended coordinating with flight operators.

Mr. Oswald also circled back to the new Pavement Testing Laboratory to ask if there are any clear recommendations. No immediate recommendations were given.

Mr. Oswald called for any additional recommendations to be emailed to him.

Dates for Fall 2022 and Spring 2023 REDAC were confirmed.

- September 7-8, 2022 – held in person at the Technical Center in New Jersey pending COVID
- April 7-8, 2023

Meeting Chat:

From Jon Schleifer - FAA R&D Management to Everyone 11:45 AM
Subcommittee members, you may find interest in reading about and/or attending the Smart Airports and Regions Conference. They have meet domestically and internationally for about a decade.

From Jeff Sedin-ALPA to Everyone 12:06 PM
What is the date for the fall meeting? Thanks

REDAC Attendees

Day 1 – March 8, 2022: Over 50 attendees

Attendance was taken at the start and end of the day. People joined and left sessions throughout the day, so some attendees might not be reflected below.

Adam Bouchard
Al Pollard
Andrew Sousa
Brett Williams
Chinita Roundtree-Coleman
Chris Oswald
David Brill
Dominique Khan
Donald W Harper
Evanicio Costa
Frank Fee
Gary Mitchell
Halil Ceylan, ISU
Holly Cyrus
Jeff Sedin, ALPA
Jeffrey Gagnon
Jeremy Valcich, AAAE
Jim Mack, CEMEX
Jim Patterson
John Dermody
John McGrath
Jon Schleifer
Jonathan Torres
Justin Barkowski
Keith Bagot
Kent Thompson
Khalil Kodsi
Lara Van Nostrand
Lauren Vitagliano
Mark Allen
Matt Griffin
Matthew Brynick
Michel Hovan
Mike DiPilato
Mike Paglione
Mike Rottinghaus
Monique Moore
Murphy Flynn
Navneet Garg
Qingge Jia
Rachel Seibert
Richard Ji
Russ Gorman
Ryan King
Ryan Rutter
Scott Murrell
Sarah Hubbard
Scott Marsh
Shailesh Gongal
Shelley Yak
Steve Debban
Susan Kaelin
Todd Truitt
Tom Mize
Wesley Major
Wilfredo Villafane

Day 2 – March 9, 2022: Over 40 attendees

Attendance was taken at the start and end of the day. People joined and left sessions throughout the day, so some attendees might not be reflected below.

Brett Williams, NAPA
Chinita Roundtree-Coleman
Chris Oswald
David Brill
Donald W Harper
Evanicio Costa
Frank Fee
Gary Mitchell
Halil Ceylan, ISU
Jeff Sedin, ALPA
Jeffrey Gagnon
Jeremy Valcich, AAAE
Jim Patterson
John Dermody
Jon Schleifer
Jonathan Torres
Kent Thompson
Lauren Vitagliano
Matthew Brynick
Michel Hovan
Mike DiPilato
Monique Moore
Navneet Garg
Qingge Jia
Rachel Seibert
Ryan King
Ryan Rutter
Scott Murrell
Scott Marsh
Shailesh Gongal, Massport
Susan Kaelin
Todd Truitt
Wesley Major
Wilfredo Villafane

Appendix – Agenda

Agenda Day 1: March 8, 2022

Time	Session	Presenter
Introduction & Overview		
8:30 am	**1. Introduction**	Christopher Oswald ACI-NA, Subcommittee Chairperson
8:45 am	**2. Opening Remarks**	Shelley Yak
9:00 am	**3. HQ ARP Update**	John Dermody Director, FAA Airport Technology Research
9:15 am	**4. Airport Technology Program Update** ○ 10 Year Plans updates, Strategic Roadmap ○ Personnel Recruiting ○ Civil Aerospace Medical Institute (CAMI)/Technical Center Joint Efforts	Dr. Michel Hovan Manager, FAA Airport Technology Research
9:30 am	**5. Review of Outstanding REDAC Recommendations**	Subcommittee Members and FAA
10:00 am	**Break**	
10:15 am	**6. REDAC Membership/Subcommittee Representation**	Chris Oswald
10:45 am	**7. Airport Cooperative Research Program (ACRP) Update**	Matt Griffin Senior Program Officer, ACRP
Program Focus:	**Safety**	
11:00 am	**8. Overview of Safety Projects Underway - Wrong Surface Landing (WSL)**	Ryan King Acting Manager, Airport Safety Research Section
	9. Alternative Aircraft Fire-Fighting Agent Research Update	Keith Bagot
	10. Emerging Entrant Update	Jonathan Torres
12:00 pm	**Lunch Break**	
12:30 pm	**11. Completed Evaluations of UAS Applications**	Jim Patterson & Mike DiPilato
	12. Trapezoidal Grooves Update	Jonathan Torres
	13. Degraded Braking Friction Research Update	Dr. Michel Hovan & Somil Shah
Program Focus:	**Resilience & Addressing Climate Change**	
1:30 pm	**14. Embodied Carbon – Environmentally Friendly Pavements**	Dr. Navneet Garg
	15. Airport Environmental Projects	Lauren Vitagliano

Time	Session	Presenter
Introduction & Overview		
	16. Evaluation of Solar Lighting Systems for Airports	Darian Byrd
3:00 pm	**Break**	
Program Focus:	**Transformation of Our Nation's Transportation Infrastructure**	
3:15 pm	**17. Roundtable presentation:**	
	○ Airport Pavement Technology Program Updates	Jeff Gagnon Manager, Airport Pavement Research Section
	○ Section 744 Update – Advance Concrete Technology Program (ACPT) Program	Gary Mitchell Chief of Engineering & Construction, American Concrete Pavement Association
	○ Section 744 Update – Advanced Asphalt Pavement Technology (AAPT) Program	Brett Williams Director, Engineering & Technical Support, National Asphalt Pavement Association
	○ Autonomous Vehicles at Airports, New efforts	Dr. Michel Hovan & Murphy Flynn
	○ Smart Airports, the future	All – Chris Oswald
4:45 pm	**Adjourn**	

Agenda Day 2: March 9, 2022

Time	Session	Presenter
Program Focus:	**Equitable Economic Strength & Improving Core Assets**	
8:30 am	**1. Airport Pavement Design Update - FAA Rigid and Flexible Iterative Elastic Layered Design (FAARFIELD)**	Dr. David Brill
	2. National Airport Pavement Test Facility (NAPTF) & National Airport Pavement and Materials Research Center (NAPMRC) Ongoing Projects	Jeff Gagnon
	3. Pavement Laboratory Construction Update	Murphy Flynn
Program Focus:	**Ensuring Investments Meet Racial Equity & Economic Inclusion Goals**	
9:45 am	**4. Airport Noise Research Update**	Lauren Vitagliano
10:15 am	**Break**	

Time	Session	Presenter
Program Focus:	**Equitable Economic Strength & Improving Core Assets**	
10:45 am	**5. Subcommittee Findings & Recommendations**	Subcommittee Members
12:00 pm	**Adjourn**	