Subcommittee on Environment and Energy | MINUTES

Meeting date & time *August 1-2, 2017*
Meeting location *A4A, Washington D.C.*

Purpose	FY20 E&E Portfolio Guidance
Facilitator	Jim Hileman, DFO
Note taker	Jim Hileman
Timekeeper	Jim Hileman

Minutes from Meeting

Presentation Chair Opening Statements | **Presenter** *Ian Redhead*

Ian Redhead introduced himself as the new E&E Subcommittee Chair and then welcomed everyone and established the meeting logistics. Everyone introduced themselves.

Presentation R&D Budget Status | **Presenter** *Mike Gallivan*

Mike Gallivan presented the FY17 budget details. The full appropriation was signed on May 5, 2017.

The FY18 RE&D request was $150M. The House Appropriation Committee and Senate Appropriation Committee funded RE&D in FY18 at $170M and $179M, respectively. Mike walked through the RE&D language that was provided in the House and Senate Appropriation Committee reports. At present, there is not an overall FY18 funding agreement. Without a legislative agreement, sequestration caps would kick in.

The FY19 RE&D target is $150M. The FY19 FAA budget was delivered to OST in June, 2017. The FY19 budget will be submitted to OMB in mid-September and then to Congress in February 2018. The RE&D out year targets for FY20-FY23 that were established in January 2017 are $150M.

The current authorization was approved by Congress on July 14, 2016 and signed by the President on July 15, 2016 which extends authorization through September 30, 2017. We are awaiting congressional action.

The Subcommittee discussed the funding levels. There were questions about how the funding levels were set and Mike clarified that the overall numbers are set by OMB.

Presentation Responses to REDAC Recommendations & Actions | **Presenter** *Jim Hileman*

Jim Hileman walked through the existing findings and recommendations from the last meeting. All of the recommendations were left open. He also walked through the action items from previous meetings.

There was a discussion around R&D on water issues. One Subcommittee member suggested that a briefing from the Office of Airports on their water R&D efforts could be useful for the Subcommittee.

Open action items are listed below.

Action items (from previous meetings)	Person responsible	Deadline
Share ASCENT NFO with REDAC E&E Subcommittee (on an annual basis)	J. Hileman	Ongoing
Leverage "right-to-left" thinking in developing roadmaps wherein we start by thinking about the endpoint (goal) that is desired and decide how to get there	J. Hileman	Ongoing
Monetize the air quality and climate benefits of having an alternative jet fuel with reduced sulfur and naphthalene content	J. Hileman	August 2018
Leverage the road mapping efforts at NASA and FAA to update the White House National R&D Plan	J. Hileman	On hold until NARP revisions completed
The FAA should work with EPA to develop a strategy for addressing emissions certification promulgation gaps and share it with the Subcommittee at a future meeting.	R. Iovinelli	March 2018

Presentation What's New in FAA and AEE | **Presenter** *Curtis Holsclaw*

Curtis Holsclaw gave an update on what is happening in the FAA and AEE. Dan Elwell has joined the FAA as the Deputy Administrator who was formerly the lead of APL.

The Second CAEP Steering Group meeting is coming in September. The meeting will have a focus on the CORSIA SARP Package. The nvPM standard will also be discussed. The meeting will be preceded by a CORSIA Training Session that will take place on Saturday before the meeting starts.

AEE still have all of the vacancies that were open from the last time. We have been able to fill the vacant Senior Policy Advisor with an internal transfer. Eric Elmore has taken this position. We have also been able to fill the Special Assistant to the Chief Scientist as Mohan Gupta is on detail to DOE. Fabio Grandi has taken this position. We currently have 12 openings in AEE. The only openings that have been approved are considered to be safety critical.

AEE and others in FAA recently met with the Congressional Quiet Skies Caucus and briefed on the work that is being done on noise by FAA. While they were pleased with the work being done, we do expect them to continue to pressure the FAA to do more.

The Subcommittee asked about the EPA work on promulgating the CO2 standard. Curtis noted that the EPA work on the CO2 standard has either been stopped or it has been dramatically

slowed. One of the Subcommittee members stated that he would follow up with EPA on this as he is a member of the EPA Science Advisory Board and he had understood that the work was on track.

Curtis noted that the Stage 5 noise rule has been designated as being insignificant by OMB and that would enable FAA to move forward with the rule.

A Subcommittee member asked Curtis what his three primary concerns are. Curtis said that his primary concern is that we could lose more staff due to the increased workload that has resulted from the loss of 12 staff. He also noted that he is concerned about the international and domestic implementation of CORSIA as we need domestic authority. He is also concerned about the efforts to develop the PM standard. Noise continues to be a challenge and everything we are doing needs to be done much faster than is possible.

The Subcommittee chair noted that AEE needs technically competent people to deliver the research results.

Presentation E&E Research Update | **Presenter** *Jim Hileman*

Jim Hileman gave an overview of the Environment and Energy Research Portfolio to refresh the Subcommittee on the research program. This includes the goals for the program and the overall strategy. The presentation covered all areas of the E&E Portfolio. He provided additional details on areas that are not covered with detailed briefings.

There was considerable discussion on what was learned from AEDT training within the FAA. The Subcommittee suggested that the FAA should use opportunities like this to improve their training materials.

Jim provided an update on the ASCENT COE Program in terms of leadership changes, future meetings, and technical reports that are being published. He concluded with a discussion on the budget that included a breakout by year of how the funding has been used in the various research areas.

A Subcommittee member asked what would be reduced with the decreased funding from the FY18 President's budget. Jim provided the following list of items that would be affected.

- Work related to helicopter noise would be stopped.
- Progress will be slowed on Aviation Environmental Design Tool (AEDT) development to enable evaluation of NextGen procedures for post-implementation analysis and for evaluation of noise from non-standard operational procedures.
- Progress will be slowed in developing a supersonic aircraft noise standard.
- Progress will be slowed in developing a UAS noise certification scheme.
- The Continuous Lower Energy Emissions and Noise (CLEEN) Program to accelerate the maturation of aircraft and engine technologies would be reduced. Progress will be slowed on all of the technologies being funded by CLEEN thereby delaying their ultimate Entry into Service date.
- Alternative Jet Fuel (AJF) research and development budget of the FAA would be reduced. Progress will be slowed on efforts to streamline ASTM approval process for AJF within ASCENT via the National Jet Fuel Combustion Program (NJFCP). Progress will be slowed to quantify the economic, environmental and social benefits of AJF.

Presentation Industry Perspective | **Presenter** *Steve Alterman*

Steve Alterman called in to lead a short discussion that shared industry perspectives. He noted that things are currently chaotic as reauthorization in the House has been delayed. The current Administration has thus far not been as concerned about the environment as the previous Administration.

Presentation Noise Research – Research Update with Focus on Helicopters and Communication | **Presenter** *Rebecca Cointin*

Rebecca Cointin presented an overview of research that is ongoing within AEE on aviation noise. She started by outlining the challenge the FAA is facing in terms of commercial aircraft noise. She provided historical trends in noise reduction from the fleet and the population exposure to significant noise (i.e., DNL 65 dB).

She talked about the current noise challenge facing aviation. She noted that there is considerable interest from the public and Congress in the noise from today's commercial aircraft fleet. She also stated there is interest in accelerating the reintroduction of civil supersonic flight. She also talked about the expansion of the use of UAS and helicopter noise concerns.

A Subcommittee member asked about how long helicopters stay in the fleet and Becky noted that some have been flying for 40 to 50 years.

Rebecca went into considerable detail on what the FAA is doing to address the noise challenges facing aviation. She noted that FAA have completed the noise survey and is examining the related policy implications. FAA are also beginning a national sleep study and is continuing work to examine the impacts of aviation noise on cardiovascular health as well as children's learning. She gave considerable detail on the work that FAA have been doing on helicopter noise. She also provided information on what the FAA is doing to increase public understanding of noise and to improve community outreach.

The Subcommittee Chair suggested that there could be much learned by conducting sleep studies at the same airports that were examined by the community annoyance survey. This was accompanied by considerable discussion on the noise impacts work.

There was a discussion around communications and what FAA could be doing on this front.

There was a discussion about procedure design and whether or not it accounts for investments such as sound insulation.

Presentation Noise Mitigation Beyond 65 | **Presenter** *Sean Doyle*

Sean presented ongoing work that is examining strategies for alternative mitigation options for noise levels below DNL 65dB. This work will be useful should a future policy update result in lowered noise thresholds.

He noted that FAA is currently conducting a broad policy review process. The FAA is also evaluating the efficacy of existing noise mitigation programs and potential for alternative noise mitigation options. This work will provide concepts for mitigation at noise levels where existing mitigation techniques may not be as effective or appropriate. This includes a consideration of alternative mitigation options that are separate from standard physical treatments.

The Subcommittee had a discussion around why noise level reduction could vary as shown in the presentation. The FAA pointed out that the data showed 90% of homes in the area considered provided more than 20 dB of sound attenuation.

Sean spent considerable time talking through mitigation ideas that were developed by sound insulation program managers and airport operator representatives.

Presentation Departure and Arrival Concepts to Reduce Noise | **Presenter** *Joe DiPardo and Chris Dorbian*

Joe provided historical trends on aircraft noise exposure. This led to considerable discussion within the Subcommittee about what has changed with respect to noise over time.

He continued the briefing by showing how the various ongoing efforts are linked to work to develop a "Toolbox" of procedures and procedural changes that could mitigate noise. These efforts include the work of ASCENT Project 23, which is developing an enhanced NAS-wide air traffic evaluation framework. The focus is on assessing implications of proposed operational procedures on fuel burn, noise, and environmental justice without detriment to safety. The work ties to the FAA-Massport MOU, which is providing a case study to evaluate the feasibility of such a framework.

Joe also provided considerable detail on the analytical framework that has been created to evaluate the noise from operational procedure concepts that could reduce noise. He outlined that the research team is developing three types of concepts to mitigate aviation noise: changing the noise signature, moving noise away from people, and dispersing noise. Joe and Chris provided considerable detail on a number of operational concepts that are being evaluated.

A Subcommittee member asked how other airports could benefit from the work that has been done with Massport and MIT.

A Subcommittee member noted that the Massport work is super sexy stuff and everyone would like to be involved in this. He would like to know how this could be deployed on a larger scale.

The FAA noted that this project has had great support from across the FAA (e.g., ATO, AFS, ANG) and that has been a key to its success.

Presentation Supersonics & Sonic Boom R&D Needs | **Presenter** *Charles Etter*

Charles provided industry perspective on the R&D needs to support supersonic flight. He noted that the design for a U.S. led low-boom flight demonstration experimental aircraft is currently underway and funding for detailed design and fabrication is included in the FY18 US President's Budget request. He also highlighted that CAEP is actively engaged in developing sonic boom and supersonic LTO noise and emissions standards. He discussed recent industry announcements for prototype aircraft test programs and he noted that type certificate applications appear imminent.

Charles provided input on two potential recommendations for consideration by the Subcommittee. One was on sonic boom certification tools and the other was on operational analysis.

One of the Subcommittee members asked if sonic boom noise data would be needed for certification or if he was asking for certification by analysis. Charles clarified that noise data would indeed be needed for certification and that a tool is also needed to correct for atmospheric conditions.

Presentation Civil Supersonic Flight – Environmental Considerations | **Presenter** *Rebecca Cointin*

Rebecca presented a variety of information related to civil supersonic flight. She started by providing a short history of noise issues related to supersonic flight. She followed this with a summary of the current state of the industry and the considerable private industry interest in developing supersonic aircraft. She gave an update on the ongoing work within ICAO CAEP to develop noise and emissions standards for supersonic aircraft. She concluded with a summary of ongoing initiatives within NASA and FAA to support the evaluation of supersonic aircraft and their reintroduction into the fleet. This includes four projects that are currently ongoing within the ASCENT COE.

Presentation NASA Update| **Presenter** *Barb Esker*

Barb gave an update on NASA Aeronautics efforts. She started with an overview of the drivers and thrusts for the NASA work. She then provided the structure of the NASA Aeronautics Mission Directorate and the FY2018 budget request. This budget level is sufficient to support the low boom flight demonstrator as well as one subsonic demonstrator aircraft.

Barb provided details of the work NASA is doing to develop a low boom supersonic technology. This includes the work to create booms using an F-18 in a dive maneuver. She noted that while NASA has indeed exposed people near Edwards AFB to a variety of boom levels, this group of people is not necessarily representative of the public as they are used to sonic boom exposure. She noted that a demonstrator is needed to check the response to the low boom from unbiased communities.

She noted that the work at NASA, which is based on their design tools and that incorporates innovative concepts for integrated supersonic propulsion systems, indicates that new supersonic designs could yield noise levels of 10 EPNdB less than FAR 36 Stage 4 demonstrated in ground test.

Barb provided an update on work that is happening on subsonic aircraft and to develop hybrid electric aircraft concepts.

Presentation Update on Technology Assessment Efforts | **Presenter** *Laszlo Windhoffer*

Laszlo gave an overview of the work that is being done in ASCENT Projects 10 and 37 which are evaluating aircraft technology.

He provided the structure of the ASCENT Project 10 work and its use of non-proprietary workshops to gather data. He discussed some of the results that have been produced by the team including trends in domestic aviation demand, which includes international departures, and the

resulting fuel use and emissions. The final report for ASCENT Project 10 should be on the ASCENT website shortly.

Laszlo then provided the work that is planned in the second phase of Project 10 that will be focused on an evaluation of supersonic aircraft.

There was discussion on the supersonic work that is being planned and there was a desire from industry to provide input.

Laszlo finished with a short update on the work of ASCENT Project 37 and the aircraft and fleetwide performance evaluation of CLEEN-II technologies.

Presentation Questions for Day 2 | **Presenter** *Ian Redhead*

Ian reiterated the questions that Jim posed earlier in the day that are copied below and added a fourth question below here.

- Are there R&D areas within the E&E Portfolio that should be lower / higher priority?
- Are there R&D areas that AEE is not examining that should be added to the E&E Portfolio?
- What do you see coming on the horizon regarding E&E that may require future R&D efforts?
- Are there other things that the Subcommittee would like to consider as recommendations?

End of Day 1

Presentation Particulate Matter – Measurement and Modeling | **Presenter** *Daniel Jacob*

Daniel Jacob provided an overview of how PM is formed and the importance of using both measurements and modeling. He then followed with a presentation on the work that has been ongoing with PM measurements of mass and number at the engine exit plane.

There was considerable discussion on the ongoing work with PM measurements and what has been learned thus far and what remains to be determined.

He continued his briefing to discuss the monitoring work that is being done within ASCENT Project 18 as well as the modeling work of ASCENT Projects 19 and 20. This led to a long discussion on the importance of background ammonia concentrations to aviation PM emissions.

Daniel finished his briefing with a discussion on the emissions from new entrants such as UAS and commercial space vehicles. The Subcommittee also had substantial discussion around the use of alternative jet fuels and how their use could reduce PM emissions from aviation.

Presentation Air Quality - Handbook, Screening Tool, and Presume to Conform | **Presenter** *Ralph Iovinelli*

Ralph Iovinelli gave a short briefing to respond to an open action item that provided details on what is needed for NEPA air quality analyses. This included a flowchart that provides clarity on

what is required in FAA Order 1050F on the Clean Air Act and NEPA Air Quality Analysis. There were questions from one Subcommittee member to seek clarification on aspects of the effort.

Presentation Alternative Jet Fuels Testing Efforts | **Presenter** *Cecilia Shaw and Levent Ileri*

Cecilia Shaw presented on the ongoing efforts in AEE relating to testing of alternative jet fuels. The briefing was focused on testing efforts that are related to fuel certification.

She provided an overview of the ASTM International process to approve alternative jet fuels. The briefing included details on what CLEEN and ASCENT to support the approval process. This included the UDRI Clearinghouse Concept to facilitate fuel approvals as well as a new process that is being developed to facilitate rapid approvals of alternative jet fuels at relatively dilute blends.

Cecilia and Levent Ileri gave a deep dive on the National Jet Fuel Combustion Program that is largely being done by the ASCENT COE. This included an overview of the program and its purpose, specific tests that have been done, plans for year 4, and OEM feedback on the overall program. Levent also provided an update on related work being done by the University of Sheffield.

Cecilia provided information on the new ASCENT project to develop a standardized two-dimensional gas chromatography testing method. She also provided information on the ASCENT alternative jet fuel test data library. She concluded the briefing with information on where industry stands with regards to alternative jet fuel production.

Priorities Discussion | Lead *Ian Redhead*

The Subcommittee Chair led a discussion on the questions that were laid out at the end of the first day.

Discussion surrounding Question#1 on priorities.

The FAA clarified that ICAO CAEP is currently working on the PM standard and CORSIA and that supersonic standards are also actively ongoing, but with a longer time horizon. Other work within ICAO CAEP is speculative at this point. Based on a question, the FAA noted that they are short staffed to do all of the work that is being requested. The Subcommittee discussed having a recommendation on staffing as AEE may not have the people to complete the needed work of CAEP. A Subcommittee member noted that the U.S. will lose economic competitiveness unless the work of ICAO CAEP is done.

The Subcommittee discussed the current interests of the Administration (e.g., on supersonic aircraft), the need to think about environmental safety and health, and the need to get ahead of commercial space and the potential issues with their PM emissions.

Several Members of the Subcommittee expressed concern about the workload being overly large for the noise division and the noise division manager in particular. One Member expressed concerns about the focus of the noise division being on supersonic aircraft when we have such large concerns regarding subsonic aircraft noise. The FAA noted that there are unique aspects of

supersonic aircraft that require different thinking than is associated with subsonic aircraft. The FAA further noted that supersonic aircraft are a priority for a number of people in the Administrator and in Congress

The Subcommittee Chair returned to the discussion on priorities. A Member noted that CLEEN, alternative jet fuels, noise, and AEDT development need to be top priorities. Another Member noted that there is much opportunity in terms of noise, operations, and modeling as this will influence what the FAA can do. A third Member said that the funding and general priorities from the FAA briefings reflect what is needed.

Discussion on Question #2 and additions to the E&E Portfolio

The Subcommittee agreed that supersonic transport aircraft needs to be included in the portfolio. There was a discussion around hybrid-electric aircraft and their certification. The FAA responded that they are working with NASA to understand the noise implications of this technology. A Subcommittee Member noted that more studies are needed to understand noise from these aircraft types.

There was a discussion about UAS noise and the work that is ongoing within ASSURE. The FAA said that AEE and the UAS office are talking extensively about work that could be done by ASSURE to gather UAS noise, assist with setting up cert procedures, and developing guidance for making quieter UAS.

A Member noted that AEDT needs to be able to account for all new entrants, including but not limited to supersonic aircraft, UAS, hybrid electric vehicles, commercial space, etc.

Another member asked the FAA if there are there things that need to be flagged should something change from the current noise significance level. The FAA said that they did not know of anything from an R&D perspective that is a roadblock to changing policy, (e.g., AEDT can model a wide range of noise levels). The FAA noted that they are doing much to look at metrics and this includes an evaluation of DNL. If there is more work that needs to be done, then the FAA asked the Subcommittee Members to please let the FAA know such that they could do the work.

A Member asked about de-icing fluids and its impact on water quality. He noted that water is an important issue and he asked if there were opportunities to develop coatings to reduce or eliminate in-flight de-icing mechanisms. If there were such coatings, then there could be opportunities to reduce the weight of aircraft and make aircraft operations more efficient during winter operations. In response, the FAA offered to have the Office of Airports or Tech Center come and talk about deicing and what is being done on this front from an R&D perspective. The FAA noted that any work related to CLEEN would have to be included in the third phase of CLEEN as it is out of scope with the current phase of CLEEN. A Member noted that NASA have much work on this front including ice-phobic materials and the discussions have come up around rotorcraft as well. NASA offered a briefing on this should the Subcommittee want it. Another Member also noted that Boeing have also worked on this subject with the Eco-Demonstrator. A Member clarified that fuel savings could come from the use of ice-phobic materials by having a lighter aircraft, better aerodynamics, and less time spent during ground operations. The FAA noted that they currently have work in CLEEN on reducing the weight of aircraft and in ASCENT to reduce emissions from ground operations.

Discussion on Question #3 and what is coming over the horizon

The Subcommittee Chair noted that commercial space is on the horizon and the FAA should continue to have an awareness of what is happening such that they can be responsive. The Subcommittee then discussed potential work on commercial space.

A Subcommittee Member noted her appreciation for the work FAA is doing with Massport under the MOU. She said that she wants to see it transferred to actual operation.

Several Members expressed concern that the FAA is being spreading too thin with everything that is happening.

The Subcommittee Chair noted that data driven policy requires research. A Member said that the E&E Portfolio is a well-oiled machine that is very well balanced, but it has a growing portfolio. He also expressed concern for how AEE will handle this given the constraints it is facing. He further noted that there has been great progress on noise, but this a moving target. Another Member noted that FAA needs to be smart about how to handle its expanding workload, for example, it should not dedicate an FTE to every topic but instead should devote a part of their time that is appropriate to the task. There was much discussion around efforts in ICAO CAEP and the promulgation of the ICAO noise and CO2 standards. Several members noted that it would be good to know where the portfolio has been and what it has accomplished over time

The Subcommittee noted that there is good work ongoing on PM and that the portfolio and AEE should be commended on that subject. They noted that there is also good work going with analytical tools, operations, and modeling. As the MIT work with Massport is concluded, the subcommittee thinks it needs to be transferred to other airports. They would also like to reinforce that tools and results that are developed need to be shared with ATO. The Subcommittee noted that all of the work to support ICAO CAEP needs to continue and be supported. This includes PM, CORSIA and alternative fuels. As it is an integral component of the efforts of industry to handle the impacts of emissions, R&D efforts to support CORSIA need to continue.

The Subcommittee Chair thanked everyone for their participation, the staff who is doing good work, and he closed out the meeting.

Action items (from previous meetings)	**Person responsible**	**Deadline**
Create a list of major accomplishments that have made an economic difference. Demonstrate how E&E portfolio has been proactive and has enabled economic growth.	J. Hileman	March 2018
Provide a briefing at the next meeting on efforts relating to water	M. Hovan	March 2018
Reach out to Allen Robinson of Carnegie Mellon University (CMU) to learn more about the PM mapping work that they are doing using multiple sensors for EPA	D. Jacob	August 2018

Meeting Close-Out | Lead *Ian Redhead*

Ian agreed to develop findings and recommendations based on the discussions for further development by the group.

Subcommittee Discussion of Open Recommendations (Discuss status of FAA response and decide to close or remain open)

All of the recommendations from the March 2017 meeting were left open.

Next Meetings – Date/Location/Agenda Items to be Included

March 7-8, 2018 in Washington DC

September 11-12, 2018 in Washington DC

Adjourned at 3:00 pm on Wednesday, August 2, 2017

FAA REDAC Subcommittee on Environment & Energy
Summer 2017 Meeting Agenda
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Read Ahead Materials: https://redacdb.faa.gov/browse.cfm

Tuesday, August 01, 2017

Time	Duration	Title	Presenter
8:00	0:30	Check-In	
8:30	0:05	Welcome	
8:35	0:10	Chair opening statement & Introductions	I. Redhead
8:45	0:15	FAA Update (AEE and International Efforts)	C. Holsclaw
9:00	0:15	Budget Update	M. Gallivan
9:15	0:15	Responses to REDAC Recommendations & Actions	J. Hileman
9:30	0:15	Discussion	
9:45	0:15	Break	
10:00	0:45	AEE Research Update (including brief updates on CLEEN Program, Alt Fuels Analysis/Coordination, Tools/Analysis, and Airport Technology Research)	J. Hileman
10:45	0:15	Discussion	
11:00	0:30	Industry Perspective	S. Alterman (call-in)
11:30	0:30	Noise Research - Research Update with Focus on Helicopters and Communications	R. Cointin
12:00	1:00	Lunch	
13:00	0:30	Noise mitigation beyond 65	S. Doyle
13:30	0:45	Departure and Arrival Concepts to Reduce Noise	C. Dorbian / J. DiPardo
14:15	0:30	Discussion	
14:45	0:15	Break	
15:00	0:15	Gulfstream - Supersonics & Sonic Boom R&D Needs	C. Etter
15:15	0:30	R&D to support Supersonic Flight	R. Cointin / R. Iovinelli
15:45	0:30	NASA Update	B. Esker
16:15	0:30	Update on Technology Assessment Efforts	L. Windhoffer
16:45	0:15	Discussion	
17:00		End of Day-1	

Wednesday, August 02, 2017

8:00	0:30	Check-in	
8:30	0:45	Particulate Matter - Measurement and Modeling	D. Jacob
9:15	0:15	Discussion	
9:30	0:45	Alternative Jet Fuels Testing Efforts - NJFCP and ASTM Support	L. Ileri / C. Shaw
10:15	0:15	Discussion	
10:30	0:15	Break	
10:45	1:15	Priorities discussion	I. Redhead
12:00	0:45	Lunch	
12:45	1:15	Priorities discussion	I. Redhead
14:00	0:45	Identify topics for subcommittee report	
14:45	0:15	Summary of Action Items and Findings & Recommendations	I. Redhead
15:00		End of Day-2	

Attendance List:

First name	Last name	Affiliation	1-Aug	2-Aug
Juan	Alonso	Stanford U.	X	X
Steve	Alterman	CAA	X	
Gonca	Birkan	FAA	X	X
Jimmy	Bruno	FAA	X	X
Becky	Cointin	FAA	X	X
Joe	DiPardo	FAA	X	
Chris	Dorbian	FAA	X	X
Sean	Doyle	FAA	X	X
Barbara	Esker	NASA	X	X
Charles	Etter	Gulfstream	X	X
Gregg	Fleming	Volpe	X	X
Mike	Gallivan	FAA	X	
Fabio	Grandi	FAA	X	X
Jim	Hileman	FAA	X	X
Levent	Ileri	FAA	X	X
Ralph	Iovinelli	FAA	X	X
Daniel	Jacob	FAA		X
Melvin	Kasanchick	Boeing	X	X
Sandy	Lancaster	DFW Airport	X	X
Dimitri	Mavris	Georgia Tech	X	X
Alex	Menotti	A4A	X	X
Maureen	Molz	FAA	X	X
Melinda	Pagliarello	ACI-NA	X	X
Tim	Pohle	A4A	X	
Ian	Redhead	Kansas City Intl Airport	X	X
Leslie	Riegle	AIA	X	X
Chinita	Roundtree Coleman	FAA	X	X
Cecilia	Shaw	FAA		X
Jim	Skalecky	FAA	X	X
Adrienne	Vanek	FAA	X	
Shelley	Yak	FAA	X	
Darcy	Zarubiak	Haley & Aldrich, Inc.	X	X
Joe	Zelina	GE	X	X