International Civil Aviation Organization

CAEP/7-IP/31
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**INFORMATION PAPER**

# COMMITTEE ON AVIATION ENVIRONMENTAL PROTECTION (CAEP)

**SEVENTH MEETING**

**Montréal, 5 to 16 February 2007**

**Agenda Item 1: Review of proposals relating to aircraft engine emissions, including the amendment of Annex 16, Volume II**
**Agenda Item 3: Review of proposals relating to aircraft noise, including the amendment of Annex 16, Volume I**
**Agenda Item 4: Future work**

## THE UNITED STATES JOINT PLANNING AND DEVELOPMENT OFFICE (JPDO) PROGRESS

(Presented by United States Member)

**SUMMARY**

This paper provides an information update on efforts by the United States' Joint Planning and Development Office (JPDO) to plan for the Next Generation Air Transportation System (NextGen). An Integrated National Plan outlines eight strategies aimed at transforming the existing U.S. air transportation system to meet a projected system capacity growth between 200 and 300 percent by year 2025. Since environmental constraints could prove the limiting factor on system capacity growth, the NextGen Plan has adopted a specific strategy to *develop environmental protection that allows sustained aviation growth.*

Appendix – Environment IPT FY07-08 Work Plan

## 1. INTRODUCTION

1.1 On December 12, 2003, the 108th Congress passed Public Law 108-176 (known as Vision 100 of the FAA Reauthorization Act). This Act established a charter to transform the current United States system into the Next Generation Air Transportation System by the year 2025. This mandate requires the Federal Aviation Administration (FAA) to complete and send to the Congress an Integrated National Plan for transforming the Next Generation Air Transportation System (NextGen) to meet future

needs for expansion of capacity. To carryout this Plan, the FAA's Joint Planning and Development Office (JPDO) was created.

1.2 This paper introduces the United States' Integrated National Plan (hence, referred to as the "Plan") for the Next Generation Air Transportation System. This Plan is under development by the FAA's JPDO. The purpose of this Plan is to develop and implement eight strategies aimed at transforming the existing U.S. air transportation system to meet a projected system capacity growth between 200 and 300 percent by year 2025.

1.3 To meet the transformation needs, this Plan has created joint coordination efforts (partnerships) between five federal agencies (U.S. Departments of Transportation, Commerce, Homeland Security, Defense, the National Aeronautical Space Administration – NASA, and the White House Office of Science and Technology Policy) and aviation community stakeholders (airlines, airports, academia, airframe and engines manufacturers, non-government organizations, etc.). These coordination efforts are intended to ensure, among other things, that environmental aviation is an enabler (rather than a disabler) to meet the anticipated growth in air travel services by year 2025.

## 2. NEED FOR TRANSFORMATION

2.1 The demand for air transportation is outpacing our ability to increase capacity in our airports. Operating and maintenance costs of the air transportation system are outpacing revenues and conventional air carriers are in serious financial jeopardy. The terrible events of September 11, 2001 radically altered our country and they exposed a new impediment to the future of the air transportation industry. New security requirements are significantly impacting costs and the ability to efficiently move people and cargo. In addition, the growth in air transportation has provoked new community concerns over aircraft noise, pollution and congestion that affect our ability to respond adequately or rapidly enough to our changing world.

2.2 Future growth in air transportation will be increasingly constrained by balancing concerns over safety and security, aircraft noise, emissions, and fuel consumption. Infrastructure investments, shifts in roles and responsibilities, and new policies and procedures must reflect this balance.

2.3 By 2025, the number of large airports handling more than half a million departures and arrivals will nearly triple. The expected average annual growth in total system passenger miles will push the amount over the one billion mark by 2015 and could triple by 2025. Air cargo is expected to grow at an average rate of 4.5% a year with a threefold increase by 2025. The growth will stress our resources for national defense, homeland security, drug and law enforcement, airspace management, and environmental concerns.

## 3. TRANSFORMATION STRATEGIES

3.1 Achieving the transformation vision for air transportation will be done via collaboration among federal, state, and local government and private industry. These efforts will be coordinated through eight major strategies that broadly address the goals and objectives for the NGATS. Supporting these strategies will be a combination of research, development, and implementation activities. These activities will involve a review of policy and financial mechanisms as well. The eight major strategies are as follows:

3.1.1 **Develop Airport Infrastructure to Meet Future Demand –** Airport infrastructure must address the need to expand in a way that meets future capacity and provide a system that meets or exceeds user demand by integrating airport, airspace and air transportation management design, development, and deployment.

3.1.2 **Establish an Effective Security System Without Limiting Mobility or Civil Liberties –** Establish a global security system to ensure reservation-to-destination security for travellers and the stream of commerce. Travellers and shippers will be confident that no undue security or health risks exist in the transportation system, and that movements and civil liberties are not unduly impeded by security measures.

3.1.3 **Establish an Agile Air Traffic System –** Establish an agile air traffic system that accommodates future requirements and readily responds to shifts in demand from all users. The system will be responsive to market elasticity; have the flexibility to deliver capacity and efficiency improvements; and ensure that equipment and personnel are able to support a wide-range and number of operations tailored to customer needs.

3.1.4 **Establish User Specific Situational Awareness –** Establish globally compatible information-sharing capabilities to provide on-demand, real-time knowledge to support more distributed decision making roles of users, operators, and service providers. Each stakeholder will be able to reach informed decisions through increased knowledge of current conditions, plans and events affecting the system.

3.1.5 **Establish a Comprehensive Proactive Safety Management Approach –** Develop and implement a common and comprehensive risk management doctrine at the national level that is applied to aviation and space travel. Encourage and participate in global safety practices to ensure the safety of the travelling public and cargo. Develop and implement a cutting-edge operational data analysis capability that identifies safety issues. Promote expansion of U.S. capability to meet national and international safety goals and objectives.

3.1.6 **Develop Environmental Protection that Allows Sustained Aviation Growth** – Develop and implement new models, metrics, policy approaches, and operational and technology improvements to mitigate environmental impact related to the growth of aviation to foster public acceptance of air transportation growth.

3.1.7 **Develop a System-Wide Capability to Reduce Weather Impacts** – Achieve increased safety and efficiency in the national aviation system by deploying and integrating scientific and operational advances in weather technology, enabling aviation system users to mitigate the negative impact of adverse weather.

3.1.8 **Harmonize Equipage and Operations Globally –** Ensure global interoperability for the Next Generation Air Traffic System by developing and supporting implementation of global air and space transportation policies, standards, and procedures. U.S. leadership toward global standards will improve safety, security, mobility, environmental quality, and economic viability.

3.2 For each strategy, an Integrated Product Team (IPT) is responsible for applying best practices from industry and the Department of Defense to achieve the mission of that strategy. Primary responsibility for assembling and leading each IPT belongs to one agency. The IPT serves as the focal point for programs related to the mission, and coordinates and assembles expertise from across the federal

government, pooling the efforts of related programs and private industry to empower and leverage participation by all affected partners in the transformation including manufacturers, suppliers, and customers from the private sector. IPTs are working to establish the detail action plans for the execution of these strategies.

3.3 Additional information on the Plan, IPTs, and JPD progress is available on the JPDO website, http://www.jpdo.aero/index.html. The website includes background questions and answers at http://www.jpdo.aero/factsheet.html.

## 4. THE ENVIRONMENT IPT

4.1 Critical to achievement of the Plan is reducing environmental impacts, especially as aircraft noise and local air quality emission concerns remain strong (and growing) constraints on system capacity. The interagency integrated product team (IPT) responsible for researching, developing, implementing, and maintaining the environmental protection strategy is the Environment IPT (EIPT). The primary environmental impact areas of concern for aviation today are noise, air quality and water quality. Research efforts are underway on greenhouse gas impacts to understand directly attributable impacts to enable appropriate action. Chaired by FAA's Office of Environment and Energy, the Environment IPT includes a Steering Group, Executive Secretariat, JPDO Liaison Support, and five Panels. The Steering Group includes representatives from FAA; other Federal agencies; industry (manufacturers, airlines, and airports); local, regional and state agencies; local community/airport organizations, environmental NGOs; and others.

4.2 The five EIPT Panels are listed below. Panels are staffed with members from government, academia, industry, and NGOs. Based on technical expertise, the Panels lead the work to achieve the goals of the JPDO environmental protection strategy and inform the decisions made by the Steering Group.

a) **Science/Metrics Panel** – Focused on development of new metrics, advancing science on health and welfare impacts (including reducing uncertainty on the impacts of aviation on climate change and advancing science related to local air quality, local water quality, supersonic transport, and related matters), and advancing public education.

b) **Analytical Tools Panel** – Focused on the development of analytical tools for aviation noise and emissions impacts, and analysis of costs/benefits of mitigation techniques.

c) **Operations Panel** – Focused on both near-term new operational procedures implementation and advanced procedures being developed by NASA, with a particular focus on: Low noise and emissions approaches (in moderate and heavy traffic situations), improved oerational procedures for both noise and emissions (runway selection, regional routes and others), and more efficient surface paths and minimizing surface delays.

d) **Technology Panel** – Focused on relevant technology programs including: Formulating strategies for technology development that address noise/emission environmental issues (engine technology, airframe technology, fuel technology);

Providing drivers for investment in noise/emissions technology development efforts; and Exploiting ongoing and future efforts in technology development in agencies/organizations.

e) **Policy Panel** – Focused on proposing policies to address the environmental impacts of aviation within a 20-year timeframe (2005-2025), including broad policy development to guide the national environmental approach to long-term environmental improvement in aviation's impacts, as well as specific policy initiatives to mitigate impacts (e.g., land use, home insulation, market-based options). The Policy Panel will also address legal considerations.

4.3 Initial goals identified by the Environment IPT include:

a) Reduce the impacts of significant aviation noise to community well being in absolute terms, notwithstanding the growth in aviation.

b) Reduce the significant local air quality impacts of aviation on local communities in absolute terms, notwithstanding the growth in aviation.

c) Gain sufficient knowledge of climate change effects of aviation to enable appropriate means to mitigate these effects.

d) Develop the appropriate metrics and models to measure aviation's environmental impacts for the system of 2025.

4.4 The EIPT FY07-08 Work Plan in the Appendix provides the draft work plans of the Environment IPT Panels. Each work plan includes high-level assignments, FY06 achievements, FY07 plans, FY08 plans, and current members and affiliations.

## 5. CONCLUSIONS

5.1 The planned growth in the U.S. air transportation system could be significantly constrained unless adequate steps are taken now to transform the capabilities of the U.S. system through the Next Generation Air Transportation System plan.. The consequences of not taking this transformation action would be constraints on growth as the system moves toward gridlock with negative impacts on economic efficiency, consumers, and the environment. These issues are not just limited to the U.S., because of their far-reaching global implications on air commerce. We are committed to working with the international aviation community to collaborate on these issues as part of the JPDO process to better address the potential consequences on the environment of increasing demand for expanded capacity growth of the global aviation system.

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CAEP/7-IP/31
**Appendix**
**English only**

**APPENDIX**

Next Generation Air Transportation System
Joint Planning and Development Office

# Environment Integrated Product Team FY07 & FY08 Work Plan

*Version 1.0*

*December 31, 2006*

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# 1. Introduction

The Vision 100 – Century of Aviation Reauthorization Act established a charter to transform our current system into the Next Generation Air Transportation System (NGATS) by the year 2025. The legislation created a unique coalition of Government agencies that will lead this historic effort. Congress has tasked the agencies to be accountable to each other by forming the Senior Policy Committee (SPC) composed of their respective leaders. This structure will gain the commitment and contribution of talent and resources required for the effort. In addition, the Secretary of Transportation established a Joint Planning and Development Office (JPDO) within the Federal Aviation Administration (FAA) to manage the work related to the NGATS.

The agencies of the SPC defined eight strategies for transformation, documented in the NGATS Integrated Plan. The Plan establishes national goals and sets the context for transforming the aviation system. Since environmental constraints could limit system capacity, one of the primary strategies of the NGATS Integrated Plan is to *develop environmental protection that allows sustained aviation growth*.

The initial national air transportation system architecture for the system of 2025 proposes an approach that relies on net-centric information services available both nation-wide and globally that ensures real-time information flows from a variety of governmental and non-governmental sources. To achieve three times capacity growth in the next 20 years, the air traffic system architecture would allow dynamic airspace configuration management, differentiated service levels aligned with user abilities, and rely on management-by-trajectory with block-to-block coverage and & NAS-wide time-based "metering," and develop "super density" operations at selected airports.

Critical to achievement of this plan is reducing environmental impacts, especially as aircraft noise and aircraft engine emission concerns (local air quality) remain strong (and growing) constraints on system capacity. Such issues have caused airport capacity expansion plans to be canceled, delayed, and/or down-scaled over the past decade. Airports of the future – whatever the eventual number developed in the NGATS - will need to deal with the current environmental concerns of the communities surrounding them. Further, depending on ongoing research, additional local air quality, as well as climate change, issues could surface that provide additional challenges to capacity expansion. Finally, environmental issues do not affect only commercial aviation interests; military readiness is also being challenged by restrictions on training and operations. These effects will be exacerbated by future aviation growth.

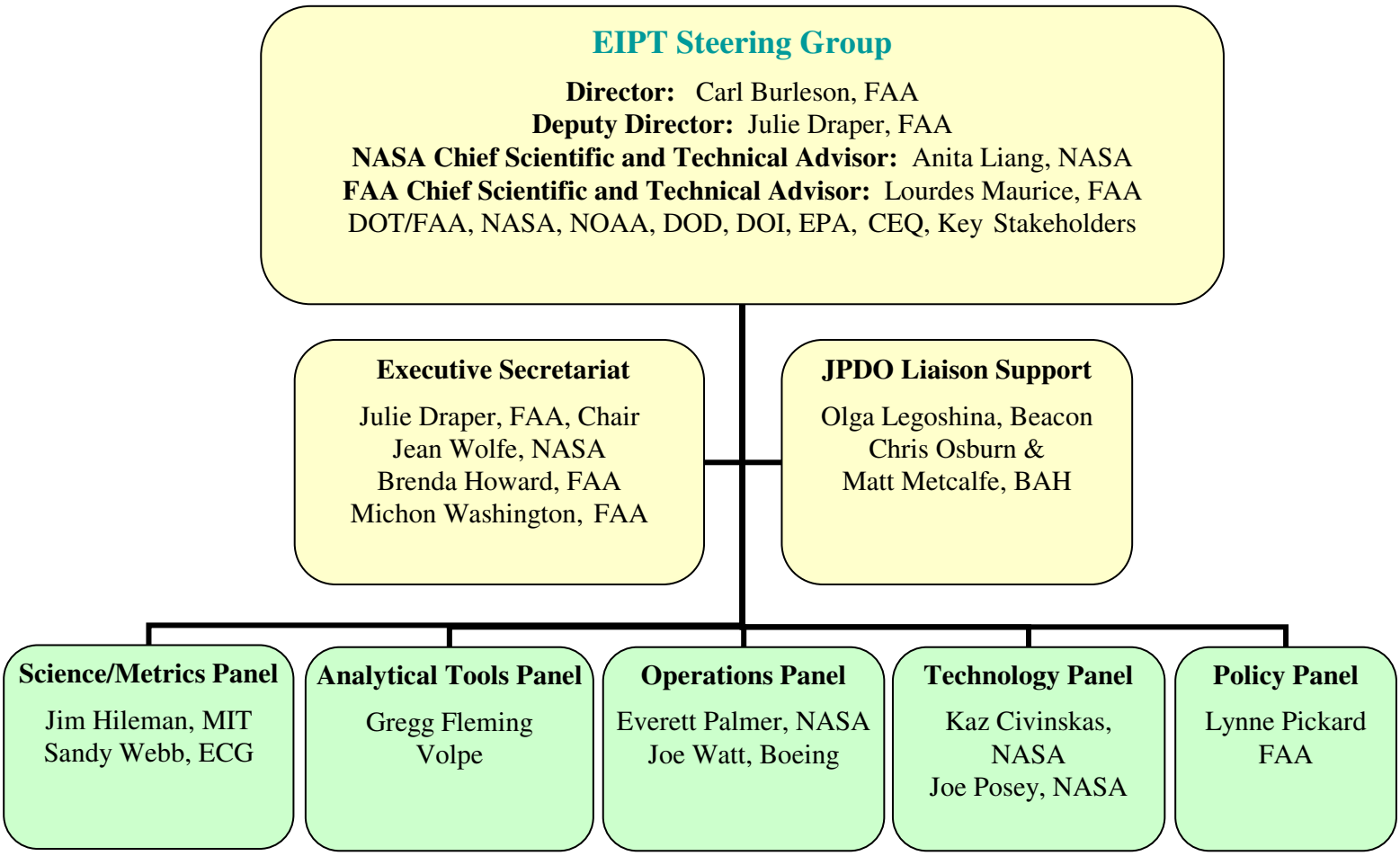
Compounding the environmental issues is the fact that aviation has features that distinguish it from other transportation modes and industries. There is a high premium placed on safety that demands the incorporation of only proven and technically sound environmental technologies in aircraft, as well as on the ground (e.g., deicing for aircraft and airport runways). Aircraft costs are high and have a long life span, requiring long lead times for new technologies to be widely incorporated in the fleet and demanding close attention to financial feasibility. Airborne systems must be lightweight and fuel-efficient. Noise, local and regional air quality, and potential climate effects of aviation result from an interdependent set of technologies and operations. Leading to the potential that action to reduce impacts in one medium (e.g., aircraft engine noise) can increase impacts in another medium (e.g., nitrogen oxides emissions). All these factors combine to make it challenging to incorporate new technologies quickly, rapidly change fleets, or manage multiple environmental impacts without trade-offs.

## 1.1 The Environmental Integrated Product Team

The interagency integrated product team (IPT) responsible for researching, developing, implementing, and maintaining the environmental protection strategy is the Environment IPT (EIPT). The primary environmental impact areas of concern for aviation are noise, air quality and water quality. Chaired by FAA's Office of Environment and Energy, the Environment IPT includes a Steering Group, Executive Secretariat, JPDO Liaison Support, and five Panels. A chart depicting the organization of the EIPT is shown on the next page. The Steering Group includes representatives from FAA; other Federal agencies; industry (manufacturers, airlines, and airports); local, regional and state agencies; local community/airport organizations, environmental non-governmental organizations (NGOs); and others. The Steering Group has sufficient authority in their respective agencies to address budget and policy matters relevant to the IPT. The Executive Secretariat is responsible for communication and coordination within the Environment IPT, as well as across the JPDO organization and with external organizations. The Executive Secretariat includes representatives of FAA, JPDO, and other Federal agencies. The JPDO Liaison Support representatives assist with coordination between the JPDO and the EIPT and JPDO product support.

The five EIPT Panels are listed below. Panels are staffed with members from government, academia, industry, and NGOs. Based on technical expertise, the Panels lead the work to achieve the goals of the JPDO environmental protection strategy and inform the decisions made by the Steering Group.

- **Science/Metrics Panel** – Focused on development of new metrics, advancing science on health and welfare impacts (including reducing uncertainty on the impacts of aviation on climate change and advancing science related to local air quality, local water quality, supersonic transport, and related matters), alternative fuels, and advancing public education.
- **Analytical Tools Panel** – Focused on the development of analytical tools for aviation noise and emissions impacts, and analysis of costs/benefits of mitigation techniques.
- **Operations Panel** – Focused on both near-term new operational procedures implementation and advanced procedures being developed by NASA, with a particular focus on: (1) low noise approaches (in moderate and heavy traffic situations); (2) operational procedures on noise (runway selection, regional routes and others); and (3) more efficient surface paths to minimize surface delays.
- **Technology Panel** – Focused on relevant technology programs including: (1) formulating strategies for technology development that address noise/emission environmental issues (engine technology and airframe technology); (2) providing drivers for investment in noise/emissions technology development efforts; and (3) exploiting ongoing and future efforts in technology development in agencies/organizations.
- **Policy Panel** – Focused on proposing policies to address the environmental impacts of aviation within a 20-year timeframe (2005-2025), including broad policy development to guide the national approach to long-term environmental improvement in the nation's aviation system, as well as to develop specific policy initiatives to mitigate environmental impacts (e.g., land use, home insulation, market-based options). The Policy Panel will also address the legal considerations inherent in developing such policies.


EIPT Steering Group
Director: Carl Burleson, FAA
Deputy Director: Julie Draper, FAA
NASA Chief Scientific and Technical Advisor: Anita Liang, NASA
FAA Chief Scientific and Technical Advisor: Lourdes Maurice, FAA
DOT/FAA, NASA, NOAA, DOD, DOI, EPA, CEQ, Key Stakeholders
Executive Secretariat
Julie Draper, FAA, Chair
Jean Wolfe, NASA
Brenda Howard, FAA
Michon Washington, FAA
JPDO Liaison Support
Olga Legoshina, Beacon
Chris Osburn &
Matt Metcalfe, BAH
Science/Metrics Panel
Jim Hileman, MIT
Sandy Webb, ECG
Analytical Tools Panel
Gregg Fleming
Volpe
Operations Panel
Everett Palmer, NASA
Joe Watt, Boeing
Technology Panel
Kaz Civinskas, NASA
Joe Posey, NASA
Policy Panel
Lynne Pickard
FAA

## Key Environmental Goals and Objectives

In developing the initial plans, policies, and resource estimates for the environmental portion of the Next Generation Air Transportation System (NGATS) plan, the following are the initial goals identified by the Environmental Integrated Product Team (EIPT):

- Reduce the impacts of significant aviation noise to community well-being in absolute terms, notwithstanding the growth in aviation.
- Reduce the significant air quality impacts of aviation on local communities in absolute terms, notwithstanding the growth in aviation
- Develop the appropriate metrics and models to measure aviation's environmental impacts for the system of 2025.
- Gain sufficient knowledge of the particulates and hazardous air pollutants effects of aviation to determine significant impact.
- Gain sufficient knowledge of climate change effects of aviation to enable appropriate means to mitigate these effects.
- Reduce significant levels of pollutants in water runoff from airports to minimize impacts on local community water resources.
- Foster communication, ideas, and joint action between IPT and communities around airports.
- Facilitate global leadership in developing operational, technology, and policy options to address mobility and environmental needs.
- Advance capacity growth at the key airports by fostering capabilities and process to streamline environmental reviews.
- Develop environmental standards to enable new and expanding operations, such as very light jets, domestic supersonic flights, space launches, low altitude reconnaissance, alternate fuel air vehicles, etc.

## Near-Term Uncertainties in Meeting Environmental Objectives in NGATS Plan

In developing the environmental roadmap for implementing the draft NGATS architecture, a number of uncertainties exist that will have a large influence on the success of tackling the environmental challenges of delivering the NGATS plan. Some critical issues include:

- Architecture Requirements. It is uncertain whether the draft architecture will produce the targeted "three times growth in capacity" of the NGATS endeavor. Additional requirements could have a large influence on potential environmental impacts and whether the current plans and initiatives have any prospect of success. Further, it is not clear at this juncture whether the NGATS system will be delivering aircraft in the same airport patterns of today or something vastly different. The potential environmental "footprint" of aviation – and hence the investments required to shrink that footprint- will be vastly different depending on this outcome of this analysis.
- Environmental Performance Requirements. While we have committed to absolute reductions in significant noise, emissions, and water quality impacts, the actual targets and performance

requirements are still being defined. It is also unclear what additional impacts may arise from improved scientific understanding on aviation's climate change influence. Finally, it is uncertain what new requirements may arise from potential introduction of new aircraft types (supersonic business jets) or new environmental concerns (high altitude noise over national parks).

- Environmental R&D Funding Gap. The next 5-7 years of R&D are critical for the fleet of 2025 given the long-lead times involved in maturing and incorporating technological innovation in the U.S. fleet. The reduction in NASA's aeronautics budget, especially in the vehicle systems program, undercuts the ability to deliver the near-term noise and emissions innovations in airframes and engines. This, in turn, will hamper the ability to meet any increase in stringency in noise and emissions metrics.
- Federal Budget Issues. Congress has not yet passed a transportation budget for FY 2007 and leadership has indicated that the Government will operate under a Continuing Resolution for the rest of the year. This "freezing" of funding for 2007 may have a significant impact on the ability to meet environmental goals in future years.
- Lateral Alignment on EIPT Agencies. Success in the NGATS endeavor will require a level of integration and cooperation among a variety of federal agencies as well as non-federal stakeholders that has little precedent.

## *Draft Work Plans for FY07-08*

The draft work plans of the Panels are provided in this document. Each work plan includes high-level assignments, objectives and requirements, FY06 achievements, FY07 and FY08 plans, potential roadblocks, current members and affiliations, and anticipated panel deliverables.

# 2. Science/Metrics Panel Work Plan

## 2.1 High-Level Assignments

- Develop better science-based understanding of impacts of aviation emissions on local air quality and climate change. (Science/Metrics leads)
- Improve understanding of health and welfare impacts from noise and local air quality emissions and translate impact into improved metrics. (Science/Metrics leads supported by Tools)
- Developing long-term environmental targets in noise and emissions. (Policy leads, supported by Tools & Science/Metrics)
- Develop improved metrics, measurement techniques, and modeling to understand and quantify impacts and inter-relationships of aviation environmental factors. (Tools leads supported by Science/Metrics & Ops Panels; interacting with EAD & Secretariat)
- Develop better science-base toward understanding alternative fuels and their potential aviation applications, while quantifying any impacts and interrelationships resultant of use for aviation environmental factors. (Science/Metrics leads; interacting with Technology)

## 2.2 Objectives and Requirements

### *NGATS Drivers/Rationale*

Develop consensus among the scientific community to provide a foundation for formulating metrics for environmental impacts that could be used in trade-off studies. This will enable development of implementation of new models, metrics, policy approaches, operational improvement, and technology innovation to mitigate environmental impact related to the growth of aviation.

### *Outcomes*

- Provide the best science-based information to assess aviation's environmental impact in context with other non-aviation sources
- Define metrics that better represent health and welfare impacts of NGATS on the environment
- Provide science-based knowledge to the other EIPT Panels to create an integrated environmental and cost/benefit analysis of all mitigation activities, including technology, policies, and operations
- Provide more effective metrics and tools to assess and communicate aviations environmental impact on the NGATS and assure the US stakeholders maintain global leadership in developing standards and operations

## 2.3 Achievements, Out-Year Plans, and Challenges

| FY 06 Achievements | FY 07 Plans | FY 08 Plans | Potential Road Blocks |
|---|---|---|---|
| ▪ Convened four working groups (noise, climate, local air quality, particulate matter) with the following deliverables.<br>— Continued current funded work and delivered identified milestone<br>— A Climate Workshop was convened in June 2006 and a white paper was prepared on current state of knowledge<br>— Other Working Groups prepared other white papers<br>▪ Leveraged existing structure/expertise<br>— Noise: NASA's Aeronautics Research Mission Directorate and FAA<br>— Climate: Modeling and Analysis Program in NASA's Science Mission Directorate and NOAA<br>— Local air quality: existing structures in NOAA and EPA<br>— Particulate matter: activities from the PM National Roadmap | ▪ Continue to monitor and report on funded work<br>— Work with Policy Panel to identify future environmental goals for noise, emissions, and fuel burn<br>— Work with Tools Panel to refine metrics for trade-studies<br>— Work with Technology Panel to identify technology gaps<br>— Work with Operation Panel to identify OI that help environmental goals<br>▪ Identify and secure funding commitments and prepare RFP for a research program to assess the uncertainty of aviation impacts on climate change with special emphasis on the effects of contrails<br>▪ Develop preliminary sonic boom acceptance metrics Identify and secure funding commitments and prepare RFP for a research program to assess the impacts of aviation on regional air quality including the effects of climb /cruise NOx emissions | ▪ Determine how to reconstitute individual working group(s) or replace with science team(s) based on expected work funded through proposals and directed work, for example:<br>— Work areas that are more mature (noise and water quality, e.g.) may be continued in working group format<br>— Work areas for which there may be many contributing research teams could choose a science team format<br>▪ Select Science team and hold a first science team meeting before the end of FY08 to:<br>— Coordinate with international research activities<br>— Liaise as appropriate to focus research thrusts<br>▪ Initiate assessment of the impacts of aviation on regional air quality including the effects of NOx emissions attributable to aircraft climb and cruise activities | ▪ Resources:<br>— Availability of funding for research plan in FY07<br>▪ Co-ordination with other national and international activities to provide input to IPCC, CAEP<br>▪ Interface with other panels<br>▪ Emissions from Technology Panel and Operation Panel:<br>— Metric definition with Tools Panel<br>— Trade-off studies with Tools Panel |

## 2.3 Achievements, Out-Year Plans, and Challenges (Continued)

| FY 06 Achievements | FY 07 Plans | FY 08 Plans | Potential Road Blocks |
|---|---|---|---|
| | ▪ Identify and secure funding commitments and prepare RFP for a research program to examine methodologies to quantify and assess the impact of Particulate Matter and HAPs<br>▪ Continue developing methods and techniques to improve use of supplemental noise metrics through the COE<br>▪ Correlate objective metrics with subjective perception of low frequency noise<br>▪ Continue evaluating the effectiveness of sound insulation, assessing encroachment issues, and examining land use vs. airport controls<br>▪ Asses the potential applications of aviation alternative fuels and the science and research needed to bring to market. | ▪ Assess whether there are unique health effects associated with particulates and HAPs from aviation sources<br>▪ Develop low frequency noise impact metrics and asses mitigation techniques, complete low frequency noise metrics assessment and publish report<br>▪ Investigate DNL performance compared to other noise metrics and complete land use metrics study<br>▪ Conduct study to analyze 4 elements of balanced approach to noise abatement<br>▪ Advance sonic boom metric definition and assess the applicability of existing noise metrics to sonic boom and determine annoyance of low boom waveforms<br>▪ Define metrics to evaluate and track water impacts | |

## 2.4 Anticipated Panel Deliverables

| FY 07 Deliverables | FY 08 Deliverables |
|---|---|
| 1. Provide the best science-based information to assess aviation's environmental impact in context with other non-aviation sources in relation to:<br>- Local air quality<br>- PM and NOx<br>- Global climate<br>- Noise<br>2. Complete annual assessment of noise exposure and fuel burn<br>3. Conduct a COE noise and emissions focused session at the national and international conferences<br>4. Develop and publish<br>- Procedures and Guidance materials for affordable engine emissions testing and certification<br>- Protocol for assessing HAPs<br>- Address uncertainties in understanding aviation's impact on climate change | 1. Metrics definition that better represents health and welfare impacts of NGATS on the environment<br>2. Science-based knowledge that can be used by the other EIPT Panels to create an integrated environmental and cost/benefit analysis of all mitigation activities, including technology, policies, and operations<br>3. More effective metrics and tools for assessment and communication of aviations environmental impact on NGATS and assure the US stakeholders maintain global leadership in developing standards and operations<br>4. Develop preliminary methods to measure PM from commercial aircraft and model for near field plume expansion<br>5. Complete study to collect PM data using light detection and ranging technology to enhance dispersion models<br>6. Conduct two COE focused sessions at a national or international conference<br>7. Initiate assessment of uncertainty of impact of aviation on climate change with special emphasis on effects of contrails |

## 2.5 Members and Affiliation

| Name | Organization |
|---|---|
| **Chair – James Hileman** | MIT/PARTNER COE |
| **Co-Chair – Sandy Webb** | ECG Consulting |
| Mohan Gupta | FAA AEE |
| Ralph Iovinelli | FAA AEE |
| Carl Ma | FAA AEE |
| Mehmet Marsan | FAA AEE |
| Donna Warren | FAA ATO |
| Malcolm Ko | NASA |
| Kevin Shepherd | NASA |
| Arnie Konheim | OST |
| Arthur Rypinski | OST |
| Camille Mittelholtz | OST |
| *Vacant* | CEQ |
| John Kinsey | EPA |
| Steven Fine | NOAA |
| Steve Baughcum | Boeing |
| Rick Miake-Lye | Aerodyne |
| Nick Miller | HMMH |
| Ben Sharp | Wyle |
| Claudio Ternieden | Water Environment Research Foundation |
| Prof. Philip Whitefield | UMR |

# 3. Analytical Tools Panel Work Plan

## 3.1 High-Level Assignments

- Develop improved metrics, measurement techniques, and modeling to understand and quantify impacts and inter-relationships of aviation environmental factors. (Supported by Metrics/Science & Ops Panels; interacting with EAD & Secretariat)
- Develop models to allow "portfolio management" of policy, technological, and market-based measures to cost-effectively manage aviation's environmental impacts. (Interacting with EAD & Secretariat)

## 3.2 Objectives & Requirements

### *NGATS Drivers/Rationale*

- To Provide Environmental Protection that Allows Sustained Aviation Growth
- Protect the Environment and Air Traffic Management Operation Goals – optimize noise and emissions reductions and balance aviation's environmental impact with other societal objectives
- Protect the Environment Strategy – analyses to enable absolute reduction of significant impacts

### *Outcomes*

- Integrated, transparent, aviation noise and emissions model to support the environmental decisions related to NGATS (e.g., infrastructure development, federal policies, and international agreements)
- Comprehensive, transparent model to support all facets of cost/benefit analysis needed to develop federal environmental policy
- Analytical tool to enable integrated transparent analysis of noise and emissions at the aircraft level

## 3.3 Achievements, Out-Year Plans, and Challenges

| FY 06 Achievements | FY 07 Plans | FY 08 Plans | Potential Road Blocks |
|---|---|---|---|
| ▪ Delivered AEDT Version 1.0 for CAEP/7 Introduction<br>▪ Delivered EDS Version 1.0 for CAEP/7 Introduction<br>▪ Delivered APMT Version 0.0 for CAEP/7 Introduction<br>▪ Evaluated the use of existing models and potential models under development (e.g., AEDT-APMT) for the analysis of trade-offs between noise and emissions and amongst emissions with other CAEP members<br>▪ Continued assessment and uncertainty analysis through the PARTNER COE, of the total environmental costs of aviation noise, local air quality and climate change impacts<br>▪ Continued upgrades to INM, EDMS, MAGENTA, and SAGE modules for incorporation into AEDT | ▪ Deliver AEDT Version 1.1, including Environmental Design Space (EDS), capability for CAEP/8 Application<br>▪ Deliver APMT Version 1.0 for CAEP/8 Application<br>▪ Obtain CAEP SG acceptance of use of AEDT, EDS, and APMT to support CAEP/8 work<br>▪ Assess noise and emissions for various technology and operational scenarios<br>▪ Demonstrate the benefit of assessing interdependencies through a significant example problem<br>▪ Continue upgrades to INM, EDMS, MAGENTA, and SAGE modules for incorporation into AEDT<br>▪ Work with stakeholders to assess the state of the art in the current need for water quality modeling tools and assess the current state of water quality modeling and determine need for future work. | ▪ Complete transition of legacy FAA tools to AEDT environment<br>▪ Deliver Version 1.2 for CAEP/8 application<br>▪ Deliver noise exposure and fuel burn analysis<br>▪ Release new methodologies to quantify and assess the impact of aviation noise and emissions and their interrelationships<br>▪ Expand EDS aircraft database/capability<br>▪ Deliver EDS Version 2.0, including validated vehicle library and demonstrated capability within AEDT framework for CAEP/8 application<br>▪ Deliver APMT framework for CAEP/8 application<br>▪ Transitions to Panel Activity 3 in FY 08<br>▪ Transitions to Panel Activity 1 in FY 08<br>▪ Follow-on assessment of state of the art need for water quality modeling tools TBD based on FY 07 white paper results | ▪ Tools Panel can oversee incorporation of new metrics identified by the Metrics/Science Panel but does not have the expertise to develop new metrics. Continued ambiguity on the separation of roles of these two panels will only result in lack of progress on metrics.<br>▪ As identified at the 6/1/05 meeting of the EDS TAB, success of EDS and ultimately AEDT/ APTM rests on gaining industry buy-in on the concept and cooperation on its development including the availability of funding for industry participation.<br>▪ Incorporation of new metrics in modules (e.g., encroachment, noise emissions interdependencies, supersonic transport, loudness); verification of tools and trade-off studies; and methodologies for predicting climate impacts.<br>– Coordination with Ops Panel on various initiatives, such as CDA |

## 3.4 Anticipated Panel Deliverables

| FY 07 Deliverables | FY 08 Deliverables |
|---|---|
| 1. AEDT Version 1.1 with integrated EDS | 1. AEDT Version 1.2 including EDS Version 2.0 |
| 2. APMT Version 1.0 | 2. APMT Version 1.2 |
| 4. Technical report (Noise/Emissions) | 3. Various CAEP 8 Analysis TBD |
| 5. Technical report (Sample/Problems) | 4. Calendar year 2007 MAGENTA and SAGE inventories |
| 6. INM Version 7; EDMS Version 5 | |
| 7. Calendar year 2006 MAGENTA and SAGE inventories | |
| 8. White Paper (current state of water quality modeling) | |

## 3.5 Members and Affiliation

| Name | Organization |
|---|---|
| **Chair – Gregg Flemming** | DOT-VOLPE |
| **Co-Chair – TBD** | NASA |
| Joe DiPardo | FAA AEE |
| Maryalice Locke | FAA AEE |
| Lourdes Maurice | FAA AEE |
| Donna Warren | FAA ATO |
| Rich DeLoof | NASA |
| Bill Kimmel | NASA |
| Robert Plencner | NASA |
| Kevin Shepherd | NASA |
| Arnie Konheim | OST |
| *Vacant* | CEQ |
| Alan Zusman | DoD |
| Joe Touma | EPA |
| Dan Allyn | Boeing |
| Jim Brooks | Ga Tech |
| Larry Gray | P&W |
| Ken Plotkin | Wyle |
| Terry Thompson | Metron Aviation |
| Don Weir | Honeywell |

# 4. Operations Panel Work Plan

## 4.1 High-Level Assignments

Pursue aviation operational changes to reduce environmental impacts

- Implement pilot programs in improved air traffic procedures to reduce aircraft noise and fuel burn/emissions to mitigate environmental impacts on communities around airports. (Interacting with Agile IPT, EAD & Secretariat)
- Implement programs to improve airport and taxiing operations to reduce aircraft noise and fuel usage in airport operations. (Interacting with Agile IPT, EAD & Secretariat)

## 4.2 Objectives and Requirements

### *NGATS Drivers/Rationale*

- To Provide Environmental Protection that Allows Sustained Aviation Growth.
- Protect the Environment Goals – optimize noise and emissions reductions and balance aviation's environmental impact with other societal objectives
- Protect the Environment Strategy – operational procedures to enable absolute reduction of significant impacts

### *Outcomes*

- Operational procedures for noise and emissions reductions that satisfy safety and capacity requirements demonstrated
- Cost/benefit for adopting new procedures established
- Operational procedures to reduce noise and emissions introduced and accepted into the NAS

## 4.3 Achievements, Out-Year Plans, and Challenges

| FY 06 Achievements | FY 07 Plans | FY 08 Plans | Potential Road Blocks |
|---|---|---|---|
| ▪ Held workshops to coordinate industry development of near-term Continuous Descent Arrival (CDA)<br>▪ Worked with candidate airports (ATL, LAX, SDF, and Mather) for appropriate implementation of CDA<br>▪ Developed Design Guidelines for developing CDAs "The CDA Cookbook"<br>▪ Completed a plan for accommodating low noise approaches in moderate traffic without negatively impacting capacity<br>▪ Continued supporting the Southern California Tracon (SCT) Airspace redesign and CDA project<br>▪ Collected data to support business case for airlines on benefits of CDA at airports including SDF, ATL, LAX, and Mather.<br>▪ Begun development of the CDA Operational Concept Document and R&D Roadmap | ▪ Continue support for near-term CDA implementation<br>▪ Analyze data from recent Continuous Descent Arrival (CDA) field and full mission simulator studies to identify the key drivers of environmental and economic benefits under differing scenarios.<br>▪ Document the environmental and economic benefits that result from the redesign of SCT airspace to enable the introduction of CDA for west bound arrivals to LAX.<br>▪ Collect data required to define the requirements for controller and pilot support tools to enable CDA in high traffic conditions without negatively impacting capacity.<br>▪ Develop en route planning tool to optimize route for environmental emission<br>▪ Initial exploration of improved departure operations to reduce emissions and noise<br>▪ Initial exploration of improved en route operations to reduce emissions and noise<br>▪ Document Lessons Leaned with FMS/VNAV in developing of CDA procedures<br>▪ Identifying candidate airport/arrival aircraft that can participate in CDA assessments | ▪ Continue support for near-term CDA implementation<br>▪ Develop prototype controller and pilot tools and document the requirements for conducting CDAs with moderate throughput<br>▪ Document the potential contribution of operations to addressing the environmental gap (In coordination with the JPDO's EAD & the EIPT Tools Panel)<br>▪ Document the requirements for a CDA procedure design tool<br>– Based on John-Paul Clarke's methodology and design tool and other analysis tools<br>– Explore doing this as an extension to the TARGETS tool<br>▪ Conduct human-in-the-loop or field evaluation of surface planning tool to minimize environmental impact<br>▪ Conduct human-in-the-loop or field evaluation of new environmental RNAV departure procedure for a US airport<br>▪ Develop a plan for field and simulator demonstrations of procedures and automation that when implemented would reduce fuel burn and emissions during ground operations. | ▪ Tools Panel can oversee Resources: Focused participation on Operations Panel by key players, and coordination within agencies and organizations. In particular, government and industry need to provide funding and key personnel in order to meet the panel and IPT goals.<br>▪ Effective coordination with other groups, panels, and IPTs (e.g. coordination with AATS IPT, other EIPT panels, PARC, etc.)<br>▪ Coordination with NASA's NGATS Airspace and airport projects<br>▪ Coordination with EIPT Tools Panel to identify the potential contribution of operations to addressing the environmental gap<br>▪ Membership Gaps, effective use of panel members, volume of work and available funding<br>▪ Technical challenges:<br>– Field implementation of advanced vertical flight profiles (e.g. RNAV, FMS, etc.)<br>– Limitations/differences of various levels of equipage<br>– Development and implementation of controller decision aids for higher-density operations (e.g. EDA, TMA)<br>– Cross coordination between ARTCCs, TRACONs<br>▪ Operational acceptance (i.e. investments) by all stakeholders<br>▪ Regulatory requirements (i.e. NPRM) |

## 4.4 Anticipated Panel Deliverables

| FY 07 Deliverables | FY 08 Deliverables |
|---|---|
| 1. List of Lesson learned<br>2. Documentation that examines the benefits of CDA<br>3. Data resulting from implementing CDA at LAX (Coordination with Tools Panel to analyze data in order to validate their noise models) (OPs Panel will analyze data for procedure feasibility) | 1. Document/define different types of operations available to fill the environmental gap and conduct technology gap assessment. |

## 4.5 Members and Affiliation

| Name | Organization |
|---|---|
| **Chair – Everett Palmer** | NASA |
| **Co-Chair – Joe Wat** | Boeing |
| Warren Gillette | FAA AEE |
| Sandy Liu | FAA AEE |
| Angel Morales | FAA AEE |
| Jon Pietrak | FAA AEE |
| Jim Arrighi | FAA ATO |
| Dannie Bennett | FAA ATO |
| Jesse Gaines | FAA ATO |
| Tina Gatewood | FAA ATO |
| Allen Lucas (alt. for Gatewood) | FAA ATO |
| Jeff Williams | FAA ATO |
| Wayne Bartlett (alt. for Kirkendall) | FAA AVS |
| Gene Kirkendall | FAA AVS |
| Clyde Jones | FAA AFS |
| Robert Mariner | OST |
| Rich Coppenbarger | NASA |
| Tod Lewis | NASA |
| Sandy Lozito | NASA |
| Kevin Shepherd | NASA |
| David Williams | NASA |
| Jim Brooks | Georgia Tech |
| John-Paul Clarke | Georgia Tech |
| Mike Jackson | Honeywell |
| Vinnie Khera | HMMH |
| Joel Klooster | Smith Aerospace |
| Stephane Mondoloni | CSSI |
| Christopher Norton | Continental Airlines |
| Gary Pheasant | Delta |
| Dom Sepulveda | P&W |
| Belur Shivashankara | Boeing |
| Claudio Ternieden | AAAE |
| Terry Thompson | Metron Aviation |
| Stephen Vail | FedEx |
| James Walton | UPS |
| Carl Zimmerman | Northrup Grumman |

# 5. Technology Panel Work Plan

## 5.1 High-Level Assignments

- Resolve federal research role in supporting development of aviation environmental technologies in airframes and propulsion. (Technology provides support to Policy.)

- Define balanced research into environmental technologies between mature and long-term initiatives for airframes, more efficient engines, advanced propulsion concepts, and new materials to reduce source noise and emissions. (Technology provides support to Science/Metrics Panel.)

## 5.2 Objectives and Requirements

### *NGATS Drivers/Rationale*

- To Provide Environmental Protection that Allows Sustained Aviation Growth.
- Protect the Environment Goals – achieve noise and emissions reductions and balance aviation's environmental impact
- Protect the Environment Strategy – technology to enable absolute reduction of significant impacts

### *Outcomes*

The following outcomes can only be achieved with target funding:

- Technologies required to reduce CO2 (-25%) and NOX (-70%) emissions
- Technology to bring 65 DNL noise contour to airport boundary

## 5.3 Achievements, Out-Year Plans, and Challenges

| FY 06 Achievements | FY 07 Plans | FY 08 Plans | Potential Road Blocks |
|---|---|---|---|
| ▪ Developed an approach for technology workshops/Industry Meetings to determine what technologies can be expected for 2015.<br>▪ Refined interdependencies and expectations with other EIPT Panel Chairs<br>▪ Developed a draft FY08 Work Plan | ▪ Achieve sufficient resolution of near-term federal research role to consider potential proposals for FAA Reauthorization.<br>▪ Conduct Technology Workshops/Industry Meetings to determine what technologies can be expected for 2015<br>▪ Complete the gap analysis (EAD) to determine the gap between NGATS goals and what will be achieved if nothing is done.<br>▪ Identify where technology gaps exist and where investment should be made.<br>▪ Draft capability and technology development roadmaps<br>▪ Support achievement of consensus on proposals for FAA Reauthorization, and support legislative drafting<br>▪ Support environmental legislative proposals through Administration and Congressional consideration | ▪ Reach agreement on financing schemes to develop and implement noise and emissions abatement technologies and operational measures<br>▪ Prepare draft technology investment portfolio addressing long-term aviation environmental targets<br>▪ Complete environmental technology investment portfolio for long-term aviation environmental improvements | ▪ Timely development of a unified and integrated aviation environmental policy and technology plan<br>▪ Funding for technology development and demonstrations |

## 5.4 Anticipated Panel Deliverables

| FY 07 Deliverables | FY 08 Deliverables |
|---|---|
| 1. Conduct industry meetings/workshops to develop input for gap analysis<br>2. Conduct gap analysis<br>3. Draft strawman technology roadmap | 1. Conduct technology workshops to identify and further refine candidate technologies for closing the gap and meeting the goals.<br>2. Complete environmental technology investment portfolio. |

## 5.5 Members and Affiliation

| Name | Organization |
|---|---|
| **Chair – Kestutis Civinskas** | NASA |
| **Co-Chair – Joe Posey** | NASA |
| Edward McQueen | FAA AEE |
| Jim Skalecky | FAA AEE |
| Arthur Rypinski | OST |
| Bradley Smith | DoD |
| Dan Allyn | Boeing |
| Willard Dodds | GE |
| Crystal Harmon | P&W |
| David Jensen | FedEx |

# 6. Policy Panel Work Plan

## 6.1 High-Level Assignments

- Support the planning, design, and implementation of approaches consistent with environmental management systems to support national and international harmonization of aviation environmental management. This includes the development of overarching policies, targets, system models, and communications mechanisms. (Policy Leads, interacting with Tools and Science/Metric Panels, & Secretariat)
- Support the development of innovative policy options and other incentives to support EIPT environmental targets. Develop proposed guidance and policy for other IPTs and EIPT panels and formalize their output in policies. (Policy Leads, interacting with Tools and Science/Metric Panels, & Secretariat)

## 6.2 Objectives and Requirements

### *NGATS Drivers/Rationale*

- Provide Environmental Protection that Allows Sustained Aviation Growth
- Allow Expansion of the NGATS while Ensuring Environmental Protection Measures are Met
- Ensure the Appropriate Environmental Approach is Established at the National Level and Harmonized Globally

### *Outcomes*

- A unified aviation environmental policy to guide the national program to reduce substantial aviation environmental impacts to sustain growth.
- An environmental management systems approach to improve environmental performance to support the goal of absolute reduction of impacts.
- Innovative policy options (e.g., market-based, land use options) to address environmental impacts.

## 6.3 Achievements, Out-Year Plans, and Challenges

| FY 06 Achievements | FY 07 Plans | FY 08 Plans | Potential Road Blocks |
|---|---|---|---|
| • Developed a plan for applying environmental management systems (EMS) approach for NGATS<br>• Proposed continued, but modified, Federal research role and funding in FAA reauthorization.<br>• Drafted legislation for Administration's aviation environmental proposals for FAA reauthorization<br>• Continued review of new financing schemes to develop and implement noise and emissions abatement technologies and operational measures, and included new schemes in FAA reauthorization.<br>• Explored ideas and community strategies to encourage good land use and zoning practices and improve community relations around airports, and included land use proposals in FAA reauthorization.<br>• Continued near-term mitigation strategies to reduce environmental impacts | ▪ Prepare "report card" on EMS approach and refine approach as necessary<br>▪ Support environmental legislative proposals through Administration and Congressional consideration<br>▪ Complete review of policy implications of interdependent models/tools on aviation noise and emissions regulations<br>▪ Complete draft environmental policy document for long-term aviation environmental improvements, including 2025 targets<br>▪ Support near-term airport compatibility improvements, both administrative and in FAA reauthorization,, with Airport Compatibility Planning Committee and NASAO.<br>▪ Reach agreement on new financing schemes to develop and implement noise and emissions abatement technologies and operational measures | ▪ Refine EMS approach and correct as necessary<br>▪ Monitor and assist implementation of measures promulgated in FAA reauthorization, and provide preliminary report card on effectiveness.<br>▪ Review policy implications of R&D achievements and provide options for integrating benefits into NAS<br>▪ Finalize and issue environmental policy document for long-term aviation environmental improvements.<br>▪ Pursue most promising compatible land use initiatives with Airport Compatibility Planning Committee and NASAO<br>▪ Provide policy platform to support effective integrated use of interdependent models/tools on aviation noise and emissions<br>▪ Explore climate change initiative for aviation | ▪ The level of agencies commitment to unified and integrated aviation environmental policy<br>▪ Resources: Focused participation on Policy Panel by key players, and coordination within agencies and organizations<br>▪ Problems with timely and efficient senior level interface and decisions, and interface with other panels and IPTs<br>▪ Volume of work |

## 6.4 Anticipated Panel Deliverables

| FY 07 Deliverables | FY 08 Deliverables |
|---|---|
| 1. A draft aviation environmental policy to guide the national program to reduce substantial aviation environmental impacts to sustain growth.<br>2. An environmental management systems approach to manage and improve environmental performance to support the goals of NGATS.<br>3. Enactment of new legislative provisions in FAA reauthorization. | 1. A final aviation environmental policy for long-term aviation environmental improvements for NGATS.<br>2. Innovative policy options (e.g., market-based, land use options) to address environmental impacts.<br>3. Policy platform to support effective integrated use of interdependent models/tools for aviation noise and emissions. |

## 6.5 Members and Affiliation

| Name | Organization |
|---|---|
| **Chair – Lynne Pickard** | **FAA AEE** |
| **Co-Chair – TBD** | |
| Paul DiBenedetto | FAA AEE |
| Aimee Fisher | FAA AEE |
| Laurie Fisher | FAA AEE |
| Patty Friesenhahn | FAA AEE |
| Matt McMillen | FAA AEE |
| Edie Parish | FAA ATO |
| Melissa Wishy | FAA ATO |
| Ralph Thompson | FAA ARP |
| Carol Ginty | NASA |
| Camille Mittelholtz | OST |
| Ted Boling | CEQ |
| David Asiello | DOD – OSD |
| Eric Strassler | EPA |
| Steve Alterman | Cargo Airlines Assoc. |
| Howard Aylesworth | AIA |
| David Cross | National Association of State Aviation Officials |
| Jeffrey Gilley | NBAA |
| Betty Hawkins | ATA |
| Dennis McGrann | NOISE |
| John Putnam | Kaplan, Kirsch, Rockwell |
| David Schaffer | JPDO, Policy Division |
| Tyler Setchell | AAAE |
| Jessica Steinhilber | ACI |
| Claudio Ternieden | Water Env Research Foundation |
| Darcy Zarubiak | Leigh Fisher Assoc. |

# 7. Panel Interactions

There are significant interdependencies between Panels. There is a need for information and/or data to be transferred from one Panel to another, and many areas of overlapping and/or joint responsibility among Panels. Continued development and evolution of Operational Improvement (OI) Pre-Implementation Plans (PIPs) for the EIPT will provide a road map of interdependencies between individual Panel activities and research initiatives and will serve to illustrate prerequisite activities needed to achieve environmental Operational Improvements. The Secretariat will be working with the Panels to identify and mature the environmental OIPIPs for future versions of the EIPT Work Plan document.

# 8. Next Steps

The five Panels, in coordination with the Steering Group, have made great progress defining the initial work plans to this point. However, more definition will be needed to complete subsequent versions of the work plans and identify all work elements necessary to achieve the goals of the EIPT and the JPDO.

- END -