

AEDT-APMT Workshop Series

OVERVIEW

Presented to: AEDT-APMT Workshop #4

By: Dr. Lourdes Q. Maurice

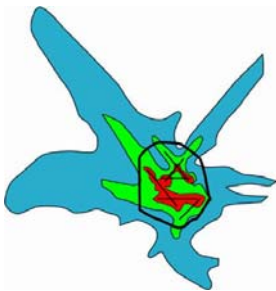
Date: December 6-8, 2006



Federal Aviation
Administration



Aviation Environmental Issues



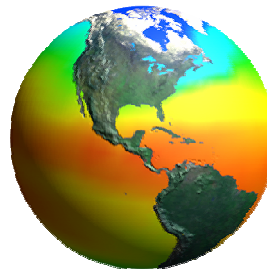
Community Noise Impacts

Limiting or reducing significant aircraft noise impacts around airports



Water Quality

Limiting or reducing impact of aviation on water quality



Global climate

Understanding and addressing impact of aviation on global climate



Air Quality

Limiting or reducing impact of aviation on local air quality



Environmental Goals



Work with local governments and airspace users to provide capacity in the United States airspace system that meets projected demand in an environmentally sound manner

http://www.faa.gov/about/plans_reports/



Environmental Protection that Allows Sustained Aviation Growth -- community noise and local air quality emissions from aviation that significantly impact human health and welfare **reduced in absolute terms**

<http://www.jpdo.aero>



FAA Flight Plan Environmental RE&D Initiatives

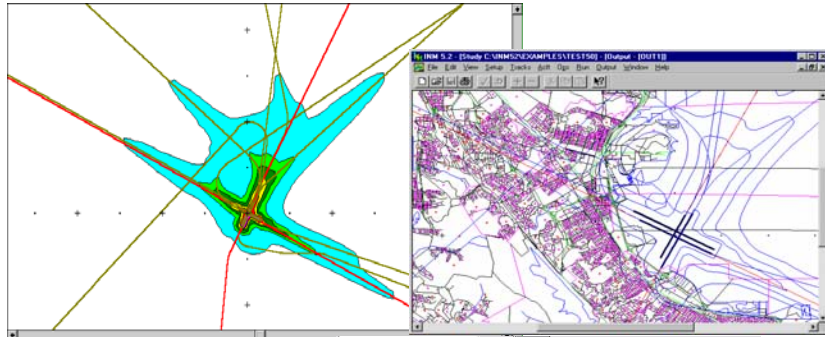


Conduct research and develop, verify, and validate analytical tools to better understand the relationship between noise and emissions and different types of emissions, and to provide the cost benefit analysis capability necessary for data-driven decision making.

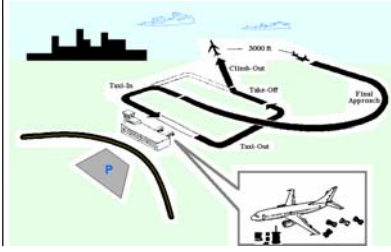


Where we started: local applications

Individual Airport Noise Contours & Emissions Inventories/ Concentrations



3000 ft



Receptor Name	X (meters)	Y (meters)	Concentration (µg/h)	Elevation (meters)	Height (meters)	Averaging Period	Source Group	Date/Time
Receptor 1	498.81665	1688.49203	22.73618	13.41	2.13	1-HR	ALL	02/02/1996 04:00 AM
Receptor 1	498.81665	1688.49203	8.89725	13.41	2.13	1-HR	ALL	02/01/1996 12:00 AM
Receptor 1	498.81665	1688.49203	5.81099	13.41	2.13	1-HR	ALL	02/01/1996 01:00 AM
Receptor 1	498.81665	1688.49203	4.14971	13.41	2.13	1-HR	ALL	02/01/1996 02:00 AM
Receptor 1	498.81665	1688.49203	3.66566	13.41	2.13	1-HR	ALL	02/02/1996 04:00 AM
Receptor 1	498.81665	1688.49203	3.07594	13.41	2.13	1-HR	ALL	02/01/1996 11:00 PM
Receptor 1	498.81665	1688.49203	3.10159	13.41	2.13	1-HR	ALL	02/02/1996 04:00 AM
Receptor 1	498.81665	1688.49203	2.80075	13.41	2.13	1-HR	ALL	02/02/1996 05:00 AM
Receptor 1	498.81665	1688.49203	2.52000	13.41	2.13	1-HR	ALL	02/04/1996 12:00 AM
Receptor 1	498.81665	1688.49203	2.47452	13.41	2.13	1-HR	ALL	02/03/1996 03:00 AM
Receptor 1	498.81665	1688.49203	2.11021	13.41	2.13	1-HR	ALL	02/01/1996 10:00 PM
Receptor 1	498.81665	1688.49203	2.07827	13.41	2.13	1-HR	ALL	02/03/1996 02:00 AM
Receptor 1	498.81665	1688.49203	2.06971	13.41	2.13	1-HR	ALL	02/01/1996 05:00 AM
Receptor 1	498.81665	1688.49203	1.88820	13.41	2.13	1-HR	ALL	02/04/1996 05:00 AM

1978

2004

Workshop Series Overview
December 6-8, 2006



Federal Aviation Administration

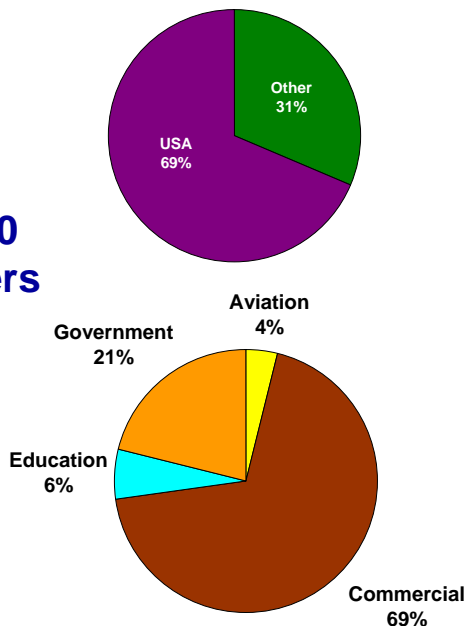
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EDMS User Base INM

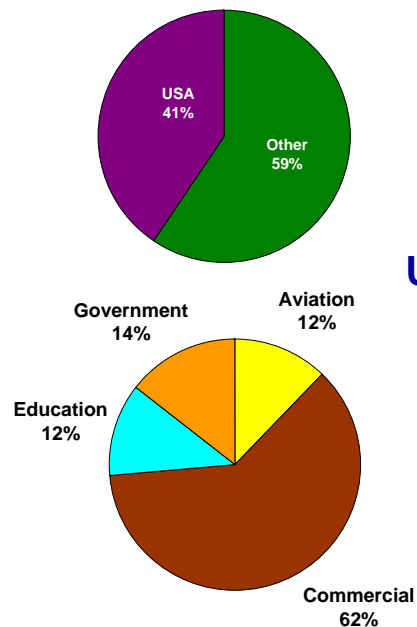
Emissions Dispersion Modeling System

Integrated Noise Model

500 Users



1011 Users



Workshop Series Overview
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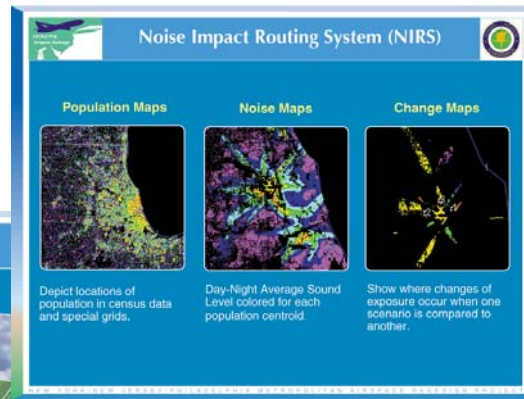
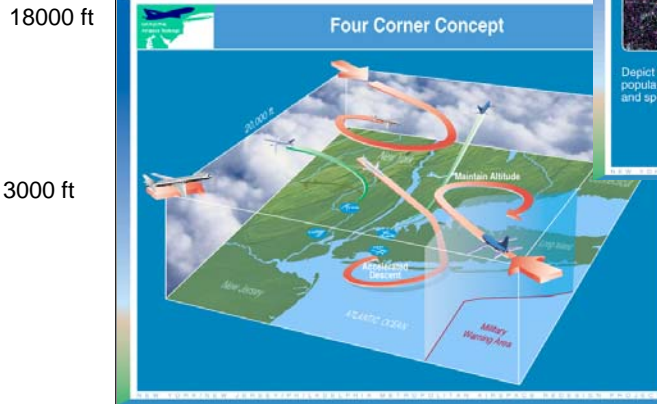


Federal Aviation Administration

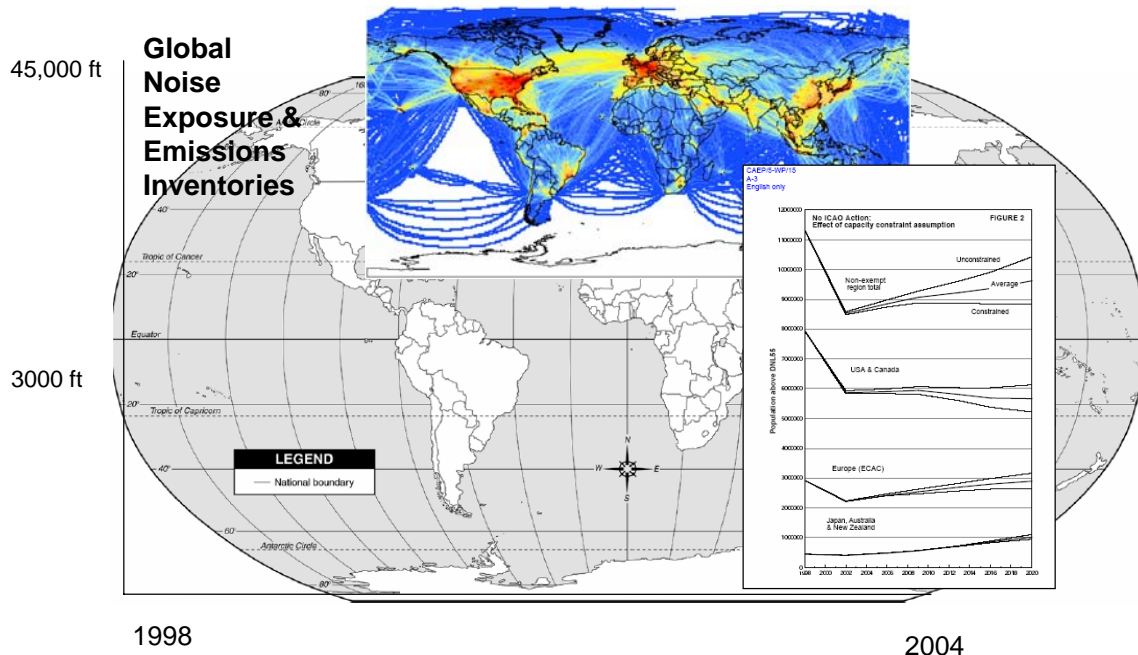
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Where we started: airspace applications

Assess impacts of airspace redesign and benefits of mitigation options

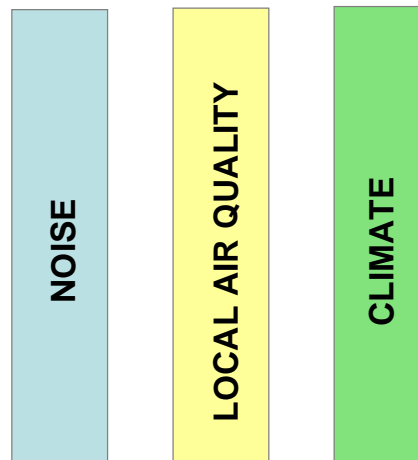


Where we started: global applications

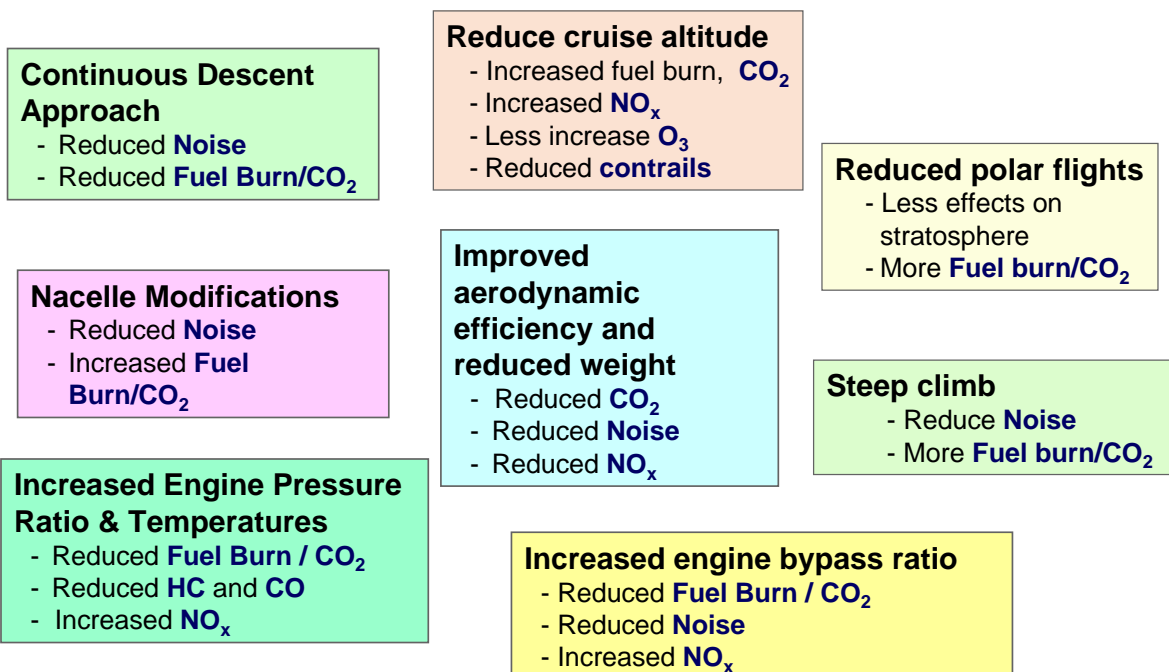


Where we wanted to go: drivers

- Great progress reducing environmental impact of aviation
- However – despite interrelationships between noise and emissions and amongst emissions, these environmental impacts addressed in “stove pipes”



Environmental Interrelationships



Where we wanted to go: drivers (cont.)

- **Delivering continuing improvements necessitates interdisciplinary analyses approach driven by interrelationships among various emissions and noise**
- **Economic considerations vital to a robust analyses**
- **Design advances and increasing computing power offer tremendous possibilities (& challenges!) for new approaches**



Definitions of New Tools

Environmental Design Space (EDS) An aircraft systems model that integrates engine and aircraft design with aircraft operations to examine environmental performance and technology development providing a single source of aircraft data to AEDT.

Aviation Environmental Design Tool (AEDT) Merging of existing tools and new modules into both a publicly available, regulatory/planning component (**Local**) and the policy component of AEDT (**Global**).

Aviation Environmental Portfolio Management Tool (APMT)
The environmental impact and economic analysis capability to be integrated with AEDT and EDS.



Our Objectives

- **Integrated aviation environmental analyses to:**
 - Help Improve Government Policies
 - Foster Better Industry Understanding and Operations
 - Inform general public



TRB Study Objectives

- To assist the FAA to accomplish its interdisciplinary environmental modeling objectives
- The focus of the Committee is on all relevant FAA environmental modeling activities
- Solicit input from the potential users, including planners, consultants, operators, manufacturers, environmentalists, and researchers on the FAA's plans to develop integrated environmental analyses tools, including an economic capability
- Summarize comments to enable FAA to refine the conceptual foundations of tool set and to formulate a comprehensive work plan, including schedule and budget
- Provide independent assessment from the aviation policy, operations, manufacturing, environmental, and research communities on the approach and work plan to develop the tools



TRB Workshop Series



March 21 – April 2, 2004, Workshop #1
 FAA Aviation Environmental Design Tool (AEDT)

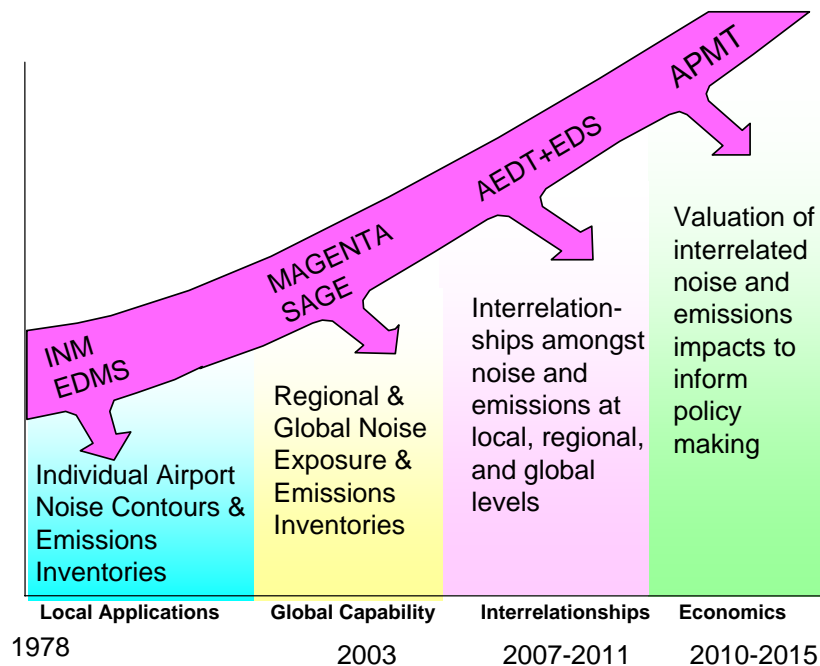


August 24 – August 26, 2004, Workshop #2
 Aviation Environmental Design Tool (AEDT) and
 Aviation Portfolio Management Tool (APMT)

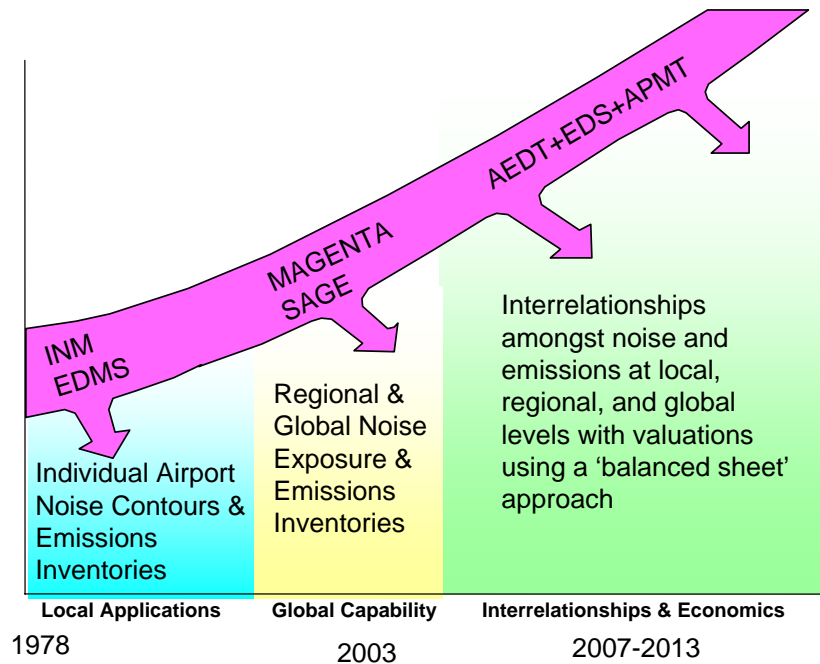


January 31 – February 2, 2005, Workshop #3
 Aviation Portfolio Management Tool (APMT)

Tool Suite Evolution – Pre TRB Workshops



Tool Suite Evolution – Post TRB Workshops



Workshop #4 Desired Outcomes

- **Communicate progress developing FAA/AEE integrated environmental analyses tool suite to our stakeholders**
- **Get informal feedback on direction of development and assessment efforts**
- **Discuss potential implications of our modeling capabilities**
- **Conclude TRB effort**



Agenda

Wednesday, December 6, 2006

1:00pm-1:15pm	Welcome Session , Christine Gerencher/Wesley Harris
1:15pm-2:00pm	Opening Remarks , Carl Burleson AEDT/APMT Workshop Series Overview , Lourdes Maurice
2:00pm-2:45pm	Motivation and Tools Overview , Lourdes Maurice
2:45pm-3:00pm	<i>Break</i>
3:00pm-5:00pm	Individual Tool Overviews <ul style="list-style-type: none">• AEDT Overview, Gregg Fleming• Environmental Design Space (EDS) Overview, Dimitri Mavris• APMT Overview, Ian Waitz



Agenda (continued)

Thursday, December 7, 2006

7:30-8:30am	<i>Continental Breakfast</i>
8:30am-10:15am	Introduce Capability Demonstrations and Sample Problems , Ian Waitz <ul style="list-style-type: none">• AEDT NOx Sample Problem, Ted Thrasher• AEDT CDA Sample Problem, Eric Dinges
10:15am-10:30am	<i>Break</i>
10:30am-12:00pm	<ul style="list-style-type: none">• RVSM Sample Problem, Gregg Fleming• Derated Takeoff Capability Demonstration, Ian Waitz
12:00pm-1:00pm	<i>Lunch</i>



Agenda (continued)

Thursday, December 7, 2006	
1:00pm-2:30pm	AEDT/APMT Capability Demonstrations <ul style="list-style-type: none"> • Overview, Ian Waitz • EDS Vehicle Technology Trade Spaces, Michelle Kirby
2:30pm-2:45pm	Break
2:45pm-4:30pm	AEDT/APMT Capability Demonstrations (Continued) <ul style="list-style-type: none"> • Economic Component, Richard Hancox • Environmental Effects, Ian Waitz
4:30pm-5:00pm	Summary and Next Steps , Lourdes Maurice



Agenda

Friday, December 8, 2006	
7:30-8:30am	Continental Breakfast (Room 100)
8:30am-10:15am	Session Break-Outs The workshop participants will meet briefly in break-out sessions on the following topics to discuss & develop questions to bring forward to the plenary <ul style="list-style-type: none"> • EDS (Room 100) • APMT (Room 109) • AEDT (Room 110)
10:15am-10:30am	Break (Refreshments provided in Room 100)
10:30am-12:00pm	Plenary Feedback Discussion (Room 100) , Mary Vigilante Closing Remarks , Carl Burleson/Wesley Harris
12:00pm	Conclusion of Workshop

