AIR TRANSPORT GROWTH AND ENVIRONMENTAL IMPACT

- Fastest growing transport mode (~4%/yr -> doubling in 20 yrs)
- Only mode with direct emissions deposition at altitude
- Global, regional, and local effects being recognized as important
- Currently only local air quality addressed through certification standards, but desire to reduce aviation emissions intensifying
- Important to know which options are effective in mitigating environmental impacts while meeting increased air travel demand and providing cost-effective solutions for industry

OBJECTIVE

"Internationally accepted computer model used for estimating aircraft emissions and evaluating the effects of different policy and technology scenarios on aviation-related emissions, costs, aircraft performance, and industry responses."

- Implementation of new aircraft technology
- Improvements to air traffic control/airspace capacity
- Enhancements to airport infrastructure
- Improvements in aircraft operations

MIT ROLE

- Build fuel burn and emissions components
- Assess uncertainties associated with data used, and performance, fuel burn and emissions predicted
- Use SAGE to analyze one or two important aviation policy questions

PROGRESS

- Years 2000-02 emissions inventories complete
- Aggregate fuel burn results in good agreement (to less than 10% difference) with measured data
- Takeoff gross weight, wind, and aerodynamic and engine performance as largest sources of error
- Continued model assessment for improvement
- Policy scenario analysis on-going

What are the recent/future trends in fuel consumption and emissions performance of world fleet and what are their technological, operational and economic drivers?

What are the environmental benefits of operational initiatives such as de-rated takeoff, Continuous Descent Approach (CDA), and Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM)?

What/how large are uncertainties in complex computer models, and how should they be treated in policy-making processes?