Implications of Environmental Requirements for NextGen

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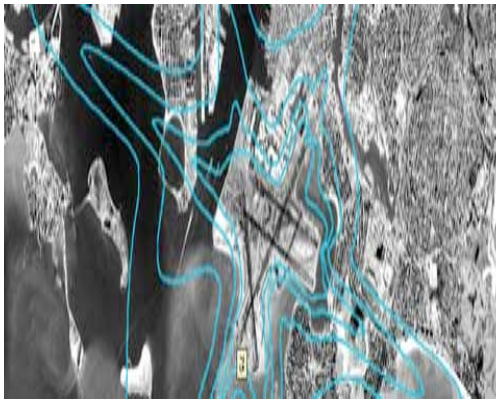
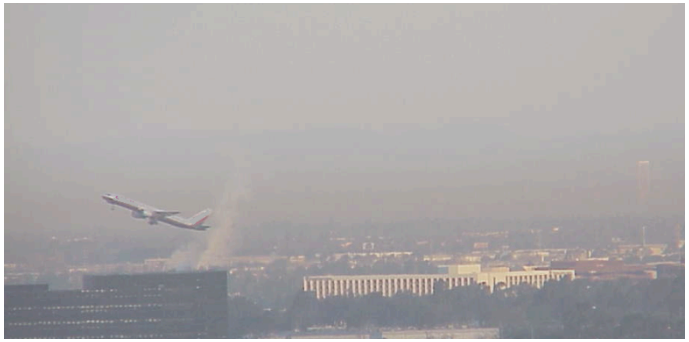
Aviation & The Environment - The Issues

Community Noise Impacts



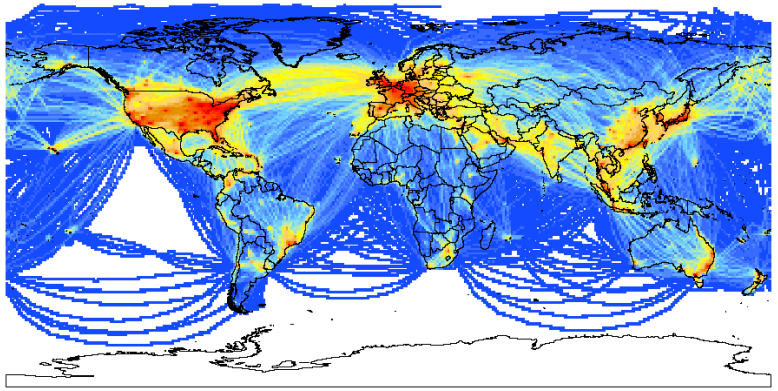
Energy

Air Quality



Water Quality

Global Climate



NextGen Environmental Challenges

NextGen goal to enhance mobility is dependent upon addressing & mitigating aviation environmental impacts & dealing with related energy issues

NextGen environmental goals

- Absolute reduction of significant ***community noise*** and ***air quality*** impacts
- Improve National Airspace System (NAS) ***energy*** efficiency and, supply of and access to, alternative fuel sources
- Limit or reduce the impact of aviation on the ***global climate***
- Reduce significant aviation impacts associated with ***water quality***

5-Pillar approach to develop solutions

1. Improved science and modeling,
2. **Accelerated ATM improvements,**
3. New technology,
4. Renewable fuels, and
5. Policy initiatives (including the NextGen Environmental Management Systems (EMS)

Pillar 2: Operational Improvements

Operational improvements can lead to near to mid-term environmental benefits

- Numerous NextGen operational improvements expected
- Involve many integrated systems
- ***Require appropriate environmental review***

If environmental reviews are not adequately planned they can slow implementation of NextGen actions

There are multiple challenges to environmental reviews for NextGen operational improvements.

Environmental Review Challenges

Many NextGen operational changes will likely require limited environmental review, but the reviews:

- Need to be done
- Need to be done well and consistently, and
- Require sufficient resources

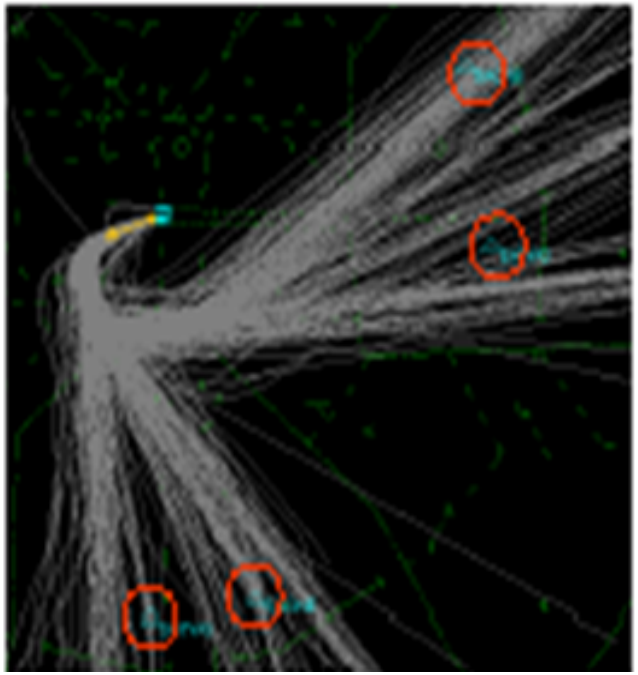
Sheer Volume of procedures will exacerbate technical challenges associated with environmental review

- New and more concentrated noise resulting from new procedures (e.g., more direct routings, Area Navigation (RNAV)/Required Navigation Performance (RNP))
- Increased capacity (and impacts) as a result of efficiency gains
- How to geographically and temporally group the environmental analyses of the expected operational changes
- Considering Greenhouse Gases (GHGs) and emerging policies as well as “traditional” noise and air quality impacts

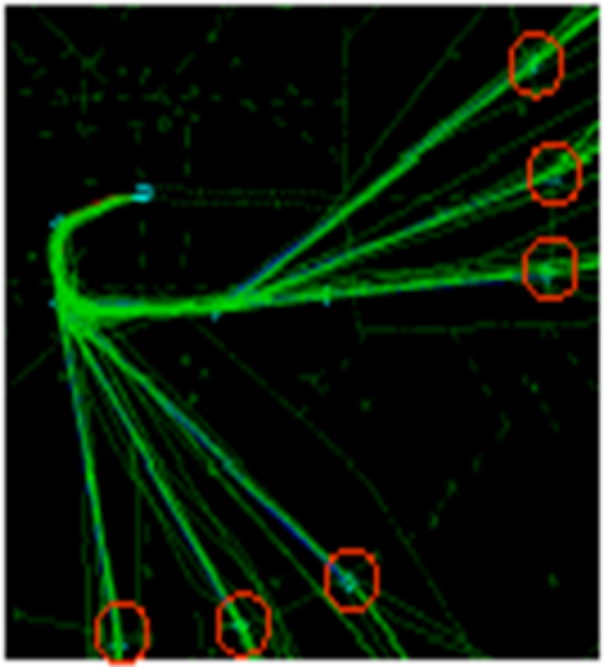
New and More Concentrated Noise

RNAV/RNP is a central tenet of NextGen operational changes that would allow aircraft to maintain precisely defined flight paths approaching a runway.

Before



After

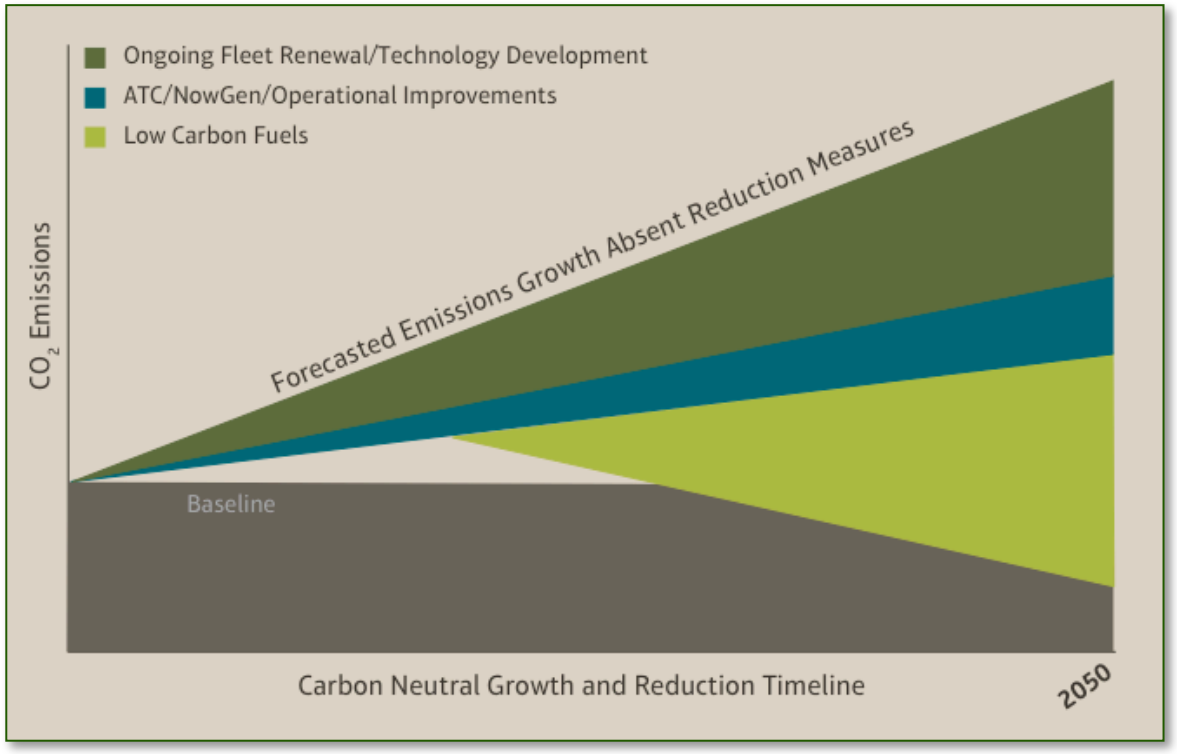


- More precise navigation can reduce fuel burn/ emissions and noise exposure
- Concentration of flight tracks could also increase noise exposure in some areas
- Could also effect surface air quality concentrations

Increased Capacity v Efficiency Gains

Many operational improvements will results in efficiency gains, which may be followed by capacity increases

- The challenge is enhancing mobility while reducing environmental impacts in absolute terms



Geographic and Temporal Grouping

The National Environmental Policy Act (NEPA) requires projects related in space and/or time be considered together for their cumulative impacts on the environment, and not segmented into multiple smaller projects.

NextGen involves a complex set of inter-related actions that must be carefully considered spatially and temporally:

1. Environmental reviews will need to group together as many related actions as foreseeable in order to evaluate their cumulative environmental impacts as well as for efficiency of analyses -> *Effectively grouping the expected volume of operational and other NextGen changes (e.g., airport related) will be a major challenge*
2. Large-scale, protracted NEPA assessment could delay the start of other projects -> *The Environmental Impact Statement for the NY/NJ/PHIL airspace redesign took 10 years*
3. Additional actions within a region where environmental review has been completed would require re-evaluation of impacts or supplemental analyses.

Greenhouse Gases

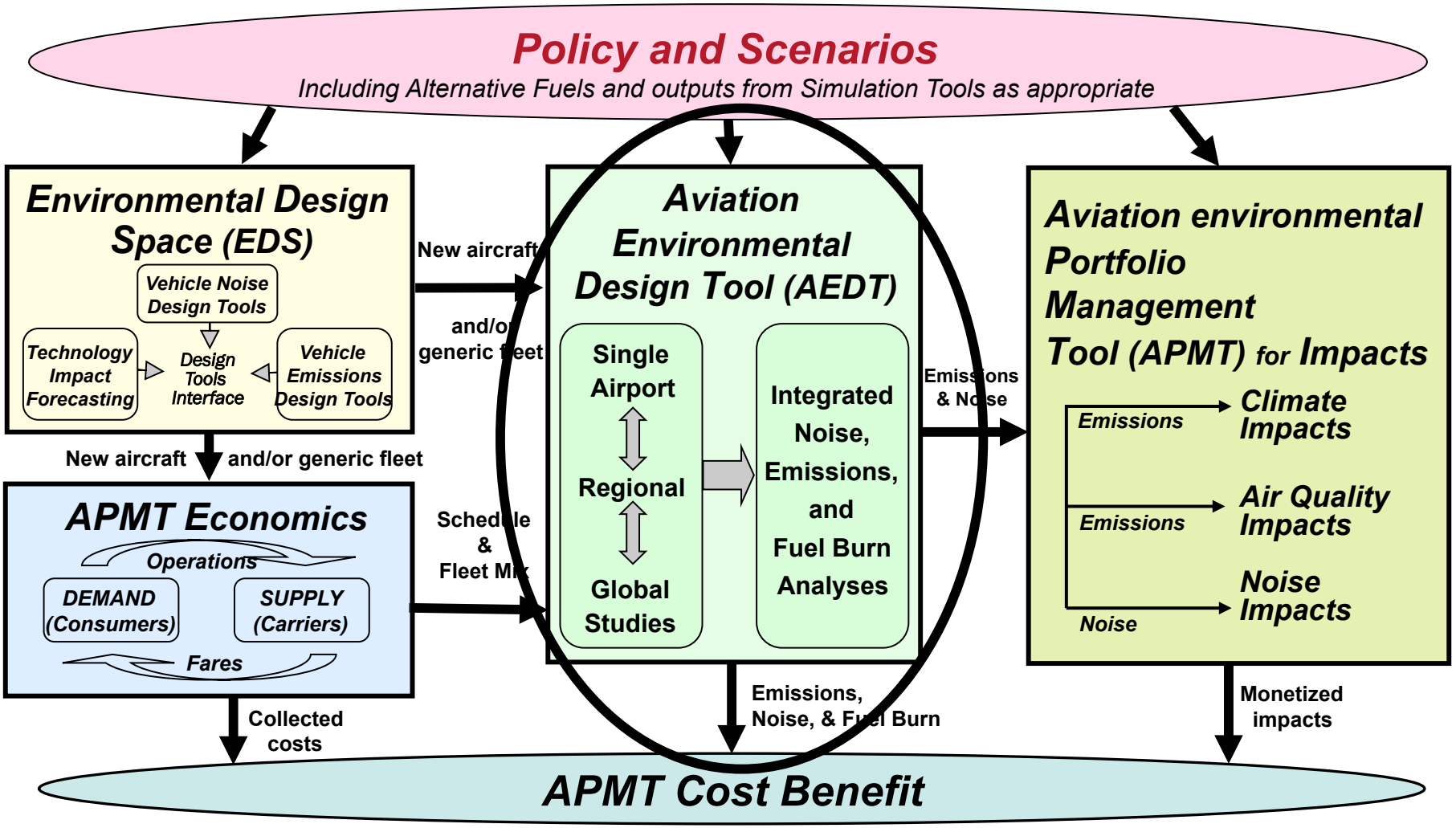
GHG policies are evolving on three fronts:

1. EPA regulation of GHGs as a criteria pollutant under the Clean Air Act
2. Congress considering cap-and-trade
3. International action

Options for considering GHGs within NextGen are complex:

- **Project-by-project** basis puts burden on individual project managers and may lead to redundant and inconsistent efforts.
- **Programmatic** evaluations regionally or nationally would be complex and abstract.

Aviation Environmental Analytical Capability



EDS = Environmental Design Space • AEDT = Aviation Environmental Design Tool • APMT = Aviation environmental Portfolio Management Tool

Our Next Steps

•Develop a "Roadmap" for ongoing compliance with NEPA and other environmental requirements while rolling out components of NextGen

•Identify special factors that, as a result of the scale of NextGen, experience with air traffic redesigns, or other reasons, could impact the environmental review process

•Identifying approaches (including analytical capability) to effectively manage the environmental review process and facilitate NextGen

Undertaking comprehensive assessment of total environmental impacts and implementation considerations