The #1 Environmental Issue at Most Airports
- Noise remains the most clearly identifiable impact on local communities.
- The environmental issue most likely to mobilise a local community against infrastructure or capacity expansion, giving rise to operational restrictions and constraints on growth.
- The problem is international. Aircraft noise standards are set internationally. Noise curfews in one region can have the effect of imposing night time noise on another region.

Managing Growth
Growth in Demand – Passengers, Flights, Freight…
Increased Airport Activity
- Congestion
- Need for New Infrastructure – Terminals, Runways…
- Planning Application for Expansion
- Project Delays, Mitigation Requirements, Cost Blowouts, Limited Permits, Permits Declined

Three Keys Component to Airport Noise
1. Aircraft Noise Management
2. Land Use Planning
3. Community and Communications
   >> Next speaker - Jim Carden
   - But keep in mind what are the actions an airport operator can take

Aircraft Noise Management
- Advancing aircraft noise technology
- Operational Procedures
- Noise Abatement Procedures
- Air Traffic Management
- Preferential runway usage
- Noise Preferential Routes (NPR)
- Operational Restrictions
- Curfews
Aircraft Noise Technology

Technology Considerations
- Airports cannot necessarily choose which aircraft land. CAA might ban Ch2 or other aircraft. Landing fees can incentivize low noise aircraft.
- The UN Agency, ICAO, write Aircraft Noise Certification Standards – currently Chapters 2, 3 and 4, with Ch 5 in development.
- The manufactures develop the technology and the airlines buy the aircraft – no role for airports.
- Possible noise trade-offs with future low fuel aircraft.

Noise Abatement Operational Procedures (NAP)
- Preferential runways or track usage
- Noise sharing
- Dispersed vs concentrated flight tracks
- Noise abatement take-off and approach procedures
- Reduced thrust take-off
- Displaced take-off and landing thresholds
- Continuous descent approach

NAP Considerations
- Operational procedures to reduce noise impacts should be developed in close consultation with stakeholders – airlines, ATM, communities, local government.
- Local conditions can vary greatly (dispersed tracks vs strict adherence to tracks).
- Usually airports can only monitor activity and encourage operators to use NAPs.
- Noise procedures (e.g., noise sharing) can have adverse effects of emissions and fuel burn.

Operational Restrictions
- Any noise-related action that limits or reduces an aircraft’s access to an airport.
  - Global, Aircraft-specific, Partial, Progressive
  - Cap rules – max number of ops
  - Noise quota, noise budget
  - Night-time restrictions
  - Curfews

Land Use Planning
- Invariably, local government or territorial authorities have jurisdiction over Land Use.
- Airports must work with local authorities to ensure that only noise compatible land use is developed in areas affected by current and future aircraft noise.
- Projected noise level contours must take into account – traffic growth, fleet composition, future infrastructure etc.
- Defining and updating zoning around airport
- Legislation/guidance to ensure appropriate land use
- Mitigation – building codes, sound insulation (and ventilation), disclosure, acquisition
- Sound insulation of existing and new housing is only a partial solution.
Land Use Planning - Extremes
- Wellington International Airport, New Zealand

Land Use Planning
- Wellington International Airport, New Zealand

Land Use Planning
- Narita International Airport, Japan

Land Use Planning
- Narita International Airport, Japan

Airport Best Practice
- Aircraft noise related landing fee
- Airline and ATM consultation – NAP
- Land Use Planning – work with local government
- Noise Monitoring
- Community Relations
- Complaints Management
- Communications – Publications, Website, Meetings
- Community Outreach – Education, Projects

Noise Related Landing Charges
- Narita Airport uses the ACI Noise Rating Index

<table>
<thead>
<tr>
<th>Categories of Narita Aircraft Noise Rating Index</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge Rate (JPY per tonne)</td>
<td>1.650</td>
<td>1.750</td>
<td>1.850</td>
<td>1.950</td>
<td>2.050</td>
<td>2.100</td>
</tr>
</tbody>
</table>
Narita Aircraft Operations

Measurements and Monitoring
- Purpose – noise limits, community levels, noise charges
- Location – background vs aircraft noise, security
- Equipment
- Automation
- Individual aircraft event identification
- Interaction with radar data

Measurements and Monitoring
- Narita International Airport

Measurements and Monitoring
- Vancouver International Airport

Web based noise reporting

Sound Insulation
- Addresses Internal noise environment in homes and schools - No benefit for outdoor noise levels
- Climate/Construction issues – Canada vs Australia vs Jamaica
- Acceptable internal noise levels – Ldn/Leq vs Single event Lmax
- Ventilation - Doors and windows must be closed to provide sound insulation. Choice of residents vs providing alternative ventilation/air conditioning.
- Maintenance – seals, air conditioning, filters
- A noise landing fee can fund sound insulation projects
Sound Insulation
- Habitable rooms vs utility rooms
- Windows
- Doors
- Ceilings
- Thermal insulation
- Walls
- Chimneys
- Ventilation
- Cost sharing/Landing fee

Airport Best Practice
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THANK YOU
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