



# Managing Noise

Aircraft Noise Community Consultative Group

**Induction Day**

February 2023

## Purpose of Presentation

- Cover the roles and responsibilities between Airways, Airlines and Airports in noise management
- How the aviation industry contributes to noise abatement
- Specific initiatives for noise abatement at Auckland Airport
- Future opportunities

## International Civil Aviation Organisation (ICAO)

- Specialist agency of the United Nations responsible for the safe and orderly development of the world's aviation industry.
- Sets standards and international aviation regulations necessary for aviation safety, efficiency and regularity.

## Ministry of Transport

- New Zealand Government's principal transport advisor.

## Civil Aviation Authority of New Zealand

- Regulates civil aviation in New Zealand and incorporates/enforces ICAO's standards and regulations into NZ Civil Rules
- Develops Civil Aviation Rules (CARs) under the Civil Aviation Act 1990. Rules govern all aspects of aviation including certification of NZ airlines, airports and Airways NZ plus how all aircraft (including international carriers) manoeuvre in New Zealand.

## Auckland International Airport Limited

- Airports provide the infrastructure for aircraft to land and take off and facilities for processing passengers as they arrive and leave.
- An airport's main influence in respect of noise relates to its role in monitoring compliance to and reporting on the airport noise overlay areas, and the management of airline schedules.
- Auckland airport also provides noise mitigation packages to homes that qualify within the airport noise contours.

## Airways Corporation of New Zealand

- Airways Corporation of New Zealand (Airways) manages 30 million square kilometres of airspace, of which 7 million sq/km are within domestic skies, providing air traffic control, surveillance, communication, flight inspections, charting and airspace design services.
- Airways operate and manage the designated airspace under the Civil Aviation Rules, which are developed under the Civil Aviation Act, and monitors the compliance of airlines to these. This includes approaches, arrivals and departures at NZ airports.
- Airways holds a CAR Part173 procedure design certificate and ensures the conformance of airlines to all instrument flight procedures at NZ Airports

## Board of Airline Representatives New Zealand Inc (BARNZ)

- BARNZ is an incorporated society comprising of 24 member airlines, and aviation support companies such as ground handling, caterers and aircraft waste .
- BARNZ represents airlines in community consultations relating to aircraft noise, and works to enable aviation growth in a socially responsible and environmentally sustainable way.

## Airlines

- Each Airline uses navigation and procedure databases derived from information supplied by Airways NZ designers. These departure, arrival and approach procedures determine the paths over the ground and minimum altitudes to be flown.
- Each Airline sets Standard Operating Procedures (and train their pilots to use these SOPs) on how they want pilots to operate the aircraft: these may, and do, differ for each airline

## Pilots

- Ultimate responsibility for safe operation of aircraft.
- Follow airline procedures and recommended best practice, but retain operational authority and discretion to make final decisions regarding safe operation of their aircraft based on the specific operating conditions at the time.
- Pilots are expected and encouraged to adhere to standard operating procedure departures, (unless maintaining safety dictates otherwise).

## Auckland International Airport Limited

- Monitor compliance of the noise contours
- Work with airlines and Airways on arrival and departure schedules
- Community consultation to engage with the public, such as ANCCG
- Provide noise mitigation packages to qualifying homes within the noise contours

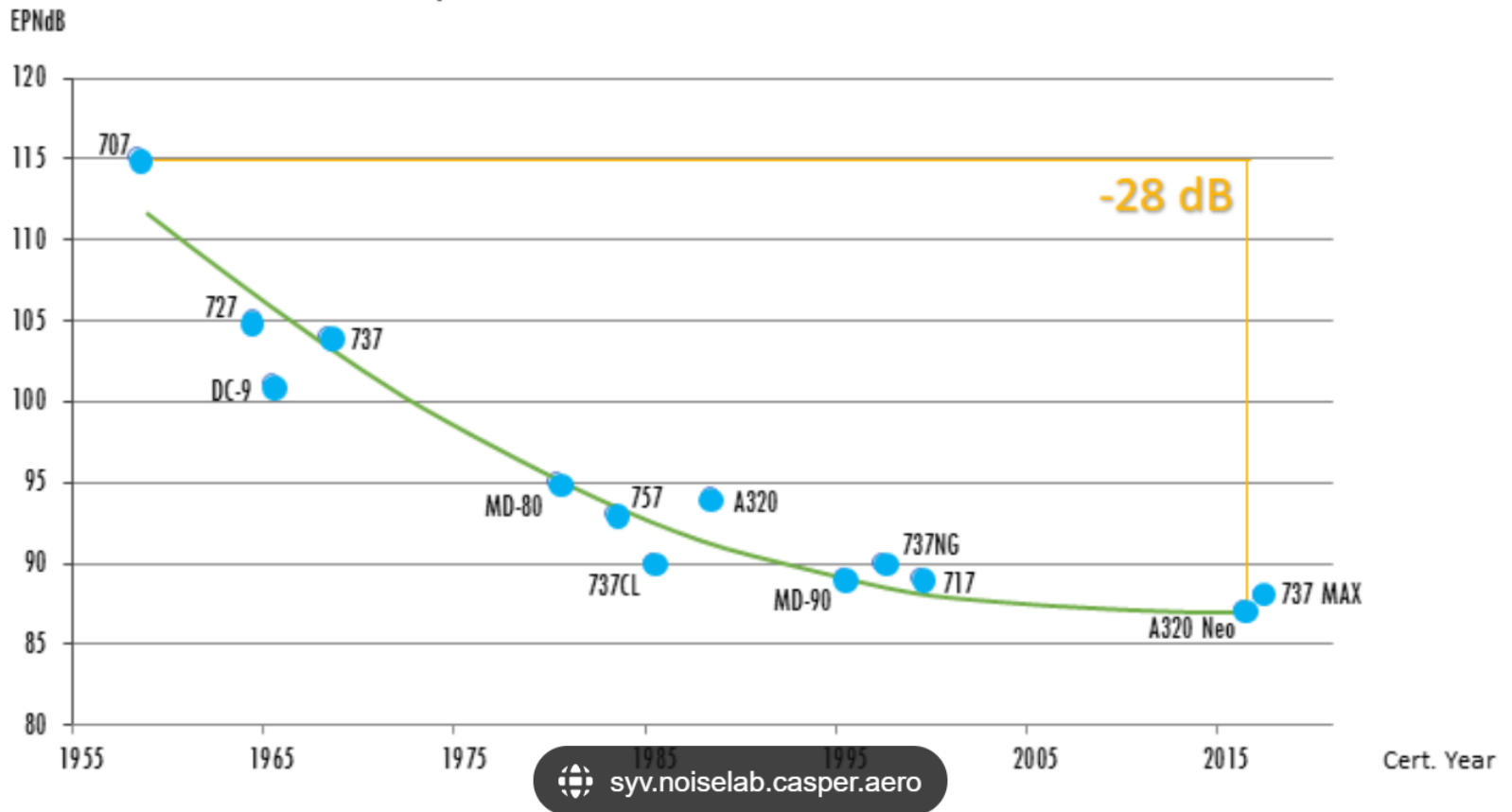
## Airways Corporation of New Zealand

- Work with airport and airlines to develop instrument flight procedures to support noise reduction benefits
- Implementing Performance-Based Navigation instrument flight procedures, including departures, arrivals, approaches that support noise reduction and environmental benefits
- Monitor compliance with noise abatement procedures (Civil Aviation Rules)

## Airlines

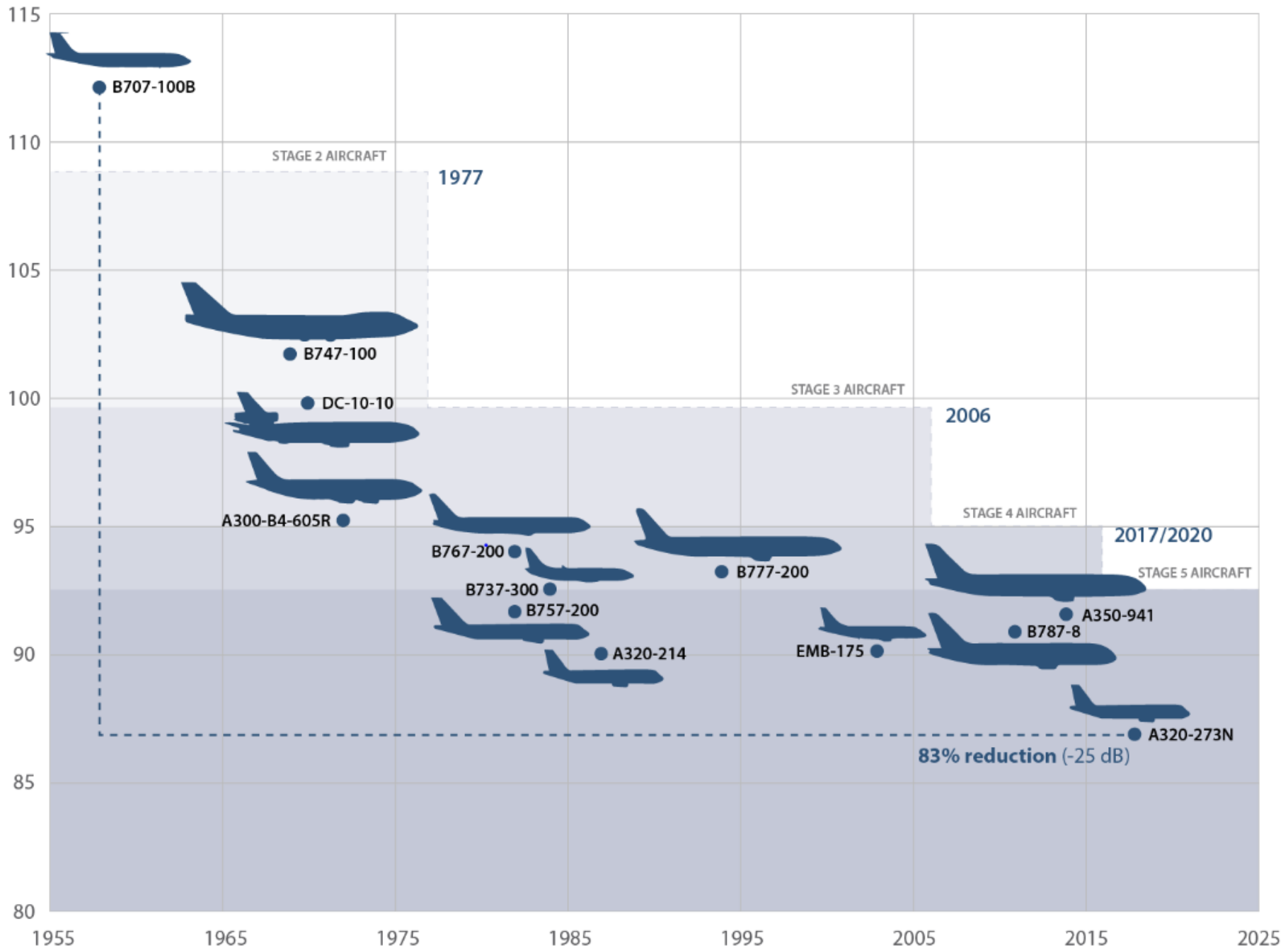
- Set approach, arrival and departure procedures for air crew (Designed by Airways NZ in compliance with CARs)
- Train air crew for noise abatement procedures, such as thrust reduction and flap retraction on takeoff, minimum altitude to lower undercarriage and guidelines for use of noise generating activity such as air brakes
- Examples – below 10,000ft aircraft speed must be below 250kt Indicated Airspeed unless otherwise directed by Air Traffic Controller. Aircraft must have undercarriage down no later than 2000ft and landing flap down by 1000ft.
- Best practice intent to manage aircraft speed without applying air brake. However high tailwind during approach may make this difficult to achieve.
- Fleet Investment– airlines continually invest in new aircraft models that have delivered quieter performance over the last 40 years (the following diagram is an example of this).
- Use of Noise Abatement Departure procedures – climb at fixed speed, reduce engine thrust and retract flaps at prescribed altitudes.

## Narrowbody Jet Sideline Noise Certification Measurements





# Aircraft Effective Perceived Noise in Decibels (EPNdB) Levels



## Pilots

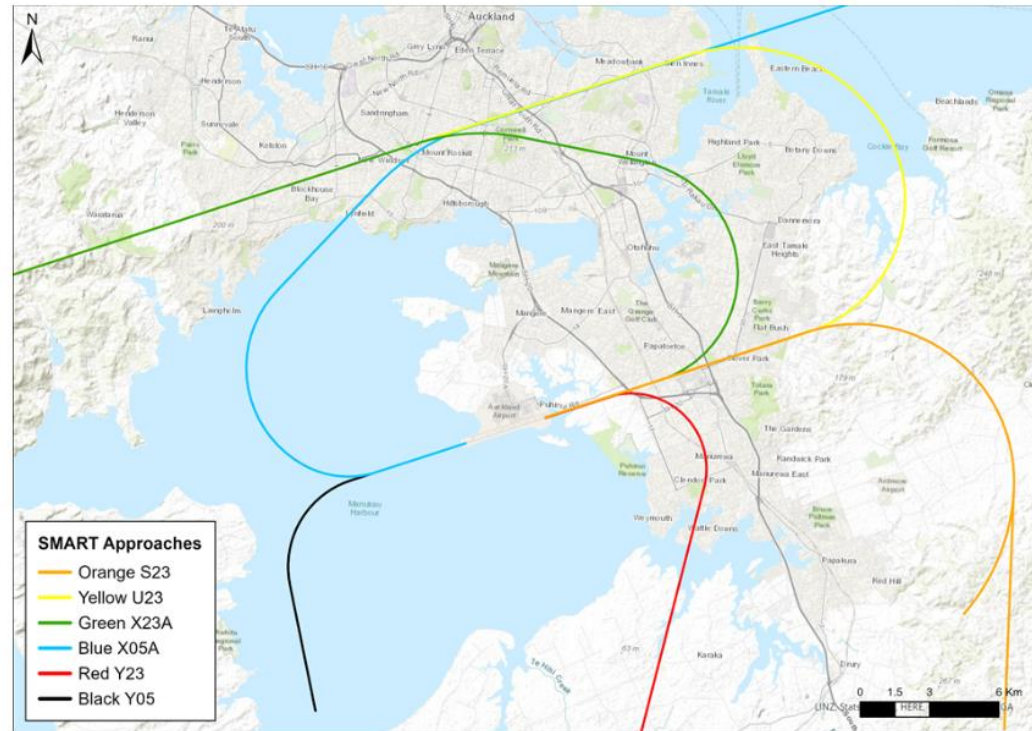
- Operational discretion allowed by pilots (altitude, speed etc) and often reflects airline standard operating procedures (SOPs).
- Managing the aircraft energy (speed/ altitude) to deliver a stable approach and safe landing is the prime objective. Operating techniques that deliver a quieter approach are typically more challenging for management of the aircraft energy for a pilot.
- Pilot performance monitored by airline using recorders of all aircraft parameters. The sole purpose is to enhance safety and recorded data is confidential (ICAO requirement). Airline looking for unstable approaches, exceedance of bank angle, adherence to company SOPs etc.
- If pilot breaches ATC instructions or some unusual event (called an occurrence) occurs then a report is filed to the CAA. All incidences must be reported to CAA of NZ. Serious occurrences can result in an investigation and in exceptional breaches of safety rules the airline or pilot can be prosecuted.

## Night STARS

- Specific flight paths have been designed for use at night which remove many flights from over central Auckland:
  - Brisbane Night Star crosses north of Auckland (also used by any North Australian flights)
  - Melbourne Night Star crosses South of Auckland (also used by any South Australian flights)
  - North American arriving flights cross north of Auckland in easterly wind conditions to use Runway 05
  - Early turn jet departure procedures implemented for domestic jets overnight to reduce overflight of South Auckland

## Performance Based Navigation (PBN)

- PBN uses satellite-based technology such as GPS to enable aircraft to fly directly between virtual waypoints, rather than between physical beacons. It enables smoother more efficient descent and climb of aircraft.
- Since 2009, New Zealand has been in the process of implementing PBN across the aviation system.
- Auckland's SMART Tracks are examples of PBN. SMART Tracks have more efficient smoother climb and descent paths, thus reducing aircraft noise compared with traditional stepped descents.



- Airways is commencing trialling an early morning departures route for narrow body flights to South Australia departing on Runway 05 (towards Manukau) in easterly wind conditions turning immediately after take-off back towards the Manukau Harbour, thus avoiding flying over South Auckland
- Depending on the results of this trial, it may be able to be extended to narrow body flights departing to Sydney
- Auckland Airport is working with the CAA on whether the height of LOSGA could be raised for night flights