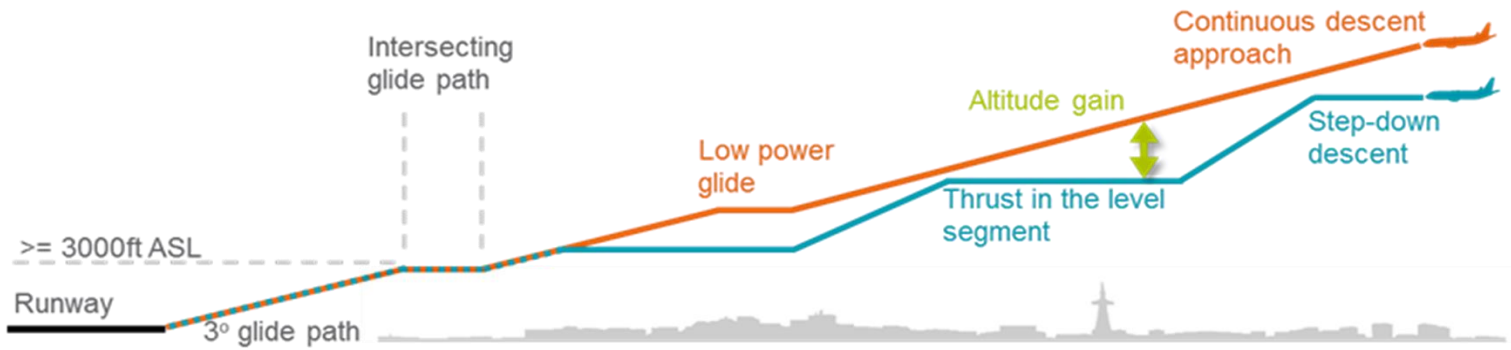
LOW NOISE ARRIVALS METRIC

NEX Meeting

15 June 2021

CONTINUOUS DESCENT OPERATIONS

- A Continuous Descent Operation (CDO), also known as a Continuous Descent Approach (CDA), is an approach procedure that allows continuous descent to the runway in a low drag configuration at near idle thrust, avoiding the need for extended periods of level flight.
- A CDO keeps aircraft higher at most stages of the descent compared to a conventional approach, and generally requires less power.
- The benefits of CDO include reduced noise, fuel burn and emissions during the arrival compared to a conventional step-down descent.



Gatwick AIP:

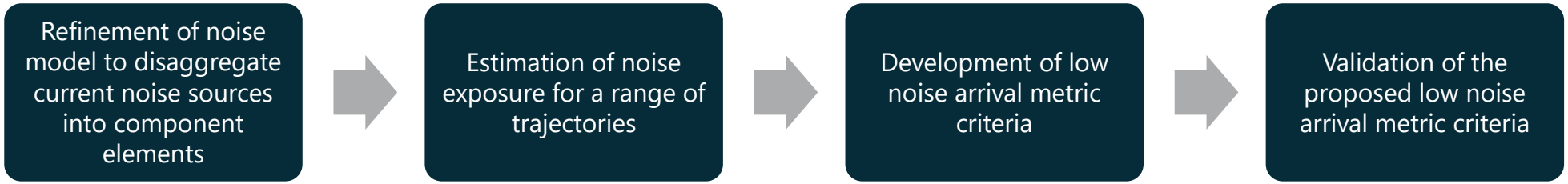
For monitoring purposes, a descent will be deemed to have been continuous provided that no segment of level flight longer than 2.5 nautical miles (NM) occurs below 7000 FT QNH and 'level flight' is interpreted as any segment of flight having a height change of not more than 50 FT over a track distance of 2 NM or more, as recorded in the airport noise and track-keeping system.

CONTINUOUS DESCENT OPERATIONS

- In 2017, preliminary research performed by CAA Environmental Research and Consultancy Department (ERCD) identified that the '*existing CDO definition was not sufficiently sensitive to provide an effective noise measure.*'
- The current CDO definition focuses on the avoidance of prolonged level flight. This presents the following issues:
  - It permits shallow angle approaches, which could be noisier at certain points on the approach compared to a traditional non-CDO approach.
  - For newer, more aerodynamically efficient aircraft types, it may constrain the delivery of optimal low noise arrivals as these aircraft may require periods of shallower descent or level flight during the initial approach (at higher altitude), to reduce speed and remain in a low power/low drag configuration.

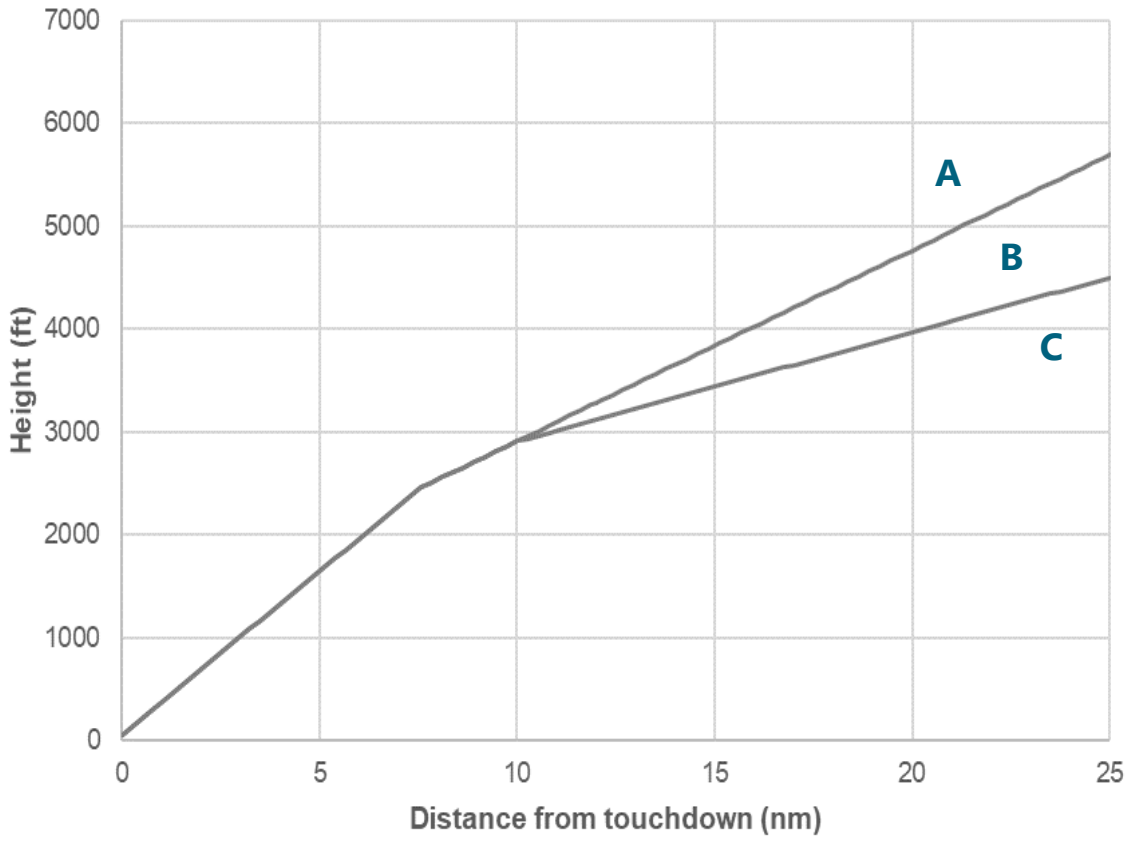
PROPOSED LOW NOISE ARRIVALS METRIC

- In 2018, a national cross-industry project was established in the UK to develop a new metric which aimed to:
  - **complement the current CDO definition** and the effectiveness of the CDO procedure in reducing noise; and
  - provide an **additional performance target** for airlines.
- This Future Airspace Strategy (FAS) sponsored initiative, overseen by Sustainable Aviation (SA), has been undertaken by the CAA's Environmental Research Consultancy Department with support from NATS.



PROPOSED LOW NOISE ARRIVALS METRIC

Three LNAM categories have been defined as A, B, and C, which represent different profiles with different noise performance



CRITERIA

Upper boundary:

- A line starting at 50ft height above the landing runway threshold, extending out to 7.5nm at an angle of 3 degrees
- A line at an angle of 1.75 degrees between 7.5nm and 10nm
- A line at an angle of **1.75 degrees** between 10nm and 5,500ft

Lower boundary:

- A line starting at 50ft height above the landing runway threshold, extending out to 7.5nm at an angle of 3 degrees
- A line at an angle of 1.75 degrees between 7.5nm and 10nm
- A line at an angle of **1.0 degrees** between 10nm and 5,500ft

MEASUREMENT

Only **CDO compliant** aircraft are assigned a LNAM category.

The **lowest category** associated with any single radar point, defines the low noise rating for each flight.

Due to the uncertainty associated with individual radar returns, a **100ft tolerance** is applied to the criteria.

LNAM VALIDATION: AIM

To validate the Low Noise Arrival Metric (LNAM) profile criteria and noise performance in a range of real-world conditions and with a wide range of aircraft types

- Verify that Category A aircraft are quieter than Category B, which are quieter than Category C

CONCLUSIONS

- The average Lmax is lowest for Cat A aircraft and highest for Cat C aircraft.
- All aircraft types achieve predominantly Cat A performance.
- Variation in LNAM performance could be attributed to ATC procedures, ATCO performance, operator procedures and/or pilot performance.
- Increased Cat C assignment and decreased Cat B assignment is observed around 10-12nm from touchdown.
- A large proportion of Cat B and Cat C aircraft dipped into Cat B and Cat C respectively for a short segment of the descent, resulting in lower category assignment.
- The metric is not invalidated by temperature, pressure, windspeed or head wind.

NEXT STEPS

1. Publication of the CAA CAP report, defining the LNA Metric.
2. Sustainable Aviation sub-group, established to consider the necessary steps for deployment of the metric for operational use.

QUESTIONS?