







# Dublin Airport Operating Restrictions

## Quantification of Impacts on Future Growth

## September 2020 Update – 2022-2025 Period

**daa**

4089451

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MOTT MACDONALD

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| Revision | Date | Originator | Checker | Approver |
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| **1.0** | 22 April 2019 | JC | NR | AK |
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| **5.3** | 17 November 2020 | JC | NR | JR |

# Contents

# Executive summary

## Introduction

- daa is developing a new North Runway with operations planned for 2022. The runway's planning permission granted in 2007 contains 31 conditions. Condition 3d requires that that the new North Runway will not be used between the hours of 23:00-07:00 local time, and Condition 5 limits the number of 23:00-07:00 operations to 65/night on average when the new runway is in operation.
- The airport is also subject to a planning condition related to the development of Terminal 2 (which opened in 2010) which caps DUB's annual terminal passenger throughput at 32 million.
- From March 2020, the global aviation industry has been impacted by the COVID-19 pandemic and associated air travel restrictions, leading to large reductions in airport throughput in 2020, with only partial recovery expected in 2021.
- This September 2020 update assesses the impact of the proposed North Runway operating restrictions during the period from 2022 until the airport's unconstrained demand returns to the 32 million annual passenger level, assumed to occur by 2025.

## Demand

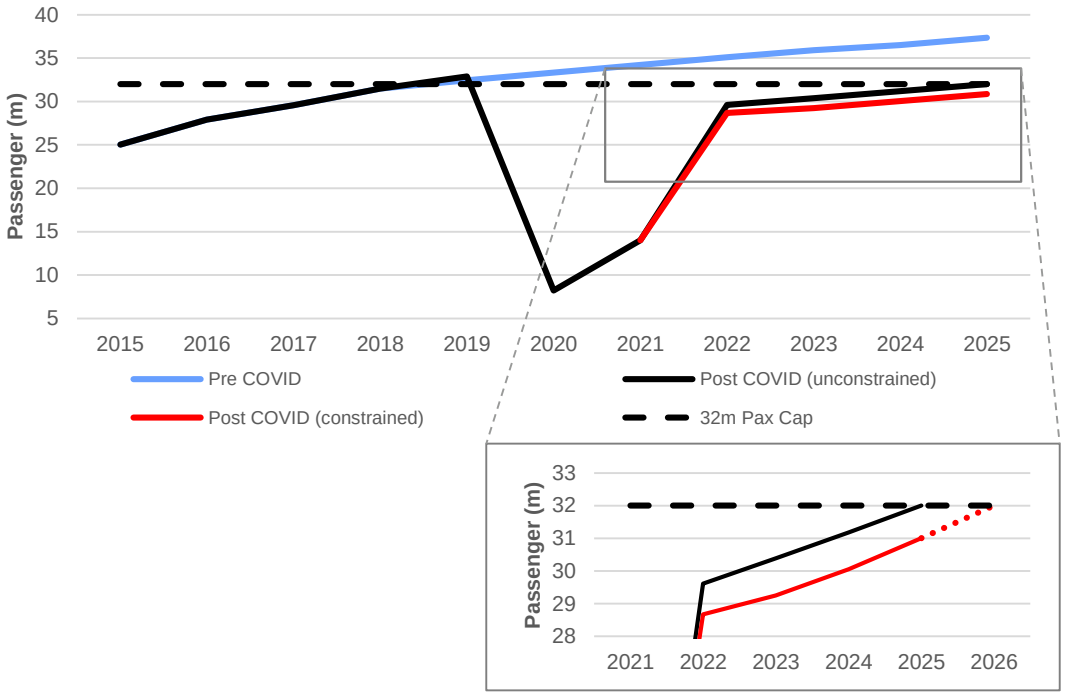
- Dublin Airport (DUB) saw strong traffic growth during the 2009-2019 period to a peak of 32.9m passengers in 2019. Ireland's island status means that air connectivity is critical to its economic development.
- The airport has two main airlines providing the majority of flights: Ryanair (35% share) and Aer Lingus (29% share), based on the Summer 2019 schedule. The airport serves mostly short haul services (90% of flights) to points in the UK and Europe. Long haul services are mainly to North America, plus some services to the Middle East, Asia and Africa.
- Demand for night flights between 23:00-07:00 is driven mainly by short haul services operated by aircraft based at DUB. In order to achieve the high levels of aircraft utilisation necessary for airline competitiveness, based aircraft tend to operate with first departure between 06:00-07:00 and last arrival after 23:00. Other 23:00-07:00 period flights are long haul arrivals in the early morning, and a small number of cargo flights mainly operated by the time-critical package delivery integrators (FedEx, DHL, TNT and UPS).
- The 1h time difference between Ireland and mainland Europe means that flights need to leave early (before 07:00) to arrive in time for business passengers to have a full working day at their destination. The geographical position of DUB means that there are longer sector distances to many European destinations than from other competing airports. This means that DUB requires longer operating days than competing European hubs. Similarly, DUB's proximity to North America compared to the rest of Europe means that transatlantic flights arrive earlier in DUB than at other European airports.
- The duration of the proposed DUB night time restrictions period, spanning 8h from 23:00 to 07:00, is unusually broad compared to other airports with such restrictions. The average night restrictions periods are 6h to 6.5h in duration. For example, the London airports night restrictions period is 23:30 to 06:00 local time.
- The DUB night restrictions period is also unusual in that it includes a peak hour of demand at the airport – 06:00-07:00. Therefore, the impact of the restriction on future growth is very significant.
- Pre-COVID levels of demand for night flights (23:00-07:00) is over 100/night, with 113/night associated with regularly scheduled services on a typical busy day in Summer 2019. This is far in excess of the proposed limit of 65/night (measured as an average over the 92 day modelling period).
- Demand for 23:00-07:00 night flights is not expected to reduce significantly during the post COVID recovery. The forecast schedules analysed for this study require 108/night movements in 2022, rising to 113/night when the airport returns to 32m annual passenger traffic levels in around 2025.
- The need for night flights at DUB – driven by the need for airlines to achieve competitive levels of aircraft utilisation, flight connection connectivity, and to support timely air freight services into Ireland – is not diminished for the post COVID air transport scenario.

# Executive summary

## Impact of Operating Restrictions

- The chart opposite shows the post COVID recovery scenario (unconstrained) compared with the daa's pre COVID centreline forecast scenario. After the severe disruption to air travel in 2020 and partial recovery in 2021, demand is assumed to recover to 90% of 2019 levels by 2022 and grow to 32m annual passengers by 2025.
- This study simulated the slot coordination process to create constrained busy day schedules from 2022 (representing the first year of operations of the new runway) to 2025 (when the 32m passenger level is assumed to be reached).
- It modelled the impact of the North Runway operating restrictions (Conditions 3d and 5) and overall runway capacity (operating in compliance with the planning conditions) on airline schedules, taking into account the impacts on aircraft rotations throughout the day.
- The assessed impact is a loss of 1.1m passengers per year (-3.5%) and a cumulative loss over the 4-year period 2022-2025 of 4.3m passengers. It should be noted that this estimated impact is a conservative assessment. It assumes that airlines are willing and able to accept alternative slot times outside of the 23:00-07:00 night period, which would be commercially and/or operationally suboptimal. In a post-COVID crisis environment, weak passenger demand will mean that airline flexibility is reduced.
- The burden of the night restrictions falls mainly on the DUB-based Irish carriers Aer Lingus and Ryanair. The DUB-based carriers require early morning departures and late evening arrivals for their short haul operations, and Aer Lingus requires early morning arrivals for its transatlantic operations. Non-Irish carriers are less affected by the restrictions as they have proportionately fewer operations in the restricted 23:00-07:00 period.
- The operating restrictions constrain growth in short haul operations throughout the day, as the lack of night slots limits the number of DUB-based aircraft that can be accommodated, with each aircraft performing multiple flights during the operating day.
- Condition 3d (limiting night operations to a single runway) does not in itself act as an additional constraint, as it provides sufficient capacity for a 65/night limited schedule. However, in the absence of the Condition 5 night movement limit, there is a requirement for dual runway operations between 06:00-07:00 to meet demand.

**DUB Annual Passenger Forecasts** Unconstrained v Constrained




**Annual Traffic Impact Summary** (millions of passengers)

| | 2022 | 2023 | 2024 | 2025 | 2022-2025 Total |
|---|---|---|---|---|---|
| Unconstrained | 29.6 | 30.4 | 31.2 | 32.0 | 123.2 |
| Constrained | 28.7 | 29.3 | 30.1 | 30.9 | 118.8 |
| Difference | -0.9 | -1.1 | -1.1 | -1.1 | -4.3 |

*Source: Mott MacDonald analysis*

# Introduction

# Introduction

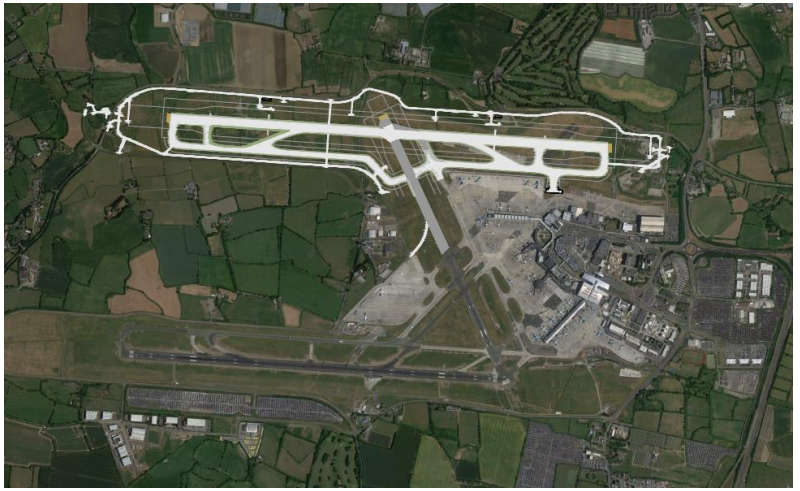
## Introduction

- This report quantifies the expected impacts of operating restrictions associated with the opening of the North Runway on traffic growth at Dublin Airport (DUB). These operating restrictions are contained in the 2007 planning permission for the North Runway.
- This report assesses the impacts of the operating restrictions on revised unconstrained projections taking account of the COVID-19 pandemic in 2020, and assesses the period from 2022 (the first year of operations of the new runway) to 2025 (when it is assumed for this study that the 32m passenger level is reached).

## Background

- daa is investing in the region of €320 million to develop a new 3,110m runway for Dublin Airport, located 1.7km north and parallel to the existing main runway. The new runway is expected to be operational in 2022.
- Planning permission for North Runway was received in 2007(1). The new runway is needed to enable future growth and to allow Dublin Airport to develop as a secondary hub competing effectively with the UK and other European airports for the expanding global aviation services market, which will in turn improve Ireland's connectivity.
- The planning permission granted in 2007 contains 31 conditions. Two of these conditions (Conditions 3d and 5) relate to operating restrictions on the use of the runways and overall airport operations at night.
- This report assesses the impact of the night time operating restrictions on airline operations and traffic projections for Dublin Airport.

*New North Runway Layout*



*Source: daa*

(1) An Bord Pleanála decision 2007, Reference Number: PL06F.217429

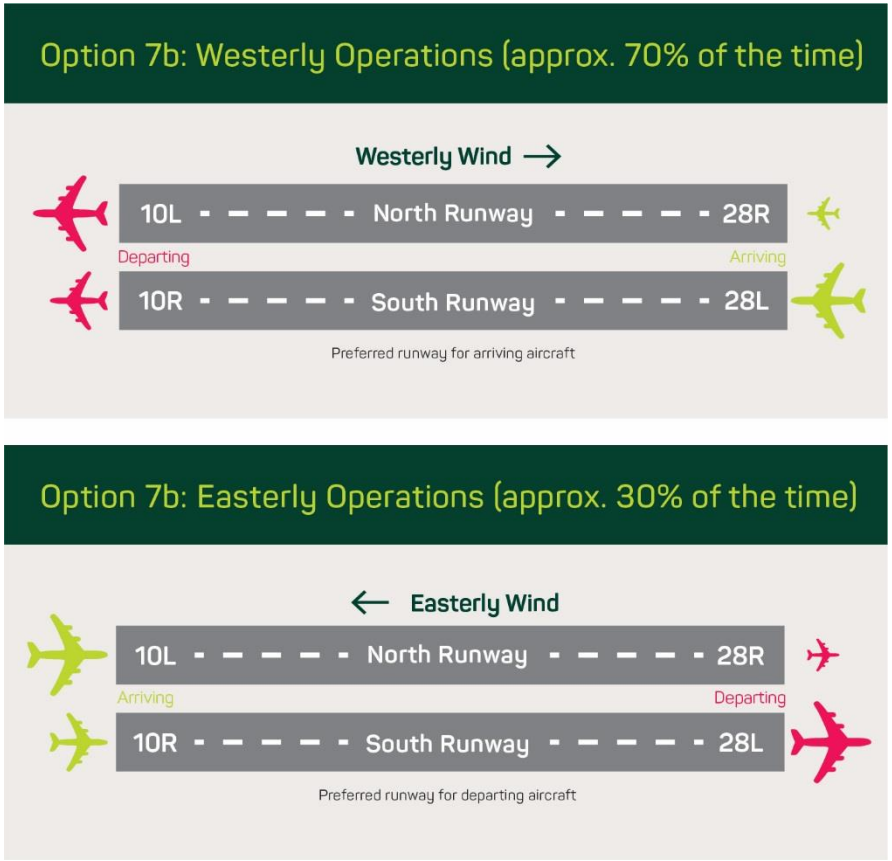
# Introduction

## Runway Planning Conditions

- The North Runway planning permission (PL06F.21742) contains the following conditions to take effect from completion of the new runway:
  - Condition 3(d) states that: *Runway 10L-28R shall not be used for take-off or landing between 2300 hours and 0700 hours*(1).
  - Condition 5 states that: *the average number of night time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and 0700 hours) when measured over the 92 day modelling period.*

- This study interprets Condition 5 as follows:
  - Night movements are based on actual aircraft landing or taking-off times.
  - The 65/night limit is based on the average over the 92 day modelling period (16 June to 15 September).
  - All night operations, including ad hoc operations and unplanned operations (e.g., delayed daytime flights), as well as regularly scheduled night flights are taken into account.
  - Therefore, scheduling limits to ensure compliance must take account of aircraft taxi times and make reasonable allowances for delayed flights.

*Runway Modes of Operation*



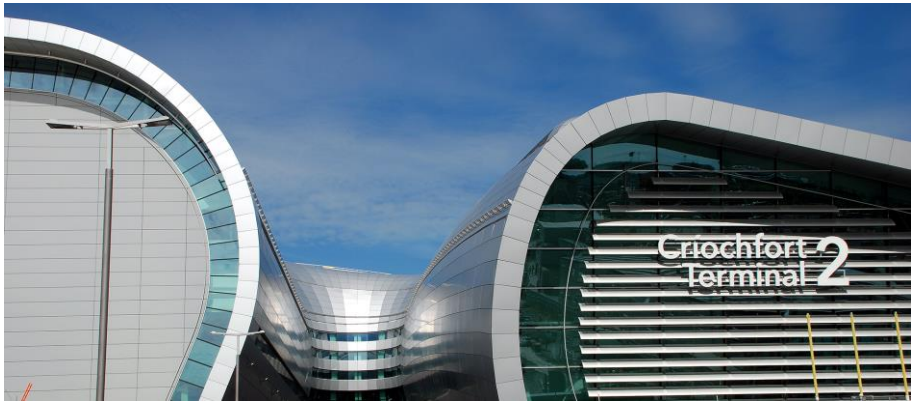

*Source: daa*

(1) except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports

# Introduction

### Terminal 2 Planning Condition

- In addition to the proposed planning conditions related to the North Runway, Dublin Airport is currently subject to a Terminal 2 planning condition limiting the annual number of passengers using the airport's terminals to 32 million.
- This September 2020 Update assesses the impact of the North Runway planning conditions on traffic recovery and growth in the post COVID impact scenario for the period from 2022 (following runway opening) until the 32 million traffic level is reached, expected to be 2025 in this scenario. This study does not consider the impacts beyond the 32m passenger traffic level.



# Introduction

## Irish National Aviation Policy

- The Department of Transport, Tourism and Sport published a National Aviation Policy (NAP) for Ireland in August 2015. The goals of the NAP are:
  - to enhance Ireland's connectivity by ensuring safe, secure and competitive access responsive to the needs of business, tourism and consumers;
  - to foster the growth of aviation enterprise in Ireland to support job creation and position Ireland as a recognised global leader in aviation; and
  - to maximise the contribution of the aviation sector to Ireland's economic growth and development.
- The NAP identified the opportunity to develop Dublin Airport as a secondary hub, competing effectively with the UK and other European airports for the expanding global aviation services market. This is seen as an important means of maximising air access for the Irish economy. The NAP also identified importance of ensuring that Dublin Airport has sufficient capacity, including a second, parallel runway, to facilitate its development as a hub.
- The commitments of the NAP include:
  - Creating conditions to encourage the development of new routes and services, particularly to new and emerging markets;
  - Ensuring a high level of competition among airlines operating in the Irish market;
  - Optimising the operation of the Irish airport network to ensure maximum connectivity to the rest of the world;
  - Ensuring that the regulatory framework for aviation reflects best international practice and that economic regulation facilitates continued investment in aviation infrastructure at Irish airports to support traffic growth
- The proposed night restrictions at DUB run counter to these policy objectives in that they limit growth at the airport, reduce potential new routes and services (especially to emerging markets), and do not serve to maximise connectivity.

# Patterns of Demand

# Patterns of Demand

## Pre COVID-19 Traffic

- In 2019, prior to the COVID-19 pandemic, the Dublin schedule was dominated by short haul services to the UK and other parts of Europe (87% of flights), operated primarily by the based-carriers: Ryanair, Aer Lingus, and Aer Lingus Regional (Stobart Air). Together these carriers made up 72% of operations.
- Long-haul operations accounted for approximately 18% of total seat capacity offered out of DUB, primarily on Transatlantic routes as well as services to the Middle East, Africa and China.

## Aer Lingus

- Aer Lingus had a fleet of 27 Airbus 320/321 aircraft based in DUB, 2 A320s that overnight at Heathrow, plus 2 Embraer 190 aircraft serving London City Airport. Its long haul fleet consisted of 13 Airbus 330s, 1 Airbus 321LRs and 2 B757s, serving 13 destinations in the US and Canada. The B757s were being replaced with A321LRs in 2020.
- Aer Lingus operates a hybrid business model, blending aspects of full service and low cost carrier strategies. In particular, it seeks to maximise aircraft utilisation from its DUB based fleet.
- Aer Lingus has been growing its transatlantic services in recent years, and developing DUB as a gateway Transatlantic-European hub.

## Ryanair

- Ryanair operated 32 DUB-based Boeing 737-800 aircraft, and also served DUB from its other European bases with away-based flights representing 25% of its DUB operations.
- In 2019, Ryanair operated from 84 bases throughout Europe and serves 234 airports. DUB is its second largest base after Stansted. It had a total fleet of 438 aircraft in 2019, and has orders and options for 210 Boeing 737-8Max 200 airrcaft[1)].
- The Ryanair LCC business model is built on achieving high aircraft utilisation, with long operating days and quick aircraft turnarounds.

*(1) Ryanair 2019 Q3 report*

**2019 market share & capacity summary table by main DUB carrier**

| Main DUB Carriers | ATMs (Pax only) | Seats | Seats/ATM |
|---|---|---|---|
| Ryanair | 35% | 38% | 189 |
| Aer Lingus | 29% | 30% | 189 |
| Aer Lingus Regional | 8% | 3% | 69 |
| British Airways | 2% | 2% | 167 |
| Other Scheduled Carriers | 24% | 25% | 186 |
| Charter Carriers | 1% | 1% | 189 |

*Source: Mott MacDonald analysis of Summer 2019 schedule*

**2019 market share & capacity summary table by main DUB market segment**

| Markets | ATMs (Pax only) | Seats | Seats/ATM |
|---|---|---|---|
| 1. UK London | 15.5% | 14.2% | 166 |
| 2. UK Provincial | 19.8% | 14.9% | 135 |
| 3. Eastern Europe | 7.3% | 7.7% | 189 |
| 4. Western Europe | 25.2% | 24.5% | 175 |
| 5. Southern Europe | 19.4% | 20.5% | 190 |
| 6. North America | 9.5% | 13.7% | 261 |
| 7. Other Regions | 2.2% | 4.2% | 350 |
| 8. Domestic | 1.1% | 0.4% | 59 |
| TOTAL | 100% | 100% | 180 |

*Source: Mott MacDonald analysis of Summer 2019 schedule*

# Patterns of Demand

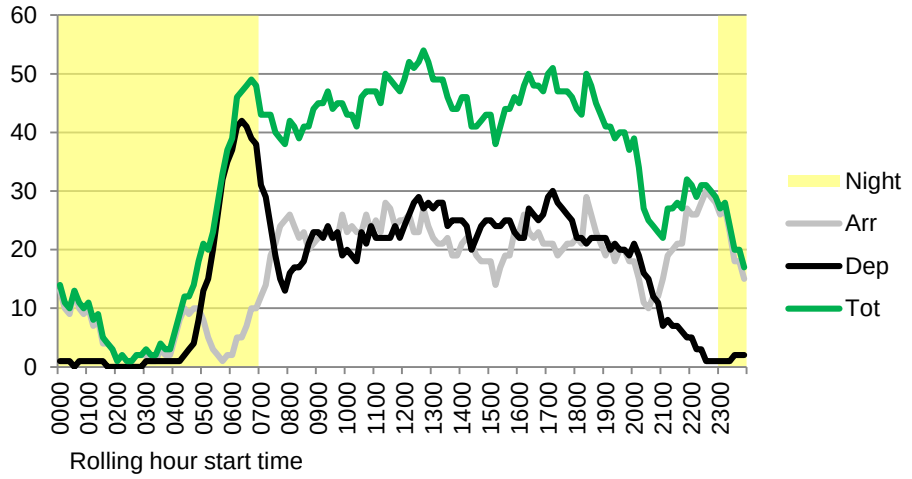
## 2019 Patterns of Demand

- The schedule structure at DUB reflects the business models of both Aer Lingus and Ryanair, with a high proportion of DUB based aircraft operating high utilisation short haul services.
- There is a sharp departures peak in the 06:00 hour and a broader arrivals peak between 22:00 and 00:00 associated with the first departures and last arrivals of DUB based aircraft.
- Long haul arrivals are concentrated in the morning period, with an early peak in the 05:00 hour and a broader peak around 08:00. Departures are spread from the mid-morning to early afternoon. This pattern of demand is typical of transatlantic services, where evening departures from North America fly overnight to arrive in DUB in the morning. Arrival times in DUB tend to be earlier than at other European airports due to Ireland's close proximity to North America and its time zone being 1h earlier than Central European Time.
- Between 02:00 and 05:00 there are few regularly scheduled flights – only a small number of freighter flights and some ad hoc charter flights.

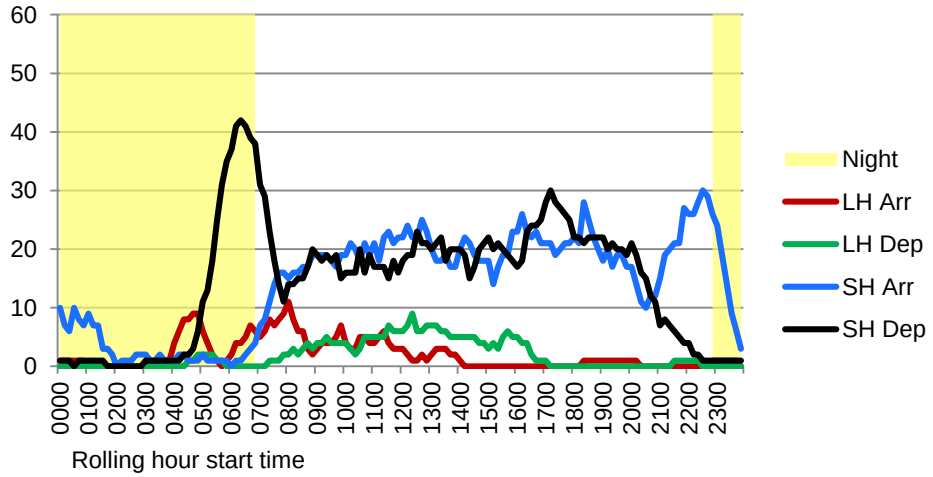
## Flight Connections

- Development of DUB as a transatlantic hub requires efficient flight connections. The early morning long haul arrivals connect with a large number of first-wave short haul departures operated by DUB based aircraft. These short haul aircraft return to DUB from around 09:00 and connect with the transatlantic departures, departing between 10:00 and 17:00.
- Maintaining this hub connectivity requires early morning transatlantic arrivals from 05:00 local time to facilitate Eastbound connections with short haul services departing from around 06:00. Early first-wave short haul departures are required to ensure that the returning inbound arriving flight can provide Westbound connections with the long haul departures in the mid to late morning.

**Demand Profile** 2019 Busy Day Schedule




**Demand Profile** 2019 Busy Day - Longhaul/Shorthaul

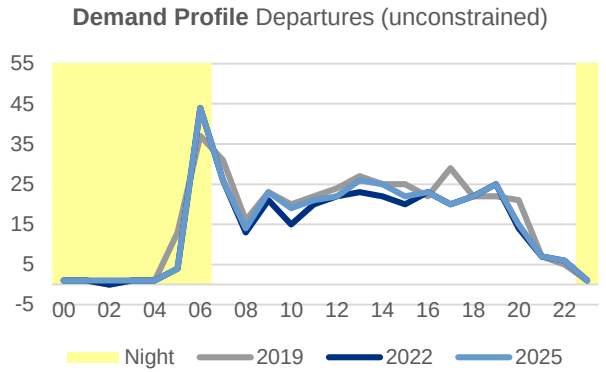


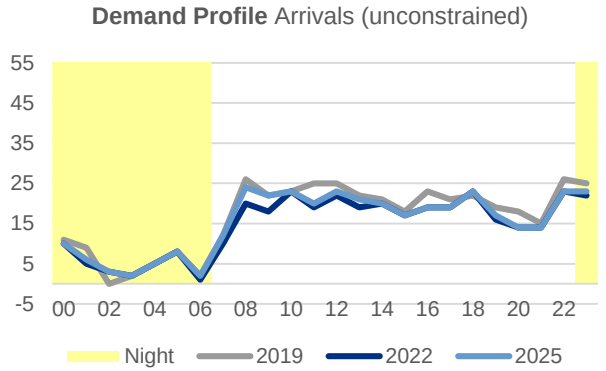

*Source: Mott MacDonald analysis*

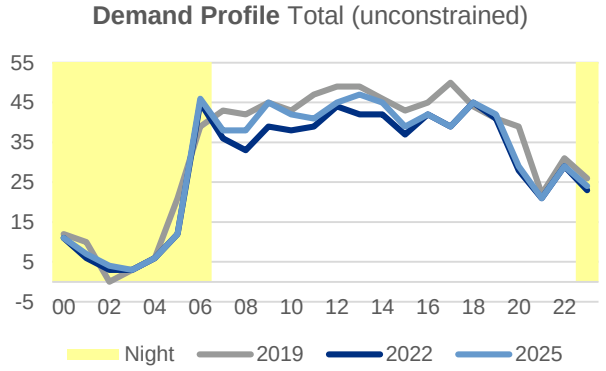
# Patterns of Demand

## Patterns of Demand

- The analyses of this study are based on unconstrained forecast busy day schedules. The forecast schedules represent expected traffic in 2022 (shortly after the opening of the new North Runway) and in each year to 2025, when traffic is expected to reach 32m annual passengers again after the COVID-19 traffic disruption.
- The general pattern of demand is expected to develop along similar patterns to today, with a large peak of departures demand in the 06:00 hour, representing first-wave departures on DUB-based aircraft. Arrivals is less peaky, but there is a peak of arrivals in the late evening (22:00 onwards) corresponding to the return of DUB-based aircraft. Longhaul arrivals are concentrated in the early morning period, particularly in the 05:00 hour.
- This pattern of demand provides improved connectivity for the development of DUB as a secondary hub airport, as well as providing for efficient point-to-point short haul services.
- Current (2019) schedules are constrained by the airport's single runway capacity. With the opening of the North Runway, a peakier pattern of demand is expected in the peak 06:00 departures hour (reflecting airlines' commercially and operationally ideal operating times). The 06:00 scheduled departures peak is expected to increase from 35 to 44 departures.
- Meeting this level of departures demand in the 06:00 hour, which exceeds single-runway capacity, requires use of the North Runway in the 06:00-06:59 hour.




*Source: Mott MacDonald analysis*

# Night Movement Demand

## Current Night Movements

- In Summer 2019, there were 113 regularly scheduled flights during the 23:00-07:00 period(1). Short haul scheduled services make up the bulk of these night flights, with departures between 06:00-07:00 and arrivals after 23:00. There are 17 long haul night arrivals in the early morning.
- The night cargo operations are primarily flights by the package integrators DHL, FedEx, TNT and UPS operating to their main sortation hubs. These operations are very time-critical in order to connect at these hubs and to achieve an overnight package delivery service.

## Future Night Movement Demand

- Busy day night movements is expected to decrease slightly with the post COVID traffic downturn, but recover to 2019 levels by the time DUB reaches 32m annual passenger throughput again in 2025.
- By 2022, DUB aircraft movements are assumed to have recovered to 95% of 2019 levels, although passengers have only recovered to around 90% due to reduced load factors and aircraft size in the post COVID recovery period. Aircraft movements recover fully to 2019 levels by 2025.
- Night movement demand is reduced in 2022 (compared with 2019) and recovers in line with DUB aircraft movements.

**Dublin Forecast Night Movement Demand** (based on busy day schedules)

| Flight Type | 2019 | 2022 | 2023 | 2034 | 2025 |
|---|---|---|---|---|---|
| Pax Scheduled | 101 | 96 | 98 | 98 | 99 |
| *Short haul* | *84* | *82* | *82* | *82* | *82* |
| *Long haul* | *17* | *14* | *16* | *16* | *17* |
| Pax Charter | 3 | 3 | 3 | 3 | 3 |
| Cargo | 9 | 9 | 9 | 11 | 11 |
| **Scheduled sub-total** | **113** | **108** | **110** | **112** | **113** |
| Other (ad hoc)* | 3 | 3 | 3 | 3 | 3 |
| **Total** | **116** | **111** | **113** | **115** | **116** |

(*) – Growth in Other (ad hoc) night movements are not explicitly forecast, but can be expected to continue at least at current levels with variability between days given the ad hoc nature of such flights

(1) Based on the busy day schedule for 22 July 2019 analysed. Number of ad hoc night flights in particular will vary.

# Drivers of Night Movement Demand

There are a number of reasons why airlines need to schedule services during the 23:00-07:00 night period:

### *Aircraft Utilisation*

- A key driver of airline cost efficiency and competiveness is the ability to achieve high levels of utilisation of their aircraft assets. The chart below illustrates the lines-of-flying (flights throughout the day) for representative DUB based aircraft.
- If airlines were restricted to a 16h operating day (07:00-23:00) then the necessary level of utilisation would not be achievable, impacting on the economic viability of aircraft based at DUB. Ryanair, for example, has operating bases at a number of airports and if it could not operate profitably at DUB then it would likely choose to base more of its aircraft at other airports.
- In this case, the traffic lost is not just the night period flights but also the daytime flights that the based aircraft would have operated throughout the day.
- If high aircraft utilisation cannot be achieved due to the reduced operating day resulting from the night restrictions, then the consequence is also likely to be higher fares for passengers' on remaining services.

### *Time Zone Differences and Geographical location*

- The 1h time difference between Ireland and mainland Europe means that flights need to leave early (before 07:00) to arrive in time for business passengers to have full working day at their destination(1).
- The geographical position of DUB means that there are longer sector distances to many European destinations than from other competing hub airports. This means that DUB requires longer operating days than competing European hubs. Similarly, DUB's proximity to North America compared to the rest of Europe means that transatlantic flights arrive earlier in DUB than at other European airports.

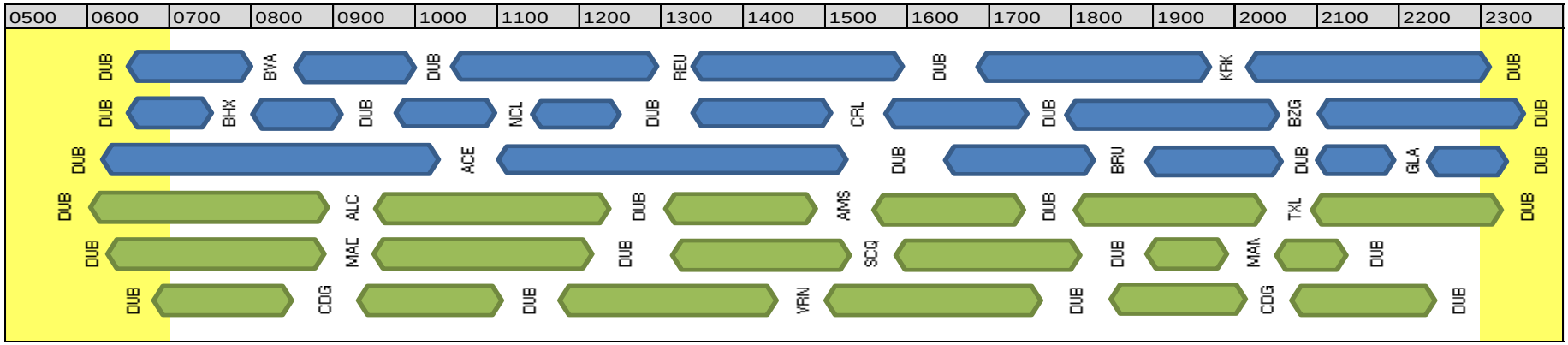
### *Hub Connections*

- The DUB hub connecting model is predicated on early morning long haul arrivals and early short haul departures able to return to connect with the long haul departures. Without this connecting traffic, the Irish point-to-point market would be too small on its own to support many transatlantic services.

### *Punctuality and Resilience*

- If aircraft lines-of-flying are squeezed into a shorter operating day there will be less flexibility in the schedule to cope with delays and disruption.

**Illustration of Airline Airrcaft Utilisation**



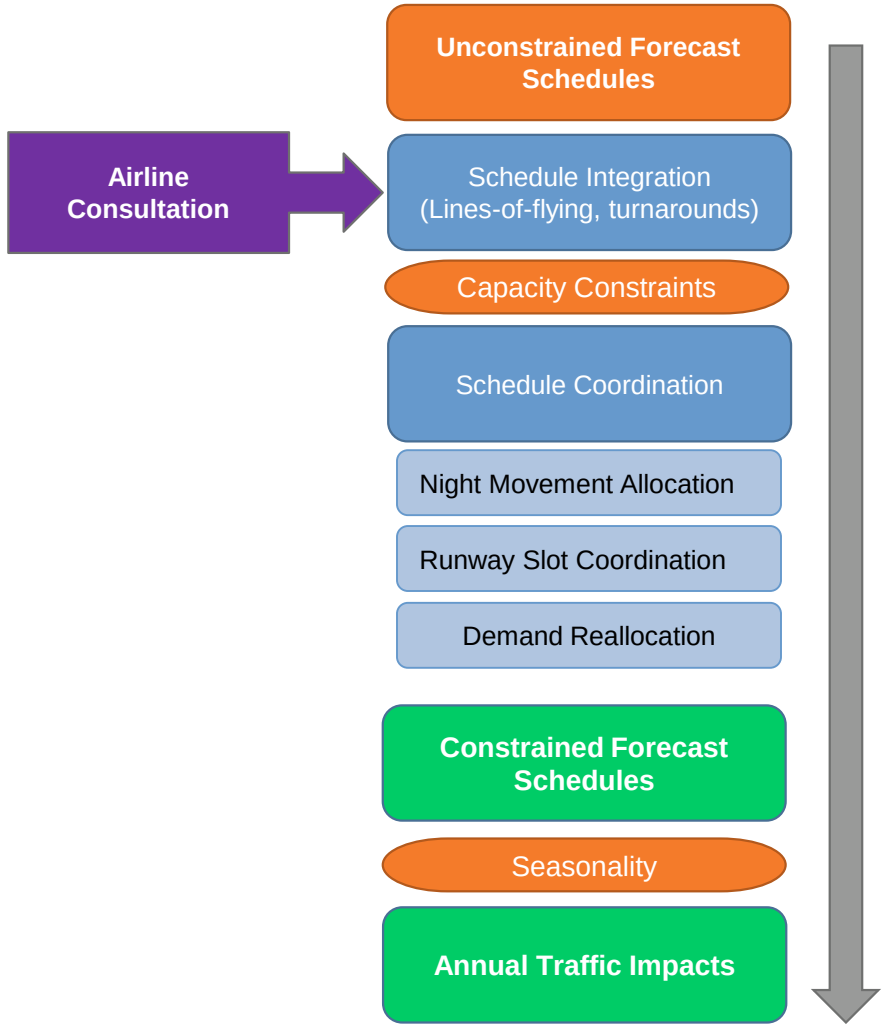

*(1) From the Behaviours & Attitudes Business Barometer Survey Results 2016, 70% of business owners believe that a flight schedule facilitating arriving in time for the start of the business day is important*

# Constrained Case Analysis

# Constrained Case Analysis

## Methodology

- Quantification of the impacts of the DUB night restrictions involved development of detailed constrained busy day forecast schedules.
- The schedules assessed were the Summer 2019 busy day schedule, and unconstrained 2022 to 2025 busy day forecast schedules. The 'unconstrained' schedules represent growth rates in line with expected passenger demand, with flights times unadjusted for any operating restrictions (i.e., night restrictions or runway operating hours).
- All arriving and departure flights were linked into turnarounds, and DUB based aircraft lines-of-flying were integrated. This allowed modelling of the full impact of the night restrictions on other rotations of the same aircraft during the day.
- The schedules were coordinated within the airport's night limits and runway capacity constraints in a simulation of the slot coordination process, allocating slots in accordance with EU slot allocation rules. The coordination process sought to optimise schedules within available capacity and to ensure operationally feasible schedules.
- In applying the capacity constraints, some demand for new flights could not be accommodated within capacity and were removed from the schedule. Where feasible, alternative flights were added to the schedule so as not to overstate the impact of the night restrictions being assessed.
- The process included an analysis as to how the constraints impacted on hub connectivity. Loss of connectivity could render assumed new services and routes unviable and/or delay their introduction.
- The outputs of the simulated slot coordination process were realistically constrained busy day schedules. The busy day traffic was then converted in annual equivalents in order to assess the overall impact of constraints on airport throughput.



# Constrained Case Analysis

## Approach to Applying Schedule Constraints

- The process of constraining the schedule was:

  - STEP 1: the 2022 forecast schedule (reflecting new runway opening) was constrained within the 65/night limit, allocating night slots based on the pro rata methodology discussed in the section 'Initial Night Movement Allocation' on page 29. Excess night slots were retimed into the day period where possible with adjustments made to the corresponding flights operated by the same aircraft as required. Where retimes were not possible, flights associated with the night movement (including subsequent flights operated by the same aircraft) were removed from the schedule.
  - STEP 2: the constrained 2022 schedule was treated as 'historic slots', and new flights for each year from 2023 to 2025 were added in stages and assigned slots within remaining available capacity. Flights were retimed where necessary and where feasible. For each year, the previously coordinated years' flights were treated as 'historic slots' to provide a realistic simulation of the slot coordination process.
  - STEP 3: if flights could not be accommodated due to the operating restrictions and no feasible alternative slot times were available, they were removed from the schedule. The corresponding arrival or departure flights associated with the same aircraft rotation or line-of-flying were also removed from the schedule.
  - STEP 4: where services operated by DUB-based aircraft could not be accommodated due to the operating restrictions, scope for additional away-based operations was evaluated and alternative flights added to the schedule where possible. This affected Ryanair operations, where flights to DUB from other Ryanair airport bases could be feasible.

  - Given that the 65/night limit was fully used under the constrained 2022 schedule, no new night slots were assigned in subsequent years.

### *Retiming Criteria*

- For short-haul, the criteria for retimes was based on operationally and commercially feasible timings, considering the whole line-of-flying for each based aircraft. If it was not possible to accommodate the full number of aircraft rotations and maintain aircraft utilisation, all aircraft rotations associated with the line of flying were removed from the schedule.
- For long haul services, retimes of up to 90 minutes were generally considered possible, but feasibility was checked against the timings at the other end of the route. Where retiming was not possible, the affected arrival/departure flight pairs were removed from the schedule.
- The timing adjustments were checked for their feasibility in terms of commercial timings for the route, considering benchmark operations at both DUB and at comparable European airports.
- A summary of the timing adjustments is provided in the Slot Allocation Summary on page 30.

## Airline Engagement

- As part of earlier iterations of this study, meetings were held with Aer Lingus, Ryanair and CityJet to understand their strategies with regard to network, route and fleet development, the key criteria for scheduling services at DUB, and understanding the importance of night operations to their businesses.
- For this post COVID-19 update, we were informed by daa that some airlines will require longer turnaround times (eg, for additional aircraft cleaning). This has been incorporated into the scheduling assumptions.
- This input has been incorporated into the approach to constraining the forecast DUB schedules to make them as realistic as possible. The constrained schedules were developed by Mott MacDonald in a simulation of the slot coordination process.

# Capacity Constraints

## Night Restrictions

- The 23:00-07:00 night restrictions period applies to landing and takeoff times. Schedules are based on on/off stand times, so an allowance needs to be made for taxi times.
- The 65/night limit applies to actual runway operations, including unplanned night flights (e.g., delayed flights). Therefore it is prudent to apply buffers to the night restrictions period to allow for modest delays. This will not prevent excessive night use on disrupted days, but will minimise such occurrences. These buffer times have been benchmarked against other airports with night restricted periods, and incorporate the views of the DUB-based carriers consulted as part of this study regarding prudent scheduling buffers for night-restricted airport operations.

### *Night Slot Periods:*

Arrivals 22:45 to 07:10 on blocks time

Departures 22:30 to 06:45 off blocks time

Note:

The above night-slot definition means that the latest arrival day-slot is 22:40 on block time (equivalent to a 22:30 landing time), giving a 30 minute buffer for operational delays. The earliest arrival day-slot is 07:15 on block time to ensure landing after 07:00.

The latest departure day-slot is 22:25 off blocks time, giving approximately a 30 minute buffer for operational delays. The earliest departure day-slot is 06:50, with takeoff after 07:00, accounting for the outbound taxi time.

## Runway Capacities

- The table below details the runway capacities assumed for this study.
- The hourly capacities are based on:
  - Single runway mixed mode operations at night
  - Segregated mode (separate arrival and departure runways) during non-peak daytime hours
  - Semi mixed mode at peak times, with one runway operating in mixed mode (both arrivals and departures) and the other runway handling either arrivals or departures depending on the demand peak.
- In addition to hourly limits, a 10 minute scheduling constraint is applied to smooth demand within each hour.

**Assumed Runway Capacities**

| | Arrivals | Departures | 2-way |
|---|---|---|---|
| *Single Runway (Night 2300-0700)* | | | |
| 60 minute | 27 | 27 | 45 |
| 10 minute | 6 | 6 | 9 |
| *Segregated Mode (Daytime except peaks 0800-2155)* | | | |
| 60 minute | 35 | 44 | 79 |
| 10 minute | 7 | 8 | 15 |
| *Semi Mixed Mode - Departures Peak (0700-0755) (see note*)* | | | |
| 60 minute | 27 | 71 | 89 |
| 10 minute | 5 | 12 | 15 |
| *Semi Mixed Mode - Arrivals Peak (2200-2255)* | | | |
| 60 minute | 62 | 27 | 80 |
| 10 minute | 11 | 5 | 15 |

**Note:** The unconstrained schedule (if there were no 23:00-07:00 night limits) departures peak hour is 06:00-06:59. With a 65/night limit during the period 23:00-07:00, the constrained departures peak hour shifts later to the 07:00-07:59 hour.

# Night Movement Allocation

## Initial Night Movement Allocation

- The number of regularly scheduled night flights on a typical busy day in Summer 2019 is 113 flights (plus ad hoc non-scheduled movements). Implementing the 65/night restriction requires a 43% reduction in current scheduled demand.
- The assumed demand reductions were made by applying pro rata reductions by airline of up to 50%, with an exemption for airlines with only 1 night flight. An exception to this general rule applies to airlines with flights scheduled close to the edge of the night restrictions period and where a retiming out of the night was assumed to minimise overall impacts.
- The consequence of this approach is that the demand reduction falls primarily on the Irish based carriers with night movements:, Aer Lingus and Ryanair.
- Flights were chosen in order to minimise the amount of timing adjustment required, for example, by moving flights from the edge of the night restrictions period into the daytime period. Consideration was given to the aircraft lines-of-flying to ensure operational feasibility and to ensure that minimum ground times for aircraft turnarounds were respected.
- Since demand in 2022 is already in excess of 65/night, any new demand for night flights arising after the 2022 night allocation cannot be offered a night slot.

**Dublin Baseline Night Movement Allocation**

| Carrier | Flight Type | 2025 Demand | 2025 Allocation | Reduction | |
|---|---|---|---|---|---|
| Aer Lingus | Pax Scheduled | 41 | 22 | -46% | |
| Ryanair | Pax Scheduled | 38 | 22 | -42% | |
| Blue Air | Pax Scheduled | 2 | 1 | -50% | |
| Air Moldova | Pax Scheduled | 1 | 1 | 0% | |
| Aegean | Pax Scheduled | 2 | 1 | -50% | |
| Air France | Pax Scheduled | 1 | 1 | 0% | |
| Cathay Pacific | Pax Scheduled | 1 | 0 | -100%* | New after 2022 |
| * New Entrant Airline | Pax Scheduled | 2 | 0 | -100%* | New after 2022 |
| Ethipoian Airlines | Pax Scheduled | 5 | 3 | -40% | |
| KLM | Pax Scheduled | 1 | 1 | 0% | |
| Lufthansa | Pax Scheduled | 3 | 2 | -33% | |
| Aeroflot | Pax Scheduled | 1 | 1 | 0% | |
| United Airlines | Pax Scheduled | 1 | 0 | -100%* | 10min retime |
| Tomsonfly | Pax Charter | 2 | 2 | 0% | |
| TNT | Cargo | 2 | 1 | -50% | |
| Bluebird Cargo | Cargo | 1 | 1 | 0% | |
| FedEx | Cargo | 1 | 1 | 0% | |
| DHL | Cargo | 3 | 2 | -33% | |
| UPS | Cargo | 1 | 1 | 0% | |
| XM Cargo | Cargo | 2 | 2 | 0%* | Retime not feasible |
| AEG Cargo | Cargo | 2 | 0 | -100%* | New after 2022 |
| **Total** | | **113** | **65** | **-43%** | |
| GA/Positioning | | 3 | | | |
| **Total** | | **116** | | | |

# Constrained Case Summary

## Summary of Schedule Adjustments

- The tables opposite provide a summary of the required schedule adjustments for 2025, when traffic is assumed to return to the 32m annual passenger level. Overall only 96.8% of the forecast demand could be accommodated in 2025 due to the impact of the night restrictions.
- The reasons for schedule adjustments are detailed in the table opposite. The primary reason for timing adjustment was the night operating restriction and the knock-on impacts on aircraft rotations, with the volume of such adjustments increasing during the forecast period 2022-2025 as unconstrained demand grows.
- There are also a number of flights removed from the schedule ('no slots') due to the night constraints and knock-on rotational issues.
- The 113/night unconstrained demand for 23:00-07:00 period night flights needed to be reduced by 48 movements (-43%). Of these 48 displaced night flights, 36 (75%) could be realistically accommodated outside of the night period and 12 (25%) could not and were 'lost traffic'.
- These 12 'lost' night flights also resulted in 12 lost daytime flights (i.e., those daytime flights operated by the same aircraft rotation). Therefore, the impact of the night constraints was to reduce the total busy 24h day movements by 24 (-3.2%).
- In terms of time adjustments, the maximum time adjustment for long haul flights was 2h. For short haul services, generally the maximum adjustment was 30 minutes – around 90% of short haul flights are accommodated within 30 minutes of required times.
- In all cases, the schedule adjustments were considered operationally feasible considering aircraft rotations and lines-of-flying, although the timings are not necessarily commercially ideal.

**Slot Allocation Summary**
(excl GA flights)

| | 2025 (32m) | Summary |
|---|---|---|
| Cleared OK | 525 | *70.9%* |
| Retimed due night | 36 | *4.9%* |
| Retimed due a/c rotations | 121 | *16.4%* |
| Runway 10min limit | 22 | *3.0%* |
| Runway 60min limit | 12 | *1.6%* |
| Allocated sub total | 716 | *96.8%* |
| No slot due Night | 12 | *1.6%* |
| No slot due to a/c rotation | 12 | *1.6%* |
| Total | 740 | *100.0%* |

**Note:** A 'no slot' flight is a flight in the unconstrained demand forecast schedule that cannot be accommodated within the airport's operational constraints, and is thus removed from the constrained forecast schedule.

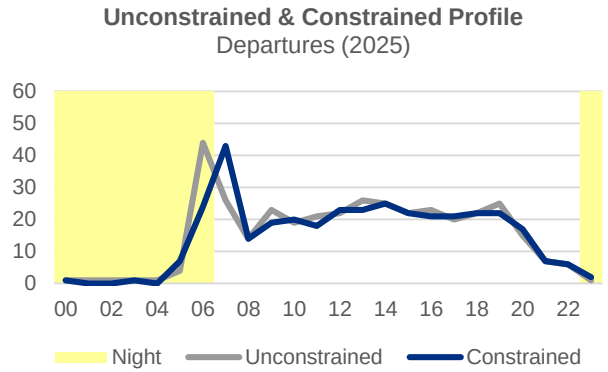
**Timing Adjustment Summary (of flights with slot allocated)**

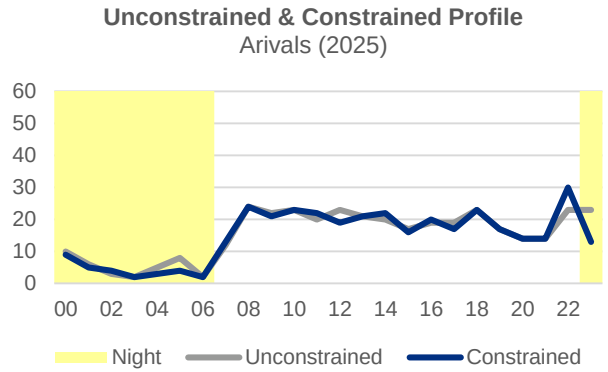
| | 2025 (32m) |
|---|---|
| Cleared OK | 73.6% |
| ±5 min | 2.4% |
| ±10 min | 3.8% |
| ±15 min | 2.2% |
| ±20-30 min | 8.5% |
| ±35-60 min | 5.9% |
| more than ±60 min | 3.6% |

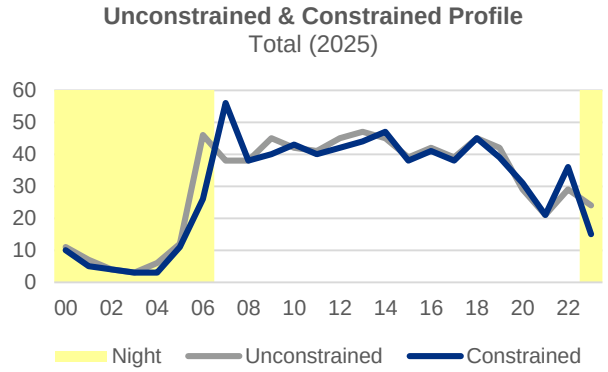
# Constrained Case Summary

## Slot Allocation Summary

- The charts opposite show the effect of the slot coordination exercise on patterns of demand for the 2025 / 32m forecast schedule. Similar patterns arise in the 2022 – 2024 year schedules.
- The morning departures peak is shifted from the 06:00 hour to the 07:00 hour, and the evening arrivals peak is shifted from the 23:00 hour to the 22:00 hour due to the constraints of the 65/night operating restriction.




*Source: Mott MacDonald analysis*

# Fleet Modernisation

# Fleet Modernisation

## Introduction

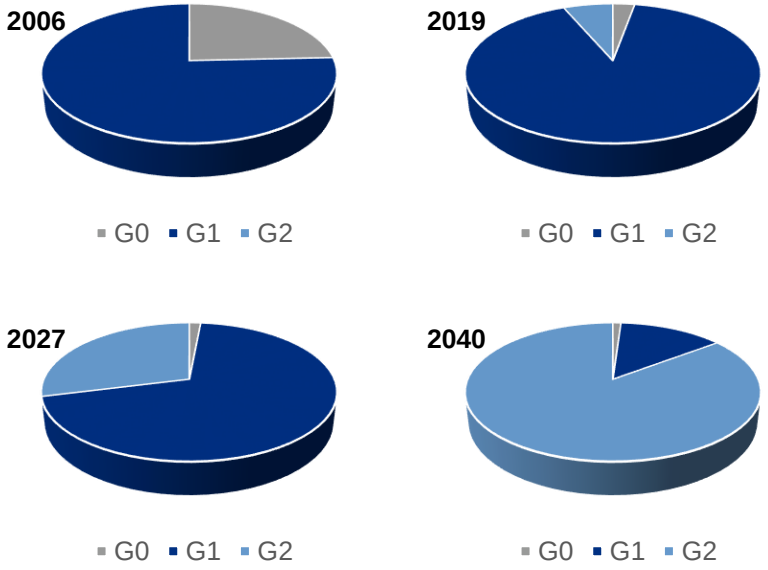
In 2019, around 91% of DUB operations use the current generation (G1) aircraft types, with 3% of movements operated by older aircraft (G0) and 6% of movements operated by the most modern (G2) types.

Our study predicts that the current G1 aircraft types will be largely replaced on a phased basis by next generation G2 types by 2040.

The main period for fleet renewal is between 2027 and 2040, although this analysis is sensitive to the timing of Ryanair's replacement of its current DUB fleet of B737-800s with new B737-8 MAX 200s.

This study assumes analyses the expected evolution of the DUB fleet during the 2022 – 2025 time horizon, taking account of the impacts of the COVID-19 pandemic on the aviation industry.

**DUB Fleet Evolution 2006 - 2040**




*Source: Mott MacDonald analysis of daa data and schedules (2006, 2019), Mott MacDonald projections (2027, 2040)*

***Note on Aircraft Generation Categorisation***
For the purposes of these analyses, aircraft have been categorised into generations of aircraft technology:

- **Generation 0 (G0) –** Older aircraft types, typically developed in the 1970s or 1980s and now generally out of production, eg, B737 Classic (300/400/500), B757, B767, A300, A310
- **Generation 1 (G1)** – Current aircraft types, typically developed in the 1990s or 2000s and still in production, eg, B737NG (700/800/900), B777, A320 series, A330, A340, A380, Bombardier CRJ, Embraer EJets, Avro RJ, Bombardier Q400, ATR42/72
- **Generation 2 (G2)** – Latest aircraft types recently entering production or under development, eg, B737MAX, B787, B777X, A320neo, A330neo, A350, Bombardier Cseries/Airbus A220, Embraer Ejet-E2, Sukoi Superjet
- **Generation 3 (G3)** – Further new-generation aircraft types not yet in development.

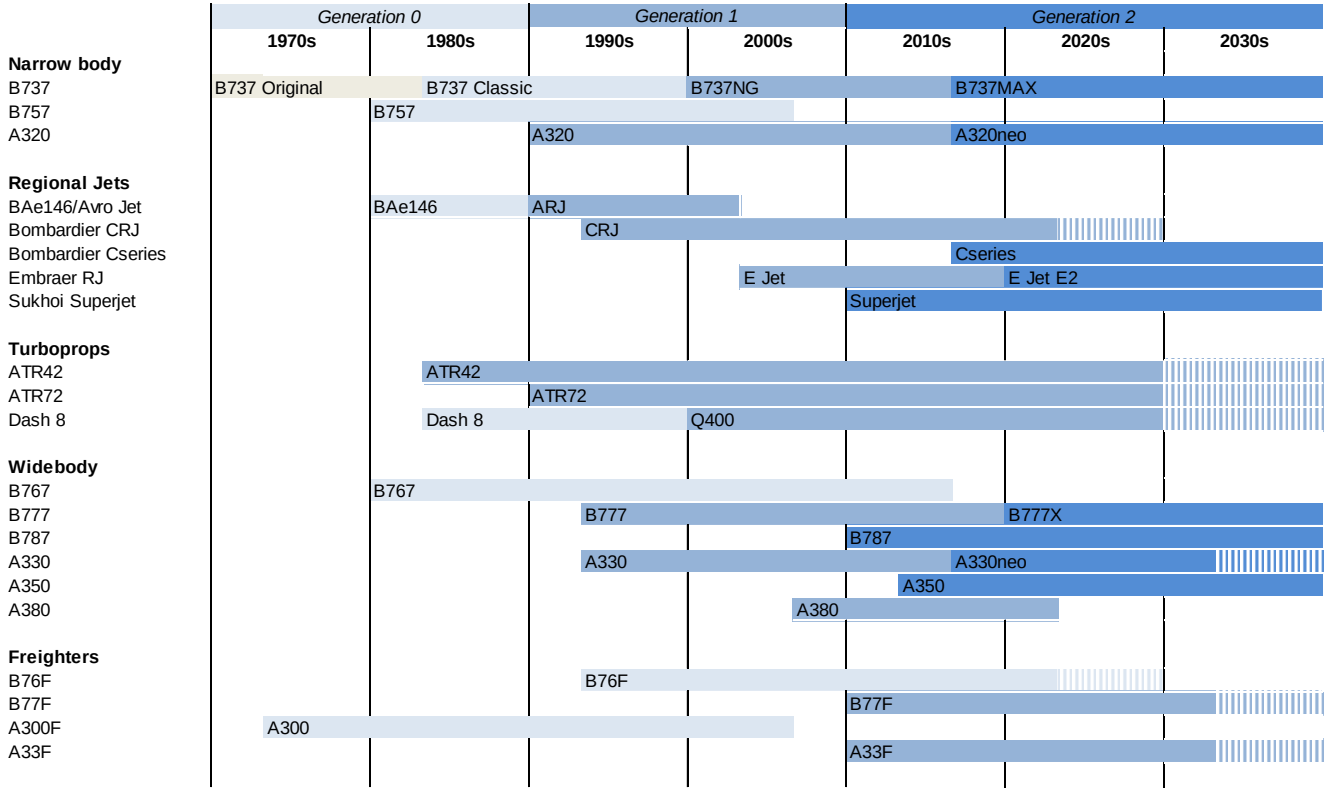
# Aircraft Manufacturers' Development and Production Cycle

## Aircraft development cycle

- The development of commercial transport aircraft represents large capital investments for the aircraft manufacturers, and typically follows a 20-30 year cycle between generations of aircraft types.
- The pace of aircraft development depends on the rate of improvement in technology (eg, engine efficiency), with new types typically seeking to achieve a 20% improvement in seat-kilometre costs over previous generation competitors.
- Another factor which influences manufactures' commitment to new aircraft development is competition between manufactures. For example, Airbus' development of the A350 and A330neo was spurred by the sales success of Boeing's B787. Similarly, Boeing's launch of the B737MAX was a response to Airbus' A320neo programme.
- Once in service, aircraft have an operational lifespan of around 25 years in mainline service, and longer as freighter conversions and as niche charter aircraft. In times of low oil prices, the life of older aircraft types may be extended.
- As a consequence, an aircraft type may be in active service over 50 years after its initial development. For example, the A320 first went into service in 1988, and is still in production. A newly-manufactured A320 entering airline service now is likely to still be flying until the early 2040s.

## Commercial Aircraft Production Cycle

Dates of aircraft types in production by generation




*Source: Mott MacDonald analysis, select aircraft types relevant to DUB*

# DUB Fleet renewal

## COVID-19 Impacts

The worldwide spread of the COVID-19 pandemic in March 2020, lockdowns and restrictions on air travel has led to a crisis in the aviation industry and a recession in the general economy. The DUB recovery scenario for this study assumes traffic returns to about 90% of 2019 levels by 2022 but does not reach 32m annual passengers again until 2025.

## Global Impacts

The demand/capacity and financial aspects of the COVID-19 crisis is having two types of impact on airline fleets:

- Firstly, some airlines are accelerating the retirement of older aircraft, which tend to be less fuel efficient and noisier
- Secondly, some airlines are deferring the ordering and delivery of new aircraft types(*), which tend to have better environmental performance

Therefore, compared with pre-crisis projections, there is likely to be a short-term improvement in average environmental performance of global airline fleets due to early retirement of older aircraft, but a slower medium-term (next 5 years) improvement due to fewer latest-generation aircraft type deliveries.

(*) Note: the deferral of new aircraft deliveries is due mainly to slower airline growth in the next few years. Airlines are still expected to replace older, life-expired aircraft at the end of their economic life (around 20-30 years' of service).

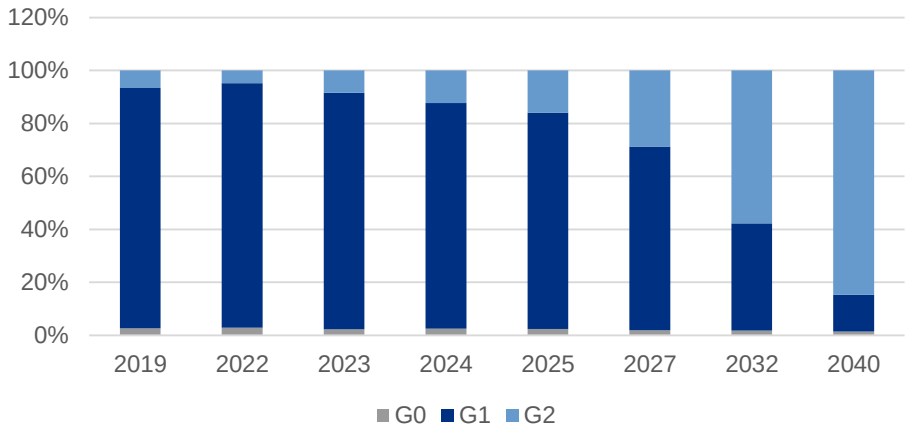
## Dublin Airport Fleet Renewal

The chart below shows the evolution of DUB fleet during the 2022-2025 period of this study, and in the context of longer-term fleet renewal to 2040.

Overall, there is modest modernisation of the DUB fleet by 2025, with the proportion of latest generation aircraft types (G2) increasing from 6% in 2019 to 16% in 2025 due to the replacement of life-expired aircraft types.

The bulk of the modernisation is expected to occur after 2025. The fleet renewal analysis and assumptions of this study are conservative and take into account the reduced new aircraft production expected as a consequence of the COVID-19 pandemic and its impact on the aviation industry.

**DUB Fleet Evolution 2019 - 2040**




*Source: Mott MacDonald analysis of daa data and schedules (2006, 2019), Mott MacDonald projections (2022 onwards)*

# Airline Fleet Renewal

## Aer Lingus

### Shorthaul fleet

- The Aer Lingus (EI) current shorthaul fleet of A320/321 aircraft are expected to be replaced with A320/321neos on a phased basis as they reach 24 years in service(1). This replacement cycle is not expected to be impacted by the COVID-19 crisis.
- Six of EI's shorthaul aircraft (16% of the fleet) were delivered 1998-2001, so are due for replacement by 2025. The remainder were delivered 2004-2011, so will be replaced on a phased basis between 2028-2035.

### Longhaul Fleet

- EI currently operate A330 widebody and A321neo LR narrowbody aircraft types for their longhaul services.
- Three of the A330s were delivered 1999-2001, so are due to be replaced at 24 years' service by 2025. The remainder were delivered 2007-2017, so are not due to be replaced until the 2030s. The A321neo LRs are new aircraft (from 2019), so will not be replaced before 2040.
- Our April 2019 analysis assumed EI's future longhaul fleet would be evenly split between narrowbody (A321neo LR) and widebody (A330neo/A350) aircraft types by 2040. In general, the impact of the COVID-19 crisis and general trends in the aviation industry is likely to favour greater use of narrowbody aircraft on transatlantic routes from DUB, so the A321LR share of EI's fleet may be higher than 50% in future. The smaller aircraft has lower environmental impacts (CO2 and noise), so our current 50/50 longhaul fleet mix assumption is conservative.

*(1) Aer Lingus advised to assume 24 year service life for A320/321s and A330s*

## Ryanair

- In 2019, Ryanair had a fleet of over 450 B737-800s and 1 B737-700, with 32 of the B737-800s (7%) based at DUB. The B737-800s were delivered between 2002-2018 and are assumed to retire after 20 years' service(1).
- Ryanair has orders and options for 210 of the new B737-8 MAX 200s, due for delivery over a 5-year period.
- The B737MAX has been grounded since March 2019 following two accidents related to its flight control systems. However, the B737MAX is expected to resume operations and deliveries during 2021.
- Ryanair has stated publicly that it still intends to take delivery of its B737MAX aircraft.
- Our fleet modernisation analysis assumes that Ryanair will switch its DUB base to B737MAX only after 2027 (but before 2030). Even with two-year delayed MAX deliveries, Ryanair will have enough MAX in its fleet to switch DUB as early as 2022, so this assumption is conservative.

## Other Airlines

- Fleet renewal assumptions for other airlines were based on replacement at around 25 years' service for passenger aircraft and around 30 years' service for freighter aircraft.
- These assumptions are not likely to be significantly affected by the COVID-19 crisis and are conservative.

*(1) Ryanair operates a young fleet to reduce maintenance costs, hence the shorter 20 year service life assumed for the B737-800s. The B737-700 is used as a corporate charter aircraft in winter and training/backup aircraft in summer. It therefore achieves less annual utilisation and a longer in-service life is assumed.*

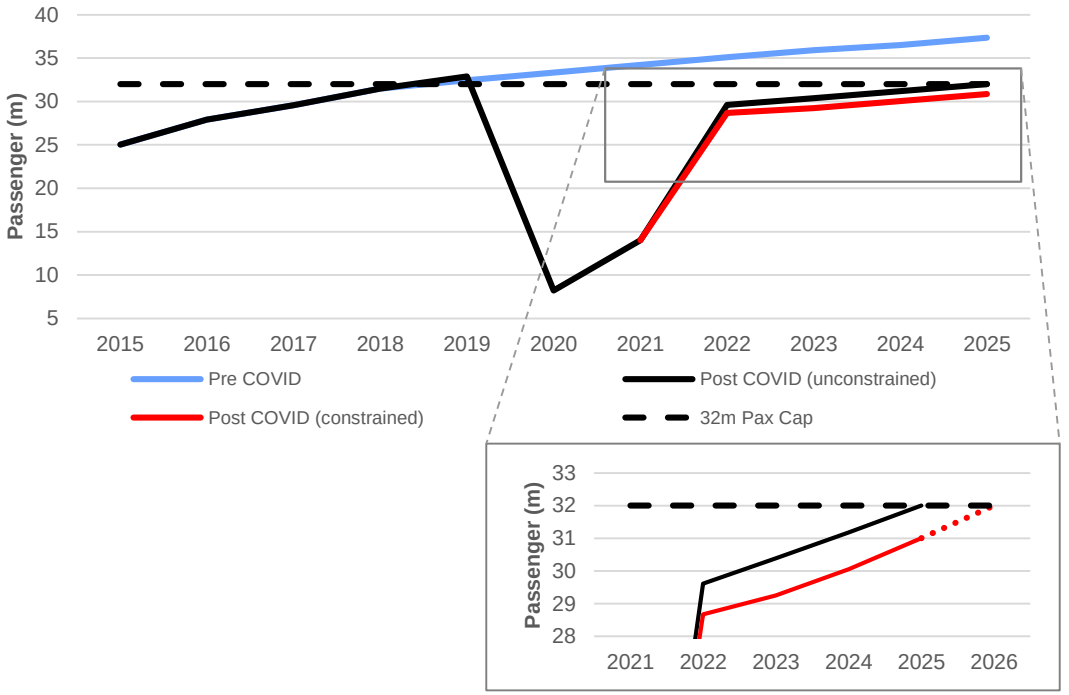
# Annual Traffic Impact

# Annual Traffic Impact

## Impact of Operating Restrictions

- The chart opposite shows the post COVID recovery scenario (unconstrained) compared with the daa's pre COVID centreline forecast scenario. After the severe disruption to air travel in 2020 and partial recovery in 2021, unconstrained demand is assumed to recover to 90% of 2019 levels by 2022 and grow to 32m annual passengers by 2025.
- The assessed impact of the Operating Restrictions is a loss of 1.1m passengers per year (-3.5%) and a cumulative loss over the 4-year period 2022-2025 of 4.3m passengers. The Operating Restrictions are estimated to delay DUB from reaching 32 million annual passengers by about one year, to 2026.
- It should be noted that this estimated impact is a conservative assessment. It assumes that airlines are willing and able to accept alternative slot times outside of the 23:00-07:00 night period, which would be commercially and/or operationally suboptimal. In a post-COVID crisis environment, weak passenger demand will mean that airline flexibility is reduced.
- The burden of the night restrictions falls mainly on the DUB-based Irish carriers Aer Lingus and Ryanair. The DUB-based carriers require early morning departures and late evening arrivals for their short haul operations, and Aer Lingus requires early morning arrivals for its transatlantic operations. Non-Irish carriers are less affected by the restrictions as they have proportionately fewer operations in the restricted 23:00-07:00 period.
- The operating restrictions constrain growth in short haul operations throughout the day, as the lack of night slots limits the number of DUB-based aircraft that can be accommodated, with each aircraft performing multiple flights during the operating day.

**DUB Annual Passenger Forecasts** Unconstrained v Constrained




**Annual Traffic Impact Summary** (millions of passengers)

| | 2022 | 2023 | 2024 | 2025 | 2022-2025 Total |
|---|---|---|---|---|---|
| Unconstrained | 29.6 | 30.4 | 31.2 | 32.0 | 123.2 |
| Constrained | 28.7 | 29.3 | 30.1 | 30.9 | 118.8 |
| Difference | -0.9 | -1.1 | -1.1 | -1.1 | -4.3 |

*Source: Mott MacDonald analysis*

# Appendix A: Annual Passenger and ATM Tables

# Annual Traffic Impact – High Growth Case (Night Restriction constraints)

**Annual Passengers (m)**

| Year | Unconstrained | Constrained | Difference |
|---|---|---|---|
| 2018 | 31.5 | 31.5 | 0.0 |
| 2019 | 32.9 | 32.9 | 0.0 |
| 2020 | 8.2 | 8.2 | 0.0 |
| 2021 | 20.7 | 20.7 | 0.0 |
| 2022 | 29.6 | 28.7 | -0.9 |
| 2023 | 30.4 | 29.3 | -1.1 |
| 2024 | 31.2 | 30.1 | -1.1 |
| 2025 | 32.0 | 30.9 | -1.1 |

**Annual ATMs (000s)**

| Year | Unconstrained | Constrained | Difference |
|---|---|---|---|
| 2018 | 233 | 233 | |
| 2019 | 241 | 241 | |
| 2020 | | | |
| 2021 | | | |
| 2022 | 229 | 223 | -5.8 |
| 2023 | 233 | 226 | -7.1 |
| 2024 | 237 | 229 | -7.8 |
| 2025 | 241 | 233 | -7.8 |

# Appendix B: EU Slot Regulation and Precedents Analysis

# Executive summary

## Introduction

- This in an annex to the report prepared by Mott MacDonald for daa entitled:
  - **Dublin Airport Operating Restrictions –** Quantification of Impacts on Future Growth (September 2020 Update – 2022-2025 Period) version 5.3
- daa is developing a new North Runway. Construction is due to be complete by the end of 2020, with commissioning occurring during 2021 and full operation by 2022. The runway's planning permission granted in 2007 contains 31 conditions. Condition 3d requires that that the new North Runway will not be used between the hours of 23:00-07:00 local time, and Condition 5 limits the number of 23:00-07:00 operations to 65/night on average when the new runway is complete.
- This annex benchmarks the proposed night restrictions for Dublin Airport (DUB) against comparable airports in Europe and worldwide, and explores the issues arising from implementation of the proposed night restrictions in ways compliant with the EU Slot Regulation.

## EU Slot Regulation Summary

- The EU Slot Regulation governs the allocation of scarce capacity at airports. DUB is designated as a 'coordinated airport' under the EU Slot Regulation. This means that operators must be allocated a 'slot' to operate at the airport by an independent slot coordinator, within capacities declared by the Commission for Aviation Regulation following consultation with the airport's Coordination Committee.
- A key principle of the slot process is that airlines have 'historic rights' to slots, whereby they have a legal entitlement to slots allocated and operated at least 80% of the time in the previous equivalent season (the *use-it-or-lose-it* rule).
- In response to the COVID-19 pandemic and disruption to air services from March 2020, the European Commission and Parliament adopted an amendment to the EU Slot Regulation to waive the *use-it-or-lose-it* rules for the Summer 2020 season. This waiver was subsequently extended to the end of the Winter 2020/21 season. As a consequence, airlines retain their historic rights to slots (including night slots) at levels equivalent to their 2019 slot use.
- The 65/night limit is significantly below the number of historic night slots held by airlines today and, therefore, infringes this entitlement.
- This study has assessed the night flying regimes of comparable European airports and found no precedents for the imposition of night limits requiring the allocation of scarce movements that affect airlines' historic rights. Examples from Amsterdam, Brussels Paris and London all show that night flying regimes have been designed to respect airlines' historic rights and introduce reductions in night flights gradually if demand falls.
- Therefore, in Mott MacDonald's view, it is unclear how the proposed DUB operating restrictions could be implemented in a way that is compatible with the EU Slot Regulation, given the lack of precedents at other EU airports, and that there are risks that an attempted implementation would be subject to potential legal challenge.

# Night Restrictions Benchmarking

- The table below summarises night restrictions at a number of comparable European airports.
- Night restrictions are applied in accordance with EU Regulations on a case-by-case basis, based on local conditions and many airports have no night restrictions. The purpose of this analysis is to benchmark the proposed DUB night restrictions with comparable European airports to understand how night movements are managed elsewhere.
- It should be noted that at other airports, night limits have been set to accommodate historic demand and only reduced in ways that do not infringe airlines' historic rights to night slots.
- It should also be noted that the proposed night restrictions period at DUB from 2300 to 0700 (8 hours) is unusually long. Only Amsterdam and Warsaw have equivalent night restrictions periods. The average night restrictions period is between 6h and 6.5h.
- In particular, the London airports (DUB's closest competitors) have a night restrictions period from 23:30 to 06:00. This night restrictions period does not constrain first-wave departures (post 06:00), which feature heavily in DUB's night restrictions period demand, and allows unrestricted arrivals up to 23:30.

| Airport | | Night Period (local time) | No of Night Hours | Slot or Runway Time | Comments |
|---|---|---|---|---|---|
| London | LHR<br>LGW<br>STN | 23:30 - 06:00 | 6.5h | Runway | Seasonal limits on movements and noise (Quota Count) points. Limits reviewed 5-yearly. Number of night flights has remained constant since the 1990s, but noise points have been reduced in line with introduction of quieter aircraft |
| Amsterdam | AMS | Arrivals 22:40-06:59<br>Departures 23:00-07:19 | 8h (approx) | Slot | Annual night movements limit currently 32,640/year reducing to 29,000/year. |
| Paris CDG | CDG | Arrivals 00:30 - 05:29<br>Departures 00:00 - 04:59 | 5h | Slot | Annual night movements limit set at 22,500/year in 2003/04 reducing progressively based on lost historics. |
| Frankfurt | FRA | 23:00 - 05:00 | 6h | Runway | Curfew. Delayed arrivals permitted 23:00-23:59. Curfew introduced with opening of the new runway in 2011. |
| Munich | MUC | 22:00 - 06:00 (restrictions)<br>23:30 – 05:00 (curfew) | 8h<br>5.5h | Runway | Curfew 2330-0500 except postal and calibration flights. During shoulder period 2200-2330 and 0500-0600, limit on scheduled movements to 28/night except for quiet aircraft types. |
| Lisbon | LIS | Arrivals 00:05 - 06:00<br>Departures 23:55 - 05:50 | 6h | Slot | Night movement cap |
| Brussels | BRU | 23:00 - 05:59 | 7h | Runway | Annual night movements limit.<br>*Silent Nights:* no new slots allocated between 01:00-06:00 Saturdays and 00:00-06:00 Sundays/Mondays. |
| Zurich | ZRH | Arrivals 00:00 - 05:00<br>Departures 00:00 - 06:00 | Arrivals – 5h<br>Departures – 6h | Runway | Curfew |
| Vienna | VIE | 23:30 - 05:30 | 6h | Runway | Night movement cap |
| Warsaw | WAW | 22:00 - 06:00 | 8h | Runway | Night noise point limit |

# EU Slot Regulation

## Slot Coordination

- Where demand for air services at an airport exceeds capacity, a process of *schedule facilitation* or *slot coordination* may be applied to manage airline schedules and the operations of other aircraft operators within available capacity. These processes are governed by the EU Slot Regulation(1).
- At a *schedules facilitated* airport, schedule time adjustments are negotiated with airlines on a voluntary basis. Where there is a significant shortfall in capacity and such voluntary processes are ineffective, the airport may be designated as *coordinated*, and a process of slot coordination implemented. At a *coordinated* airport, airlines must have a *slot* allocated prior to operation, and must adhere to the allocated slot time. Financial penalties are in place for intentional slot misuse (e.g., operating without a slot or intentionally operating at the wrong time). Slots are allocated by an *airport coordinator*.
- The Member State is responsible for designating an airport as *coordinated* and ensuring that an independent coordinator is appointed. In Ireland, these responsibilities are performed by the Commission for Aviation Regulation (CAR). The CAR's roles are:
  - to designate Community airports located in Ireland as schedules facilitated or coordinated as appropriate,
  - to appoint a schedules facilitator or coordinator as necessary,
  - to approve any local guidelines proposed by the airport's Coordination Committee
  - the seasonal declaration of slot coordination parameters.
- The CAR designated Dublin Airport as a *coordinated* airport with effect from March 2007, and appointed Airport Coordination Limited as the airport's coordinator.
- The EU Slot Regulation also requires Member States to ensure that at a coordinated airport:
  - A *Coordination Committee* is set up to advise on matters relating to airport capacity and slot allocation *(Article 5);* and
  - That the airport's coordination parameters (capacities) are determined each season (*Article 6*).

(1) Council Regulation (EEC) No 95/93 on common rules for the allocation of slots at Community airports, as amended by Regulation (EC) No 793/2004

- Dublin Airport has a Coordination Committee, with membership consisting of daa as the airport operator, IAA as the ATC provider, and the airlines operating regularly at the airport.
- The CAR is responsible for the determination of coordination parameters under Article 6 of the EU Regulation following consultation at the airport's Coordination Committee.
- The Coordination Committee also has the ability, under the EU Regulation, to develop local guidelines relating to the allocation of slots. DUB currently has two local guidelines(2). The London airports have guidelines relating to the allocation of night movements and noise quota, for example. All local guidelines must be approved by the Member State (the CAR in Ireland) and must be in compliance with Community law (ie, they cannot override an explicit provision of the EU Regulation).
- daa, as the airport operator, has 4% of the voting rights on the Coordination Committee. Over 90% of the votes are controlled by airlines (in proportion to their movements at the airport)(3). This means that daa does not control the process for declaring coordination parameters or setting local guidelines on the administration of operating restrictions at the airport.
- The roles and responsibilities under the EU Regulation, as applied in Ireland, are summarised below:

| Role | Responsible Body |
|---|---|
| Airport designation | CAR |
| Appointment of coordinator | CAR |
| Allocation of slots | Coordinator |
| Determination of coordination parameters | CAR |
| Development of local guidelines | Coordination Committee + CAR approval |

(2) *Local Guideline 1: Urgent and Time Critical Operations; Local Rule A (to manage Covid-19 related capacity reductions)*
(3) Dublin Airport Coordination Committee Constitution

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## Historic Right to Slots

- Article 10(2) of the EU Slot Regulation grants airlines *'historic rights'* to series of slots, where a *series of slots* is at least 5 operations at the same time on the same day-or-week in a season (e.g., a series 06:30 departure slots on at least 5 consecutive Tuesdays in a summer season). This means that historic rights apply only to regularly scheduled services, and not to ad hoc operations such as a one-off positioning flight or GA operation.
- Historic rights are subject to a *use-it-or-lose-it* rule, whereby the airline must operate at least 80% of the slots in the series to retain the slots in future seasons (e.g., operate 4 of the 5 Tuesday 06:30 departures in the example above). Except for this *use-it-or-lose-it* rule, there is no mechanism under the EU Slot Regulation to withdraw airlines' historic slots.
- Dublin Airport's currently-established schedule (as at Summer 2019) has more slots to which *'historic rights'* apply within the 23:00-07:00 period than the 65/night permitted under the planning condition – there were 113 regularly scheduled commercial night flights in the Summer 2019 busy day analysed for this study.
- In response to the COVID-19 pandemic and disruption to air services from March 2020, the European Commission and Parliament adopted an amendment to the EU Slot Regulation to waive the *use-it-or-lose-it* rules for the Summer 2020 season. This waiver was subsequently extended to the end of the Winter 2020/21 season. As a consequence, airlines retain their historic rights to slots (including night slots) at levels equivalent to their 2019 slot use.
- Therefore, there is an issue of how the 65/night movement limit could be implemented under the EU Slot Regulation. This study has examined case studies and precedents applied at other European airports.

## DUB Night Restrictions and the Slot Regulation

- The key characteristics of the Dublin night restrictions from a Slot Regulation point of view are:
  - That the limits are below historic levels of night flying and compliance would impact on airlines' historic rights;
  - The restrictions are not temporary; and
  - The restrictions are not a curfew, where the airport is effectively closed, but a limited number of movements which must be allocated to airlines according to some mechanism deemed to be fair and reasonable.
- The case studies for the European airports examined are discussed on the following pages.

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### Case Study – Frankfurt Airport

- Frankfurt Airport opened a new runway in late October 2011. On 11 October 2011, the Hessian Administration Court ruled that night flights between 23:00 and 05:00 were no longer allowed at Frankfurt Airport after the inauguration of the new runway, and therefore over-rode an approval from the Hessian government from 2007 which allowed 17 scheduled flights per night. On 4 April 2012 the German Administrative Court confirmed the decision of the Hessian Administration Court, banning night flights between 23:00 and 05:00.
- As the ruling imposed a curfew on the airport, it was deemed that airlines' historic rights to night slots were void. The curfew applied to all flights, so there were no issues of having to allocate a scarce resource, and applied to all types of flight.
- Before the curfew was introduced, night operations were primarily cargo services, with Lufthansa being the largest operator. The affected night flights were rescheduled out of the curfew period with priority given to these mandatory time changes in the slot coordination process.

### Case Study – Brussels Airport

- In 2009, the Belgian authorities introduced a *Silent Nights* policy, applying to the 3 weekend nights (Friday through Monday). It is not a curfew, but restrictions prohibiting the allocation of new slots during the Silent Night periods. Historic night flights are permitted to continue to operate.

### Case Study – Paris CDG

- In November 2003, effective from the Winter 2003/04 scheduling season, the French authorities implemented an annual limit on night flights at Paris CDG. The restrictions apply between 00:00 and 04:59 for departure slots and between 00:30 and 05:29 for arrival slots. The limit was set in 2003 at 22,500 night slots measured over a 52 week period for the Winter 2003/04 and Summer 2004 season. This level was set to accommodate current levels of demand at that time.
- For subsequent years, the limit of 22,500 is reduced if airlines fail to retain historic rights to night slots or return them voluntarily. Such slots are permanently lost and not reallocated to other airlines.
- The order implementing the Paris CDG night restrictions specifically refers to compatibility with the EU Slot Regulation. The mechanism to reduce available night slots only as and when slots are lost under the usage rule is designed to avoid conflicting with airlines' historic rights while progressively reducing night flying.

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### Case Study – London Airports

- The 3 main London airports (Heathrow, Gatwick and Stansted) are subject to night flying restrictions between the hours of 23:30-06:00, applied by the UK Department for Transport (DfT). The restrictions set seasonal limits on both the number of night movements and on the number of *Quota Count* (QC) noise points. Each aircraft is assigned a QC rating based on its noise certification and there is a limit on the total number of QC points operated each season.
- The London night restrictions are set for 5-year periods, and the DfT consults widely on changes in the limits in advance of each new quinquennium. The number of night movements available has remained the same at each airport since 1999, but there have been reductions in the QC limits.
- The reductions in QC limits were applied progressively and followed analysis and consultation to ensure that they remained adequate for continued airline operations while at the same time bearing down gradually on aircraft noise, so incentivising airlines to invest in quieter aircraft.
- This progressive approach in line with airline fleet modernisation has ensured that airline historic rights to night slots has not been affected.

### Case Study – Amsterdam Schiphol

- In 2013 the number of historic night slots at Amsterdam Schiphol airport was 34,620 per annum. There is a policy objective to bring this down to 29,000 over a number of years. In order to do this, when airlines fail to retain historic rights to night slots or return them voluntarily, such slots are not re-allocated on a basis eligible for historic rights. Instead, spare night slots may be only used by airlines on a non-historic basis.
- This process is intended to gradually reduce the number of night slots eligible for historic rights so that the movement limit may be reduced in future. Airlines allocated non-historic night slots understand that such slots are only available temporarily.

### Case Study – Warsaw Chopin Airport

- Warsaw Chopin airport had night restrictions of 40/night. Demand had grown above this level and, in 2012, slot coordination was introduced to reduce demand within the limit and control night flying going forward.
- Prior to this point, Warsaw Chopin had not been designated as *coordinated* and airlines did not have historic rights to slots (which only exist at a coordinated airport). Therefore, airlines did not have a legal basis to challenge the imposed reduction in night flights.
- In establishing slot coordination for the first time, airlines were required to adjust their schedules to fit within the night restriction. The process was administered by Airport Coordination Limited, who also act as the coordinator of Dublin Airport.
- The coordination process adjusted the timings of flights by the minimum amount necessary to reduce demand (i.e., moving flights from the edge of the night restrictions period), and in a proportionate way amongst airline operators.
- Subsequently, the night movement restriction at Warsaw Chopin was replaced by a Noise Point limit modelled on the London QC system. The effect of this change was to allow approximately 20% more night flights within the same noise contour profile, made possible by the introduction of quieter aircraft at the airport.

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### Case Study – Temporary Demand Reductions

- Dubai International (DXB) and Brussels airports underwent major runway resurfacing projects in 2014 and 2015 respectively. As a result of these works, there were significant reductions in runway capacity for a temporary period meaning that reductions in the flight schedules were required.
- In both cases, airlines were required to make pro rata reductions in their schedules, with exemptions for airlines which only operated 1 or 2 flights per day. The effect of these exemptions was that the larger airlines were required to make reductions above the airport average. This was deemed to be the fairest way to 'share the pain'.
- In both cases, there was a waiver of the *use-it-or-lose-it* rule during the works so that airlines' historic rights to slots were protected and flights could resume after the works were complete and capacity returned to normal.
- There is no process under the EU Slot Regulation or IATA Worldwide Slot Guidelines (which cover slot allocation rules worldwide, but do not have the force of law) to cater for such demand reductions. The demand reduction processes were developed specifically for these capacity reduction scenarios, but were none-the-less accepted by the industry on the basis that the works were necessary, the reductions were temporary, and the alternative to planned schedule reductions would have been unacceptable levels of flight delay and disruption.
- Although these cases do not relate to night movements, they provide a guide on possible ways to reduce demand in a fair way.

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## Conclusions on EU Slot Regulation Assessment

- The conclusions from these case studies, which relate to Dublin's night restrictions, are:
  - Except in the case of the Frankfurt Airport night curfew, reductions in night movements have only occurred as demand for night flying naturally fell or where airlines have lost historic slots through non-use. The principle of historic rights has been respected.
  - However, the Frankfurt curfew case is not comparable to the Dublin situation as it involved a complete night ban, not limits on night flying creating a scarce resource with the consequent allocation and distribution issues.
  - Where demand reductions have been implemented, the approach of requiring pro rata reductions with exemptions for small operators has been adopted. This has only been applied in the case of temporary reductions (eg, Brussels and Dubai airports), however.

- The 65/night limit proposed for Dublin presents a difficult issue of how current levels of night flying can be reduced. Such reductions are in conflict with the EU Slot Regulation, appear to be without precedent, and are likely to be open to legal challenge.
- daa is not in control of the capacity declaration process, responsibility for which resides with the CAR. Therefore, the ability of daa to declare night restriction limits, particularly without the support of the Coordination Committee and the CAR, is untested. Local rules relating to night slot allocation are subject to agreement by the Coordination Committee and approval by the CAR.
- The majority (over 90%) of votes on the DUB Coordination Committee are held by the airlines who would have their historic rights to night slots impacted by the restrictions.

## Assumptions for this Study

- For the purposes of this study, a pro rata reduction in night flying has been assumed, described in the next section.
- These assumptions are made for the purposes of the subsequent analyses. Whether such rules could be introduced and applied in practice is open to challenge, for the reasons discussed above.

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