
DUBLIN AIRPORT
“Response to Capacity Assessment at Dublin Airport”
14 November 2017

Executive Summary

Dublin Airport welcomes the opportunity to respond to the draft report by Helios Technologies Ltd on the assessment carried out in relation to the capacity of Dublin Airport.

The Commission for Aviation Regulation (CAR), by virtue of Section 8(1) of the Aviation Regulation Act, 2001, is the competent authority in Ireland for the purposes of Council Regulation (EEC) No.95/93 (as amended) on common rules for the allocation of slots at Community Airports other than the function of the coordinator. Article 6 of the Slot Regulations states that, at a coordinated airport, the member state responsible shall ensure the determination of the parameters for slot allocation twice yearly, while taking account of all relevant technical, operational and environmental constraints as well as any changes thereto.

The report assesses the following:

- Runway and airspace capacity
- Taxiway and stand capacity
- Firebreaks in the flight schedule
- Coordinating to five minute periods, rather than ten minute periods
- Passenger terminal building capacity
- Road access

Dublin Airport has reviewed the Helios Capacity Study and believe there are several further improvements required. We would emphasise the following:

- The stand analysis should include the full range of stand demand i.e. commercial, general aviation, technical transit flights, cargo operations and standby aircraft
- The terminal capacity should be assessed against the appropriate IATA Level of Service Concept for passenger processing areas
- Further modelling work is required for the security screening area to demonstrate that the proposed coordination parameters are achievable and allow for contingency should there be any unserviceable equipment in the area
- There should be a full demand and capacity analysis for the Piers based on a stand and gate allocation plan taking into account the available space in each pier
- The Immigration recommendations should be revised once the e-gate project has been delivered based on actual operational performance data.
- The capacity of the baggage handling system should be analysed based on the peak 15-minute demand rather than peak hour demand.

Runway and Airspace Capacity

Regarding the airfield analysis, daa acknowledge that the study has been based on logical assumptions through historic data and engagement with stakeholders, and that these assumptions may change over time or depending on the specific approach undertaken. Hence, the conclusions are considered as a useful guide but should not serve as hard/static constraints and should be reassessed on an ongoing basis, based on latest available assumptions as required for the purposes of capacity declaration to maintain validity. For example, the maximum arrival/departures throughput envelope will be highly sensitive to the actual fleet mix. Similarly, it is vital that airfield performance (taxi/times) continue to be based upon the most realistic forecast information available, given the level of sensitivity in the resulting analysis (as indicated in the report's taxi time charts).

In section 3.3, the report sets out that the maximum achievable throughput is 24 arrivals in arrivals mode, 41 departures in departures mode and 48 flights in mixed mode. It highlights that these limits are sensitive to operating fleet mix and reduce by 2 movements in mixed mode for every 15% increase in the share of heavy (Code E/F) aircraft in fleet mix. We would ask that the data and/or analysis to support this reduction be shared to provide clarity regarding how this was calculated.

For the future, we would recommend adopting a model/models which will:

- Inform the decision based on theoretical runway capacity limits (maximum runway capacity declaration);
- Advise of expected airfield performance for forecast vs. baseline (expected taxi times vs baseline etc.).

The Helios proposal of using a single model with a combined delay criterion of 18-minutes would not serve this purpose on the basis that it introduces additional variability into the runway capacity study itself, is sensitive to assumptions about what constitutes the additional slots, and it is not possible to simulate a saturated schedule up to the maximum total limits as it would be unrealistic. Agreeing on an acceptable “average delay” metric as a hard constraint for the entire airfield based on a simulated day of operations would be difficult to quantify, as delay tolerances are carrier-specific and each would have their own views. Therefore, we believe that the most logical process going forward is to proceed with an isolated runway capacity study (continuing with the 10-minute delay criterion as a hard limit) and an indicative airfield model as a supplement (for committee advisory).

Taxiway and stand capacity

We generally agree with the comments and findings in the taxiway section especially where the report highlights that except for peak periods, the taxiways can serve the traffic reasonably well. The Helios report has effectively captured the main congestion hotspots and bottlenecks on the taxiway system with justifications.

We note the consideration of options to improve capacity of the taxiway system include:

- A new taxiway from Link 6 to RWY 16-34
- A new taxiway from Link 3 to RWY 16-34
- Extension of the F-Inner and F-Outer Taxiways

The new taxiway infrastructure options to improve capacity presented have been considered by daa and are currently included within a suite of Programme of Airport Campus Enhancement (PACE) proposals. Given that the report clearly highlights complications in traffic flow around Piers 3 and 4, similar quantitative analysis on the potential benefits of the Link 3 extension taxiway, in addition to the other options shown, would have added value.

The stand capacity section has highlighted many of the existing challenges and limitations as of S17, including overnight stand occupancy (having reached its limit), lack of contingency stands, a shortage of widebody contact stands (for a sustained wide-body peak period throughout the day and not just in the 0900-1000 UTC hours) and operational difficulties with future increases in towing operations without additional stand capacity. A further stand capacity concern that should be highlighted in addition to Helios’ findings is that, of the 140 total stands included in Table 10 in the report, many fall short of full Code C/Code E capacity and cannot truly be counted as narrow-body equivalent (NBE) or wide-body stands, respectively. Future fleet up-gauges may lead to underutilisation of these stands due to lack of flexibility. Moreover, there are existing operational constraints associated with several turnaround stands which mean that they also cannot be used flexibly. Thus, the true NBE capacity falls short of the 140 stands declared in the report and reinforces the importance of relying on realistic stand planning as a tool in relation to this coordination parameter.

Regarding stand demand, the Helios analysis has focussed only on commercial stand demand. It has not taken into account technical transit flights, Cargo operations or general aviation. The report says that no more than 73 aircraft sought to use a turnaround stand capacity of 79 NBE stands in Summer 2017. We would suggest that all activity including, Commercial, Technical Transit, General Aviation, Cargo and the requirement for standby aircraft operations must be included to assess the true level of stand demand. For Summer 2017 there were 105 stands available to serve 101 NBEs.

Firebreaks in the flight schedule

There are some natural firebreaks already in schedule at Dublin. These occur after the first wave of departures and around lunch-time. The report suggests that an additional firebreak be created between 1400 and 1900 to reduce any delays which occur during this period. We would highlight that the current scheduling limits are aligned to airline demand. To create a new firebreak during this time period some airlines would be required to give up their historic rights to slots. Given the current demand environment at Dublin it is unlikely that airlines would return slots. We would have to wait for airlines to lose historic slots to create a firebreak.

Coordinating to 5-minute periods rather than 10-minute periods

We welcome the analysis supporting the introduction of 5-minute coordination intervals. We agree that a transition to 5-minute scheduling limits has the potential to streamline the flow of aircraft and could result in decreased ground and runway delays. We would highlight that a number of airports have successfully moved to 5-minute coordination intervals and we will support initiatives to introduce this at Dublin.

Further work would be required to introduce 5-minute scheduling limits. For example, the proposed 4 departures per 5 minutes during the 0500hr UTC would allow for 8 departures in a 10-minute interval rather than the current 7. Evidence from other airports shows that a further in hour sub constraint of 20-minutes is required to balance the spread of movements over the hour. Any initiative to introduce 5-minute coordination intervals would have to consider the impact on airlines' historic slots.

Passenger Terminal Building Capacity

There are several areas of concern regarding the terminal modelling section. Our initial concern relates to how Level of Service concepts have been used to assess capacity. While there is some mention of the IATA Level of Service concept in the report, there is no evidence to show how this has been used as part of the process. None of the facilities have been assessed against the Over Design/Optimum/Sub Optimum criteria as outlined in IATA's Airport Development Reference Manual 10th Edition or if they have the results have not been shared as part of the report.

Transfers

For the section on transfer process time the report says that it takes 60 minutes to connect from a short-haul to transatlantic flight and 75 minutes to connect from a transatlantic flight to a short-haul. These figures should be reversed. More time is required to connect from short-haul to transatlantic flights because of the US Preclearance requirements.

Security

Section 7.4 of the report focuses on the capacity of the security screening areas. This section of the report is unclear and inconsistent. In one section, it states that the capacity of the T1 screening area is 3,600 passengers per hour and in another indicates that 4,200 passengers could be processed in

T1 in 70 minutes. Further details are required to explain why their capacity has been calculated based on a 70-minute period rather than a 60-minute period. It then further suggests increasing the security throughput by 14% to obtain their estimated departure capacity parameter having previously stated that it would not be reasonable to assume a greater throughput. It also suggests 4,800 enplanements in one hour can be obtained. The calculations used to support this figure are unclear and no modelling has been completed to demonstrate if this is achievable or in any way realistic. We would have similar concerns about the sections on T2 security.

The numbers on the report are based on every x-ray machine being available for use. It does not consider any need for operational contingency and ability to maintain queue time service levels should an x-ray machine become unserviceable. A contingency factor should be applied to the calculations. We would suggest the calculations should be based on 14 out of 15 x-rays in T1 and 17 out of 18 in T2.

We would query if the assessment has taken into consideration the requirement of the current service quality measures for security and if a figure of 4,800 enplanements per hour has been modelled to show the impact on service standards.

The security section references the presentation profile of passengers and how certain percentages of flights appear in any one hour. Passenger presentation profiles change frequently and have an impact on security processing. They are monitored continuously and updated frequently. During July 2017, the profiles were updated on a weekly basis to capture this variance.

Finally, with regard to security we believe that smaller incremental releases are more appropriate than large releases. The capacity released should align to the demand. This ensures that should security regulations change, there is always sufficient capacity available to meet the current level of demand and to meet the required service levels

Gate Facilities

We have identified several errors in section 7.5 relating to the Boarding Process and gate facilities. These are listed below:

- The report states that Pier 1 has 19 Walk in/Walk out (WIWO) gates, including 6 new gates provided by the Pier 1 Extension. This is incorrect. Pier 1 has 16 gates, including 4 new gates provided by the extension and these serve 23 stands
- Pier 2 has 10 gates serving 10 NBE contact stands and 5 bussing gates, 4 of which are located on the ground floor. The gates in the OCTB are no longer in use
- Pier 3 has 8 gates to serve 11 NBE contact stands
- Pier 4 has 19 gates to serve the 19 NBE contact stands rather than the 20 mentioned in the report

Our principle concern relates to the methodology used within this section of the report. Helios have used a very simple assumption to initiate a capacity calculation. They have assumed that each gate can service one code C aircraft with 150 passengers in one hour. This assumption doesn't consider the space provision, the level of service experienced by passengers, the stand to gate ratio or the fact that all stands ultimately must be serviced from these gates.

It is the stand allocation that drives demand in each of the piers. In Pier 1 there are 16 gates to service 23 stands. A single gate is used for adjacent stands with a 20-minute separation between departures. This means that passengers for 23 flights will occupy the Pier in one hour. This represents 3,450 using Helios' methodology (23 stands x 150 passengers).

Using a standard load of 150 passengers per gate doesn't account for any variation in the seat capacity of Code C sized aircraft which can range between 95 and 189 passengers. The largest operator in Pier 1 uses B737-800 aircraft with a capacity of 189 passengers. 150 passengers per

aircraft would represent a 79% load factor on these flights. These flights have load factors more than 90% which is approximately 170 passengers. A recalculation would suggest 3,910 passengers could board per hour (23 stands x 170 passengers) but this doesn't not take into account the actual space available in the Pier, the proportion of passengers seated or standing at each gate or the level of comfort experienced.

We would suggest the following actions to improve this section of the report:

- Conduct a true capacity assessment of the space provision in each of the Piers, considering all gate, circulation and retail space. This space should be assessed against the IATA Optimum Level of Service standard. The Optimum Level of Service includes a range for the proportion of space required e.g. 1m – 1.2m for passengers whom are standing, 1.5m – 1.7m for seated passengers and for 50% - 70% of passengers to be seated at each gate. This range allows for flexibility in the capacity calculation and variations operational concepts depending on airline preferences.
- Completion of a demand assessment based on both the stand and gate allocation for a busy day in summer 2017 using the actual load factors for the day
- Comparison between the demand and the capacity assessments and identification of the achieved IATA Level of Service.

Immigration Process

The report indicates there is 950m² of space available in the Pier 1/Pier 2 Immigration facility and that with the introduction of e-gates in 2018 the capacity of the facility will be between 3,965 and 4,100 passengers per hour. We would highlight that there is 422m² of queuing space available in this facility. The report makes no reference to the fact that passengers arriving in Pier 1 are regularly forced to queue on the Pier 1 Skybridge before entering the Immigration area. It is necessary at peak times to restrict usage of the travellator and the escalators, and to deploy customer service agents (CSAs) to manage queues in this area. This does not provide an acceptable level of customer service or safety for passengers. An extension to the Immigration hall is required to meet the increase in processing capacity provided by the e-gates and to eliminate queuing on the Skybridge.

The report recommends decreasing T2 capacity to 3,000 passengers per hour and increasing the declared to capacity of T1 Immigration to 4,100 passengers per hour based on a theoretical capacity of 4,800 passengers per hour. This is based on a combination of the Pier 1/2 and Pier 3 Immigration facilities. This approach does not consider that during the peak hour for T1 Immigration demand, the Pier 3 facility is not in use. This is because Pier 3 is used for T2 arrivals at that time. Therefore, T1 Immigration capacity should be based on solely on the Pier 1/2 demand to account for this significant operational factor.

We believe that changes to the Immigration capacity figures are premature. The calculations are based on assumptions for the expect performance of e-gates which have yet to be installed. We would suggest the following actions before revising these parameters:

- Conduct a demand assessment based on typical busy day stand allocation in Summer 2017 to show the demand by hour for each Immigration area
- Complete surveys of e-gate operational performance and transaction times once they have been installed and are operational
- Monitor benefits arising from the introduction of e-gates to establish if arriving passengers in T1 continue to queue on the Skybridge
- Update simulation models with revised assumptions

Baggage Delivery Process

For the baggage delivery process, we would highlight the need to consider the space available in the baggage hall for circulation. It is limited and can only accommodate 5,000 passengers per hour.

The infrastructure available in T1 Baggage Hall has not been increased since the addition of the 6-bay extension in 2000 and there were major congestion issues in the baggage hall which were only alleviated when T2 opened. This was based on a capacity of 4,380 passengers per hour. We would draw attention to the increase in the number of Code E (wide body) flights in T1. There are no full-length belts (70m) for Code E flights in the existing baggage reclaim hall and there is significant congestion for passengers around carousels. Our analysis suggests that the reclaim area needs to increase to provide the required space around belts and at least 1 belt should be extended to provide flexibility for Code E flights. Currently Code E flights require staff to monitor the bags on the belt and remove bags if the belt reaches capacity. We would suggest a maximum capacity of 5,079 based on an optimised utilisation.

Baggage Handling System Capacity

Having reviewed the section on the baggage handling system capacity we would stress that the assumption that the T1 and T2 Systems can handle double the current number of bags without significant investment is flawed. We would propose the following changes need to be made to the analysis:

- Baggage Peak capacities must be looked at in 15 minute windows. At a minimum if only the hourly peaks are used then a factor needs to be applied to account for the 15-minute peak within that hour.
- The need to design critical elements of the system e.g. HBS Machines, Critical Conveyor Stream elements, etc. using an N+1 approach for resilience purposes is not dealt with in full and should be considered
- While test capacities of HBS Machines may be the 1200 or 1400bph mentioned, there needs to be a qualification explaining why such machines don't achieve the same figures in an end to end BHS process of the type in operation at Dublin.

Conclusion

The report has captured many of the capacity issues at Dublin Airport at a high level. We consider the section on the Runway and airfield to be generally accurate given the level of modelling undertaken. However, there are several errors which need to be corrected throughout the document and we have called attention to these in our response to each section. We believe further modelling work and/or evidence should be presented for the Terminal and Baggage Handling System analysis as it has not been developed to a sufficient level of detail in the report to support any changes to the current coordination parameters. We would stress the importance of assessing each of the terminal processing elements against the IATA Level of Service concepts and integrating all current measures of airport service quality.