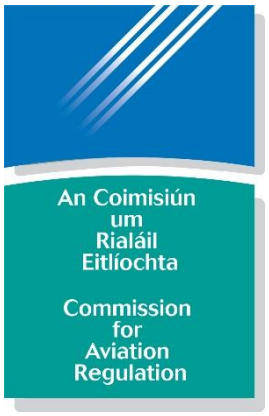

Draft Decision on Summer 2018 Slot Coordination Parameters at Dublin Airport

Commission Paper 10/2017

15 September 2017

Commission for Aviation Regulation

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1. Executive Summary

1.1 The Commission for Aviation Regulation, as the authority charged with declaring coordination parameters at coordinated Irish Airports, herein sets outs our draft decision on the parameters for the Summer 2018 slot season at Dublin Airport.

1.2 Proposals were received to adjust various coordination parameters. These proposals are published alongside this document. There were a number of changes proposed to the hourly movement limits on the runway, for example, 1 additional departure in both of the peak morning hours. The proposal includes increasing the limits on the number of departing passengers in Terminal 1 and 2 from 3,375 and 3,450 respectively to 3,700 in each and increasing the limit on the number of arriving passengers in Terminal 1 from 3,390 to 3,550.

1.3 This final proposal from the Coordination Committee was arrived at following an iterative process. Parallel to this, we provided modelling results to the Committee on its draft proposals prior to the finalisation of the Committee's advice to us.

1.4 The Coordination Committee at Dublin Airport have considered the proposals and have advised the Commission to increase the parameters in line with their final proposals.

1.5 In arriving at our draft decision, we have examined and relied on a large body of evidence. We commissioned fast time simulation modelling of the airport to assess a range of scenarios relating to the proposed increase in the coordination parameters. The assessment of these scenarios takes the form of a comparison of a range of metrics on the airfield and in the terminal buildings. We have also considered modelling work conducted by Dublin Airport on the terminal buildings and the airfield, and modelling work on the runway capacity conducted by NATS for Dublin Airport. We have considered evidence on current performance metrics of various parts of the airfield and terminal buildings and also the physical processing capabilities of key processors in the airport. We were not presented with modelling work or evidence from any other party.

1.6 This draft decision follows an extensive iterative process of engagement over the past number of months between stakeholders. This includes consultation between the Commission (and its advisors) and industry on the fast time simulation modelling we have conducted. In addition, there has been extensive engagement and sharing of information between members of the Coordination Committee in arriving at their advice for the Commission. The Coordination Committee comprises Dublin Airport, the Irish Aviation Authority and airlines operating at Dublin Airport. While open to all airlines operating at the airport, the following participated in the Summer 2018 process: Aer Lingus, British Airways, Cityjet, Norwegian, Ryanair and Stobart. The Commission observe meetings of the Committee in which the coordination parameters are discussed.

1.7 Our draft decision is to increase the coordination parameters as recommended by the Coordination Committee.

1.8 Alongside this paper we have published the following supporting documents:

- Advice received from the Coordination Committee
- Parameters proposed by the Coordination Committee

- Modelling results presented to the Coordination Committee by the Commission's advisors Helios on the fast time simulation modelling results of the forecast schedule using the proposed parameters
- Helios Responses to feedback received from Coordination Committee
- Additional modelling scenarios conducted by Helios for the Commission to isolate the effect of the parameters change
- Airfield model validation document - Helios
- Terminals model validation document – Helios

1.9 Responses to this paper should be evidence based. They should be titled "Response to draft S18 Declaration of Slot Parameters" and sent by email to info@aviationreg.ie or by post to: Commission for Aviation Regulation, 3rd Floor, Alexandra House, Earlsfort Terrace, Dublin D02 W773.

1.10 This is a consultation paper and we welcome the views of interested parties on this draft decision. [1] The timeline for this process is constrained at both ends and this results in the short consultation period for this paper. Before we can start modelling the effects of the proposals we need to receive them from the Coordination Committee. Then the IATA World Slot Guidelines requires us to communicate the parameters to the coordinator by 28 September 2017. It also reflects the extensive interaction between the members of the Coordination Committee and the Commission on this point over the past year. We will publish our final decision on 28 September 2017. The deadline for responses to this consultation is **5pm, Friday, 22 September 2017**.

1.11 All references to times or hours are in UTC 24 hour format. Where a reference is made to a particular hour, such as the 0500 hour, this refers to a time period of one hour from the stated time. To give an example, the 0500 hour spans from 5 am to 6 am UTC.

[1] Respondents should be aware that we are subject to the provisions of the Freedom of Information legislation. Ordinarily we place all submissions received on our website. We may include the information contained in submissions in reports and elsewhere as required. If a submission contains confidential material, it should be clearly marked as confidential and a redacted version suitable for publication should also be provided. We do not edit submissions. Any party making a submission has sole responsibility for its contents and indemnifies us in relation to any loss or damage of whatever nature and howsoever arising suffered by us as a result of publishing or disseminating the information contained within the submission.

2. Background

Legislation

2.1 Section 8(1) of the Aviation Regulation Act, 2001, states that the Commission is the competent authority in Ireland for the purposes of Council Regulation (EEC) No. 95/93, as amended by Regulation (EC) No 793/2004 ("the Slot Allocation Regulations"). The Commission is therefore responsible for:

- The designation of the Coordination status of Irish airports.
- Appointing a qualified schedules facilitator or coordinator, as appropriate, at airports which have been designated as Schedules Facilitated or Coordinated.
- The declaration of coordination parameters at Coordinated airports, taking into account relevant technical, operational, and environmental constraints.

2.2 Dublin Airport is designated as Coordinated by the Commission; Airport Coordination Limited (ACL) is the appointed coordinator. No other airport in Ireland has been designated as either Schedules Facilitated or Coordinated.

2.3 Under Regulation No. 95/93, one of the roles of the Coordination Committee is to advise on appropriate coordination parameters.

2.4 Article 6(3) of the Slot Allocation Regulations details the required interaction between the Commission and the Coordination Committee:

"*The determination of the parameters and the methodology used as well as any changes thereto shall be discussed in detail within the coordination committee with a view to increasing the capacity and number of slots available for allocation, before a final decision on the parameters for slot allocation is taken. All relevant documents shall be made available on request to interested parties.*"

2.5 Subsequent sections of this paper detail how this requirement was met by the Commission.

Helios capacity assessment

2.6 Following the Summer 2017 Capacity Declaration process which ended in October 2016, we indicated that we would commission independent modelling work to assist us in declaring parameters for future seasons. To this end, we engaged Helios Technologies Ltd, a specialised aviation consultancy. Helios commenced work in April 2017, holding initial meetings with a wide range of stakeholders shortly thereafter.

2.7 At the core of Helios' work was the development of fast time simulation models of both the airfield and the terminals. In both cases, a 2016 baseline model was built and validated. Validation involved a comparison of simulated key metrics, such as aircraft taxi out times, with actual data from 23 June 2016 (the '2016 Design Day').[2] This day was chosen as a typical day of Summer 2016 operations, for which a comprehensive range of data was available. Model

[2] Helios started building the model prior to peak weeks of Summer 2017, hence a design day from 2016 was used. When 2017 data was available, it was used to cross check the model.

validation is an iterative process whereby adjustments are made to the models in order to better simulate the actual metrics. The goal for the validation phase was to develop models which replicate the 2016 Design Day operations with sufficient accuracy such that they can be deemed fit for purpose for this assessment. Specific airfield and terminal metrics are discussed in further detail in sections 3 and 4, respectively.

2.8 An initial meeting for validation of the 2016 baseline airfield model was held with Dublin Airport and IAA on 27 June. A first airfield validation document, together with video of the model in operation, was shared with the Coordination Committee members on 17 July. Following feedback, a second distribution took place on 28 July, with the final distribution on 4 August. Terminal validation documents, again accompanied by videos of the model, were circulated on 9 August and 11 August. Following the validation process, we, and our advisors, were satisfied that the models were fit for purpose as described above. Validation of the airfield model is discussed further in the next section. A number of stakeholders also agreed that the model was fit for purpose. No stakeholder submitted a contrary view at that time; consequently, Helios proceeded to model Summer 2017 and Summer 2018. The validation documents are published alongside this paper.

2.9 In assessing the capacity of infrastructure, it is necessary to examine the maximum capacity of that infrastructure when it is operated efficiently. For the airfield, this implies the efficient use of stands, taxiways and runways. The modelling should not take account of inefficient practices which can be changed but which may be constraining the use of the infrastructure. For terminals, it means that the modelling must assume that processing facilities such as security screening and immigration control are efficiently staffed to meet demand. For maximum capacity, this means fully staffed with all lanes operational. The IATA World Slot Guidelines state, that when assessing the capacity of airport facilities "the analysis should assume that the airport facilities are being managed efficiently and are fully staffed."[3]

2.10 The next phase of the assessment was to update the models for any relevant infrastructural or operational changes for Summer 2017. The Design Day chosen for the Summer 2017 model was 11 August 2017 (the '2017 Design Day'). The flight schedule on that day was modelled. Following this, a likely Summer 2018 flight schedule was modelled. This schedule was drawn up by Dublin Airport based on the best current information available as to the likely additional demand for slots in Summer 2018; these aircraft movements were then added to the Summer 2017 flight schedule. The Summer 2018 simulation also assumed that the proposed changes to the runway limits were effected.

2.11 Draft results were shared by our advisors with the Coordination Committee on 11 August 2017, inviting written responses by 18 August. Helios presented the results to Committee members on 17 August. A number of changes were implemented based on written and oral feedback received; revised results comparing key metrics from the Summer 2017 simulation and the Summer 2018 simulation were then circulated on 25 August. A document summarising and responding to the feedback received was also circulated on that date. These documents are published alongside this paper.

2.12 Following this, we instructed Helios to compare 2 further scenarios in the airfield model. Firstly, we asked for a comparison between the Summer 2018 forecast schedule coordinated

[3] The World Slot Guidelines are the rules and guidelines established by the air transport industry worldwide and referred to in article 8(5) of the Slot Allocation Regulations.

to the Summer 2017 runway limits, and the same schedule coordinated to the proposed Summer 2018 limits. Secondly, we asked for the same comparison but with three additional movements such that the proposed 0600 hour departures limit would be reached. These comparisons are also published alongside this paper.

2.13 Separate to this process Helios will submit a final capacity report in late September 2017, assessing a range of other scenarios. The report will also consider the need to include 'firebreaks', or intermittent caps on available capacity, and will look to identify pinch points in airport infrastructure. This report will help to inform future capacity decisions.

Coordination Committee's assessment of Parameters for Summer 2018

2.14 In August 2017, Dublin Airport circulated the following to other Committee members:

- A summary of Summer 2017 airfield performance and delay metrics.
- Details of any relevant infrastructural projects.
- Two proposed scenarios for increasing runway capacity (Wishlists 1 and 2).
- The results from a runway capacity assessment carried out by NATS to assess Wishlists 1 and 2.
- A summary of key results from Dublin Airport's own airfield simulation model, comparing a Summer 2017 scheduled day of operations with a forecast Summer 2018 scheduled day of operations, in the latter case assuming that Wishlist 1 has been implemented.
- Dublin Airport's proposals for terminal and stand parameters.

2.15 The Committee met on 17 August, at which the above documents were presented and discussed. Clarifications were sought, and adjustments to certain aspects of the various simulations were sought and agreed. On 26 August, Dublin Airport circulated the results from NATS assessment of a third Wishlist, and a document comparing the three pieces of airfield simulation modelling work carried out by NATS, Dublin Airport, and Helios.[4]

2.16 The Committee met again on 29 August to finalise its advice to the Commission on coordination parameters for Summer 2018. Voting rights for Committee members are set out in the Coordination Committee Constitution. A set number of votes are allocated to Dublin Airport and IAA, with the rest shared out among other members present at the meeting based on the number of movements flown at Dublin in the preceding year. Wishlist 3 was put to vote and the votes were cast as follows:

[4] A Wishlist is the proposed changes in parameters required to give effect to the forecast schedule.

Table 2.1: Committee votes in favour of full set of runway limit adjustments

Member	Number of votes	In Favour	Against
Aer Lingus	247		✓
British Airways	36		✓
Cityjet	23	✓	
Dublin Airport	40	✓	
IAA	20	✓	
Norwegian	4	✓	
Ryanair	334	✓	
Stobart	103		✓
Total	**807**	**421**	**386**

Source: Coordination Committee

2.17 Based on the voting rights, the advice of the Committee is therefore to implement the changes in Wishlist 3 to the Summer 2017 runway limits for the Summer 2018 Season.

2.18 Aer Lingus, Stobart, and British Airways voted against, stating that while they supported a rebalancing of the arrival-departure mix in the 08:00 hour and an increase in arrivals in the 2200 hour, they did not support the other changes in Wishlist 3.[5] The IAA stated that it would support any of the three Wishlists, as it is confident the increased capacity can be delivered by the runway.

2.19 The Committee also voted on the terminal, stand, and referral parameters as proposed by Dublin Airport. It was proposed that hourly terminal capacity for departures would increase from 3,375 in Terminal 1 and 3,450 in Terminal 2 to 3,700 in both terminals, and the 2-hourly limit would no longer apply. For arrivals, it was proposed to increase the hourly capacity in Terminal 1 from 3,390 to 3,550, leaving Terminal 2 unchanged. They proposed that the stand parameter would remain unchanged as a hard constraint, while the referral parameters relating to Terminal 2 check-in desks and US Preclearance should remain in place. Votes were cast as follows:

Table 2.2: Committee votes in favour of their proposed terminal, stand, and referral limits

Member	Number of votes	Terminal	Stands	Referrals
Aer Lingus	247	✓	✓	✓
British Airways	36	✓	✓	✓
Cityjet	23	✓	✓	✓
Dublin Airport	40	✓	✓	✓
IAA	20	-	-	-
Norwegian	4	✓	✓	✓
Ryanair	334	X*	✓	-
Stobart	103	✓	✓	✓
In Favour		**453**	**787**	**453**
Opposed		**334**	**0**	**0**

Source: Coordination Committee

**Ryanair voted against the increases in terminal parameters, however, the reason it gave was that it believes the infrastructure in Terminal 1 could handle a higher number of passengers than those proposed. Therefore, there was unanimous support to*

[5] Aer Lingus and British Airways share a common owner, IAG. An important part of Stobart's business is a franchise operation for Aer Lingus.

increasing the limits to a level at least as high as those proposed by Dublin Airport

2.20 The advice of the Committee is, therefore, to implement the terminal, stands, and referral parameters as proposed. The IAA abstained from this vote, as is their normal practice for decisions on terminal capacity.

2.21 The formalised advice from the Committee is published alongside this paper.

3. Airfield Coordination Parameters

3.1 The Commission's draft decision is to amend the runway coordination parameters in accordance with the final proposal from the Coordination Committee.[6] The full set of parameters is laid out in the appendix. The changes are as follows:

Table 3.1: Changes to runway limits from Summer 2017

UTC Hour	Departures	Arrivals	Totals
0500	+1		
0600	+1		
0800	-4	+2	+1
0900		+1	+2
1100			+1
1200	+1		
1500	+1		+1
1600	+1		
1700			+2
2200		+2	

3.2 We propose to retain the stand parameter as a hard constraint. Where demand for stands exceeds supply, movements are referred to Dublin Airport for detailed assessment. If the issue cannot be resolved, a slot will not be allocated.

Helios airfield modelling

3.3 As described in Section 2, the validation process for the airfield model was comprehensive, involving close collaboration between Helios, the Commission, and stakeholders. Following this process, we would make the following key observations regarding the Summer 2016 baseline model:

- Key simulated metrics, including taxi-out times, counts of aircraft coming on block, off block, lifting off, touching down, runway occupancy times and runway throughput, show a close match with the actual data from the Summer 2016 Design Day, both in magnitude and daily profile.
- 99.3% of aircraft in the simulation use the same stand as was the case on the Summer 2016 Design Day.
- The number of tows in the simulation in general shows a good match to the number of tows on the 2016 Design Day.
- Taxiway, stand, runway, and runway exit usage restrictions and patterns have been implemented in the model.

3.4 The final airfield validation document, which includes the Summer 2016 baseline model, is published alongside this paper; full details are contained therein. The full assessments of each

[6] In meetings of the coordination committee this was referred to as Wish List 3

scenario described in this section are also published.

3.5 Runway capacity limits are set based on runway 28 only, as this is the runway on which the majority of movements take place. Where Helios have included results for runway 10, this is provided for information purposes only.

3.6 The model was updated for any changes in infrastructure that were put in place for Summer 2017. A forecast Summer 2018 schedule was then simulated in the model, assuming the proposed changes to the runway limits to be in effect. The key results from this comparison are summarised in Table 3.2.

3.7 Taxi-out time measures the time elapsed from the aircraft coming off blocks until it crosses the runway stop bar to begin its take-off roll. Departure ground delay is the accumulation of all delay experienced in the same period, i.e. all components of taxi-out time other than unimpeded taxi-time. The estimated effect of proposed airfield capacity increases on these two related metrics is, in our view, the best way to assess the proposal. We would note that, as referenced in Section 2, a similar comparison was modelled by Dublin Airport using its own airfield model. The results are similar to those set out by Helios. The results contained in Table 3.2 were communicated to the Coordination Committee on 25 August.

Table 3.2: Summer 2018 forecast schedule relative to Summer 2017 Design Day schedule

Metric (minutes and seconds)	Period	Summer 2017	Summer 2018	Difference
Taxi-out time	Daily average	11:03	12:32	+1:29
Taxi-out time	Peak average	20:09	25:47	+5:38
Departure ground delay	Daily average	3:52	5:09	+1:17
Departure ground delay	Peak average	11:19	16:55	+5:36

Source: Helios main report.. Average times are based on a rolling 10 minute window. Peak times refer to the window with the highest average value.

3.8 It should be noted that most of the additional movements in the Summer 2018 forecast schedule could be accommodated within the existing 2017 runway limits. The results set out in Table 3.2, therefore, should not be viewed as an estimation of the effect on airfield delay of a decision to implement the proposed changes. Part of the estimated increases is caused by additional movements that are likely to occur regardless of any increase in the runway limits.

3.9 To better isolate the direct effect of this proposal, we asked Helios to compare the Summer 2018 scenario above with the Summer 2018 forecast schedule coordinated to the Summer 2017 limits. Assuming that demand materialises as expected, this comparison shows what the direct effect of the proposed increase would be relative to leaving the parameters unchanged. The key results are set out in Table 3.3.

Table 3.3: Summer 2018 forecast schedule, coordinated to Summer 2017 and proposed 2018 limits

Metric (minutes and seconds)	Period	2017 Limits	Proposed limits	Difference
Taxi-out time	Daily average	12:17	12:32	+0:15
Taxi-out time	Peak average (AM)	24:11	25:47	+1:36
Taxi-out time	Peak average (PM)	17:50	20:14	+2:24
Departure ground delay	Daily average	04:57	05:09	+0:12
Departure ground delay	Peak average (AM)	15:07	16:55	+1:48
Departure ground delay	Peak average (PM)	09:08	11:29	+2:21

Source: Helios additional scenarios. Average times are based on a rolling 10 minute window. Peak times refer to the window with the highest average value.

3.10 The 0500 hour is the peak hour for departures. As can be seen in Table 3.1, the proposal adds 1 extra departure movement to the limit in this hour, which would take it from 35 to 36. In each modelled schedule, the 0500 hour is full of departures, as is the case in reality. In the 0600 hour, it is proposed to also add 1 extra departure, bringing the limit from 30 to 31. However, the forecast schedule includes only 28 departures in this hour. Thus, there is scope for additional departure slots to be allocated; indeed, we note that the limit has been reached on certain days in the current season.

3.11 Given that the departure metrics peak between 0500 and 0700, and that the relative firebreak provided by the 0600 hour could potentially be undermined by additional departures, we asked Helios to add three departures in the 0600 hour to the forecast schedule. The schedule was then coordinated according to both the Summer 2017 and the proposed Summer 2018 runway limits, such that in both scenarios, the departure limits for 0500 and 0600 are reached. Results from this comparison are set out in Table 3.4.

Table 3.4: Summer 2018 forecast schedule with three extra departures in 0600 UTC, coordinated to Summer 2017 and proposed 2018 limits

Metric (minutes and seconds)	Period	2017 Limits	Proposed limits	Difference
Taxi out time	Daily average	12:37	12:44	+0:07
Taxi out time	Peak average (AM)	26:06	27:39	+1:33
Taxi out time	Peak average (PM)	17:50	20:14	+2:24
Departure ground delay	Daily average	05:09	05:23	+0:14
Departure ground delay	Peak average (AM)	16:54	18:40	+1:46
Departure ground delay	Peak average (PM)	09:08	11:29	+2:21

Source: Helios additional scenarios. Average times are based on a rolling 10 minute window. Peak times refer to the window with the highest average value.

3.12 We summarise the Helios results as follows:

- The forecast Summer 2018 schedule, combined with the proposed parameters, leads to an average increase in accumulated ground delay, and consequently taxi-out times, of 1.5 minutes across the day relative to Summer 2017. The average increase peaks at 5.5 minutes at approximately 6 am.

- Much of the additional delay is caused by increases in movements within the current limits.

- The direct effect of the proposed increases is small when the metrics are averaged across the whole day. The proposed changes in the afternoon peak hours (1500, 1600, and 1700) are the most significant in terms of additional delay and taxi-time, with a difference in the peak in this period of 2.5 minutes, although in absolute terms, the delay in this period remains lower than in the morning peak (0500 and 0600). In the morning, the difference is 1.5 minutes.

- Adding 3 departures in the 0600 hour, and then coordinating as necessary to fit the respective limits, does not significantly alter the effect of the decision. It does, as expected, increase the magnitude of delay in that hour whether the current limits or proposed 2018 limits are in place.

3.13 At the Coordination Committee meetings, a stakeholder was critical of the fact that bussing to remote stands has not been incorporated into the airfield modelling. They also stated that towing operations have not been properly modelled.

3.14 As stated above, departure ground delay and taxi-out times are the key metrics for the purposes of this assessment. Busses on the airfield must give way to aircraft, and thus the busses themselves do not affect these metrics. We understand that if busses are delayed by obstructions, whether by aircraft or ground traffic on the apron, the delay could lead to a late departure from a remote stand. A late departure could in turn have an effect on departure ground delay, either positive or negative.

3.15 Within reason, it is the responsibility of the airline in question to ensure that adequate time is allocated to ensure that bussing operations are efficient. This is therefore an issue which relates to operational planning by the airline rather than airfield capacity. As noted in Section 2, our view is to set parameters based on the capacity of the infrastructure without factoring in operational inefficiencies. Therefore, incorporating assumptions relating to inefficient bussing would be inappropriate; on the other hand, if bussing is efficient, it will not affect taxi-out times or ground delay. In any case, we have seen no evidence to suggest that such a knock-on effect is actually occurring; Table 3.5 shows that overall, the On-Time Performance of aircraft using bussing gates has been consistently and significantly higher than those using contact stands.

3.16 Towing of aircraft on and off stand is included in the airfield model in order to capture its negative effect on taxi times and ground delay. As noted above, the number of tows which occurred in the 2016 baseline model matches well with the actual data. Towing operations in the airfield model are not hard coded in terms of when they happen or based on assumptions as to duration. Instead, the timing and duration of tows are optimised by the software. Again, this is consistent with our view that the parameters should be declared based on the infrastructure, without building in operational inefficiencies.

3.17 Given the close match in the model validation outputs, it is our view that no significant airfield capacity affecting element has been omitted from the model.

NATS runway modelling

3.18 As has occurred in previous seasons, Dublin Airport commissioned NATS to assess the impact of the proposed changes in runway parameters. It is important to note that the purpose of the NATS assessment is different to that of the airfield modelling carried out by Helios and Dublin Airport itself. NATS assess whether the runway alone is capable of delivering a theoretical schedule, whereby the traffic in each hour fills the proposed runway limits, without breaching a 10-minute runway holding delay criterion. The purpose of the airfield models is to assess the effects of the Summer 2018 forecast schedule on a range of metrics, under different assumptions, across the entire airfield. The main difference is that our modelling and that of Dublin Airport includes modelling of the runway, taxiways and stands whereas NATS assess the runway only.

3.19 In practice, slots could not be allocated such that the runway limits are completely filled due to the hard constraint on stands.

3.20 NATS modelled the final proposed parameters and the 10-minute delay criterion was not breached.

On Time Performance (OTP) and taxi-out times

3.21 Table 3.5 shows OTP for Summer 2015, 2016 and Summer 2017 to date.

Table 3.5: On time performance by pier at Dublin Airport

	S15	S16	S17*
Pier 1 Remote	80.9%	82.3%	87.2%
Central Apron	84.5%	83.9%	85%
South Apron	77%	82.5%	84.9%
Pier 2	79.2%	73.2%	73.7%
5G	80.3%	74.6%	73.3%
Pier 1 Contact	78.5%	71.5%	73.3%
Pier 4	72.5%	76.6%	73%
Pier 3	74%	71.2%	69.5%
Overall	**76.9%**	**74.7%**	**74.5%**

Source: Dublin Airport

** Year to 10 September 2017*

3.22 We would make the following observations:

- Following a deterioration in OTP in Summer 2016, this trend has not continued into Summer 2017, despite significant traffic growth and no major changes in airport infrastructure or operating procedures.

- There are no large differences in OTP across different areas of the airfield with the exception of bussed stands, which have consistently demonstrated better OTP than contact stands.

3.23 Actual taxi-out times in the morning peak have improved slightly relative to Summer 2016, on both runways 28 and 10. This improvement averages out at approximately 2 minutes across the airfield; again, there is no great variation across different areas of the airfield.

Draft decision - Airfield

3.24 The Commission's draft decision is to amend the runway coordination parameters in accordance with the final proposal from the Coordination Committee.[7] The full set of parameters is laid out in the appendix.

3.25 It is clear that there is a trade-off between ground delay and runway capacity, particularly in the peak periods, where the marginal delay caused by the addition of movements is higher. However, where there is demand for additional movements, and these can be delivered without a substantial increase in delay, it is in the interests of users for us to declare increased capacity accordingly.

3.26 Our view is that the evidence demonstrates that the proposed increases are feasible. The proposed decision to alter the limits is based on the following factors:

[7] In meetings of the coordination committee this was referred to as Wishlist 3

- The Coordination Committee has advised us to increase the runway capacity as proposed.

- The Helios assessment shows that the direct effect of the proposed Summer 2018 limits relative to the Summer 2017 limits is likely to be limited, with overall delay across the day averaging out in both scenarios. Average delay is likely to increase by approximately 1.5 minutes and 2.5 minutes in the morning and afternoon peak windows respectively.

- The NATS assessment shows that the runway can handle the additional movements without breaching a 10-minute runway holding delay criterion.

- The IAA are confident they can handle the additional movements.

- OTP and taxi-out time statistics have been maintained or improved from Summer 2016 despite the increase in traffic.

3.27 The Summer 2017 season has demonstrated that additional movements need not necessarily lead to increases in delay or a reduction in OTP. We recognise that this is due to the efforts of a range of stakeholders.

4. Terminal Parameters

4.1 Our draft decision is to increase the hourly limit for departing passengers to 3,700 in both terminals and the hourly limit for arriving passengers in Terminal 1 to 3,550. We propose to make the other adjustments to the parameters which were recommended by the Coordination Committee.

Proposed Parameters – Dublin Airport

4.2 The following changes were proposed by Dublin Airport to the coordination parameters for the terminals:

- Increase the hourly limit for departing passengers to 3,700 for both Terminal 1 and Terminal 2
- Remove the 2-hour rolling limit for departures in both terminals
- Increase the hourly limit for arriving passengers in Terminal 1 to 3,550

It also proposed retaining the hourly limit for arriving passengers in Terminal 2 of 3,050

Table 4.1: Departure and Arrivals Limits - Summer 2017 and proposed Summer 2018

	Summer 2017				Summer 2018	
	Departures Hourly Limits	2 Hour Limit	Arrivals Hourly Limits		Departures Hourly Limits	Arrivals Hourly Limits
Terminal 1	3375	5400	3390		3700	3550
Terminal 2	3450	5040	3050		3700	3050

Hourly limit rolled every 10 minutes

Proposed Referral Limits – Dublin Airport

4.3 Referral limits are not hard coordination parameters. If a proposed operation hits a referral limit, it is referred to the airport to attempt to find a workable solution.

4.4 The airport proposed retaining the referral parameter for Terminal 2 check-in desks 1-28 (Terminal 2 operators excluding Aer Lingus) – where demand exceeds 28 desks.

4.5 It recommended retaining the referral for CBP operations but extending it to cover the full day rather than just the 9.30 to 12.30pm window as in place for Summer 17.[8] This change has already been approved for Winter 2017.

4.6 There is currently a referral flag for Terminal 2 arrivals from 06:30 and 11:30 of 1,500 passengers per rolling hour. It is proposed that this is dropped.

Proposed Parameters – Other parties

4.7 No other party, except for Dublin Airport, made concrete proposals on changes to the

[8] These are operations which are processed through US customs and immigration control in Dublin rather then on arrival in the US.

coordination parameters for terminal buildings.

Load Factors

4.8 For the purposes of coordination, a load factor of 85% is currently used for scheduled flights. In reality, the current average load factor is 90% but it varies across airlines, type of route and time and day of flight. At the pre-meeting of the Coordination Committee there was some discussion on changing how load factors were applied in coordination. However, this discussion did not reach conclusions or result in any proposed changes.

Advice of the Committee

4.9 As set out in Table 2.2, the Coordination Committee have advised the Commission to amend the terminal parameters as proposed by Dublin Airport.

Modelling Conducted for the Commission

4.10 As discussed in Section 2, Helios have developed a comprehensive, validated, fast time simulation model of the terminal buildings. This model tracks the journeys of both arriving and departing passengers.

4.11 Helios have modelled the forecast schedule for Summer 2018. The full report published alongside this paper shows how the forecast schedule will affect the service level at key pinch points.

4.12 Overall the Helios modelling concludes that:

- the additional demand in Summer 2018 can be serviced by the available terminal infrastructure. It notes that there is additional capacity available in the terminal buildings throughout the day.
- additional demand in the morning departures wave will increase waiting times at security.
- the TSA Security Process is the limiting element of the US Preclearance area and any additional flights to the US should continue to be referred to the airport for assessment of options.
- the overall arrival capacity is sufficient, however, the increased demand does result in some increases to queuing times.
- the introduction of 20 e-gates before Summer 18 is likely to decrease immigration waiting times.

Departure Parameters

4.13 For the departing passenger journey, the limiting factor in both terminals is the security screening process. This has a physical maximum capacity:

- In Terminal 1 there are 15 processing lanes each capable of processing 235 passenger per hour giving a total capacity of 3525.
- In Terminal 2 there are 18 processing lanes each capable of processing 140.5 passenger per hour giving a total capacity of 2529.

In Terminal 2, in the peak hours, some 900 departing passengers will transfer from arriving flights and therefore do not present at central search – they go through the transfer facility.

4.14 Load factors for coordination are 85% whereas actual load factors are 90%. If the actual load factor remains at 90% for Summer 2018, then the proposed limits of 3,700 departing passengers in an hour would require the infrastructure to be able to deal with 3,917 departing passengers. If load factors were 100%, 4,353 passengers would depart in the peak hour.

4.15 When setting a departing passenger limit we need to be mindful of the timing of when people present themselves at security. In the peak hour 3,700 passengers may be departing the airport, but many of those will have processed security in the previous hour, or indeed the hour before that. Therefore, you can have a higher number of passengers departing in an hour than the hourly processing capability of security screening.

4.16 For example, if you have a flight with 100 passengers departing for western Europe at 11am, on average, 5 of those passengers would present at security screening before 8am, 42 between 8 and 9am, 45 between 9 and 10am and the remaining 8 would arrive in the final hour. This example shows that the infrastructural requirement of these 100 passengers is spread over a number of hours.

4.17 In addition, because departure movements tend to occur in waves rather than being evenly spread across the day, the peak level of departing passengers is not sustained beyond the peak hour. For example, in Terminal 1, while you might have 3,700 passengers departing in the peak hour of the morning, 0500, it is likely that only about 1,000 will depart in the 0400 hour and 2,000 in the 0600 hour.

4.18 Dublin Airport conduct extensive data collection on passenger show-up times compared to flight times using the scanning of boarding cards to collect the data. This is then used to plan the staffing requirements of the security process at any given time. This data also allows us to map the coordination parameters to the physical processing capacity of the security process. These show-up profiles were used by Helios in setting up the fast time simulation model.

4.19 In the Helios modelling, there were some 4,300 departing passengers in the busiest hour in Terminal 1, but when the show-up profiles were applied to this hour and all other hours, the maximum number of passengers presenting at security in Terminal 1 in an hour was about 3,000. This is less than the physical processing capacity of the security processing facility.

4.20 Terminal 2 is somewhat complicated by the fact that a large number of passengers do not present at central search. Some 900 departing passengers use the transfer facility. The same principles apply, Helios modelled some 3,900 passengers with flights departing in a single hour, and this had no adverse impact on security queue times.

4.21 To reach these maximum capacities the security area would need to be fully staffed with all lanes open. The assumption of being fully staffed allows us to establish the infrastructure limit and not a constrained limit due to operational decisions. This concept is discussed in Paragraph 2.9. Dublin Airport can, and do, increase staffing to match security screening demand and to ensure internal and external KPIs are reached.

4.22 Based on this analysis, our proposed decision is to increase the limits on departing passengers in both terminals.

Arrivals Parameters

4.23 The proposal is to increase the limits for arrivals in Terminal 1 to 3,550, this is with 85% load factors. If the load factor was actually 90% this would represent 3,758 passengers. No change is proposed for Terminal 2 arrivals.

4.24 In both terminals, the limiting factor for the arrivals journey is the immigration process.

4.25 Once again, when deciding on coordination parameters we need to examine the capabilities of the infrastructure when it is fully staffed, as discussed in Paragraph 2.9.

4.26 Given the number of booths available in the 2 processing areas in Terminal 1, the processing rates for EU and non-EU passengers, and the allocation of booths between the different types of passengers, the processing capacity of the immigration facilities of Terminal 1 is some 4,000 passengers per hour. The introduction of e-gates will likely increase this by a few hundred per hour. However, the full effect of e-gates is not yet known.

4.27 The Helios modelling uses 100% load factors (to fully stress the systems) and models 4,385 passengers arriving into Terminal 1 in the peak hour. When fully staffed, and with the e-gates operational, this results in peak queue times of about 12 minutes.

4.28 Given the ability of the physical infrastructure in Terminal 1 to process in excess of 4,000 passengers per hour, we propose to increase the coordination limit to 3,550 in line with the proposal of Dublin Airport and the advice of the Committee.

4.29 We are aware that currently there can be long queues experienced by passengers when presenting at immigration control. The analysis we have conducted suggests this is not a function of infrastructure limitations but rather a function of the staffing levels at the facilities. Staffing of these facilitates is not the responsibility of Dublin Airport. The facilities at Terminal 1 are staffed by the Irish Naturalisation and Immigration Service (INIS).

4.30 We will work with all stakeholders, including INIS, to ensure that the consequences of increasing these parameters is understood in terms of the number of presenting passengers which can be expected.

CBP Referral

4.31 The US Customs and Border Protection (CBP) for flights to the US is currently a referral limit. This means that a new slot request wishing to use these facilities will be “referred” to the airport to examine whether it can be accommodated. If the facility is at capacity, this process allows for the discussion of possible solutions, for example, a time change, or proceed with the flight but do not use CBP, etc. CBP is not a hard limit; that is, a slot can still be allocated if this element is at capacity provided there is stand, terminal, and runway capacity available.

4.32 Dublin Airport proposed maintaining this approach but extending it to the full day. The Coordination Committee supported this.

4.33 Given there is the option to fly to the US with or without preclearing, this approach is currently superior to having a hard limit.

4.34 We therefore plan to retain the CBP referral extending the time in which it applies to the full

day, in line with the decision for Winter 2017.

Check-in Desk Referral

4.35 Check-in desks are not a hard limit. However, there is a referral limit for Terminal 2 desks 1-28 (excluding Aer Lingus). If a slot request results in the demand for desks in this area exceeding 28 then this is flagged to Dublin Airport. The airport can look for solutions to allow the slot to be allocated.

4.36 There was no proposal to change this.

4.37 Given this approach is superior to refusing the slot, we propose to retaining this referral flag.

Removal of T2 Arrivals Referral

4.38 The airport proposes removing the referral flag of 1,500 passengers per rolling hour in Terminal 2. The Coordination Committee agreed with this proposal. The modelling work conducted by Helios did not identify a need to retain this referral flag. We propose removing this from the coordination parameters.

Other Issues

4.39 At the Coordination Committee meeting, there was some discussion of the baggage handling capabilities of Terminal 2. However, in terms of coordination parameters, no proposals were made and it was not part of the advice received by us from the committee. The Helios analysis of the baggage hall showed no issues with capacity; this analysis will be in their full capacity report to be published later.

Terminals – Summary of Draft Decision

4.40 Based on the above analysis our draft decision is to amend the coordination parameters in line with the proposals of Dublin Airport and the advice of the Coordination Committee. The main changes are, increase departure limits for both terminals to 3,700/hour and to increase arrival limits in Terminal 1 only to 3,550.

5. Appendix 1: Draft Decision on Coordination Parameters at Dublin Airport for IATA Summer 2018 Season

The Commission for Aviation Regulation proposes the following scheduling limits for the Summer 2018 season.

Runway Scheduling Parameters:

Runway Hourly Limits			
Time UTC	Arrivals Limit	Departures Limit	Total Limit
0000	23	25	32
0100	23	25	32
0200	23	25	32
0300	23	25	32
0400	23	25	32
0500	23	**36**	40
0600	20	**31**	42
0700	25	25	42
0800	**24**	**25**	**43**
0900	**24**	24	**43**
1000	27	27	45
1100	27	28	**47**
1200	23	**27**	46
1300	27	24	46
1400	23	26	44
1500	26	**25**	**46**
1600	25	**29**	48
1700	23	27	**44**
1800	23	24	37
1900	23	22	38
2000	25	22	38
2100	30	25	36
2200	**28**	25	32
2300	23	25	32

Totals	584	622	950

Maximum number of movements per 10 minute period	
Maximum Total	9
Maximum Arrivals	6
Maximum Departures	6*

*Exception – Maximum Departure Limit is 7 movements at 0500, 0510, 0520, 0530, 0540, 0550 UTC.

Passenger Terminal Parameters:

	Departures Hourly Limit	Arrivals Hourly Limit
Terminal 1	3,700	3,550
Terminal 2	3,700	3,050

Notes:

1) The hourly limit for passengers is rolled every 10 minutes.
2) Load factors of 85% and 90% are applied to Scheduled and Charter services respectively.

Stand Parameters:

	GA	**Non-Turnaround**			**Turnaround Stands**								**All**
	LAB	APC	W.A.	Total	5G	P1	P2	P3	P4	S.A	Triangle	Total	Total
Contact						23	10	11	19			61	61
Remote	12	13	23	36	14				1	9	5	31	79
All	12	13	23	36	14	23	10	11	20	9	5	92	140

Note: Stands defined based on ICAO Code B and C size.

Area	**Constraint**
Stands	Where demand for stands exceeds supply based on coordination allocation, flights to be referred to Dublin Airport for detailed assessment.

Referral Parameters:

Area	**Flag**
T2 Check-in Desks 1-28 (T2 Operators excluding EI)	Demand exceeds 28 desks
US Preclearance	New flights and schedule changes