

Summer 2025: Final assessment of the likely impact of declaring the Wishlist runway capacity

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The Irish Aviation Authority (IAA) is responsible for determining the parameters for slot allocation at Dublin Airport.

To ensure that optimal parameters are set, the IAA has instructed Egis to undertake airfield fast time simulations in preparation for the Summer 2025 (S25) season at Dublin airport.

This document provides results from two simulated scenarios:

- S25 flight schedule coordinated to the proposed S25 limits and
- S25 flight schedule coordinated to the existing S24 limits.





Model description

- Based on the model developed to support the coordination committee decisions in 2017 and used since.
- Historically validated against a number of design days from previous seasonal assessments.
- Calibrated against a single day of S24 operations (31 May 2024).
- Run from actual block times to take into account all delays.
- A comparison set of airside performance metrics is provided on following slides.



Busy day simulated for the purpose of model calibration

- 31 May 2024
 - Westerly operations for 100% of the time;
 - Arrivals on 28L only;
 - Departures 28L 2200-0559 UTC (2300-0659 local);
 - Departures 28R 0600-2159 UTC (0700-2259 local);
- 684 flights in total, incl. GA and cargo
 - 377 arrivals and 384 departures;
 - Helicopter operations were not simulated.



Calibration of departure performance



Metric definition:

Time duration between the off-block time and aircraft lifting off.

*This graph is presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).





Metric definition:

The number of aircraft that have been pushed back in the last rolling period. The count is incremented when the aircraft leaves its departure parking position (either being pushed back at gate or taxiing / pulled away from a parking position).

* This graph is presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).

Calibration of arrival performance



Metric definition:

Time duration between touch-down and aircraft parking on-blocks.

*This graph is presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).



Metric definition:

The number of aircraft that have reached their arrival parking position in the last 10-minute rolling period. The count is incremented when the aircraft reaches its in-blocks position.

* This graph is presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).

Calibration of runway performance



Metric definition:

Lift-off count: The number of aircraft that have lifted off in the 60-minute rolling period. The count is incremented when the aircraft passes over the opposite end of the runway.

Touch-down count: The number of aircraft that have touched down in the 60-minute rolling period.

Runway throughput: Sum of all aircraft touching down and lifting-off in the 60-minute rolling period.

* All graphs are presented as a rolling 60-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).

Result of model validation exercise

As the metrics calculated through the FTS model closely match the real-world data, both in terms of magnitude and profile shape, the model can be considered a satisfactory representation for the purpose of evaluating the impact of the proposed changes on flight schedules.

The model is considered to be valid if it is a sufficiently accurate representation of the corresponding real-world problem from the perspective of the intended uses of the model. "Valid" for a simulation does not mean the same as "indistinguishable from the real-world system", even though in this case there is a close match.





Task description

The purpose of this comparison is to assess the likely effect of either:

- declaring an increased runway capacity, as per the Dublin Airport Wishlist proposal, or
- maintaining the Summer 2024 capacity declaration limits.

The Summer 2025 schedule was designed based on expected S25 demand.

The same number of movements are modelled in all cases, the difference being the limits to which they are coordinated. This difference is therefore a best current information estimate of the effect of a decision to increase the runway limits on a busy Summer 2025 day.



Approach and key changes in the model



Changes to airfield model:

- W2 segment closed
- S1 and A segments closed ~



- Dual runway operations:
 - Semi-mixed mode (arrive 28L, depart 28L & 28R) during the day (06:00 – 21:59 UTC) and
 - Single runway operations for both arrivals and departures from 28L for the night period (22:00 05:59 UTC).
- No changes to operating procedures
 - Departure-departure separation kept at minimum of 84 seconds;
 - Arrival-arrival separation kept at minimum of 3.5 NM;
 - A-D-A separation kept at minimum of 5.5 NM.

Summer 2025 (S25) flight schedule

The flight schedule used for modelling of both scenarios:

- Contains a total of 888 flights (446 arrivals and 442 departures);
- Contains 51 new arrivals and 48 new departures;
- Does not contain helicopter, military, state or medical flights.



S25 Wishlist proposed by Dublin Airport

Hour UTC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
Arrivals			-	-	-	-		-												-		-		·	
Existing S24 arrivals capacity	23	23	23	23	23	23	20	25	27	27	29	30	24	28	23	26	27	26	23	25	27	33	28	23	609
Proposed S25 arrivals capacity	23	23	23	23	23	23	20	25	29	27	29	30	28	28	23	26	27	26	23	26	27	33	28	23	616
Difference (against S24 declaration)	0	0	0	0	0	0	0	0	2	0	0	0	4	0	0	0	0	0	0	1	0	0	0	0	7
Departures																									
Existing S24 departures capacity	25	25	25	25	25	36	40	25	25	26	27	30	29	26	29	27	29	28	26	22	22	25	25	25	647
Proposed S25 departures capacity	25	25	25	25	25	36	40	25	25	30	27	30	29	30	29	27	29	28	26	22	22	25	25	25	655
Difference (against S24 declaration)	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	8
Totals																									
Existing S24 totals	32	32	32	32	32	40	52	45	48	52	52	52	50	52	49	47	52	51	43	41	40	44	32	32	1034
Proposed S25 totals	32	32	32	32	32	40	52	45	50	54	52	54	54	56	49	47	52	51	46	46	46	44	32	32	1062
Difference (against S24 declaration)	0	0	0	0	0	0	0	0	2	2	0	2	4	4	0	0	0	0	3	5	6	0	0	0	28

10-minute limits:

Dual RWY operations:

- 6 arrivals
- 7 departures
- 13 total
- Single RWY operations:
- 6 arrivals
- 9 departures
- 9 total

S25 constrained by proposed S25 limits

Hour UTC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
Arrivals																									
Proposed S25 arrivals capacity	23	23	23	23	23	23	20	25	29	27	29	30	28	28	23	26	27	26	23	26	27	33	28	23	616
Arrivals in simulated S25 schedule	11	1	0	7	7	4	15	25	29	24	25	29	28	26	20	20	25	22	20	26	27	17	16	22	446
Historic	10	0	0	7	7	2	14	25	26	21	25	27	22	25	17	19	22	21	18	16	19	17	15	20	395
Additional arrivals proposed for S25	1	1	0	0	0	2	1	0	3	3	0	2	6	1	3	1	3	1	2	10	8	0	1	2	51
Spare capacity (against S25 wishlist)	12	22	23	16	16	19	5	0	0	3	4	1	0	2	3	6	2	4	3	0	0	16	12	1	170
Departures																									
Proposed S25 departures capacity	25	25	25	25	25	36	40	25	25	30	27	30	29	30	29	27	29	28	26	22	22	25	25	25	655
Departures in simulated S25 schedule	0	2	2	0	16	36	37	15	21	30	27	25	26	30	29	27	23	22	26	20	19	6	3	0	442
Historic	0	1	2	0	14	36	37	15	20	24	27	25	25	23	25	24	23	20	23	16	7	5	2	0	394
Additional departures proposed for S25	0	1	0	0	2	0	0	0	1	6	0	0	1	7	4	3	0	2	3	4	12	1	1	0	48
Spare capacity (against S25 wishlist)	25	23	23	25	9	0	3	10	4	0	0	5	3	0	0	0	6	6	0	2	3	19	22	25	213
Totals																									
Wishlist S25 Totals capacity	32	32	32	32	32	40	52	45	50	54	52	54	54	56	49	47	52	51	46	46	46	44	32	32	1062
Totals in simulated S25 schedule	11	3	2	7	23	40	52	40	50	54	52	54	54	56	49	47	48	44	46	46	46	23	19	22	888
Historic	10	1	2	7	21	38	51	40	46	45	52	52	47	48	42	43	45	41	41	32	26	22	17	20	789
Additional movements proposed for S25	1	2	0	0	2	2	1	0	4	9	0	2	7	8	7	4	3	3	5	14	20	1	2	2	99
Spare capacity (against S25 wishlist)	21	29	30	25	9	0	0	5	0	0	0	0	0	0	0	0	4	7	0	0	0	21	13	10	174



Constraining the S25 schedule by the S24 limits results in spreading the flights into shoulder hours



Some of the additional services envisaged in S25 schedule had to be re-timed to make the flight schedule compatible with the existing S24 declaration. This simulates a case where existing S24 declaration will be rolled forward to Summer 25 season, but all of the new services would still operate – although not necessarily at the originally scheduled times.

S25 constrained by existing S24 limits

Hour UTC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
Arrivals																									
Existing S24 arrivals capacity	23	23	23	23	23	23	20	25	27	27	29	30	24	28	23	26	27	26	23	25	27	33	28	23	609
Arrivals in simulated S25 schedule	11	1	0	7	9	4	15	25	27	26	25	27	24	26	20	21	26	26	18	23	25	22	16	22	446
Historic	10	0	0	7	7	2	14	25	26	21	25	27	22	25	17	19	22	21	18	16	19	17	15	20	395
Additional arrivals proposed for S25	1	1	0	0	2	2	1	0	1	5	0	0	2	1	3	2	4	5	0	7	6	5	1	2	51
Spare capacity (against S24 limits)	12	22	23	16	14	19	5	0	0	1	4	3	0	2	3	5	1	0	5	2	2	11	12	1	163
Departures																									
Existing S24 departures capacity	25	25	25	25	25	36	40	25	25	26	27	30	29	26	29	27	29	28	26	22	22	25	25	25	647
Departures in simulated S25 schedule	0	2	2	0	16	36	37	19	21	26	27	25	26	26	29	26	26	25	25	18	15	10	5	0	442
Historic	0	1	2	0	14	36	37	15	20	24	27	25	25	23	25	24	23	20	23	16	7	5	2	0	394
Additional departures proposed for S25	0	1	0	0	2	0	0	4	1	2	0	0	1	3	4	2	3	5	2	2	8	5	3	0	48
Spare capacity (against S24 limits)	25	23	23	25	9	0	3	6	4	0	0	5	3	0	0	1	3	3	1	4	7	15	20	25	205
Totals																									
Existing S24 totals	32	32	32	32	32	40	52	45	48	52	52	52	50	52	49	47	52	51	43	41	40	44	32	32	1034
Totals in simulated S25 schedule	11	3	2	7	25	40	52	44	48	52	52	52	50	52	49	47	52	51	43	41	40	32	21	22	888
Historic	10	1	2	7	21	38	51	40	46	45	52	52	47	48	42	43	45	41	41	32	26	22	17	20	789
Additional movements proposed for S25	1	2	0	0	4	2	1	4	2	7	0	0	3	4	7	4	7	10	2	9	14	10	4	2	99
Spare capacity (against S24 limits)	21	29	30	25	7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	12	11	10	146





(westerly operations)



04.

Departure taxi out time

	S24 limits	S25 limits	Difference
Daily average	00:12:24	00:12:36	00:00:12
Peak	00:22:42	00:22:54	00:00:12

Definition: This metric is defined to be the time period between off-block and the time the aircraft lifts-off. This value is updated every second during the simulation when the aircraft is taxiing for departure even if the aircraft is stopped on



--- S25 constrained by proposed S25 limits

S25 constrained by existing S24 limits

*This graph is presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).

Departure ground delay and runway holding delay

Departure ground delay: Total delay of departing aircraft accumulated between off-block and entering the runway. It is effectively the sum of runway holding delay and other delays.



Runway holding delay: The delay experienced while the aircraft is queueing for runway entry. The delay can be caused by other aircraft (being slowed down or stopped) or when waiting at runway stop-bar (because the runway is not free for lining up). This metric is defined to be the time period between joining the back end of the queue and the time the aircraft reaches its stop bar for runway entry.



*These graphs are presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).

Arrival taxi in time and arrival ground delay

Arrival taxi-in time: The time duration the arriving aircraft has been taxiing on the ground of its arrival airport. This value is updated every second of simulation time when the arriving aircraft is taxiing even if the aircraft is stopped on ground.



Arrival ground delay: The delay caused by traffic (slowing down or being stopped) while the aircraft is taxiing to its arrival stand. Every second of simulation time the aircraft is stopped on ground due to other traffic, the delay is increased accordingly. Additionally, if the aircraft is forced to slow-down due to other traffic, a proportional delay is calculated.



*These graphs are presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).



Increasing the RWY limits in line with the S25 Wishlist

Assuming the S25 schedule materializes as expected, increasing the runway limits in line with the S25 Wishlist:

- Is likely to lead to scheduled capacity limits being reached during day between 0500-15:59 and during evening between 1800-2000.
- The daily average and peak taxi out times are on average not materially impacted by declaring the additional capacity.
- Is likely to cause minor localized deterioration of ground delays in and around those hours where capacity increases are proposed.
- The average departure taxi time in the first morning wave peaks between 0530-0820 with peak departure taxi time of around 22 minutes and 42 seconds per flight.
- For the remaining part of the day, departure taxi times are typically between 12-15 minutes.



Maintaining the RWY limits in line with the S24 declaration

Assuming the S25 schedule materializes as expected, maintaining the runway limits in line with the S24 capacity declaration:

- Is likely to lead to scheduled capacity limits being reached between 0500-1959.
- Is likely to cause re-distribution of newly planned services to hours with any remaining available capacity.
- The overall impact of keeping S24 limits is marginal.
- Re-planning the new services to comply with S24 limits will:
 - Cause local reduction in taxi time performance (compared against S25 wishlist schedule) in those hours where the additional services were initially proposed and then rescheduled to comply with S24 limits.
 - Local increase in taxi time performance (compared against S25 wishlist schedule) is not expected as flights were typically rescheduled into hours with enough spare capacity.



Additional scenario Wishlist 2



06.

Wishlist 2 – Additional scenario

Wishlist 2 Additional slots									
	requ	iired							
υтс	А	D	т						
00:00:00	0	0	0						
01:00:00	0	0	0						
02:00:00	0	0	0						
03:00:00	0	0	0						
04:00:00	0	0	0						
05:00:00	0	0	0						
06:00:00	0	0	2						
07:00:00	5	0	5						
08:00:00	2	0	5						
09:00:00	0	0	0						
10:00:00	0	2	3						
11:00:00	0	0	3						
12:00:00	0	0	2						
13:00:00	0	0	0						
14:00:00	0	0	0						
15:00:00	0	1	4						
16:00:00	0	0	0						
17:00:00	0	0	0						
18:00:00	1	3	10						
19:00:00	0	1	5						
20:00:00	0	0	1						
21:00:00	0	0	0						
22:00:00	0	0	0						
23:00:00	0	0	0						
Totals	8	7	40						

Wishlist 2 Capacity												
υтс	UTC Arr Dep Tot											
00:00:00	23	25	32									
01:00:00	23	25	32									
02:00:00	23	25	32									
03:00:00	23	25	32									
04:00:00	23	25	32									
05:00:00	23	36	40									
06:00:00	20	40	54									
07:00:00	30	25	50									
08:00:00	29	25	53									
09:00:00	27	26	52									
10:00:00	29	29	55									
11:00:00	30	30	55									
12:00:00	24	29	52									
13:00:00	28	26	52									
14:00:00	23	29	49									
15:00:00	26	28	51									
16:00:00	27	29	52									
17:00:00	26	28	51									
18:00:00	24	29	53									
19:00:00	25	23	46									
20:00:00	27	22	41									
21:00:00	33	25	44									
22:00:00	28	25	32									
23:00:00	23	25	32									
Totals	617	654	1074									

Wishlist 2 Availability After												
υтс	UTC A D T											
00:00:00	12	25	21									
01:00:00	22	23	29									
02:00:00	23	23	30									
03:00:00	16	25	25									
04:00:00	16	9	9									
05:00:00	19	0	0									
06:00:00	4	2	0									
07:00:00	0	5	0									
08:00:00	2	1	2									
09:00:00	3	0	2									
10:00:00	3	0	0									
11:00:00	0	5	0									
12:00:00	0	1	0									
13:00:00	2	0	0									
14:00:00	3	0	0									
15:00:00	3	0	0									
16:00:00	2	4	2									
17:00:00	2	6	5									
18:00:00	0	0	0									
19:00:00	2	0	0									
20:00:00	1	7	0									
21:00:00	16	19	21									
22:00:00	12	22	13									
23:00:00	1	25	10									
Totals	164	202	169									



Departure taxi out time

Definition: This metric is defined to be the time period between off-block and the time the aircraft lifts-off. This value is updated every second during the simulation when the aircraft is taxiing for departure even if the aircraft is stopped on



*This graph is presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).

Arrival taxi in time

Definition: The time duration the arriving aircraft has been taxiing on the ground of its arrival airport. This value is updated every second of simulation time when the arriving aircraft is taxiing even if the aircraft is stopped on ground.



*This graph is presented as a rolling 10-minute average (value for each time period has been calculated as average of values of all events occurring within the T-60 minutes window from the start of the measurement).



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