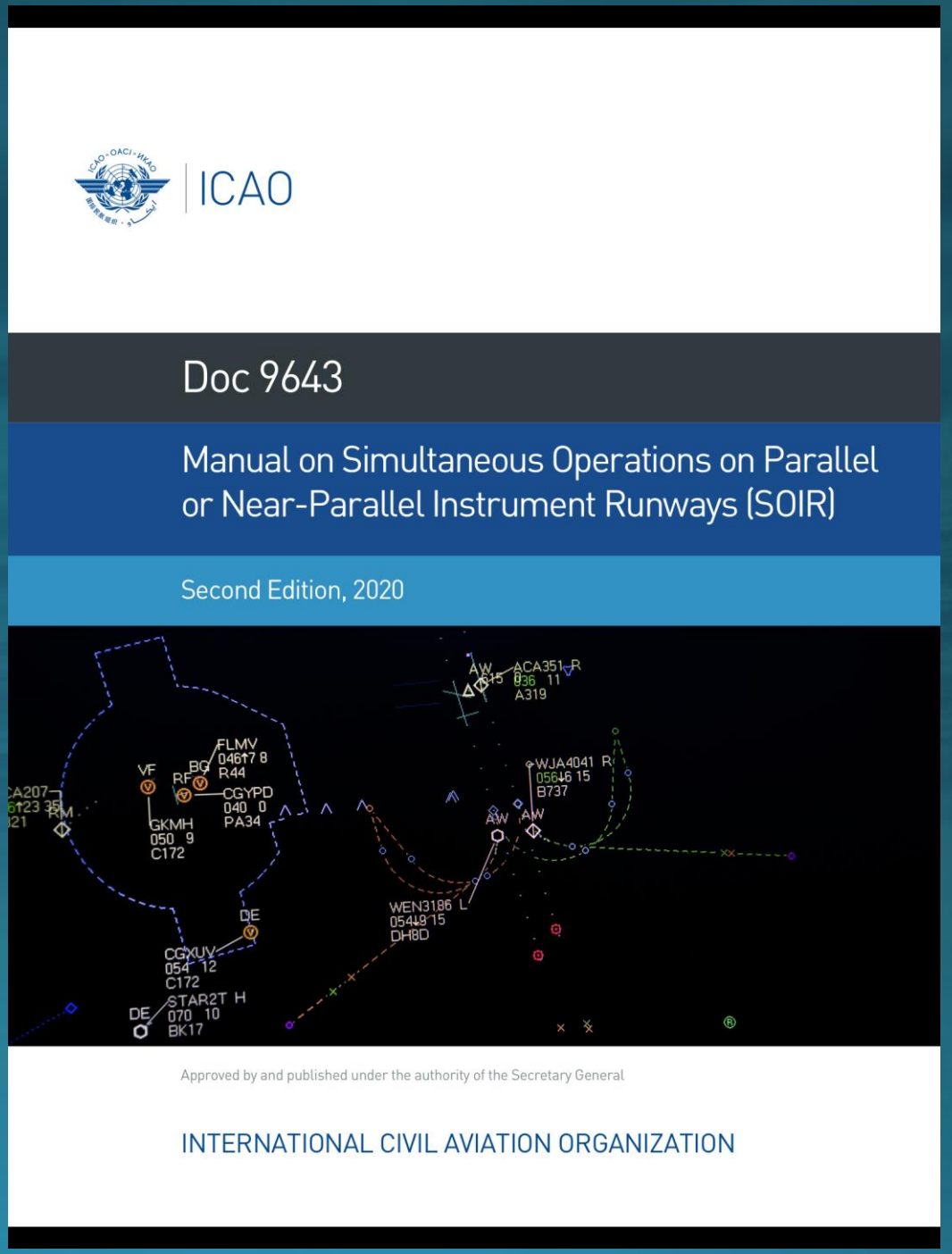
27TH October 2023

Dublin Airport

Departure Routes

Parallel Runway Operations

- All procedures are outlined in the ICAO (International Civil Aviation Organisation) DOC 9643.
- Edition 1 was published in 2004, and edition 2 in 2020, and requires Airports to comply to these restrictions.
- The DAA would submit departure and arrival procedures to the IAA for approval.
- The current departure (SIDS) and arrival (STAR) procedures are in compliance with these procedures, however departures off 28R with a 10 degree turn are possible under these procedures.



Parallel Runway Operations

- Separation from simultaneous Departures off parallel runways, and
- Separation from a missed approach from one runway, and the departure from the parallel runway.
- Departures from parallel runways must diverge by at least 10 degrees and turn within 2nm of the runway.
- The required divergence between a missed approach from one runway and the departure off the parallel runway must diverge by at least 30 degrees immediately.
- This means that if the DAA wish to depart off 28L and 28R at the same time a departure turn of 10 degrees is required from 28R
- This will require the missed approach off 28L to track left by 30 degrees by the end of the runway.

Chapter 3

INDEPENDENT INSTRUMENT DEPARTURES FROM PARALLEL RUNWAYS (MODE 3)

3.1 GENERAL

Parallel runways may be used for independent instrument departures if:

a) both runways are used exclusively for departures (independent departures); or

b) one runway is used exclusively for departures, while the other runway is used for a mixture of arrivals and departures (semi-mixed operation); or

c) both runways are used for mixed arrivals and departures (mixed operation).

3.2 REQUIREMENTS AND PROCEDURES

3.2.1 Procedures for independent instrument departures from parallel runways are contained in the PANS-ATM, Chapter 6, 6.7.2.2. It states that independent IFR departures may be conducted from parallel runways provided:

a) the runway centre lines are spaced by a minimum distance of 760 m (2 500 ft) (see Annex 14, Volume I); however, when the spacing between two parallel runways is less than the specified value dictated by wake turbulence considerations, the runways are considered as a single runway with regard to separation between departing aircraft. For further detail regarding wake turbulence on departure, refer to Circular 350, *Guidelines for the Implementation of Reduced Divergence Departures*.

b) the nominal departure tracks diverge by at least (see Figure 3-1):

1) 15 degrees immediately after take-off; or

2) 10 degrees where:

i) both aircraft are flying an RNAV or RNP instrument departure; and

ii) the turn commences no more than 3.7 km (2.0 NM) from the departure end of the runway;

c) a suitable ATS surveillance system capable of identifying the aircraft within 1.9 km (1.0 NM) from the end of the runway is available; and

d) ATS operational procedures ensure that the required track divergence is achieved.

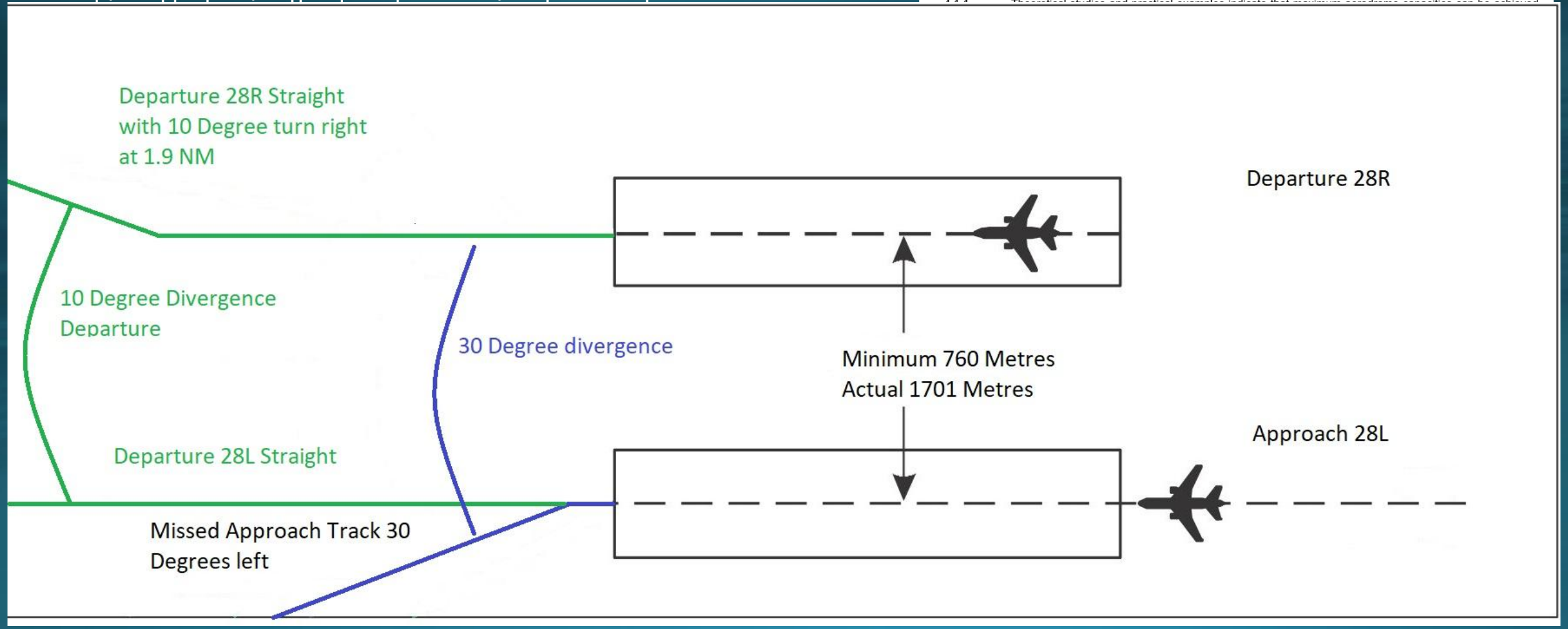
Parallel Runway Operations

- The required 30 degree separation between the missed approach of one runway and the departure track of another runway can be

Chapter 4

SEGREGATED OPERATIONS ON PARALLEL RUNWAYS (MODE 4)

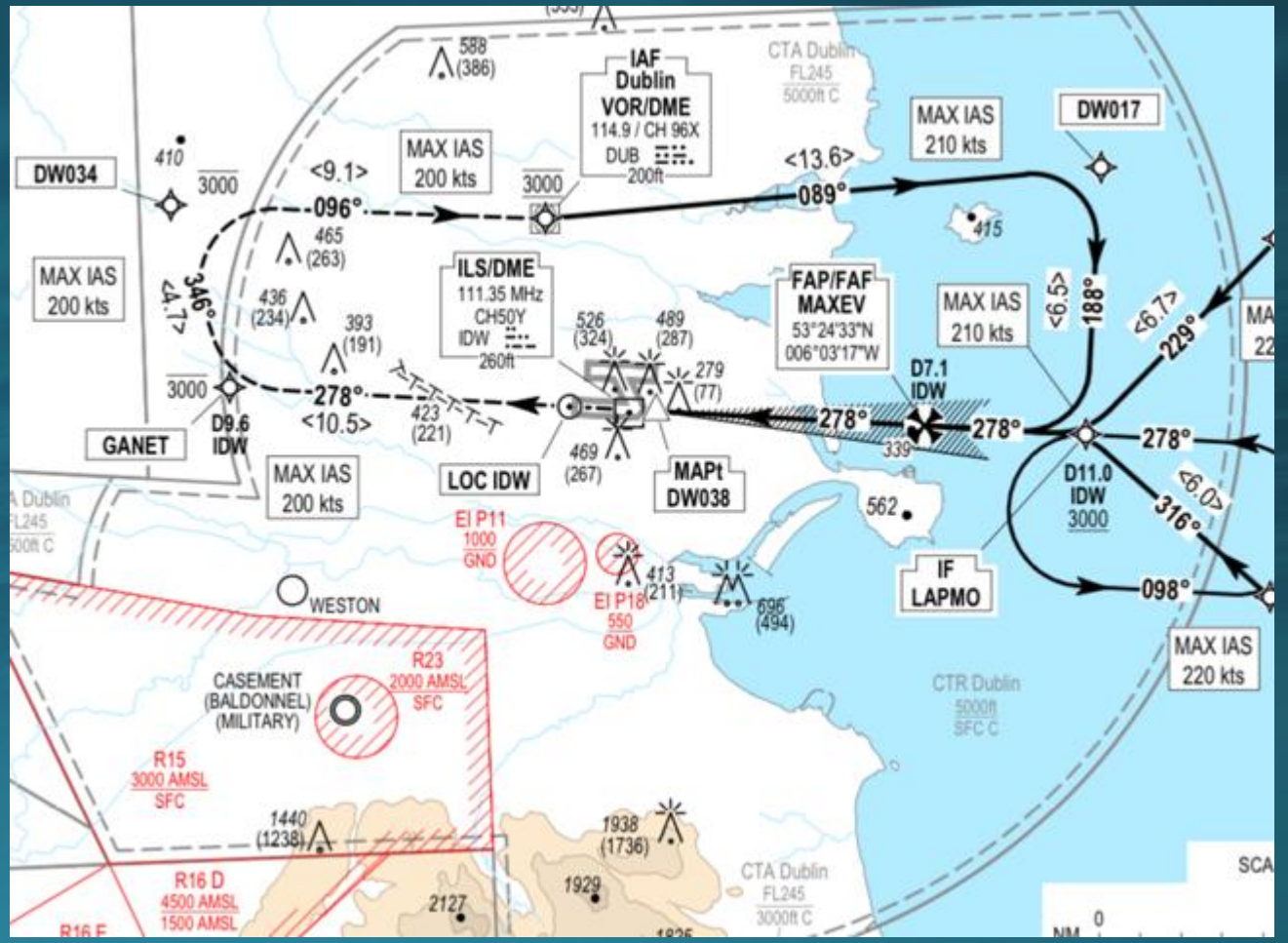
4.1 GENERAL



Parallel Runway Operations

Departure from 28R, Arrival on 28L.

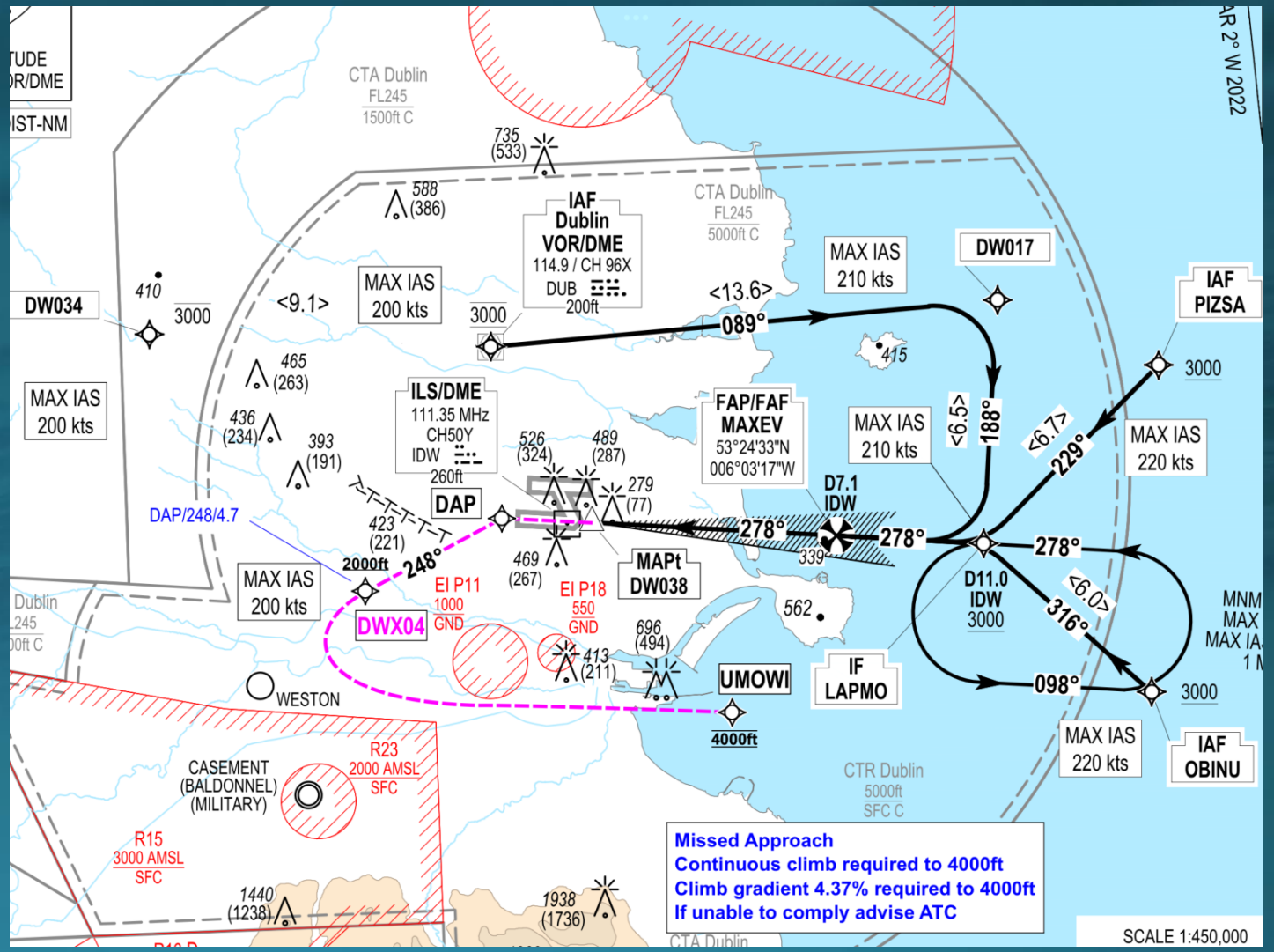
- Currently the DAA operate one runway for departures 28R, and one runway for arrivals 28L.
- The DAA could operate departures off both 28L and 28R, spreading the noise equally to residents south and north of the airport
- The only requirement is that the departure tracks diverge by 10 degrees by 3,7 Km.
- However this is dependant on the missed approach of the arrival runway.
- Currently the missed approach off 28L is straight ahead, therefore requiring a 30 degree turn to the right off 28R.
- Changing the go around off 28L to turn to the south would enable straight departures off 28R.



Parallel Runway Operations

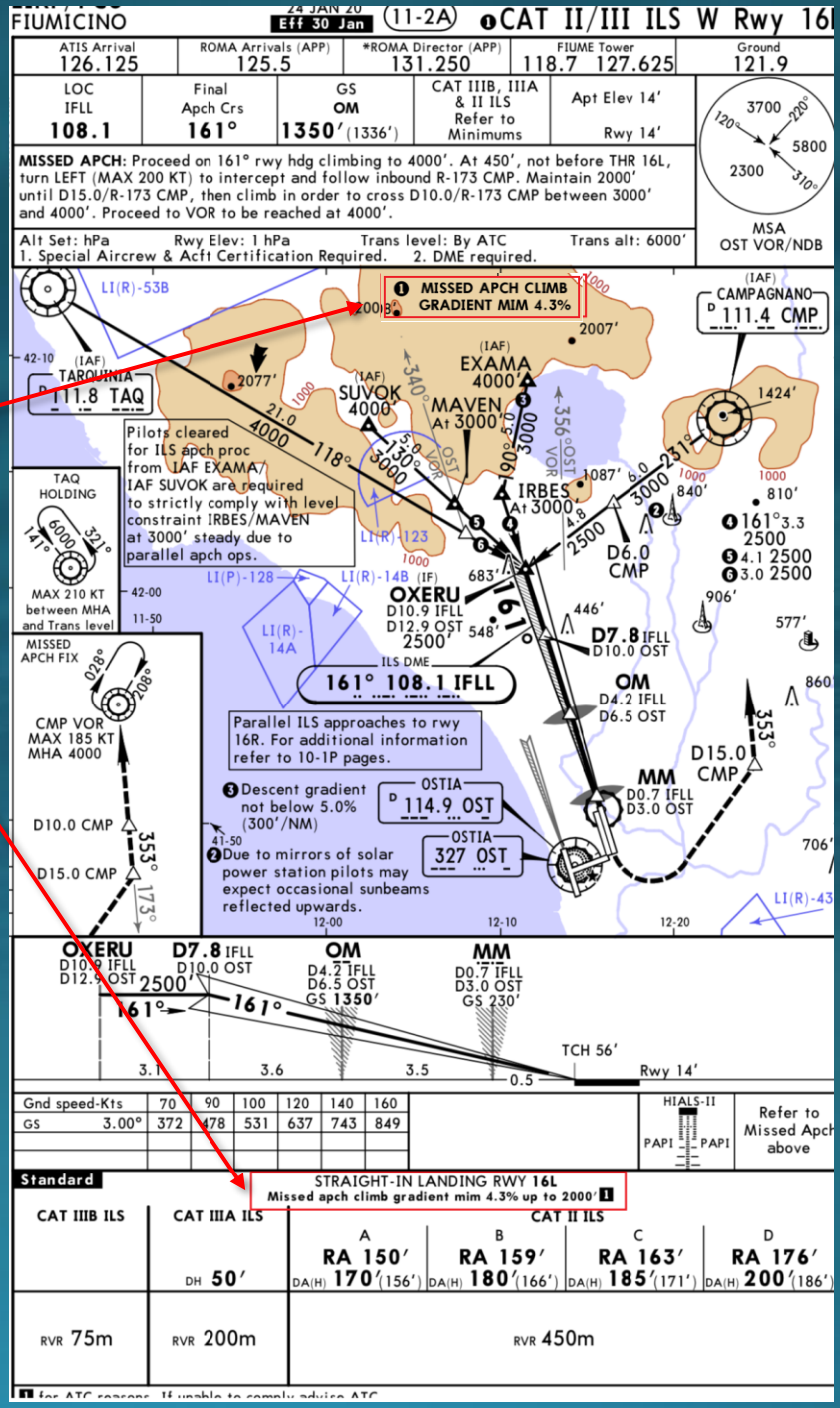
Departure from 28R, Arrival on 28L.

- Here we can see a proposed missed approach from 28L in magenta. This would give a 30 degree divergence to the departure from 28R.
- The aircraft are required to climb above airspace at Weston and Baldonnel with a gradient of 4.37%.
- A straight departure off 28R would limit departure off one runway only, therefore a 10 degree turn north off 28R should be used to allow both runways to be used for departure.
- Go arounds are in frequent, so the noise footprint would be 2- 3 flights per day, (Single ops) rather than a departure every 90 seconds from 28R.
- Noise generated from a missed approach is very low compared to a departure, as the aircraft reaches the altitude quickly, and then has low power and low speed.



Examples of Missed Approach Turns

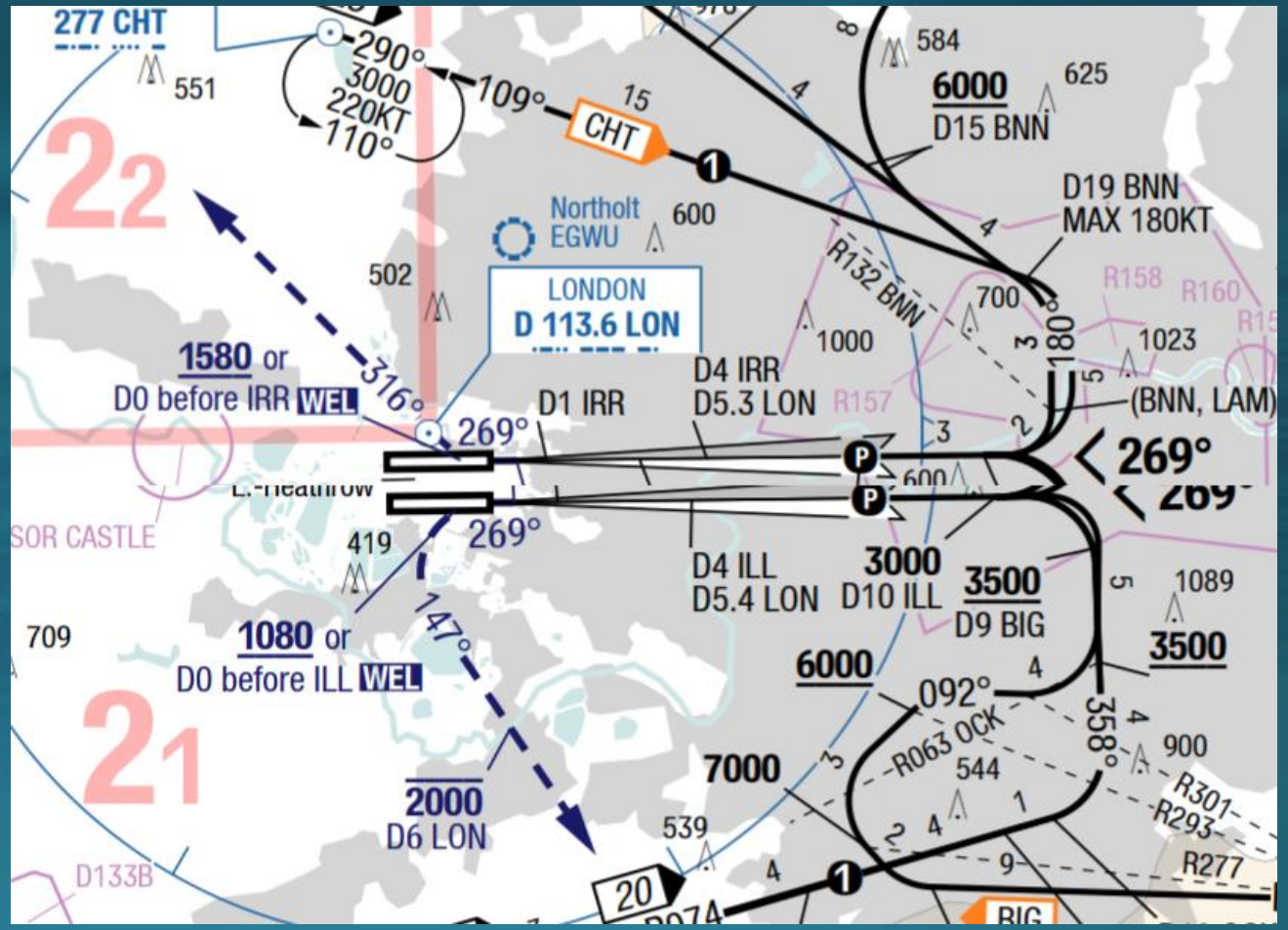
- The standard missed approach gradient is 2.5%. Eg 2.5 feet climb per 100 feet forward.
- Airports can apply a higher gradient if required for airspace restrictions, and it must be notified on the chart.
- See an example of LIRF (Rome), 16L has a higher gradient required due to airspace restrictions. This is a similar gradient required for Dublin 28L.
- Pilots must inform ATC if unable to comply.



Examples of Missed Approach Turns

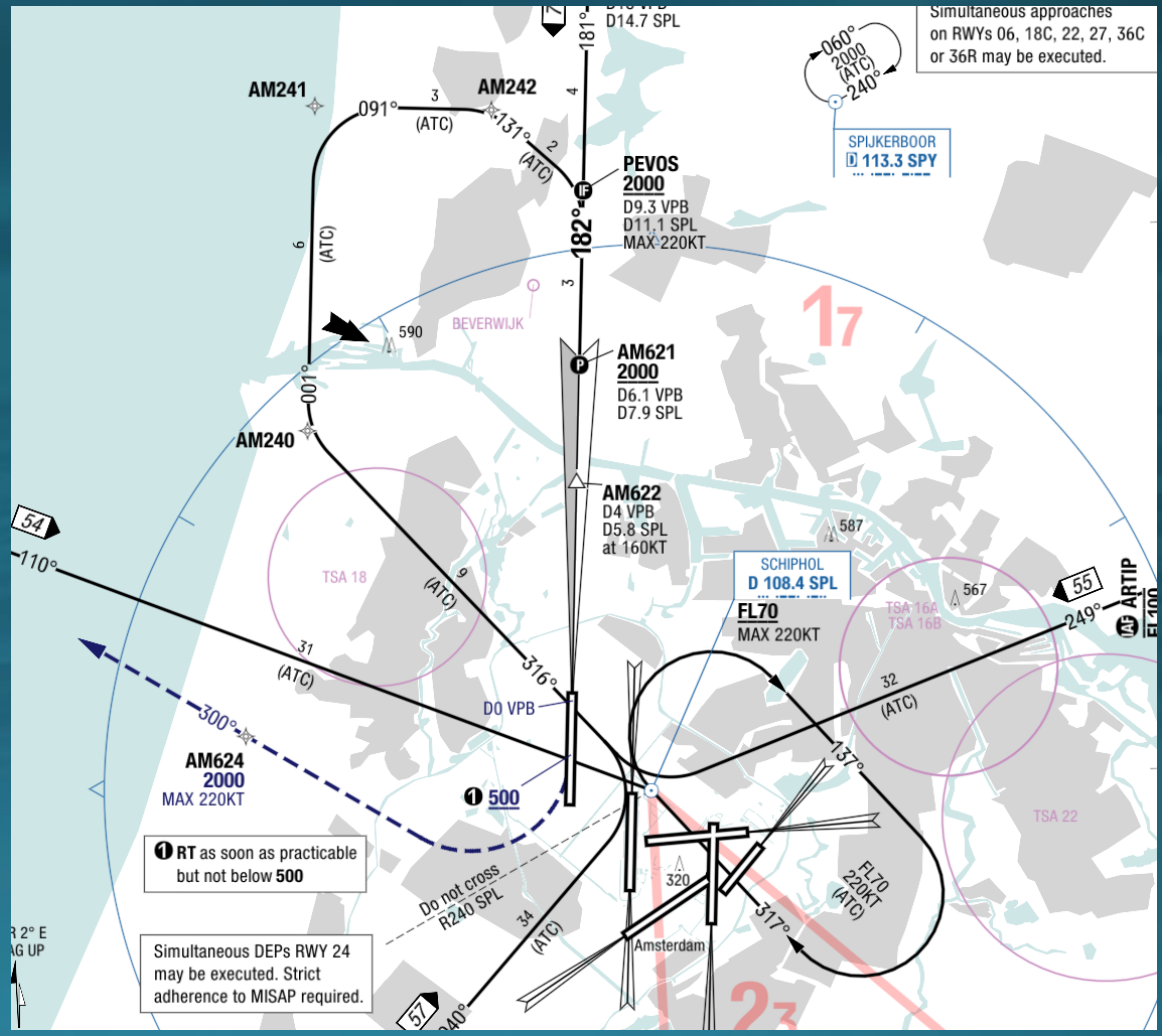
London Heathrow

- Most airports around the world turn the missed approach track away from the runways immediately, to allow greater flexibility for the departure tracks.
- The missed approach tracks turn away from the runway, enabling the minimum turn of 10 degrees divergence between runway departures.
- London Heathrow uses one runway for take off and one for landing just like Dublin. The runways swap at 3pm daily to spread the noise.



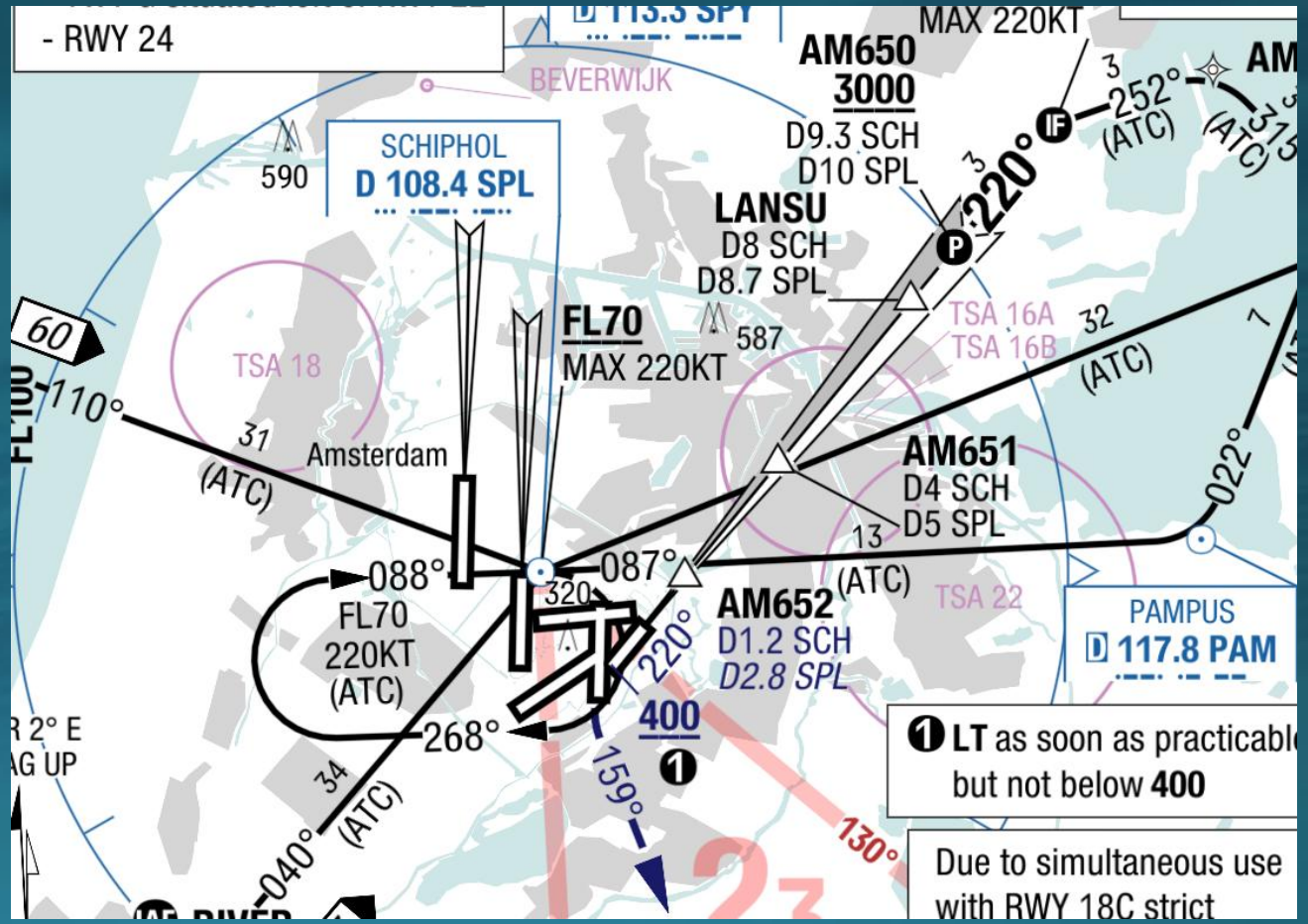
Examples of Missed Approach Turns

- Amsterdam 18R



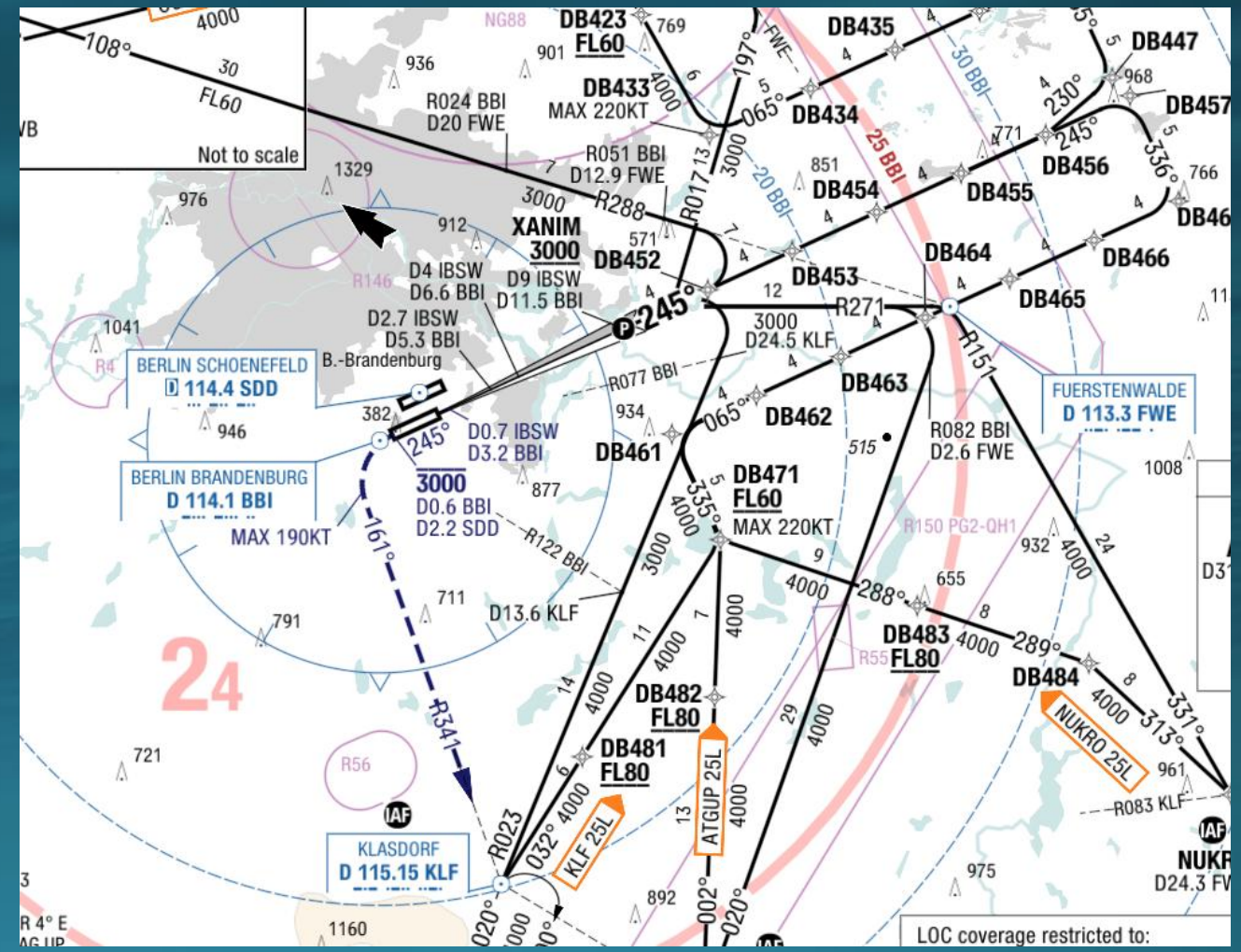
Examples of Missed Approach Turns

- Amsterdam 22



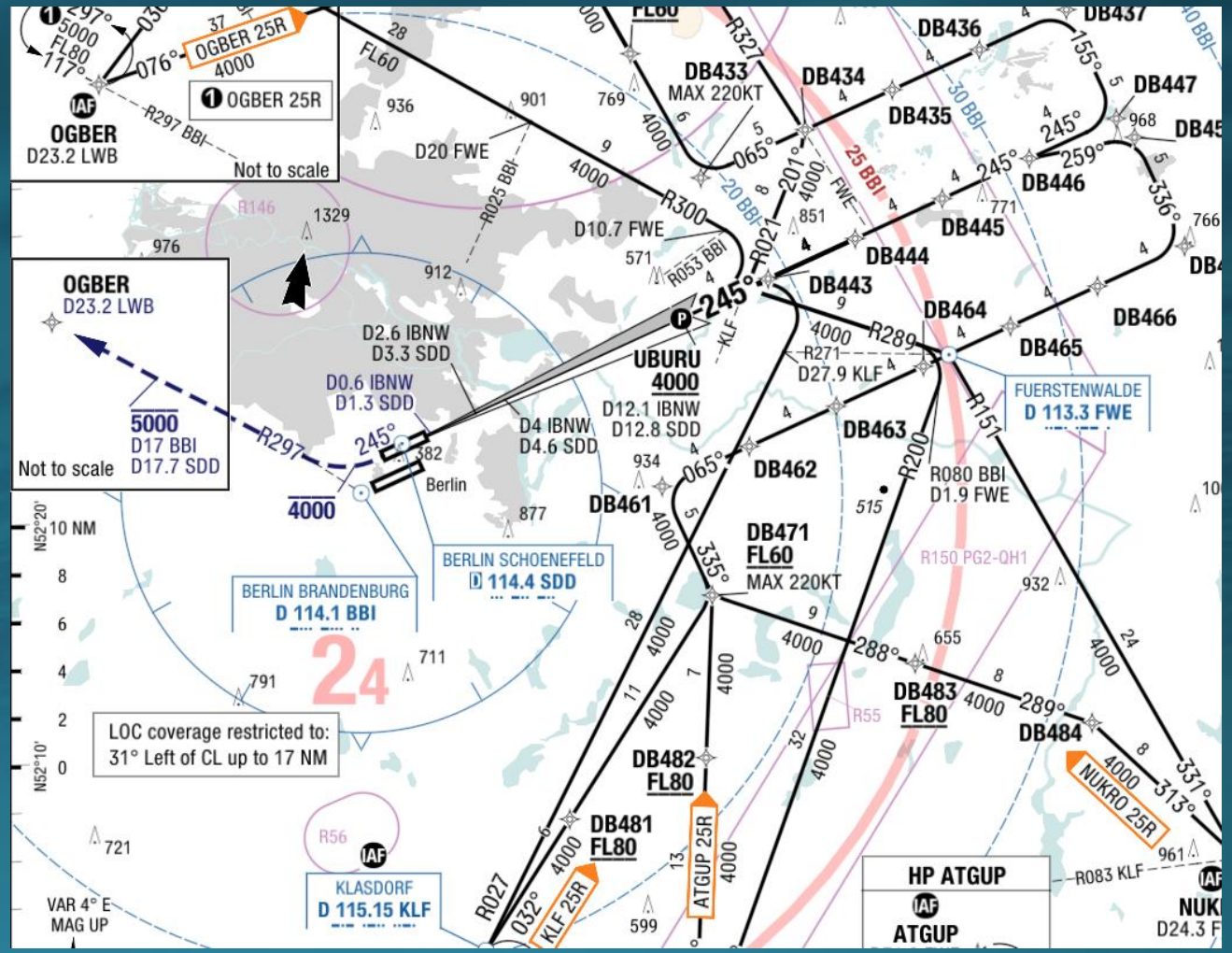
Examples of Missed Approach Turns

- Berlin 25L.



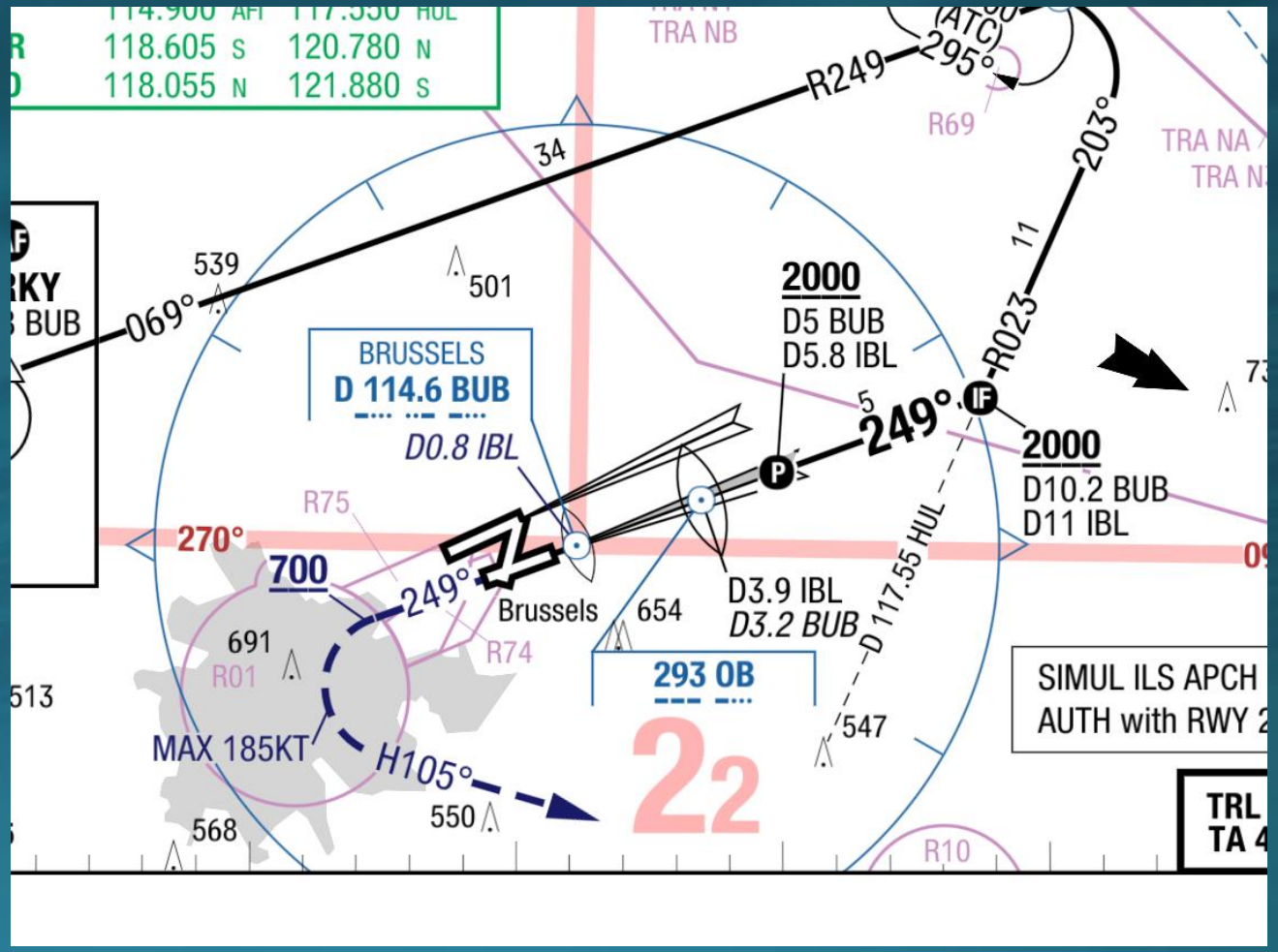
Examples of Missed Approach Turns

- Berlin 25R



Examples of Missed Approach Turns

- Brussels 25L



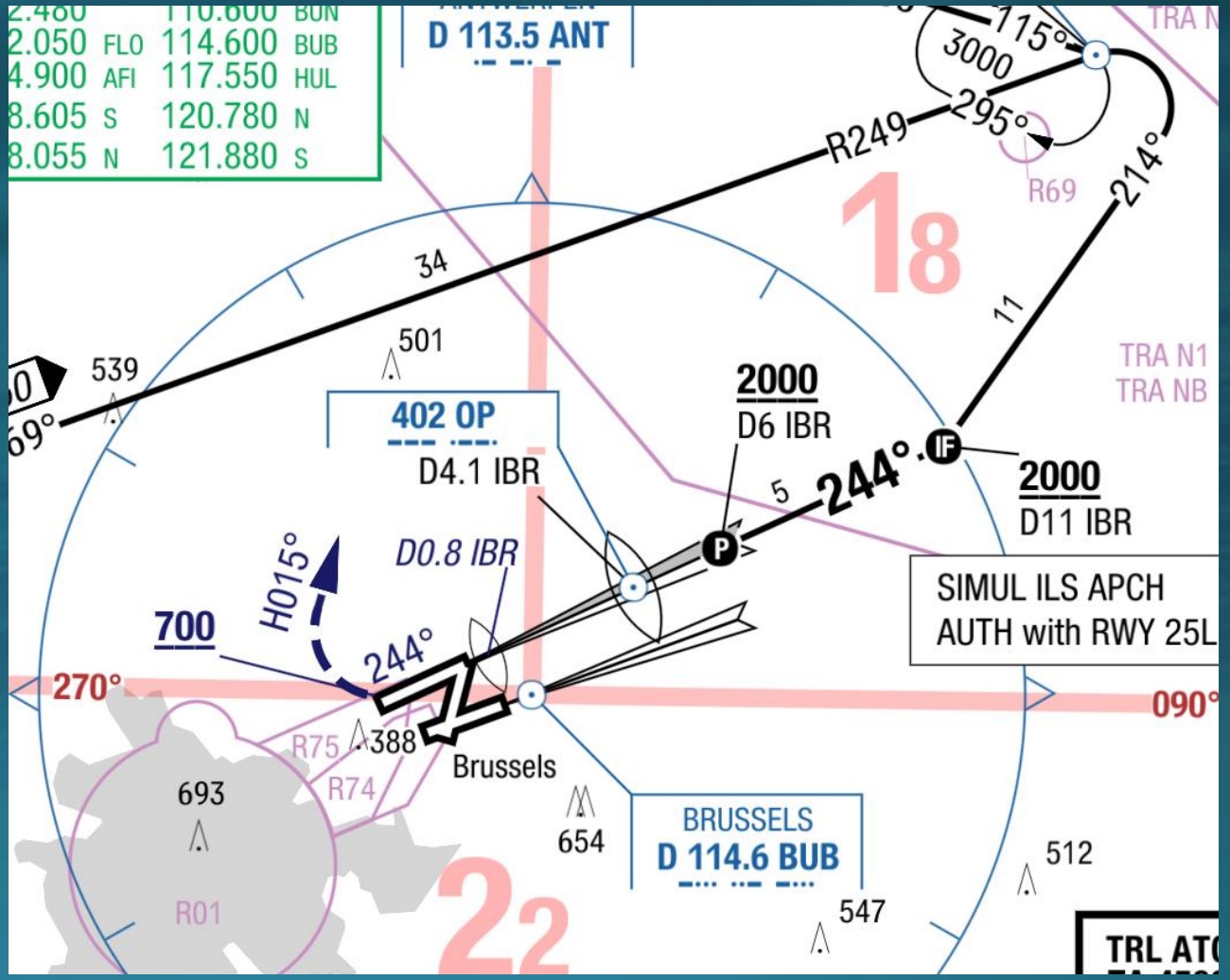
Examples of Missed Approach Turns

- Brussels 25R

- As shown turning missed approach traffic at large angles is custom and practice so as not to limit any departure traffic.

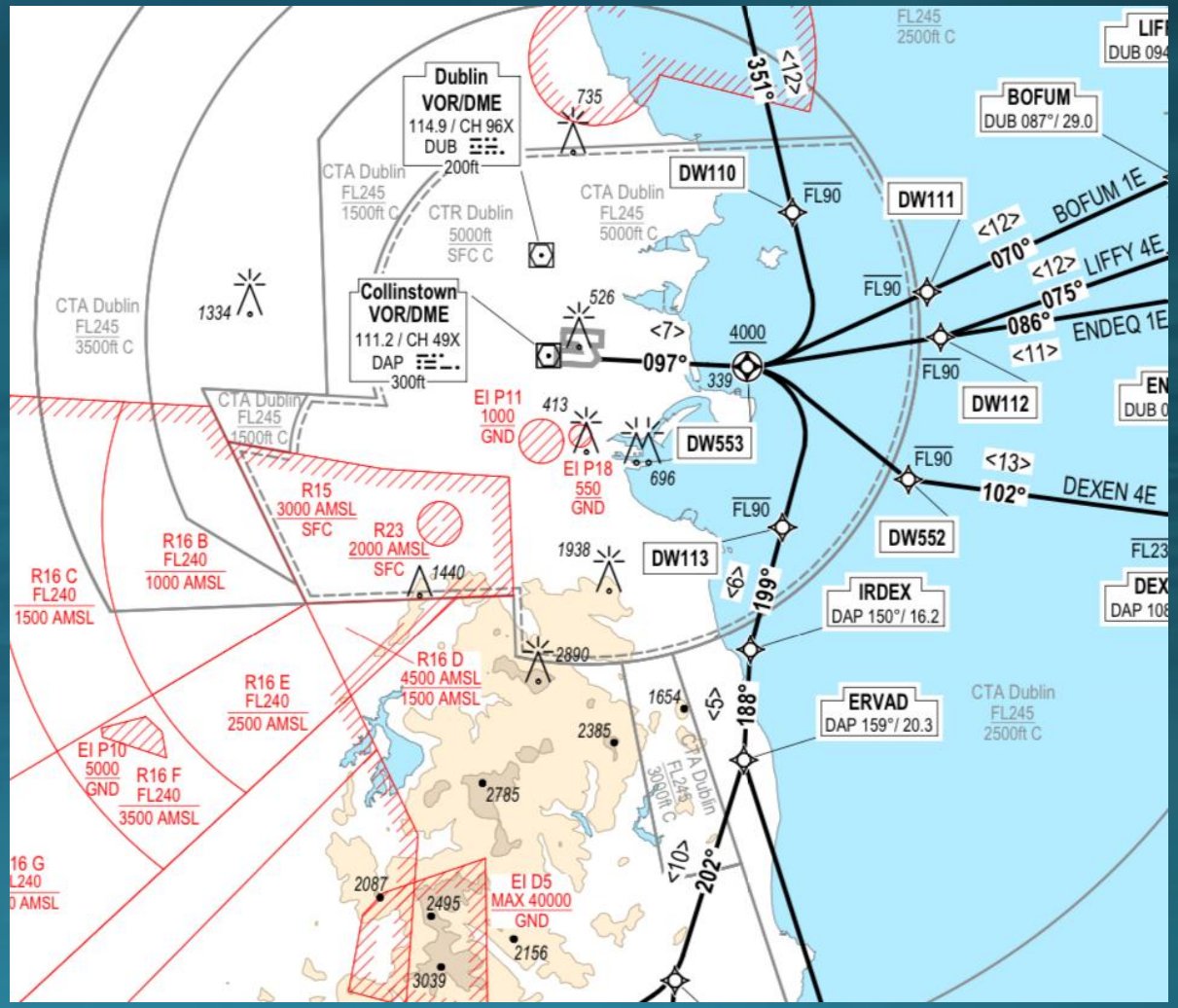
- Dublin airport could turn the missed approach off 28L south to not limit the departures off 28R, and reduce the noise.

- This would also enable full use of both runways to the maximum efficiency, while minimising the noise to its neighbours.



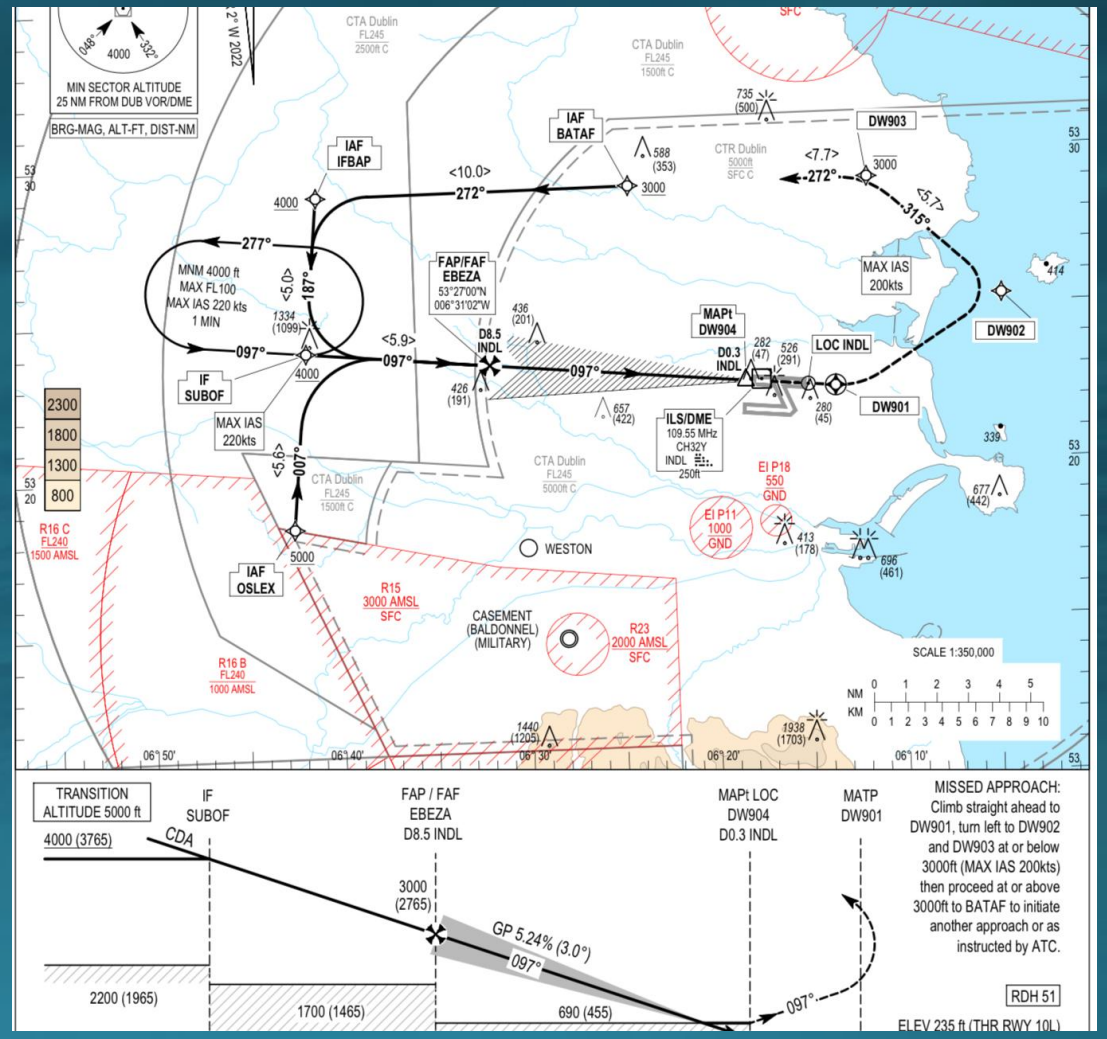
Easterly Operations

- EIDW 10R Departure



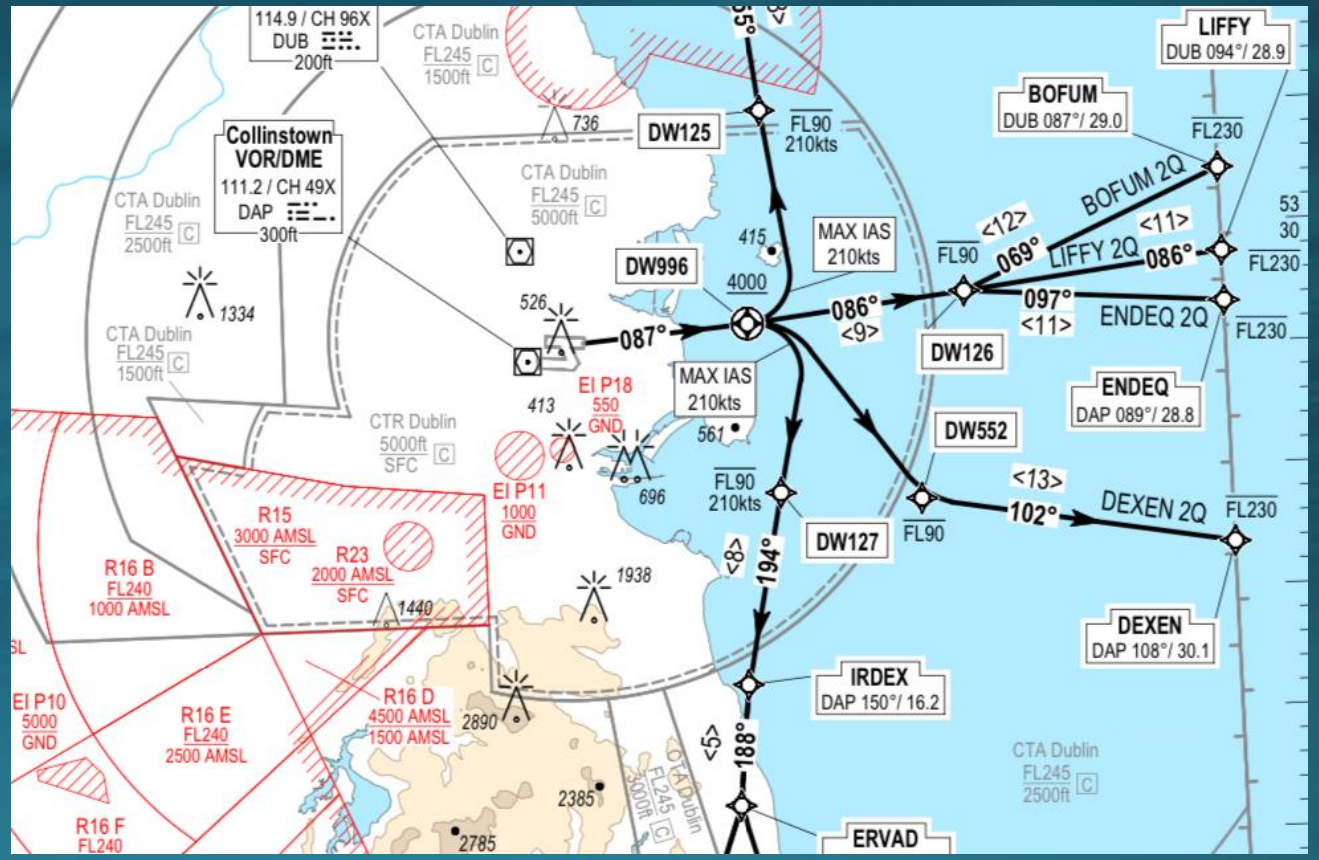
Easterly Operations

- EIDW 10L ILS
- The missed approach track turns 30 degrees to the left allows a straight ahead departure of the south 10R.
- This same procedure could be used for the west operations, and allow reduced turns from 28R.



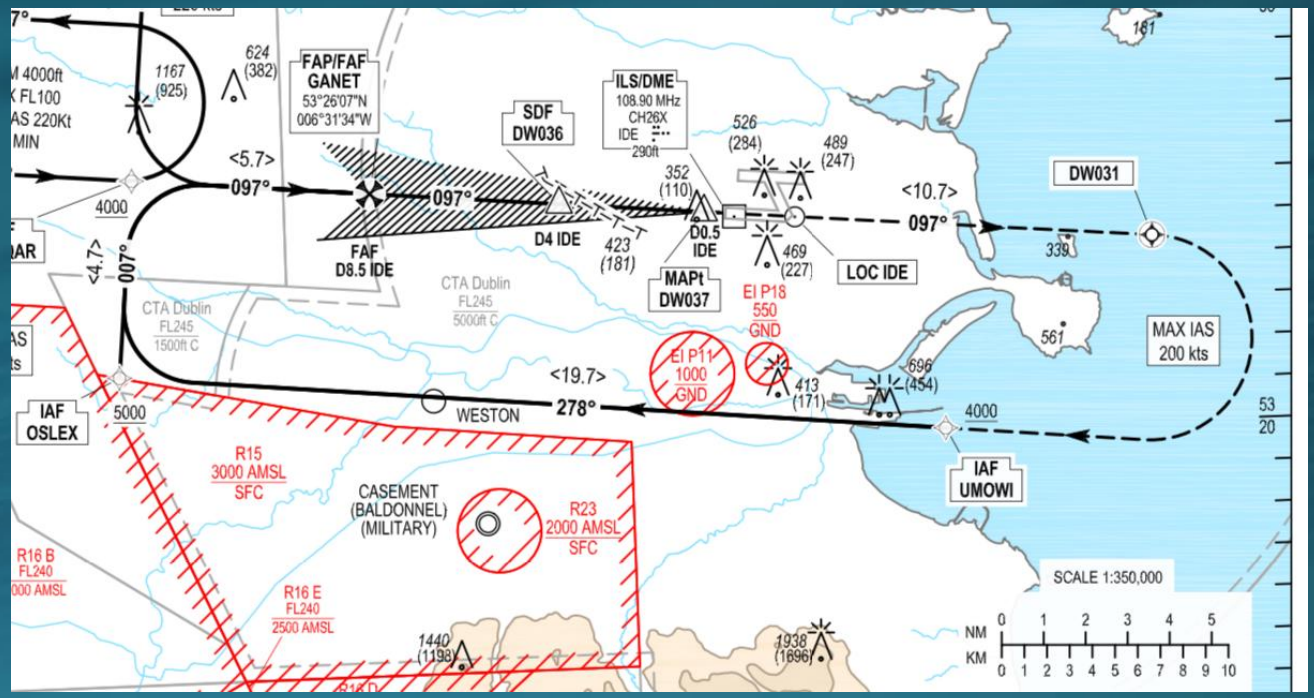
Easterly Operations

- EIDW 10L Departure
- This does not give the required 30 degrees from the south missed approach, therefore departures off 10L are not allowed if 10R is in use for arrivals.
- All arrivals easterly are on to 10L, and departures are from 10R, therefore the east operations complies with all divergence restrictions, and allows departures from both 10L and 10R simultaneously.



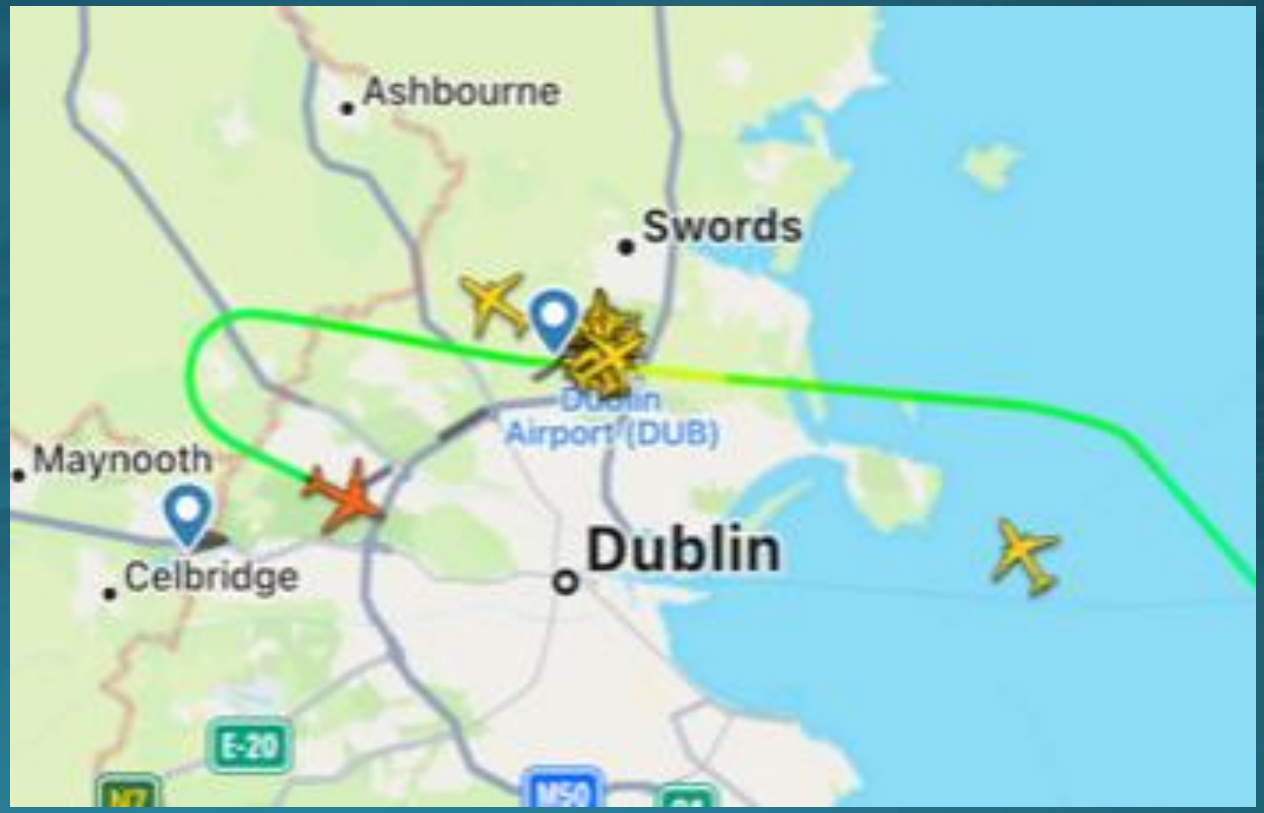
Easterly Operations

- EIDW 10r ILS
- This has the Aircraft climbing straight ahead, and turning south over Dublin city.
- This is an existing published procedure.
- The proposed missed approach procedure for 28L will fly in the same airspace.



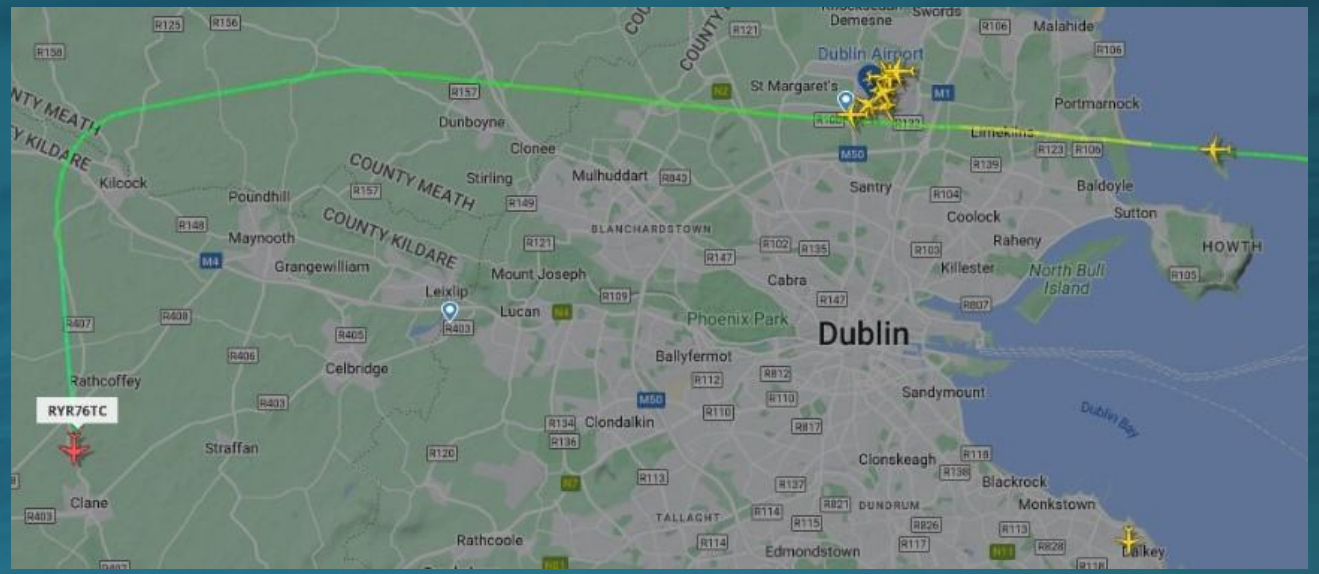
South 28L Proposal.

- 28L actual missed approach
- ATC required to intervene
- Aircraft overflies Baldonnel and Weston.
- Also to note a departure from the north 28R in progress.



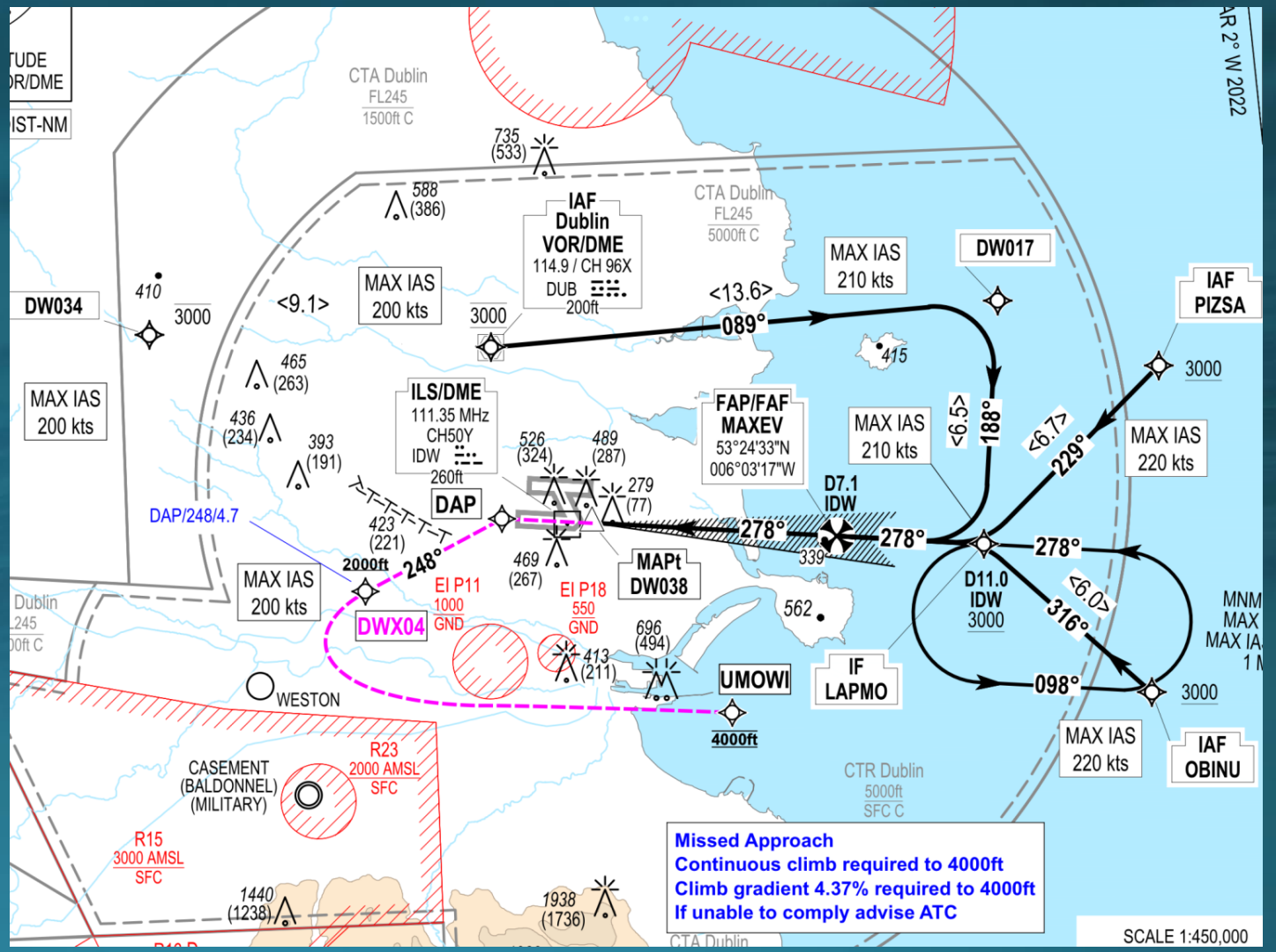
South 28L Proposal.

- Here is another example of an actual missed approach.
- ATC were required to intervene due to departing traffic off 28R.
- This clearly shows that the current missed approach off 28L is not fit for purpose, and the aircraft can be turned south over the city if required.



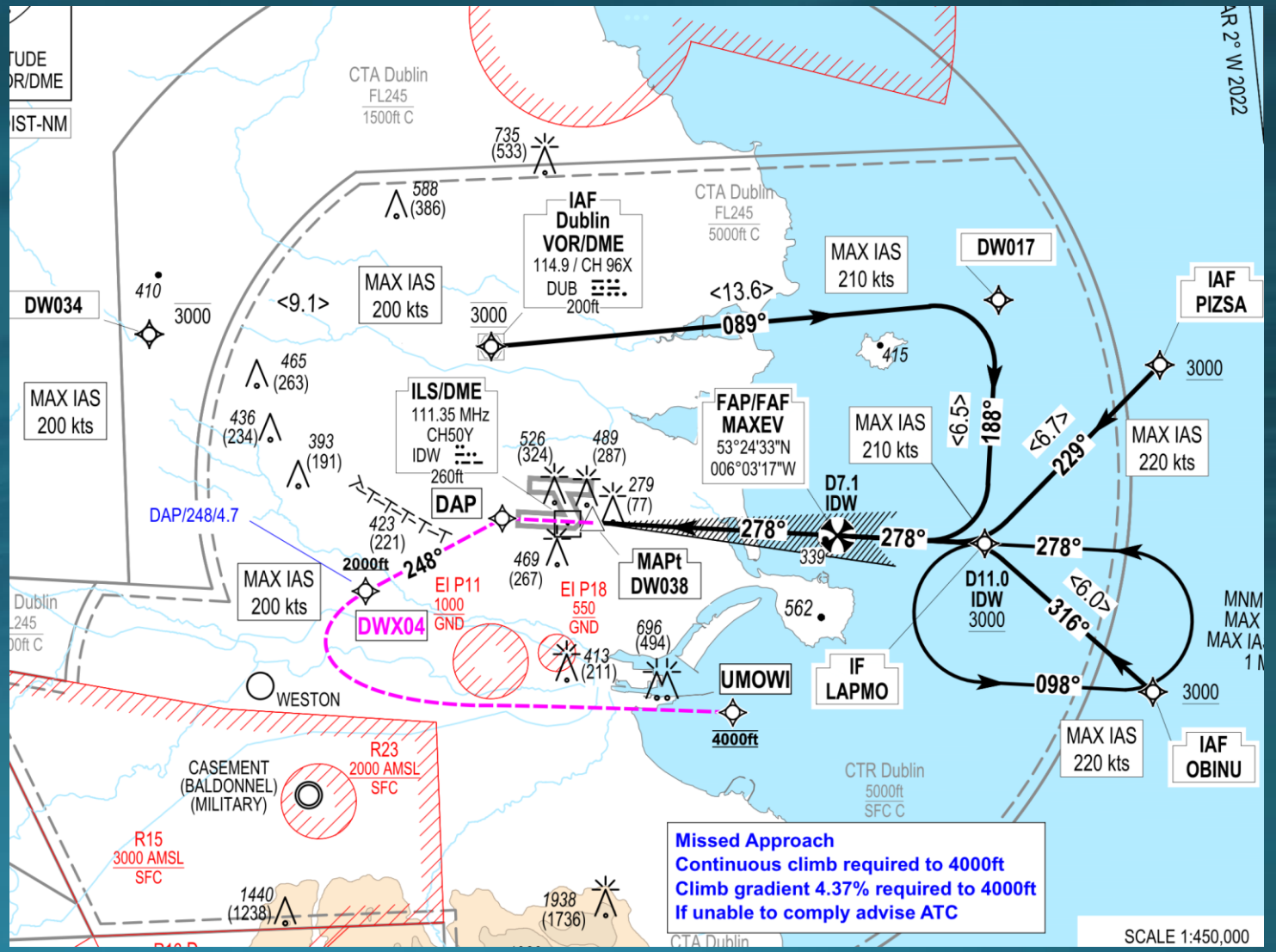
South 28L Proposal. Preceived issues

- Garda Helicopter
- SAR OPS
- BAL VOR 28
- Weston AOR
- High density population being overflown
- ATC workload
- Military agreement
- Single engine missed approach



South 28L Proposal. Reasons to change

- No loss of comms procedure for missed approach
- Current procedure is not safe in the event of loss of comms.
- Lack of deconfliction.
- ATC are required to intervene with every go around
- Gives flexibility to ATC to allow straight departures in the event of weather.



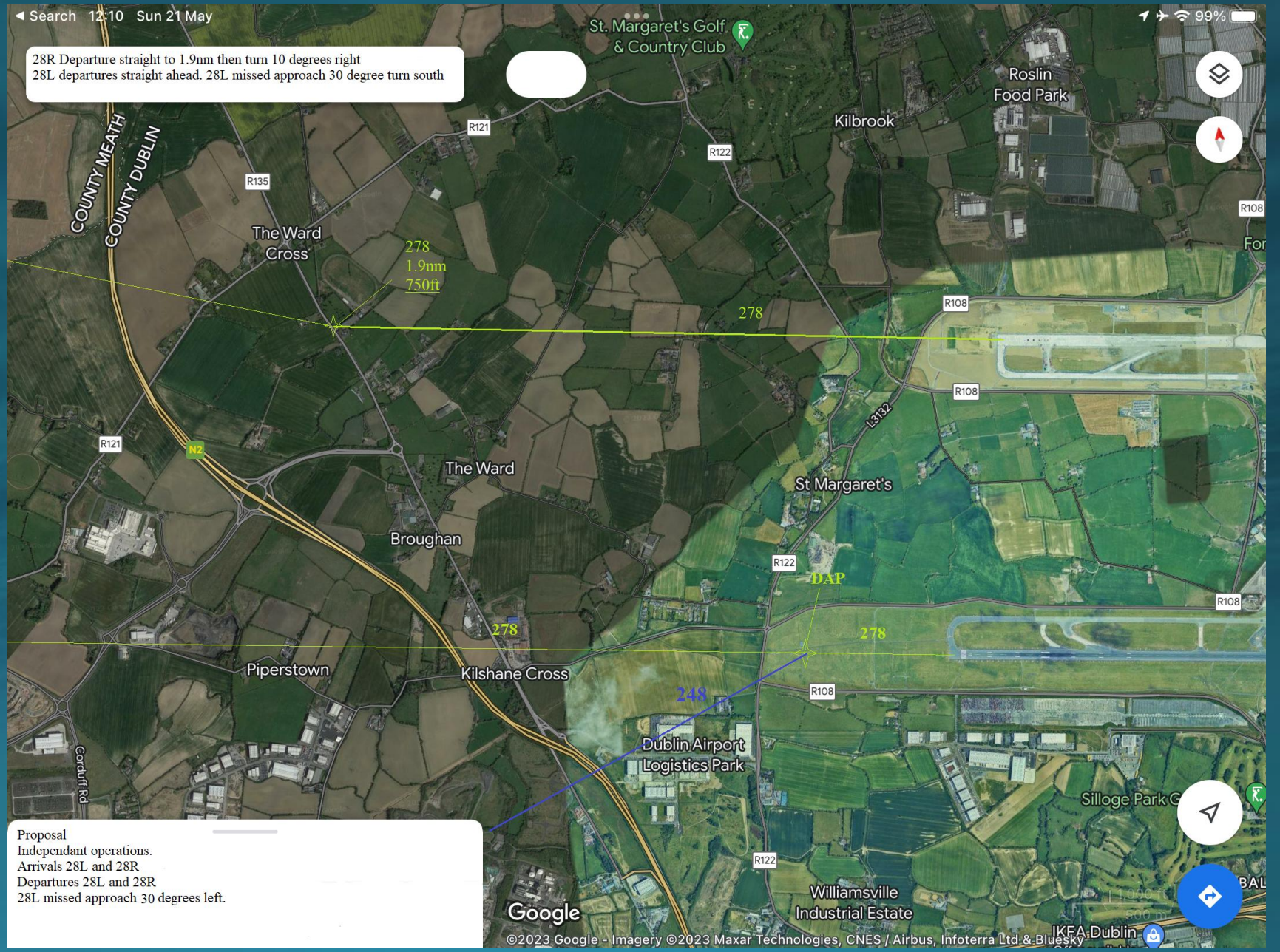

SPEED
LAND
CAT3
SINGLE
BARO 410
AP2
1 FD 2
A/THR
180
160
140
120
10
10
10
10
210
4000
005
000
MM
QNH 1013
IDW
111.35
0.5 NM
26 27 28 29 3
GS 153 TAS 144
101/9
ILS28L
PBD03 261
5.2
23:26
24 25 26 27 28 29 30 31 32
BAL
PBD03
7.5
5
DAP
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1.2L
28L
MAN GAIN
VOR1
VOR2
DAP
2.3

South 28L Proposal.



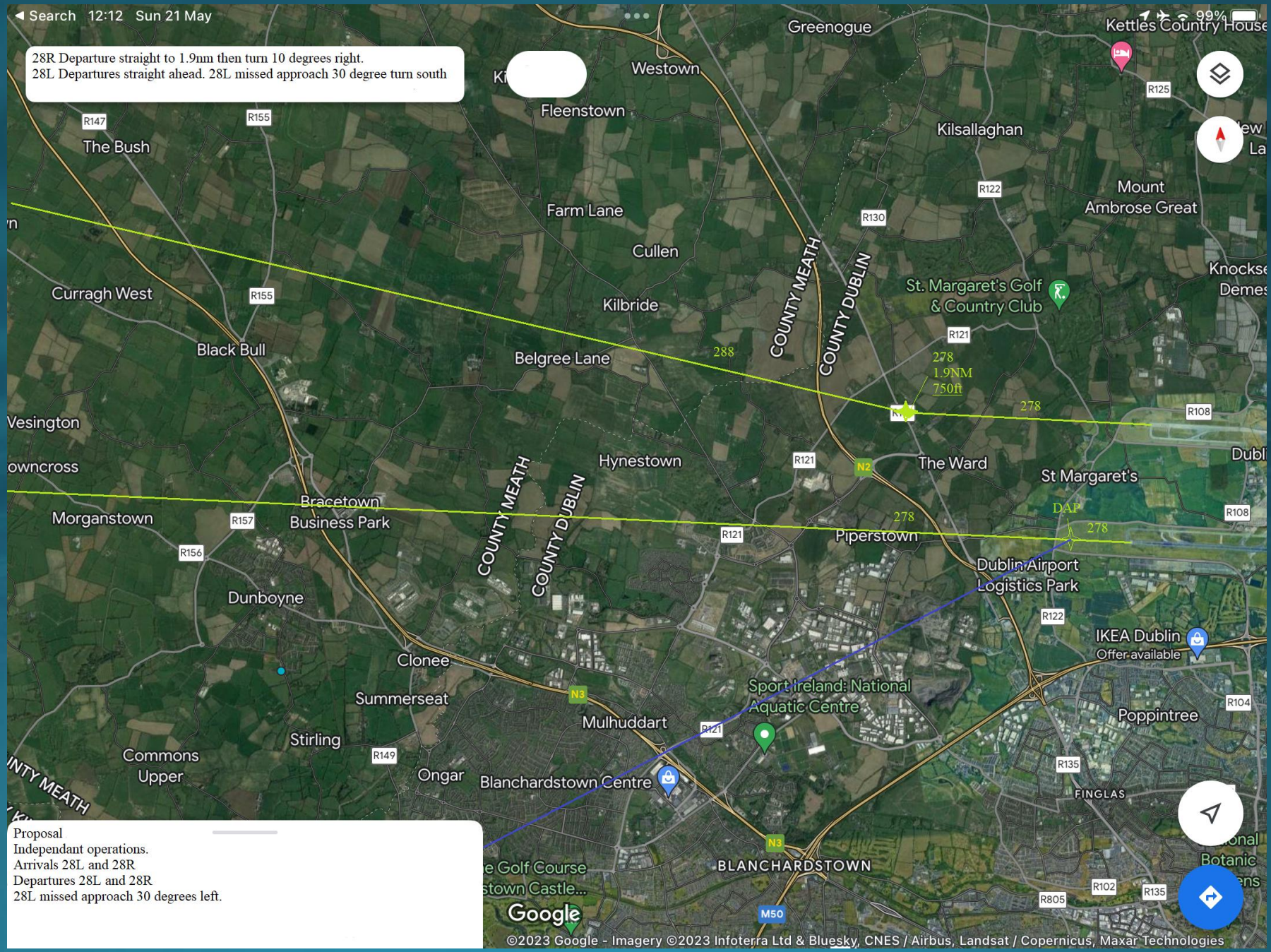
Proposed Routes
10 Degree Turn 28R

- 28R Departure 10 degree turn at 1.9 miles.
- Turn must be started by 2 miles / 3.7km.
- Missed approach 30 degrees left 28L
- Angle between Departure track and missed approach 30 degrees required.
- This would allow departures on 28L and 28R.
- Missed approach would climb above, and avoid Baldonnel and Weston airspace.
- Missed approach track would also be above the Baldonnel VOR 28 Approach.

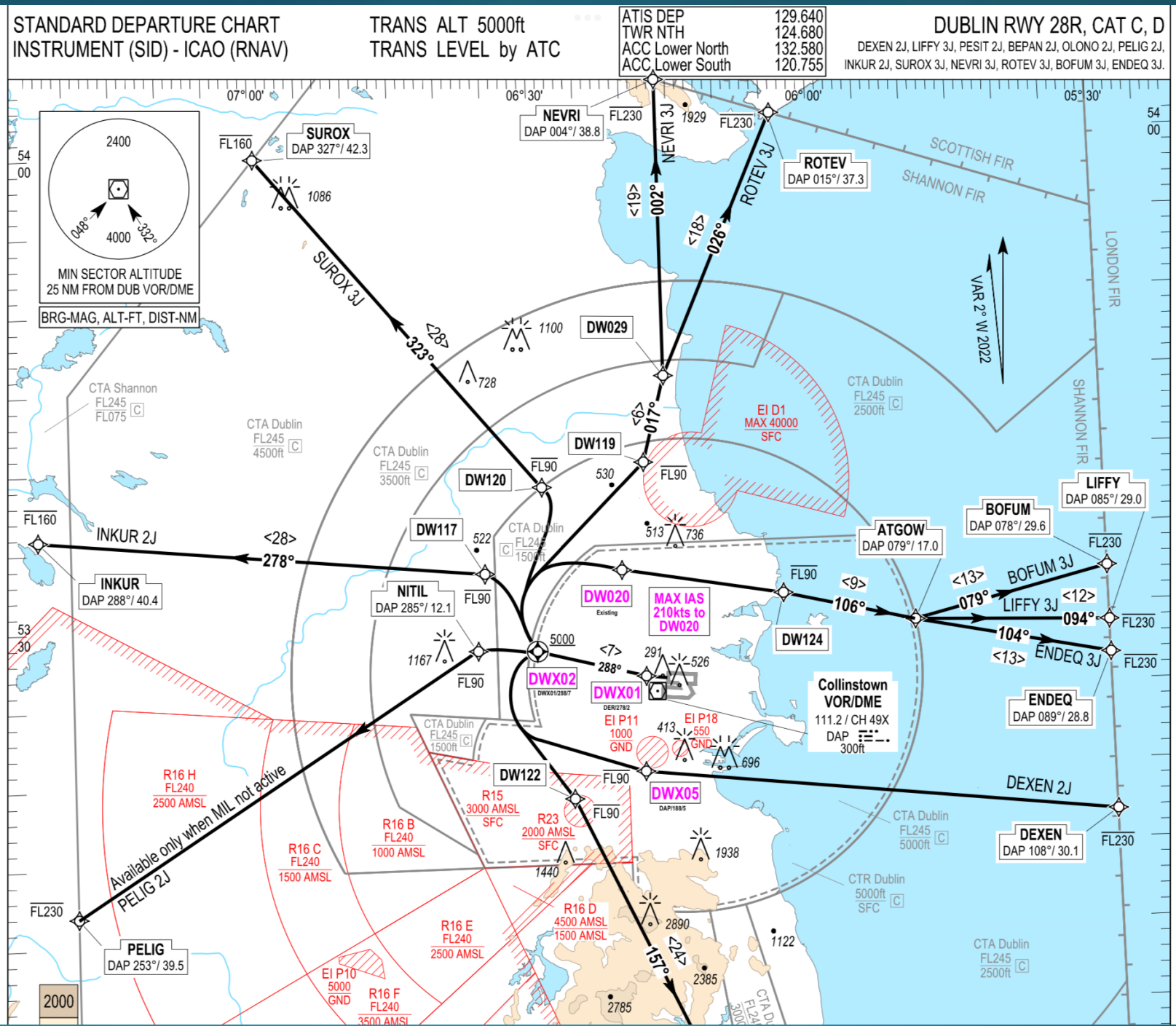


Proposed Routes
10 Degree Turn 28R

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- Turn must be started by 2 miles / 3.7km.
- Missed approach 30 degrees 28L
- Angle between Departure track and missed approach 30 degrees required.
- This would allow departures on 28L and 28R.
- Missed approach would climb above Weston, and avoid Baldonnel airspace.
- Missed approach track would also be above the Baldonnel VOR 28 Approach.



Proposed Routes
10 Degree Turn 28R



Proposed Routes
10 Degree Turn 28R

- This proposed procedure will allow the DAA to expand with their goals into the future while protecting residents from noise.
- This is a win for all parties concerned, and protects the expansion of Dublin Airport into the future.
- Thank you.

