ACP Stage 2 Stakeholder Workshop (Re) Engagement

Bournemouth Airport FASI(S) ACP

October-November 2023

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  - Stage 1 – Design Principles
  - Recap of Design Principles

- Stage 2a - Options Development
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  - Methodology

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  - Runway 26
- Arrivals
  - Runway 08
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Introduction

Bournemouth Airport is in the process of redesigning their arrival and departure routes as part of a nationwide program of airspace modernisation.

This is being done, along with 20 other airports and NATS, following the CAA's CAP 1616 process, as part of the governments Airspace Modernisation programme.

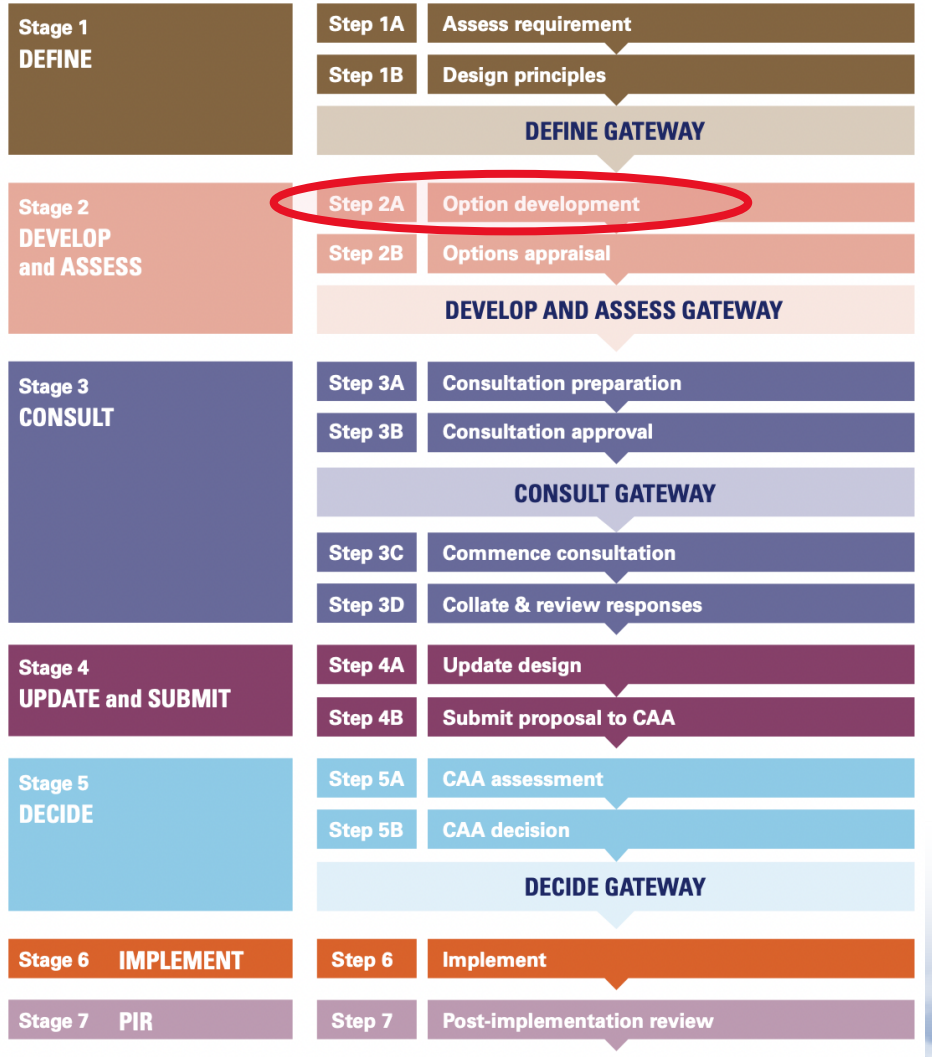
Bournemouth Airport is responsible for redesigning their routes up to 7000ft.

This presentation includes the options developed with the help of our stakeholders in the December 2022 workshop, and as the baselines have been reassessed, it includes these and further developed options, we therefore require further feedback.

CAP1616/ACP Update

Bournemouth Airport have passed the Stage 1 Define Gateway and engaged with stakeholders for step 2A Options Development in December 2022.

A comprehensive list of options aligned with the design principles from Stage 1 was developed, however as the baselines for these options have been re assessed we require further engagement.



Bournemouth Airport Design Principles

Design Principle Number & Title	Description
1- Safety	The airspace design and its operation must maintain or where possible, enhance current levels of safety.
2- Overflight	The new procedures should not increase the number of people overflown by aircraft using the Airport.
3- Noise Footprint	The design should limit, and where practicable reduce the impact of noise to stakeholders on the ground, in line with the Bournemouth Airport Noise Action Plan and where possible periods of built-in respite should be considered.
4- Tranquillity	Where practical, route designs should limit effects upon sensitive areas. These may include cultural or historic assets, tranquil or rural areas, sites of care or education and AONB.
5- Emissions and Air Quality	The proposed design should minimise CO2 emissions per flight.
6- Airspace Dimensions	The volume and classification of controlled airspace required for Bournemouth Airport should afford the appropriate volume to contain and support commercial air transport for both runways, enabling safe, efficient airspace design which considers the needs of all airspace users.
7- Airspace Complexity	The airspace design should seek to reduce complexity and bottlenecks in controlled and uncontrolled airspace and contribute to a reduction in airspace infringements.
8- Technical Requirements	The design shall be acceptably compliant with PANS-OPS and UK CAA criteria to meet the technical capability requirements of aircraft using the airport.
9- Systemisation	The arrival transitions and departure procedures shall be deconflicted and integrate with the en-route network and Southampton Airport, as per the FASI(S) programme. Arrival transitions shall integrate with the Instrument Approach Procedures (IAPs) reducing the requirement for tactical coordination.
10- Independence	Where possible, the new procedures and airspace configuration should enable Bournemouth Airport to access controlled airspace independently of service provision from the Southampton Radar service.
11- Operational Cost	Provided it does not have an adverse impact to community disturbance and other airspace users, procedures should be designed to optimise fuel efficiency.
12- AMS Realisation	This ACP must serve to further, and not conflict with, the realisation of the AMS.
13- PBN	The new procedures should capitalise on as many of the potential benefits of PBN implementation as are practicable.

Options Development Considerations

Impact on Bournemouth

Solent Control Area

Airspace

Noise Action Plan (NAP)

Noise Preferential Routes (NPR)

Impact on Bournemouth Airport

Bournemouth Airport is required as part of the AMS and FASI(S) programme to introduce the following procedures:

- PBN approaches in the form of Required Navigation Performance (RNP) Instrument Approach Procedures (IAPs);
- PBN departure routes (known as Standard Instrument Departures (SIDs) to link the Airport to the evolving airspace structure above 7,000ft;
- Arrival Transitions to enable aircraft to get established on an approach into the Airport; and
- It is likely that in the development of options for new departure, arrival and approach profiles, that the airspace configuration may also require re-configuration.

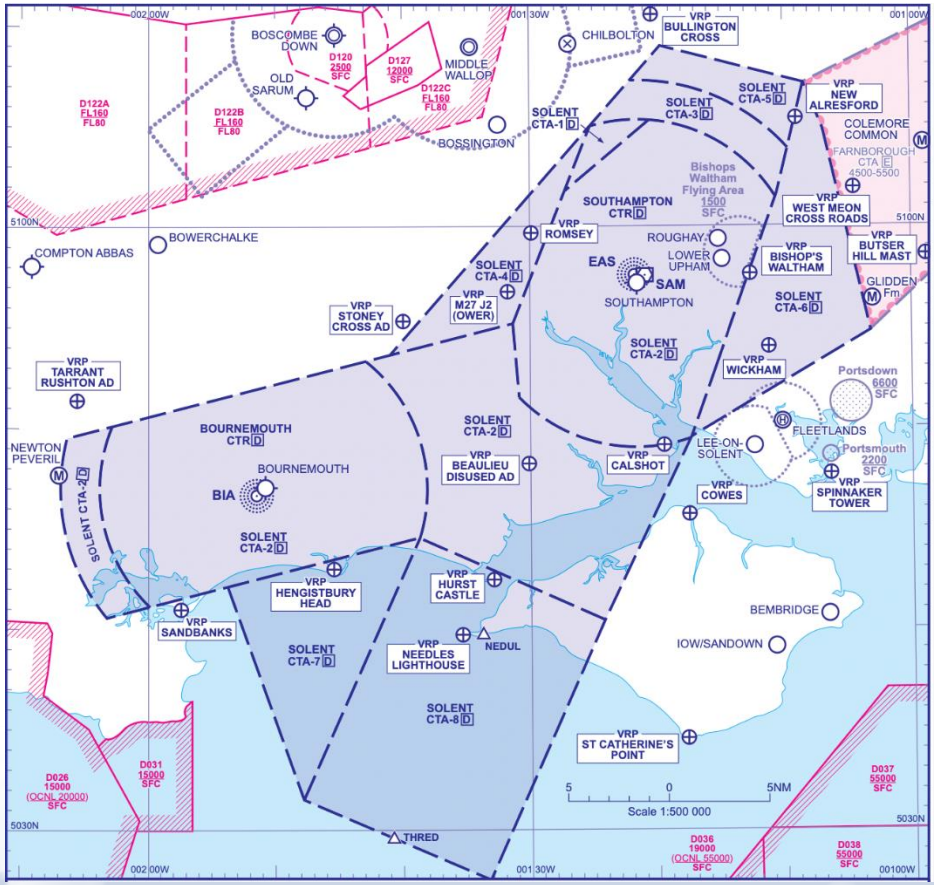
Solent Control Area (CTA)

The terminal airspace surrounding Bournemouth Airport is complex and shared with Southampton Airport.

BOH relies on Southampton Airport being open to benefit from the additional volume of controlled airspace.

Normally Class D (controlled) airspace - If Southampton are closed this airspace reverts to Class G (uncontrolled).

DP10 – Independence – Where possible, the new procedures and airspace configuration should enable Bournemouth Airport to access controlled airspace independently of service provision from the Southampton Radar service.



Airspace Considerations

In addition to this, there is insufficient controlled airspace for the vectoring of arrivals/approaches to Bournemouth Runway 08. Keeping aircraft within controlled airspace on departure on continuous climb profiles also presents a challenge for Bournemouth Radar.

As a result, aircraft are often outside controlled airspace for part of their arrival or departure to/from Bournemouth Airport. Accordingly, the Airport would like controlled airspace containment to form part of the discussion on change.

DP6 – Airspace Dimensions – The volume and classification of controlled airspace required for Bournemouth Airport should afford the appropriate volume to contain and support commercial air transport for both runways, enabling safe, efficient airspace design which considers the needs of all airspace users.

Noise Action Plan

Routing instructions are published in the Aeronautical Information Publication (AIP) instructing pilots of departing aircraft to fly a track that avoids, as far as is possible, the more densely populated areas, to minimise the impact of noise.

As required by Regulations, Bournemouth Airports Noise Action Plan (NAP) has been informed by feedback from public consultation, this in addition to measures within the 'Section 106' legal agreement are assessed and reported annually.

Link to annual review or ref to 2021 Strategic Mapping Report (pub. 2022)

Noise Preferential Routes (NPRs)

Bournemouth Airport has a Section 106 agreement with Christchurch Borough Council that requires the following:

- Departing aircraft are required to follow specified departure routings (Noise Preferential Routings (NPRs)). Commercial aircraft are not permitted to make any turn below 2,000 feet and it is the intention of the departure routings that aircraft avoid flying over built up areas where it is possible to do so. The effect of the routings is to minimise impact to Parley and the Bournemouth agglomeration when aircraft depart to the west (Runway 26) and to minimise the impact to Bransgore when aircraft depart to the east (Runway 08); and
- Departing aircraft are required to climb as steeply as is compatible with safety, in an effort to maximise altitude and thereby reduce noise.

NPRs are published in the Aeronautical Information Publication (AIP), however, their ownership and enforcement is the responsibility of the Local Authority and not the DfT or the CAA;

The introduction of PBN will improve the accuracy and compliance with the NPR;

NPRs might evolve by mutual agreement should an improvement be possible.

Options Development Methodology

What is Airspace	Route Design	Design Considerations
Design Swathes	Applying our Design Principles	Continuous Descent Approaches
	Design Boundary	

What is Airspace?

Three dimensional volumes of air in which different rules apply to aircraft and operators flying within them.

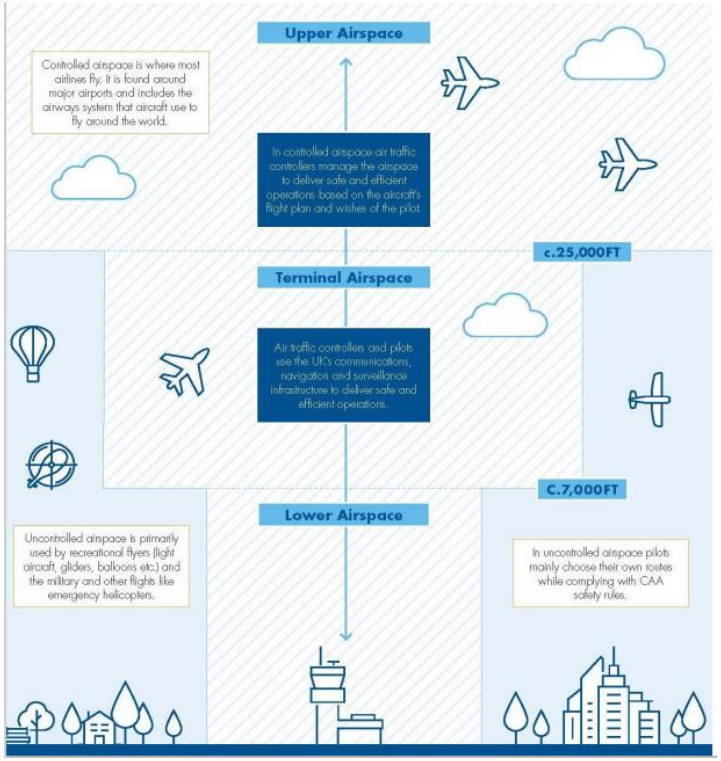
Divided into controlled airspace (all flight activity is known to ATC) and uncontrolled airspace (flying can take place without reference to ATC).

Used by commercial flights, general aviation and the military.

Divided into a number of vertical layers

BOH has its own controlled lower airspace called a control zone which extends up from ground level.

Above this is terminal and upper airspace which is the responsibility of NATS (NERL).



The Foundation of our Route Design

CAP 1616 sets out the rules for airspace change.

Our responsibility is from the ground to 7,000ft

Above that it is the responsibility of NATS.

Each departure route option has two points which define the start and finish of each route:

The start point is the runway.

The finish is at 7,000ft where the route option joins with the NATS upper (network).

For arrivals, the reverse applies:

The start point is at 7,000ft (i.e. where the arrival leaves the NATS upper (network) airspace.

The finish is the runway.

Design Considerations – The Rules

INTERNATIONAL RULES

The rules for route design are governed by the International Civil Aviation Organisation (ICAO) under a document called PANS-OPS 8168.

This stands for Procedures for Air Navigation Services – Aircraft Operations and sets out aspects such as:

- Minimum clearances between aircraft and obstacles (such as buildings or masts);
- When an aircraft can turn, and how tightly and at what speed; and
- The standards that apply to aircraft using satellite based navigation.

UK RULES

The UK rules are driven by ICAO and regulated by the Civil Aviation Authority (CAA).

In addition to CAP1616, the CAA also set policies and guidance on many aspects of route design.

These include the Airspace Modernisation Strategy which we capture in **DP12 - AMS Realisation** - This ACP must serve to further, and not conflict with, the realisation of the AMS.

Design consideration – The NATS Network

The airspace network is similar to motorways in the sky.

- When designing our routes, we must consider the airspace network and how other airports access this structure.
- This aligns with **DP9 – Systemisation -** The arrival transitions and departure procedures shall be deconflicted and integrate with the en-route network and Southampton Airport, as per the FASI(S) programme. Arrival transitions shall integrate with the Instrument Approach Procedures (IAPs) reducing the requirement for tactical coordination.
- This creates some constraints on our designs, based on where the NATS network can connect to us or where we expect other airports to have routes.
- As the designs mature, we'll share our options with other airports and work together to resolve any interactions.

Design Considerations - General

Routes designed to Performance Based Navigation (PBN) principles

Minimum departure climb gradients 6%

Instrument Landing System (ILS) to be used for final approach

Remove the reliance on ground based navigation aids (DVORs)

Design routes to ensure minimum ATC intervention with Continuous Climb or Continuous Decent Approach (CCO/CDA)

Deconflict our routes from other airports

Swathes– What are they?

An area where we can design route options

A wide area of airspace that goes from the runway to 7,000 feet above sea level

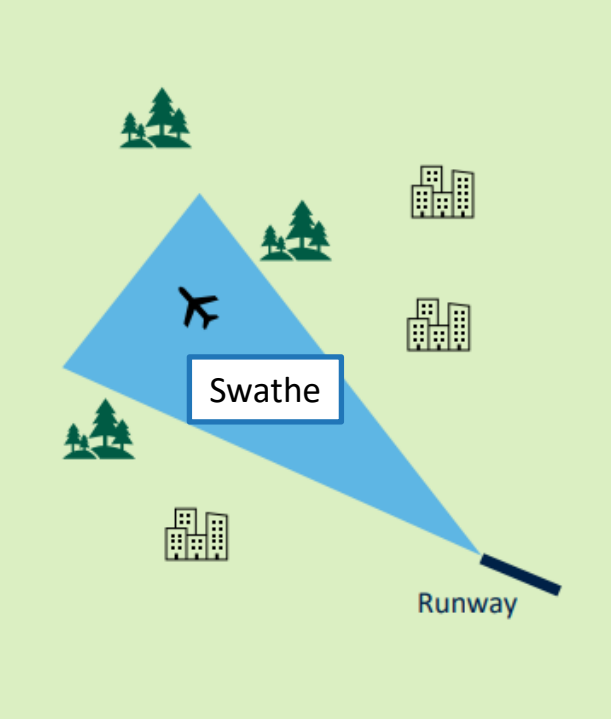
- Our baseline swathes are based on a 6% climb gradient which all aircraft can fly

Based around aircraft flying Continuous Climb Departures

- Less noise and improved fuel efficiency

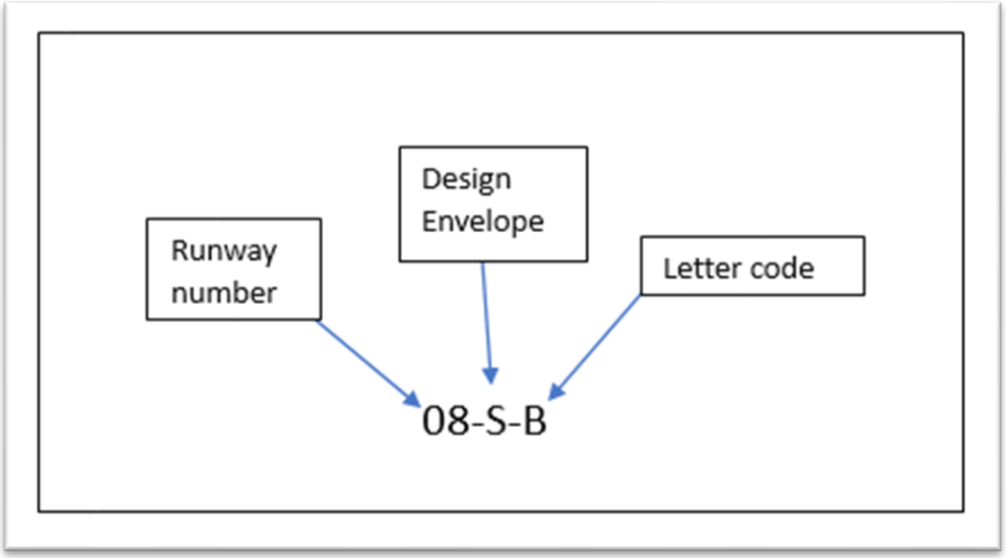
At least 4.5 nautical miles wide at 7,000 feet

Some swathes have been created as options to design in respite.



Design Envelopes

The options were developed using swathes, a group of swathes in each direction were developed to create design envelopes and these envelopes are coded by runway, direction and individual letter to identify each option within each design envelope.



Applying our design principles

Our **'Technical Requirements'** Design Principle requires us to design to industry standards and regulations

These provide guidance on the joining point onto final approach and create an area within which we can't design an arrival procedure

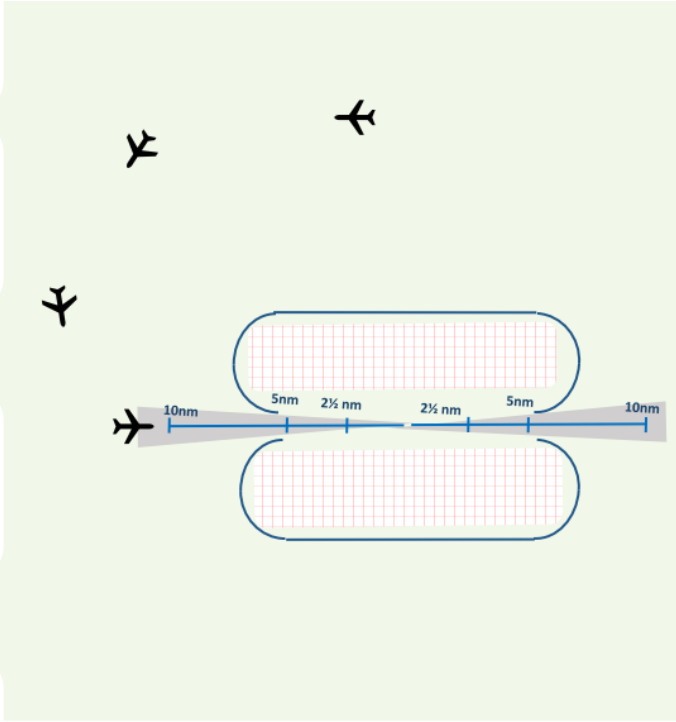
- This is because of safety rules on turn radius, speed and the minimum height for final approach

Our '**Systemisation'** and **'Technical Requirements'** Design Principle requires us to consider 2 documents:

- The Air Navigation Guidance 2017 and the CAA Airspace Modernisation Strategy (AMS)

Both highlight the use of Continuous Descent Approaches (CDA) to reduce the environmental impact of arriving aircraft

- Our arrivals designs will therefore endeavor to provide continuous descents to both runway ends to meet this design principle



What are Continuous Descent Approaches?

Continuous Descent Approaches (CDA) involve arriving aircraft using minimum thrust and avoiding prolonged level flight

The objective of a **CDA** is to reduce the environmental impact of the arrival by:

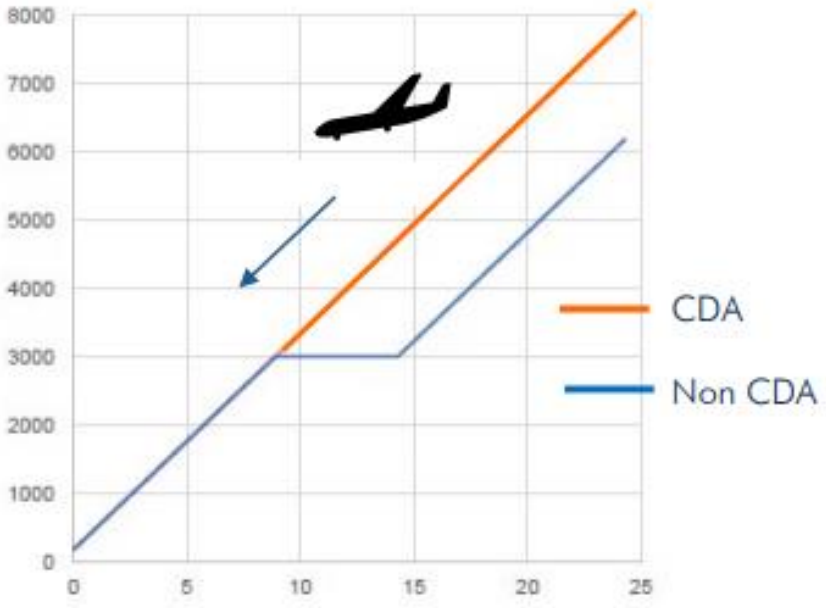
- Reducing noise
- Minimising CO2

There is a range of descent gradients for a **CDA** which will provide benefits

- The optimal is between around 3.5% and 5.25%
- Below this may require engine power, creating noise
- Above this may result in air brakes being needed, which also create noise

We've therefore created a design area for arrivals that provides a **CDA** within this optimal range

- This equates to an arrival track of between 25-32 miles from 7,000 feet



Design Boundary

Our design limit for departures and arrivals is at 7,000 feet above sea level (asl) using the following criteria:

- To provide a **Continuous Climb (CCO)** or **Continuous Descent Approach (CDA)** in line with our '**Systemisation', 'PBN' and 'Noise'** Design Principles
- The flow of traffic that interfaces with the NATS network in line with the **'Systemisation'** Design Principle

Or **PBN** Design Principle also requires us to use the latest technology

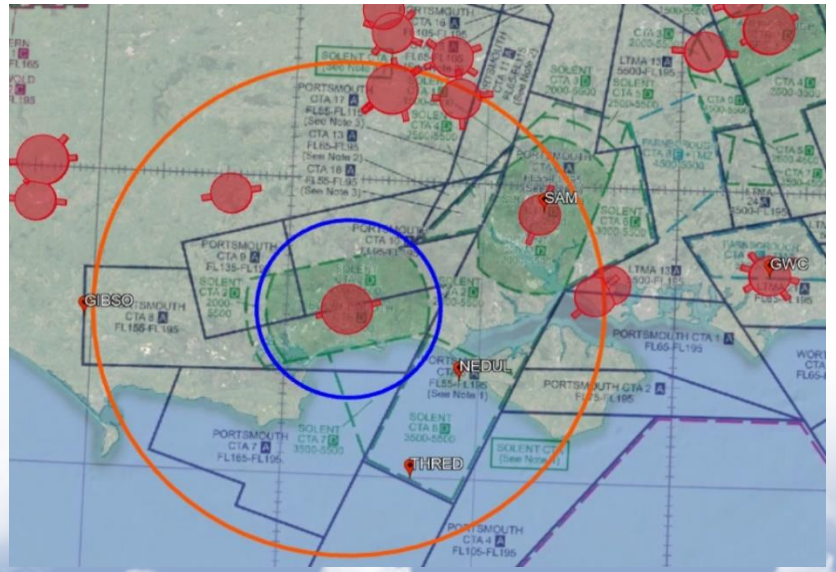
- Our arrivals will therefore be based on Performance Based Navigation
- These remove the need for significant tactical intervention by air traffic control
- PBN routes would result in less dispersed aircraft tracks than currently

Our Design Boundary for departures and arrivals is shown by the orange circles

- The radius of our circle is 25 Nautical Miles
- This is based on a minimum of a 3 degree climb/descent gradient, resulting in 7000 feet being reached at 21 Nautical Miles from the runway, with an extra buffer.

Our area of assessment for Noise and Tranquillity is shown by the blue circles

- The radius of this circle is 10 Nautical Miles
- This is based on a minimum of a 3 degree climb/descent gradient, resulting in 3000 feet being reached at 9 Nautical Miles from the runway, with an extra buffer.



Options Development Assumptions

The Options have been conceived with no preconceptions

The Options developed are swathes. The areas within which a final departure or arrival nominal track might ultimately be designed.

The Option do not take into account Holds or the potential for Point Merge which will be discussed and developed later in the ACP process.

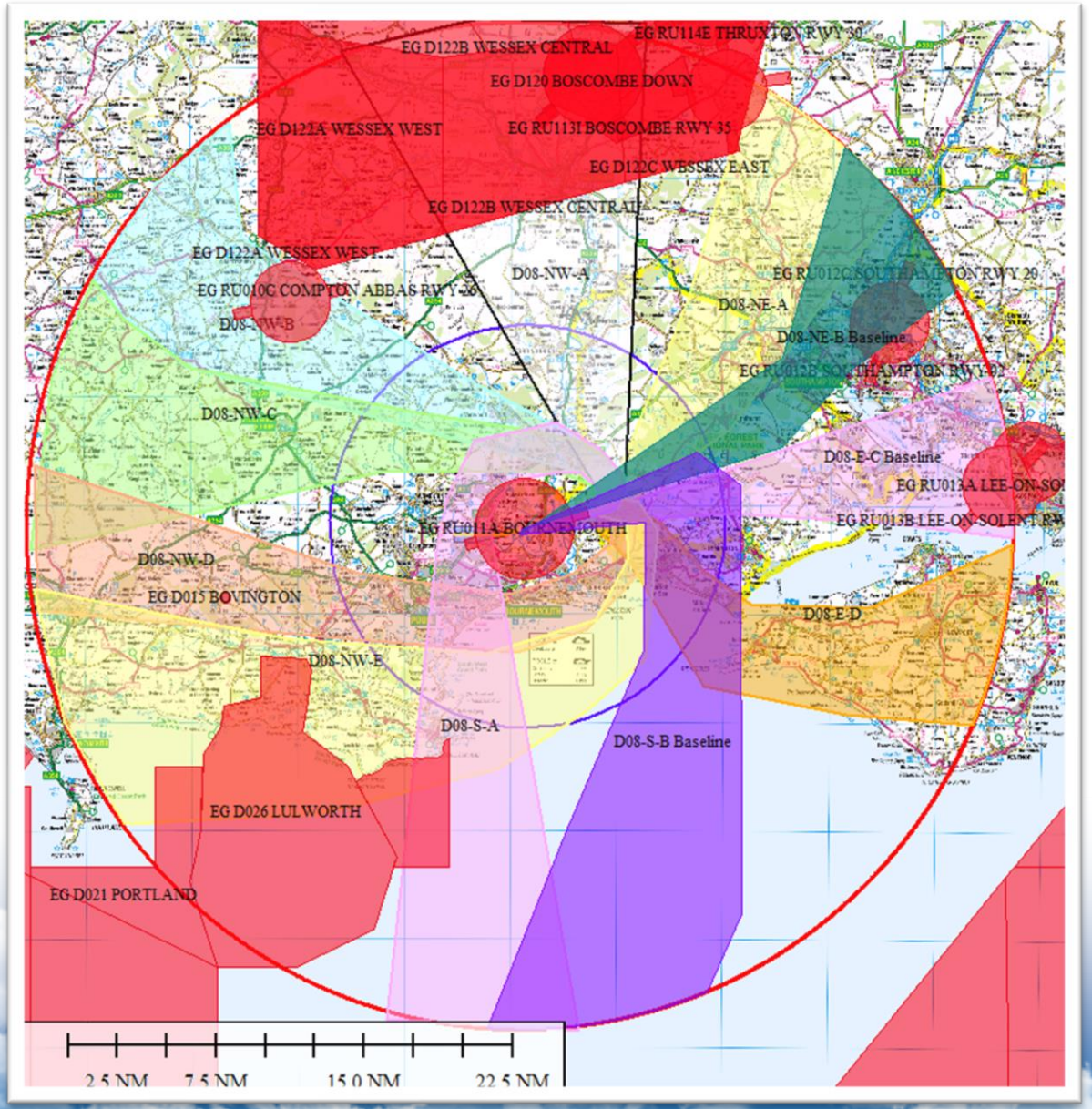
This workshop is not a consultation on final routes, but an overview of broad high-level options where routes will be defined.

Summary of changes 08 Departures

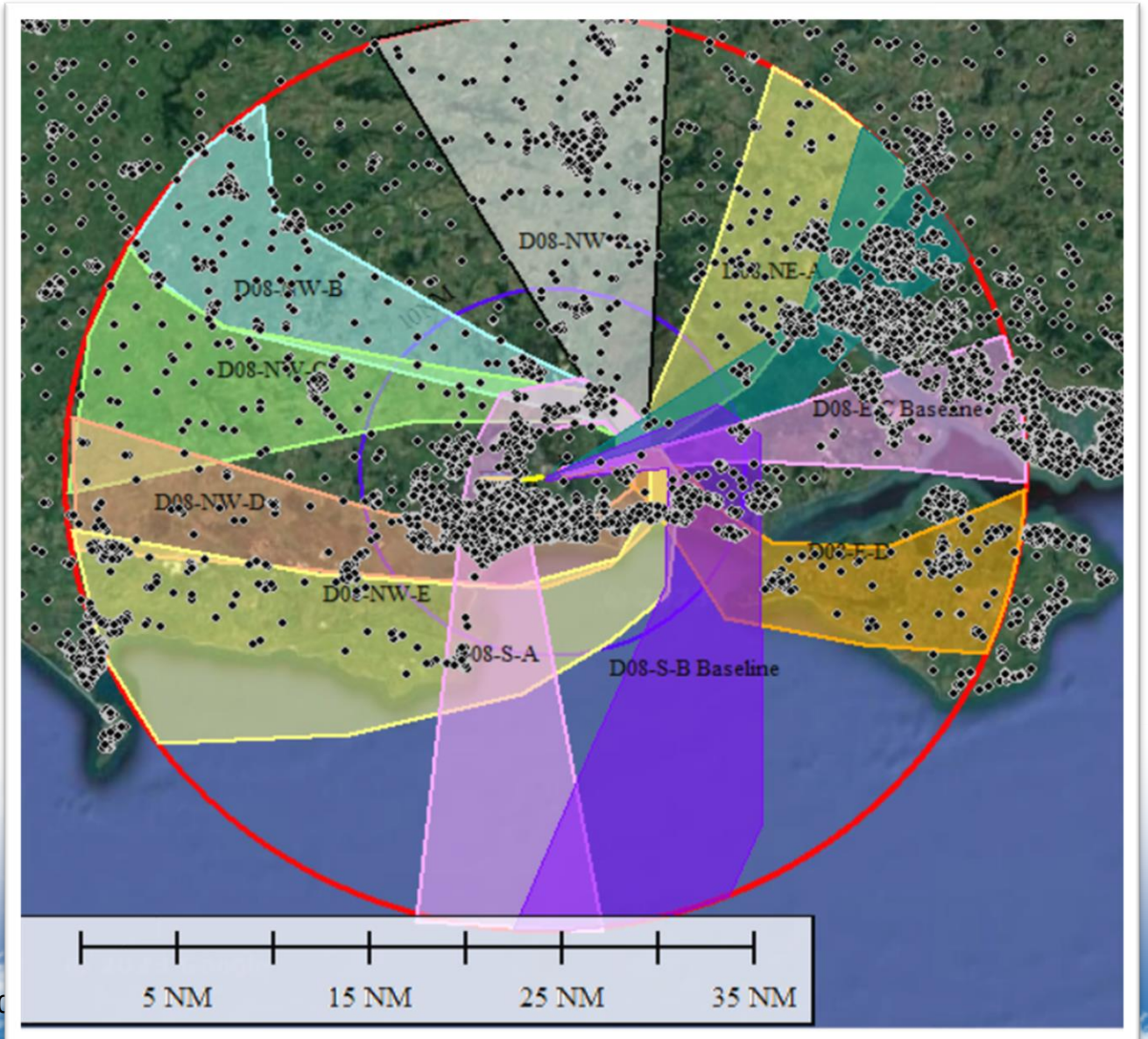
The following summarises the changes in options and baselines developed since previous stakeholder engagement.

- East and Northeast no change
- South – Baseline changed marginally
- Northwest baseline removed; options must now be assessed against no current operation.

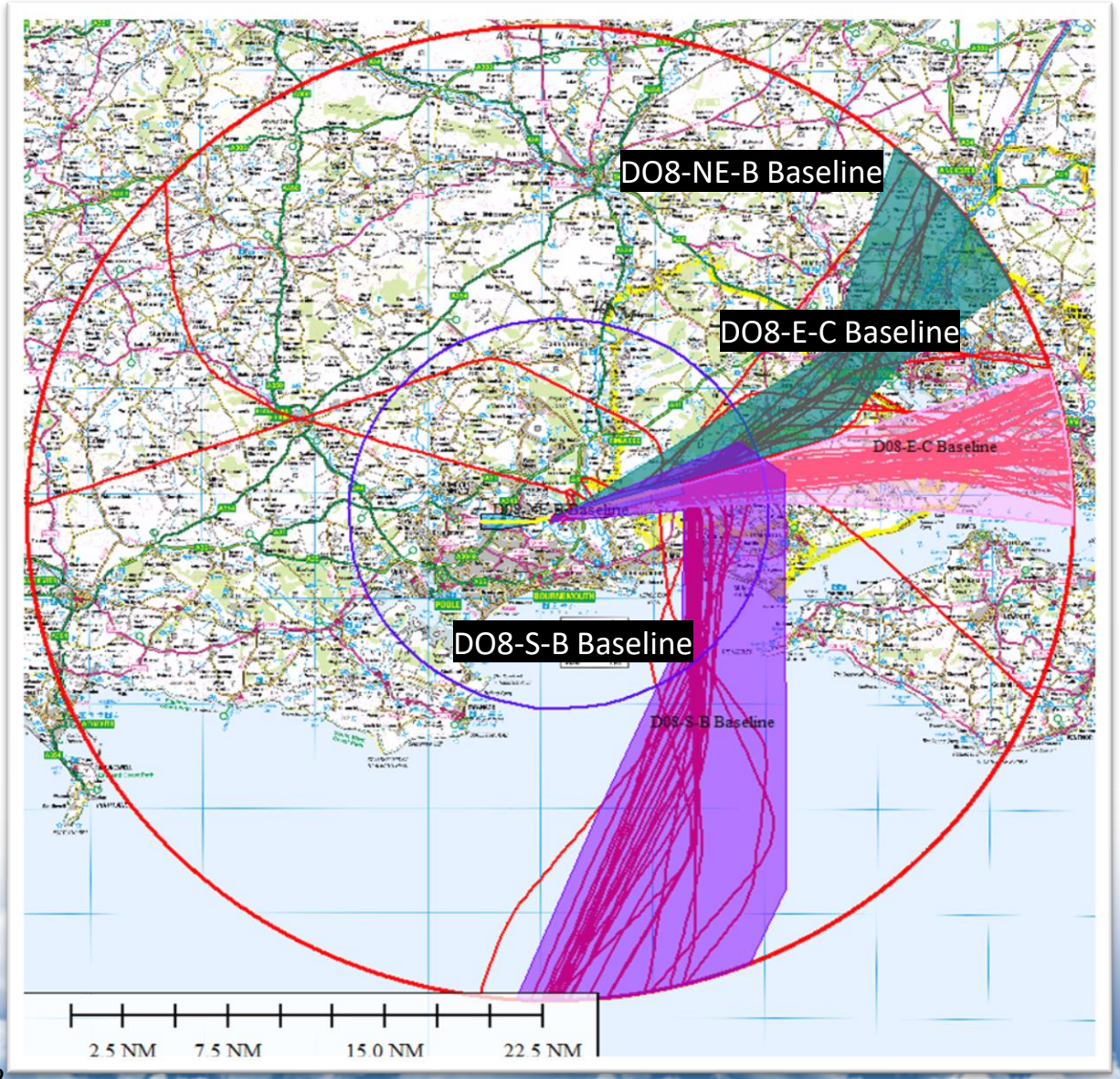
Runway 08 Departure Options (ALL)



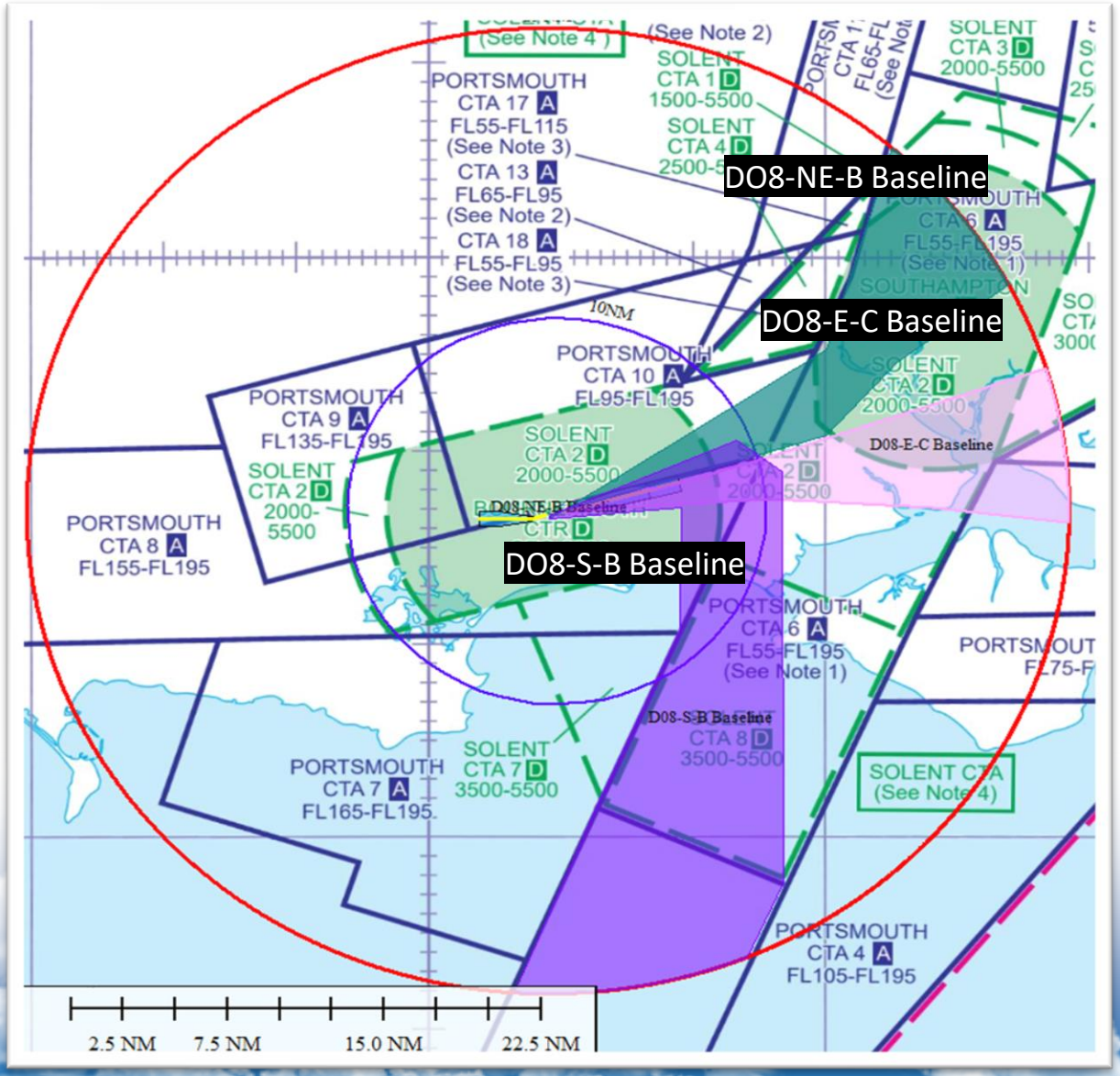
Runway 08D over Population density map



08 Departure baseline over tracks



08 Departures Baseline Over ENR

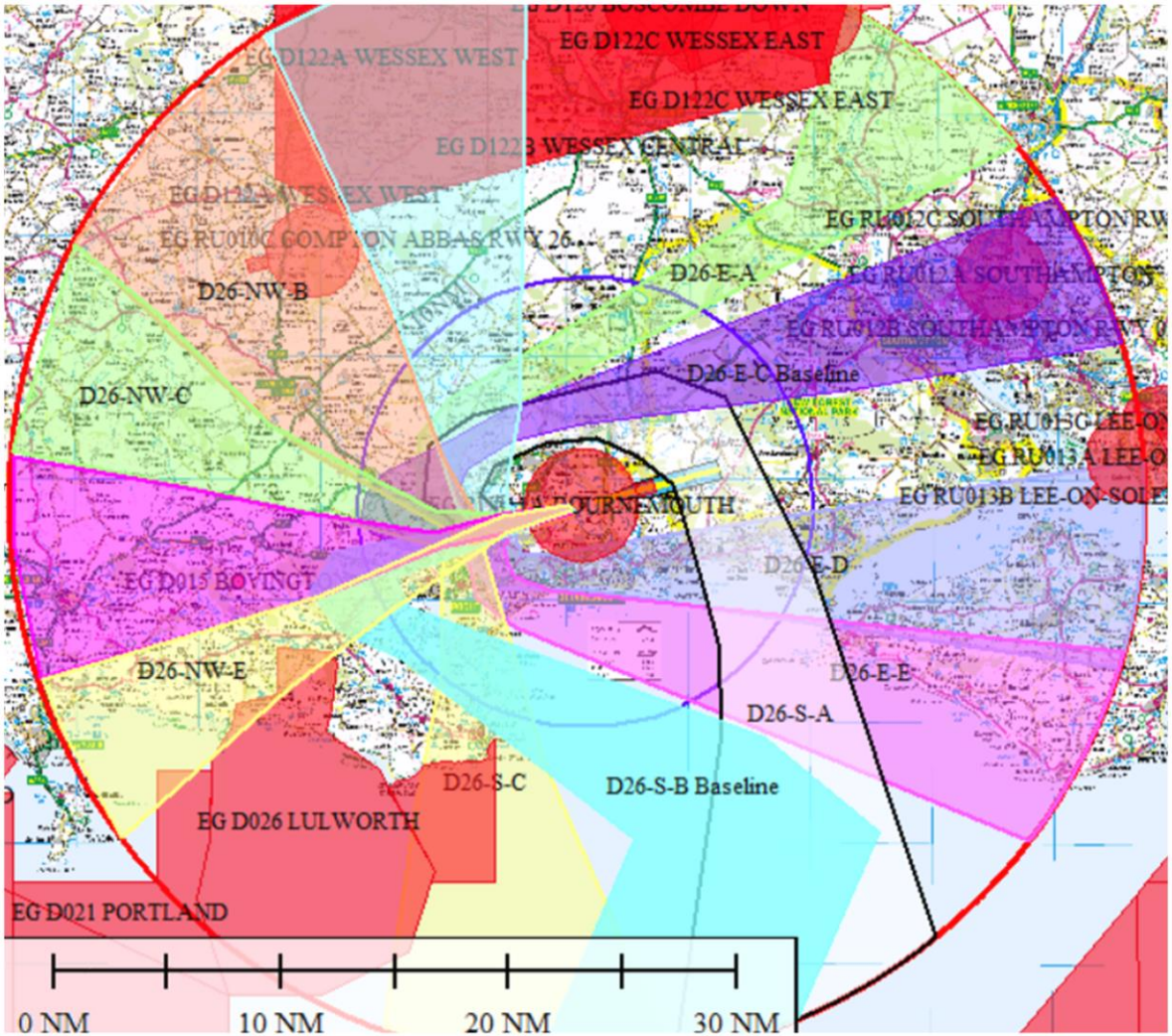


Summary of changes 26 Departures

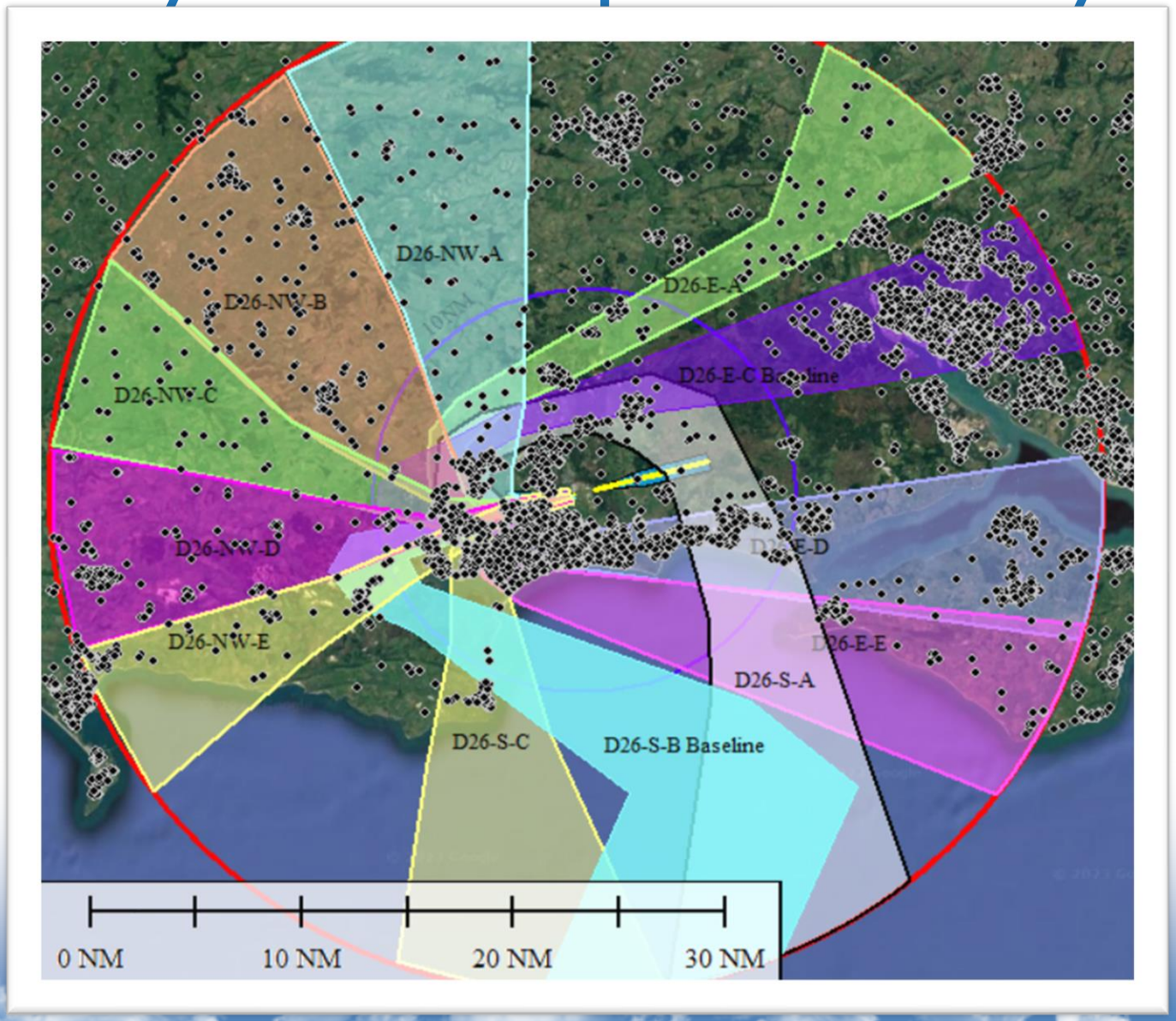
The following summarises the changes in options and baselines developed since previous stakeholder engagement.

- The baseline for East departures has changed to reflect current operations and procedures.
- The baseline for South departures has changed to reflect current operations and procedures.
- Northwest baseline has been removed; options must now be assessed against no current operation.

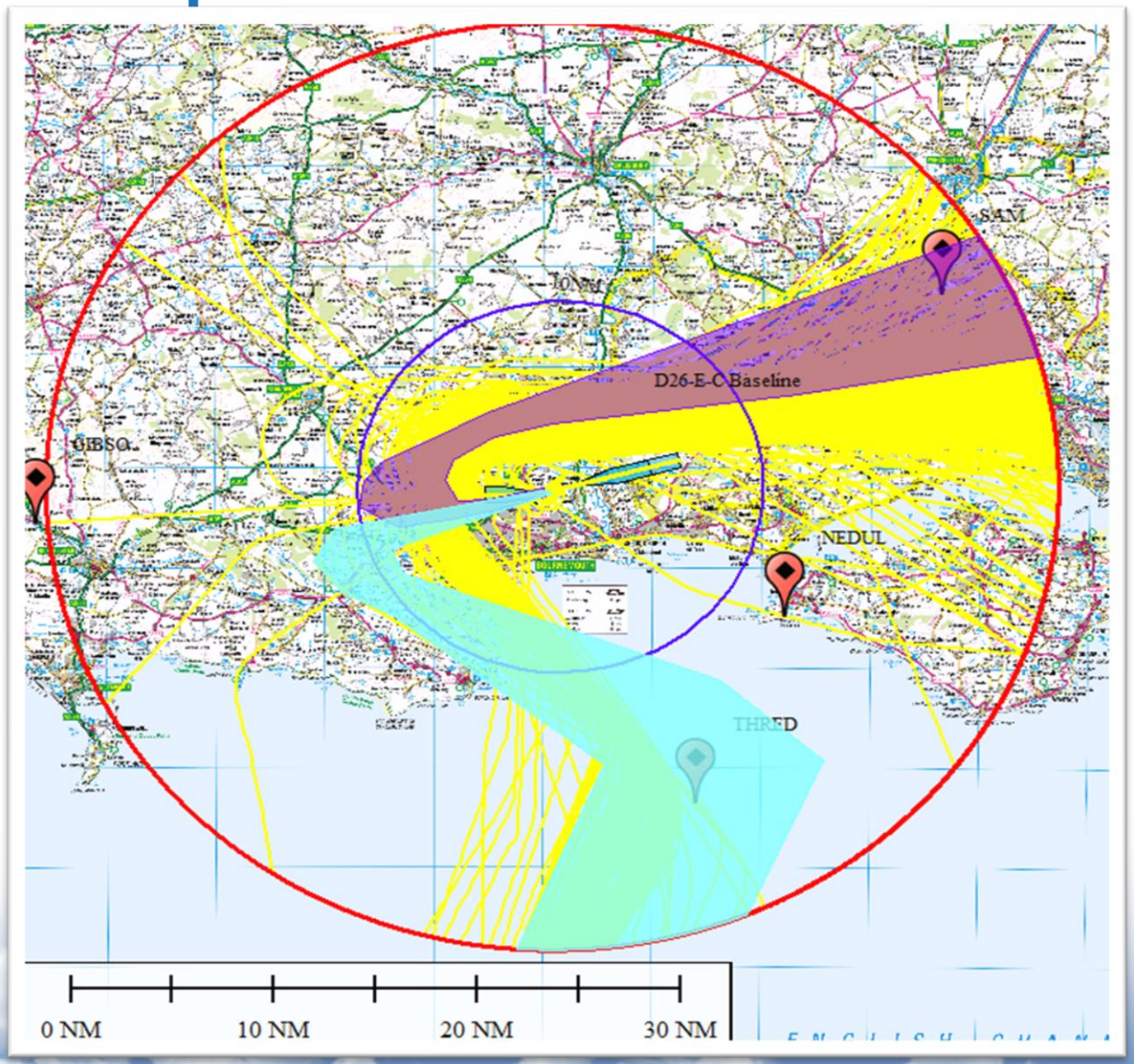
Runway 26 D Options (All)



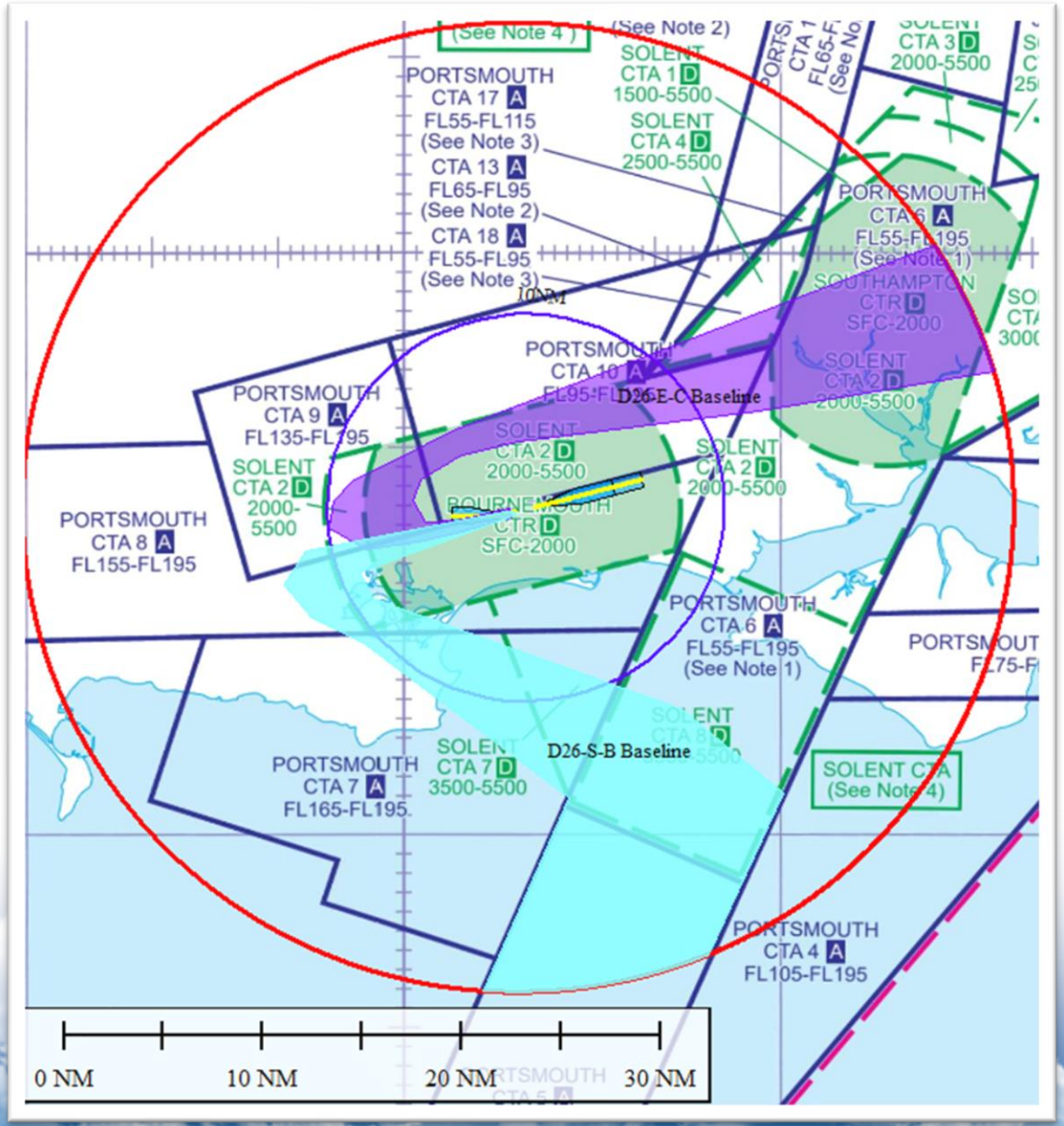
Runway 26D over Population density map



26 Departure Baseline over tracks



26 Departures Over ENR

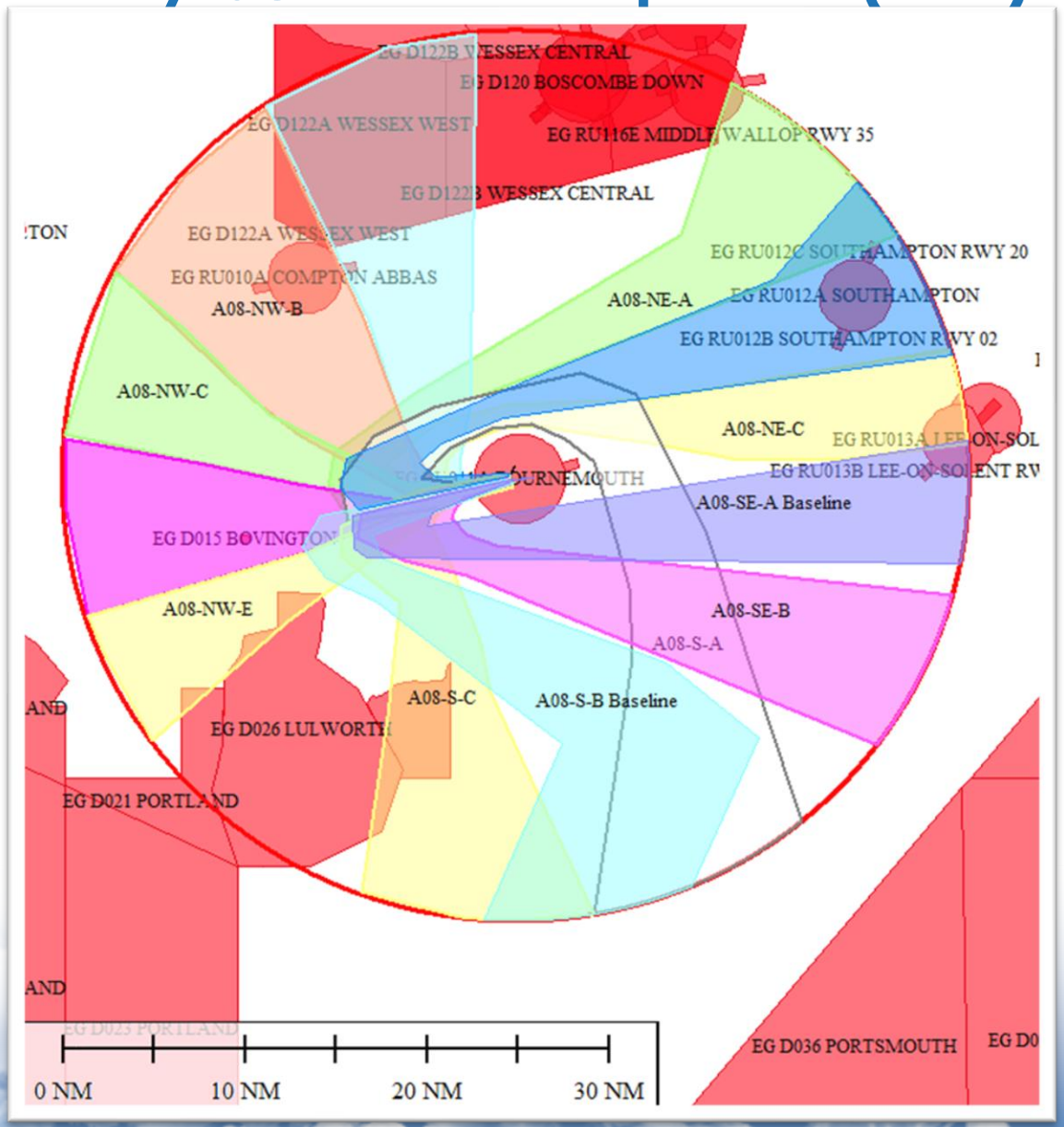


Summary of changes 08 Arrivals

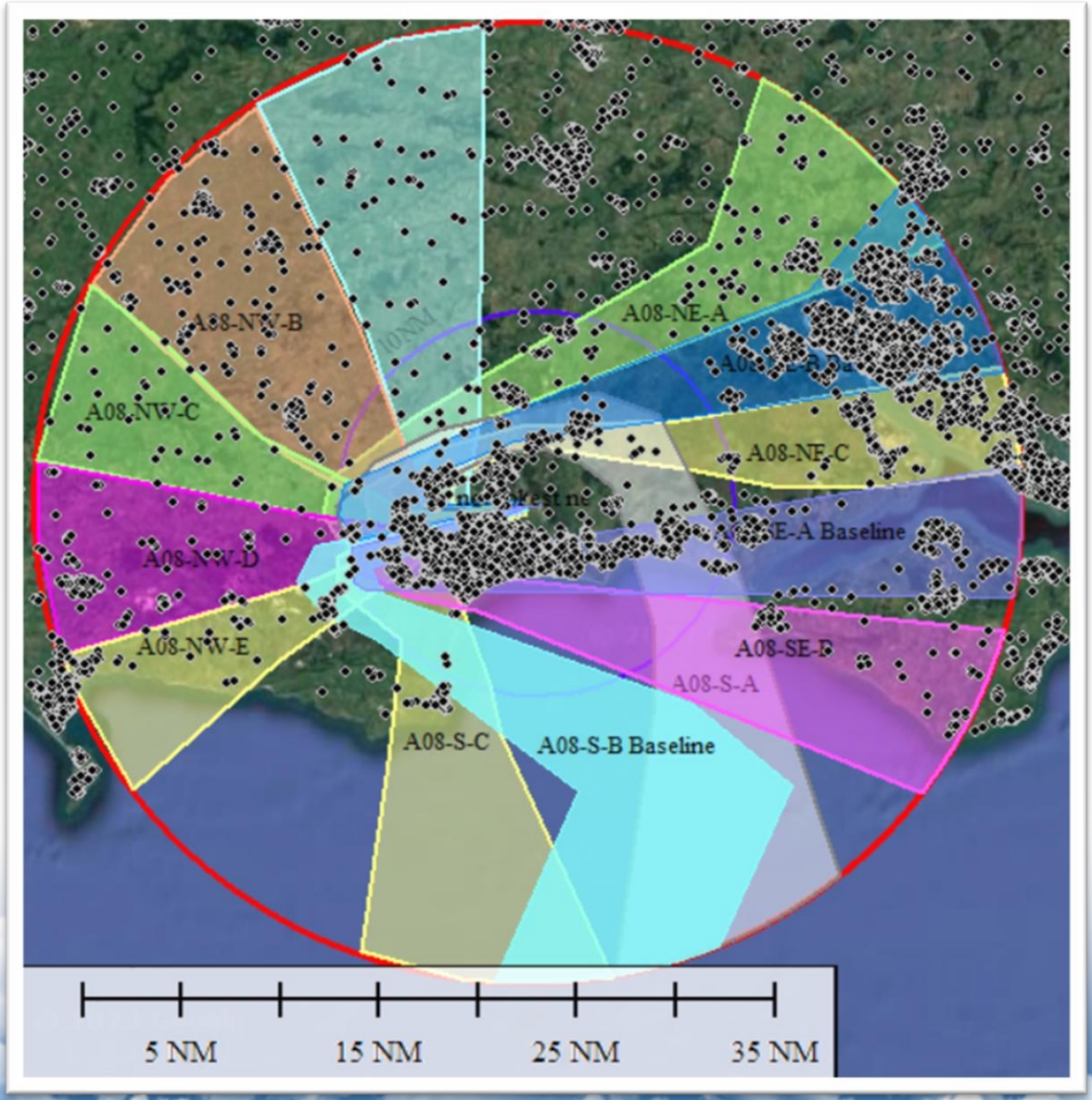
The following summarises the changes in options and baselines developed since previous stakeholder engagement.

- Baseline to the south has been changed marginally
- Northwest baseline has been removed; options must now be assessed against no current operation.

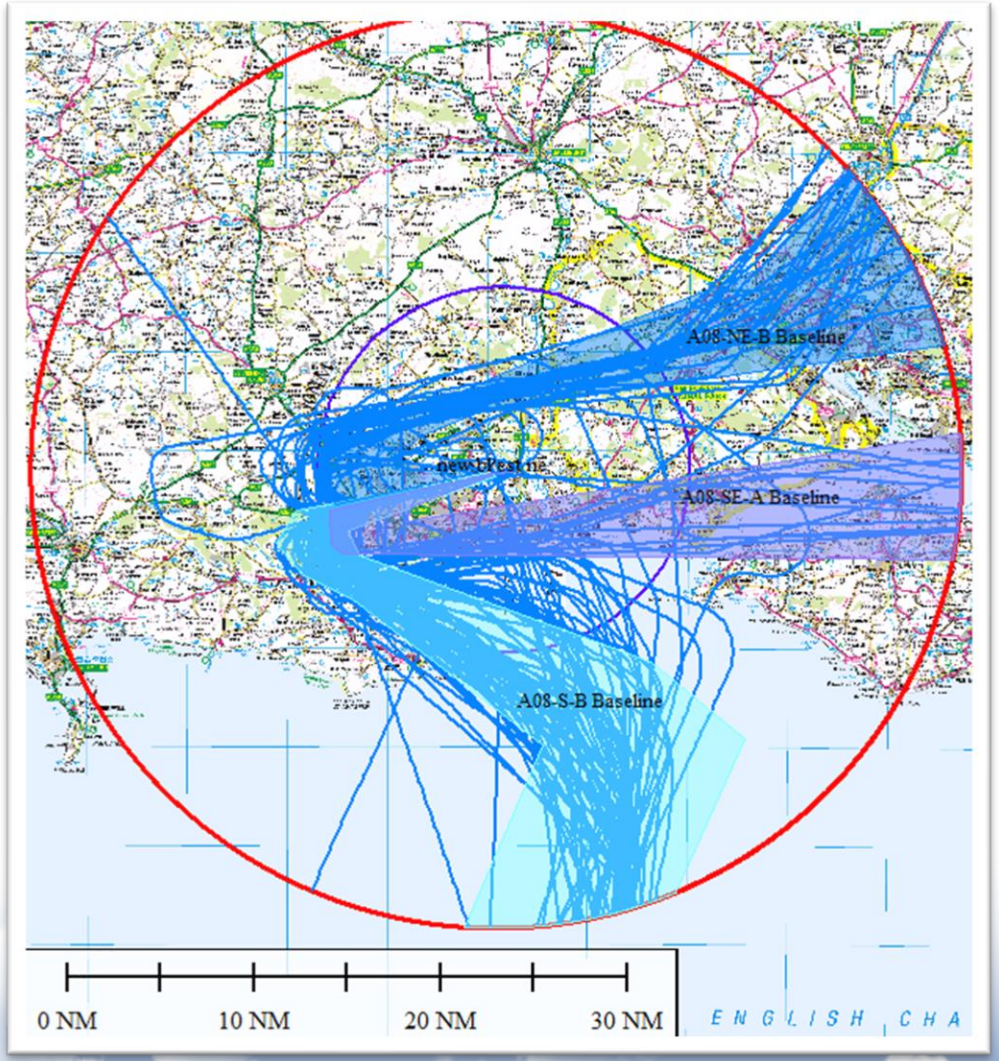
Runway 08 Arrivals options (ALL)



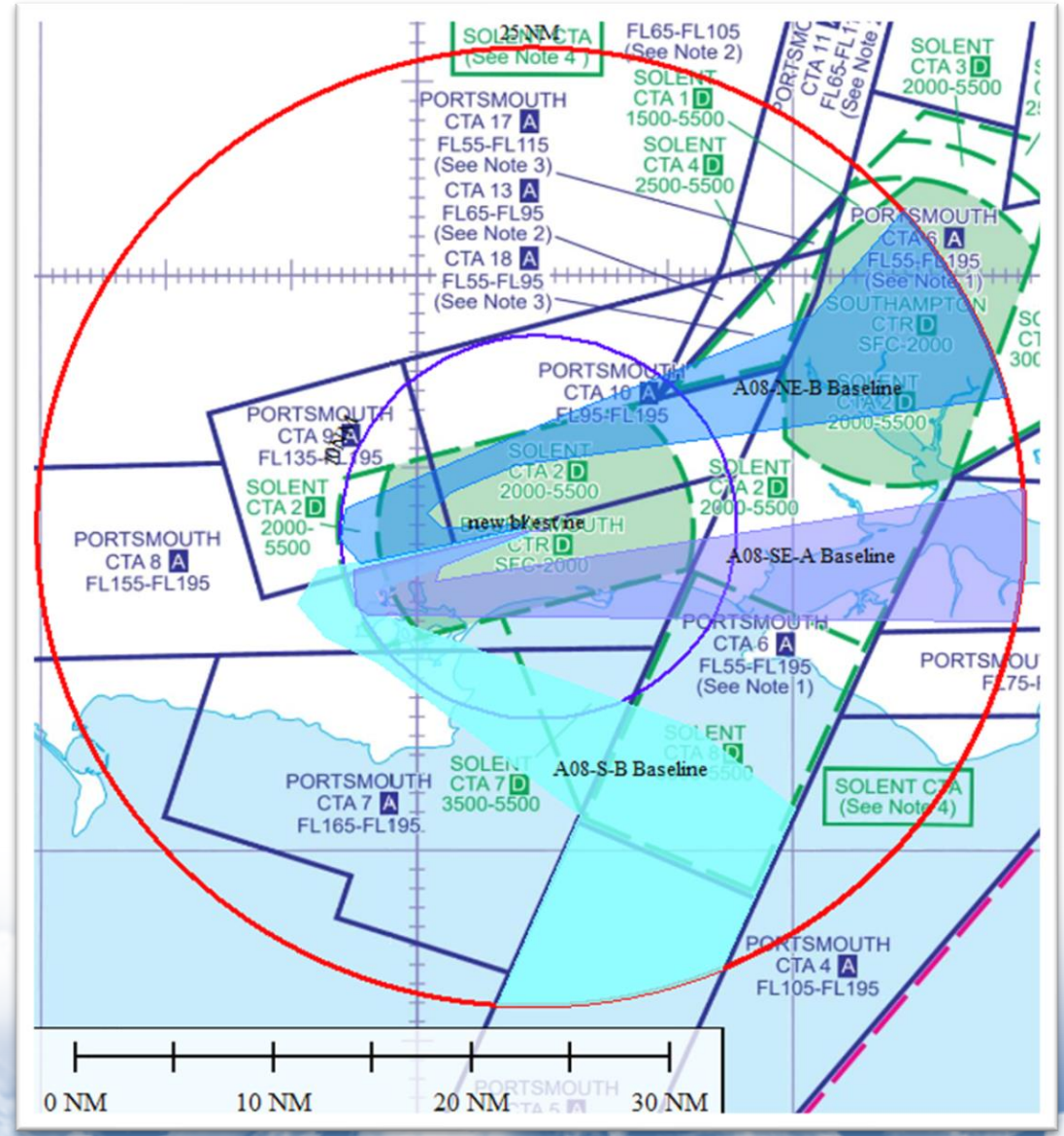
Runway 08A over Population density map



08 Arrivals Baseline over tracks



08 Arrivals Baseline over ENR

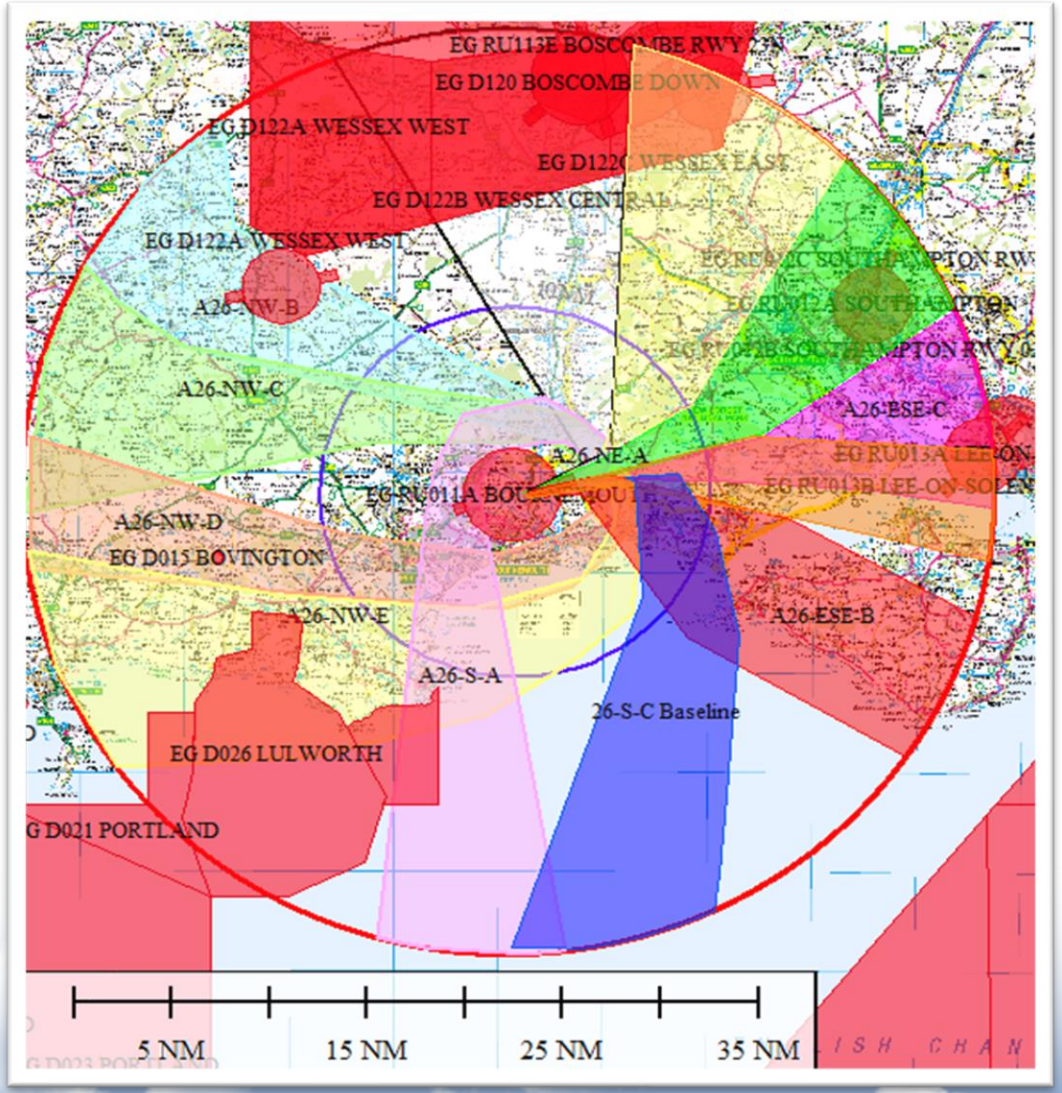


Summary of changes 26 Arrivals

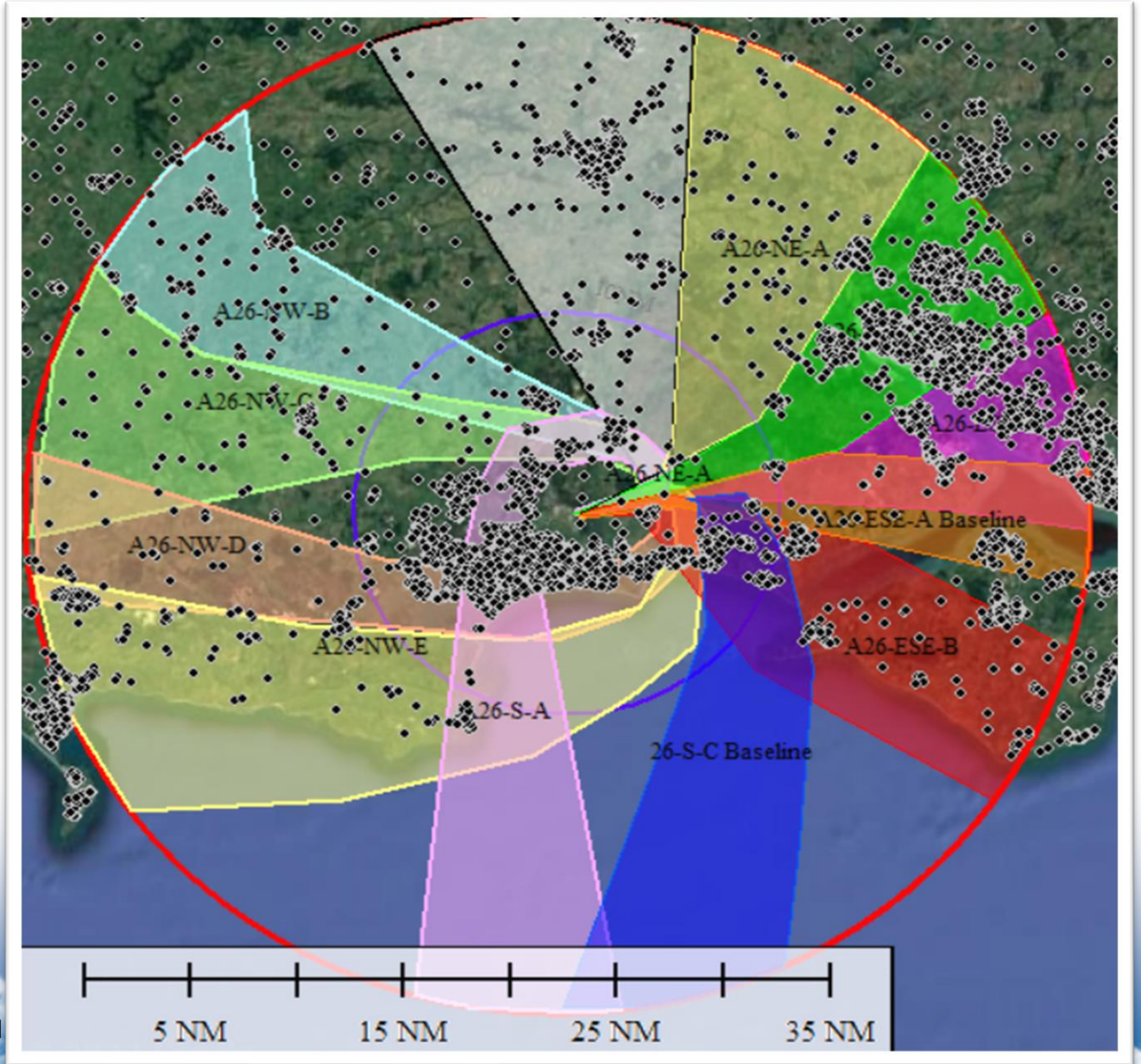
The following summarises the changes in options and baselines developed since previous stakeholder engagement.

- Previous Northeast design envelope has been split into two new envelopes with new baselines to reflect current operations and procedures:
    - Northeast (NE)
    - East Southeast (ESE)
- South – new baseline to reflect current operations and procedures.
- Northwest baseline has been removed; options must now be assessed against no current operation.

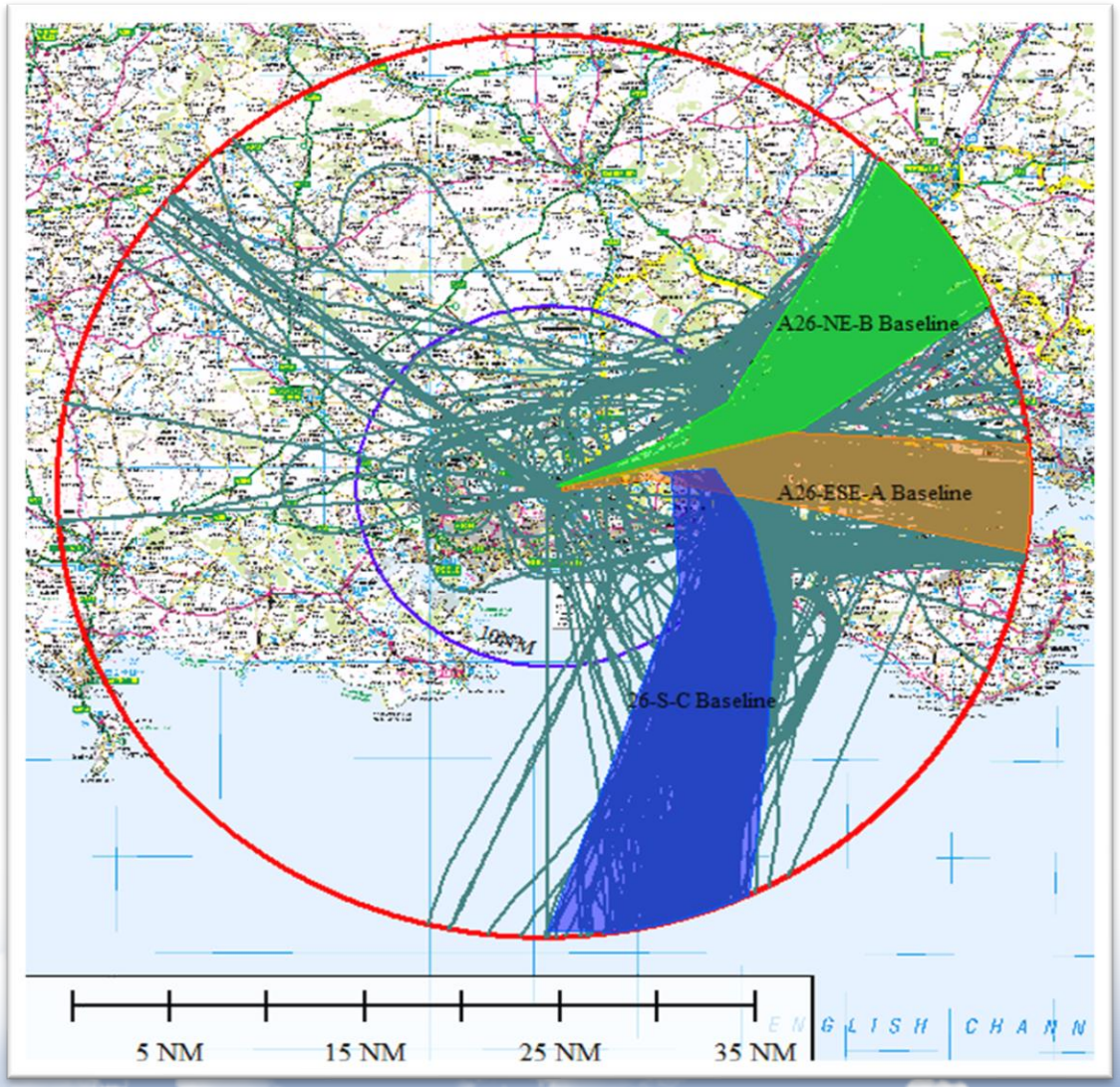
26 Arrivals options all



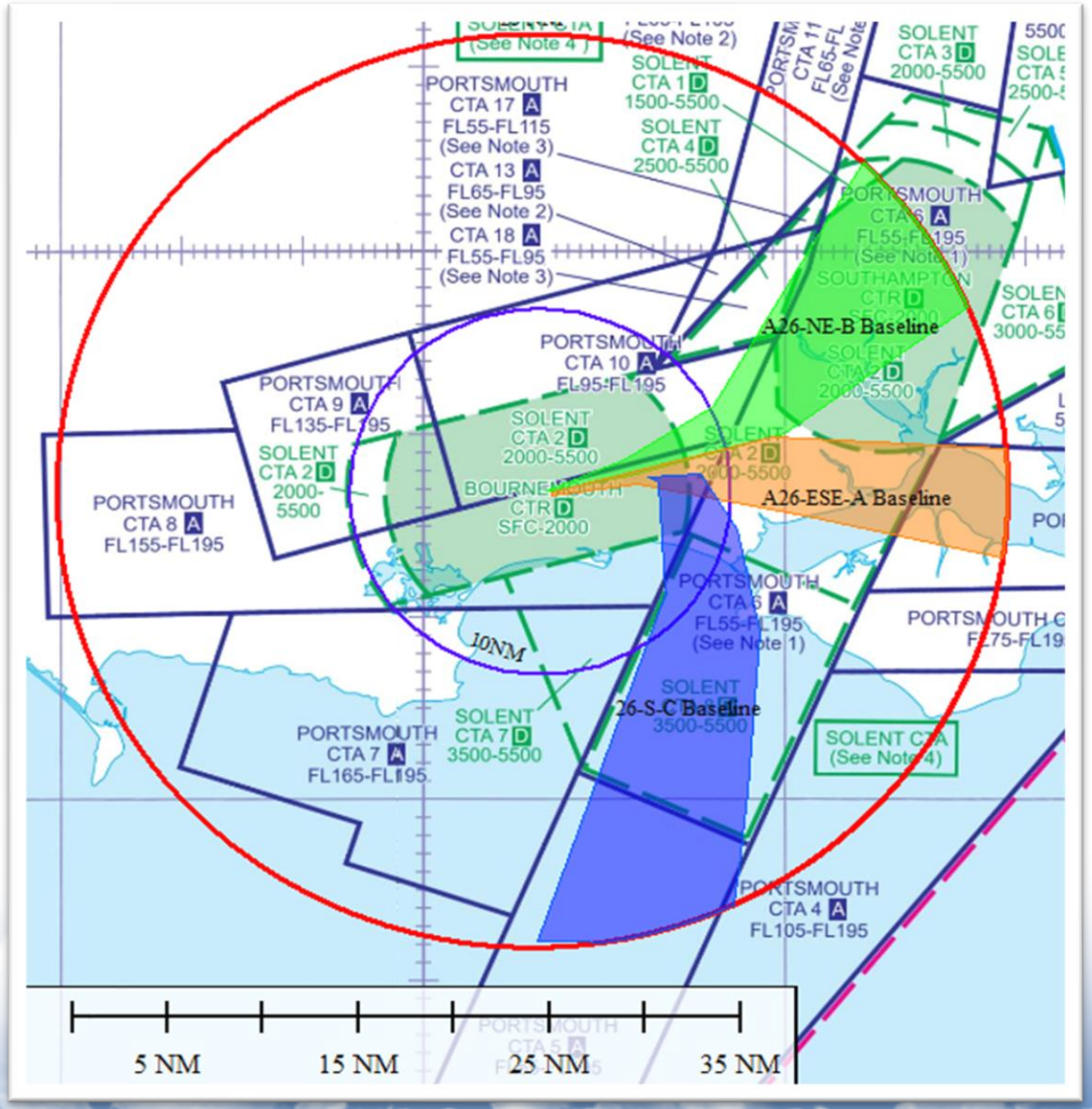
Runway 26A over Population density map



26 Arrivals Baseline over tracks

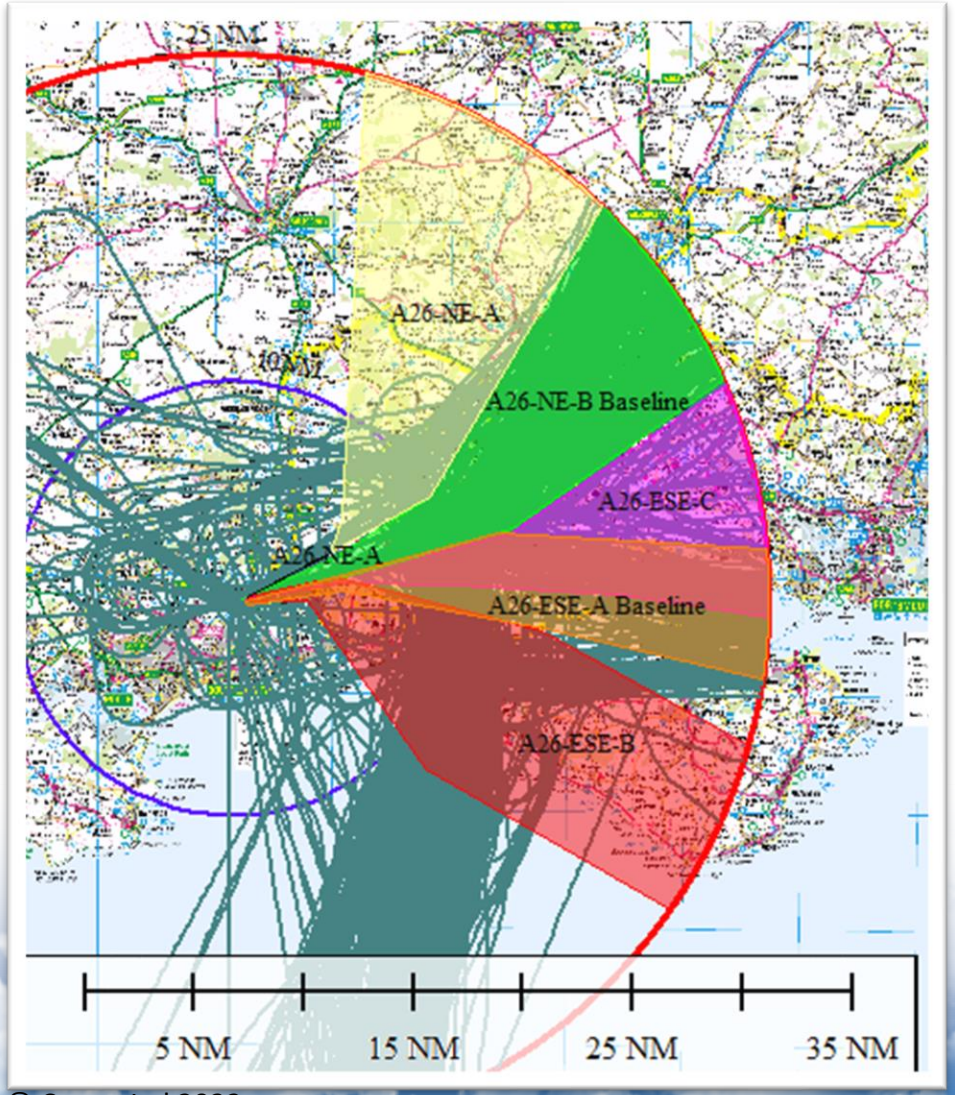


26 Arrivals Baseline ENR



26A new design envelopes

From East to Northeast and East/Southeast



New design envelopes:

Northeast

A26-NE-A

A26-NE-B Baseline

East/ Southeast

A26-ESE_A Baseline

A26-ESE_B

A26-ESE_C

Next Steps

A link to an online survey, and a copy of the presentation will be sent following the workshop today.

- In the survey you will be asked if you agree with the Options we have developed and if there are any you think we have missed.
- Feedback from this workshop and the survey will shape our Stage 2A Airspace Change Design Options submission.

The next step for Stage 2A is to conduct a Design Principle Evaluation on the developed Options.

- You will be asked in the survey if you agree with the Design Principle assessment for each option.
- This feedback will then be integrated with our own DP assessment and a full Design Principle evaluation completed. This will create the second document in our Stage 2A submission.

Thank you for your time are there any Questions?