

# Manston Airport Airspace Design and Procedures

Step 2A  
Options Development  
Issue 2



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# Glossary

| Acronym | Meaning   |
|---------|---|
| aal     | above aerodrome level                           |
| ACP     | Airspace Change Proposal                        |
| AEF     | Aviation Environment Federation                 |
| AIP     | Aeronautical Information Publication            |
| AMS     | Airspace Modernisation Strategy                 |
| ANSP    | Air Navigation Service Provider                 |
| AONB    | Area of Outstanding Natural Beauty              |
| APD     | Approved Procedure Designer                     |
| ATC     | Air Traffic Control                             |
| ATM     | Air Transport Movement                          |
| ATS     | Air Traffic Service                             |
| ATZ     | Aerodrome Traffic Zone                          |
| CAA     | Civil Aviation Authority                        |
| CAP     | Civil Aviation Publication                      |
| CAS     | Controlled Airspace                             |
| CTA     | Control Area                                    |
| DCO     | Development Consent Order                       |
| FAS     | Future Airspace Strategy                        |
| FASI-S  | Future Airspace Strategy Implementation - South |
| FIR     | Flight Information Region                       |
| ft      | feet  |
| GA      | General Aviation                                |
| IAF     | Initial Approach Fix                            |

## Glossary (continued)

| Acronym | Meaning  |
|---------|--|
| ICAO    | International Civil Aviation Organisation          |
| IFP     | Instrument Flight Procedure                        |
| IFR     | Instrument Flight Rules                            |
| LAMP    | London Airspace Modernisation Programme            |
| MAP     | Missed Approach Procedure                          |
| MOD     | Ministry of Defence                                |
| NATMAC  | National Air Traffic Management Advisory Committee |
| NATS    | formerly National Air Traffic Services             |
| NDB     | Non-Directional Beacon                             |
| PBN     | Performance Based Navigation                       |
| RSP     | RiverOak Strategic Partners Ltd                    |
| SID     | Standard Instrument Departure                      |
| SoN     | Statement of Need                                  |
| SPA     | Special Protection Area                            |
| SSSI    | Site of Special Scientific Interest                |
| TMA     | Terminal Manoeuvring Area                          |
| TMZ     | Transponder Mandatory Zone                         |
| VFR     | Visual Flight Rules                                |
| VMC     | Visual Meteorological Conditions                   |

# 1. Introduction

## 1.1 Introduction

The Manston Airport Airspace Design and Procedures project is currently at Stage 2 – Develop and Assess – of the Civil Aviation Publication (CAP) 1616 Airspace Design process. Step 2A requires the change sponsor to develop a comprehensive list of options that address the Statement of Need and that align with the Design Principles developed in Stage 1.

This document provides a narrative explanation of steps taken in Step 2A to develop the options for airspace design and arrival and departure routes at Manston Airport. The document shows how the options have evolved from an initial list of all possible options through to a longlist of options taken forward to Step 2B Options Appraisal. The Appendices to this document contain enlarged images of the options developed, against a backdrop of an Ordnance Survey roadmap. The overland portions of the options were shown against a backdrop of Ordnance Survey Landranger maps for greater detail in the documents provided to stakeholders during stakeholder engagement. These documents can be found alongside this document on the Civil Aviation Authority (CAA) airspace portal:

<https://airspacechange.caa.co.uk/PublicProposalArea?PID=112>

This document should be read alongside the Manston Airport Airspace Design and procedures Design Principles Evaluation which has also been uploaded to the airspace portal.

## 1.2 Background

Manston Airport is a disused airport on the Isle of Thanet in Kent. RiverOak Strategic Partners (RSP) is proposing to secure the future of the airport by redeveloping and reopening it as a successful hub for international air freight which also offers passenger travel, executive travel and aircraft engineering services.

RSP has applied to the Planning Inspectorate for a Development Consent Order (DCO) to build Manston Airport. In addition, RSP must also secure approval from the CAA, through the CAP 1616 process, for its use of airspace and procedures.

This document relates only to the CAP 1616 process and the proposal to introduce the airspace and Instrument Flight Procedures (IFPs) required to enable safe and efficient operations to and from the airport.

## 1.3 Statement of Need

The full Statement of Need (SoN) is available in Step 1A of the airspace portal and the key elements in terms of procedure design are illustrated by the following extracts. The first relates to the implementation of Performance Based Navigation (PBN) instrument flight procedures and implies that the design options will be compliant with the parameters set out in the International Civil Aviation Organisation (ICAO) document *PANS OPS 8168 Aircraft Operations - Volume 2 Construction of Visual and Instrument Flight Procedures*.

### SoN Extract 1: Instrument Flight Procedures

*[there will be a need to introduce appropriate flight procedures and airspace to enable safe operations. The procedures will need to comply with Resolution 36/23 ratified by the 36th ICAO General Assembly and the UK Future Airspace Strategy<sup>1</sup> (FAS) published by the Civil Aviation Authority (CAA). This involves the introduction of routes and procedures compliant with PBN criteria; a State requirement for 2024.]*

The second extract from the Statement of Need relates to the modernisation of UK airspace and implies the requirement for this airspace change to be developed in coordination with other identified change sponsors.

<sup>1</sup> Superseded and replaced by the Airspace Modernisation Strategy (AMS (CAP 1711))

## SoN Extract 2: Harmonisation

*[Future Airspace Strategy Implementation (South) (FASI(S)) and London Airspace Management Programme (LAMP) require UK southeast airports to implement PBN in order that the complex interactions between the region's airports are fully considered. The aerodrome sits below Controlled Airspace (CAS), the eastern extensions of the London Terminal Manoeuvring Area (TMA) which contains busy routes into and out of inter alia Heathrow, Gatwick and London City (to/from The Continent). Routes into and out of the future Manston Airport will need to integrate with these London TMA routes at some distance from the Airport]*

### 1.3.1 Constraints

The following constraints have been identified as being applicable:

1. C1: Instrument Flight Procedures must be safe.
2. C2: Instrument Flight Procedures must be PANS-OPS 8168 compliant.
3. C3: The airspace solution must integrate with Future Airspace Strategy Implementation (South) – FASI-S.
4. C4: Fixed Runway position.

### 1.3.2 Application of the Constraints to the Design Process

The Instrument Flight Procedures (IFP) must be safe (**C1**) and therefore the designers have to take into account the minimum requirements for separation from terrain and obstacles, and from other procedures/volumes of airspace. Stakeholder input was sought at the beginning of Step 2A from Air Navigation Service Providers (ANSP) and FASI-S co-sponsors to elicit specific details of where possible routes to and from Manston Airport could interact with their procedures and operations. Further details of this engagement can be found in Section 2. The primary means by which it is intended to provide safety assurance to support the options is a Safety Case developed in accordance with CAP 760<sup>2</sup>. Detail on the Safety Assessment is contained in Section 5 of the Initial Options Appraisal in Step 2B on the airspace portal.

The requirement for all design options to be PANS-OPS 8168 compliant (**C2**) means that the parameters of the IFPs e.g. shape, accuracy, turn areas and obstacle clearances are predetermined (to a degree) in ICAO document *PANS OPS 8168 Aircraft Operations - Volume 2 Construction of Visual and Instrument Flight Procedures*. This is the international standard for all IFPs and IFPs must be designed by a CAA Approved Procedure Designer (APD).

Constraints **C3** (Integration with FASI-S) and **C4** (Fixed Runway position) are the necessary starting points for developing the design options to ensure full connectivity between Manston Airport and the en-route airways network:

- The runway position is fixed and designated 10/28; this means that the runway orientation is on a bearing of 100° (the 10 direction) and the opposite direction 280° (the 28 direction). The runway direction in use on a given day is selected based on a range of factors including, but not limited to, wind direction. Aircraft generally take-off and land in the same direction i.e. into the wind. Runway direction may change during the day if the wind changes. In favourable wind conditions, it may be possible for aircraft to land on Runway 10 and take off from Runway 28 (aircraft landing from, and taking off to, the west) in order to limit the noise impact on the nearby town of Ramsgate.
- Traffic departing from Manston Airport must fly straight ahead on runway heading until achieving 500 feet (ft) above aerodrome level (aal) before any turns are permitted. Aircraft will then follow a series of turns and straight sections known as a Standard Instrument Departure (SID), which finishes at an airway's entry point.
- Traffic arriving at Manston Airport leave the airways at fixed points and fly a Transition route to join an Approach procedure, which ends in a straight section lined up to the runway.

<sup>2</sup> CAP 760: Guidance on the Conduct of Hazard identification, Risk Assessment and the Production of Safety Cases: For Aerodrome Operators and Air Traffic Service Providers

## 1.4 Prioritised List of Design Principles

The work undertaken during Stage 1 helped to establish a prioritised shortlist of Design Principles to act as a framework against which Design Options have been drawn up. The prioritised list of Design Principles is shown in Table 1 below.

| Prioritised DP | Design Principle  |
|----------------|---|
| 1              | Procedures must be designed to meet acceptable levels of flight safety  |
| 2              | Design options must accord with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it |
| 3              | Procedures should be designed to minimise the impact of noise below 7,000 feet  |
| 4              | Where practicable, designs should seek to minimise the impact of noise on particularly sensitive areas  |
| 5              | Designs should minimise the impact on other airspace users in the local area  |
| 6              | Procedures should be designed that minimise aircraft emissions to reduce air pollution  |
| 7              | Designs should make provision for multiple routes that can be used to spread the noise burden more equitably                                      |
| 8              | Procedures should be designed to minimise the number of track miles flown   |

Table 1 - Prioritised Design Principles

Notwithstanding the prioritisation of the Design Principles shown above, one of the government's key environmental objectives is to limit and, where possible, reduce the number of people in the UK significantly affected by the adverse impacts from aviation noise. As there are currently no procedures in place for Manston Airport, it is not possible to create a reduction in the number of people affected by aircraft noise. The proposal will, however, aim to minimise the number of new people who will be affected. In line with the government laid out altitude-based priorities, the proposal will aim to limit the adverse effects on people from aircraft below 4,000 ft. Between 4,000 ft and 7,000 ft, the priority will be to continue to minimise the impact of aviation noise, unless to do so would adversely increase CO2 emissions.



### 1.4.1 High-Level Design Criteria

In accordance with the requirements in paragraph E18 of CAP 1616, a set of high-level criteria was developed from the Design Principles to support the design process; the application of these criteria to the initial list (tested with the stakeholders) generated the longlist of designs to take forward to Design Principle Evaluation. The best practice guidance contained in the government Green Book<sup>3</sup> was used to develop five high-level objectives or criteria. These criteria are listed below along with the quantitative 'measures' used to gauge each option against the objective:

- Ob 1: The option shall be acceptably safe
  - o Obstacle clearance, other procedures/airspace, PANS-OPS 8168
- Ob 2: The option must accord with the Airspace Modernisation Strategy and any associated plans
  - o FASI-S
- Ob 3: Minimise the impact of noise
  - o Numbers overflown
  - o Noise sensitive areas
  - o Multiple routes to spread the noise burden equitably
- Ob 4: Minimise the impact on other airspace users
- Ob 5: Minimise emissions
  - o Facilitates optimum aircraft power to minimise greenhouse gases and air quality effects
  - o Enables continuous climb and descent operations

## 1.5 Defining the Baseline

In accordance with CAP 1616, a baseline will be required for all environmental assessments. This will allow the change sponsor to conduct an assessment to understand the current impacts so that a comparison can be made with the impacts of the options. In most cases, the baseline will be the 'Do Nothing' option and will largely reflect the current day 'business as usual' scenario. In certain cases, doing nothing is not a feasible option and the change sponsor must therefore set out its informed view of the future and the minimum changes required to address the issues identified – a 'Do Minimum' option.

### 1.5.1 Do Nothing Option

The Do Nothing option represents the current situation where there is no airport at Manston, and no air traffic. There is no environmental impact associated with this option and therefore no measurable comparative baseline against which to assess the options. The airport development can only proceed with approval of the DCO. Should the DCO not be approved and the development of Manston Airport is not able to proceed, this Airspace Change Proposal (ACP) will be withdrawn. An assumption is made that the airport consent leads to an introduction of a level of air traffic into the environment for which we must identify at least minimal safe operational procedures. Therefore, the Do Nothing option is not a feasible option in terms of an airspace change proposal.

### 1.5.2 Do Minimum Option

The Do Minimum option represents the opening of the airport without any approved procedures or airspace. The minimum requirement would be for the airport details to be promulgated in Part 3 of the UK Aeronautical Information Publication (AIP). The necessary entry requirements in the UK AIP for Manston Airport to open as an airport will be delivered by a separate project. This ACP relates only to the procedures and airspace requirements at the airport.

When it opens, Manston Airport will have a surveillance capability and will be able to provide aircraft with an Air Traffic Service (ATS). Aircraft operating to or from Manston Airport will be able to receive an ATS appropriate to their flight conditions (IFR or VFR) in Class G airspace. Manston ATC will also be able to provide an ATS to other air traffic operating in the vicinity of the airport if the aircraft captain requests such a service. There is no obligation for aircraft operating VFR in the vicinity of the airport to talk to ATC or receive an ATS.

<sup>3</sup> The Green Book: appraisal and evaluation in central government:  
<https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government>

Basic Service and Traffic Service will be available to flights in Class G airspace operating under both Instrument Flight Rules (IFR) and Visual Flight Rules (VFR), whereas a Deconfliction Service will only be available to flights in Class G airspace operating under IFR. It is anticipated that the majority of commercial air traffic operating from Manston Airport will operate under IFR.

- Departures – aircraft departing IFR from Manston Airport will route direct to their nominated airways joining point. It is likely that the majority of commercial air traffic will route south east towards the Flight Information Region (FIR) boundary via the reporting points KONAN or VABIK with some traffic routing towards DOVER for onwards transit to the south or west. Aircraft departing from Runway 10 are likely to route to the east of Ramsgate before commencing direct routing to their airway’s entry point. However, this cannot be guaranteed and as long as aircraft achieve a height of 500 ft above aerodrome level before turning, some aircraft may commence their turn whilst over the populated area of Ramsgate. Aircraft departing from Runway 28 will turn either left or right initially to achieve the most direct routing to their airway’s entry point. Whilst transiting Class G airspace, aircraft in receipt of a Deconfliction Service may receive deconfliction advice from ATC and be required to alter their track to ensure deconfliction with other air traffic.
- Arrivals – with no published procedures, aircraft arriving at Manston Airport will be required to perform a visual approach. It is likely that the majority of commercial traffic will perform a straight in approach to land. This approach will require the aircraft captain to carry out a descent and approach in Visual Meteorological Conditions (VMC). In poor weather conditions, descent to a safe altitude may be carried out under ATC surveillance but the aircraft may not always be able to achieve VMC in order to fly the approach, resulting in either multiple approaches needing to be flown, or a diversion to an airfield with suitable approach aids. Transitions from leaving the airways to a point suitable to carry out a visual approach would be dependent on the route flown towards the airport and where the aircraft is able to leave Controlled Airspace (CAS). For Runway 28 arrivals, these are all likely to be over the Thames Estuary. For Runway 10 arrivals, these could either be over the sea, north of the extended centreline or overland to the south of the extended centreline.

Forecast aircraft movements as shown in Table 2 below. Year 2 is considered the ‘opening year’ and Year 20 is considered the ‘worst-case’ year in terms of noise.

| <b>Forecast Aircraft Movements</b> |                |                |                |                |                |                |                |                |                |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Year 1</b>                      | <b>Year 2</b>  | <b>Year 3</b>  | <b>Year 4</b>  | <b>Year 5</b>  | <b>Year 6</b>  | <b>Year 7</b>  | <b>Year 8</b>  | <b>Year 9</b>  | <b>Year 10</b> |
| 0                                  | 5252           | 10736          | 14724          | 15000          | 16846          | 17626          | 17938          | 18146          | 18354          |
| <b>Year 11</b>                     | <b>Year 12</b> | <b>Year 13</b> | <b>Year 14</b> | <b>Year 15</b> | <b>Year 16</b> | <b>Year 17</b> | <b>Year 18</b> | <b>Year 19</b> | <b>Year 20</b> |
| 19030                              | 19733          | 20464          | 21224          | 22015          | 22837          | 23693          | 24582          | 25507          | 26469          |

Table 2 - Forecast Aircraft Movements

The aircraft forecast predicts a gradual increase in aircraft movements between Year 2 and Year 20. This would lead to an increase in aircraft noise over time. Over this period there will also be changes in aircraft, with airlines phasing out older aircraft. This could reduce aircraft noise levels over time. However, Year 20 is considered to be the likely “worst-case” year in terms of noise, even considering the phasing out of some louder aircraft. The forecast assumes that total aircraft traffic will grow from approximately 33 Air Transport Movements (ATMs) for a typical busy day in Year 2 to 79 ATMs per typical busy 24-hour day in Year 20. An ATM includes all landings and take-offs of commercial flights related to the transport of passengers and freight. There will also be an average of approximately 16 non-ATMs per 24-hour day in all years including general aviation and training flights.

During the daytime period (between 07:00 to 23:00) Manston Airport is forecast to handle approximately 72 aircraft movements during a typical busy day and during the night-time period (between 23:00 and 07:00) it is forecast to handle an average of seven aircraft movements on a typical busy night.

## 2. Options Development

### 2.1 Step 2A – Options Development

Stage 2, Step 2A in the process concerns the development of a potential long list of procedure design options that seek to meet the original Statement of Need and are aligned with the Design Principles shown above. A comprehensive list of design options for Manston Airport was developed initially and subsequently refined, through stakeholder input, to produce a long list of options. Copies of the documents used for stakeholder engagement can be found on the CAA portal alongside this document. A full list of those contacted is included in Appendix A1.

### 2.2 Airspace Considerations

The comprehensive list of options allowed for aircraft arriving at and departing from Manston Airport in any direction. This list was not constrained and considered every option, even if not apparently feasible or desirable. In order for all the design options to be compliant with constraints **C1** (Instrument Flight Procedures must be safe) and **C3** (Integration with FASI-S), the first engagement was limited to Air Navigation Service Providers (ANSP) and FASI-S co-sponsors in order to identify any areas where the comprehensive list of options could interact with their operations, including airspace and procedures.

#### 2.2.1 Summary of Stakeholder Feedback (Airspace Considerations)

NATS provided a comprehensive response detailing a number of considerations for the Manston procedure design. NATS stated that it is important to consider the overarching Air Traffic Services (ATS) route structure in the area with the main flows shown in Figure 1 below with indicative arrows to show the direction of traffic. Due to the incorporation of the UK route network into the wider European route network, NATS considered that these flows would not change in their orientation through the FASI-S programme of changes.

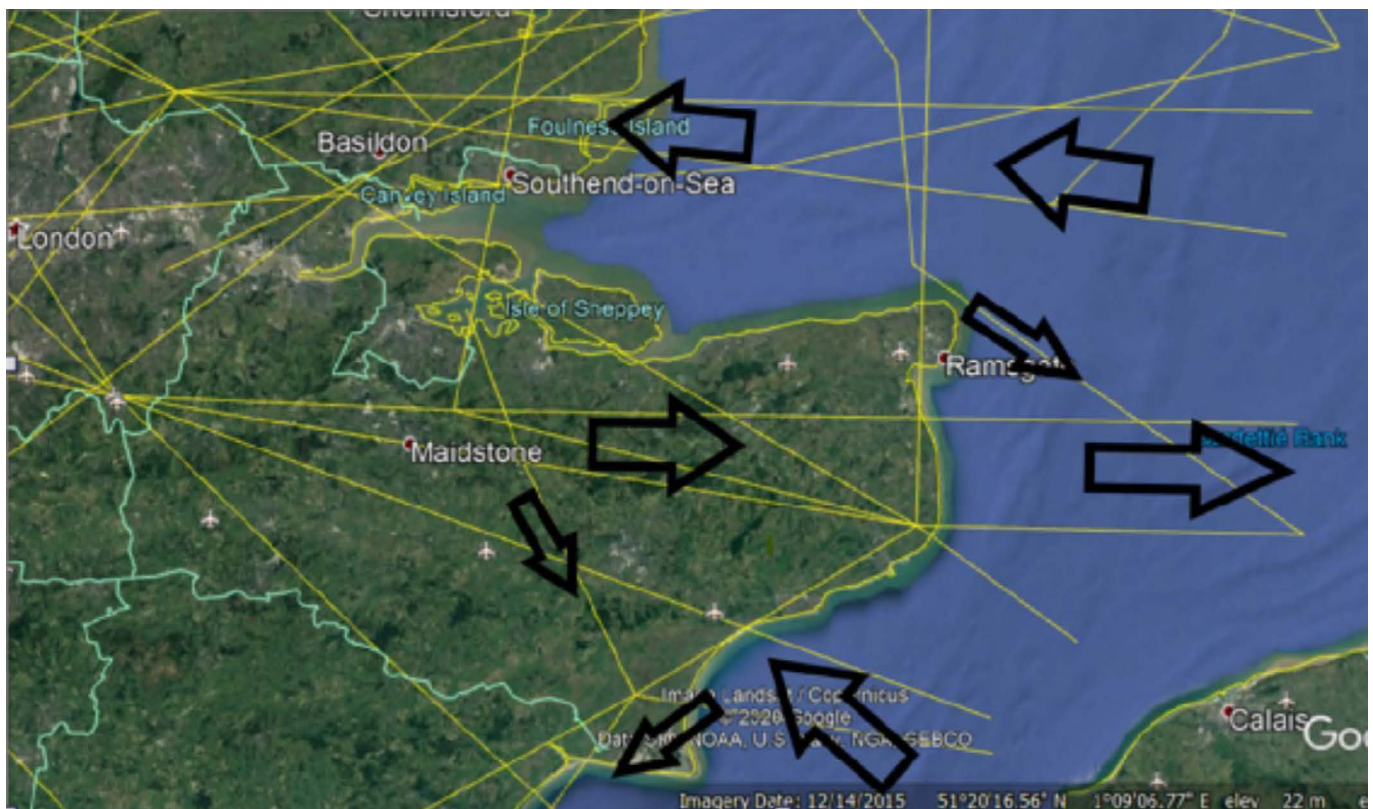


Figure 1 – En-Route Airways Network Flow

Image Landsat / Copernicus © 2020 Google.

Additionally, whilst the airspace designs for LAMP are still being developed in conjunction with the FASI-S airports, there is unlikely to be a significant change to the utilisation of the airspace. This is mainly driven by the fact that the airspace further to the west of Manston is predominantly used for traffic arriving at and departing from other London Terminal Manoeuvring Area (TMA) airports. The existing airspace structure above the Manston area is predominantly utilised by arrival routes to London City, Biggin Hill and Southend airports. These procedures were only introduced in 2016 and are a relatively modern part of the airspace system, so are unlikely to change. NATS also highlighted that routes would need to consider the activation of Danger Area D138 to the northwest.

#### **Comments were also received from other stakeholders for consideration:**

- Gatwick Airport – requested no changes that would inhibit the free flow of departing traffic and that their aim would be to facilitate Continuous Climb operations. To that end, Manston departures in the sector 180° to 315° would need careful consideration.
- London Biggin Hill Airport – westerly departures from Manston Airport may conflict with east bound departures from Biggin Hill
- Southend Airport – key areas of concern geographically are in the vicinity of Shoeburyness, Isle of Sheppey and Isle of Grain (west northwest of Manston).
- MOD – acknowledged consideration of the Shoeburyness Danger Area D138.

#### **2.2.2 Conclusions from Stakeholder Feedback (Airspace Considerations)**

In broad terms, NATS considered that any options for aircraft departing Manston Airport between a northwest and southwest direction would be difficult to incorporate into the network due to the interactions with the arrival procedures described above plus the flow of opposite direction traffic departing from the London TMA. Other stakeholders commented that any departures to the west of Manston Airport should not conflict with their own departures from the London TMA and the ability of departing aircraft to conduct continuous climb operations.

## **2.3 Design Envelopes**

Feedback from the ANSP responses identified areas where the comprehensive list of options could interact with their operations, including airspace and procedures. The comprehensive list of options, plus the areas identified by the ANSPs where the options would conflict with their procedures, was shared with those stakeholders and representative bodies that contributed to the development of the Design Principles in Stage 1. These included a wide range of organisations and groups from airlines and the wider aviation industry, regional and local councils and public officials and national and regional conservation and environmental organisations. Stakeholders were asked at this stage to comment on the areas, or envelopes, where they consider that the route designs should, or should not, be.

#### **2.3.1 Summary of Stakeholder Feedback (Design Envelopes)**

The responses from stakeholders on the comprehensive list of design options generally fell under a number of key themes, specifically:

- Routes over the sea – it was suggested that for Runway 28 departures, all options should turn right as soon as possible after take-off so that all routes should be over the sea. Departures from Runway 10 should extend straight out on runway heading to minimise the noise impact.
- Avoid urban/densely populated areas – specifically the towns of Deal, Sandwich, Ramsgate, Broadstairs, Margate, Westgate-on-Sea, Herne Bay and the City of Canterbury.
- Avoid sensitive areas – avoid overflying schools, care institutions, the Thanet Coast and Sandwich Bay Special Protection Area (SPA), Pegwell Bay Site of Special Scientific Interest (SSSI), Goodwin Sands, Stodmarsh Nature Reserve and Fordwich Conservation Area.

- Minimise the number of people affected by aircraft noise – in addition to avoiding urban and densely populated areas, overflight of all towns and villages in the area should be avoided, where possible. Left hand departures from Runway 28 should be avoided unless there are network requirements to do so.
- Avoid overflight of areas of tranquillity – flight paths across the Kent Downs Area of Outstanding Natural Beauty (AONB) should be avoided as far as possible.

**The feedback from stakeholders on the comprehensive list of design options can be summed up by the response from Kent County Council:**

*The geographical location of Manston Airport provides real, opportunities for routes to be designed over the sea. This would avoid flying over both urban and sensitive areas. Where possible, overflight of densely populated areas should be avoided to minimise the number of people affected by aircraft noise; and where possible, overflight of areas of tranquillity should also be avoided.*

**In addition to those comments summarised above, the following points were also received:**

- All overland options could conflict with glider operations from Waldershare Park. Gliders currently operate up to 7,000 ft within a 15-mile radius of the field.
- Both Ramsgate Town Council and the Aviation Environment Federation (AEF) stated that overflight of Ramsgate is not acceptable.
- Natural England reiterated their view that the arrival and departure routes should not be altered from those that were assessed during the DCO examination, otherwise the conclusions reached would be invalidated.

**2.3.2 Conclusion of Stakeholder Feedback (Design Envelopes)**

Figure 2 below shows those areas around Manston Airport that stakeholders considered should be avoided wherever possible.

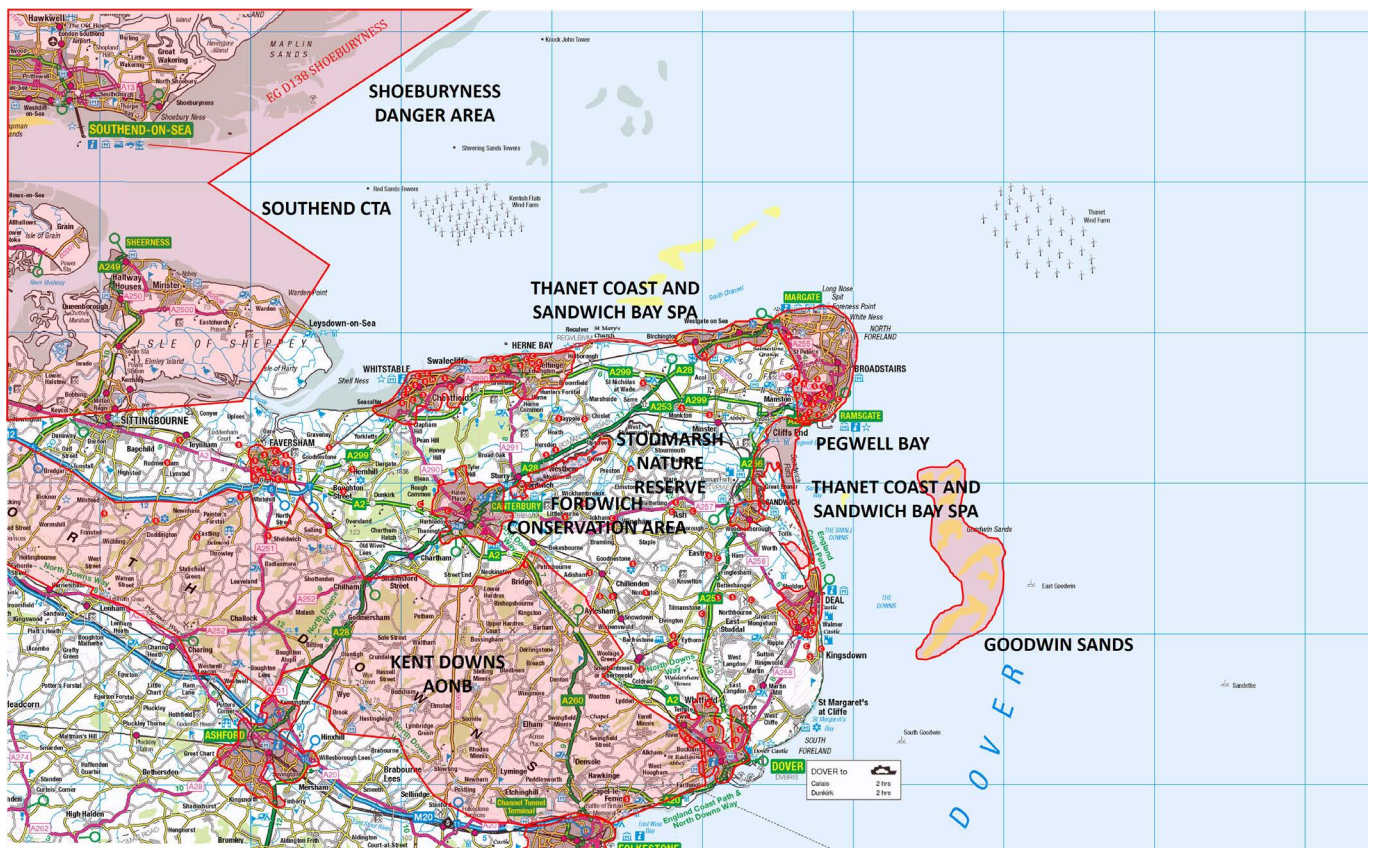


Figure 2 – Areas for Consideration to Avoid

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When taking into account these areas to avoid, Figure 3 below shows the possible corridors that could be used for departure routes that would minimise the disruption due to noise. However, as previously stated in paragraph 2.2.2, Runway 28 departures on the western track would be difficult to incorporate into the network due to the flow of opposite direction traffic departing from the London TMA, hence this option was not considered viable for departure routes.

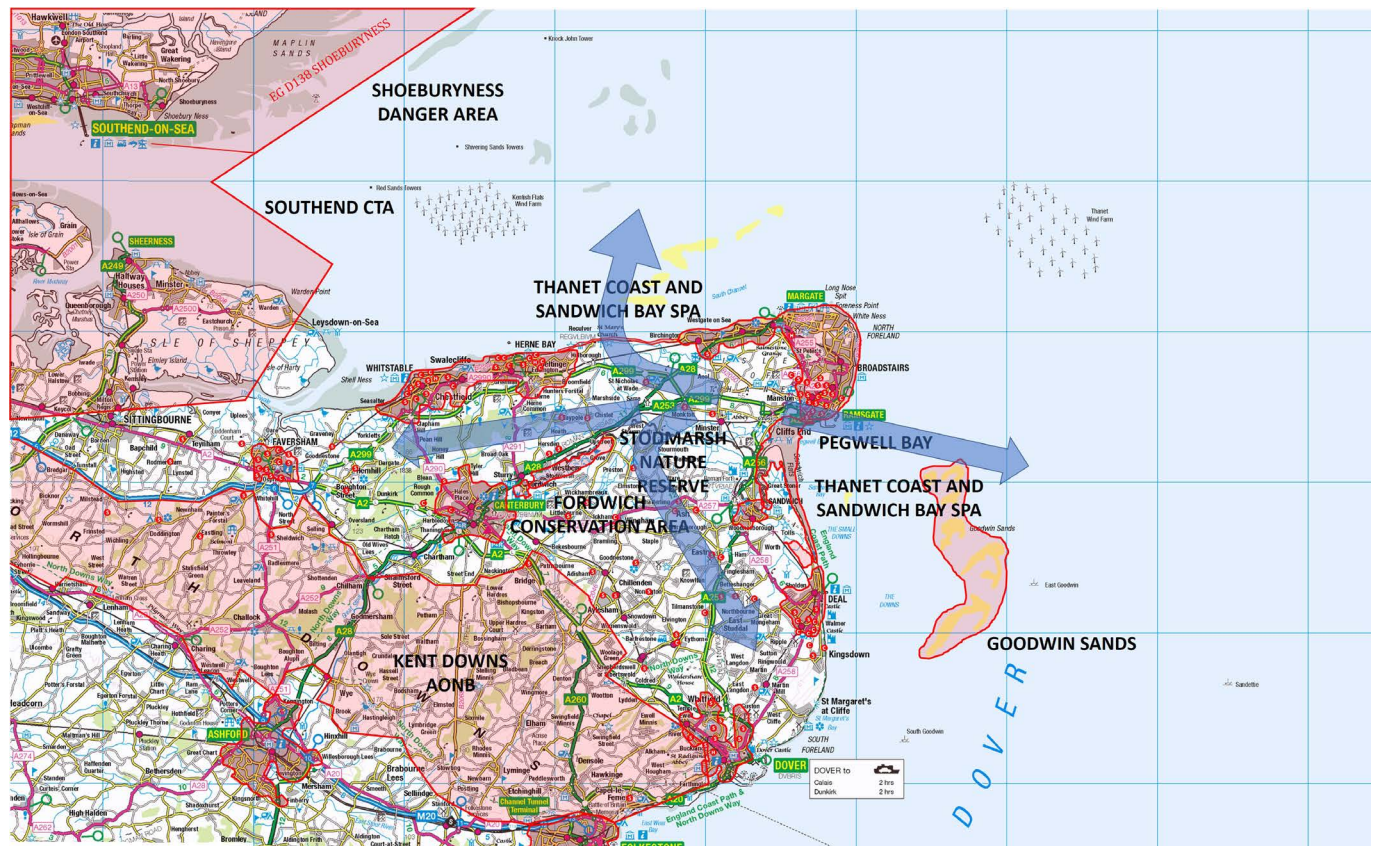


Figure 3 – Departure Route Directions

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Arrival routes, specifically for Runway 10, would also need to take into account those areas highlighted by stakeholders as being areas to avoid, where possible.

## 2.4 Design Options

Following stakeholder input to the design envelopes and taking the feedback into account, a series of route options were developed for each of the required procedures. These route options were again shared with the same stakeholders who were invited to contribute to the previous step to check that we had properly understood and accounted for stakeholder concerns specifically related to the design options and that we had accurately reflected their feedback. It was stressed that the options shared were not the final designs but had been developed based on information provided by all stakeholders. Stakeholders were asked to provide their input to help further develop the designs to form the short list that would be taken forward to the next stage of the process.

**Stakeholders were asked to provide their views which could include, but was not limited to:**

- Their route preference, where more than one option was given.
- Any suggested amendments to any of the designs shown.
- Any alternative ideas to those offered.
- Any options that they felt should not be taken forward, with reasons why.

Stakeholders were also invited to attend an online workshop where they had the opportunity to discuss the options that had been presented, or to ask questions about why the routes had been planned as they were.

Appendices A2 to A7 includes the images of all the procedure options that were developed at this step and shared with stakeholders. Each of the flight procedures is shown against the backdrop of an Ordnance Survey roadmap. The overland portions of the options were shown against a backdrop of Ordnance Survey Landranger maps for greater detail in the documents provided to stakeholders during stakeholder engagement. Appendix A8 shows the locations of the NDB Hold options, against the backdrop of an Ordnance Survey Landranger map. Feedback from stakeholders during the Design Envelopes engagement had stated that options should avoid areas sensitive to noise. As a result of this feedback, a fourth option, to the south east of the airport, was considered, but discounted due to it being located above the Sandwich and Pegwell Bay Natural Nature Reserve, a site of international importance, providing a vital refuge for many species of wildfowl and waders. The documents provided to stakeholders can be found alongside this document on the CAA airspace portal.

#### **2.4.1 Summary of Stakeholder Feedback**

##### **• Runway 28 Departure Routes to the South (Left-Hand Turn)**

There was opposition from community representatives to the southern departure routes due to the negative impacts they would cause. The impact of noise was the main focus in an area with a large number of isolated rural communities with good local tranquillity. Exposure of residents and wildlife to other environmental pollution and the effect on other airspace users was also a cause for opposition to these routes. These routes should only be considered if there were network requirements to route south after take-off. The eastern option was preferred due to the shorter distance which would result in the lowest exposure to noise and pollution.

NATS considered this to be a feasible, but high workload option with the potential for heavy interactions above 7,000 ft. Traffic may need to remain at approximately 7,000 ft for an extended overland portion to the west of Dover to remain below traffic arriving at other London airports.

##### **• Runway 28 Departure Routes to the North (Right-Hand Turn)**

There was strong support from all community representatives for departures making a right-hand turn after take-off to cross the coast in a less populated area as soon as possible. Routes should then head eastwards to remain over the sea, routing around and away from the Thanet coast before routing as required. This would increase the distance flown, therefore increasing fuel burn and emissions, but would affect less residents and areas and the aim should be to minimise the number of people affected by noise. The preferred route was the eastern option which was over a sparsely populated area and further from the village of St Nicholas-at-Wade.

NATS considered this to be the lower workload option from a network perspective, although careful consideration would be required in relation to the arrival routes to other London airports. It was also considered that this option had the potential to make some common routing with the Runway 10 departure routes, which would ease Air Traffic Control (ATC) workload.

##### **• Runway 10 Departure Routes**

Ramsgate Town Council reiterated its request to avoid wherever possible landings and take-offs to the south of the airport and therefore avoid overflying Ramsgate, adding that it should be possible to separate landings and take-offs in time such that normally both can take place to and from the northerly direction.

Procedurally, the airport will require Instrument Flight Procedures that allow both departures and arrival from an easterly direction. However, RSP have always stated that operationally, procedures will be implemented whenever possible to reduce the impact of noise to the east of the airport. When prevailing weather conditions permit, the airport will operate a noise preferential runway system where inbound aircraft will utilise one runway whilst outbound aircraft will use the opposite runway direction.

Other community representatives acknowledged that whilst overflying Ramsgate was inevitable, measures should be implemented that minimise the overall impact on the town. One stakeholder requested that routes over the sea avoid the Marine Conservation Zone at Goodwin Sands area due to the seal population.

Although less of a concern, NATS feedback indicated that departure routes from Runway 10 would still need to consider the arrival procedures to London City, Biggin Hill and Southend airports, with aircraft possibly having to remain at approximately 7,000 ft for an extended overland portion to the west of Dover to remain below these routes. There was the potential to extend the routes to the south to avoid the Dover area and joining the westbound flow in the SANDY/LYDD area to avoid outbound aircraft from the TMA. Extending the routes to the east after take-off and aligning with the Runway 28 departure routes would ease ATC workload.

#### • **Transition Procedures**

There were no issues generally with the Runway 28 Transition procedures, assuming the procedures remain to the east of the arrival routes for the other London airports.

The Runway 10 Transition procedure routing to the north of Manston was considered a good option as it maximised flights over the sea and had the potential to fit in to the flow of existing arrival procedures so would not restrict other airport's operations.

The Runway 10 Transition routes from the south overfly the Kent Downs AONB and aircraft descending over this area will impact on the area's tranquillity. Of the routes presented, the western option was preferred as it would result in a shorter section of the AONB being overflown.

These routes also have the potential to impact on glider operations in the area. Routing further west, where the base of the TMA is lower, would be a preferred option for the gliding community.

Aviation stakeholders expressed concern that the ability to descend aircraft from the en-route network to the Initial Approach Fix (IAF) for the approach would conflict with aircraft performing continuous climbs out of the London TMA. NATS stated that this would be a difficult option to integrate due to this conflict, but the option was feasible when traffic density was low.

#### • **Runway 28 Approach Procedures**

Ramsgate Town Council reiterated its request to avoid wherever possible landings and take-offs to the south of the airport and therefore avoid overflying Ramsgate, adding that it should be possible to separate landings and take-offs in time such that normally both can take place to and from the northerly direction.

Procedurally, the airport will require Instrument Flight Procedures that allow both departures and arrival from an easterly direction. However, RSP have always stated that operationally, procedures will be implemented whenever possible to reduce the impact of noise to the east of the airport. When prevailing wind conditions permit, the airport will operate a noise preferential runway system where inbound aircraft will utilise one runway whilst outbound aircraft will use the opposite runway direction. The flight paths for aircraft approaching the airport from the east to land are constrained by the horizontal and vertical requirements in relation to the position of the runway.

The impacts of the Missed Approach Procedure (MAP) routing are minimised wherever possible and affect the fewest people possible. Maximum use is made of flight paths and holding areas over the sea. Of the options presented, the eastern route to the north was preferred as it was furthest from the village of St Nicholas-at-Wade and would affect the least number of residents.

#### • **Runway 10 Approach Procedures**

Stakeholders expressed concern that the approach path would take aircraft directly over Herne Bay. The flight paths for aircraft approaching the airport from the west to land are constrained by the horizontal and vertical requirements in relation to the position of the runway.

Aviation stakeholders stated that there was a possible conflict with General Aviation (GA) aircraft in the vicinity of Herne Bay, although this could be mitigated by stipulating a minimum height of 2,500 ft to join the procedure to prevent early descents. Southend Airport preferred the 2,500 ft approach procedure as this would give a greater buffer to Southend Control Areas (CTA).

It was requested that the MAP remain fixed to the principle of flight paths staying over the water for as long as possible and that routes over the land should be for the minimum time possible.



The Hold position located to the north of the approach path was close to both the Southend CTAs and Shoeburyness Danger Area D138. The position would also be restrictive to GA aircraft transiting across the Thames Estuary that are already constricted by the CTAs, the Danger Area and the London Array wind farm Transponder Mandatory Zone (TMZ).

The Hold position to the south of the approach path caused concern to community representatives due to the potential impact on the rural communities close to Faversham. It would also impact the tranquillity of the Kent Downs AONB, particularly as the routes are over some of the most rural and remote parts of the designated landscape where background noise is extremely low.

The Hold is also positioned overhead Challock Airfield, which would impact gliding activities on and around the airfield. This area is used extensively to launch Glider Tow plane combinations and for spin and aerobatic training.

- **NDB Hold**

The NDB Hold, which could be introduced purely for light aircraft use, should be the southwest option to avoid overflying the urban settlements of Birchington, Broadstairs and Ramsgate.

- **Regulated Airspace**

The only responses relating to the implementation of Regulated Airspace were received from members of the NATMAC; one welcomed the approach to a limited volume of airspace, whilst the other stated that they would support the establishment of a segregated route structure which afforded CAS protection to aircraft.

RSP considers that due to anticipated traffic levels at the airport during the initial years of operation, the establishment of an Aerodrome Traffic Zone (ATZ) would be required to protect aircraft at the critical stages of flight when departing, arriving and flying in the vicinity of the aerodrome.

## 2.5 FASI-S Coordination

In addition to the options development step described above, bilateral meetings were conducted with the relevant FASI-S sponsors to discuss the coordination of the design options for Manston Airport with the proposals for each of the sponsors.

### 2.5.1 NATS

The information provided by NATS concerned the flow of inbound and outbound traffic into the London TMA in the airspace around Manston Airport, and how this general flow was unlikely to change as a result of the network changes. Specifically, NATS highlighted the use of the existing airspace structure above the Manston area for arrivals to London City, Biggin Hill and Southend Airports and that these routes were a relatively modern part of the airspace system and would be unlikely to change. The Manston procedure design options are based on avoiding restrictions on the ability of arrivals traffic at these other airports to conduct continuous descent operations.

Further discussions with NATS extended the design options to understand how the Manston procedures would integrate with the network above 7,000 ft. Coordination with NATS will continue as the project progresses, with the possibility of making adjustments to the routes, primarily above 7,000 ft, to improve network integration.

### 2.5.2 Southend Airport

The main area of concern for Southend Airport was the consideration of the Southend arrivals procedures that route from holds in the vicinity of Dover to the east of Manston. Any routes that would restrict the ability of Southend arrivals traffic to perform a continuous descent would be an issue, and therefore the options for Manston Airport have been designed to remain below these routes until laterally separated to the east. Southend Airport also commented on the proximity of some of the procedures to Southend CTAs (including the proposed CTA extension that is currently under consideration), stating that there was scope to adjust the procedures. The proposed Southend CTA extension has received due consideration in our initial options appraisal and safety assessments to date.

It was considered that there would be no requirement for a coordinated consultation exercise based on the likely location of any overland routes below 7,000 ft as there is unlikely to be any overlap in Southend and Manston planned routes overland.

### **2.5.3 London City Airport**

The main area of concern for London City Airport was the possible interactions with arrival and departure routes and the conflicts that may occur. London City's current procedures are working well and are unlikely to change substantially as part of their FASI-S Airspace Change Proposal. London City arrivals route through JACKO in the north and OKVAP/GODLU in the south and then via the Point Merge. Any routes that would restrict the ability of arrivals traffic to perform a continuous descent would be an issue, and for this reason, the design options for Manston Airport remain below these routes until laterally separated. The aspiration for London City is to hold aircraft higher for longer on arrival, which will further deconflict from Manston departures. London City felt that there was unlikely to be any conflict with London City departure routes due to the location of each airport and the departure routes utilised by London City.

At this stage, it was unlikely that there would be a requirement for a coordinated consultation exercise based on the locations of each airport's overland routes with no interactions anticipated below 7,000 ft.

### **2.5.4 Biggin Hill Airport**

The main areas of concern for Biggin Hill Airport were any interactions with arrivals traffic via the Point Merge and any restrictions on the ability of Biggin Hill departures to conduct continuous climb operations. The Manston options have been designed to avoid restricting the ability of Biggin Hill arrivals traffic to conduct continuous descent operations and to remain below these routes until laterally separated. Biggin Hill departures to the east via DET are predicted to remain able to perform continuous climb operations without being constrained by Manston arrivals descending from the west.

## **2.6 Design Options**

Following the stakeholder engagement, the long list of possible options were all assessed to meet the high level criteria developed from the Design Principles and were carried forward to Design Principle Evaluation. The publication of the Design Principle Evaluation along with this Options Development document onto the CAA airspace portal completed Step 2A.

## A1 Stakeholders Contacted – Stage 2

### A1.1 Aviation Stakeholder Matrix

The following tables represents the key aviation stakeholders identified by Manston Airport as potentially being affected by the proposal. We engaged with all of these stakeholders during the development of the design options.

#### A1.1.1 Air Cargo Operators

We are engaging with freight airline operators who have the potential to operate from Manston Airport.

| Air Cargo Operators |                 |
|---------------------|-----------------|
| Cargolux            | Coyne Air       |
| Magma Aviation      | Network Airline |
| FedEx               | Sound Moves     |

Table 3 - Air Cargo Operators

#### A1.1.2 Local Aerodrome and Aviation Organisations

We are engaging with the following local airports, airfields and aviation organisations:

| Local Aerodromes                |                      |
|---------------------------------|----------------------|
| Air Ambulance Kent Surry Sussex | Channel Gliding Club |
| Gatwick Airport                 | Kent Gliding Club    |
| London Biggin Hill Airport      | London City Airport  |
| Lydd Airport                    | Maypole Airfield     |
| Rochester Airport               | Southend Airport     |

Table 4 - Local Aerodrome and Aviation Organisations

#### A1.1.3 Air Navigation Service Providers

We are engaging with the following ANSPs:

| ANSP               |              |
|--------------------|--------------|
| ANS (Gatwick)      | NATS         |
| NATS (London City) | Southend ATC |

Table 5 - Air Navigation Service Providers

### A1.1.4 National Aviation Organisations

We are engaging with the following National Aviation Organisations through members of the National Air Traffic Management Advisory Committee (NATMAC):

| National Aviation Organisations                  |  |
|--|--|
| Airlines UK                                      | Airport Operators Association                    |
| Airspace4All                                     | Airfield Operators Group                         |
| Aircraft Owners and Pilots Association           | Association of Remotely Piloted Aircraft Systems |
| Aviation Environment Federation                  | British Airways                                  |
| British Airline Pilots' Association              | British Balloon and Airship Club                 |
| British Business & General Aviation Association  | British Gliding Association                      |
| British Hang Gliding and Paragliding Association | British Helicopter Association                   |
| British Microlight Aircraft Association          | British Model Flying Association                 |
| British Parachute Association                    | General Aviation Alliance                        |
| General Aviation Safety Council                  | Guild of Air Traffic Control Officers            |
| Honourable Company of Air Pilots                 | Helicopter Club of Great Britain                 |
| Heavy Airlines (Virgin Airlines)                 | Light Aircraft Association                       |
| Low Fares Airlines                               | Military Aviation Authority                      |
| MoD Defence Airspace & Air Traffic Management    | NATS   |
| Navy Command HQ                                  | PPL/IR   |
| UK Airprox Board                                 | UK Flight Safety Committee                       |
| BAE Systems                                      | Isle of Man CAA                                  |

Table 6 - National Air Traffic Management Committee

## A1.2 Non-Aviation Stakeholder Matrix

The following tables represents the key non-aviation stakeholders identified by Manston Airport as potentially being affected by the proposal. We engaged with all of these stakeholders during the development of the design options.

### A1.2.1 Elected Local Representatives

We are engaging with the following Members of Parliament:

| Member of Parliament | Constituency              |
|----------------------|---------------------------|
| Damian Green         | Ashford                   |
| Rosie Duffield       | Canterbury                |
| Charlie Elphike      | Dover                     |
| Nathalie Elphike     | Dover                     |
| Helen Whately        | Faversham and Mid-Kent    |
| Damian Collins       | Folkestone and Hythe      |
| Sir Roger Gale       | North Thanet              |
| Gordon Henderson     | Sittingbourne and Sheppey |
| Craig Mackinlay      | South Thanet              |

Table 7 - Members of Parliament

### A1.2.2 Local Authorities

We are engaging with the following Local Authorities:

| Local Authorities                     |                         |
|---------------------------------------|-------------------------|
| Kent County Council                   | Dover District Council  |
| Folkestone and Hythe District Council | Ashford Borough Council |
| Swale Borough Council                 | Thanet District Council |
| Canterbury City Council               |                         |

Table 8 - Local Authorities

### A1.2.3 Town and Parish Councils

We are engaging with the following Local Authorities:

| Town and Parish Councils                 |  |
|--|--|
| Acol Parish Council                      | Acrise Parish Council                        |
| Adisham Parish Council                   | Alkham Parish Council                        |
| Ash Parish Council                       | Aylesham Parish Council                      |
| Barham Parish Council                    | Bekesbourne-with-Patrixbourne Parish Council |
| Birchington Parish Council               | Bishopsbourne Parish Council                 |
| Blean Parish Council                     | Boughton under Blean Parish Council          |
| Bridge Parish Council                    | Broadstairs & St Peters Town Council         |
| Brook Parish Council                     | Cape-le-Ferne Parish Council                 |
| Chartham Parish Council                  | Chestfield Parish Council                    |
| Chilham Parish Council                   | Chislet Parish Council                       |
| Cliffsend Parish Council                 | Crundale Parish Council                      |
| Deal Town Council                        | Denton with Wootton Parish Council           |
| Dover Town Council                       | Dunkirk Parish Council                       |
| Eastry Parish Council                    | Elham Parish Council                         |
| Elmsted Parish Council                   | Eythorne Parish Council                      |
| Folkestone Town Council                  | Fordwich Town Council                        |
| Godmersham Parish Council                | Goodnestone Parish Council                   |
| Graveney with Goodnestone Parish Council | Guston Parish Council                        |
| Hackington Parish Council                | Harbledown & Rough Common Parish Council     |
| Hawkinge Town Council                    | Herne & Broomfield Parish Council            |
| Hernhill Parish Council                  | Hersden Parish Council                       |
| Hoath Parish Council                     | Hougham Without Parish Council               |
| Hythe Town Council                       | Ickham & Well Parish Council                 |

## Town and Parish Councils (continued)

|   |   |
|---|---|
| Kingston Parish Council                   | Langdon Parish Council                        |
| Leysdown Parish Council                   | Littlebourne Parish Council                   |
| Lower Hardres & Nackington Parish Council | Lydden Parish Council                         |
| Lyminge Parish Council                    | Manston Parish Council                        |
| Minster Parish Council                    | Monkton Parish Council                        |
| Nonington Parish Council                  | Northbourne Parish Council                    |
| Paddlesworth Parish Council               | Petham Parish Council                         |
| Preston Parish Council                    | Ramsgate Town Council                         |
| Ringwould & Kingsdown Parish Council      | Ripple Parish Council                         |
| River Parish Council                      | Sandwich Town Council                         |
| Sarre Parish Council                      | Sheperdswell and Coldred Parish Council       |
| Sholden Parish Council                    | St Nicholas-at-Wade with Sarre Parish Council |
| St. Margaret's at Cliffe Parish Council   | Staple Parish Council                         |
| Stelling Minnis Parish Council            | Stourmouth Parish Council                     |
| Sturry Parish Council                     | Sutton by Dover Parish Council                |
| Swingfield Parish Council                 | Temple Ewell Parish Council                   |
| Thanington Parish Council                 | Tilmanstone Parish Council                    |
| Upper Hardres Parish Council              | Walmer Parish Council                         |
| Waltham Parish Council                    | Westbere Parish Council                       |
| Westgate-on-Sea Town Council              | Whitfield Parish Council                      |
| Wickhambreaux Parish Council              | Wingham Parish Council                        |
| Womenswold Parish Council                 | Woodnesborough Parish Council                 |
| Worth Parish Council                      | Westwell Parish Council                       |

Table 9 - Town and Parish Councils

#### A1.2.4 Conservation and Environmental Organisations

We are engaging with the following conservation and environmental organisations:

| Conservation and Environmental Organisations |                       |
|--|-----------------------|
| CPRE Kent                                    | Elmley Nature Reserve |
| Kent Downs AONB                              | National Trust        |
| Natural England                              | Woodland Trust        |

Table 10 - Conservation and Environmental Organisations



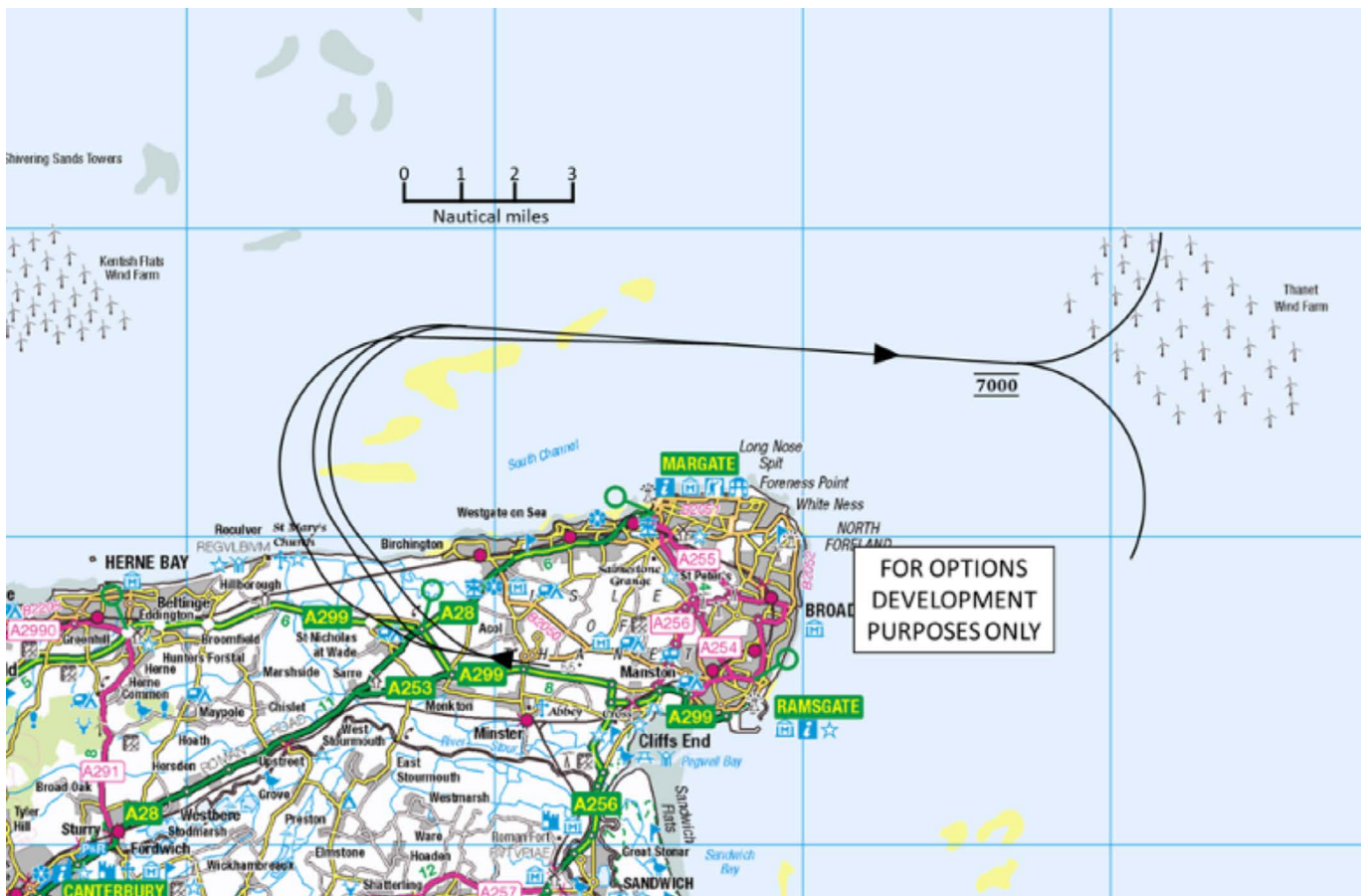
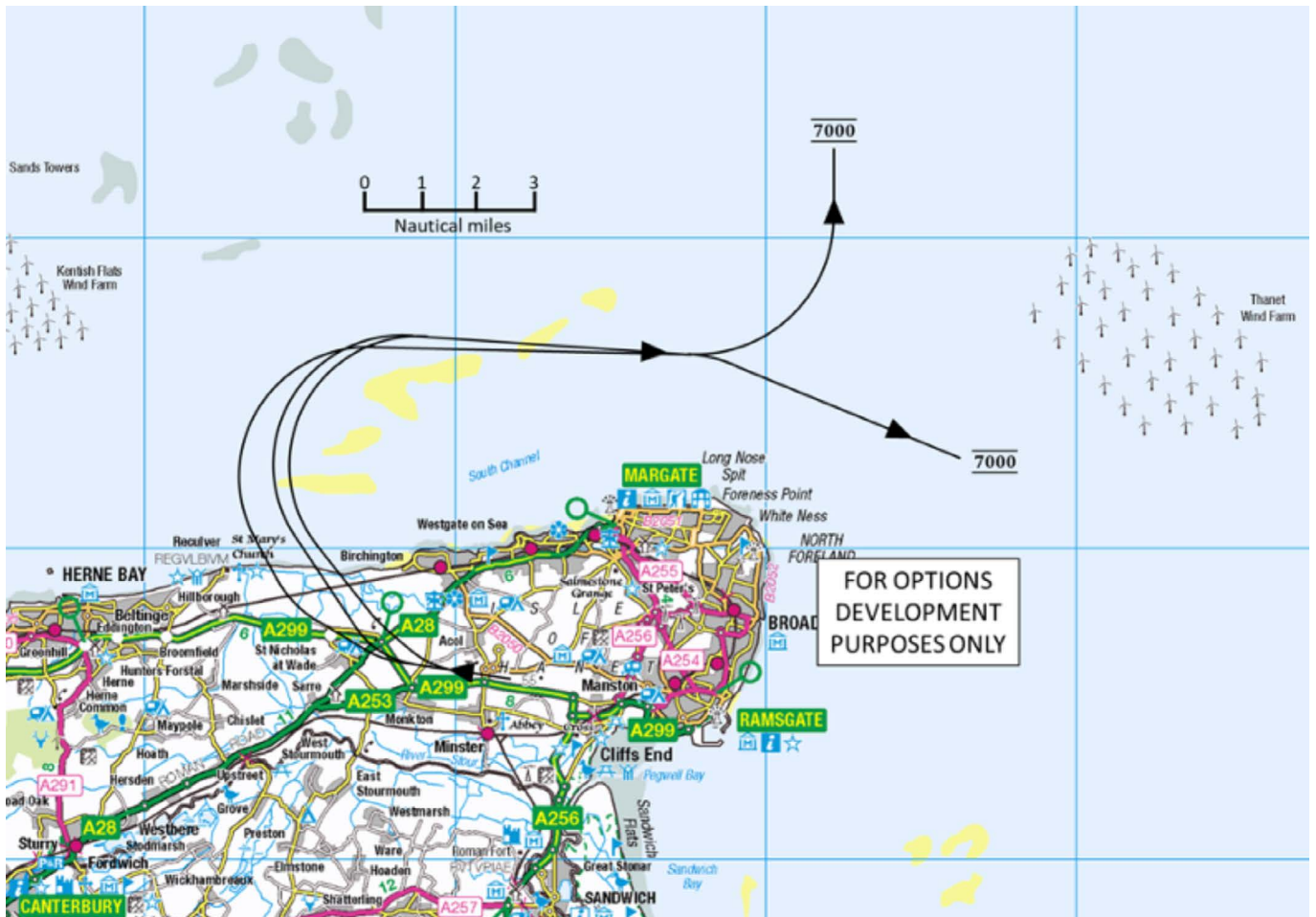
# A2 Runway 28 Standard Departure Routes

## A2.1 Departures to the South



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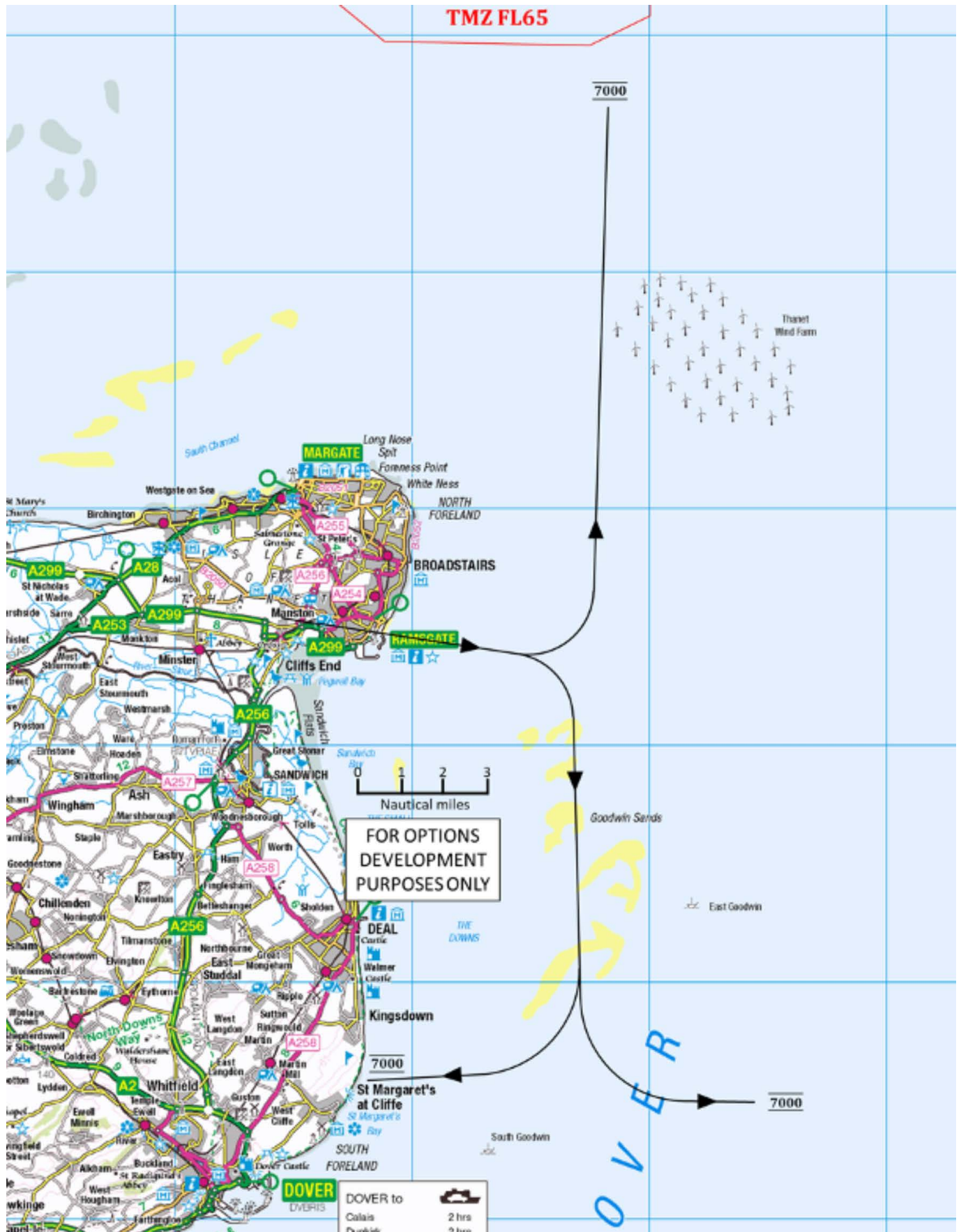
## A2.2 Departures to the North



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# A3 Runway 10 Standard Departure Routes

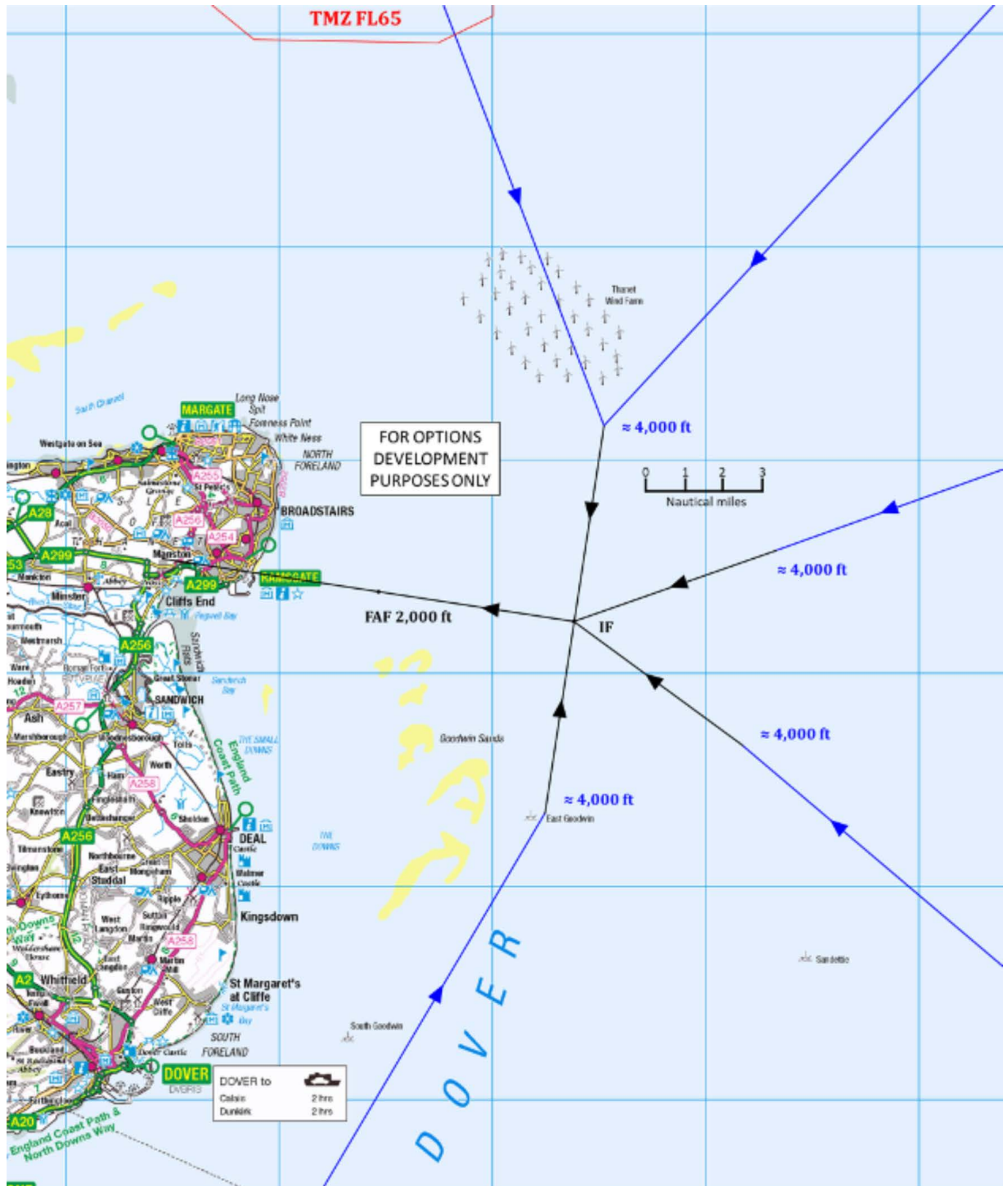
## A3.1 Runway 10 Departures



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# A4 Runway 28 Arrival Transitions

## A4.1 Runway 28 Arrival Transitions to Approach Procedure



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# A5 Runway 10 Arrival Transitions

## A5.1 Runway 10 Arrival Transitions to 2,500 ft Approach Procedure



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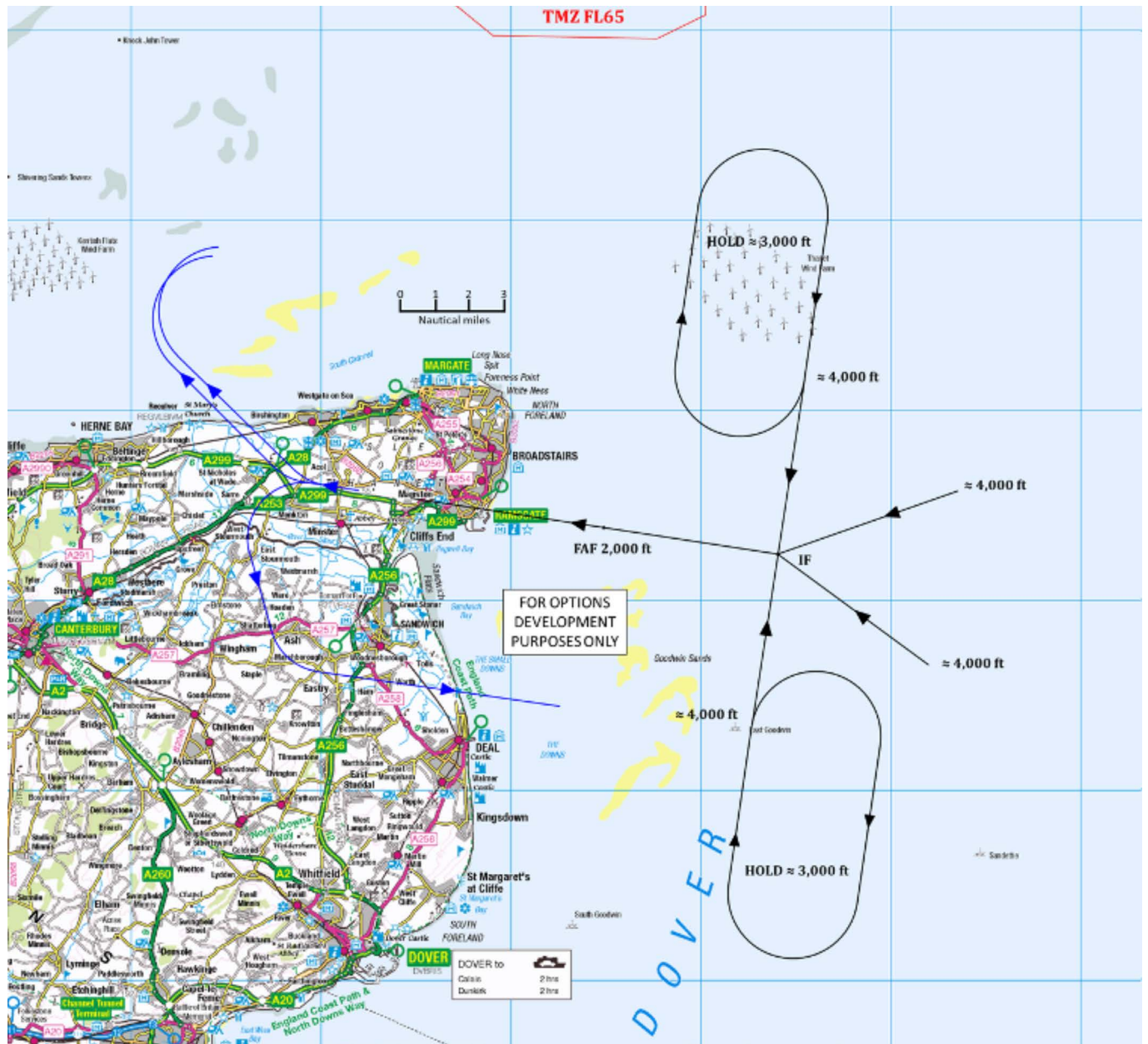
## A5.2 Runway 10 Arrival Transitions to 3,000 ft Approach Procedure



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# A6 Runway 28 Approach Procedures

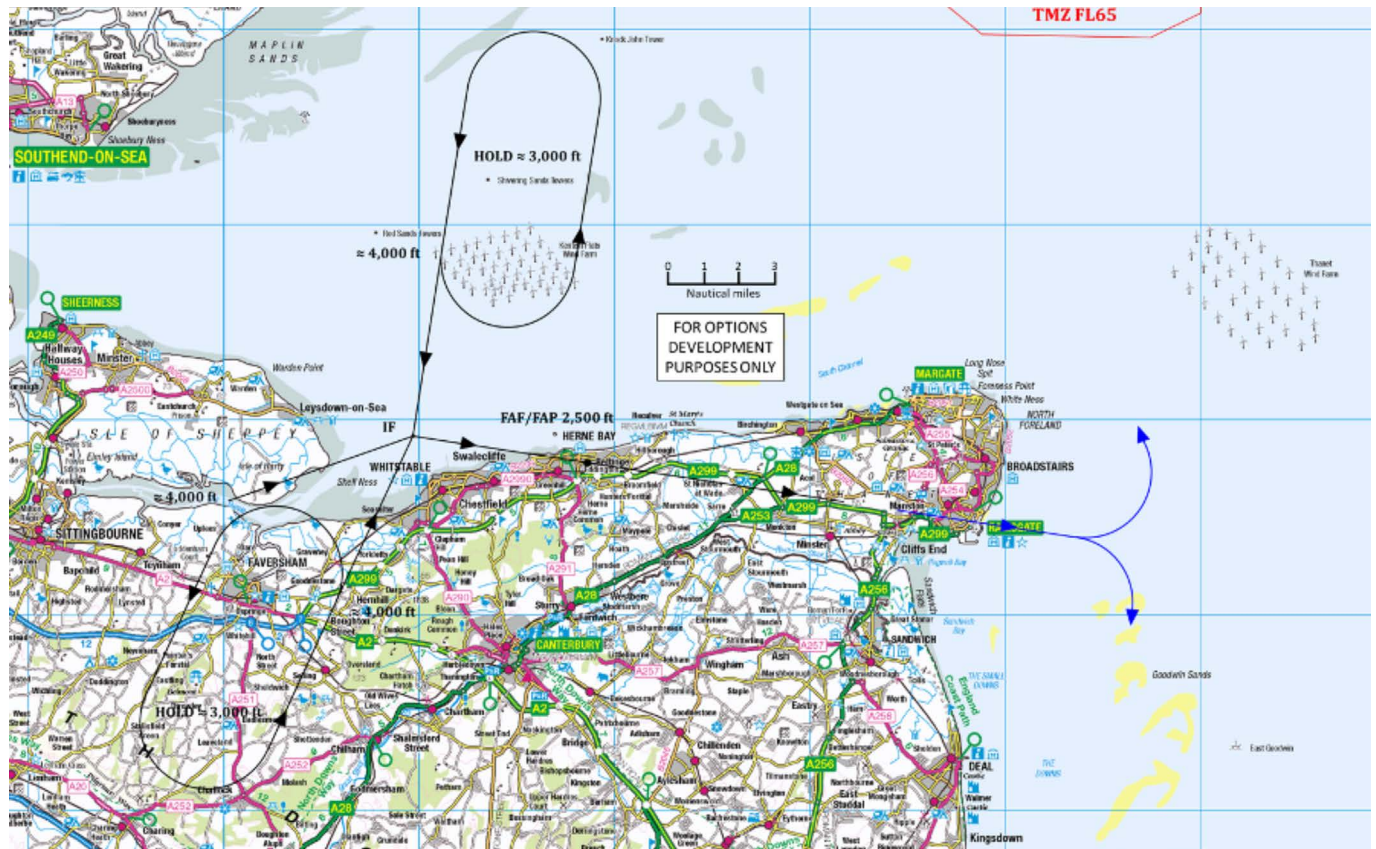
## A6.1 Runway 28 Approach Procedure



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# A7 Runway 10 Approach Procedures

## A7.1 Runway 10 Approach (2,500 ft Final Approach)



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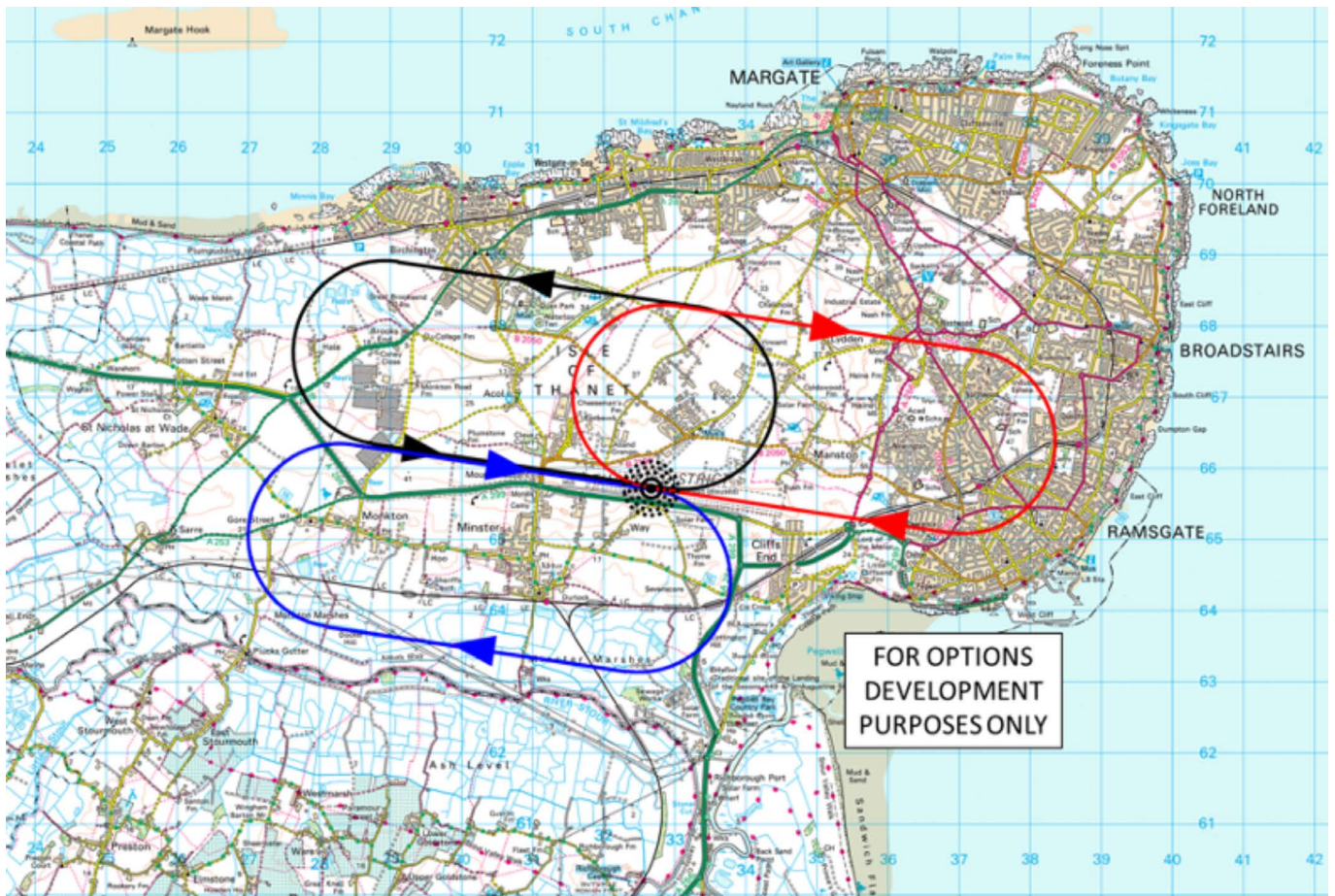
## A7.2 Runway 10 Approach (3,000 ft Final Approach)



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# A8 NDB Hold

## A8.1 NDB Hold Position



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# RSP

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