YOUR LONDON AIRPORT Gatwick

Gatwick Route 4

Redesign of RNAV Standard Instrument Departures

2022 Engagement Group

1st and 2nd February 2022

Welcome & Introductions

Representing Gatwick Airport

- Airspace Change Manager

Representing Air Navigation Solutions Ltd (ANSL)

- (Osprey Consulting Services)
- ANSL Route 4 Project Manager

Please use the Raise a Hand icon when asking a question, the presentation has numerous breaks for questions, and the presenter of each section will lead the question and answer session at the end of each section. We will not be utilising the chat function. Any questions not answered during this presentation can be emailed to the Team for a response. Minutes and feedback will be published.

Purpose, Objectives and Outcomes

- Purpose
  - To provide stakeholders with an update on progress of the Route 4 ACP
- Objectives
  - Provide an overview of this ACP and CAP1616 stage
  - Review the key reasons for previous Stage 2 Gateway CAA Feedback
  - Present the new baseline “do nothing”
  - Review the comprehensive list of options, which articulates a “do minimum”
- Outcome
  - To inform stakeholders of the current situation

Agenda

- Current Status - Presenter
- Stage 2 Gateway January 2020 - Presenter
- Establishing a New Baseline - Presenters
- Design Options Review and New Option 7 – Presenters
- Next Steps - Presenter

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Current Status

Airspace Change Objectives - reminder

- Improve further, where practicable, aircraft and passenger safety
- Limit & seek to reduce, where possible, the environmental impact on local communities in the vicinity of the Route 4 Standard Instrument Departures
- Enable further improvements in safety and noise reduction through the application of more efficient FASI-S operating procedures and opportunities
- Provide long-term predictability of flight paths

Current Status of Route 4

- CAA published CAP1912 (May 2020) Post Implementation Review Report requiring GAL to:
  - Safely remove all temporary Route 4 satellite based departure routes that had been in place since 2016; and
  - Revert to a legacy ‘conventional’ departure route last flown by aircraft in significant volumes in November 2013
- All changes were implemented successfully on 25 February 2021 and performance monitoring of the ‘conventional’ route is continuing.

CAP 1616 - Progress

Stage 1 - DEFINE

- Step 1A - Assess Requirement ☑ — 22 Jan 2019
- Step 1B - Design Principles ☑ — 27 Sep 2019

Stage 2 - DEVELOP & ASSESS

	1	2	
Step 2A - Options Development	☑	☐	
Step 2B - Options Appraisal	☑	☐	X 31 Jan 2020 / 27 May 2022

Stage 3 - CONSULT

- Step 3A - Consultation Preparation
- Step 3B - Consultation Validation — 30 Sept 2022
- Step 3C - Commence Consultation — 12wks Q4 2022
- Step 3D - Collate & Review Responses

Stage 4 - UPDATE & SUBMIT

- Step 4A - Update Design
- Step 4B - Submit Proposal to CAA — Q4 2023

Stage 5 - DECIDE

- Step 5A - CAA Assessment
- Step 4B - CAA Decision — DECIDE Gateway

Stage 6 - IMPLEMENT

Stage 7 - PIR

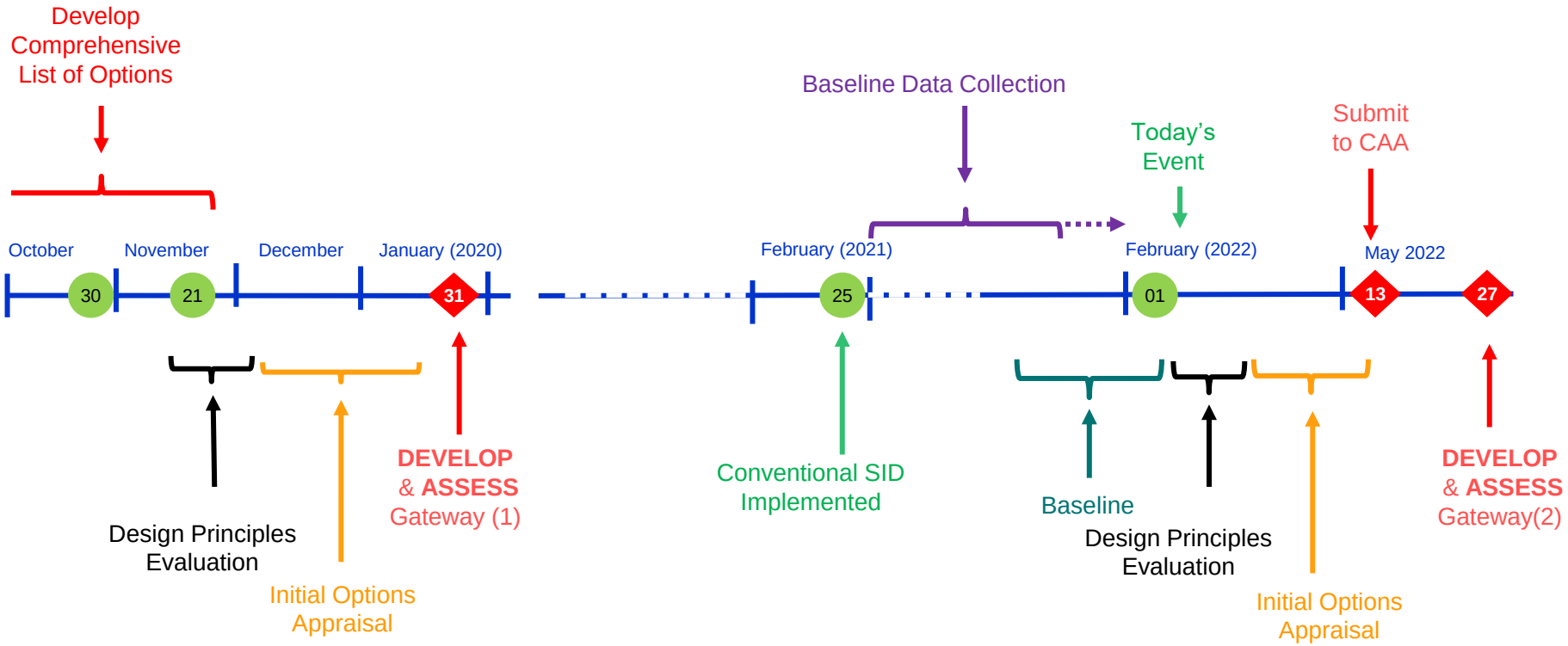
** Formal CAA Gateways*

All dates subject to change for a variety of reasons

Design Principles Approved at Stage 1 - reminder

DP No.	Details
Design Principle 1	Route 4 options will be designed safely with full regulatory compliance.
Design Principle 2	Designs should be built to facilitate dispersion below 7,000 ft.
Design Principle 3	New Route 4 design options should give due regard to the historic routings in use prior to the introduction of RNAV routes in 2012.
Design Principle 4	Route 4 designs should seek to minimise the adverse impact of noise on previously unaffected populations and seek to reduce the total number of people overflown.
Design Principle 5	Designs should seek to minimise the impact of noise on particularly sensitive areas.
Design Principle 6	Route 4 designs should enable transition to a vertical profile that allows an efficient, and potentially faster, climb to higher altitudes.
Design Principle 7	Designs that seek to provide respite should not overfly previously unaffected populations.
Design Principle 8	Route 4 designs should not be constrained by the existing NPR to 4,000ft.

Timeline


Develop Comprehensive List of Options
Baseline Data Collection
Today's Event
Submit to CAA
October
November
December
January (2020)
February (2021)
February (2022)
May 2022
30
21
31
25
01
13
27
Design Principles Evaluation
Initial Options Appraisal
DEVELOP & ASSESS Gateway (1)
Conventional SID Implemented
Baseline
Design Principles Evaluation
Initial Options Appraisal
DEVELOP & ASSESS Gateway(2)

Any Questions?

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Stage 2 Gateway Jan 2020

Key CAA Feedback

1. Baseline: Sponsor did not provide an adequate ‘do nothing’ option
    - The temporary Route 4 satellite based departure routes that had been in place since 2016 was not accepted as the do nothing option
    - The re-instigation of conventional route post Judicial Review requires us to define a new baseline against which to measure the other options
2. Design Principle Evaluation
    - Our DPE report requires greater narrative to describe how the original 8 options were reduced to the shortlist of 3
3. Engagement: Sponsor did not demonstrate a consistent approach to engagement
    - CAA was content that our engagement had been consistent but felt it wasn’t evidenced in our reports

Any Questions?

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Establishing a New Baseline

Baseline February 2021

- Following the temporary re-instigation of the conventional navigation route (25 February 2021) and in accordance with guidance from CAA, we have been collecting data on aircraft using Route 4.
- Airlines continue to fly Route 4 departures, predominantly with the tracks over the ground guided by a satellite-based coded overlay of the conventional SIDs.
- There are three complications influencing our establishment of the 2021 baseline:

  1. Traffic levels and track deviation
  2. Environmental Assessment
  3. DVOR (ground based navigational aids) Rationalisation Programme

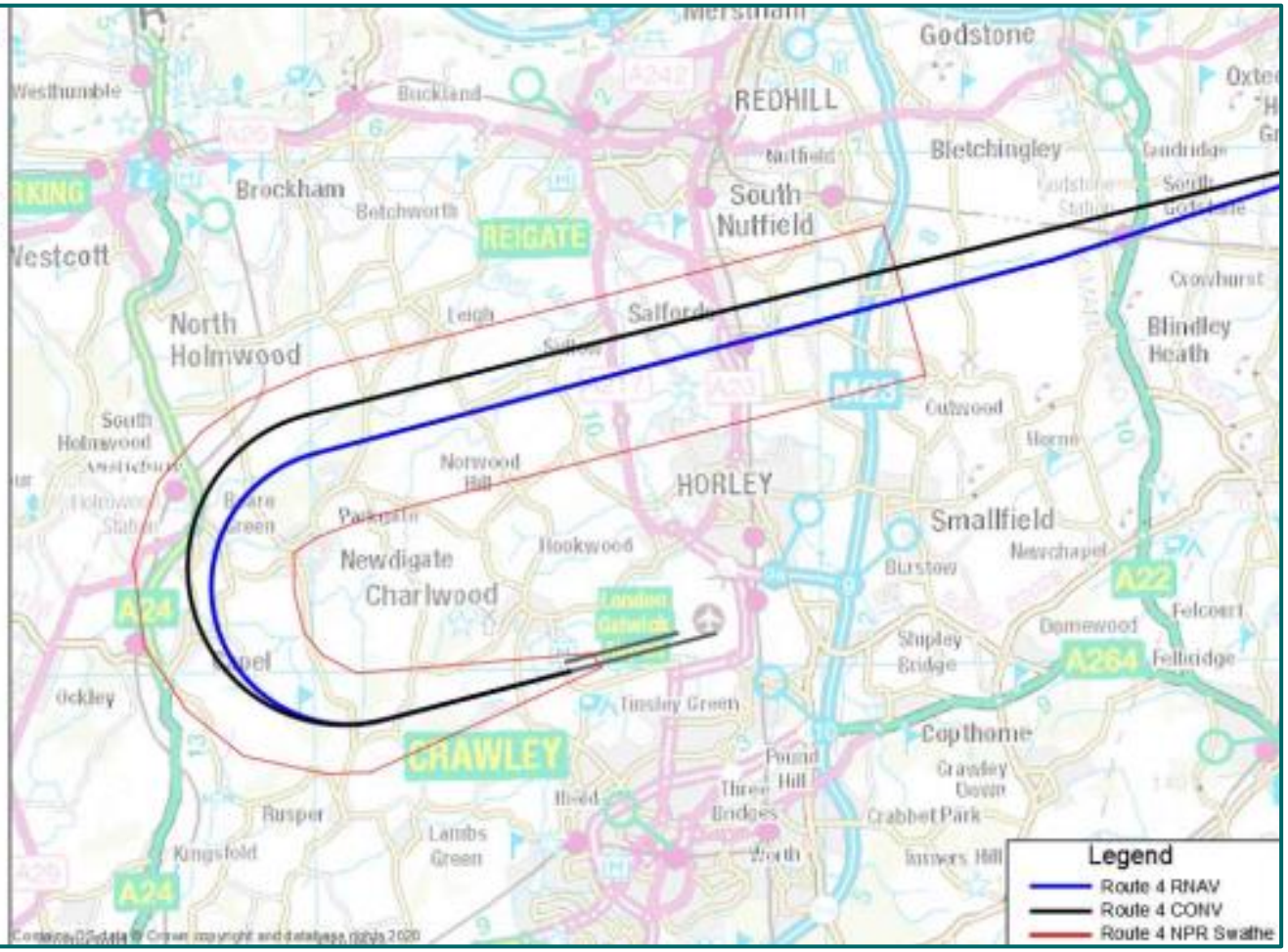
1. Traffic levels and track deviation 2021

- Traffic levels on the February 21 Conventional Routes are very low due to COVID impact so stakeholders may have little to compare with 2019 traffic
- Very little traffic has flown to European destinations traditionally served by Route 4
- Vectoring of aircraft has been frequent and significant over the recording period:
  - ‘Coding Houses’ – different airlines use different coding standards for plotting RNAV overlays of conventional routes in the Flight Management System
  - Aircraft and ATC have taken advantage of low levels of air traffic in the London area meaning that aircraft can be vectored off the route early to ‘fly direct’

Route 4 2016 RNAV vs Conventional

Route 4 1st Turn

Average flight paths of the Gatwick Route 4 SIDs, conventional and RNAV, drawn according to the AIRAC 01/2020 AIP Data, ICAO PANS OPS 8168 Vol II criteria and CAP 778 criteria where different.



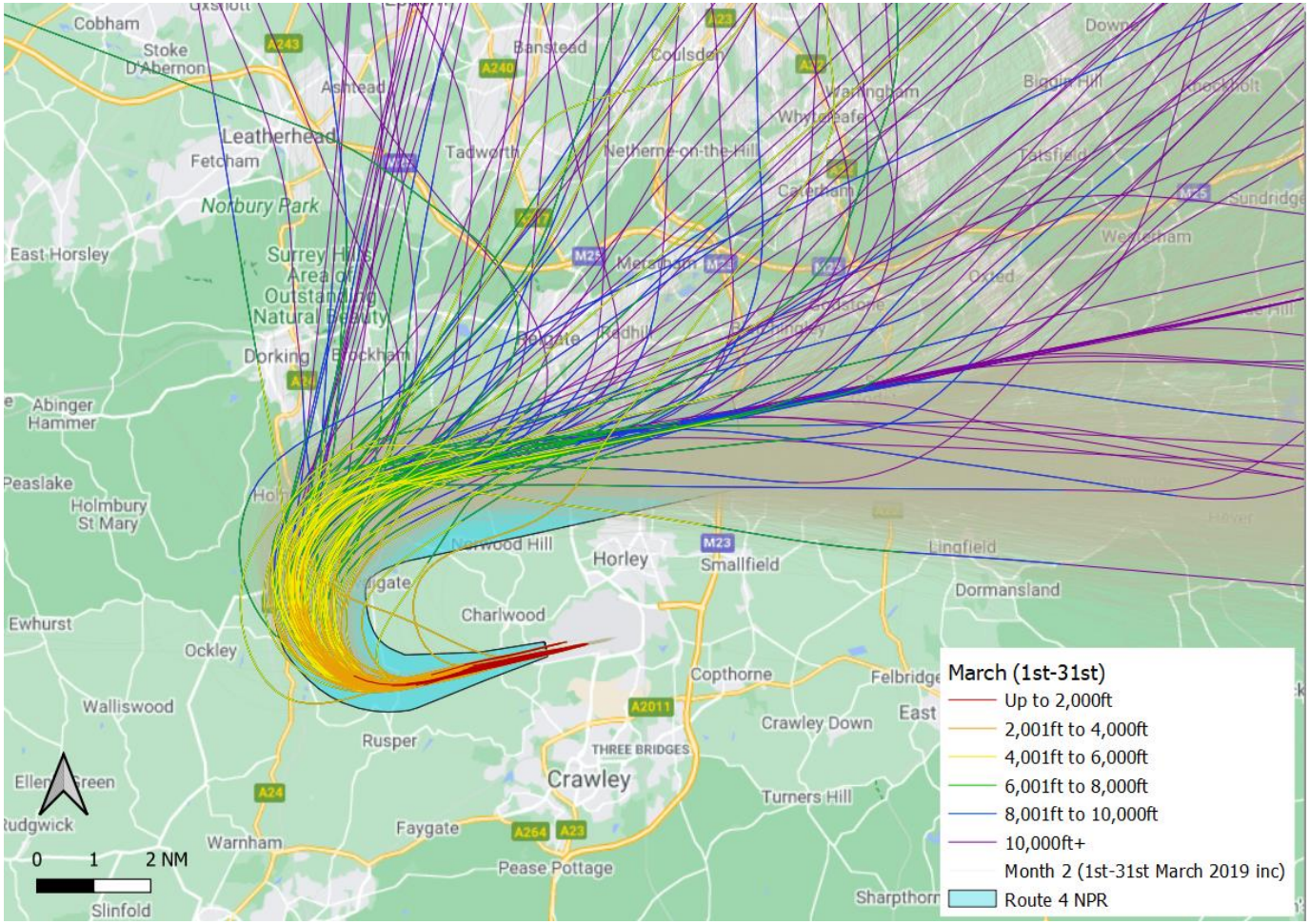
Route 4 2016 RNAV vs Conventional (2)

Route 4 to ACORN / SUNAV

Average flight paths of the Gatwick Route 4 SIDs, conventional and RNAV, drawn according to the AIRAC 01/2020 AIP Data, ICAO PANS OPS 8168 Vol II criteria and CAP 778 criteria where different.

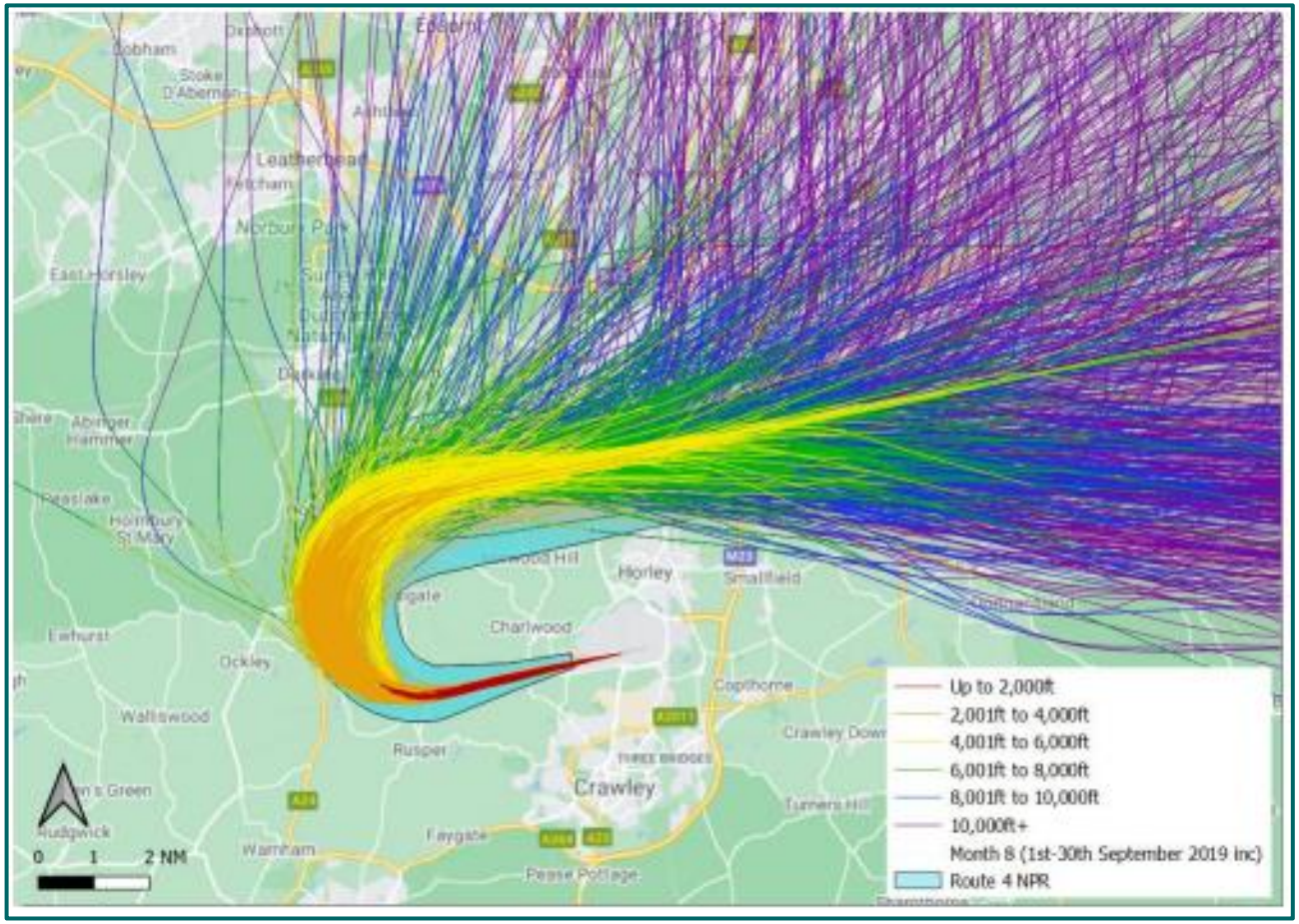
Route 4 Track Keeping – March 2021

- 95% R4 Track Keeping compliance
- 8 LHR positioners in the month
- 98% TK compliance without positioners
- Source: Route 4 NATMAG Update 04/11/21



Route 4 Track Keeping – Sept 2021

- 93.03% R4 Track Keeping compliance
- 13 LHR Positioners in the month
- 93.04% TK compliance without positioners



Any Questions?

2. Environmental Assessment Challenge

- CAP1616 requires environmental assessment to be based on traffic volumes and ground tracks from a peak summers day and night.
- CAA has no set policy on how to deal with low traffic levels within the ACP process.
- Since the Conventional Route was instigated February 21, we have recorded 9 months of track data from real aircraft movements. Data recording will continue into Stage 3 in order to support our environmental assessment.
- Low traffic levels on the route mean that the data is not suitable to use as a representative measurement baseline in its raw form. The CAA has therefore accepted our proposed method for establishing the measurement baseline for the Environmental Assessment:
  - We will apply sound analytical processing to the recorded data to establish a mean track flown by aircraft along the Conventional Route.
  - We will then use summer 2019 data (including detailed breakdown of aircraft numbers, types, and destinations) to populate this route to give a realistic comparison against which to assess our options for noise and environmental impact.

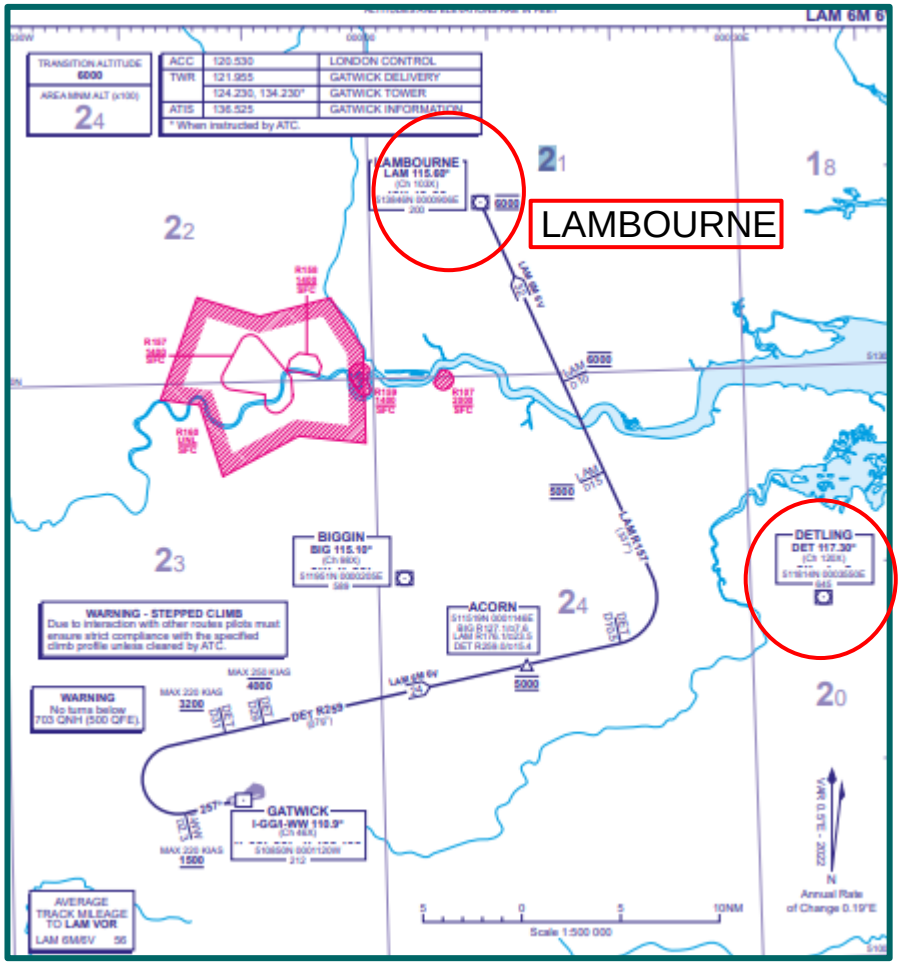
Any Questions?

3. DVOR (Ground based navigational aids) Rationalisation

- A key enabler to airspace modernisation in the UK is the concept of Performance Based Navigation (PBN) using aRea Navigation (RNAV) techniques.
- RNAV relies on satellite based navigation and no longer depends on conventional ground-based navigation aids. As a consequence many of these navigation aids are being switched off.
  - **30 planned for Dec 2022.**
  - **Around 36 airports are affected.**

- The Route 4 Conventional Routes at Gatwick are based on the Detling (DET) and Lambourne (LAM) DVORs which will be decommissioned by December 2022.
- Other routes at Gatwick are affected not just Route 4.
- This is why an absolute Do Nothing is not an option, we must change to RNAV. Therefore we need to develop an RNAV Do Minimum as a baseline comparator.
- CAA guidance (CAP1781) means that affected airports can apply to implement an RNAV Substitution for the affected conventional routes for an agreed time period.
- The spirit of the process ensures there is **no fundamental change to ground tracks**.

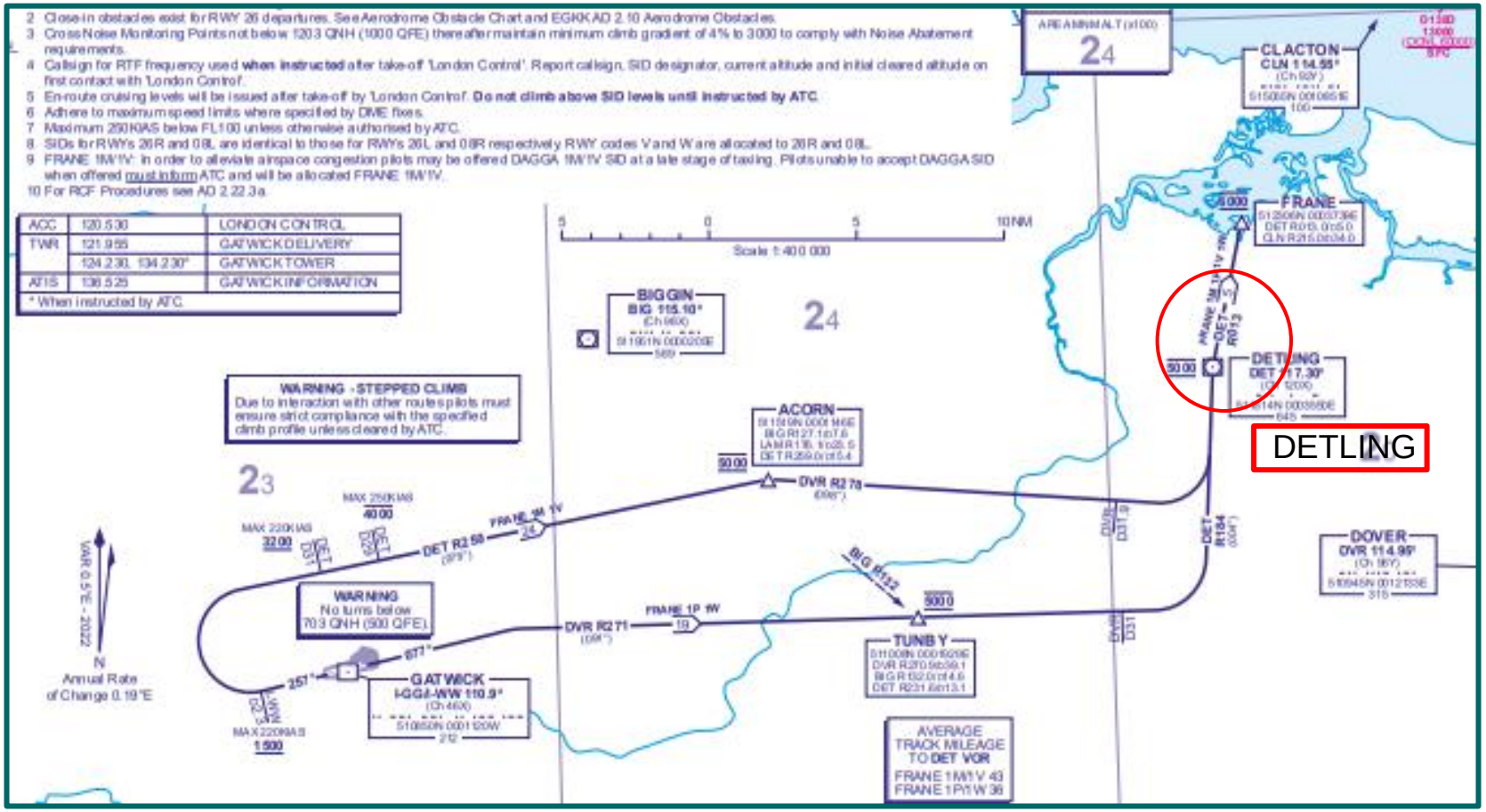
3. DVOR Rationalisation (DET and LAM)



- Conventional February 2021 Standard Instrument Departure via Lambourne

3. DVOR Rationalisation (DET, BIG, DVR)

- Conventional February 2021 Standard Instrument Departure via Detling



Any Questions?

New Baseline Consequences

- The first time we completed Step 2A (Jan 2020 Stage 2 Gateway) we had 8 Options, labelled 0-7 which were reduced to 3 options at Step 2B.
- CAA decision in CAP1912 dictated that a temporary RNAV route could not be used as a baseline.
- The New Do Nothing Baseline is the February 2021 Conventional Procedure and is designated Option B.
- The new Option 0 is the same design used for the previous temporary RNAV procedure (2016) - which in itself is the RNAV replication of the 2012 conventional
- Option 0 therefore remains an operationally viable option within the Comprehensive List and is the New Do Minimum baseline. It will be used for the option appraisal comparisons.
- The DVOR Rationalisation programme means that we will require an RNAV Substitution for Route 4 conventional tracks when the DVOR are decommissioned (Dec 2022) with **no change to the ground tracks**. Our baseline do nothing option remains unchanged.
- The Step 2B DPE and IOA assessments will be re-done.

Any Questions?

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Design Options Review and New Option 7

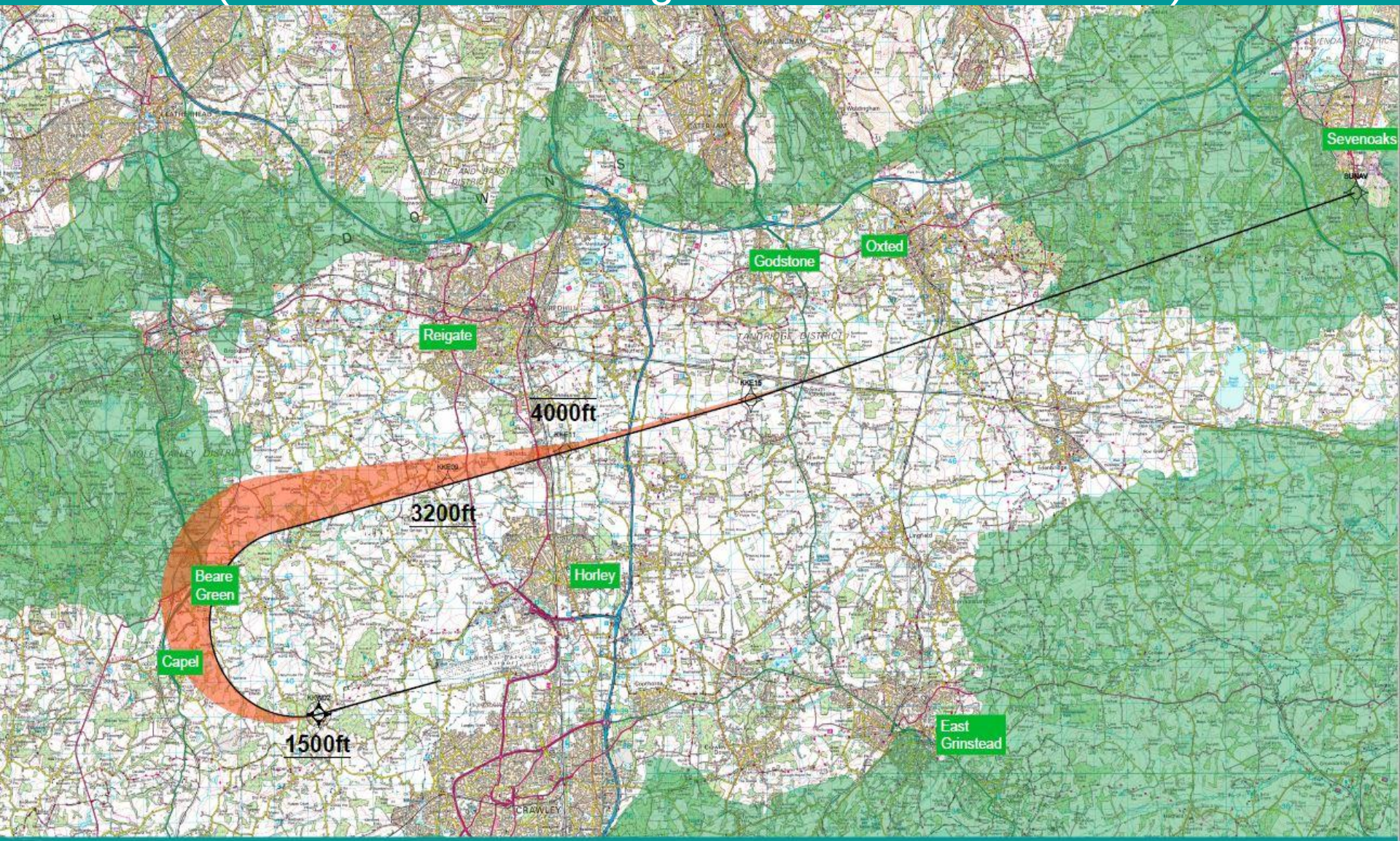
Comprehensive List - Unsupported

Option	Option Description	Challenges
A	Wraparound south after take-off	• Conflict with Route 9 • Runway centreline crossing • Overflight of Crawley
B	Extension west on centreline after take-off (No turn below 4000ft)	• Conflict with Route 1 SIDs • Significant constraints of departure flows - delays • Increase in noise impact on centreline
C	Track further north after take-off	• Gatwick Airport Airspace constraints • Interaction with Heathrow • Increasing levels of residential housing
D	Offset departure north (22° Turn immediately on Departure)	• Aircraft would have to track south following the turn to re-intercept the outbound track • Increase in track miles • Gatwick Airport Airspace constraints
E	Offset departure south (22° Turn immediately on Departure)	• Increase in track miles • New areas of population would be overflown • Respite not supported during initial engagement

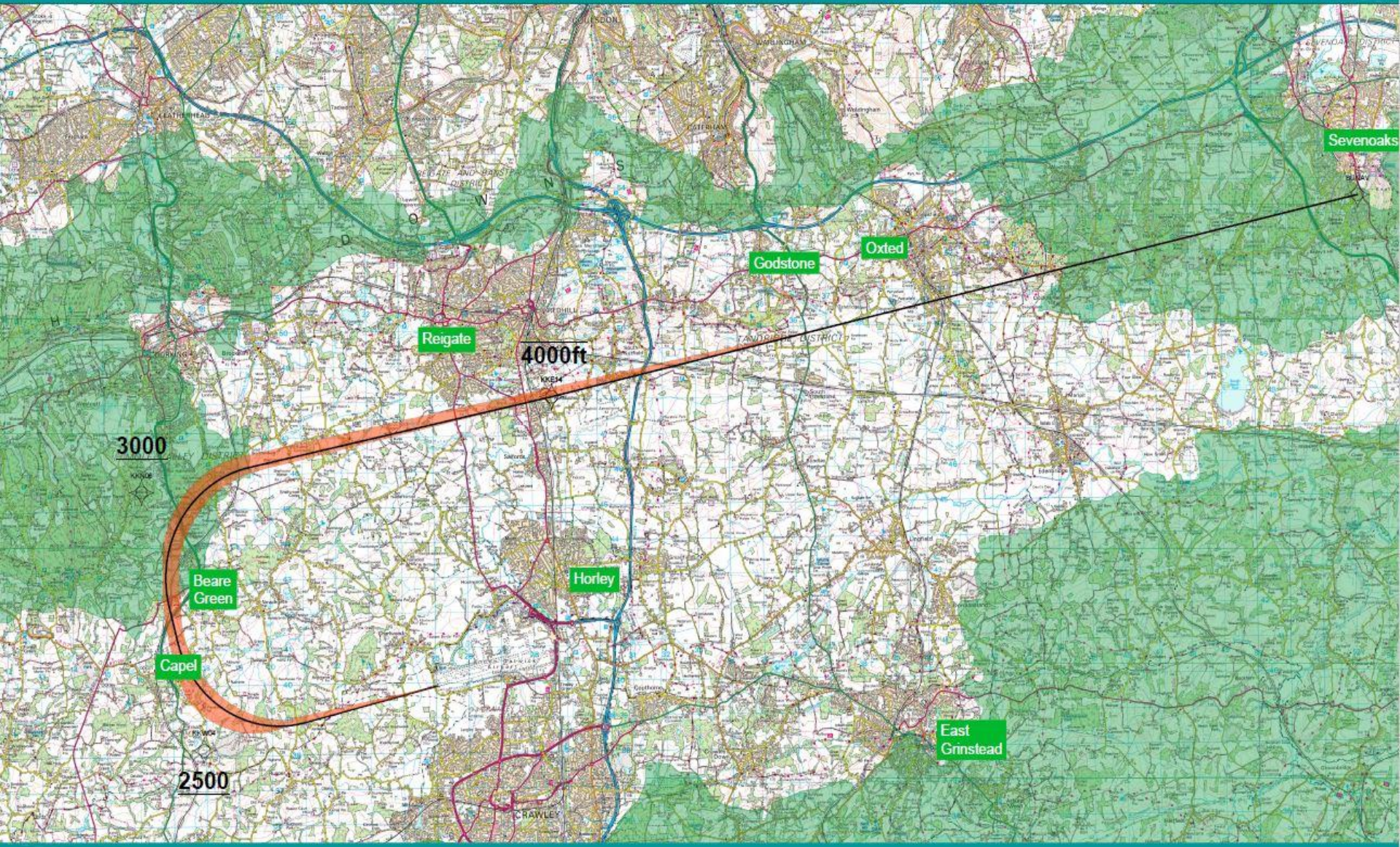
Comprehensive List - Viable

Option	Option Description	Feature
B	Baseline ‘Do Nothing’	Conventional procedures instigated in February 2021
0	Baseline ‘Do Minimum’ Fly-over, Fly-by LAM2X	Same design as was used for the previous temporary RNAV procedure (2016) which in itself is the RNAV replication of the 2012 conventional
1	Fly-by, Fly-by, LAM1X	Two 90° Turns
2	Fly-over, Fly-by	LAM2X DCT SUNAV
3	Fly-by, Fly-by	Apparent dispersion following second turn
4	Fly-over, Fly-by	Multiple turn points
5	Fly-by, Fly-by	Speed reduced from Option 1
6	Fly-over, Fly-by	Multiple turn points plus apparent dispersion
7	Constant Radius to Fix	Concentrated – Old and New versions

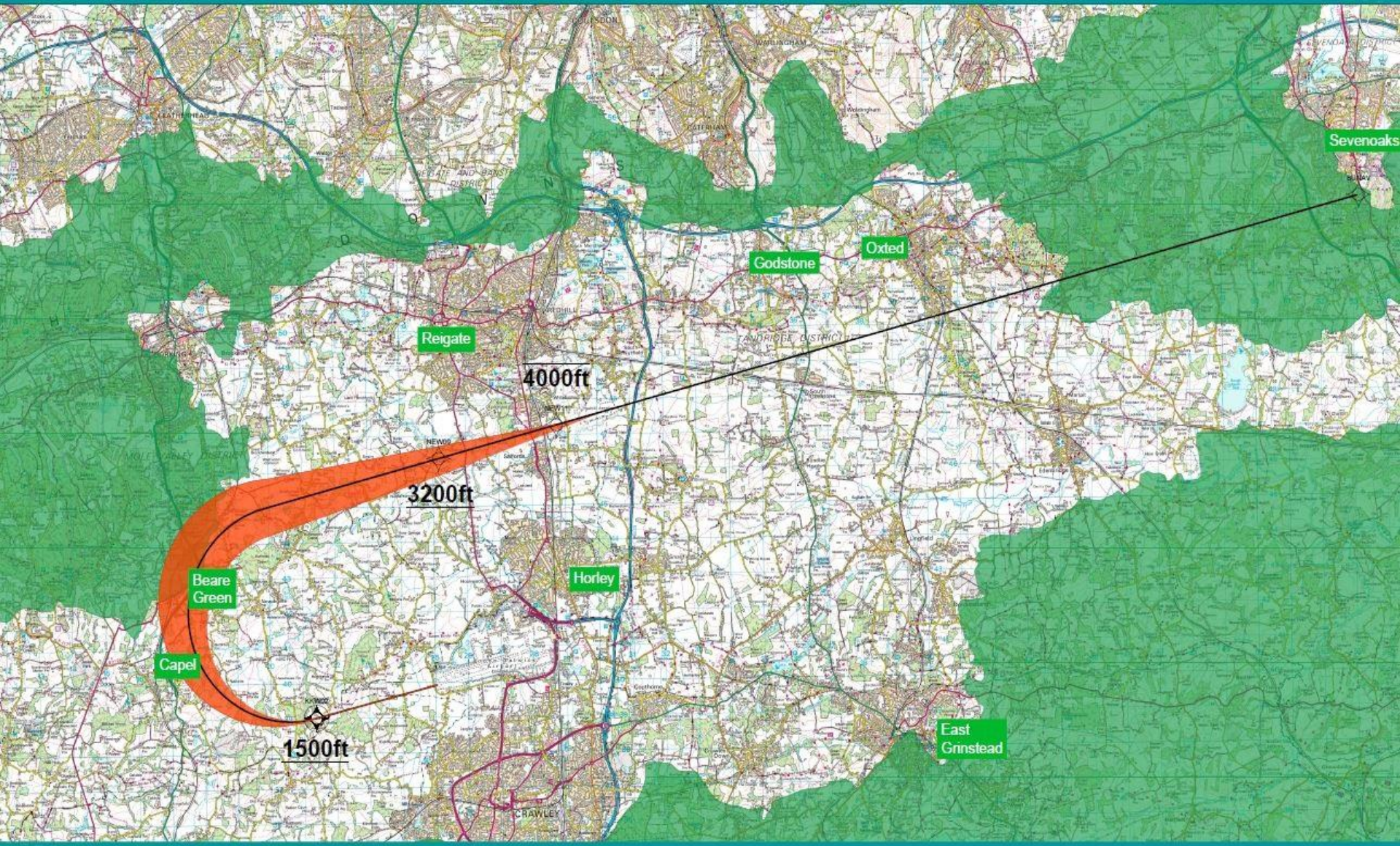
Option 0 Fly-Over, Fly-By (Do Minimum Baseline) (Previous RNAV design for 2012 Conventional)



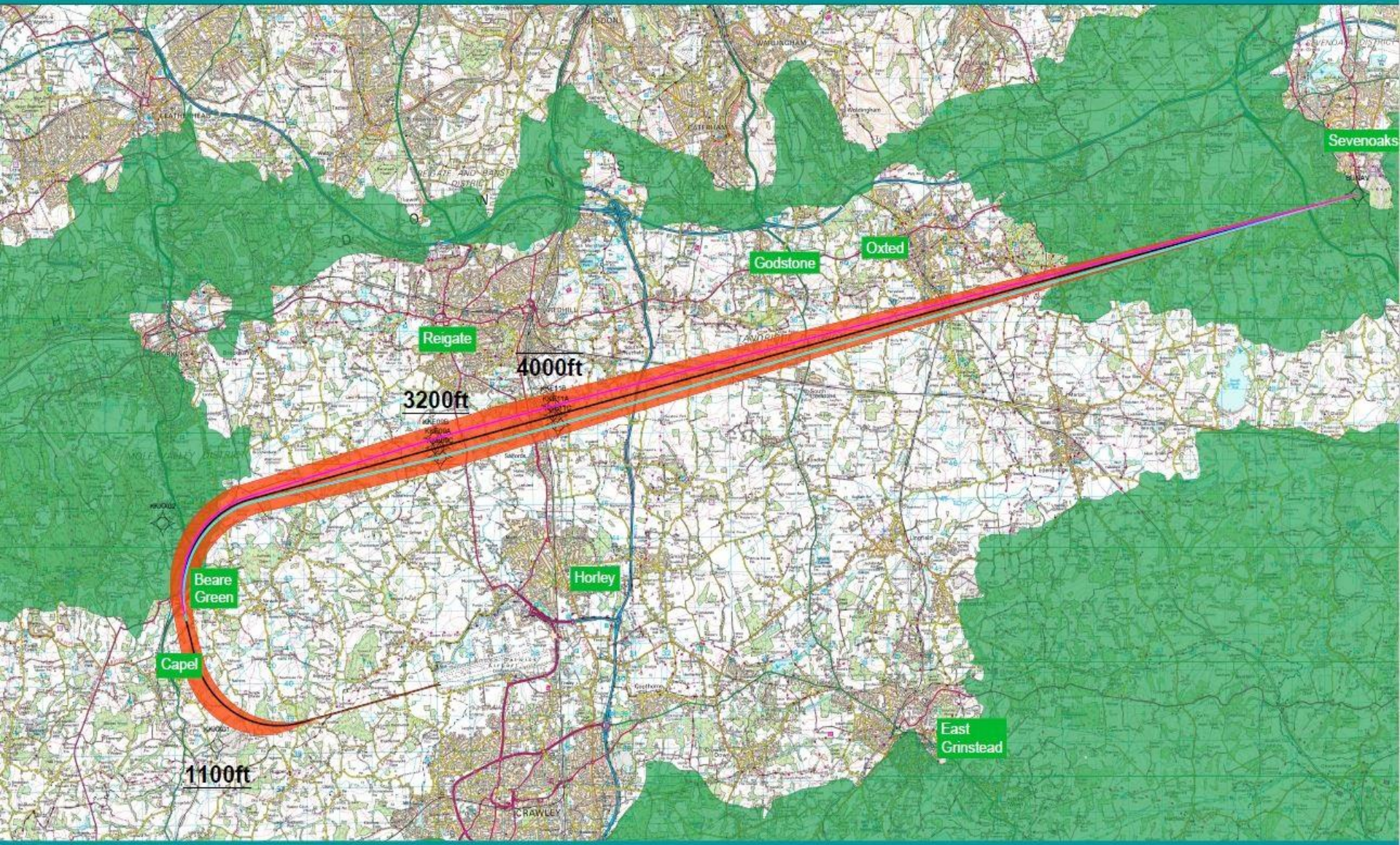
Option 1 Fly-by Fly-by (LAM 1X)



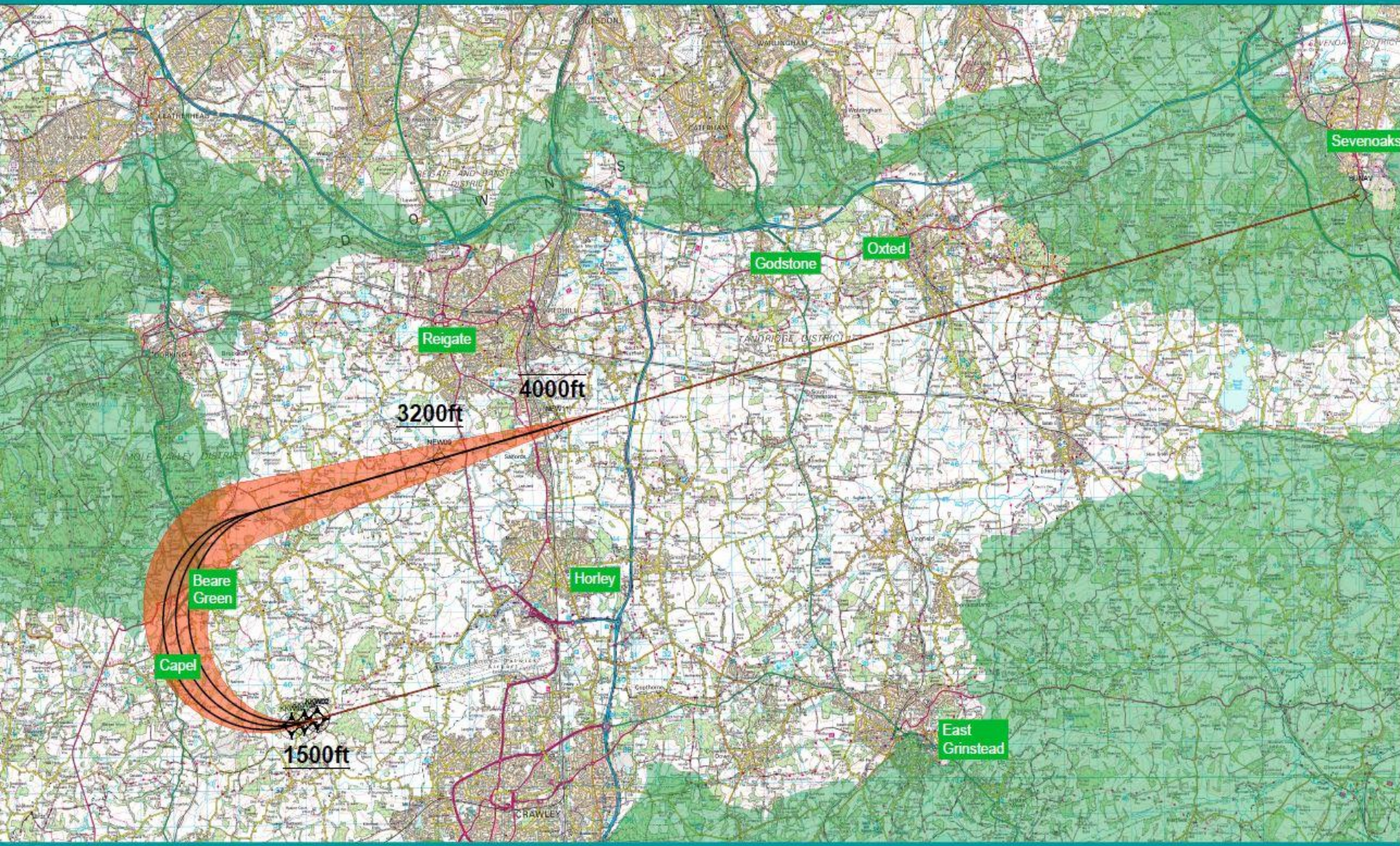
Option 2 Fly-over Fly-by (LAM 2X) Direct SUNAV



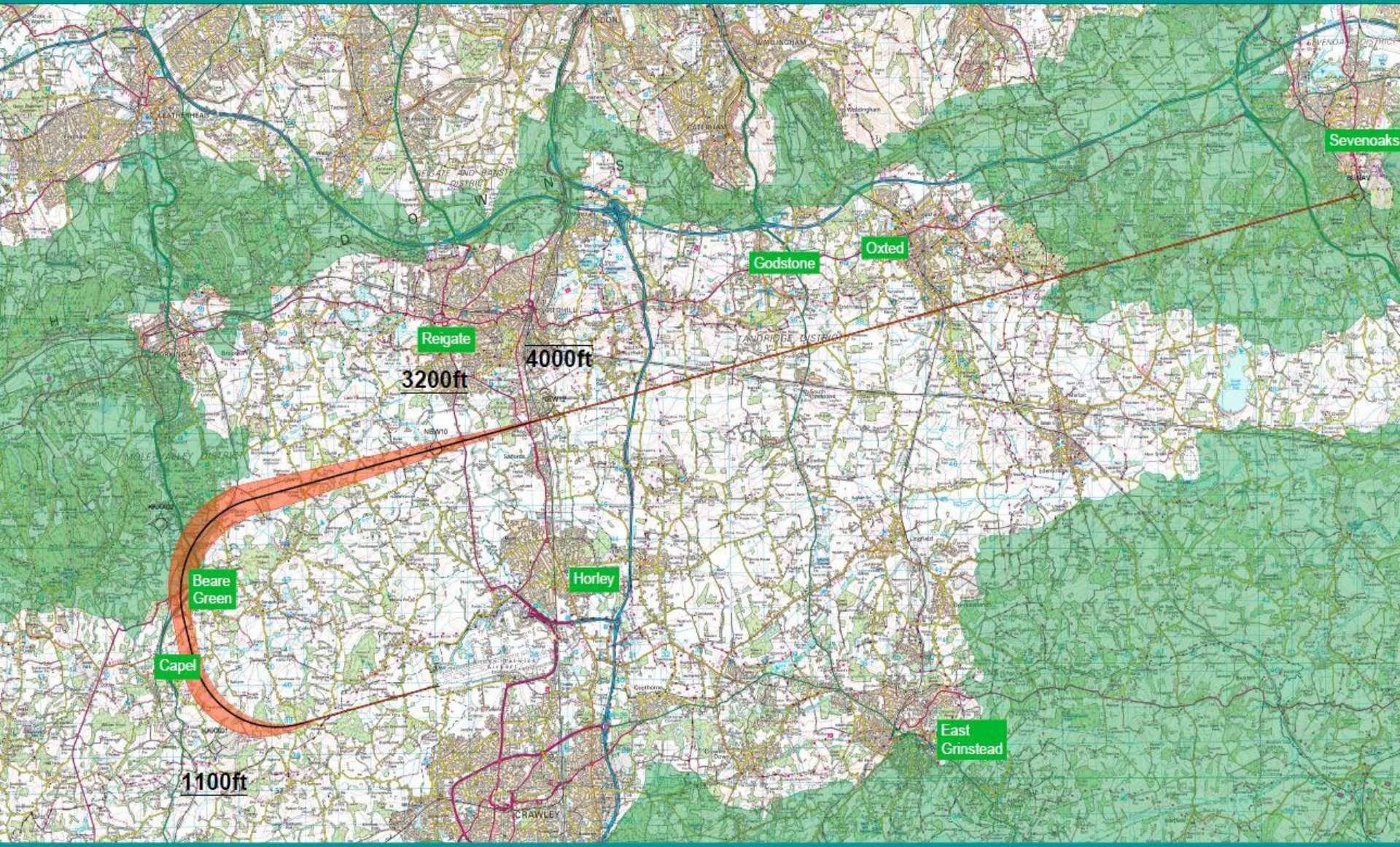
Option 3 Fly-by Fly-by (Apparent Dispersion Late in Turn)



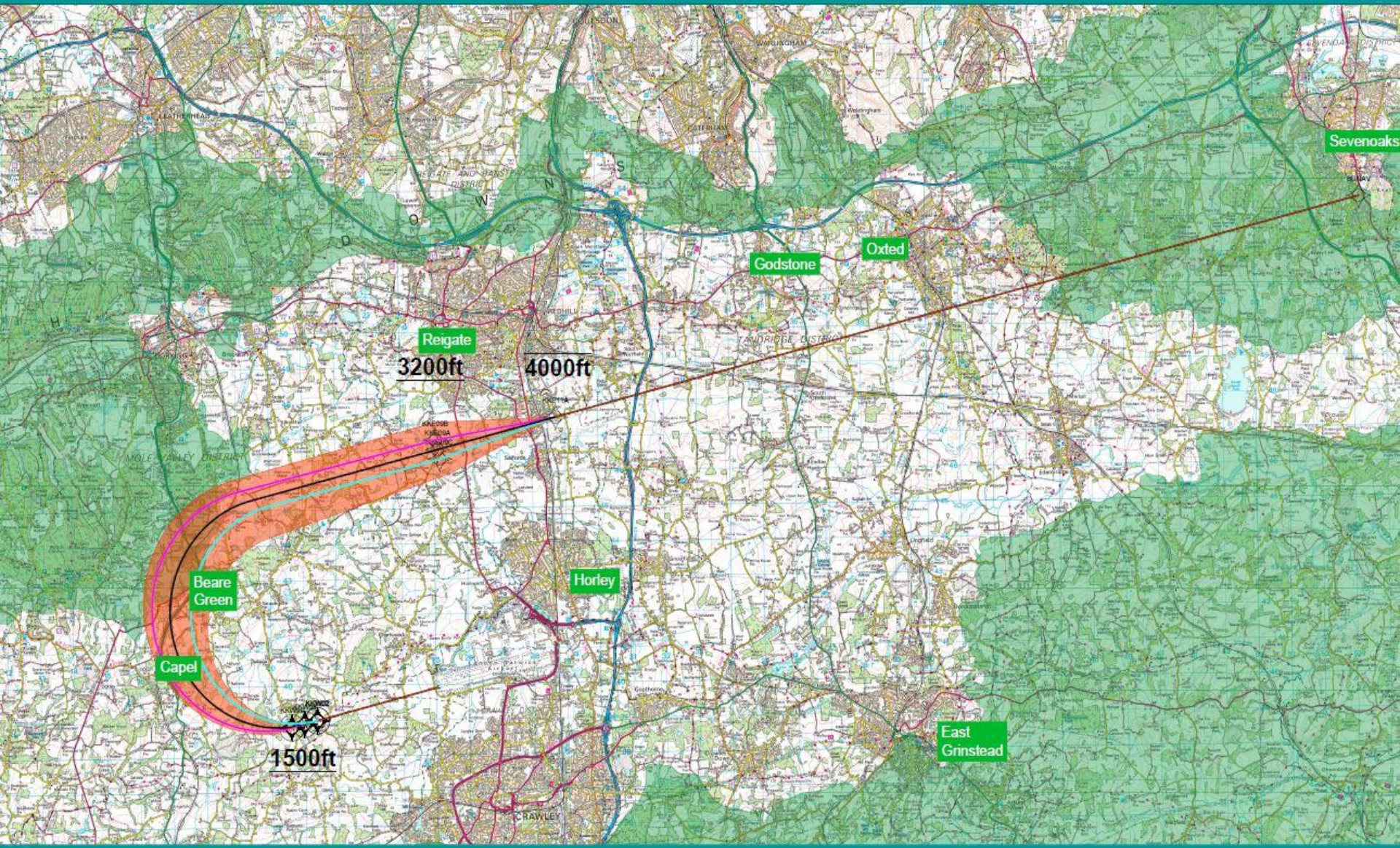
Option 4 Fly-over Fly-by (Multiple Initial Turn Points)



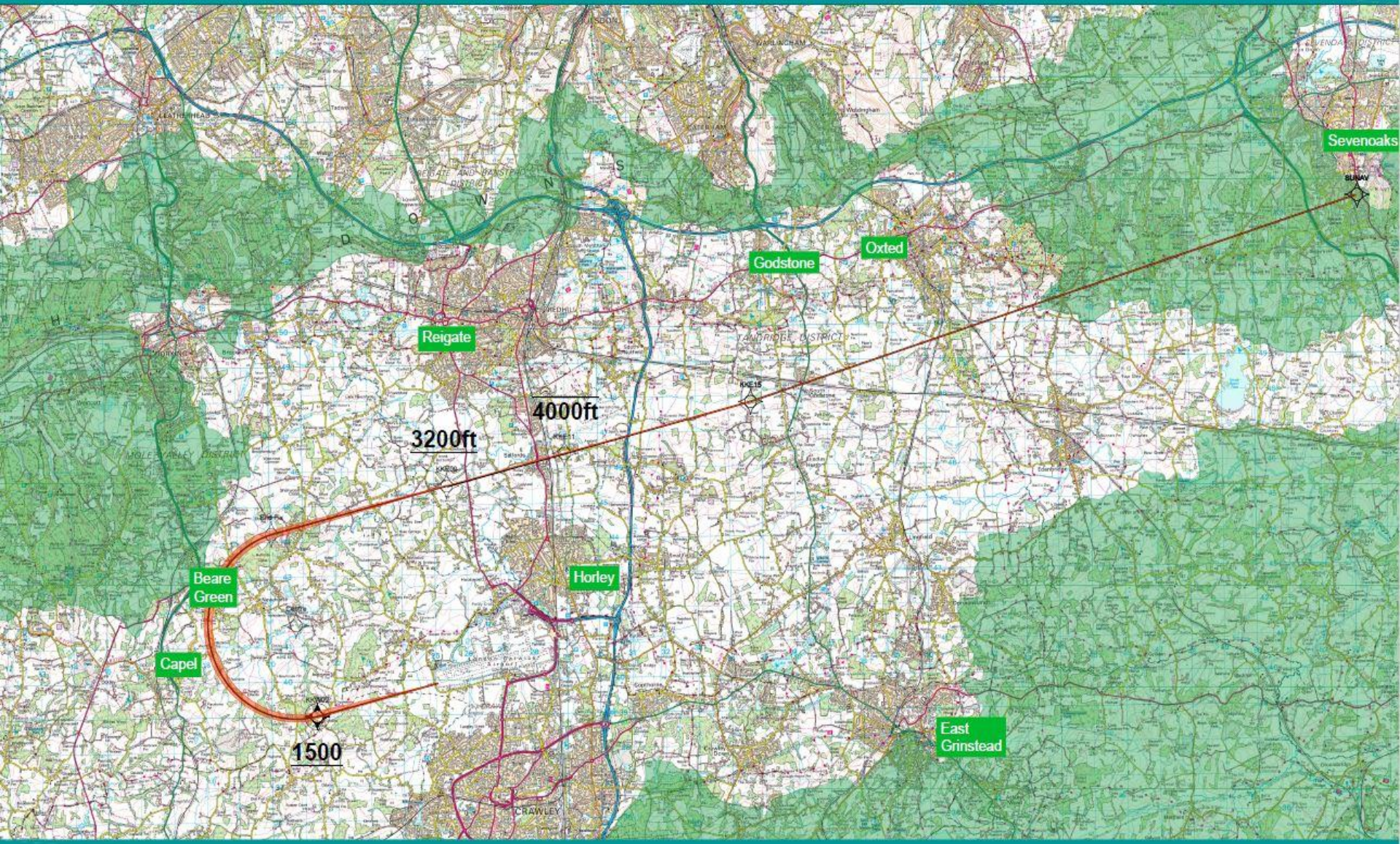
Option 5 Fly-by Fly-by (Lower Speed Vs Option 1)



Option 6 Fly-over Fly-by (Multiple Initial and Turn Points)

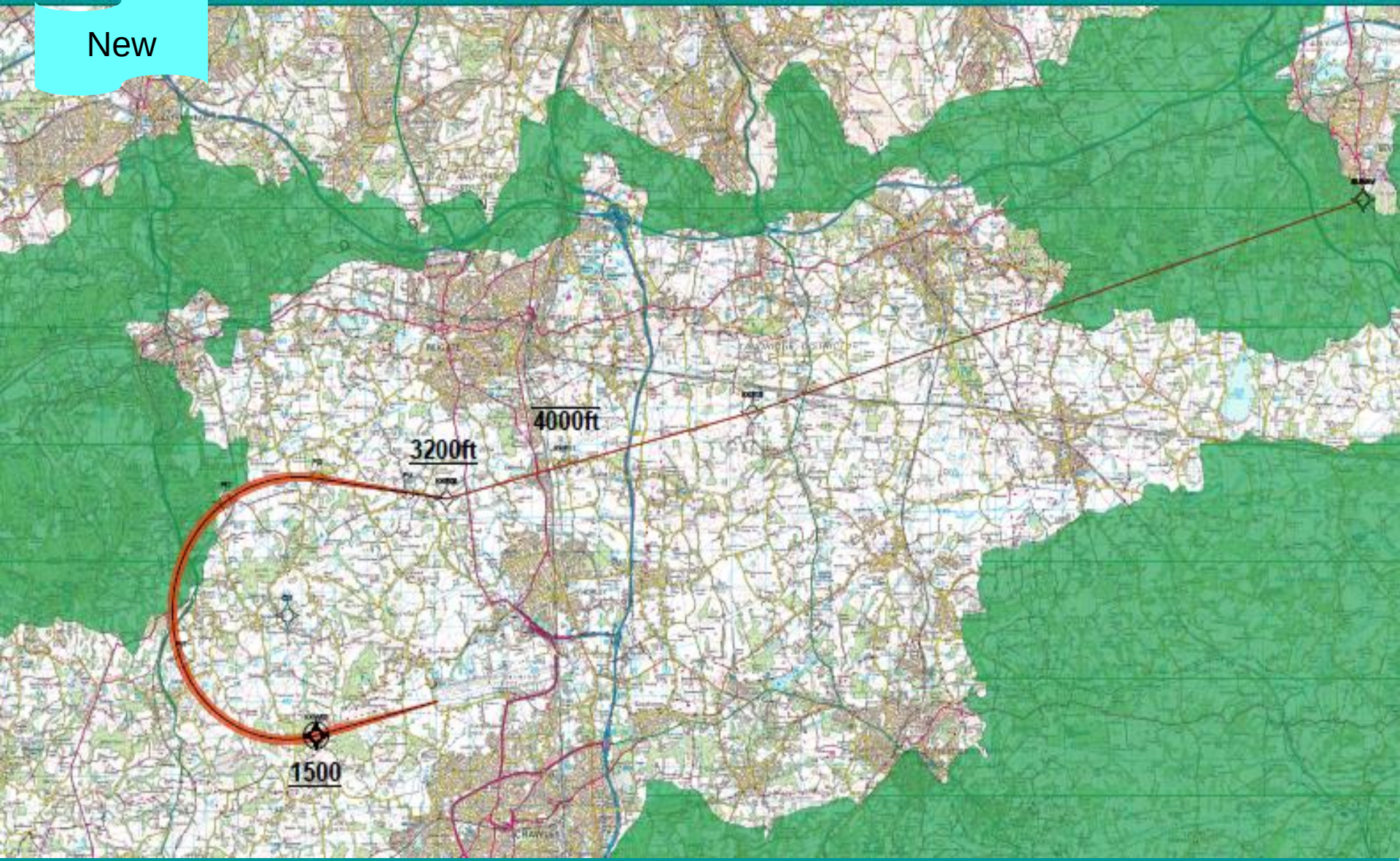


Option 7 Constant Radius to Fix (Tracks Concentrated)



Option 7 Constant Radius to Fix (Tracks Concentrated)

New



Feedback sheet

Name Representing

OPTION 7 Constant Radius to Fix (Tracks Concentrated)

Question 1	Yes	No
In your opinion, does this route option facilitate dispersion below 7,000 ft?		
If not, please state why below:		

Question 2	Yes	No
In your opinion, has this route option been designed to give due regard to the historic routings in use prior to the introduction of RNAV routes in 2012?		
If not, please state why below:		

Question 3	Yes	No
In your opinion, does this design seek to minimise the adverse impact of noise on previously unaffected population and seek to reduce the total number of people overflown?		
If not, please state why below:		

Question 4	Yes	No
In your opinion, does this design seek to minimise the impact of noise on particularly sensitive areas?		
If not, please state why below:		

Question 5	Yes	No
Do you have any other comments this particular design, or in general? Please record below:		

Feedback Request

Please use the feedback sheet for the new Option 7 additional general feedback is also welcome

Please respond to LGWairspace.Rte4@gatwickairport.com

by 2nd March 2022

Specific feedback to the CAA should be directed to airspace.portal@caa.co.uk

Any Questions?

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Next Steps

Stage 2 - Next Steps

Step 2A

- Complete the Design Principles Evaluation (DPE) document
- Publish draft design options and DPE on CAA portal

Step 2B

- Complete Initial Options Appraisal (qualitative assessment)
- Publish Initial Options Appraisal on CAA portal
- Gateway (DEVELOP & ASSESS) marks end Stage 2 (May 2022)
- Baseline track keeping and data recording continues into Stage 3

Stage 3 and beyond

- Full Options Appraisal (quantitative assessment)
- Full Public Consultation expected to take place over 12 weeks in Q4 2022 with Stage 4 ACP submission planned for September 2023.

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Thank you