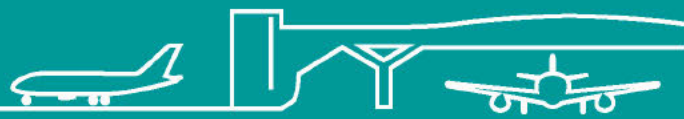
YOUR LONDON AIRPORT Gatwick

Gatwick Route 4

Redesign of RNAV Standard Instrument Departures

First Design Options Focus Group

30th October 2019



Welcome & Introductions

Representing Gatwick Airport

- [redacted] Hd Airspace Strategy & Engagement
- [redacted] Procedure Designer

Representing Air Navigation Solutions (ANS)

- [redacted] ANS Route 4 Project Manager
- [redacted] Procedure Designer

Domestics (Fire Alarm, Facilities, Refreshments)

Agenda

- Objectives
- Route 4 Context
- Progress to Date
- Review Potential Design Options

Focus Group - Objectives

- Your opportunity to influence draft design options for further development
- To share the comprehensive list of design options derived from earlier engagement activities
- Seek and record your views on our initial draft design options ahead of more detailed design work
- Discuss & further understand your preferences

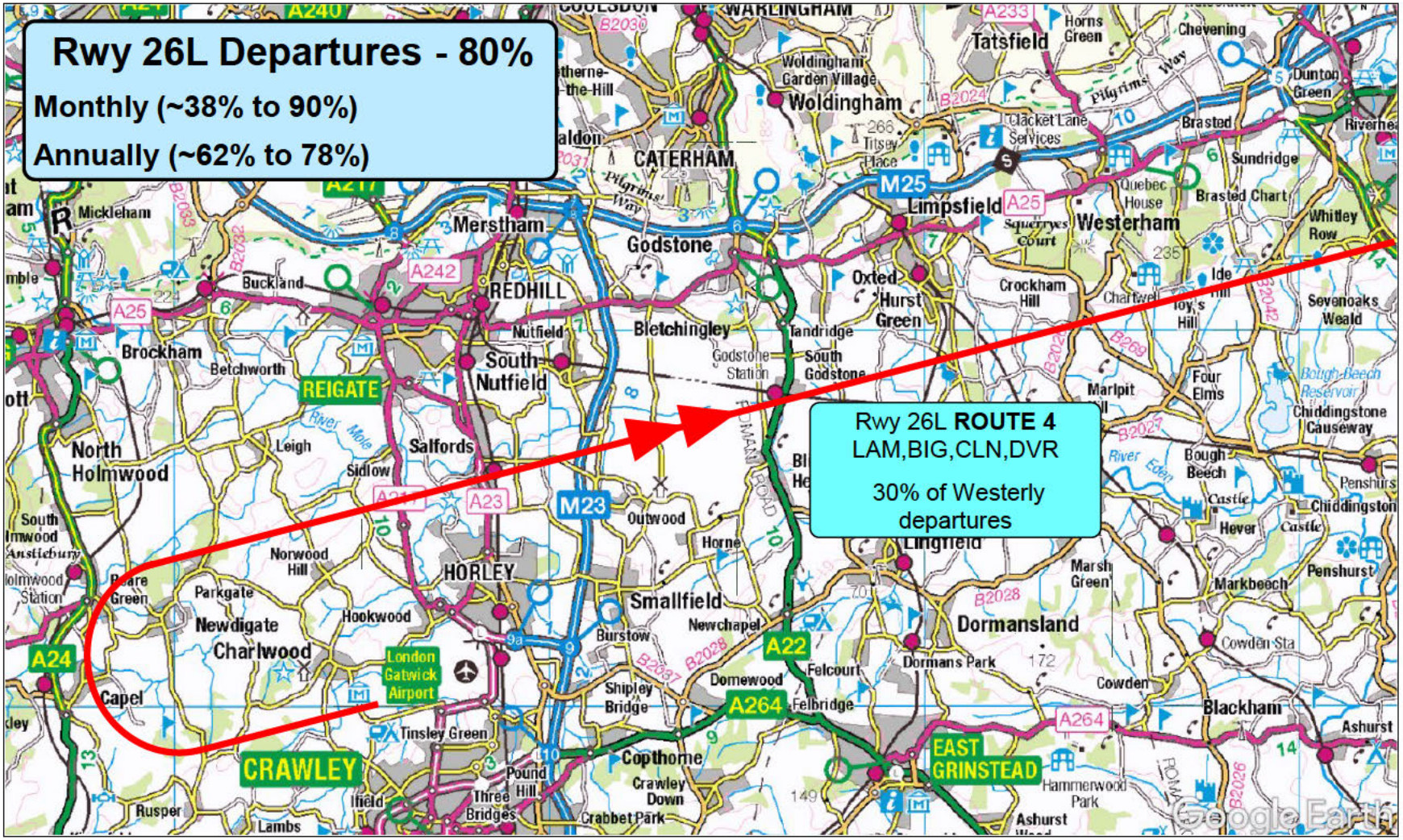
Focus Group Engagement

- When making your points please state your name/ organisation
- Views welcomed on your reflections on design options
- If something is unclear please ask
- We recognise you may have strong opinions, but please be considerate and allow others time to share their views
- Please respect diverse or conflicting opinions

Airspace Redesign - Objectives

- Improve further, where practicable, aircraft & 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

Gatwick Airport - Route 4



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Progress to Date

CAP 1616 - Overview

Stage 1 - DEFINE

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

Stage 2 - DEVELOP & ASSESS

- Step 2A - Options Development ☐
- Step 2B - Options Appraisal — 31 Jan 2020

Stage 3 - CONSULT

- Step 3A - Consultation Preparation
- Step 3B - Consultation Validation — Q2 2020
- Step 3C - Commence Consultation
- Step 3D - Collate & Review Responses

Stage 4 - UPDATE & SUBMIT

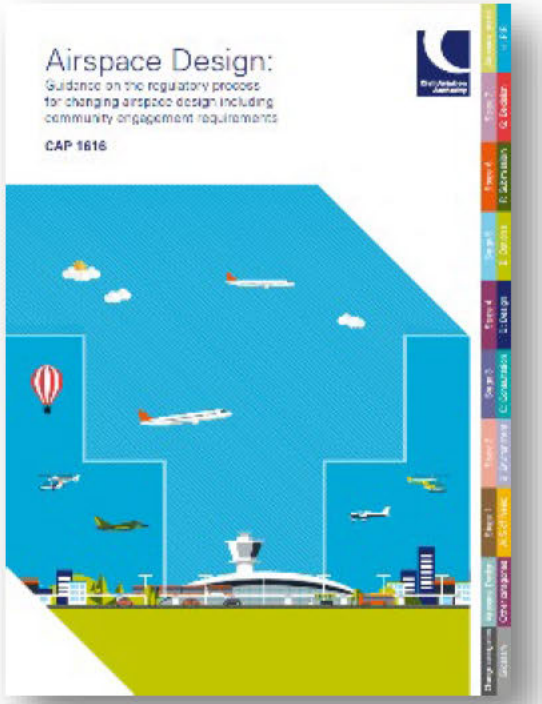
- Step 4A - Update Design
- Step 4B - Submit Proposal to CAA — Q4 2020

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

Completed Stage 1 Workstreams

	Published on CAA Portal
Step 1A	
Assessment Meeting Presentation	7 Feb 19
Assessment Meeting Minutes	
Step 1B	
Design Principles Questionnaire Returns	13 Sep 19
Focus Group Minutes	
Design Principles Review Responses	
Design Principles Report (process & all responses)	

Design Principles

Route 4 options will be designed safely with full regulatory compliance

Designs should be built to facilitate dispersion below 7,000 ft

New Route 4 design options should give due regard to the historic routings in use prior to the introduction of RNAV routes in 2012

Route 4 designs should seek to minimise the adverse impact of noise on previously unaffected population and seek to reduce the total number of people overflown

Designs should seek to minimise the impact of noise on particularly sensitive areas

Route 4 designs should enable transition to a vertical profile that allows an efficient and potentially faster climb to higher altitudes

Designs that seek to provide respite should not overfly previously unaffected populations

Route 4 designs should not be constrained by the existing NPR to 4,000 ft

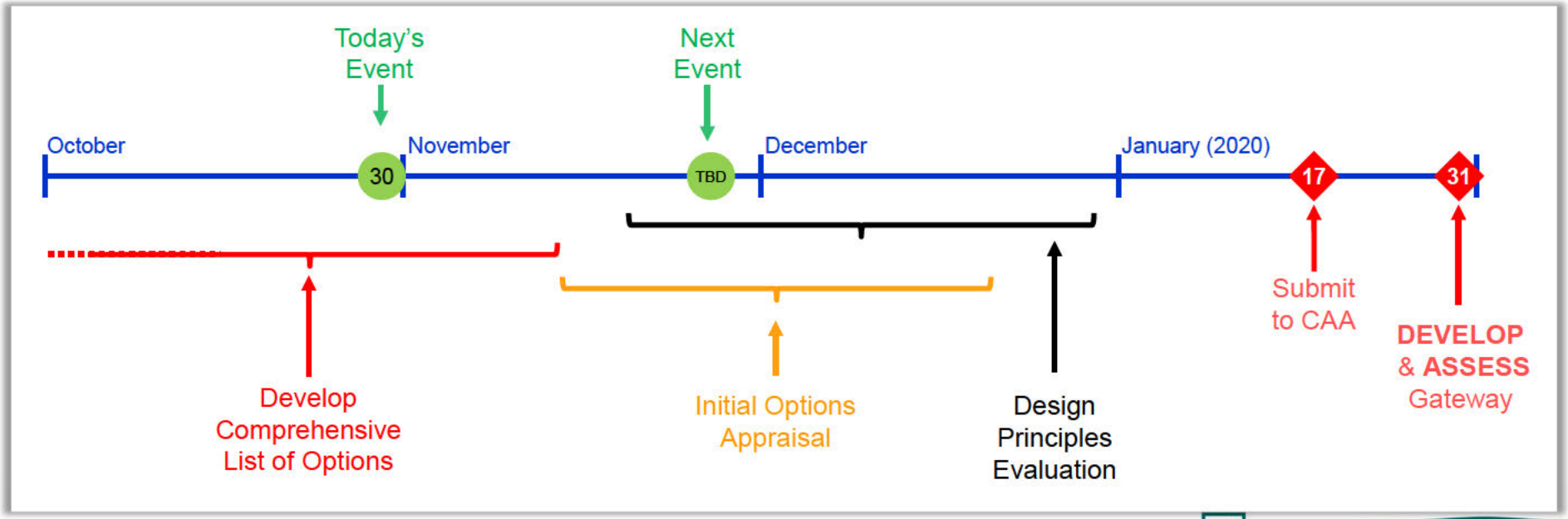
Current Stage 2 Workstreams

Step 2A - Options Development

- Develop comprehensive list of options
- Draft Design Principles Evaluation

Step 2B - Initial Options Appraisal

- Whittle down to shortlist of viable options for Stage 3
- Qualitative Options Appraisal
- Compared to current temporary track
- Criteria in App E, CAP 1616 (plus safety)
- Must indicate preferred option going forward



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Potential Design Options

Effective Standard Instrument Departure (SID)

Design Aims

- Expedite the safe and efficient flow of air traffic
- Deconflict traffic by utilising defined routes, levels, speed restrictions and waypoints
- Minimise noise impacts
- Minimise track mileage flown in order to reduce fuel burn and carbon emissions

Design Challenges

General

- Technical and regulatory flight envelope restrictions

  No turns below 500ft AAL

  20/°25° Angle of bank (2,000ft)

  Recommended speed 210KIAS for initial turn

- Airport capacity
- Flight Management Computer (FMC Capacity)
- Climb Gradient

Route 4 Specific

- Route 4 fundamental principle to enable aircraft to turn ASAP
- Wraparound turn required
- Climb restrictions due to other routes

  (Above 3200ft then below 4000ft following turn)

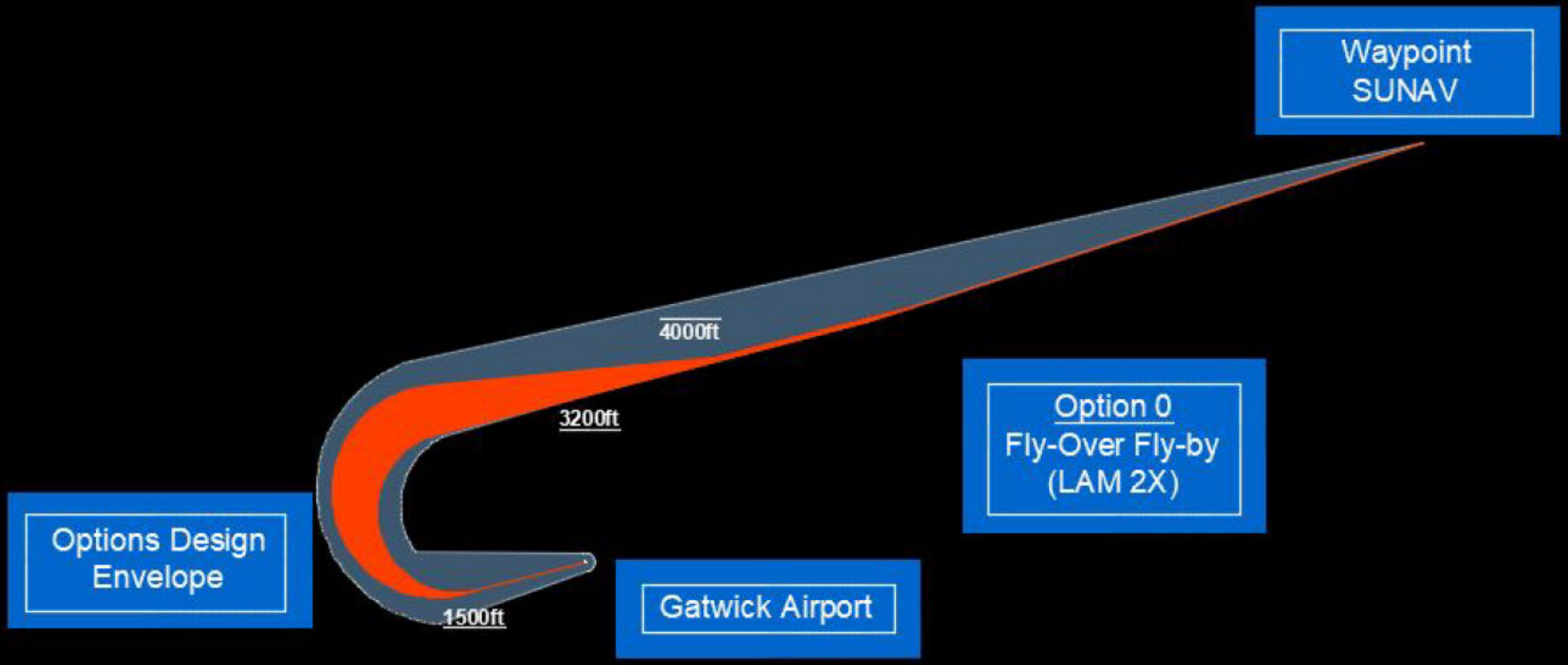
Comprehensive List - Unsupported

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
0	Fly-over, Fly-by LAM2X	Current temporary status of Route 4 (as flown today)
1	Fly-by, Fly-by, LAM1X	Two 90° Turns
2	Fly-over, Fly-by	LAM2X DCT SUNAV
3	Fly-by, Fly-by, LAM1X	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

Option 0 – Currently Flown R4 SID

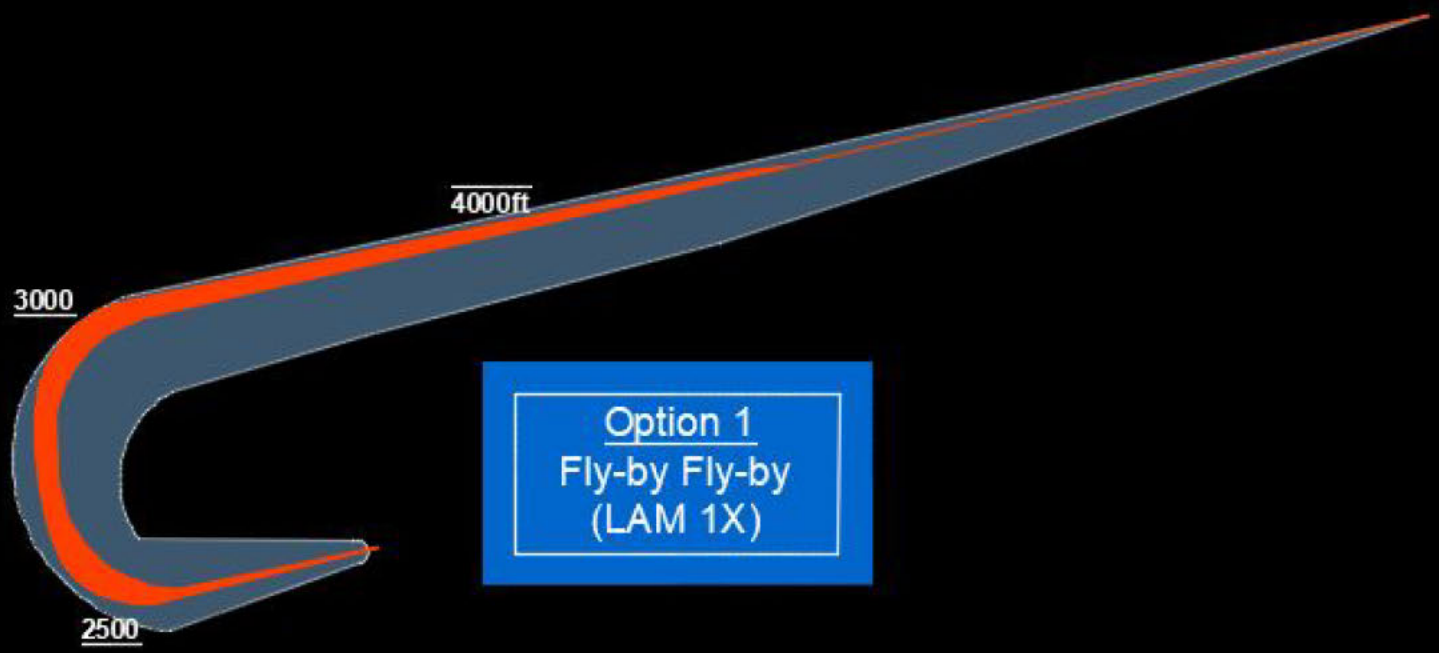


Post Meeting Note:

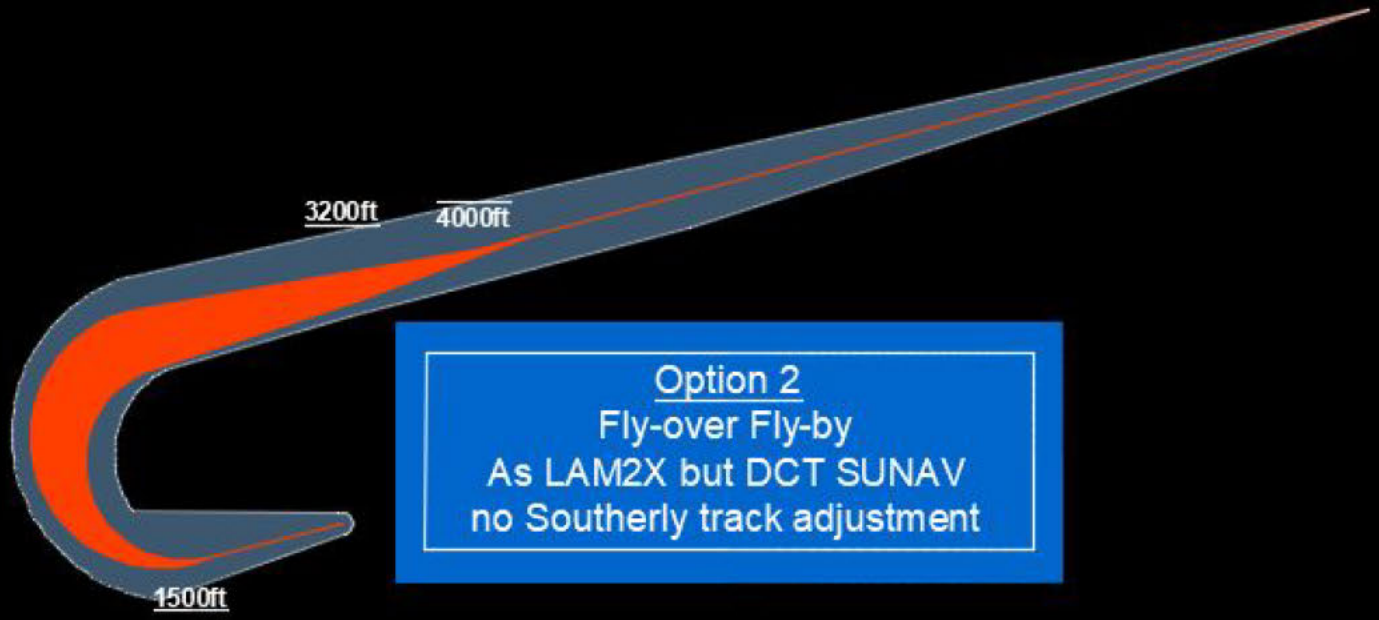
This design envelope is not the NPR swathe

It depicts the boundaries of the geographic area that encompass the Standard Instrument Departure (SID) designs 0 to 7

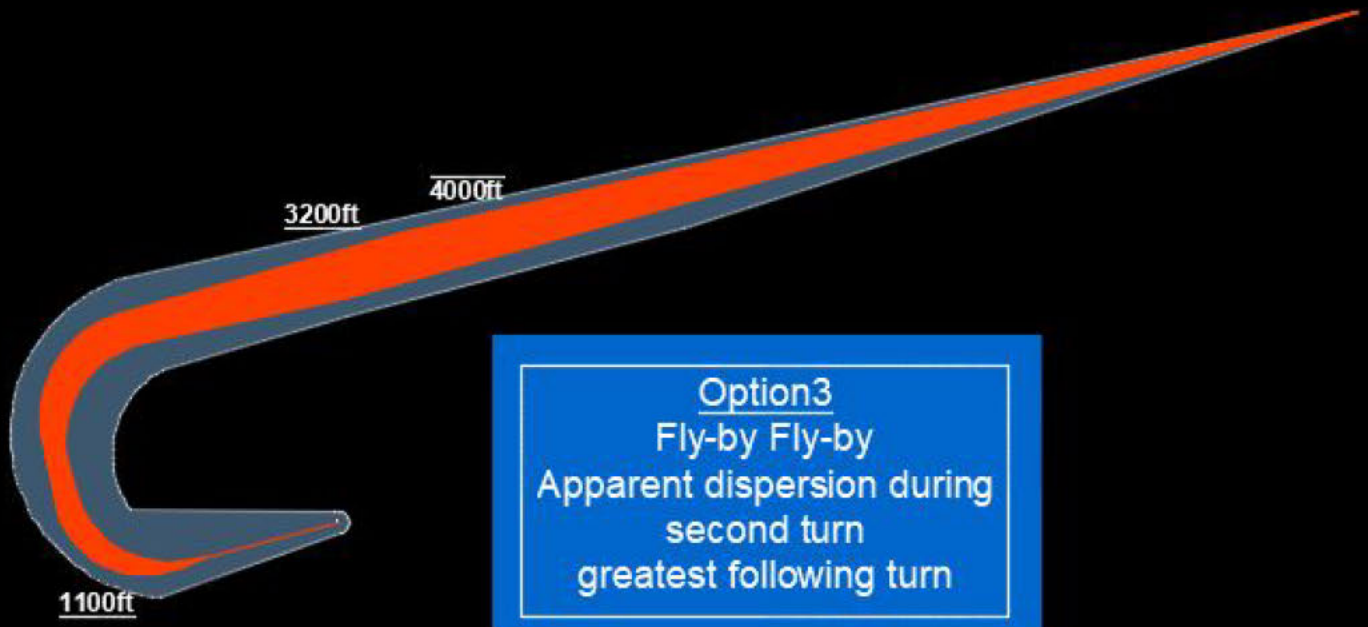
Option 1 – Two 90° Turns



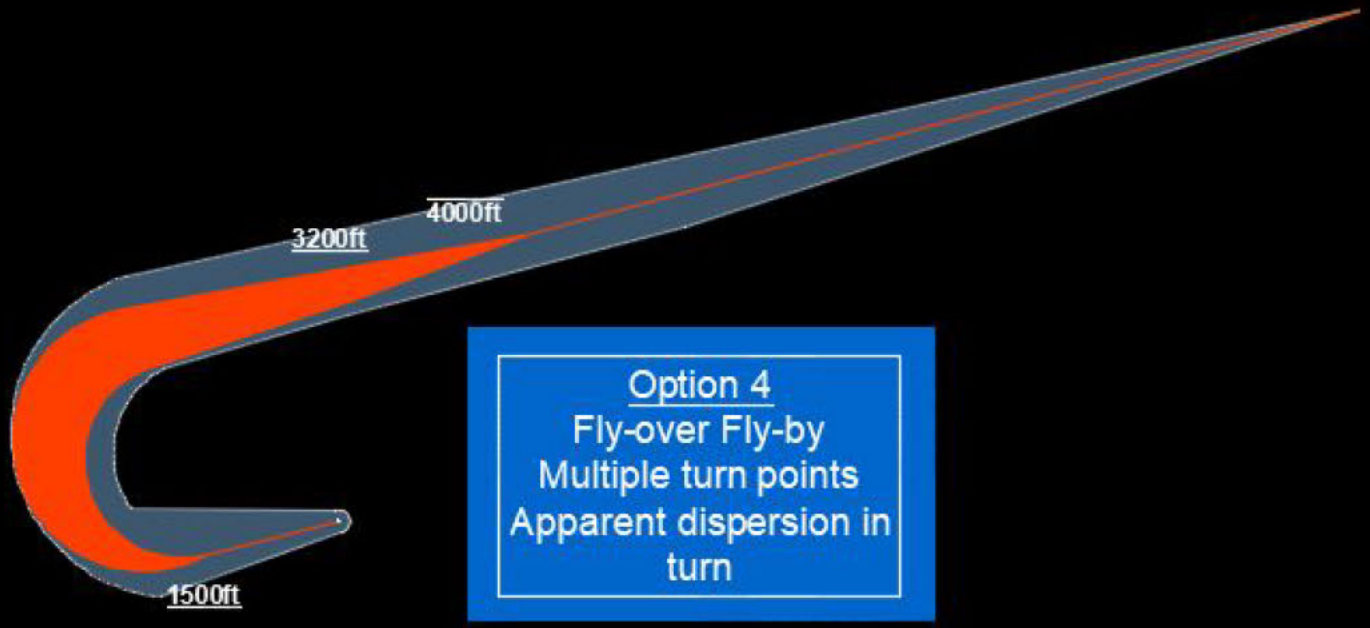
Option 2 – As currently flown but direct to Waypoint



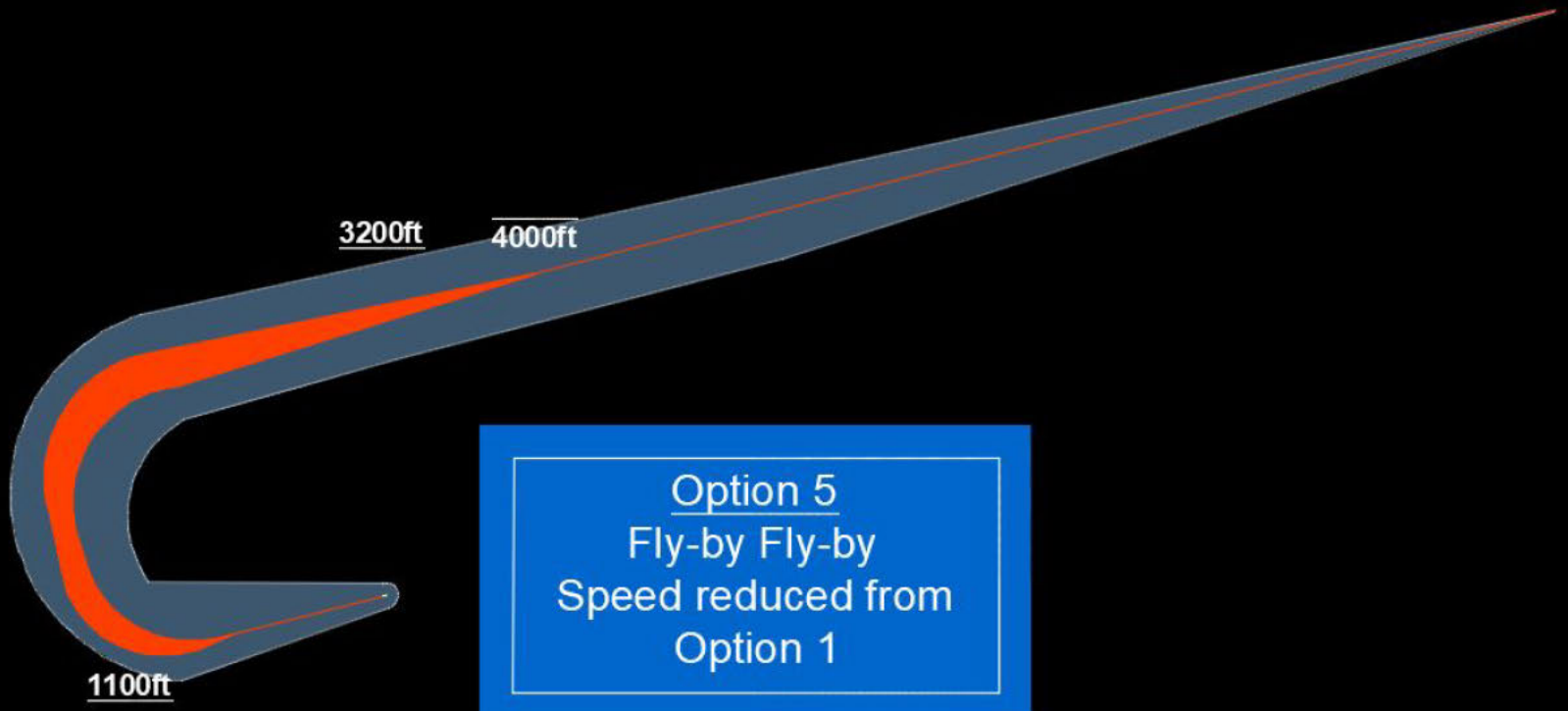
Option 3 – Apparent Dispersion Late in Turn



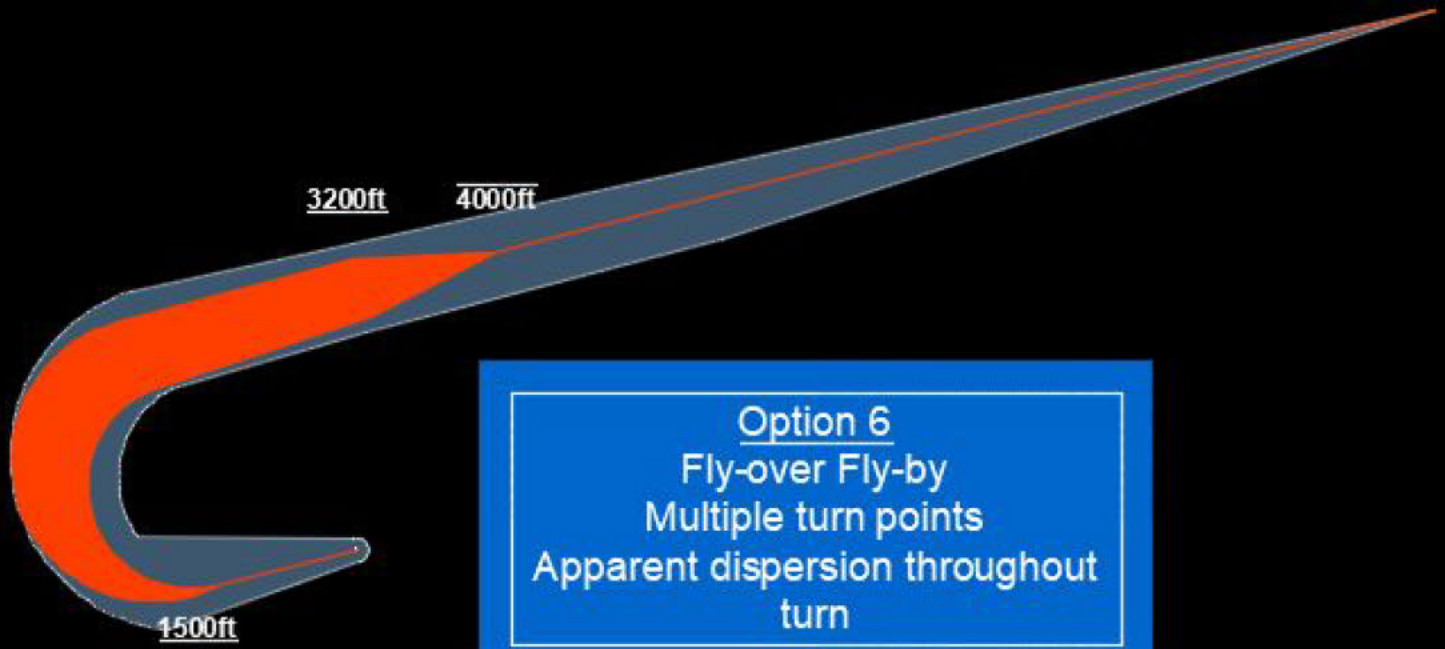
Option 4 – Multiple Initial Turn Waypoints



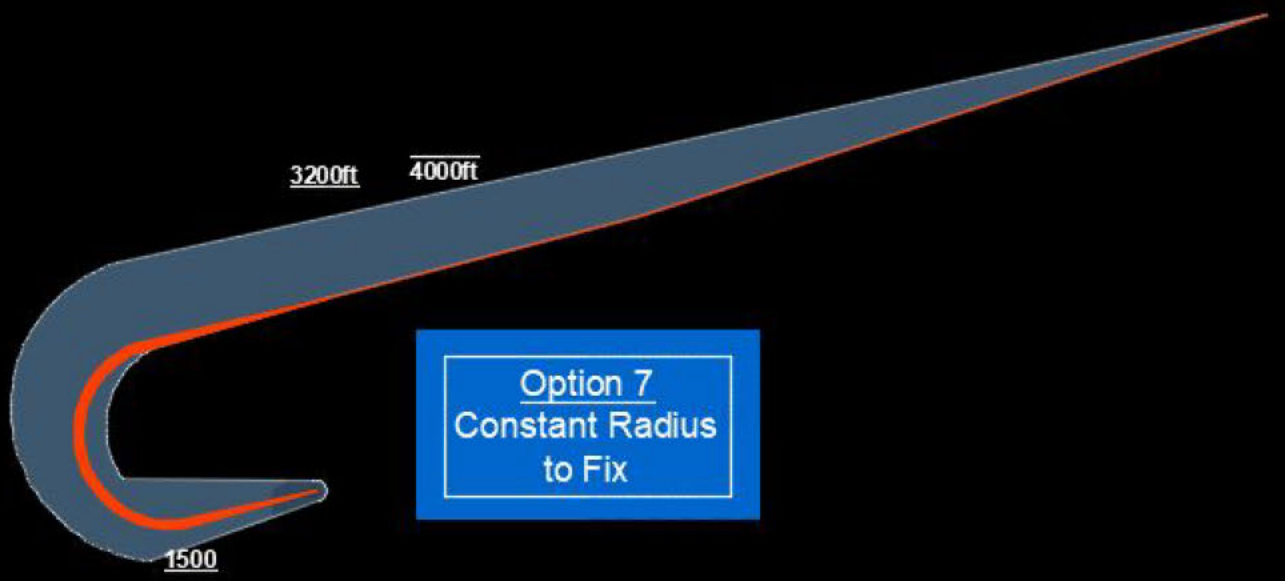
Option 5 – Two 90° Turns (Lower Speed)



Option 6 – Multiple Initial Turn Points and Multiple Points Following Turn



Option 7 – Tracks Concentrated in Turn



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Next Steps

Stage 2 - Next Steps

Step 2A

- Share draft design options with key stakeholders …..
- Draft detailed design options (next event end Nov)
- Complete Design Principles Evaluation (DPE) document
- Publish draft design options and DPE on CAA portal

Step 2B

- Complete Initial Options Appraisal (qualitative)
- Publish Initial Options Appraisal on CAA portal
- Gateway (DEVELOP & ASSESS) marks end Stage 2 (31 Jan 20)

Consultation preparation Q2 20

Consultation date TBC

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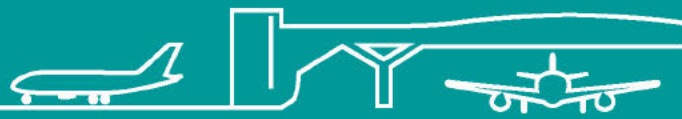
Final comments or questions?



Your feedback is requested by 13 Dec 19

LGWairspace.Rte4@gatwickairport.com

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Gatwick Route 4

Redesign of RNAV Standard Instrument Departures

Second Design Options Focus Group

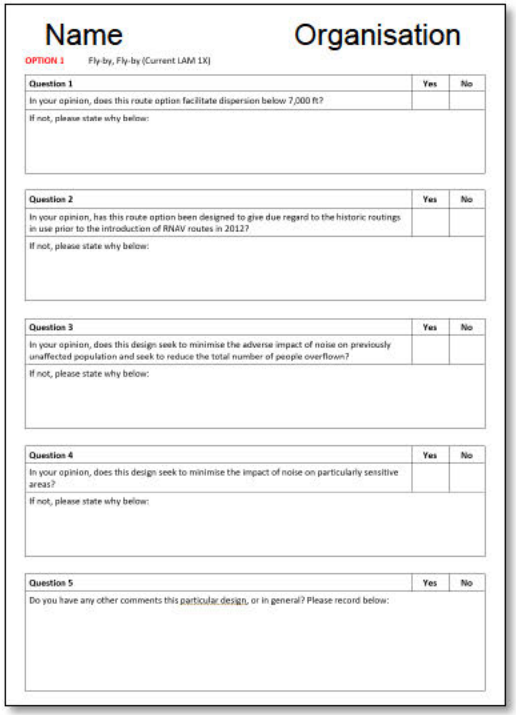
21st November 2019

Agenda - Session 1

- Objectives & Progress/ Recap
- Reminder of Options (Map)
- Coffee Break

Agenda - Session 2

- Return from coffee
- Each option depicted on large map on table
- Facilitator each table
- Move between tables
- Discuss issues with us
- Record Views
- After event feedback by 13th Dec



Name Organisation

OPTION 1 Fly-by, Fly-by (Current LAM 1X)

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:		

Route 4 Airspace Change - Objectives

- Improve further, where practicable, aircraft & 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
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Focus Group Engagement

- When making your points please state your name/ organisation
- If something is unclear please ask
- We recognise you may have strong opinions, but please be considerate and allow others time to share their views
- Please respect diverse or conflicting opinions
- Views welcomed on design options, please ensure these are captured on our maps or by our team

Current Stage 2 Workstreams

Step 2A - Options Development

- Develop comprehensive list of options
- Draft Design Principles Evaluation

Step 2B - Initial Options Appraisal

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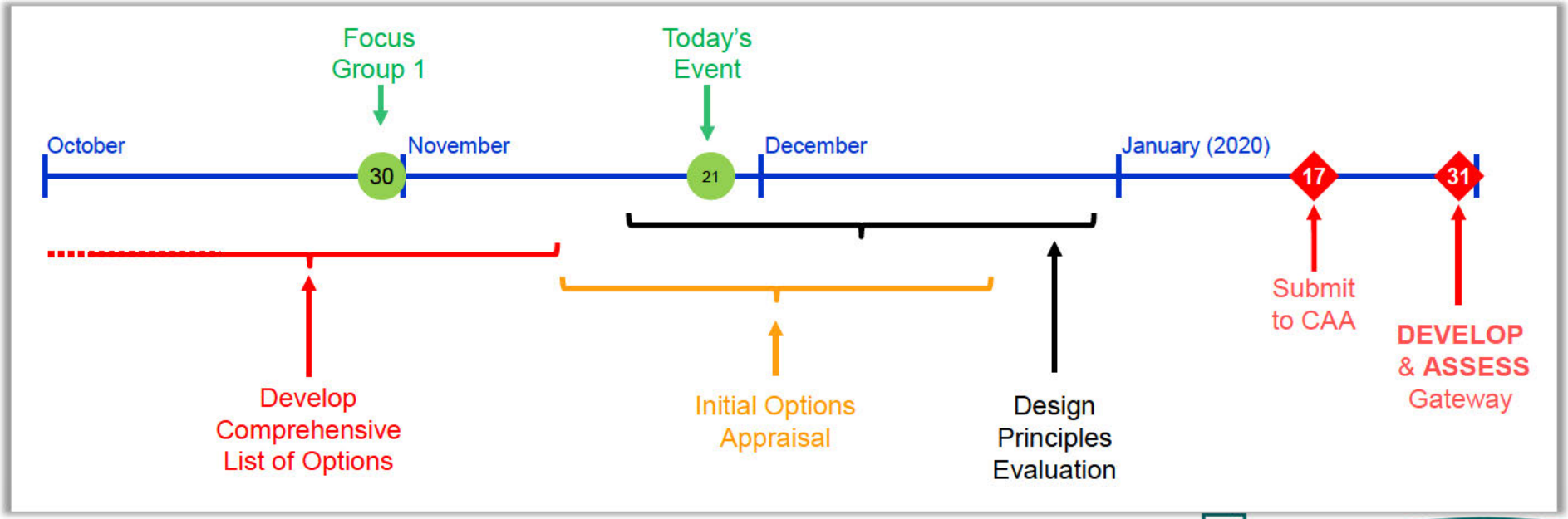

First Focus Group - 30 Oct

- Introduction
- Objectives (ACP & Focus Group)
- Route 4 overview
- Progress as at 30 Oct
- Review of design principles
- Design aims & challenges
- Comprehensive list of design options (unsupported)
- Design Options against design envelope
- Next Steps

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Potential Design Options

Clarify Definitions

- Design Envelope
- Performance-Based Navigation (PBN) route
- Noise Preferential Route (NPR)
- Swathe
- Design Options

Noise Preferential Routes

The NPRs at Gatwick are designated and overseen by the Secretary of State for Transport (not the CAA), and were designed to avoid the overflight of built-up areas where possible. They set a path for the aircraft to take from the runway until they reach the main UK air traffic routes.

Each NPR is contained in a corridor extending 1.5 km either side of the NPR centre line. Aircraft flying inside this corridor are considered to be flying on-track.

Once an aircraft reaches the NPR release altitude (typically 4,000 feet), a controller can instruct it to turn onto a more direct heading to its destination, which may take the aircraft outside the NPR corridor - this is called vectoring. There may be occasions where it is necessary for safety reasons (e.g. to avoid severe weather conditions) to vector aircraft off NPRs below the release altitude.

Any change to the dimensions of NPRs would require the approval of the Secretary of State for Transport.

Comprehensive List - Unsupported

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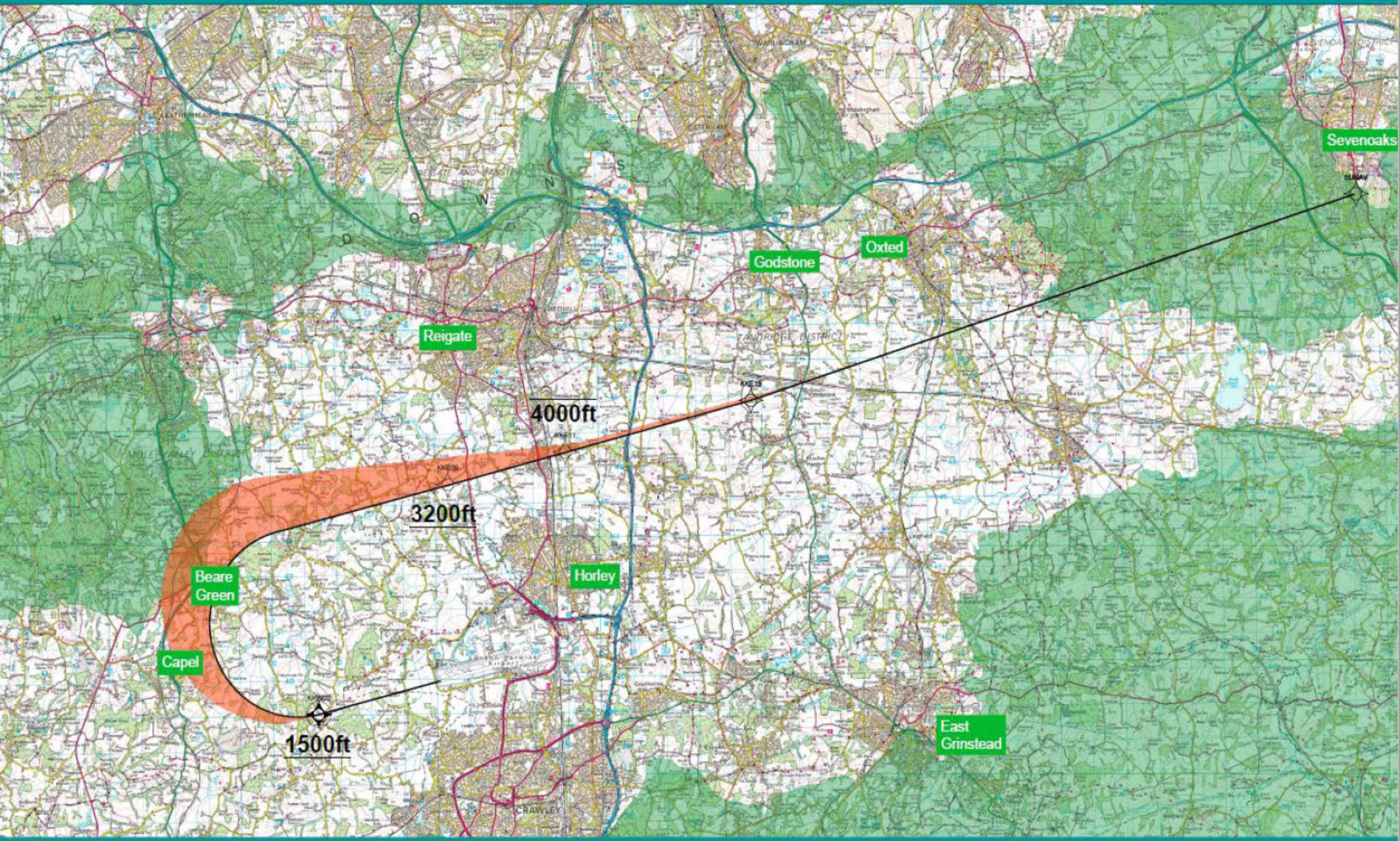
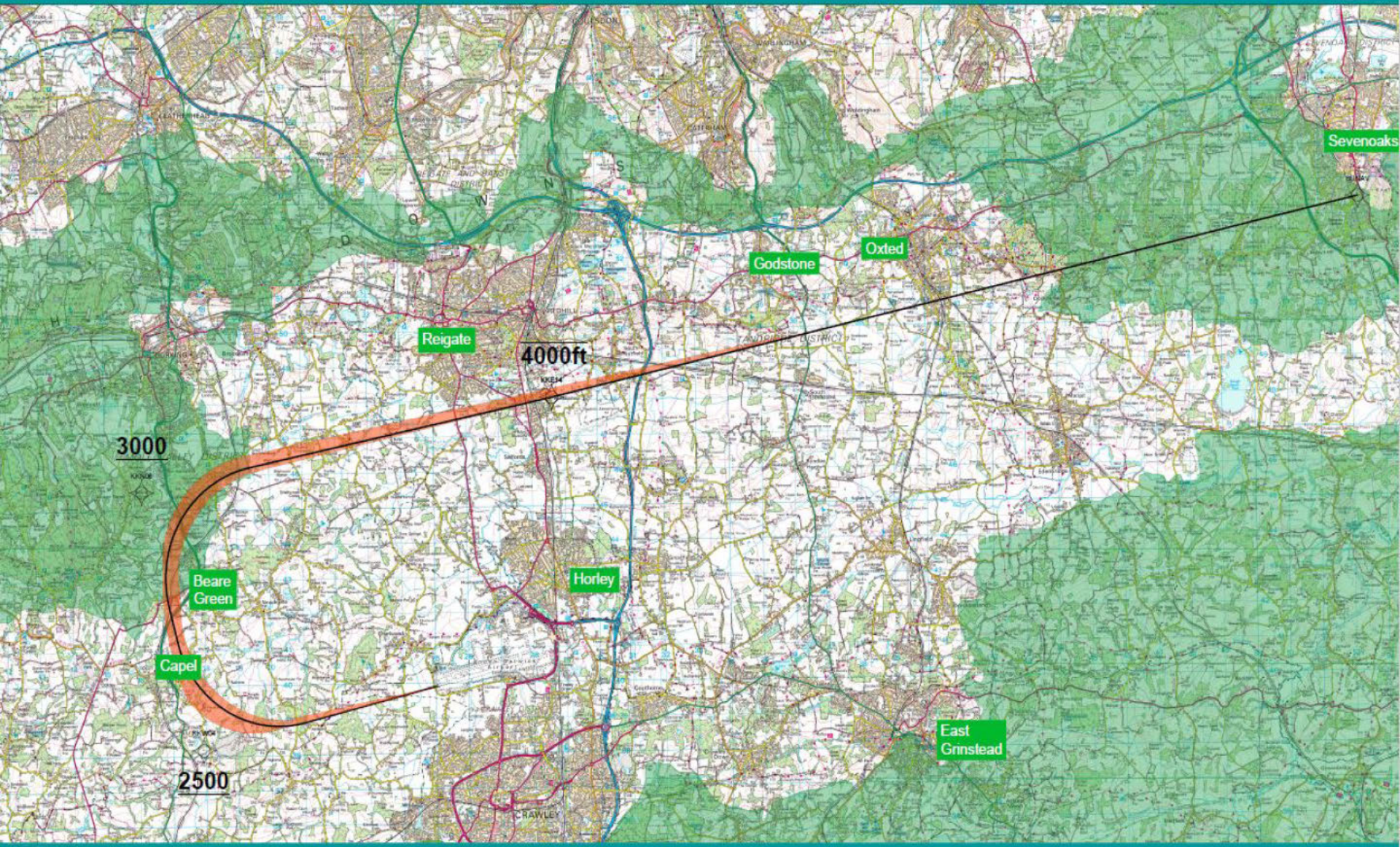
4	Fly-over, Fly-by	Multiple turn points
5	Fly-by, Fly-by	Speed reduced from Option 1
6	Fly-over, Fly-by	Multiple turn points plus apparent dispersion
7	Constant Radius to Fix	Concentrated

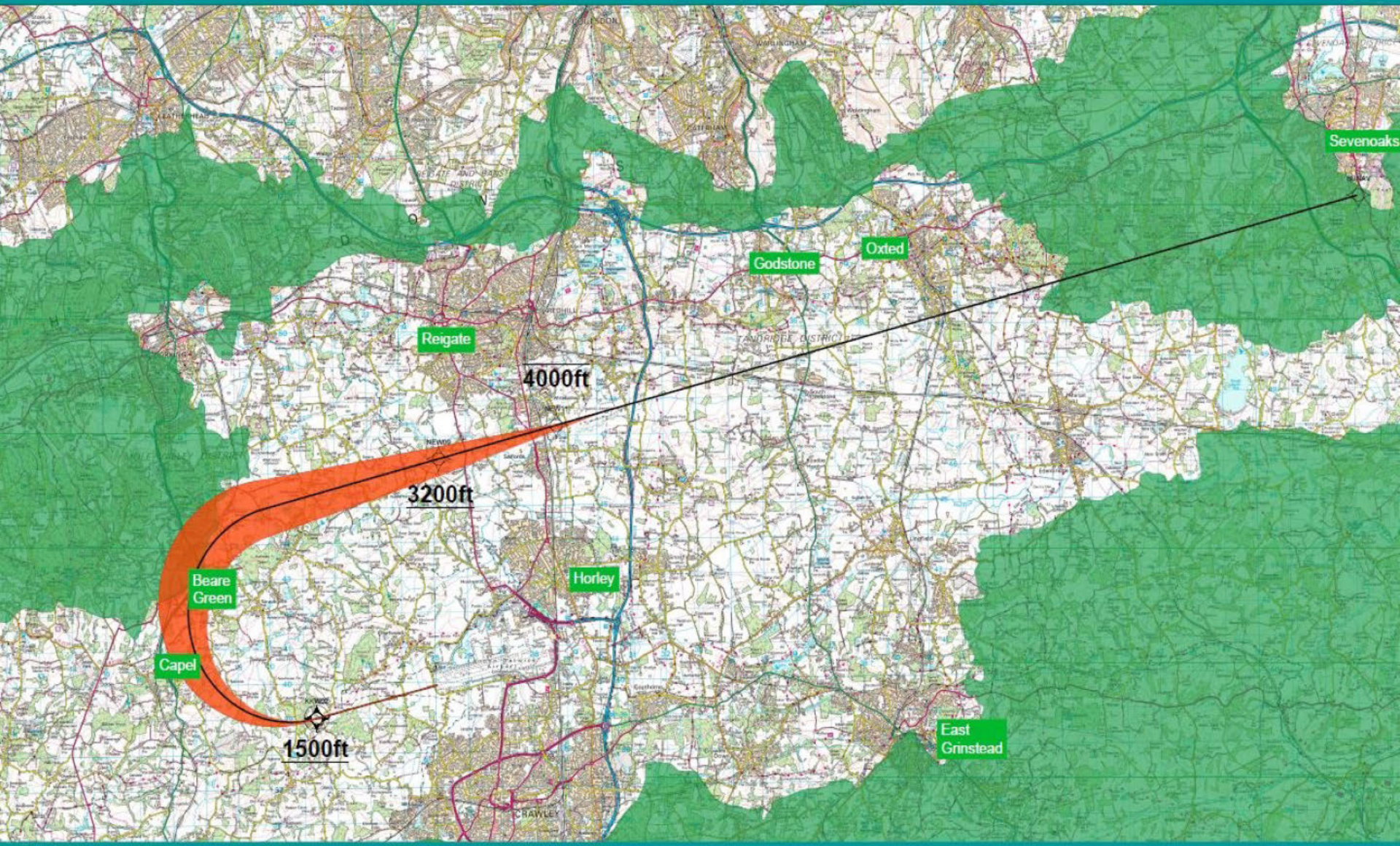
Option 0 Fly-Over Fly-by (Current LAM 2X)



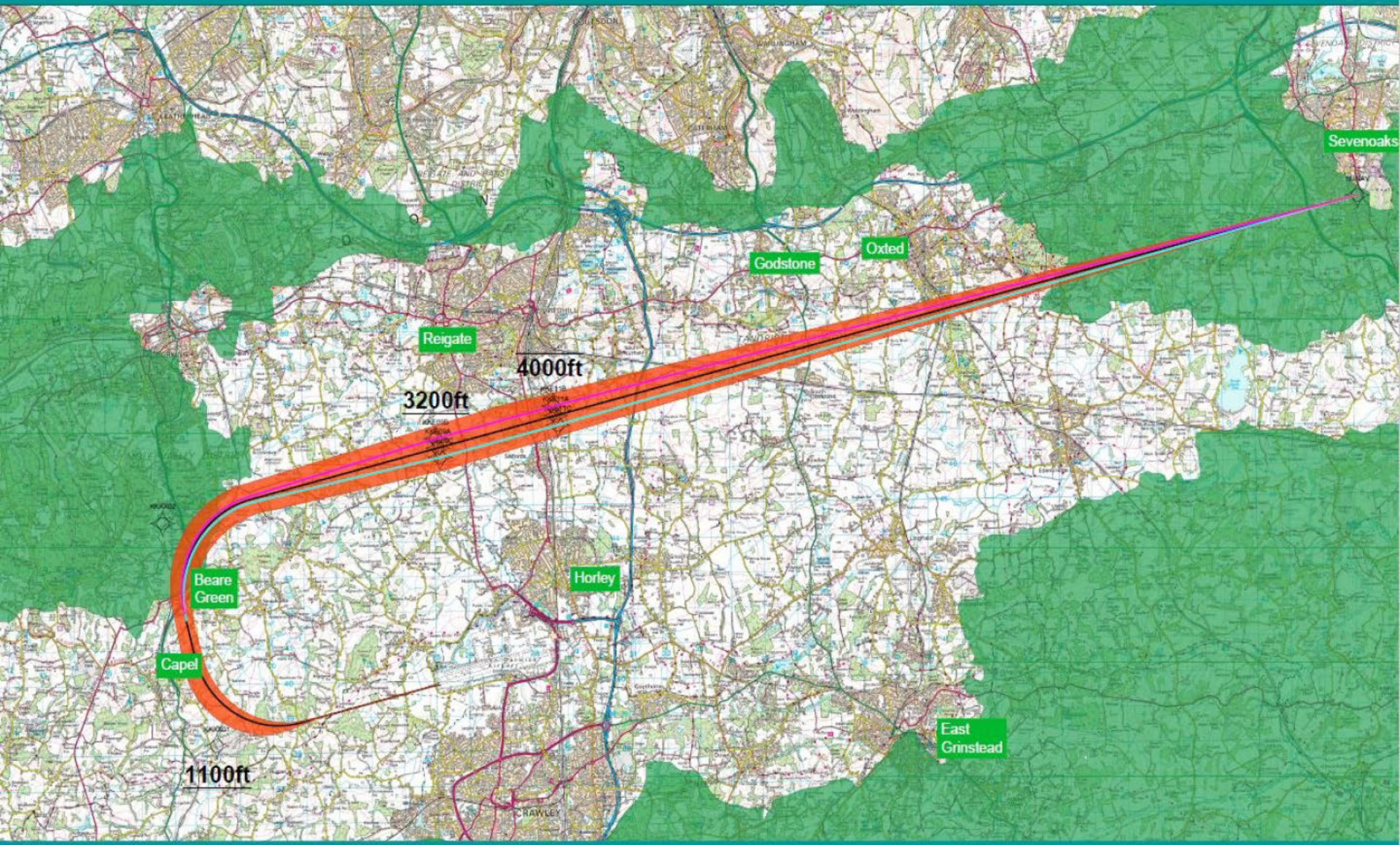
Option 1 Fly-by Fly-by (LAM 1X)



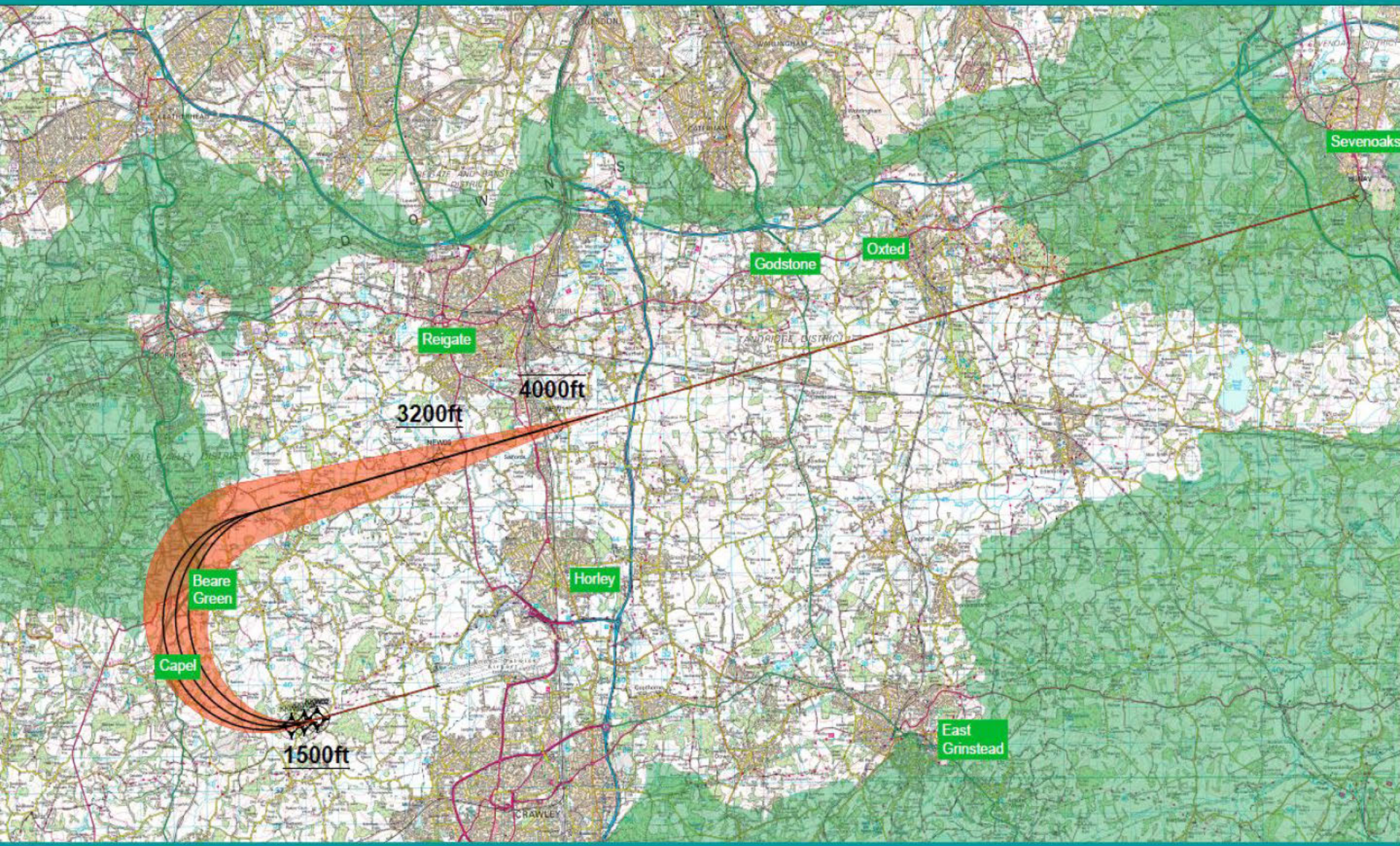
Option 2 Fly-over Fly-by (LAM 2X) Direct SUNAV



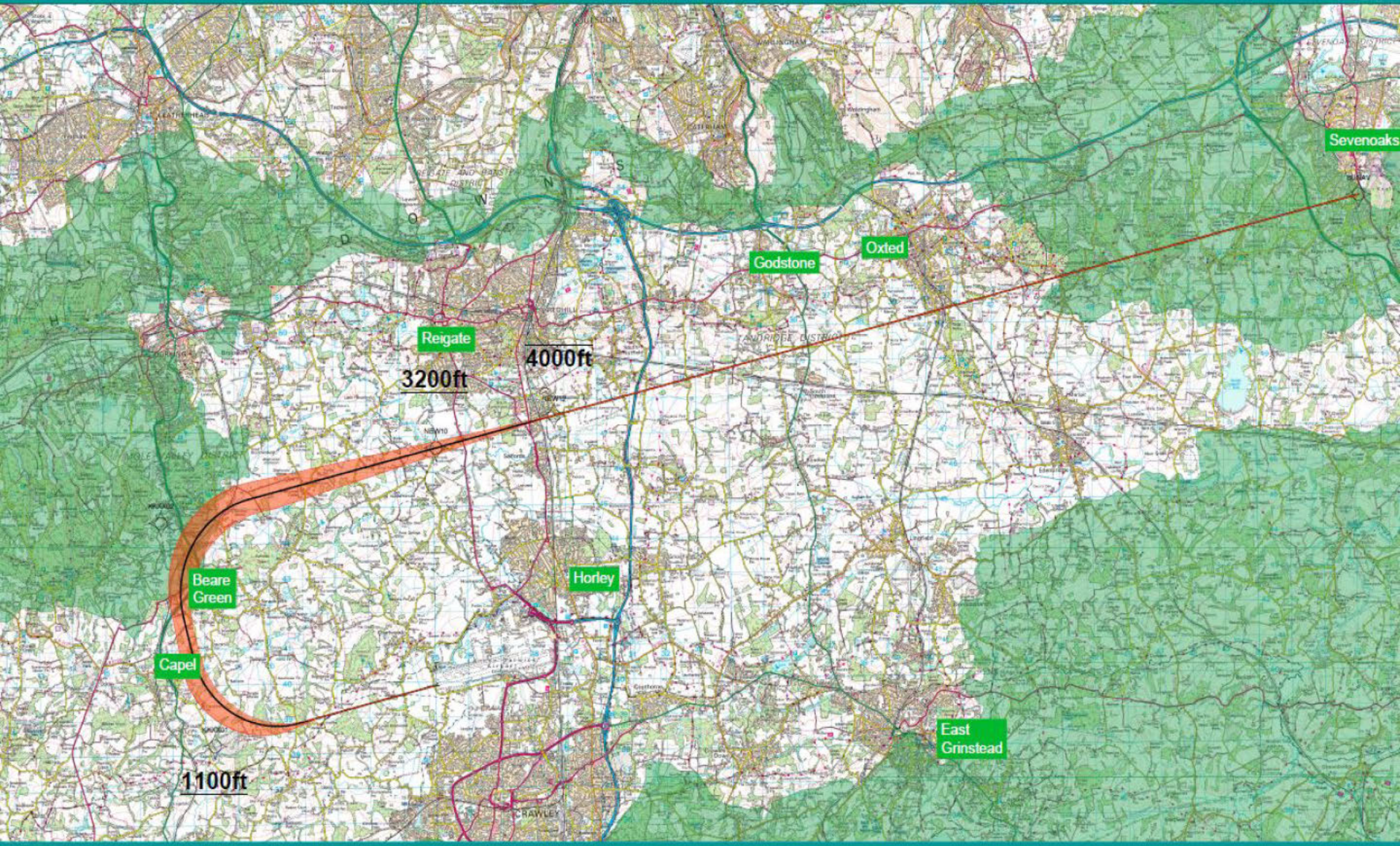
Option 3 Fly-by Fly-by (Apparent Dispersion Late in Turn)



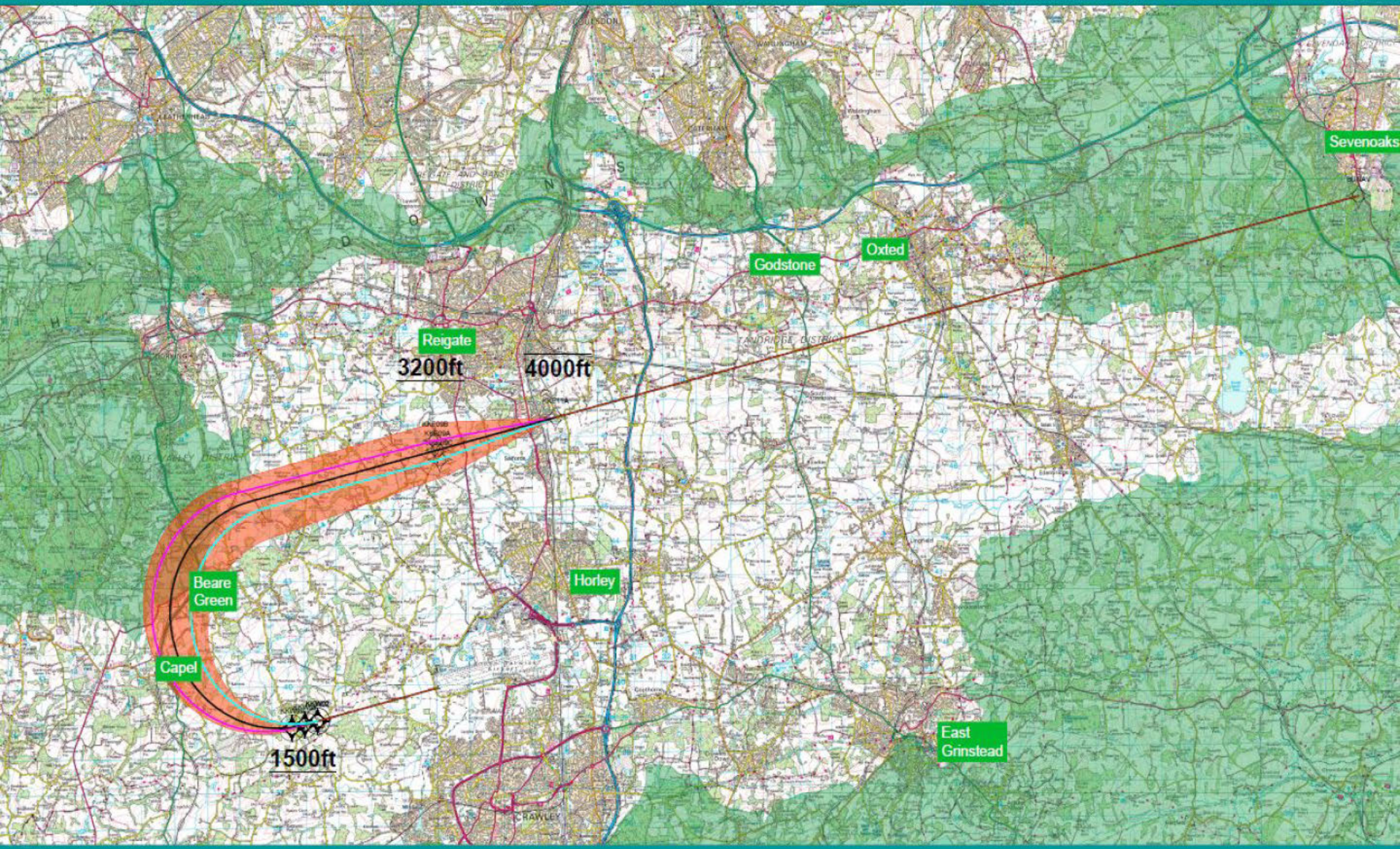
Option 4 Fly-over Fly-by (Multiple Initial Turn Points)



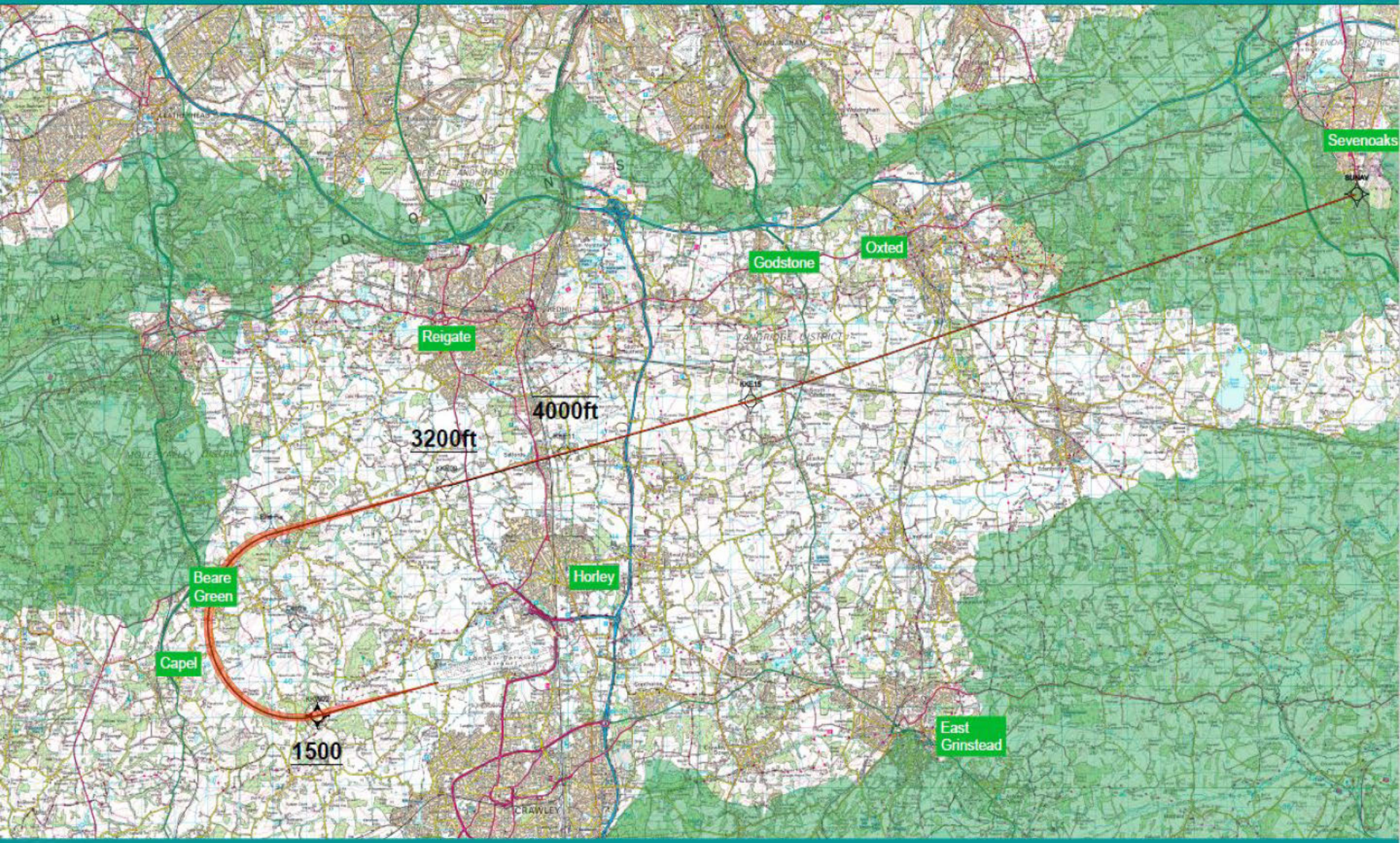
Option 5 Fly-by Fly-by (Lower Speed Vs Option 1)



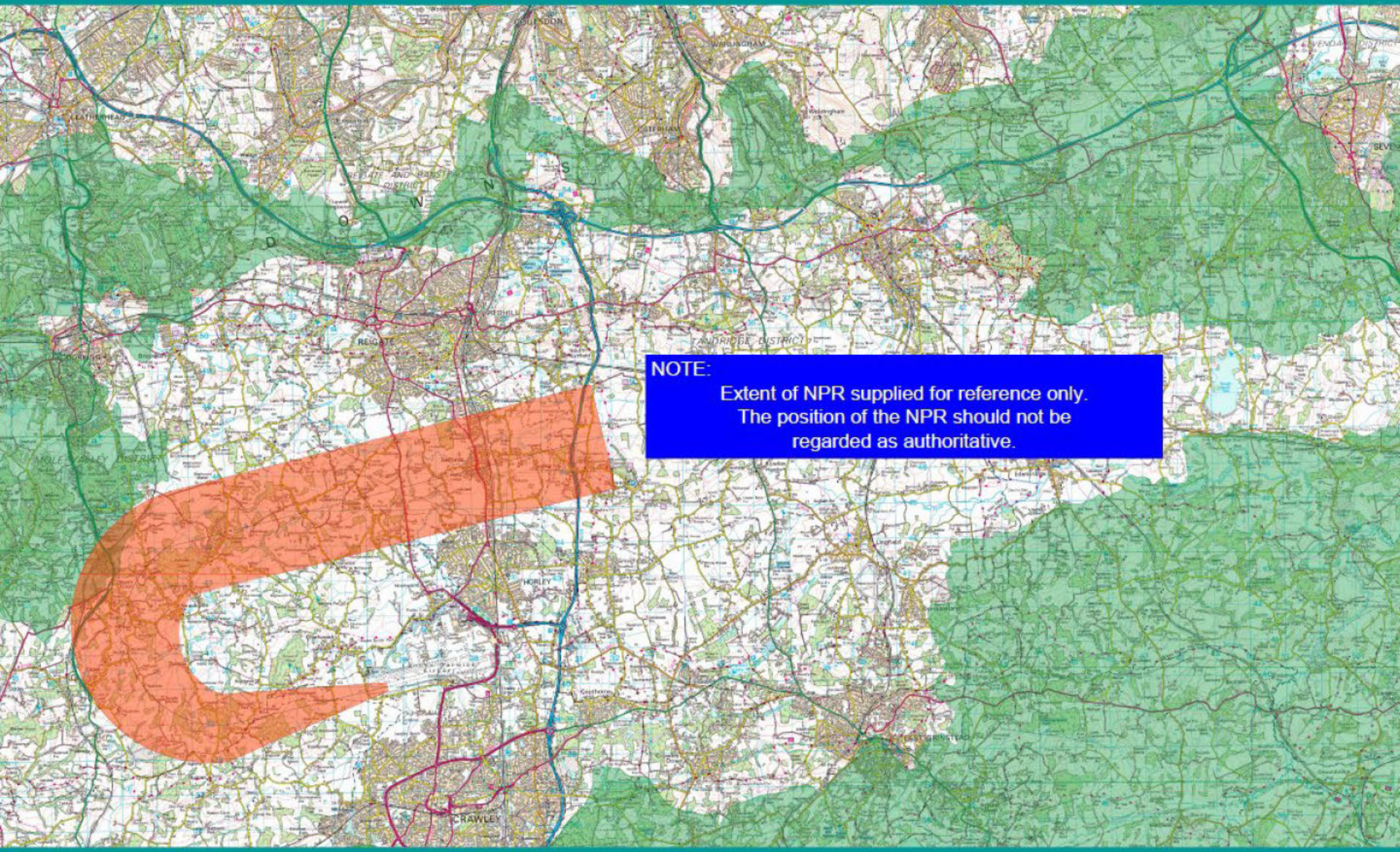
Option 6 Fly-over Fly-by (Multiple Initial and Turn Points)



Option 7 Constant Radius to Fix (Tracks Concentrated)



Noise Preferential Route (NPR)



Your Opinions on the Design Options

- Options 0-7 are individually displayed on maps on tables
- On another table, an Ordnance Survey Map, with acetate overlays show each route for comparison
- Places of interest (from your perspective) such as schools, churches etc can be highlighted by you
- Please ensure your opinion is captured, either on maps or by our team

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Final comments or questions?