FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Farnborough Airport FASI-S ACP

Stage 2 Stakeholder Engagement (2nd round)

Summary of previous feedback received

Provision of more detail in response to that feedback

Summary of the initial Design Principle Evaluation

May 2024

DISCLAIMER:

The information contained within this document is provided to facilitate discussions with Farnborough Airport for you to provide preliminary feedback on our developing proposals. The incomplete and preliminary nature of the information should be recognised when reviewing this material.

All route options are shown for discussion only and do not reflect a final Farnborough Airport Limited view.

This information is intended for your sole purpose and should not be shared outside your organisation or with any third party without the permission of Farnborough Airport Limited.

Farnborough Airport will submit a formal Stage 2 submission that will be publicly available on the CAA Airspace Change Portal in 2024.

All options in this document are subject to change throughout the airspace change process as options are matured in detail and refined in accordance with safety requirements, design principles, appraisals, stakeholder engagement and consultation.

Glossary of Terms

FARNBOROUGH AIRPORT

Abbreviation	Description of Term
ACP	Airspace Change Proposal
ATM	Air Traffic Movement. An ATM is a single aircraft movement, an arrival or a departure.
CAS	Controlled Airspace. Airspace of defined dimensions within which air traffic control (ATC) services are provided.
CG	Climb Gradient. The assumed minimum gradient at which an aircraft is expected to climb away from the airport.
DPE	Design Principle Evaluation
EC	Electronic Conspicuity. An umbrella term for the technology that can help pilots, unmanned aircraft users and air traffic services be more aware of what is operating in surrounding airspace.
LTMA	London Terminal Manoeuvring Area. The designated area of controlled airspace surrounding the London airports, where there is a high volume of traffic.
PANS Ops	Procedures for Air Navigation Services – Aircraft Operations. These are the rules for designing arrival and departure procedures which airspace designers must adhere to.
PBN	Performance Based Navigation. Satellite based navigation for aircraft.
RNP-AR	Required Navigation Performance – Authorisation Required. A specific type of PBN procedure.
SIDs	Standard Instrument Departures. The departure profile an aircraft will fly on leaving the airport.
STARs	Standard Arrival Route. The arrival procedure an aircraft will follow to land at the airport.

Purpose of this engagement

FARNBOROUGH AIRPORT

Farnborough Airport would like to thank you for engaging on this Airspace Change Proposal.

This presentation aims to to provide additional information on our options, following on from the Stage 2A engagement, which took place between December 2023 – January 2024, in which we presented and asked for feedback on our comprehensive list of options.

Following analysis of the feedback we received, we found some recurring themes with responses requesting more information about our options, including clarity of vertical profiles.

We have taken this on board and have been working on additional information, which we can now share with you.

As a result of the information contained within this presentation, if you would like to amend or update any feedback you have previously submitted, please email fasi-s@farnboroughairport.com
Please provide feedback by Friday 7th June 2024

Re-cap - The Airspace Change Process

FARNBOROUGH AIRPORT

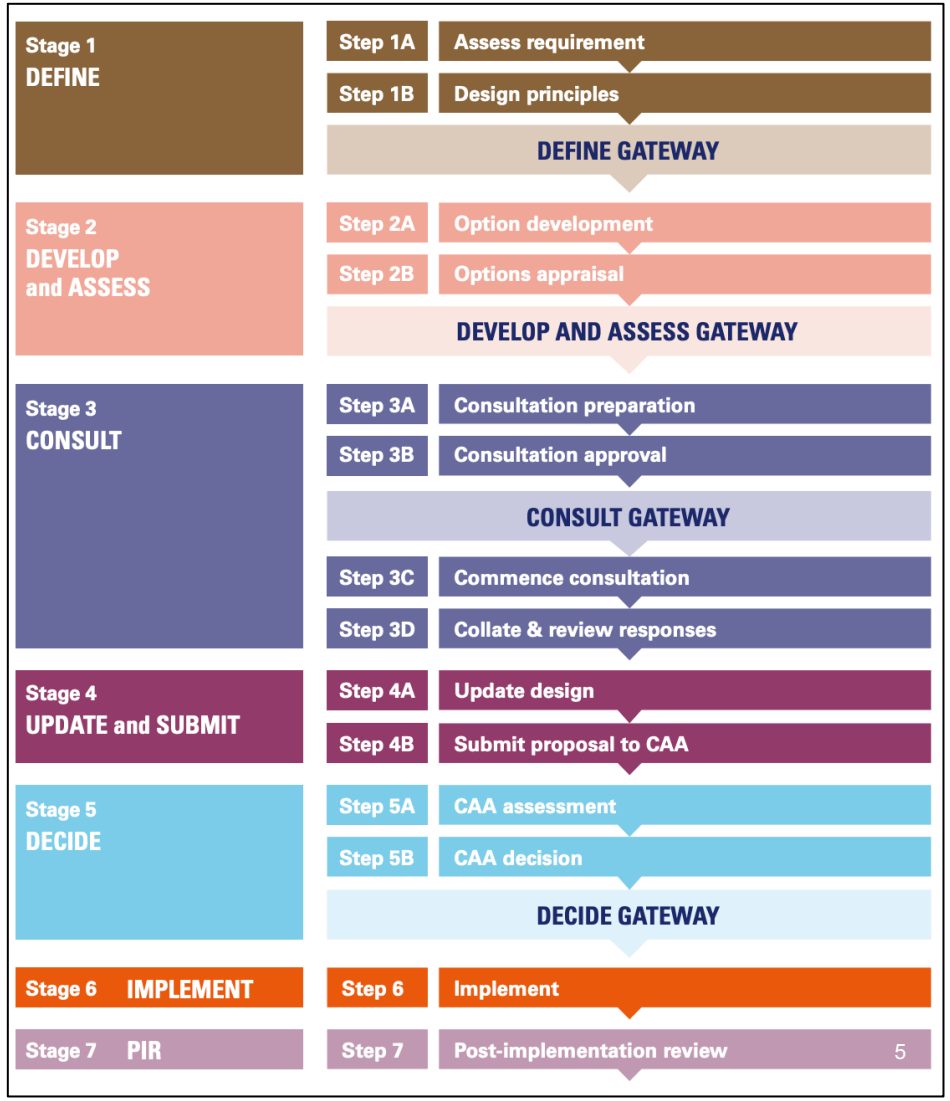
CAP1616

In June 2022, Farnborough Airport submitted a Statement of Need to the CAA, which began the formal airspace change process.

To carry out an airspace change proposal, airports must follow the CAA's guidance on the regulatory process for changing notified airspace design and planned and permanent redistribution of traffic, this is known as CAP1616.

CAP1616 is a 7-stage process which provides a framework for changing airspace and places significant importance on engaging a wide-range of stakeholders.

The CAA released an updated (5th) edition of CAP1616 at the end of October 2023. CAA have confirmed Farnborough will be assessed against **Edition 4** at the Stage 2 gateway.



Farnborough's Design Principles

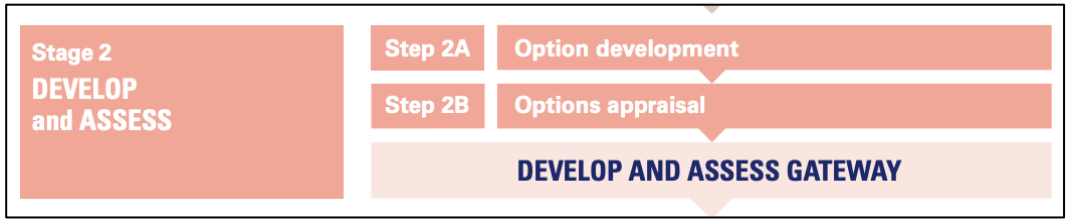
FARNBOROUGH AIRPORT

	Final Design Principles
1	Must be as safe or safer than today for all stakeholders that are affected by the airspace change* (*We will set out our methodology for assessing this in Stage 2 with a view to using data e.g. flight density plots outside CAS/Volume nm^3 of CAS, to support other qualitative assessments.)
2	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it, b) Air Navigation Guidance 2017 & other relevant policy and legislations
3	Shall not constrain the ability to meet forecast demand for Farnborough Airport
4	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise, b) a reduction in CO_2 emissions per flight from Farnborough aircraft, c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS, d) a reduction in the reliance on tactical intervention
5	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users
6	Where lateral changes to existing tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles, b) minimise population numbers newly overflown, c) avoid overflying the same communities with multiple routes to & from Farnborough Airport, d) avoid overflying the same communities with Farnborough's routes and those routes to & from other airports below 7000ft
7	Make best use of Farnborough's modern aircraft fleet capabilities
8	Ensure that Farnborough Clutch airways traffic can still be accommodated, as a result of the changes

Re-cap of CAP1616 Stage 2 Requirements

FARNBOROUGH AIRPORT

- Stage 2 is known as “Develop & Assess” and is split into two steps, Step 2A “Options Development” and Step 2B, “ Options Appraisal”.



- Farnborough Airport are in Step 2A, “Options Development”, where we are required to develop a comprehensive list of options that address the Statement of Need and that align with the Design Principles from Stage 1.
- Farnborough must then share those options with the same stakeholders who were engaged at Stage 1 and request their feedback. We did this in Dec 23 – Jan 24 however feedback from stakeholders requested more information. We are now responding to that request.
- We will then produce a Design Principle Evaluation (DPE) that sets out how each of our design options responds to the design principles. This presentation includes an initial summary of the extent to which we consider each option addresses the design principles.
- Following the DPE, Farnborough Airport then moves into Step 2B, Options Appraisal and carries out the first of 3 appraisals. This is called the Initial Options Appraisal (IOA).
- At this stage our design options will be assessed in more detail, against the criteria laid out in Edition 4 of CAP1616 Appendix E. The full DPE and IOA will in due course be uploaded to the CAA’s Airspace Change Portal.

Our Stage 2 progress so far

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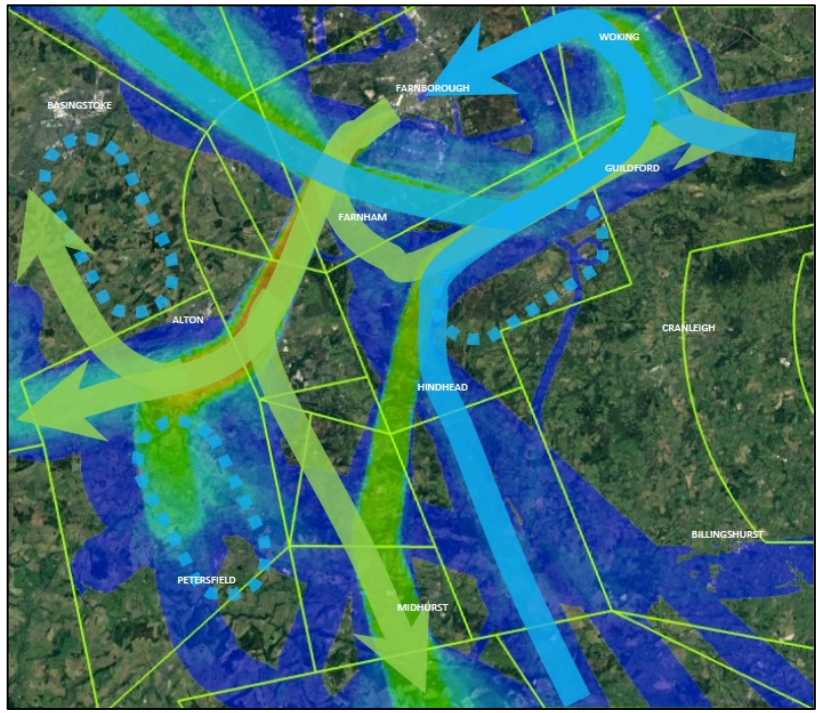
- In our previous engagement we summarised the first 2 steps of the CAA's Airspace Change Process and we:
  - Shared detailed information on the baseline scenario including forecast information out to 2040 which utilised information generated for Farnborough Airport's Planning Application to Rushmoor Borough Council, to increase the movement cap.
  - Explained how Farnborough Airport's flight paths are heavily constrained by flight paths to/from Heathrow and Gatwick and any changes to enhance these profiles are entirely dependent on the wider designs for the London Airspace.
  - Showed all the scenarios being investigated for initial viability.
  - Shared 5 system options comprised from components we considered to be technically viable at this stage, even though some of those options require changes to routes to/from adjacent airports. A system option is a group of easterly and westerly arrival and departure routes that can work in combination.
  - The image on the right, is a reminder, showing how we previously depicted the options.
  - In accordance with CAP1616 we then asked stakeholders for feedback, including if they felt our options were aligned with the Design Principles.



Response to Stakeholder Feedback Themes

The following table contains a very high-level summary of the key themes identified by stakeholders in the feedback we received as part of our Stage 2A engagement earlier this year.

The full feedback and our response to individual comments will form part of our Stage 2 submission, which will be submitted to the CAA and uploaded to the Airspace Change Portal later in 2024.

Response to Stakeholder Feedback Themes

FARNBOROUGH AIRPORT

Key Themes	Farnborough Response
Request for more information on vertical/horizontal dimensions of swathes and routes to better understand the options. The lack of information on potential vertical profiles meant it was difficult to give meaningful feedback. The options as presented alongside verbal explanation were understandable, but difficult to follow as a standalone presentation.	Owing to the dependencies on the changes required to the routes to/from adjacent airports combined with the general uncertainty with their designs, defining accurate profiles for Farnborough is extremely challenging. However, the following slides contain an estimate of what typical vertical profiles might be like with each option, based on some assumptions. These can then be compared to an existing 'average' profile for Farnborough's traffic flows. We have also provided separate images of westerly configurations, easterly configurations and combined easterly/westerly configurations.
Request for more information on options from adjacent airports and how they interact with Farnborough's options. Multiple comments that the options can't clearly be assessed against the design principles until there is a wider LTMA system design where the full picture can be understood.	There is still a great amount of uncertainty with all airports' options, as well as the wider network design. We agree that more detailed benefits and impacts cannot be defined until greater maturity of designs exists, which will not be until the Full Options Appraisal, in Stage 3 of the process, where dependent airspace change sponsor timelines are aligned into a combined consultation activity. Options will continue to mature in granularity and certainty as we progress through the CAP1616 process. At this stage (Stage 2) of the process, options are relatively immature, and we can only assess based on the information available at the time. CAA allow sponsors of interdependent proposals to progress through Stage 2 in isolation however by Stage 3, designs will need to be integrated and mature enough for Full Options Appraisal. Owing to the scale and complexity of the FASI programme, this is why many sponsors have carried forward multiple options into Stage 3. Following our Initial Options Appraisal (IOA) of our Stage 2 options, we anticipate we will be able to discontinue options that are clearly going to underperform against our design principles and the categories of impacts assessed within the IOA. Stakeholders can follow the progress of Heathrow (ACP-2021-056), Gatwick (ACP-2018-60) and Southampton's (ACP-2019-03) ACPs from the CAA Airspace Change Portal https://airspacechange.caa.co.uk/ This presentation includes an initial **summary** of our purely qualitative design principle evaluation (DPE). Owing to the qualitative nature of the DPE, it is unlikely that we will discount any options on the outcomes DPE alone. We expect to discount options and/or elements of options following analysis of quantitative data as part of the Initial Options Appraisal

Response to Stakeholder Feedback Themes

FARNBOROUGH AIRPORT

Key Themes	Farnborough Response
Concerns regarding contingency holds, location and potential levels from both a controlled airspace and noise perspective.	We have included a slide within this presentation on the potential minimum holding level of each hold in the locations posed so far. We have also indicated whether this could be expected to require a change to the base of Controlled Airspace.
Lack of clarity on exactly how Controlled Airspace would be affected by each option and therefore impact on Glass G operations and/or RAF Odiham operations.	As mentioned above, the lack of clarity on the wider airspace designs means that being exact about impacts, positive or negative, on controlled airspace is not possible at this stage. The volume of Farnborough's CAS requirements is directly dependent on the profiles of traffic to/from Heathrow and Gatwick airports. However, as committed to in Stage 1, we are using flight density plots of traffic patterns outside CAS, to support the qualitative assessments of our options at this stage. These flight density plots have been included within this presentation. To highlight an example of how we have used this information, in the DPE summary you'll see that options with a slightly longer RWY 06 approach have been assessed as only Partially Meeting DP1 and DP5 for the 'B' options, which all contain that component which would most likely require an extension of CAS to the west into an area of very high GA density.
Concerns about some options which would clearly overfly more people or more AONB or require more CAS. i.e. that they wouldn't meet the design principles	Our options were designed to explore multiple competing demands/principles i.e. improved operational performance, a reduction in population numbers affected by noise, a reduction in CO_2 emissions per flight, a reduction in the volume of CAS, minimise overflight of AONBs and National Parks and so on. In airspace design, it is highly unlikely that a single option can address all these demands to the maximum extent. Therefore, the airspace design process seeks to enable sponsors to investigate a series of different options that meet each principle to a greater or lesser extent. It is inevitable that where one option may fully meet Principle X it may only partly meet Principle Y, and another option vice-versa. Our goal is to arrive at a final proposal that best balances the series of competing demands and in order to do that, options need to be created at the outset that may be undesirable against a single objective. As we progress through the Initial Appraisal (Stage 2), network integration, Full Options Appraisal, consultation (Stage 3) and refinement (stage 4), designs will be whittled down and/or merged to combine the optimal components of different options.

Response to Stakeholder Feedback Themes

FARNBOROUGH AIRPORT

The information presented on the following slides has been developed specifically to help address feedback from our engagement.

For each option, including Option 1 (Do Nothing) we have developed average profiles for each traffic flow within the option. For the Do Nothing option, this takes all the actual vertical profiles from a busy day and creates an average vertical profile for each traffic flow.

For Options 2 - 4 this average vertical profile is unchanged, but is just applied to a new centreline, where applicable.

For Option 5, the vertical profile is enhanced to what we consider could potentially be a realistic future profile but only with certain changes made for routes to/from Heathrow and Gatwick. This should be treated as an approximate indication only at this stage. Such profiles have been generated at the request of stakeholders and would not normally be produced at this stage of the process. The images assume all traffic remains on the flight path centrelines, in reality we would expect an element of ATC tactical invention (vectoring).

Images have been created to articulate some sub-options with subtle differences that we are considering. These are not new options, they were part of the set shared in December 2023, but we have broken them down to aid understanding as to the subtle variations under consideration. These are represented in the differences between Version A or Version B of an option.

We have also shared the outcomes of our initial DPE evaluation as well as information on Class G airspace usage heatmaps.

All options in this document are subject to change throughout the airspace change process as options are matured in detail and refined in accordance with safety requirements, design principles, appraisals, stakeholder engagement and consultation.

Guide to comparing options

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The options are presented with two slides per option.

The first slide of each option shows that option with an easterly configuration on the left and a westerly configuration on the right.

The second slide shows both easterly and westerly configurations combined. Whilst the airport can only operate in one configuration (easterly or westerly) at any one time, this slide is useful to begin to illustrate the overall impact of the airspace design. For example, you can see where an area may be overflown by departures in one configuration but arrivals in another.

The images have been produced in such a way that if you switch (toggle) between slides, you can see the differences in the option. For example, if you toggle between Slide 18 (Option 2A) and Slide 21 (Option 2B) and keep your eyes on the left-hand image, you can see how the departure route from Runway 06 changes between the options, as does the point at which arrivals to Runway 06 join final approach. This will be easier if you view the PDF with the thumbnail images open in the side bar.

To view the thumbnail images alongside the main images, click on this symbol on your PDF toolbar. 

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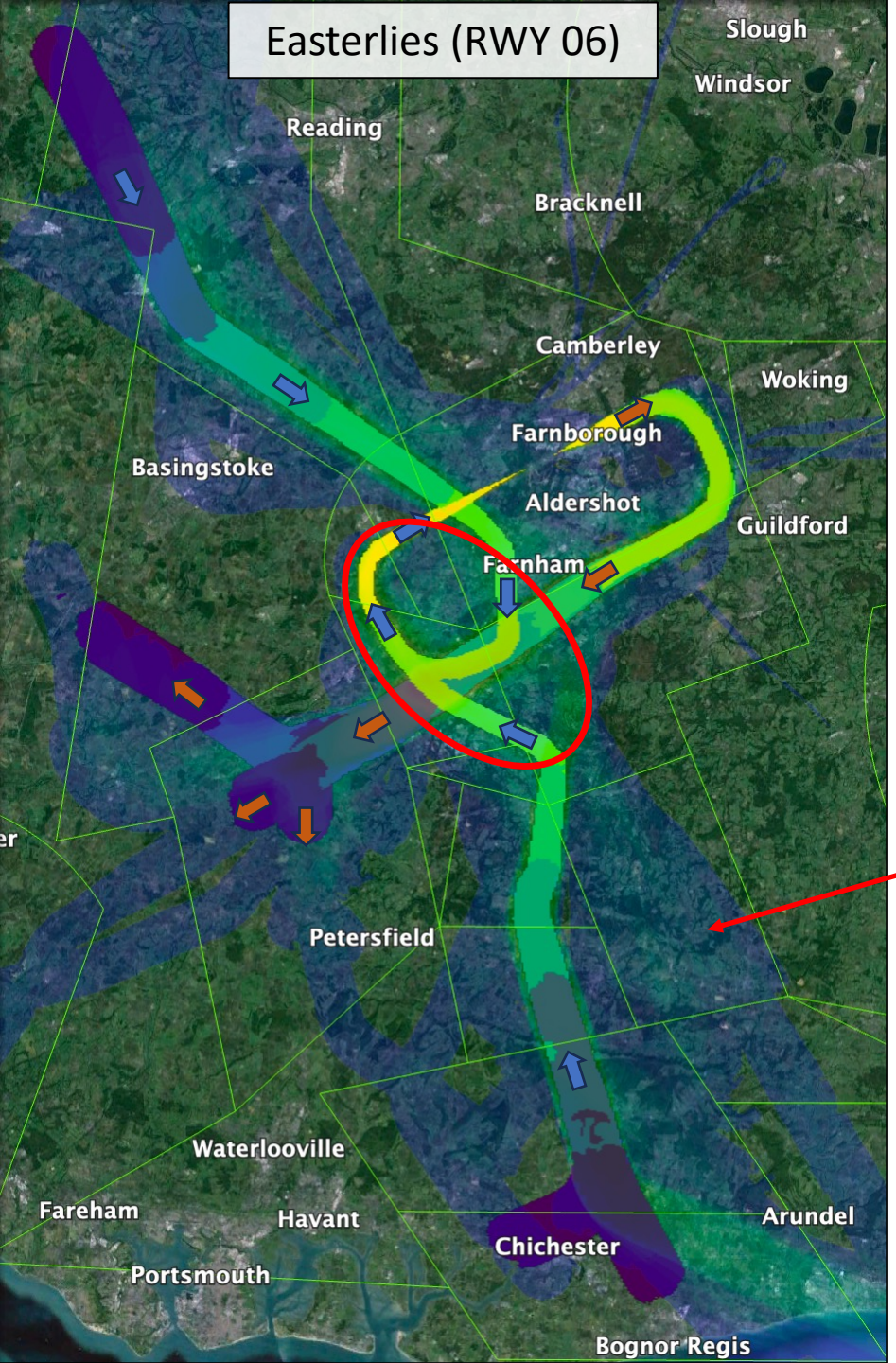
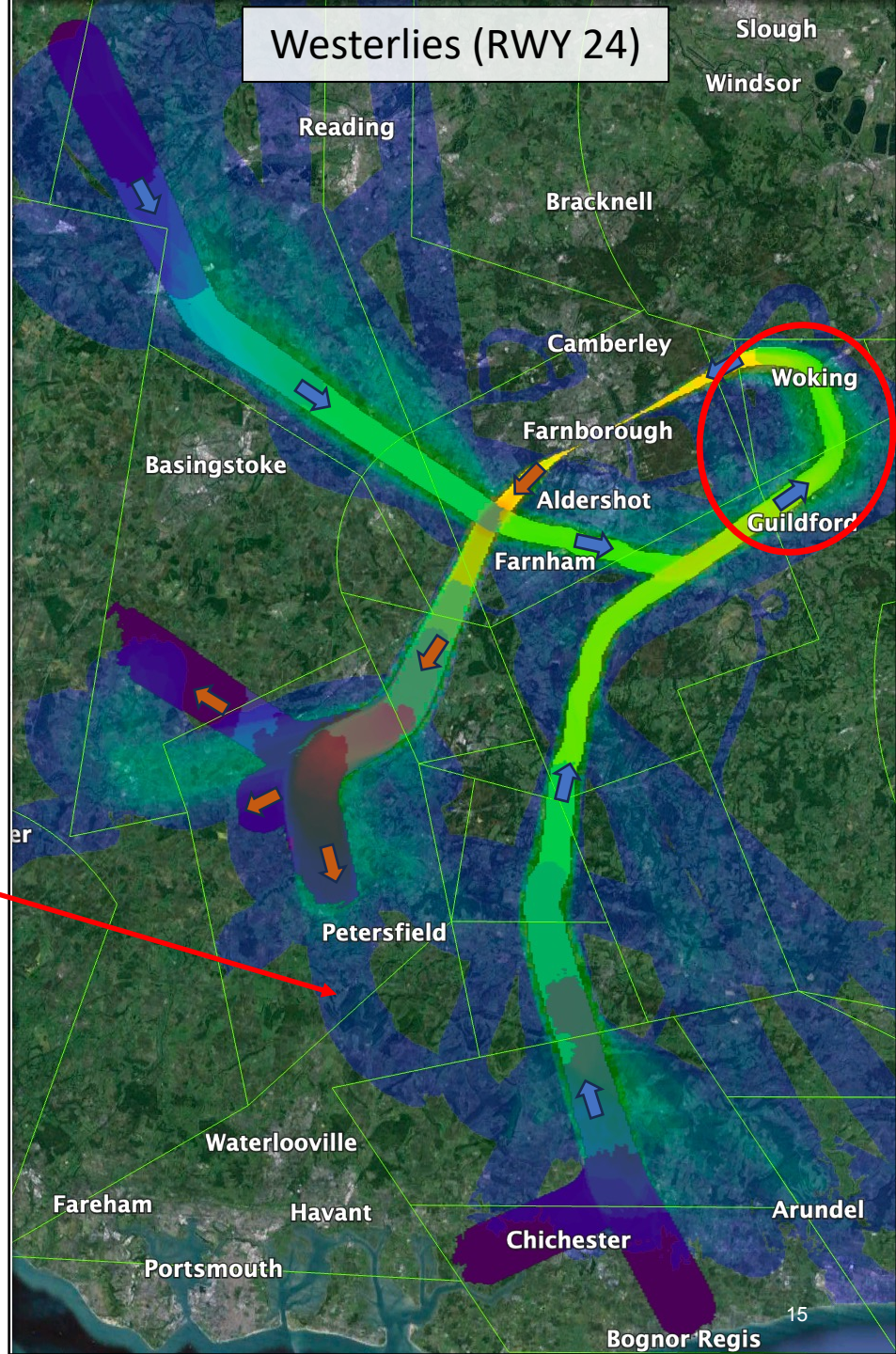
FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 1
(Do Nothing)

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 1 Baseline "Do Nothing"	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	DOES NOT MEET	MEETS

OPTON 1 (DO NOTHING)





Important:

The sections of arrival paths, circled in red, are not published routes for arriving aircraft. ATC have to manually vector aircraft in these portions of flight. The routes in these portions represent where the concentration of flights are, when being vectored.

Published route centrelines do exist for the portion of flight outside of these circles

Average vertical profiles created from all the traffic in the real sample, whether on the published centreline or not

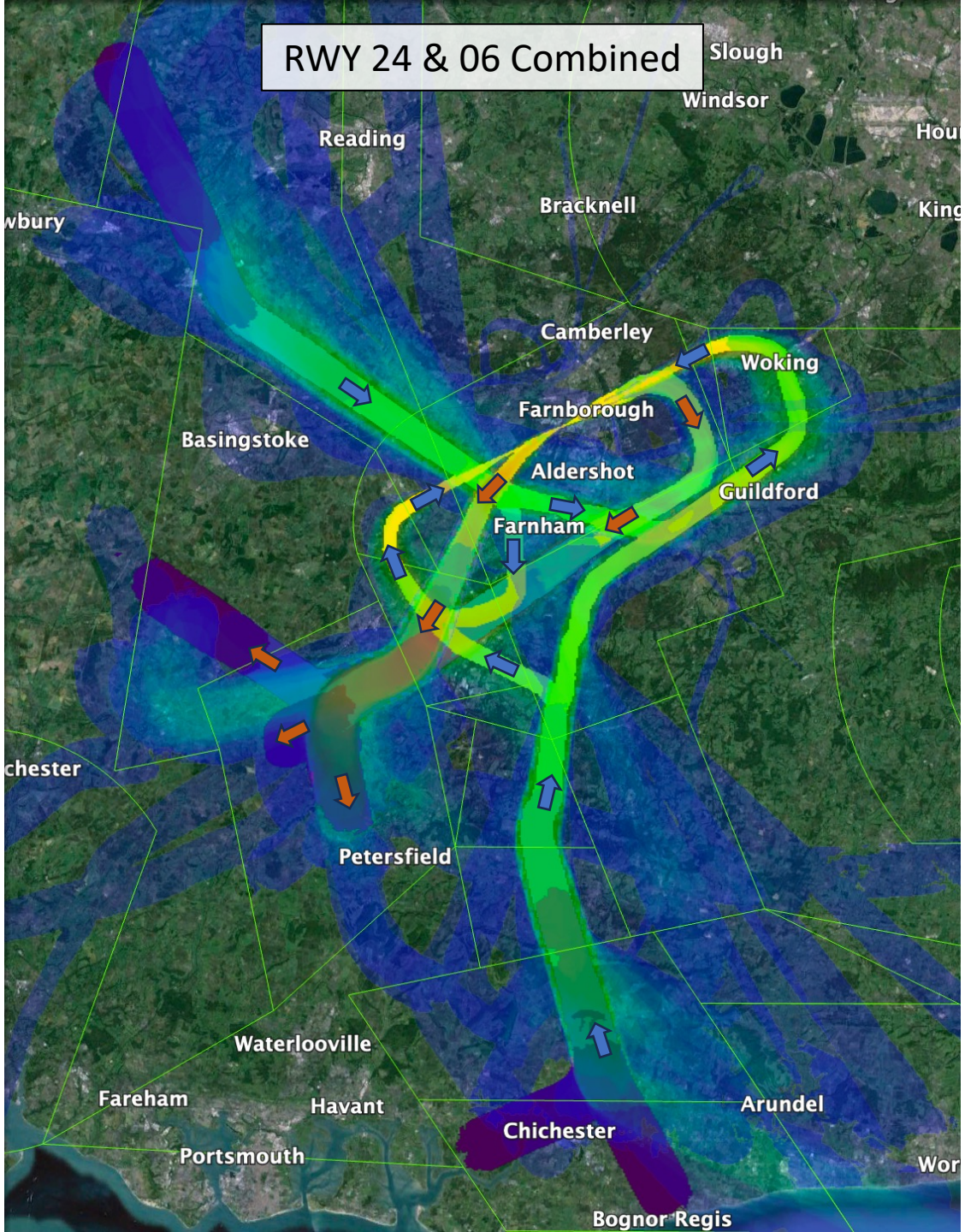
Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

Departure Direction

OPTON 1 (DO NOTHING) - System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

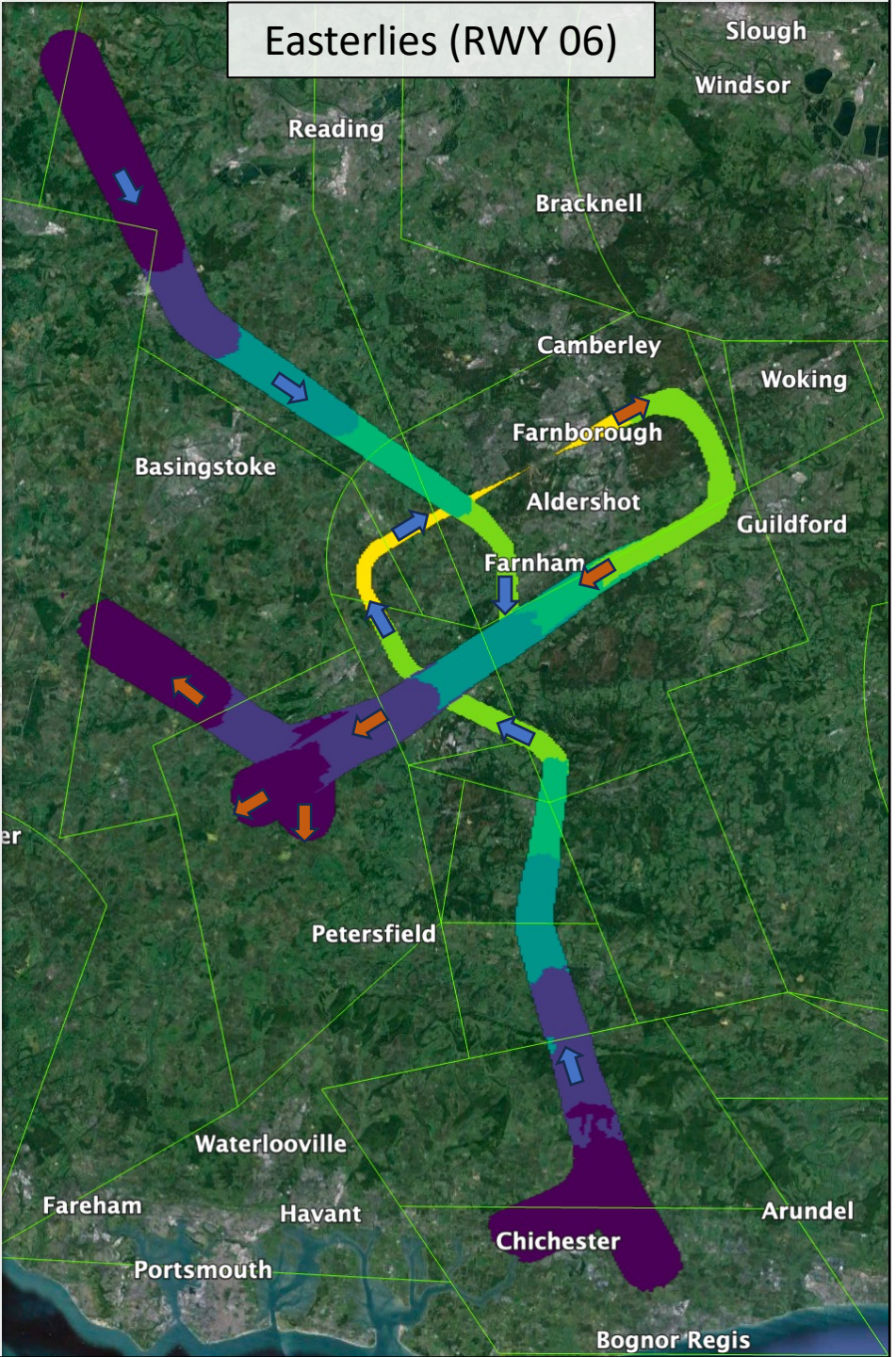
Departure Direction

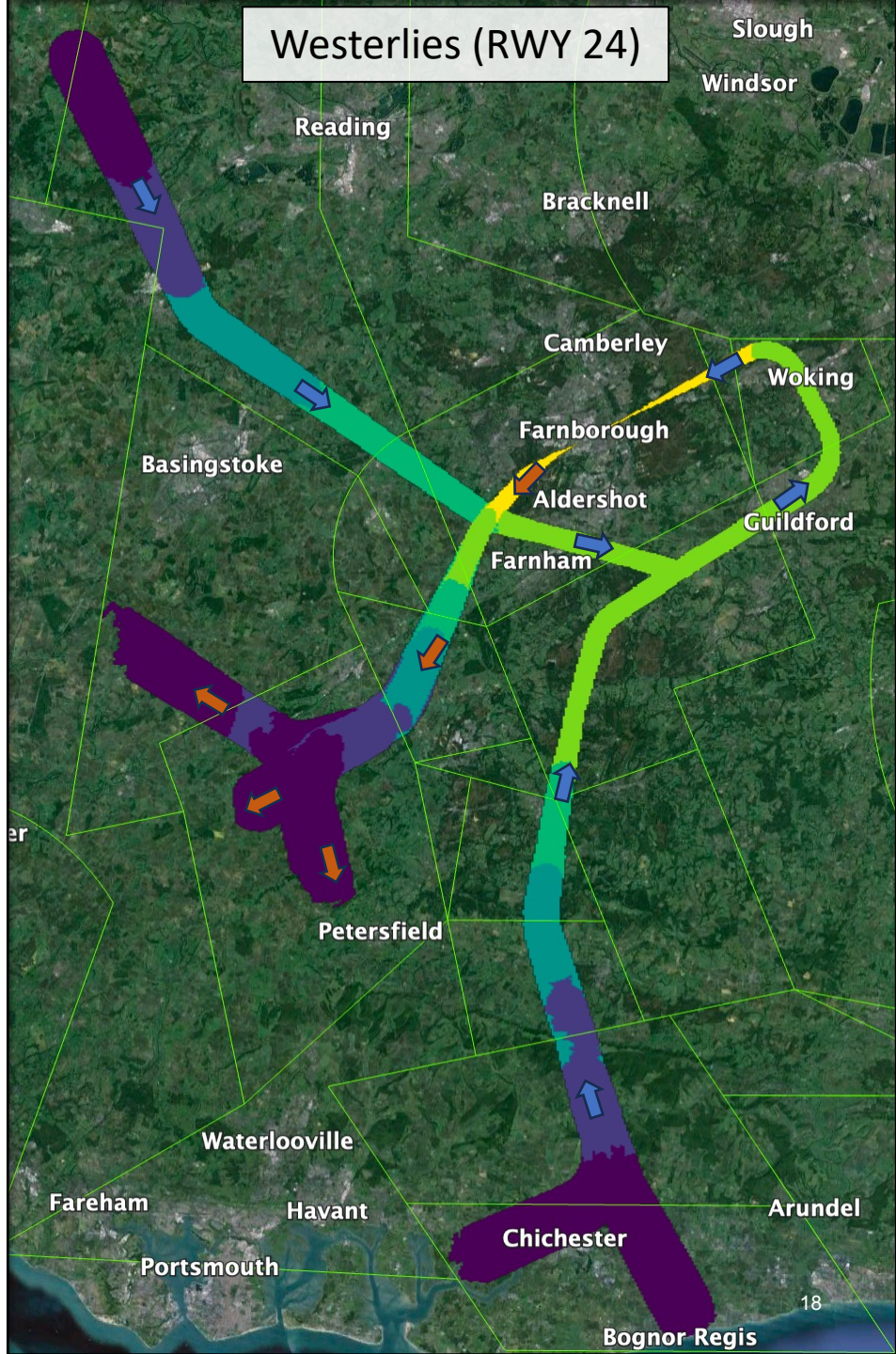
FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 2A

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 2A	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS

OPTION 2A





<u>Difference to Do Nothing</u>

- PBN arrival routes all the way to final approach (ILS only) to replicate what happens today as closely as possible

<u>Design Assumptions</u>

- Changes at adjacent airfields may enable some, but not significant improvements to Farnborough's profiles

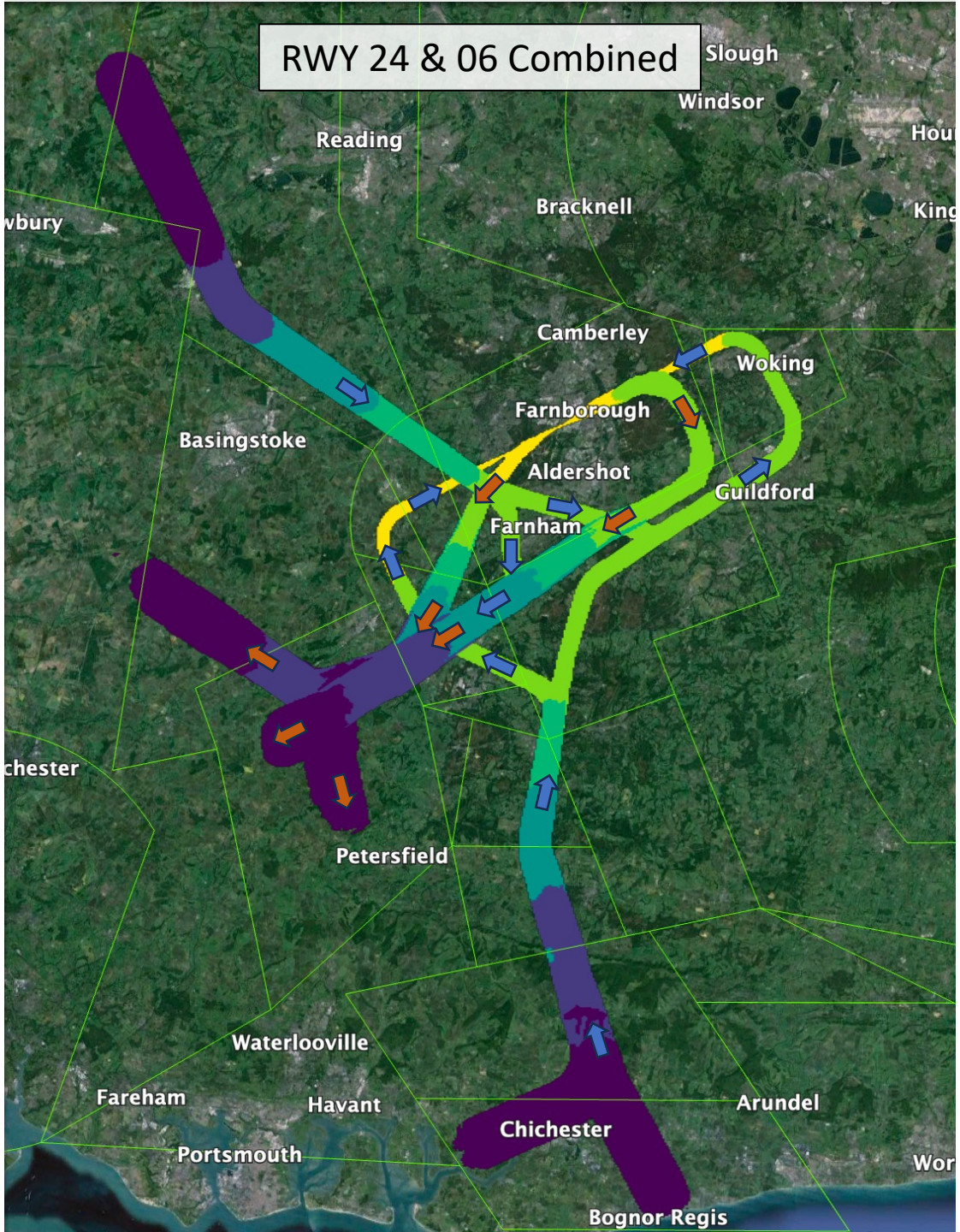
Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

Departure Direction

OPTON 2A System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

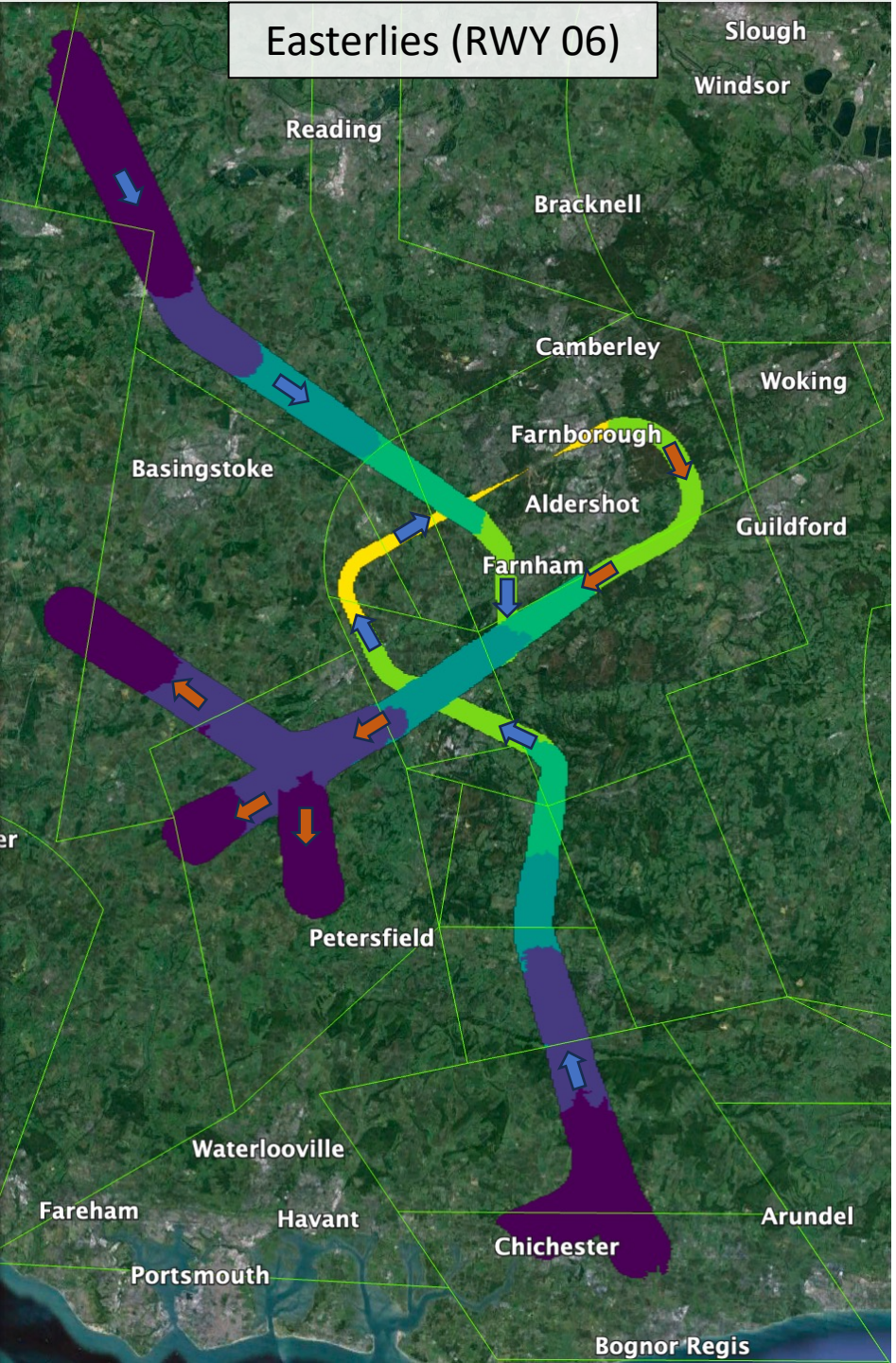
Arrival Direction

Departure Direction

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 2B

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 2B	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS



OPTION 2B

Difference to 2A

- PBN arrival routes all the way to final approach (ILS and RNP APCH*). **These would be slightly different to those in option 2A**

- RWY06 departure turns south earlier than today

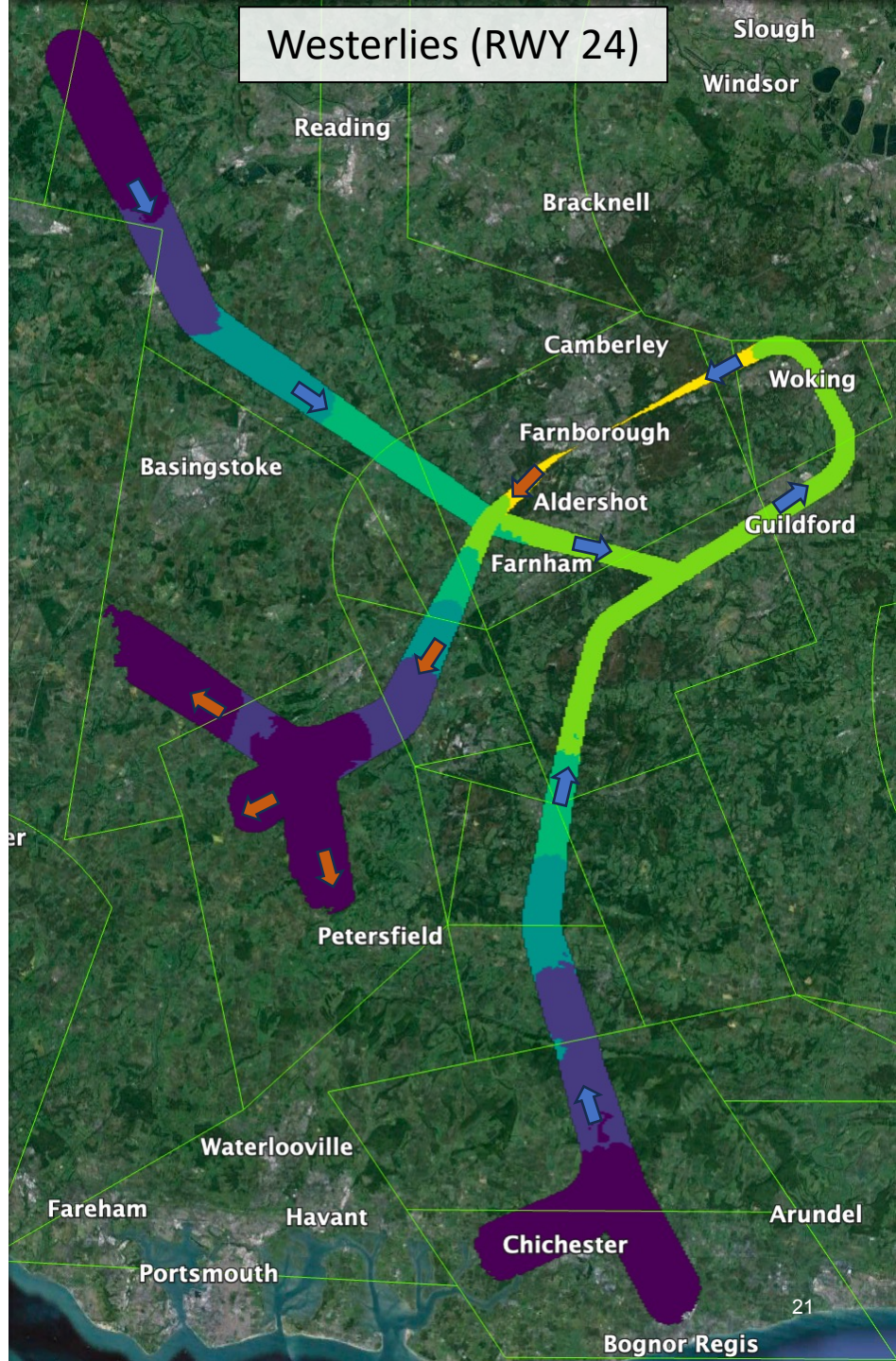
Design Assumptions

- Changes at adjacent airfields may enable some, but not significant improvements to Farnborough's profiles

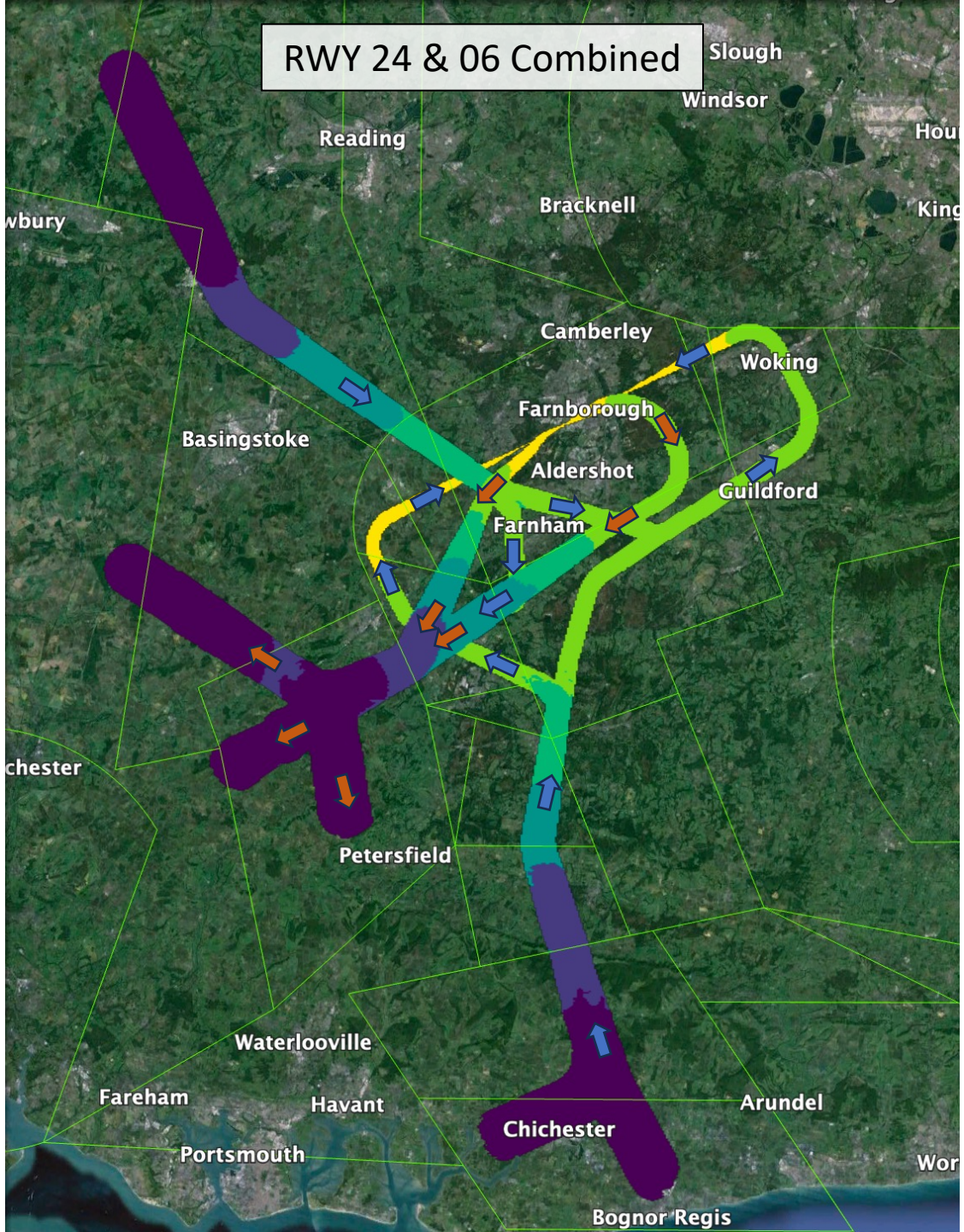
* 3.2˚ RNP APCH (ILS remains at 3.5˚)

Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+
- Arrival Direction
- Departure Direction



OPTON 2B System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

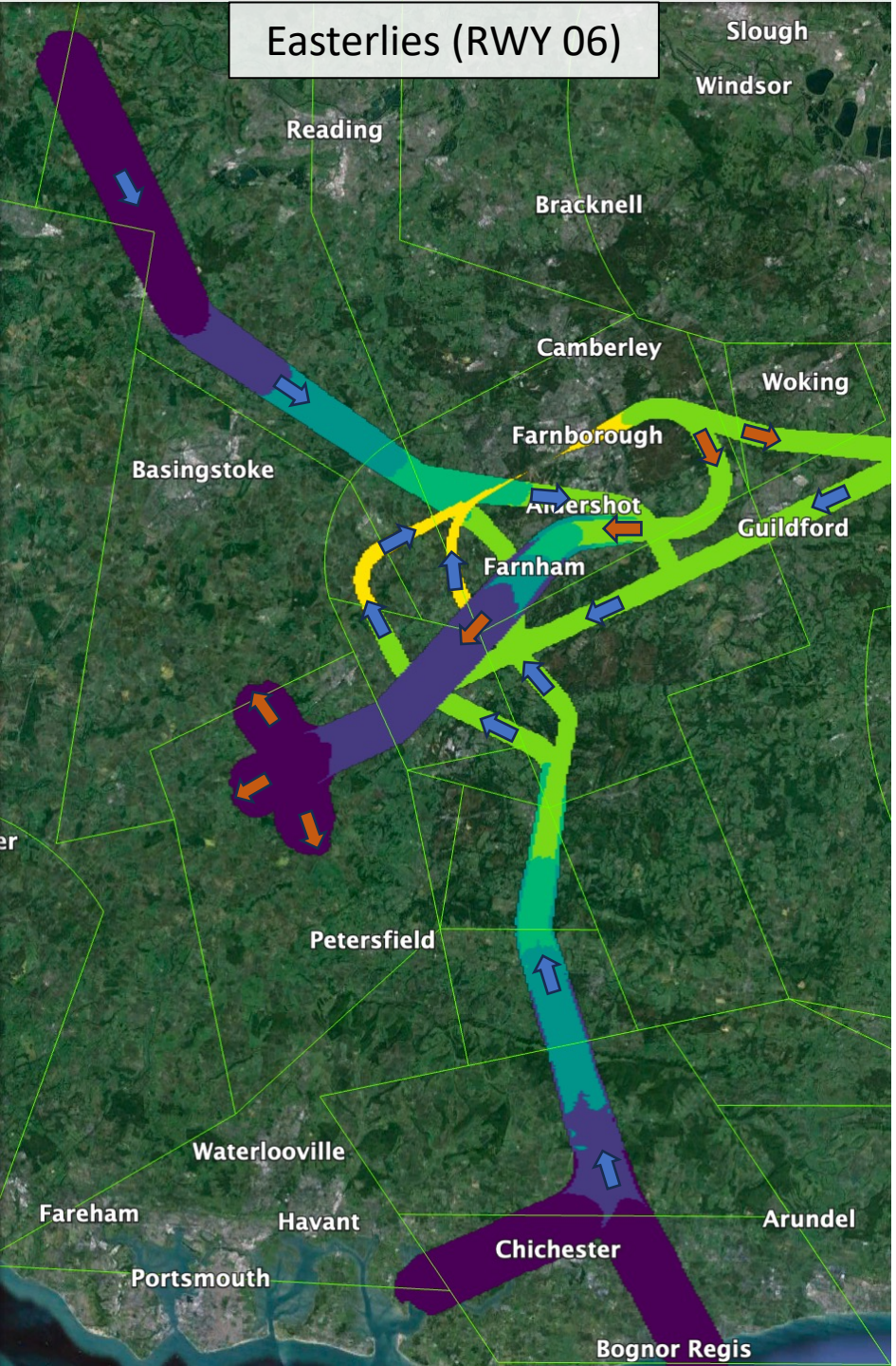
Arrival Direction

Departure Direction

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 3A

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 3A	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	MEETS	MEETS



OPTION 3A

Difference to 2A

- RWY06 departure bends to help ATC manage confliction with arrivals from the south
- Low level routes between Farnborough and Biggin Hill
- Additional high-end PBN arrival route to RWY 06 to avoid RAF Odiham

Design Assumptions

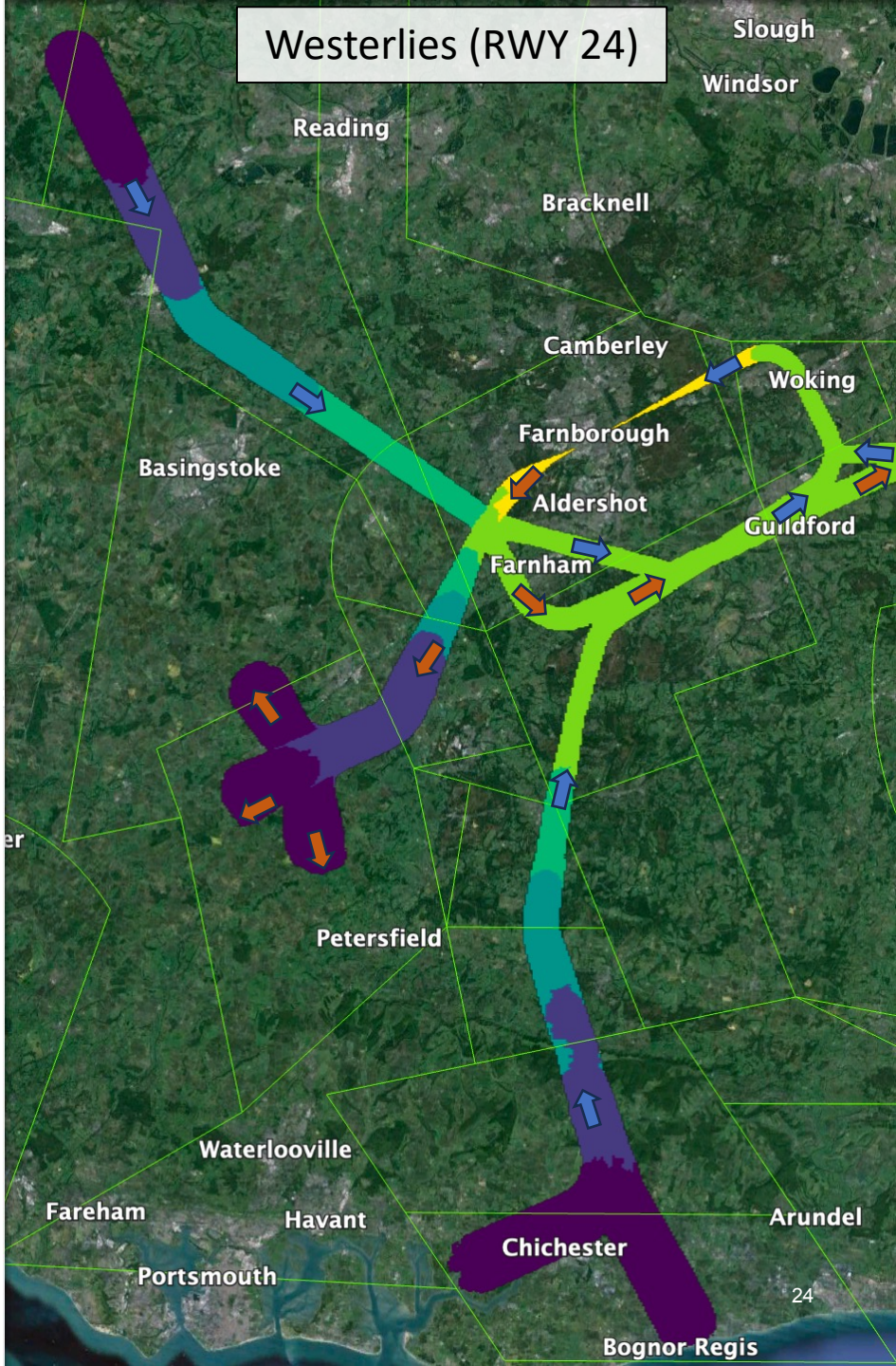
- Changes at Heathrow and Gatwick enable route between Farnborough and Biggin Hill but do not allow significant improvement to Farnborough's profiles

Legend

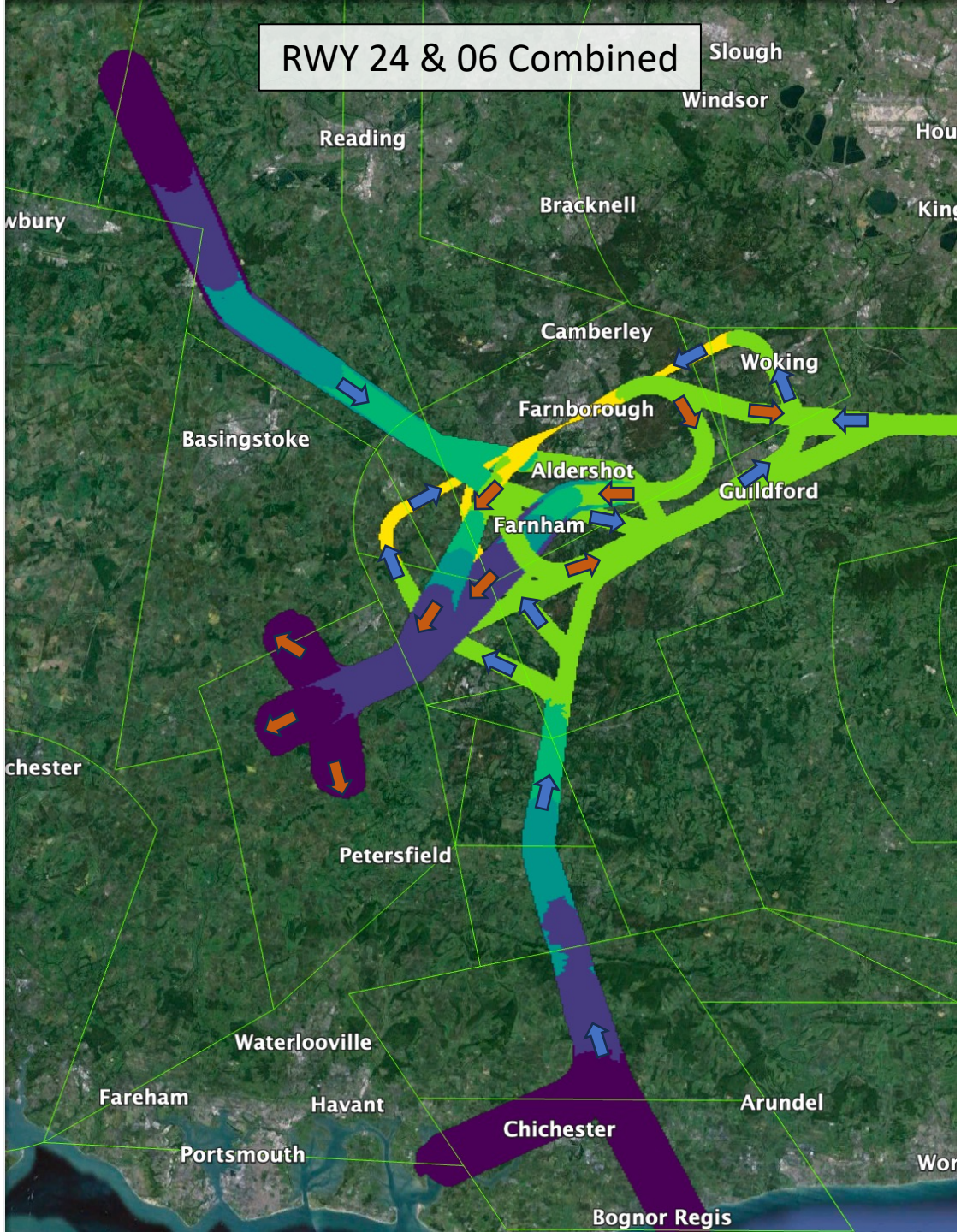
- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

Departure Direction



OPTON 3A System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

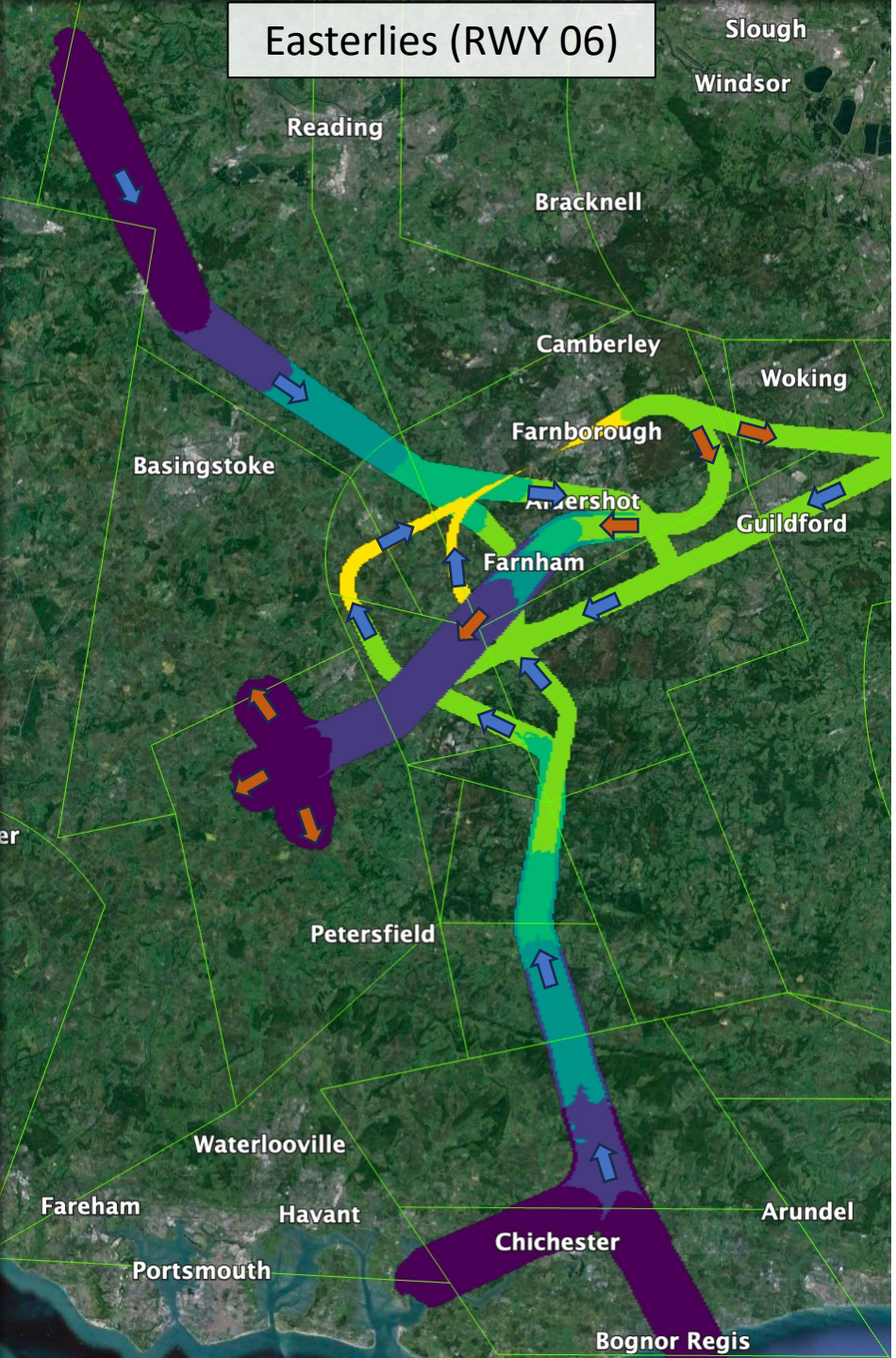
Departure Direction

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 3B

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 3B	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS

OPTION 3B

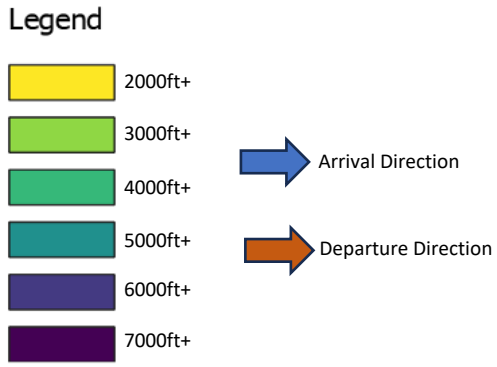


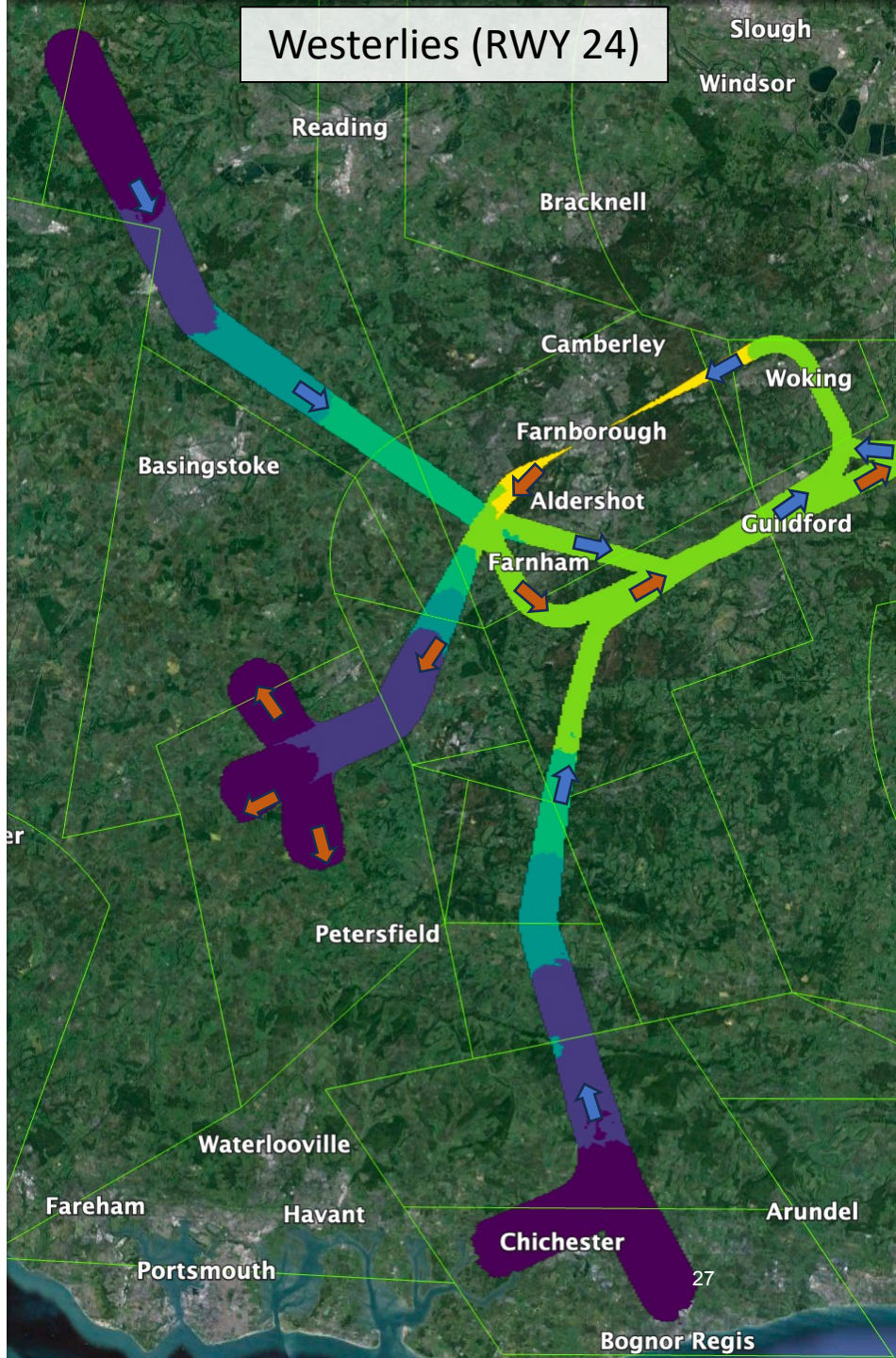
Difference to 3A

- PBN arrival routes all the way to final approach (ILS and RNP APCH). **These would be slightly different to those in option 3A**

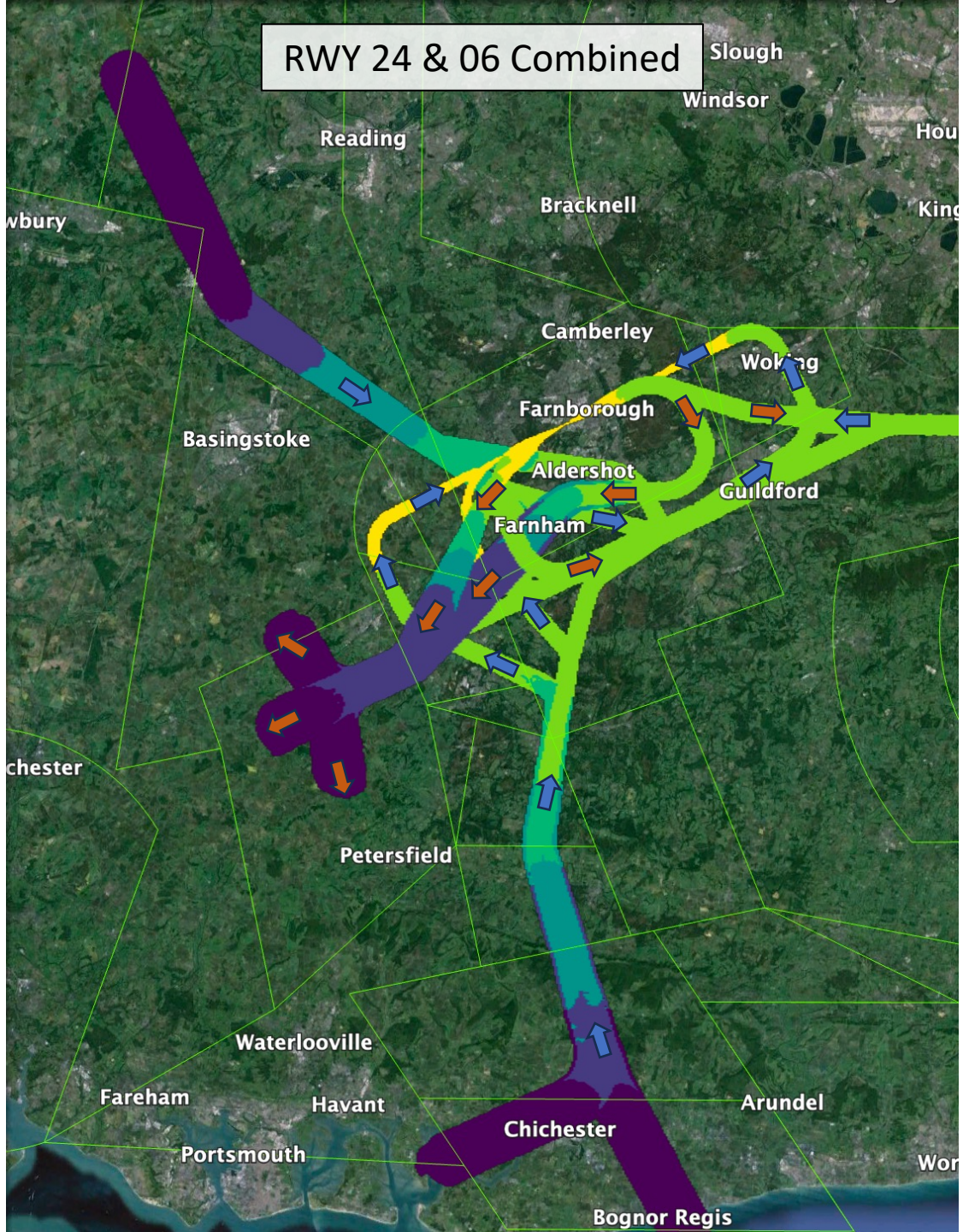
Design Assumptions

- 3.2˚ RNP APCH (ILS remains at 3.5˚)





OPTON 3B System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

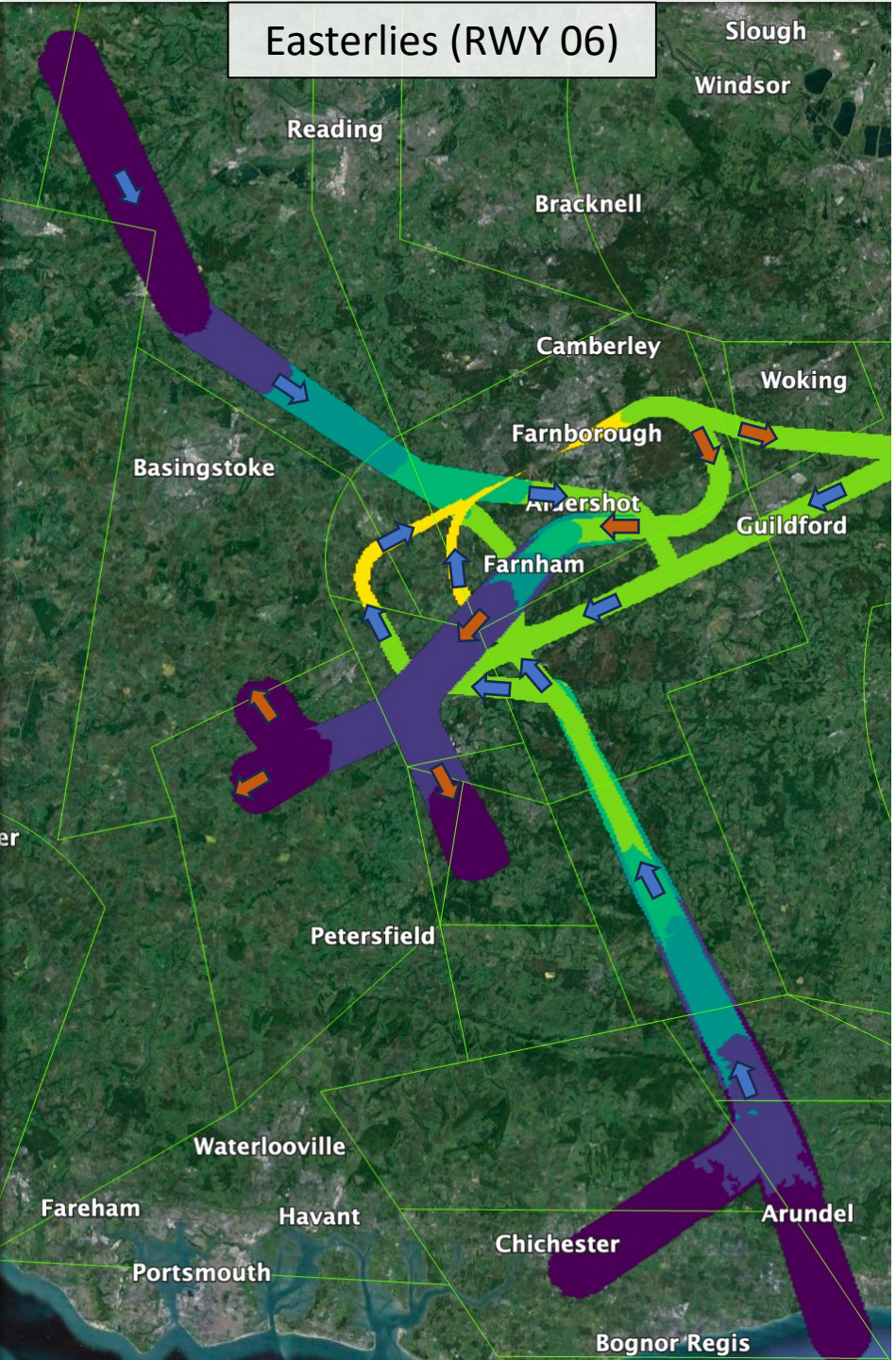
Departure Direction

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 4A

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 4A	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS	MEETS	PARTIALLY MEETS	MEETS	MEETS

OPTION 4A



Difference to 3A

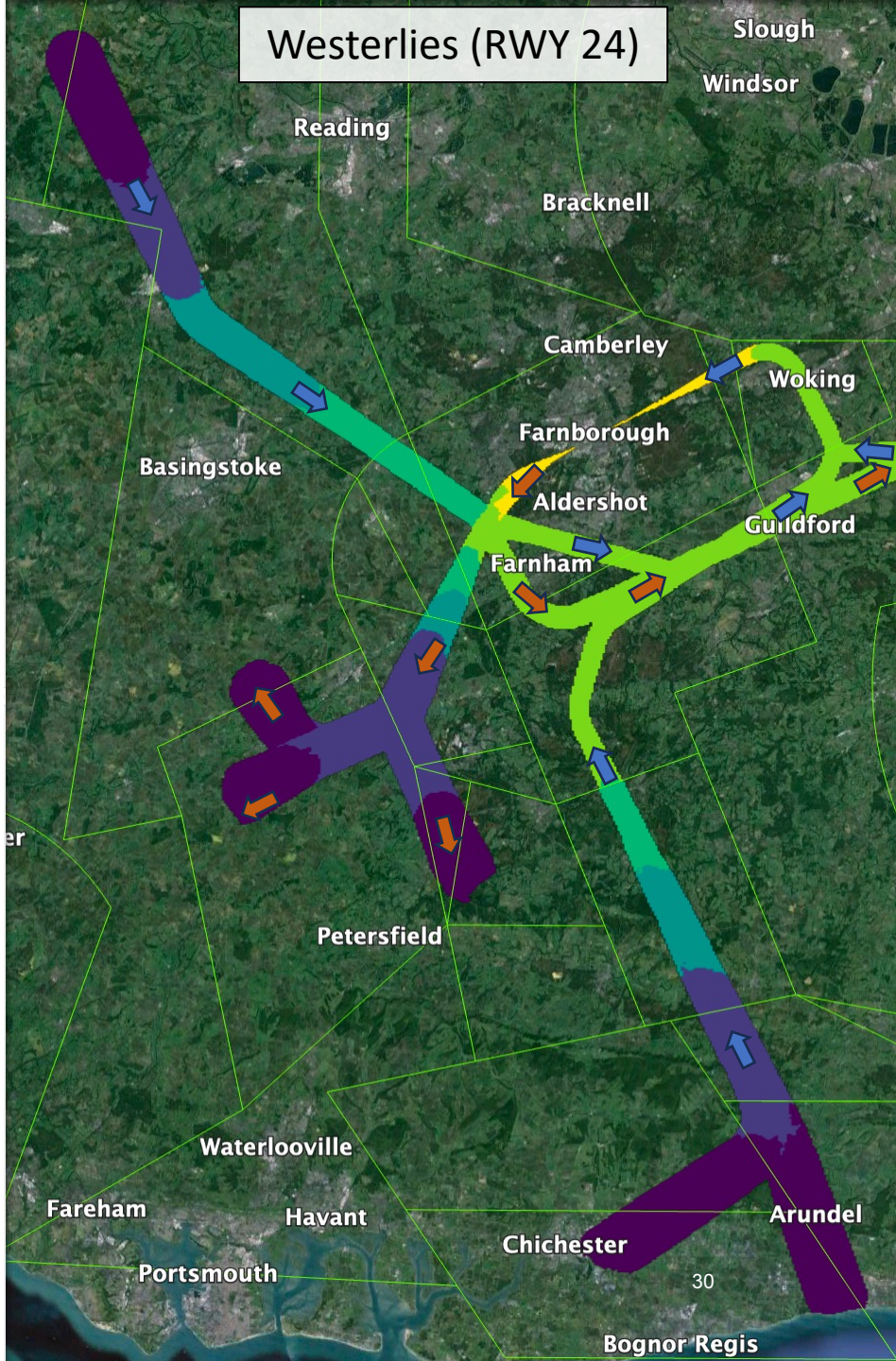
- More direct arrival and departure routes from/to the south
- Southerly SID tracks slightly different between runways

Design Assumptions

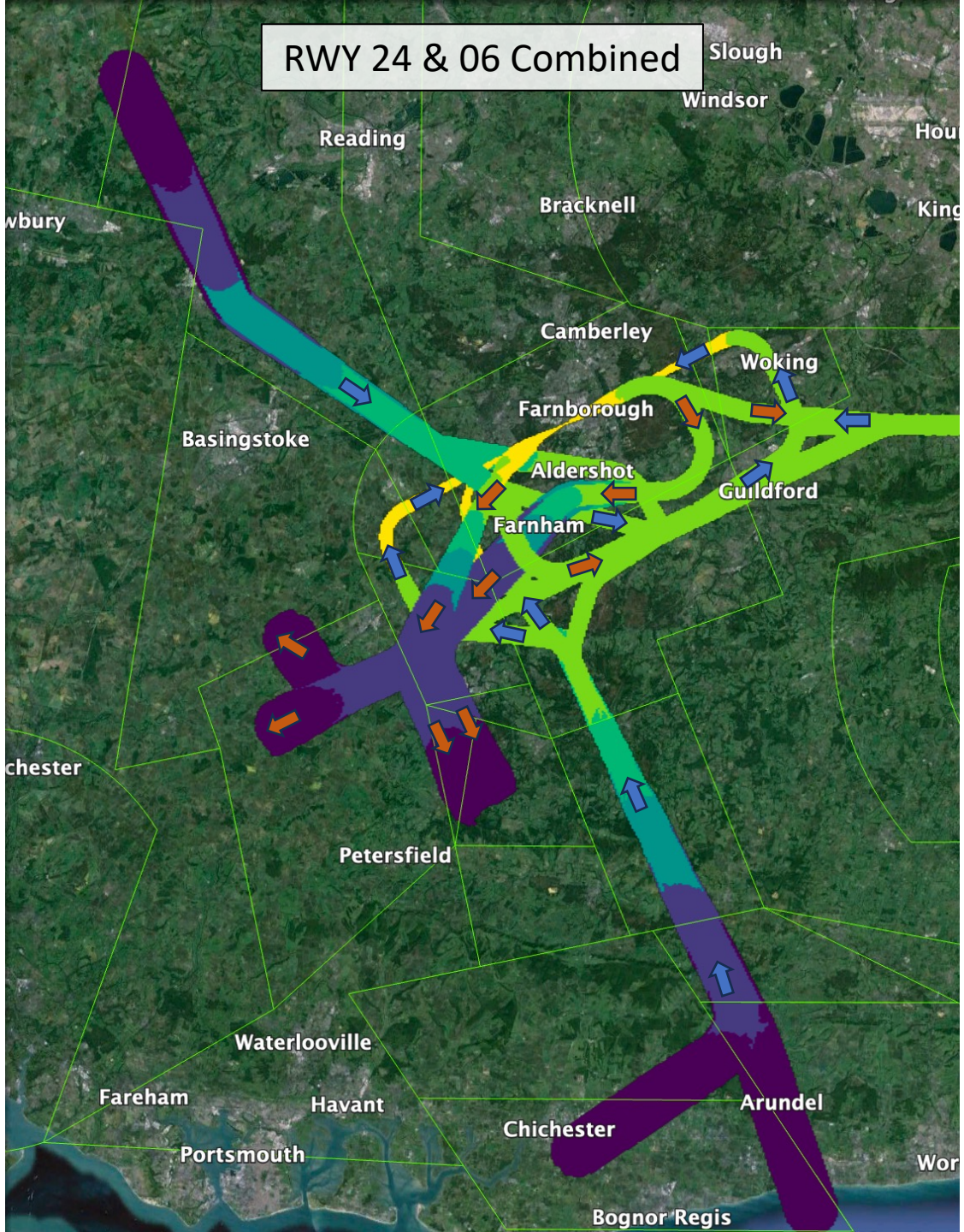
- Improvement to Gatwick's profiles enable change to Farnborough's arrival and departure routes from/to the south

Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+
- Arrival Direction
- Departure Direction



OPTON 4A System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

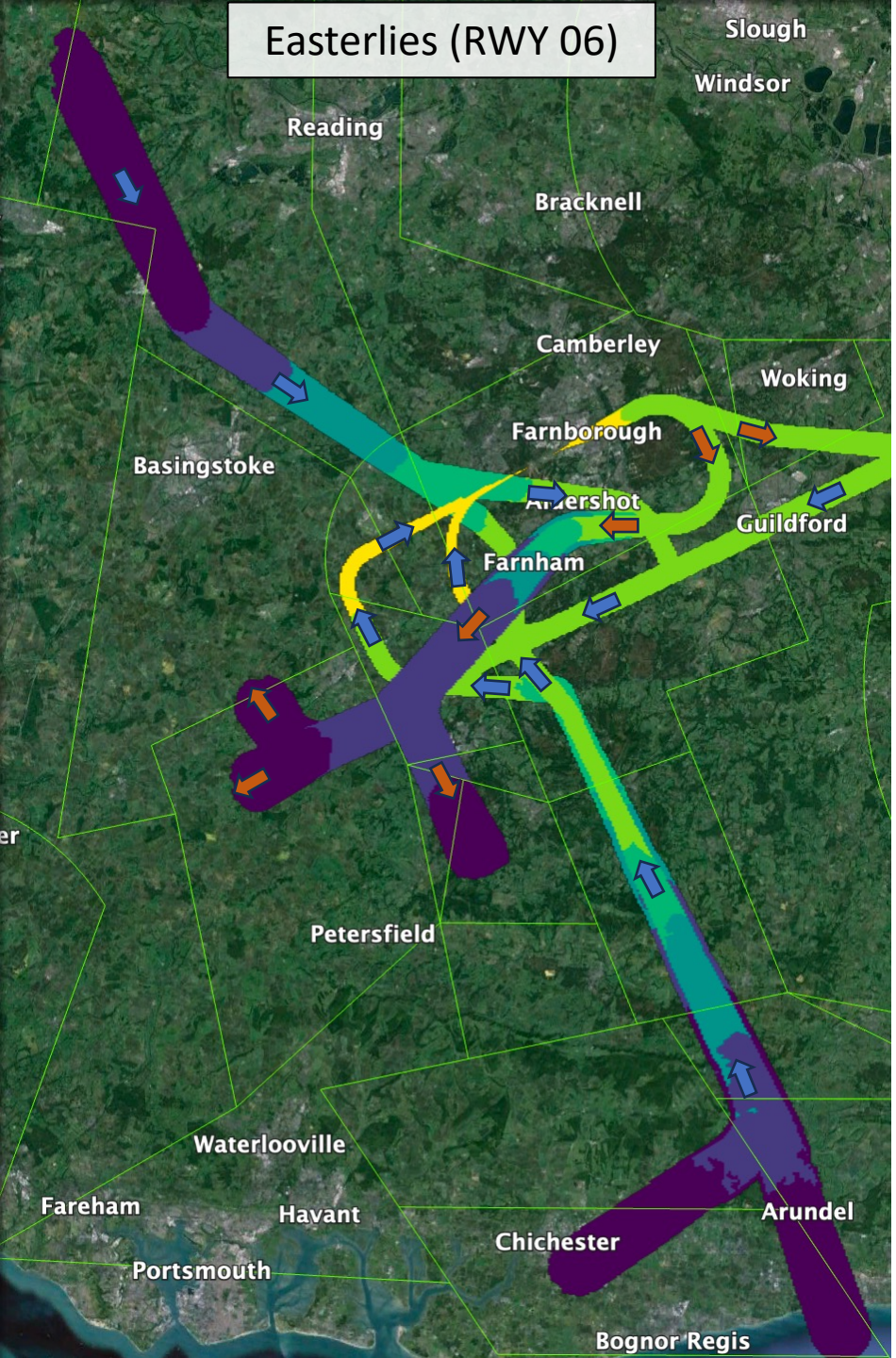
Arrival Direction

Departure Direction

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 4B

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 4B	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS



OPTION 4B

Difference to 4A

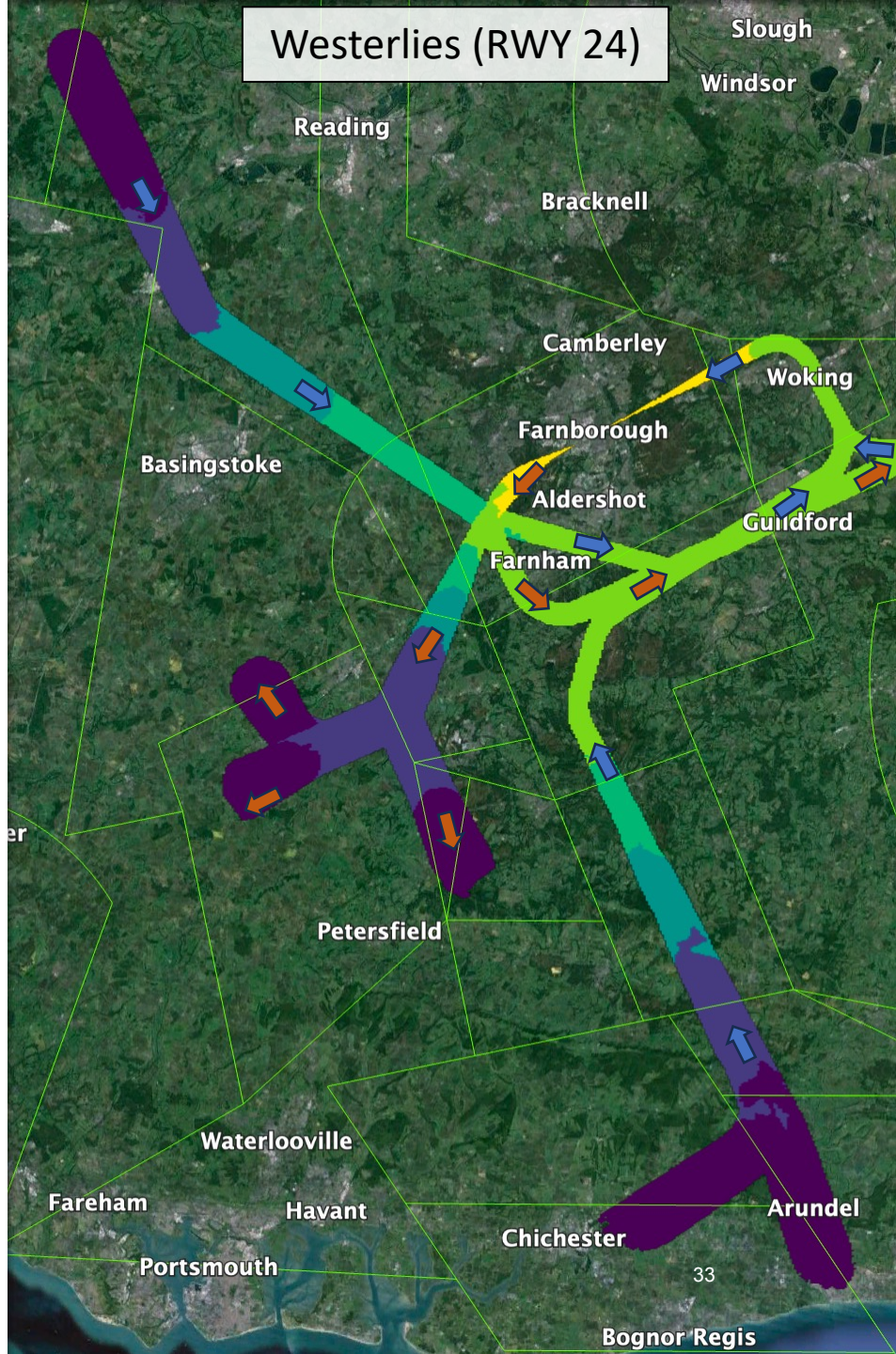
- PBN arrival routes all the way to final approach (ILS and RNP APCH). **These would be slightly different to those in option 4A**

Design Assumptions

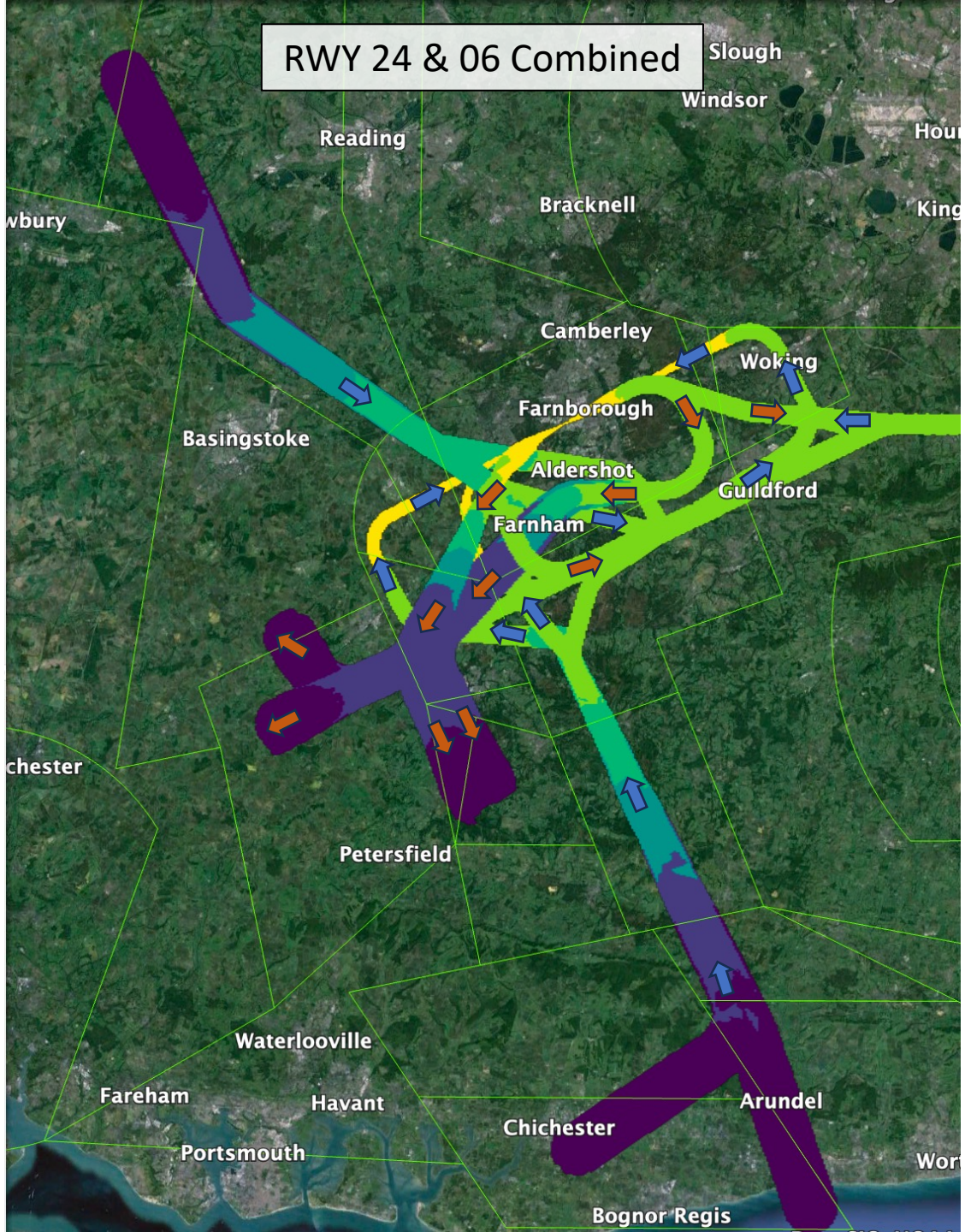
- 3.2˚ RNP APCH (ILS remains at 3.5˚)

Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+
- Arrival Direction
- Departure Direction



OPTON 4B System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

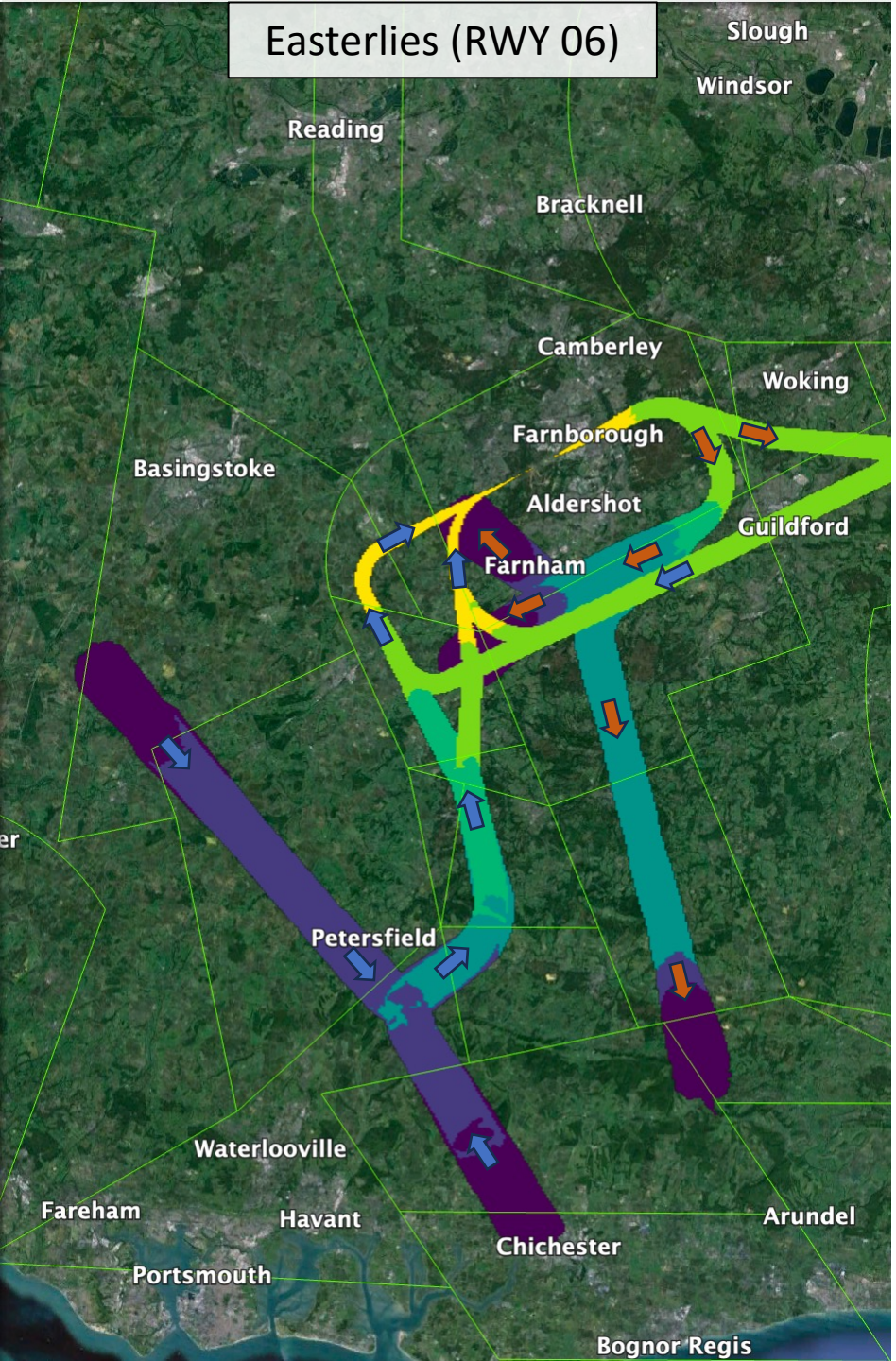
Arrival Direction

Departure Direction

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 5A
(Greater dependency on the wider FASI design)

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 5A	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS	MEETS	PARTIALLY MEETS	MEETS	MEETS



OPTION 5A

Difference to Do Nothing

- All arrivals enter from the SW
- Departures and arrivals deconflicted by design with improved profiles
- PBN arrival routes all the way to final approach (ILS only)
- Low level routes between Farnborough and Biggin Hill
- Additional high-end PBN arrival route to RWY 06 to avoid RAF Odiham

Design Assumptions

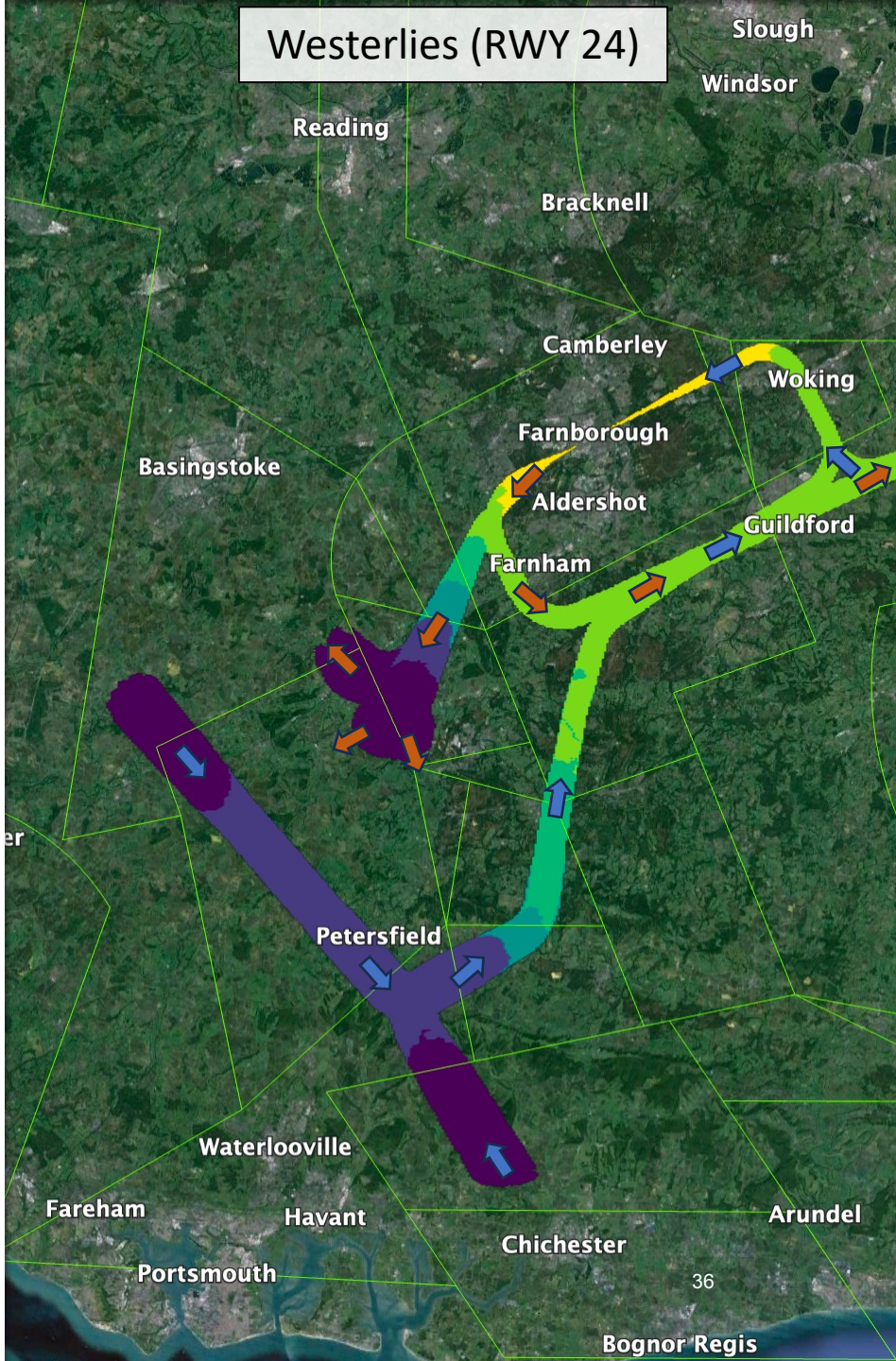
- Significant improvement to Gatwick and Heathrow profiles enables improved profiles for Farnborough

Legend

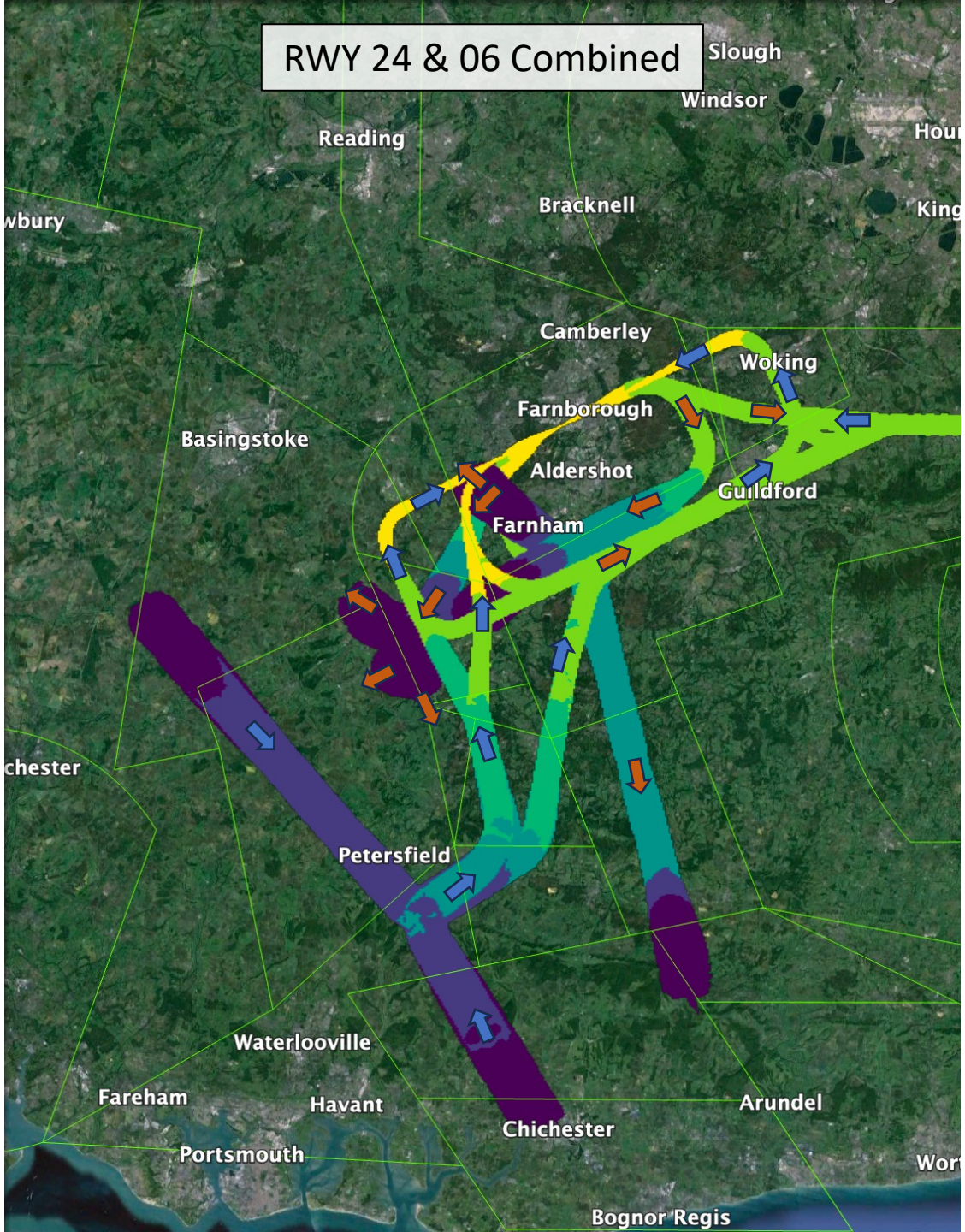
- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

Departure Direction



OPTON 5A System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

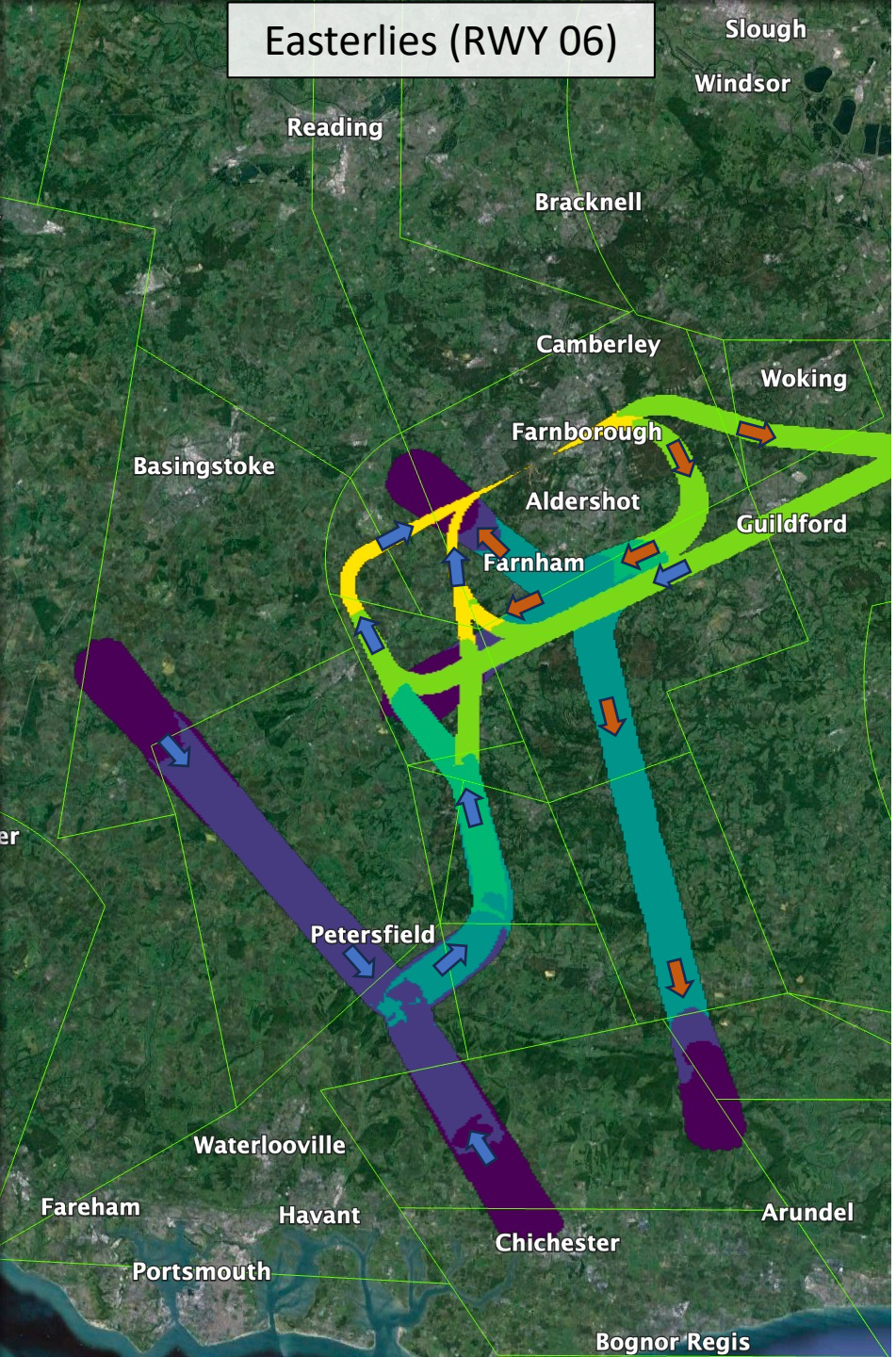
Departure Direction

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Option 5B
(Greater dependency on the wider FASI design)

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations		Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
		Overall AMS Objectives	Overall DP2						
Option 5B	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS

OPTION 5B



Difference to 5A

- PBN arrival routes all the way to final approach (ILS and RNP APCH) **These would be slightly different to those in option 5A**

- RWY06 departure turns south earlier than today

Design Assumptions

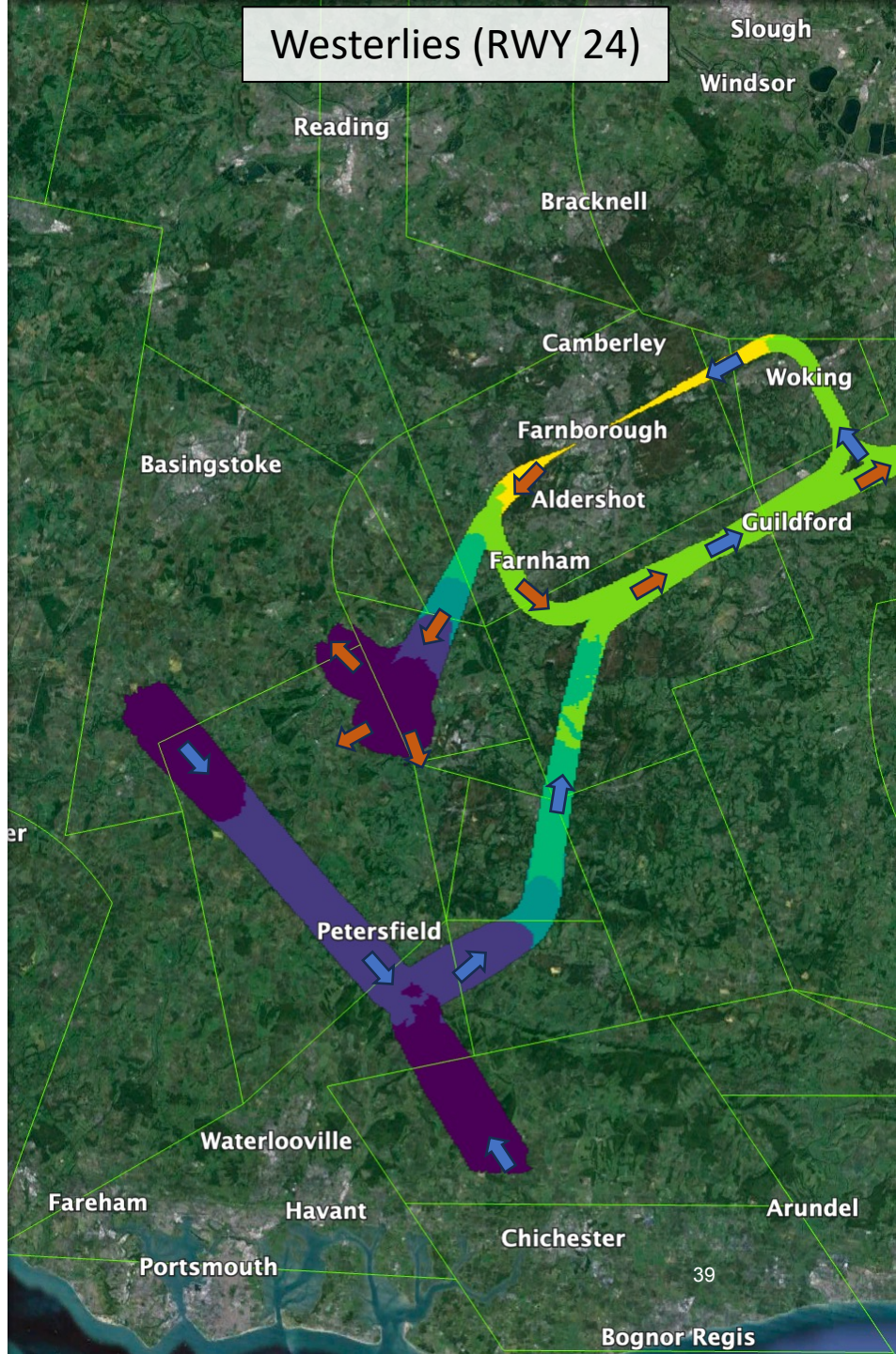
- 3.2˚ RNP APCH (ILS remains at 3.5˚)

Legend

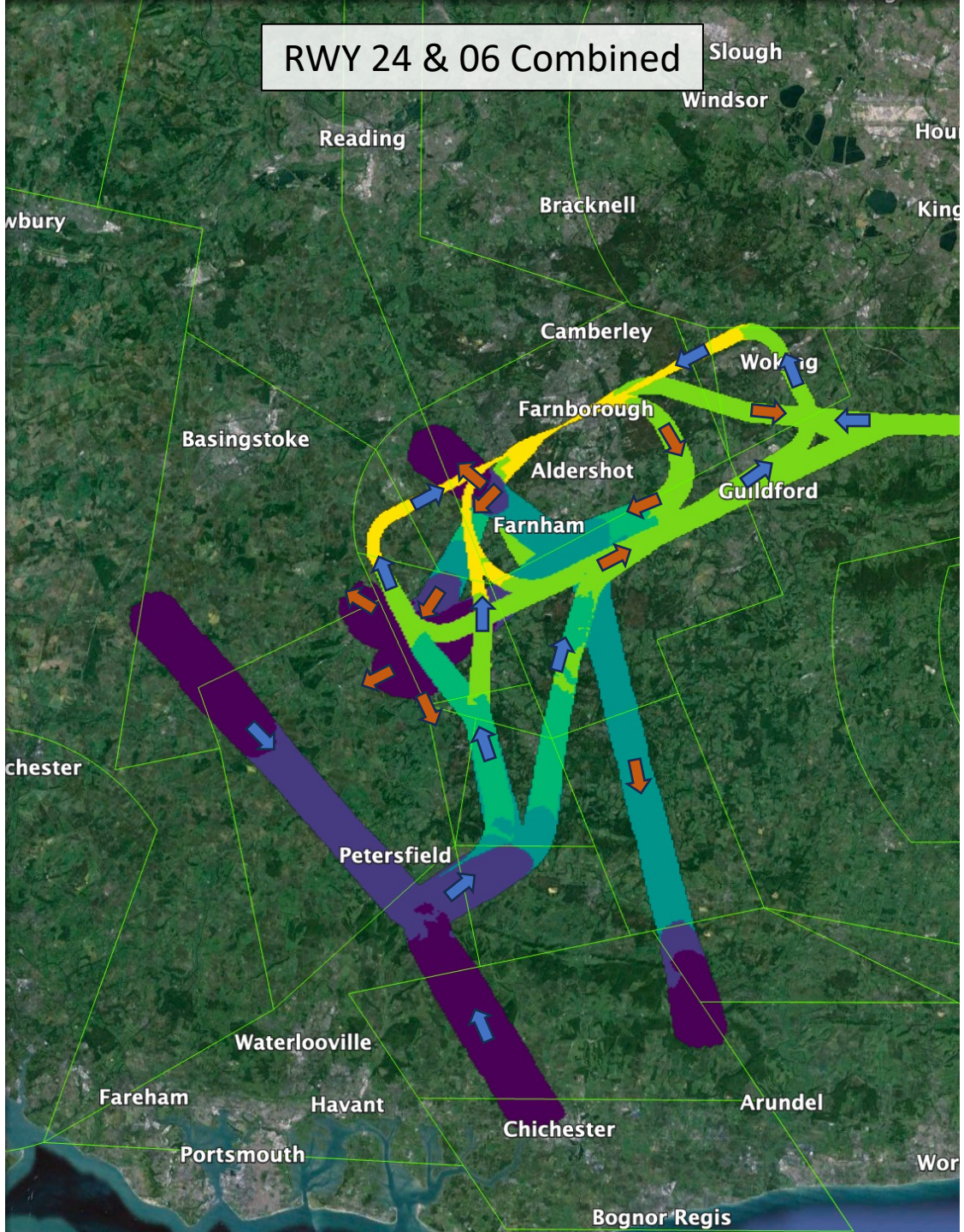
- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

Departure Direction



OPTON 5B System



Legend

- 2000ft+
- 3000ft+
- 4000ft+
- 5000ft+
- 6000ft+
- 7000ft+

Arrival Direction

Departure Direction

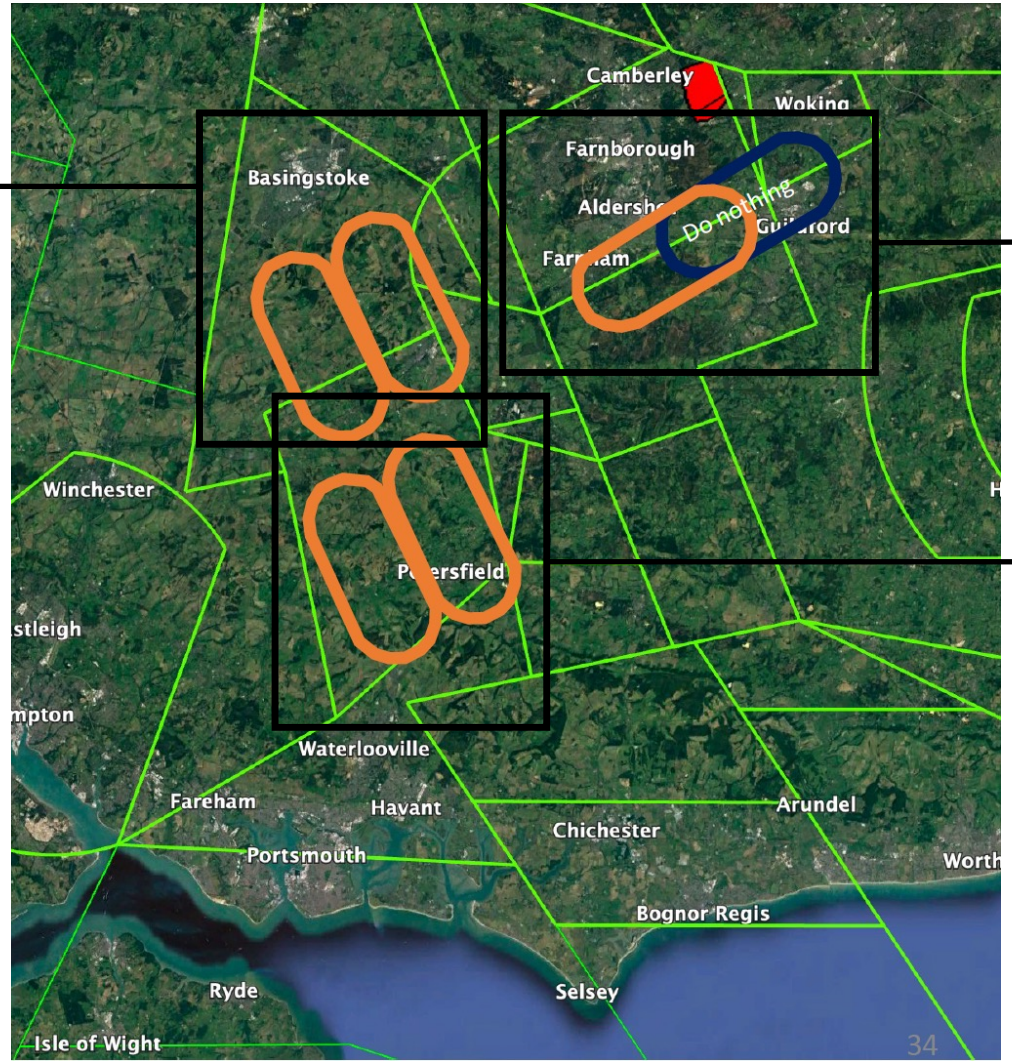
FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Potential contingency holding stack information

Holding stack information

FARNBOROUGH AIRPORT

A hold in this location would be likely to have a minimum holding level of 6000ft.



The hold in blue already exists at 3000ft but would be better placed slightly further to the SW from an operational perspective. Any hold in this region is likely to remain at 3000ft.

We still expect there to be holding available at or above 7000ft in the network. Any changes to the existing holding arrangements at or above 7000ft will be proposed within NERL's ACP.

Such holds are currently 20-30nm from Farnborough, beyond Farnborough's airspace.

The ability to hold 1-2 aircraft closer (15-20nm) to the airfield, inside Farnborough's airspace would help cater for unusual circumstances in a much more effective manner.

A hold in this location would be likely to have a minimum holding level of 5 or 6000ft. If at 5000ft it may require a change to LTMA13/EGLFCTA9. Our preference would be to have a minimum holding level at 6000ft so long as Heathrow, Gatwick and Southampton traffic can avoid (outclimb) the holding area.

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Traffic density outside CAS

(Analysis to support DPE)

Traffic density in Class G (uncontrolled) airspace

FARNBOROUGH AIRPORT

As part of the DPE, Farnborough Airport committed to using data to produce flight density plots outside CAS, to support the qualitative DPE assessments.

To achieve this, Farnborough Airport procured 6 months of historical (1st April – 30th September 2023) Electronic Conspicuity (EC) data. This is data broadcast from airspace users to provide information on their position*.

Airspace users that were not broadcasting information on their presence has not and cannot form part of this assessment. Even if Primary radar data was utilised, the height of the aircraft cannot be ascertained.

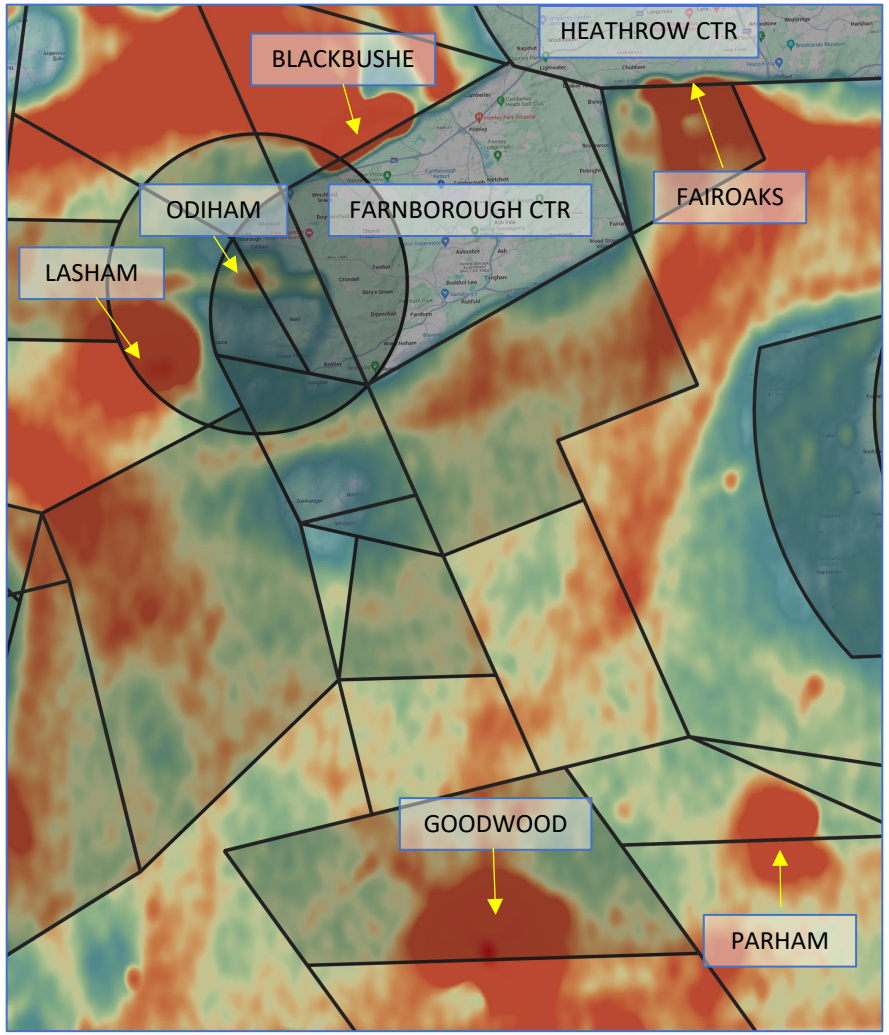
The EC returns were used to produce the heat maps shown in the following slides.

All EC returns above the bases of CAS have been filtered out to illustrate typical traffic patterns and density outside Controlled Airspace (Class G).

*For industry stakeholder information, this data included Mode S returns which were multi-laterated, ADS-B, FLARM and Pilot Aware returns.

Class G 0-2500ft

FARNBOROUGH AIRPORT



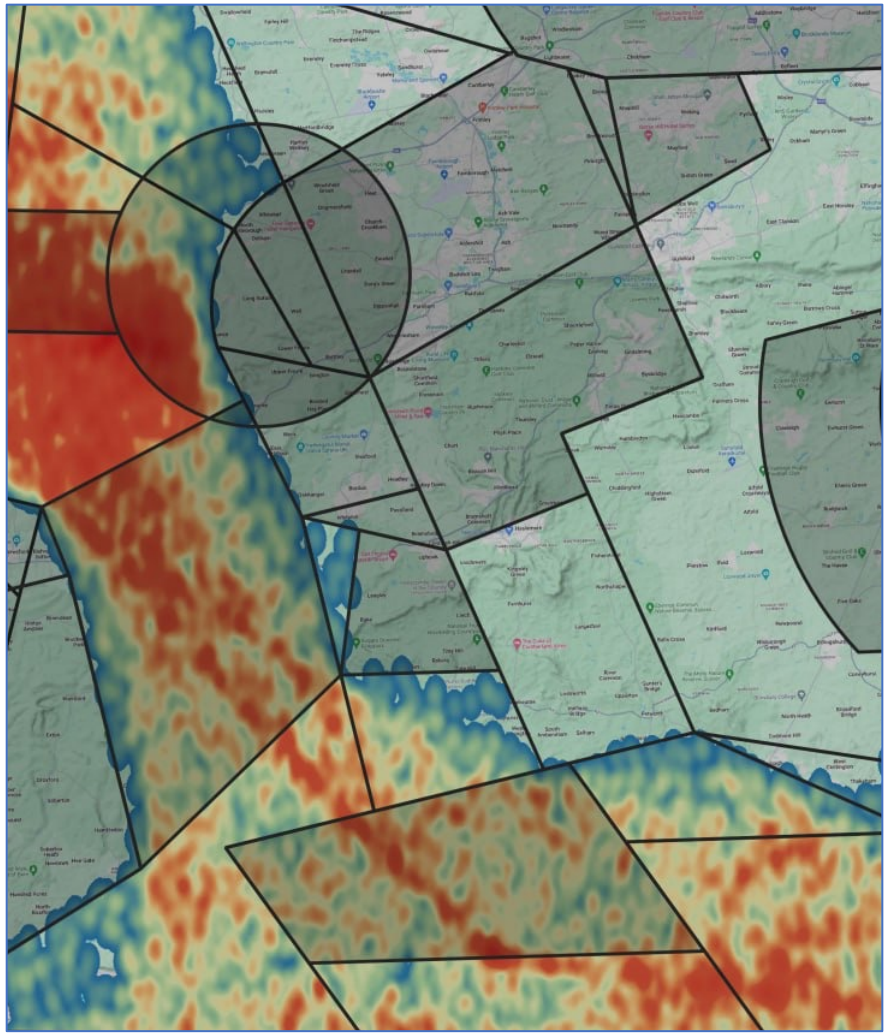
This image shows typical traffic patterns and densities of aircraft flying up to 2500ft, outside Controlled Airspace.

Orange shows where traffic outside Controlled Airspace is most concentrated. The black lines represent different boundaries of airspace where each segment has a different base level and/or different controlling authority.

All traffic inside Controlled Airspace has been excluded from the image. For example, the airspace in the Farnborough and Heathrow CTRs.

Class G 4000 - 5000ft

FARNBOROUGH AIRPORT



This image illustrates where traffic needs to fly if operating at altitudes of 4000-5000ft, outside of Controlled Airspace.

This is because the bases of controlled airspace to the east of the traffic shown has base levels lower than 4500ft.

This image shows traffic operating between 4000ft and 5000ft only. The traffic shown on the previous slide is still present, but down at lower altitudes.

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

DPE Summary

	1	2		3	4	5	6	7	8
	Must be as safe or safer than today for all stakeholders that are affected by the airspace change	Accord with: a) the CAA's published airspace modernisation strategy (CAP1711) and any current or future plans associated with it b) Air Navigation Guidance 2017 & other relevant policy and legislations Overall AMS Objectives	Overall DP2	Shall not constrain the ability to meet forecast demand for Farnborough Airport	Improve vertical profiles compared to the baseline published SID/STAR levels, to enable: a) a reduction in population numbers affected by noise b) a reduction in CO2 emissions per flight from Farnborough aircraft c) a reduction in the volume and where possible, complexity of Farnborough Airport's CAS d) a reduction in the reliance on tactical intervention	Aim to remove dependencies with adjacent ATC units and minimise impacts on other airspace users	Where lateral changes to exisiting tracks are required to achieve improved environmental and operational performance, options should: a) deliver an overall reduction in flight plannable track miles b) minimise population numbers newly overflown c) avoid overflying the same communities with multiple routes to & from Farnborough Airport d) avoid overflying the same communities with Farnborough's routes and those to & from other airports below 7000ft	Make best use of Farnborough's modern aircraft fleet capabilities	Ensure that Farnborough Clutch* airways traffic can still be accommodated, as a result of the changes (*Now known as Wessex Group)
Option 1 Baseline "Do Nothing"	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	DOES NOT MEET	MEETS
Option 2A	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS
Option 2B	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS
Option 3A	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	MEETS	MEETS
Option 3B	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS
Option 4A	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS	MEETS	PARTIALLY MEETS	MEETS	MEETS
Option 4B	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS
Option 5A	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS	MEETS	PARTIALLY MEETS	MEETS	MEETS
Option 5B	PARTIALLY MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS	PARTIALLY MEETS	PARTIALLY MEETS	MEETS	MEETS

FARNBOROUGH AIRPORT

The methodology describing how MET, PARTLY MET and NOT MET have been defined, together with a breakdown of the qualitative evaluation of each criteria of each principle will be included in the Stage 2 Submission Documents.

However, stakeholder feedback from our last engagement stated how it was difficult to ascertain whether the options were aligned to the principles or not. The image to the left represents an initial summary of our purely qualitative evaluation.

Owing to the qualitative nature of the DPE, it is unlikely that we will discount any options on the DPE alone.

We expect to discount options and/or elements of options following analysis of quantitative data as part of the Initial Options Appraisal.

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Any Questions?

Farnborough Airport are holding 2 online, drop-in sessions for all stakeholders. A TEAMS link to each session can be found below.

These sessions will **not** be a presentation of this material, but the team will be available online to answer any questions you may have on the information you have read.

Session 1 – 1300-1400 hrs on Monday 20 May 2024 – link here

Session 2 – 1730-1830 on Wednesday 29 May 2024 – link here

Feedback & Next Steps

FARNBOROUGH AIRPORT

- As a result of the information contained within this presentation, if you would like to amend or update any feedback you have previously submitted, please email the address below.
- All feedback will be included as part of our Stage 2 submission.
- Following the feedback we receive, we will continue to develop our Design Principle Evaluation in more detail and carry out the Initial Options Appraisal.
- These will be submitted to the CAA and available for you to read on the Airspace Change Portal later this year.
- Farnborough Airport would like to thank you for engaging on this Airspace Change Proposal.

As a result of the information contained within this presentation, if you would like to amend or update any feedback you have previously submitted, please email fasi-s@farnboroughairport.com
Please provide feedback by Friday 7th June 2024

FARNBOROUGH AIRPORT AHEAD OF THE CURVE

Ahead of the Curve