Future Airspace Strategy Implementation South:
ATS Route Network managed by NERL under London Airspace Management Programme 2

'LAMP 2 - FASI(S) Network'

Stage 1 Assessment Meeting

Friday 23rd February 2018

4x NATS attendees

NATS

NATS Unclassified

Agenda

- Statement of need

- Background

- Issues and benefits arising from proposed change

- How to address identified issues

- Scaling level, process Requirements

- Draft Timescales and Planned Gateway Assessments

- Next steps

Original Statement of Need

The LTMA was built piecemeal using legacy aircraft performance & conventional ground-based navigation constraints. It is reaching capacity, requiring modernisation via clean-sheet redesign.

In accordance with FAS, taking advantage of the potential benefits of PBN will enable significant improvements in both capacity and environmental impact.

This airspace change proposal makes major changes to LTMA airspace & the ATS route network. The proposed changes will interface with SIDs & STARs serving the 5 major LTMA airports. Other airports will also be considered and accommodated. Some are in the process of changing their SIDs/STARs/Transitions; the changes proposed to the LTMA by this ACP will be coordinated with the airports' proposals & will complement them, improving the efficiency & capacity of the region.

We expect this ACP to follow the LAMP1A template of a modular suite of sub-proposals. The structure includes a bridging module and network module (both sponsored by NATS), and separate modules for each individual airport. The timescales for delivery of individual modules is still to be confirmed - the date below is a placeholder.

This ACP will include, but is not limited to:
1. Bridging module: System-wide fuel/CO2/safety/capacity considerations.
2. ATS Route Network: Explore & consider innovative advanced PBN solutions, coordinated interface with airport arrivals and departures and free-route airspace.
3. Heathrow: PBN SIDs, STARs, Transitions, capacity improvements to accommodate R3
4. Gatwick: PBN SIDs, STARs, Transitions.
5. Stansted: PBN SIDs, STARs, Transitions.
6. Luton: PBN SIDs, STARs, Transitions.
7. London City: Potential updates to existing PBN SIDs, STARs, Transitions.
8. Others: Northolt, Farnborough, Biggin Hill, Southend, Bournemouth, Southampton, Cardiff, Bristol, Birmingham, East Midlands.
(The list above does not necessarily represent the module designations TBC)

Revised Statement of Need

Current situation
The ATS route network serving the UK is managed by the en route ANSP NATS, which handled 2.5m flights in 2017.
In the southern UK this is handled at Swanwick by London Area Control (LAC), in the wider London and South East region by London Terminal Control (LTC).

Issue or opportunity to be addressed, and the cause
Today's network has evolved over time and does not exploit modern navigation technology. It does not provide capacity for the long-term growth in aviation.
Many airports served by our network plan to change their low-level airspace structures to better meet their needs, driven by increasing demand by the flying public & the carrier airlines. This leads to the increased use of modern aircraft with flight & navigation performance far exceeding that of the types for which the network was originally designed.
There is an opportunity to enable significant benefits in capacity and environmental impacts by taking those needs and changing the network to suit.

Desired outcome
Optimal alignment & connectivity of the ATS route network with each airport's airspace structures, such that network capacity should not be a significant constraint on airport capacity and environmental impacts are minimised.

Specific challenges
Will be a very large scale undertaking - the main region of interest is likely to be from the Midlands to the FIR boundaries in the south and east but it may go further still in places.
Design and implementation challenges are proportional to the extent of the change – a clean-sheet redesign of a large region would have the most challenges but the most potential benefit.
Each airport would be responsible for their local procedures at lower levels, with NATS being responsible for the higher level ATS route network. This proposal relates to the latter, however, some level of coordination will be required with airport led design.
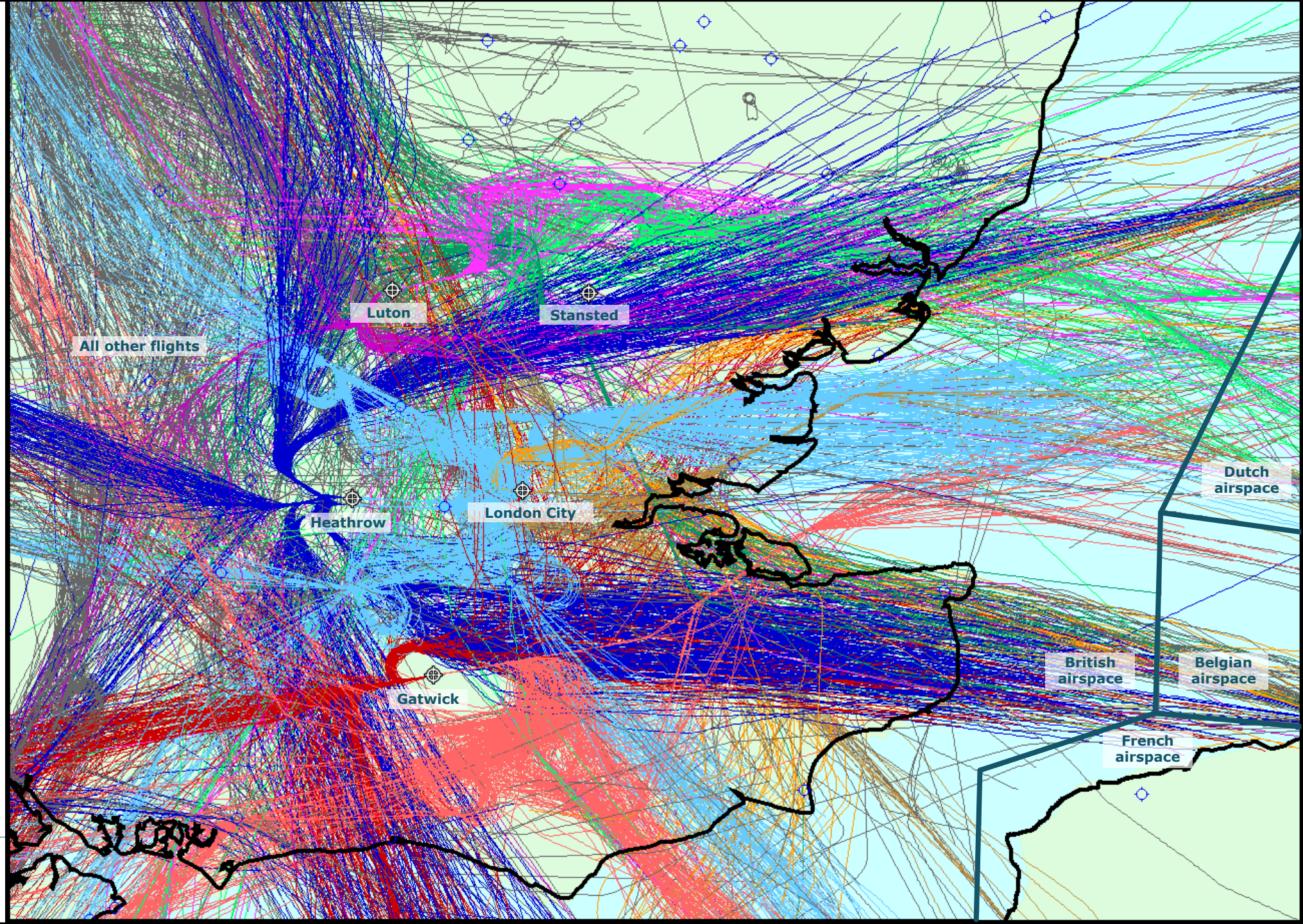
Background and Concept

Background

- London Airspace Management Programme Phase 1 started network systemisation in the South East

- Focussed on London City operations and some South Coast routes

- This proposal is for the next phase of LAMP to complete network systemisation across the region, meeting the statement of needs

- Legacy route network was not designed for forecast future traffic levels. It relies heavily on manual controller interactions; when controllers cannot handle more traffic then delay regulations are applied to prevent overloads (safety). Operationally this is never desirable but sometimes necessary due to today's airspace

- Ground infrastructure (at more than one airport) and low level route changes (for many airports in the region) will support increased traffic levels

Considerations

- **Safety is always the number one priority**

- Navigational and surveillance technology has improved by orders of magnitude compared with legacy systems

- ATC systems and tools are being modernised to introduce more 'systemisation' – these tools will require a complementary route structure based on modern navigation capabilities if they are to operate optimally

- LAMP2 aims to provide network capacity to meet potential traffic growth to c.2040. In this time period an extra runway is expected at Heathrow c.2025; other airports may make ground infrastructure changes to increase their capacity. Airport traffic growth forecasts from several sources are being used as the initial assumptions for airspace concept modelling

- From a NATS (NERL) point of view, we are an en route ANSP, therefore a design principle will be Level 2 change (or multiple phased Level 2 changes) to fit in with our airport stakeholders' changes (expected to be Level 1)

- Level 2 changes presume network efficiency is prioritised over noise impacts (DfT ANG 2017 7,000ft+)
  NATS envisages an environmental benefit *per flight* via less fuel use / less delay
  Less fuel / delay *per flight* reduces costs of airline customers, economically benefitting the fare-paying passenger

Legacy

- Westerly day
  05 Aug 2011
  FL250 and below

- Today's airspace is fundamentally the same, except London City arrivals under LAMP1A

- Heathrow
- Gatwick
- Stansted
- Luton
- London City
- Other flights

Labels on map: All other flights, Luton, Stansted, Heathrow, London City, Gatwick, Dutch airspace, Belgian airspace, British airspace, French airspace

Baseline (do nothing):

- Current LTMA and ATS route network

- Not shown:
  - SIDs
  - STARs
  - Holds

- LAMP2 is **not only** about the five major London airports

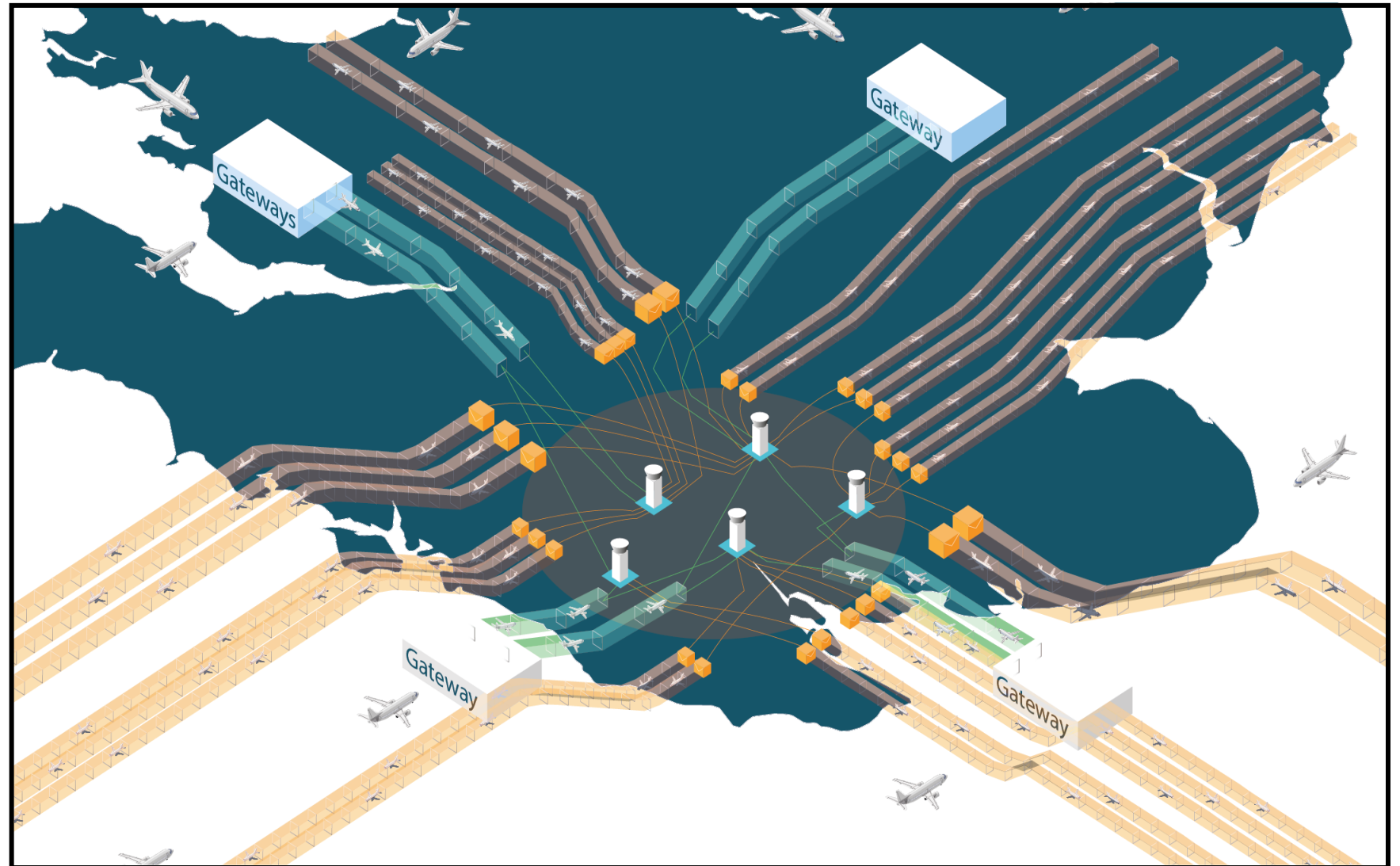- Midlands, East Anglia, South East, South Central, South West, South and Mid Wales
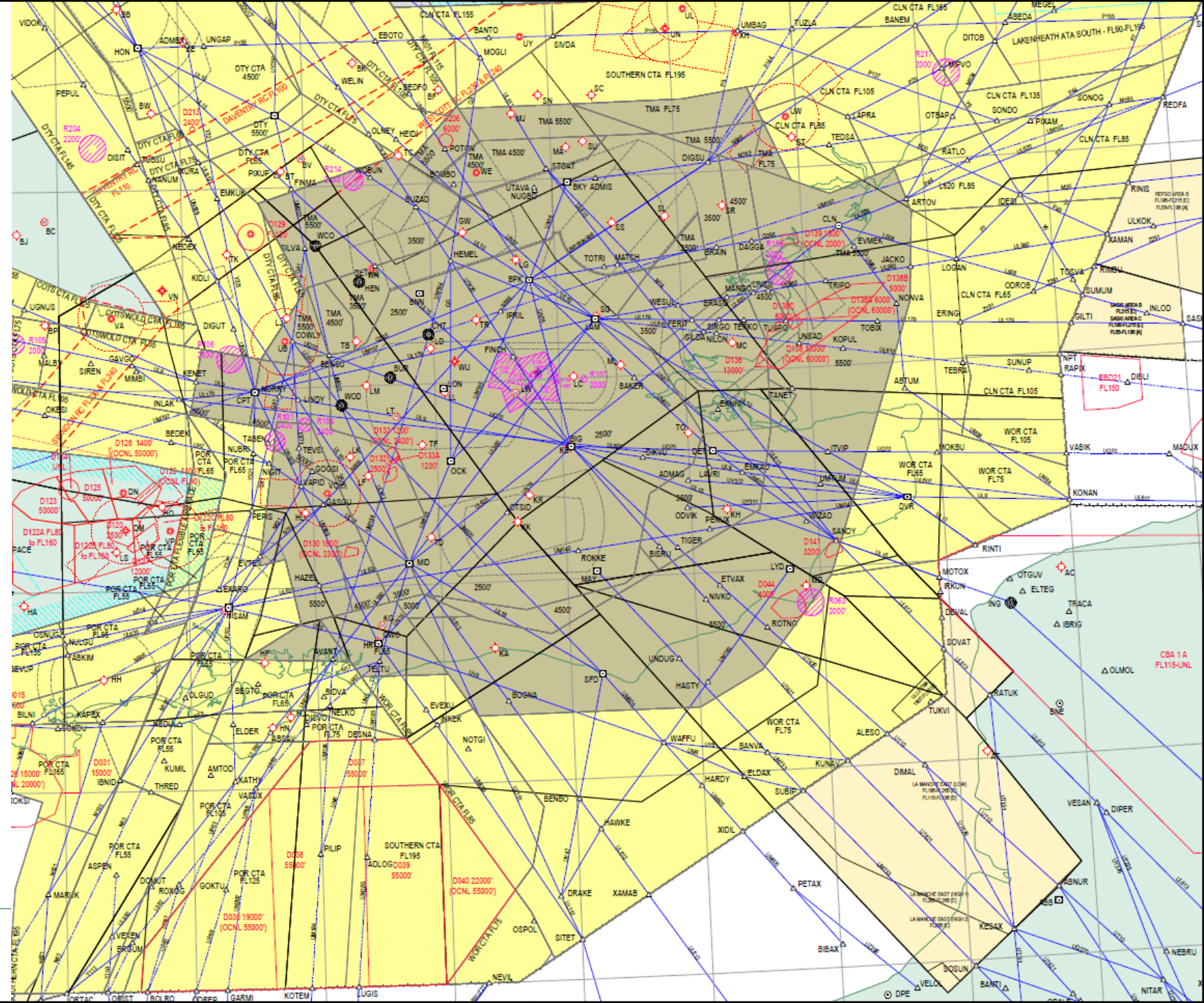
Baseline (do nothing):

- Current controller-intensive activity continues, many interactions, highly tactical

Concept development – Overview

- Systemisation to reduce controller interactions in all phases of flight

# Concept development – Airport responsibilities under FASI(S)

- Airports decide how best to systemise their operations for arrival and departure phases

- Airports know their local communities and how best to engage with respect to aviation noise impacts

- Expected to be Level 1 by design principle

Concept development – NATS NERL LAMP2 responsibilities

- NATS LAMP2 decides how to systemise operations for en route phase of flight

- Design principle will be to meet Level 2 criteria
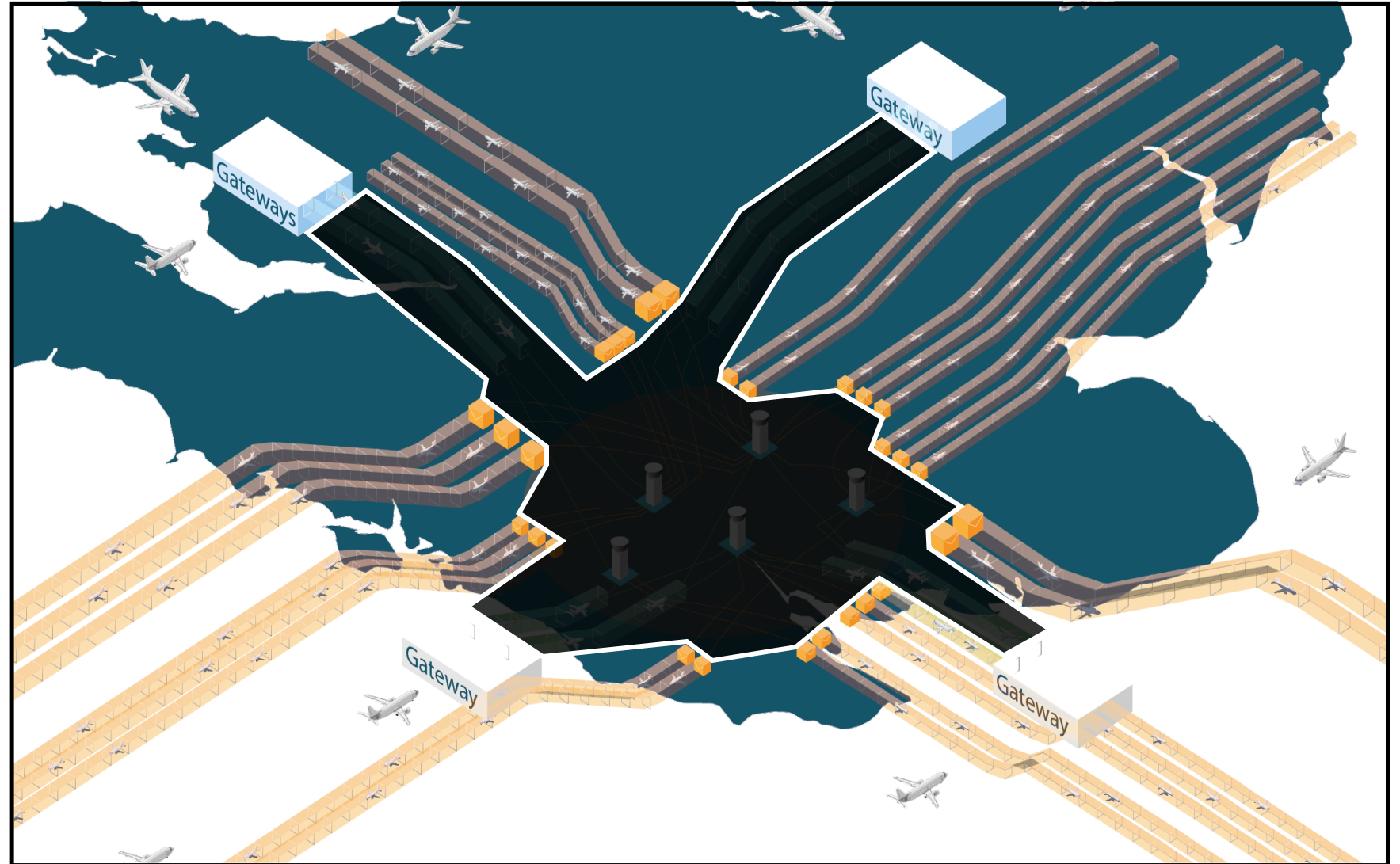
Concept development – Agreed interfaces

- Arrival gateways, departure letterboxes will be 'fixed' at mutually agreed interfaces

- Positions and details are not yet agreed between airports and NATS

Concept development – Linking interface points

- LAMP2 is an en route concept

- 'Routes' are segregated in 3D, possibly 4D, linking...
  - Upper airspace, descending to Arrival Gateways
  - Departure Letterboxes, climbing into upper airspace
  - Seamless interfaces to other flight phases at their lower and upper ends

- Design process to initially be data driven, demonstrating concept options for the basic geometry

- Concept options to be assessed against design principles as per Stage 2

- Development of modelling concept options continues
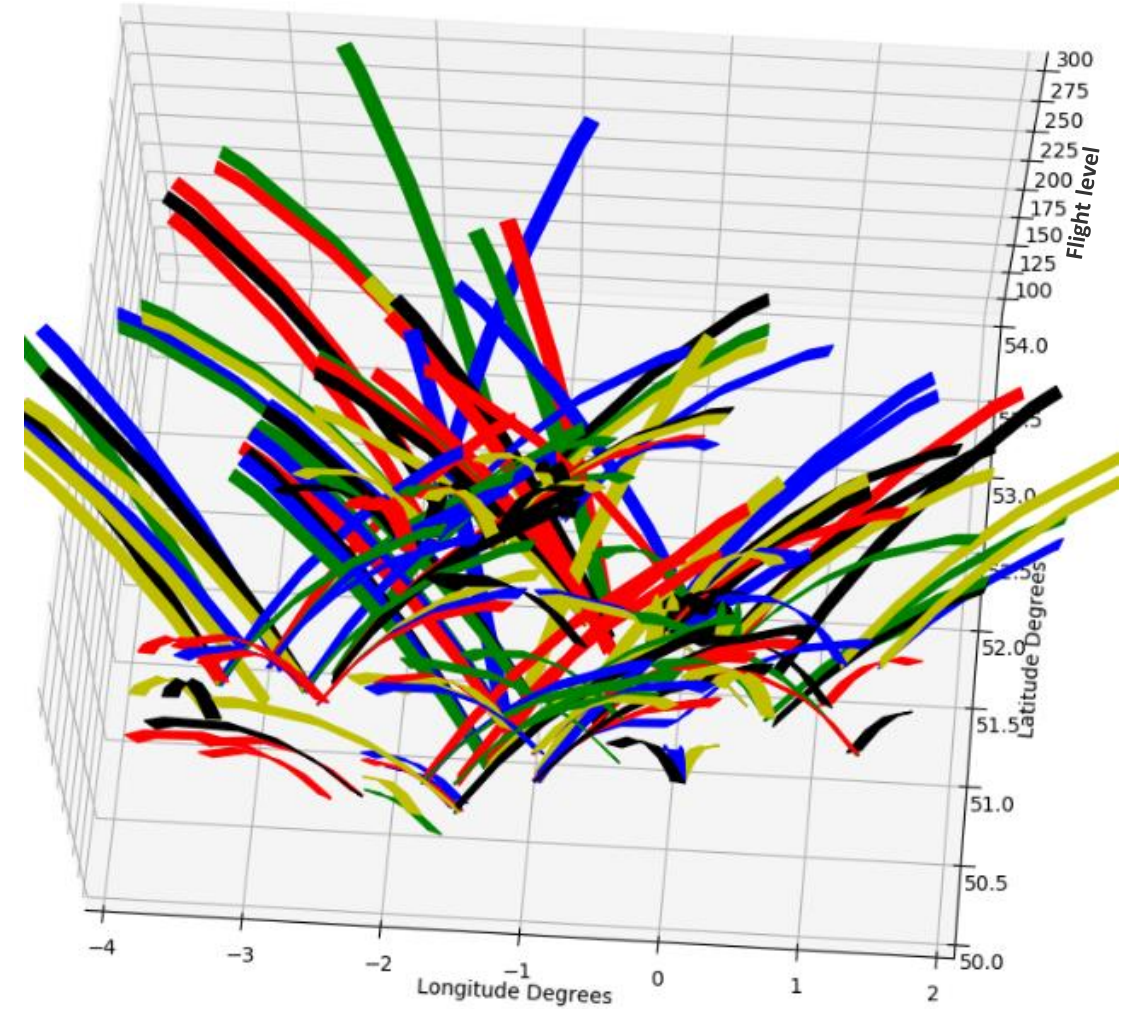
Benefits

- Reduced controller interaction per flight

- Alignment & connectivity of the ATS route network with each airport's airspace structures

- En route network capacity should not be a significant constraint on airport capacity

- Modernisation:
  - Airspace reflects modern navigation system capabilities
  - ATM decisions driven by accurate and comprehensive data
  - Route network will complement developments in ATM tools & systems

- More flights, less delay, less environmental impact *per flight*

Issues

- Doing nothing would cause increasing delay and ultimately limit air traffic growth in the South East (and beyond)

- Scale of change and its implementation

- Interfaces (gateways and letterboxes) may conflict between competing airports

- Qualitatively, investment cost would be high

Process

Addressing the identified issues

- Do nothing
  - Baseline arrangements continue
  - Mainly tactical, multiple controller interactions
  - Piecemeal development, when required
  - Sub-optimal design for the long term, limiting capacity, leading to delay

- Scale
  - Greater change, greater potential benefits
  - More challenging coordination, implementation
  - Phased approach, or 'big bang'?
  - Ongoing discussions with SARG re framework

- Interfaces
  - Coordination and cooperation between competing airports
  - Airports on board with modernisation concepts – evidenced by attendees at FASI(S) meeting

- Cost
  - Customers demand we invest in airspace modernisation as per RP3 consultation

Scaling level, process requirements

- NATS is en route ANSP primarily interested in airspace network improvements at higher levels

- Engagement is not planned with environmental stakeholders (local authorities, community organisations and individuals) who may represent the interests of people living in the neighbourhood of any particular airport

- A high-priority design principle will reflect this Level 2 expectation

- Fits with DfT ANG 2017 altitude based priorities

  3.3.d.   *In the airspace at or above 7,000 feet, the CAA should prioritise the reduction of aircraft CO_2 emissions and the minimising of noise is no longer the priority where practicable;*

  3.3.e   *It is desirable that airspace routes below 7,000 feet should seek to avoid flying over Areas of Outstanding Natural Beauty (AONB) and National Parks; and*

  3.3.f.   *All changes below 7,000 feet should take into account local circumstances in the development of the airspace design, including the actual height of the ground level being overflown, and should not be agreed to by the CAA before appropriate community engagement has been conducted by the sponsor.*

Draft Gateway Timescale

For _illustrative_ purposes only

Stage 1 – Assessment meeting   **23 Feb 2018**   ✔

Stage 1 – Define   25 May 2018   (Document deadline 11 May 2018)

Stage 2 – Develop (macro)   25 Jan 2019   (Document deadline 11 Jan 2019)

Consider two-phase Stage 2, providing additional investment assurance

Stage 2 – Develop (micro)   20 Dec 2019   (Document deadline 06 Dec 2019)

Stage 3 – Consult   Summer 2020

Stage 4 – Update and Submit   Spring 2021

Stage 5 – Decide   (SARG, SofS timeline)

Stage 6 – Implement   Spring 2022 onwards

Typo in original presentation, corrected

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Engagement and next steps

- **Stakeholder engagement so far – aviation specialists:**
    - Airlines: through Lead Operator Meetings
    - Airports: ongoing briefings, requests for info, feedback and LTMA Working Group
    - MoD: through DAATM and Force Command
    - GA: links via FASVIG with appropriate representative organisations

- **Next steps:**
    - Produce: Stage 1 Assessment Meeting minutes and submit to SARG for portal upload
    - Continue: analytics work, to engage effectively with stakeholder (airlines, airports, MoD, GA)
    - Continue: appropriate engagement with aviation stakeholders, to establish Design Principles
    - Continue: development work on concept modelling
    - Update: SARG at appropriate intervals

- **AOB?**

Questions?