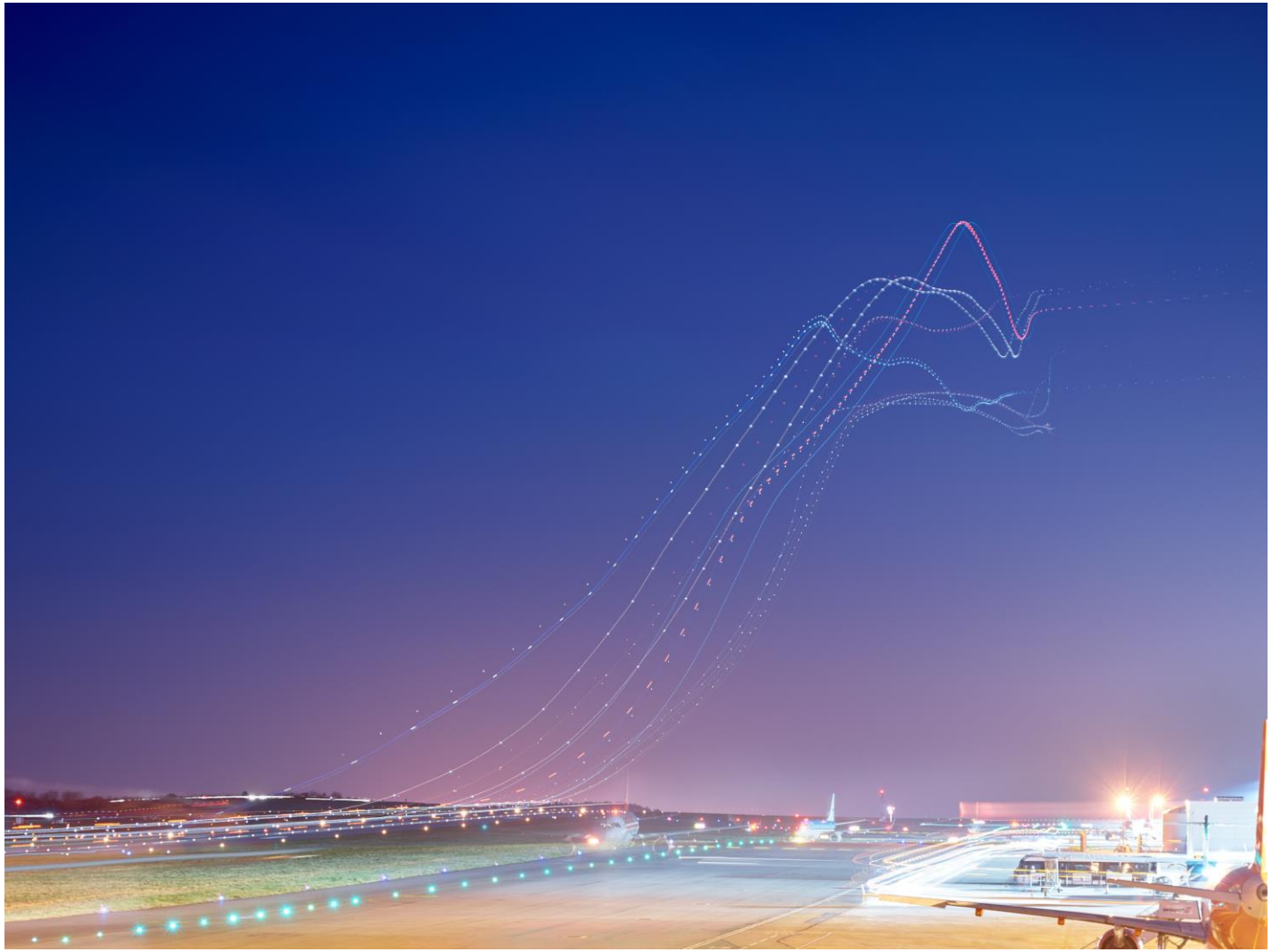
Bristol Airport
Airspace Change Proposal (ACP) Update



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Introduction

Airfield Technical and Compliance Manager

Bristol Airport

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Airspace Modernisation and Bristol's Airspace Change Proposal (ACP)

Airspace Change Specialist

NATS

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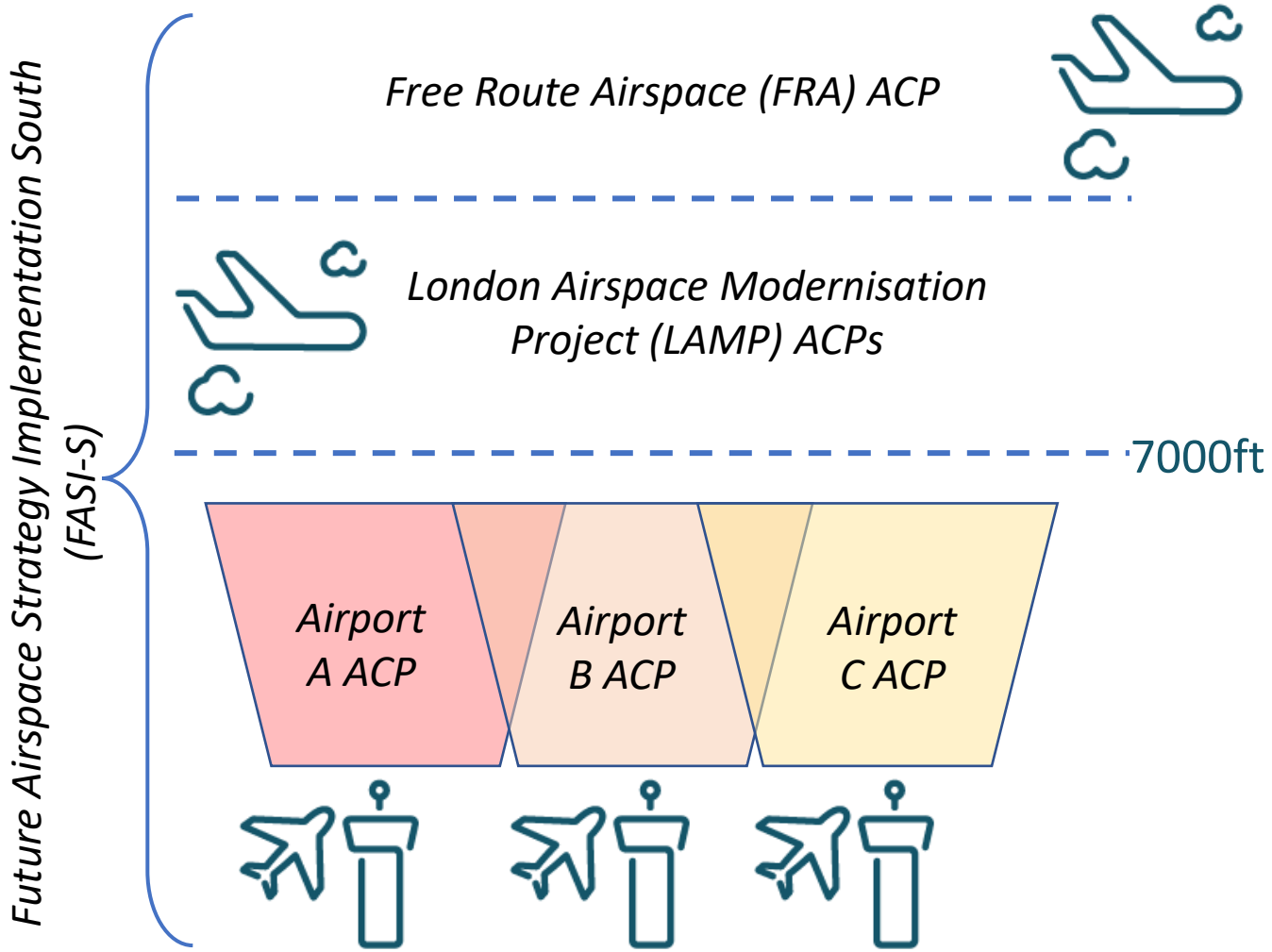
Airspace Modernisation

- Bristol Airport's ACP is part of the Future Airspace Strategy Implementation South (FASI-S) alongside:
  - 14 other low-level airport ACPs;
  - High-level network ACPs (NATS)
- These linked ACPs can achieve collective benefits such as:
  - Reduce the environmental impact of flights;
  - More precise and direct flights;
  - Accommodate other airspace users;
  - Reduce the impact of aviation noise.



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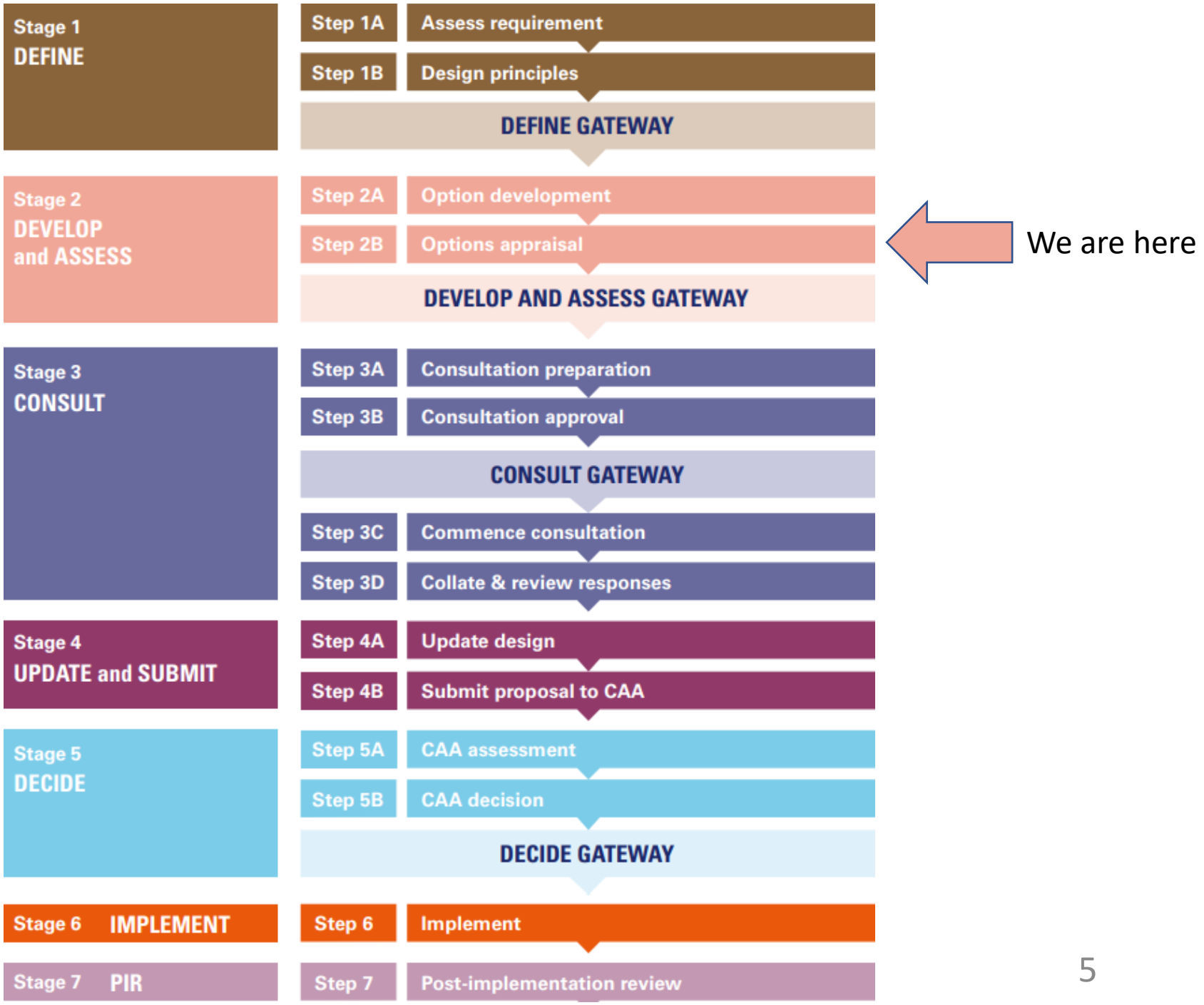
CAP1616 Airspace Change Process



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Bristol ACP – CAP1616 Inputs

- Operational issues identified from airport & airspace performance surveys (2017 & 2018)
- DfT Air Navigation Guidance
- CAA Airspace Modernisation Strategy (CAP1711)
- ACP Statement of Need (from ACP Step 1A)
- Design Principles (from ACP Step 1B)
- Bristol – London Airspace Modernisation Programme (LAMP): airport requirements

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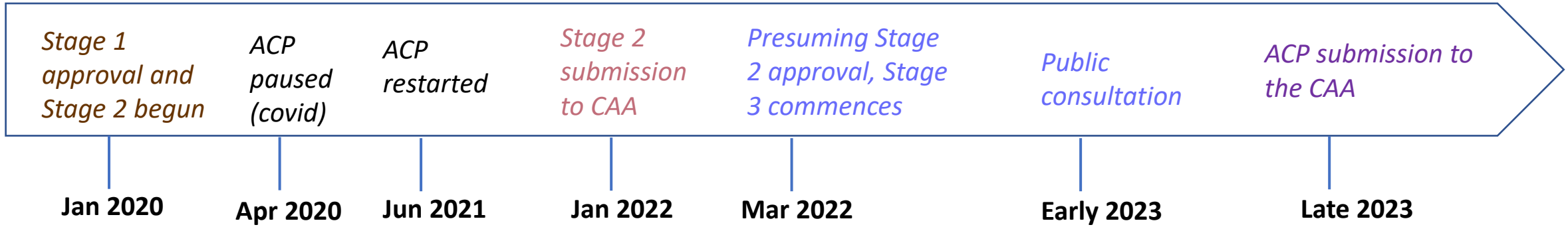
Bristol ACP – CAP1616 Timeline

Stage 1 Define
Step 1A: Assessment Requirement
Step 1B: Design Principles

Stage 2 Develop and Assess
Step 2A: Options Development
Step 2B: Options Appraisal

Stage 3 Consult
Step 3A: Consultation Preparation
Step 3B: Consultation Validation
Step 3C: Commence Consultation
Step 3D: Collate and Review Responses

Stage 4 Update and Submit
Step 4A: Update Design
Step 4B: Submit Proposal to CAA



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Bristol Airport's Statement of Need

Bristol Airport submitted a formal Statement of Need to the CAA in late 2018. It outlines what Bristol Airport seeks to achieve from an airspace change including:

- Reduce noise impacts of flight paths over populated areas
- Reduce emissions and the environmental impact of flights
- Change where Bristol Airport's main holding procedure is located
- Make use of the latest satellite based navigation specification

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Bristol Airport's Design Principles

In late 2019, Bristol Airport engaged stakeholders on a set of draft Design Principles which outline the objectives of the ACP e.g. safety and environmental.

Common feedback from stakeholders received included:

- *"Support for modernisation and future-proofing"*
- *"Safety should never be compromised"*
- *"Minimising environmental impacts should be a priority"*

- *"Avoid populated areas – sympathetic towards local residents"*
- *"Share noise impact through dispersing routes"*
- *"No new people being overflown"*
- *"Precise routes could create noise ghettos"*
- *"Cognisant of areas enjoyed for their tranquillity"*
- *"Fly over fields, not towns"*

As a result of the differing feedback received for noise management, Bristol Airport created a number of additional Design Principles covering the different mitigation techniques.

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Design Principles

Category	Design Principle and Priority
Safety	DP1) Must maintain and where possible, enhance safety standards (A)
Policy	DP2) Must accord with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it (A)
Regulation	DP3) Must be compliant with all relevant laws and regulations (A)
Technical	DP4) Must maximise efficiency by using modern navigation technology (A)
Operational	DP5) Must provide sufficient capacity to support future demand (A)
Environmental	DP6) Should minimise fuel burn and CO_2 emissions per flight as far as possible (A)
Environmental	DP7) Should use noise-efficient operational practices to minimise the impact of aircraft noise on the local community and stakeholders (A)
Operational	DP8) Should maintain or enhance operational resilience of the Air Traffic Control network (B)
Technical	DP9) Should minimise impact on other airspace users
Technical	DP10) Should minimise controlled airspace (CAS) and impact on adjacent aerodrome and airfields (B)

Noise Mitigation Design Principles
DP11) Minimise the number of people newly overflown (C)
DP12) Maximise sharing through predictable respite routes (B)
DP13) Avoid overflying communities with multiple routes, including from other airports (C)
DP14) Maximise sharing through managed dispersal (C)
DP15) Minimise the total population overflown (B)

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Airspace Design Options Update

Bristol ACP Airspace Design Lead

NATS

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Operational issues from internal survey - 1

- Current Holding pattern (BRI) causes operational difficulties
  - loss of traffic in overhead and radar label ‘garbling’
  - departures cannot climb continuously
- BRI Hold capacity is stretched during peak periods/ adverse weather
- Controlled airspace to the south is insufficient for containment of arrivals, and no ability for parallel tracks
- Airspace bases to the North East are set at levels when both Filton and Lyneham were open; relatively high base levels not complementary to continuous decent profiles and tactical vectoring

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Operational issues from internal survey - 2

- Airspace for runway 09 is constrained; not favourable for efficient sequencing
- Runway capacity - 2 minute departure separation does not make the most of runway capacity and increases local environmental impact
- Departure routes do not all match required network alignment
- Current routes require high levels of tactical input

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Bristol ACP Statement of Need: Key Points

- Airport ACPs address the lower levels (up to circa 7000ft)
- London (NATS En-Route) responsible for the airspace above
- Improved flight efficiency and environmental performance
- Airspace capacity to enable future growth
- Re-designed SIDs & STARs using satellite navigation standards to connect efficiently to the revised LAMP network
- Also:
  - minimise flight paths over populated areas
  - reduce emissions by minimising additional track miles
  - alter position of Bristol's holding pattern
  - Controlled Airspace borders to support RNAV as default method of navigation

(SID = Standard Instrument Departure, STAR = Standard Arrival

RNAV = Area Navigation; flight not necessarily by reference to ground based aids)

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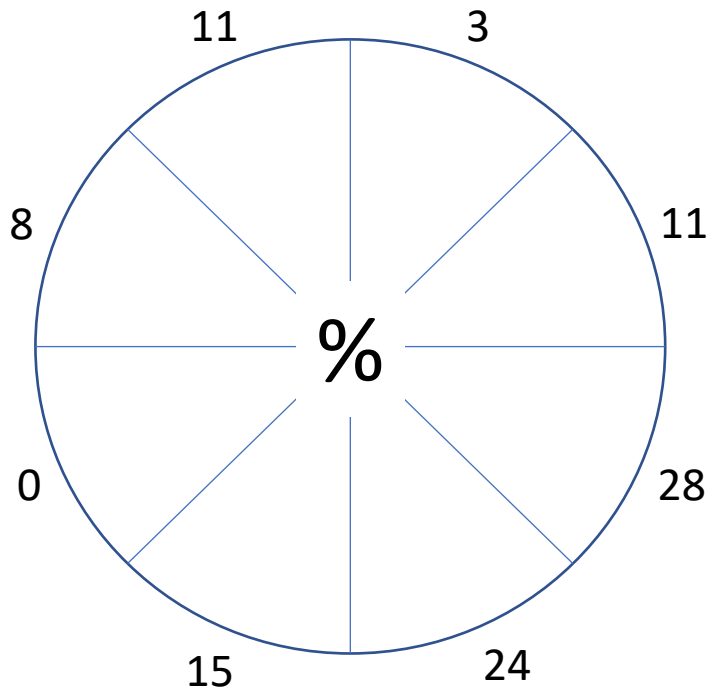
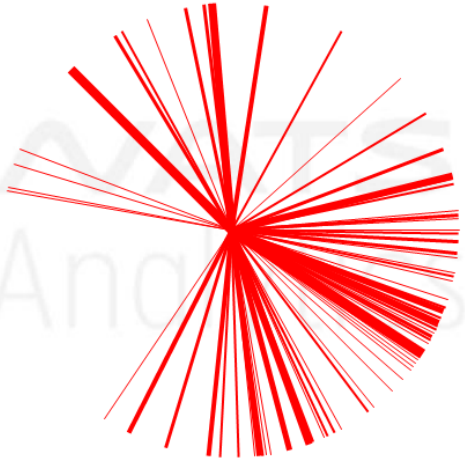
Traffic distribution

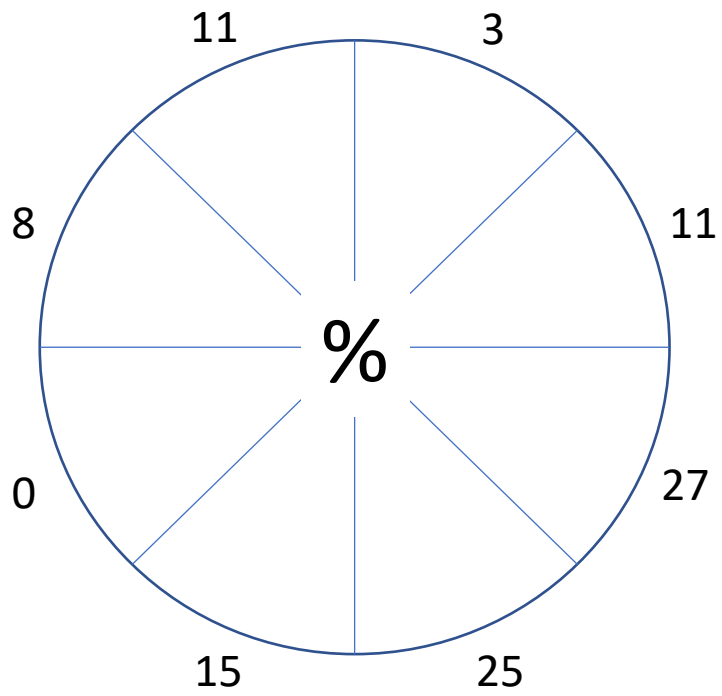
ARRIVALS
(9,187)

Totals for 3 months: June to August 2019

DEPARTURES
(9,346)







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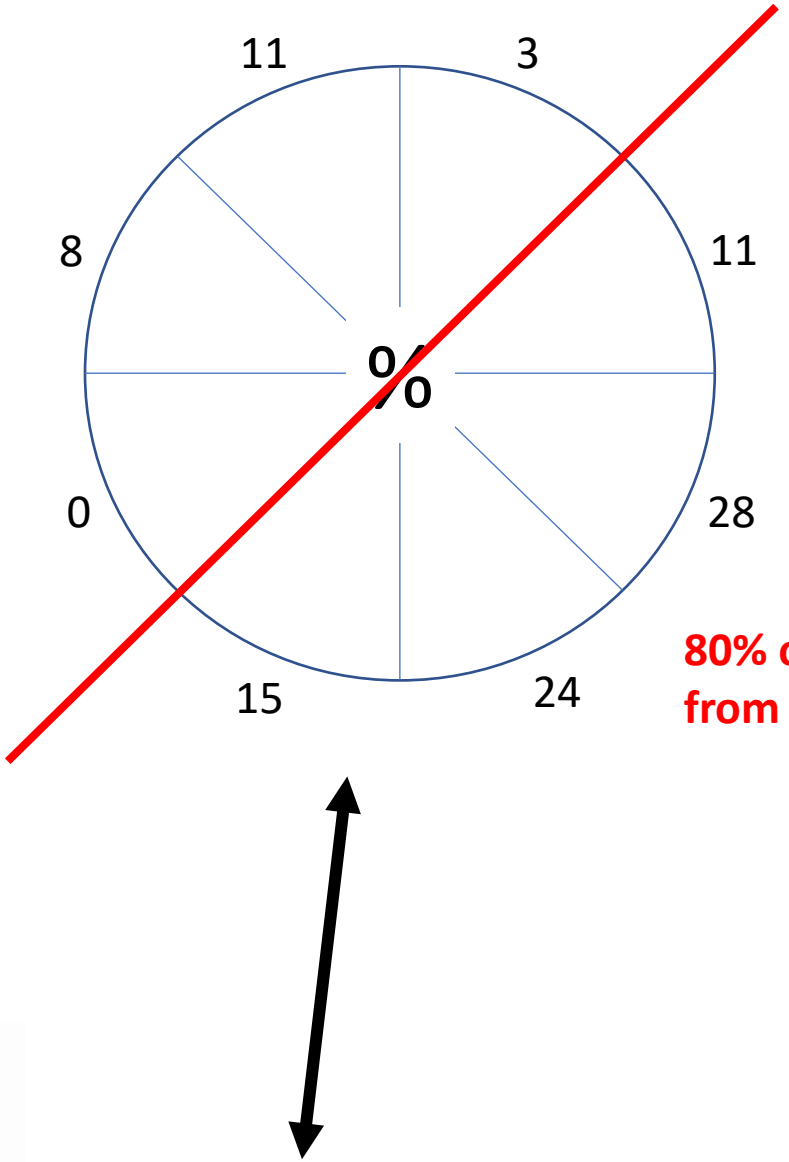

Main network routes

80% of all traffic from this sector

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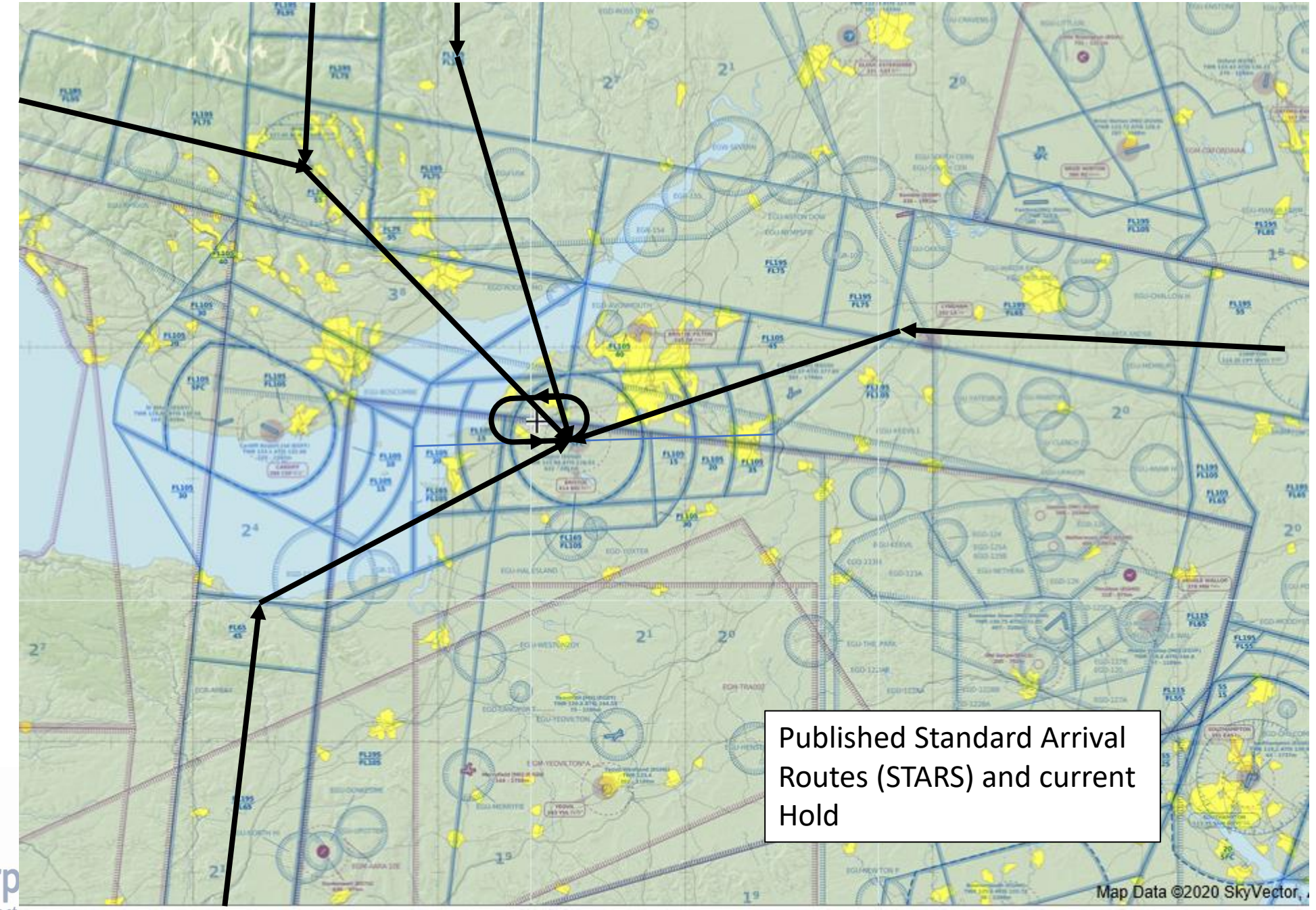

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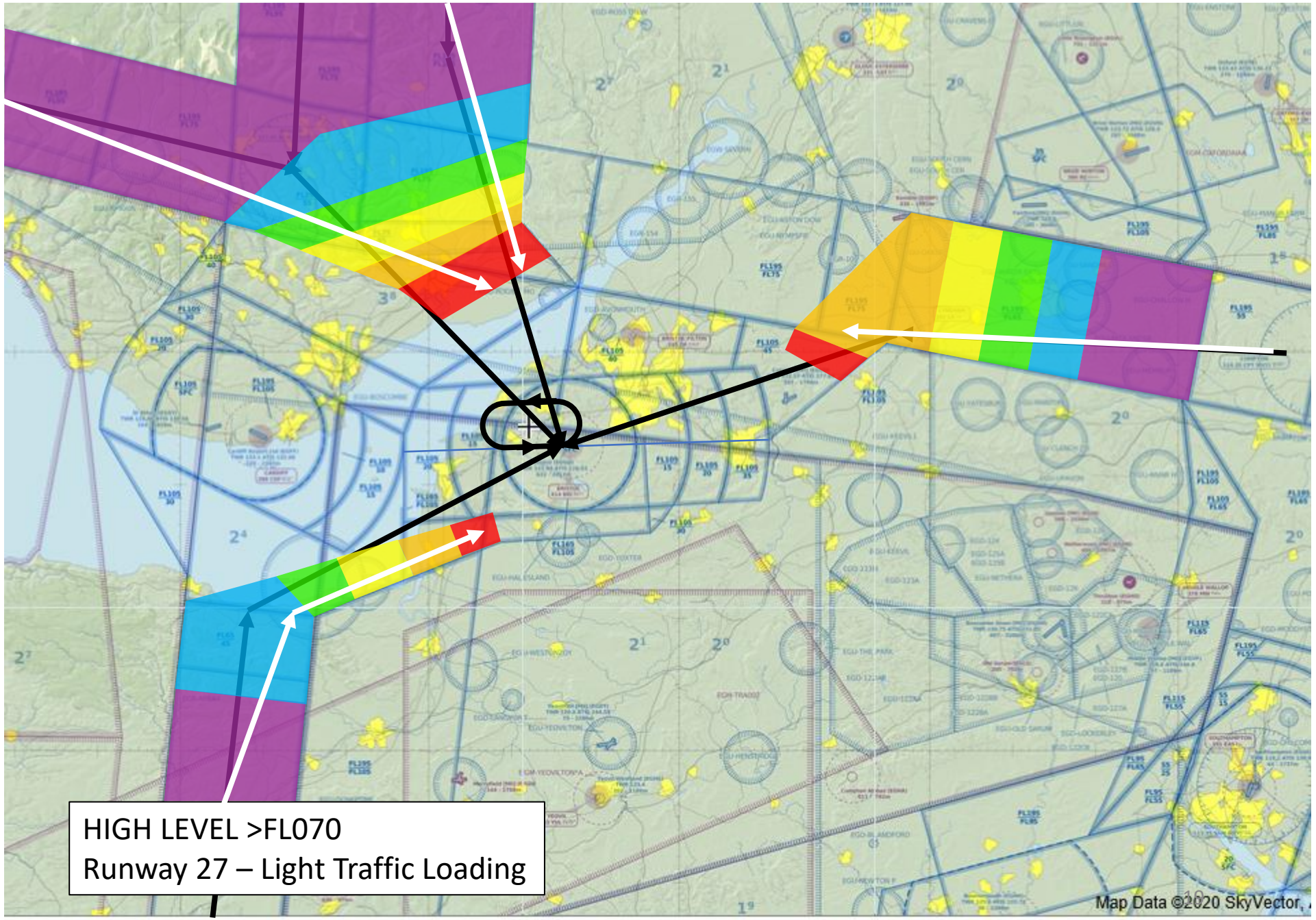
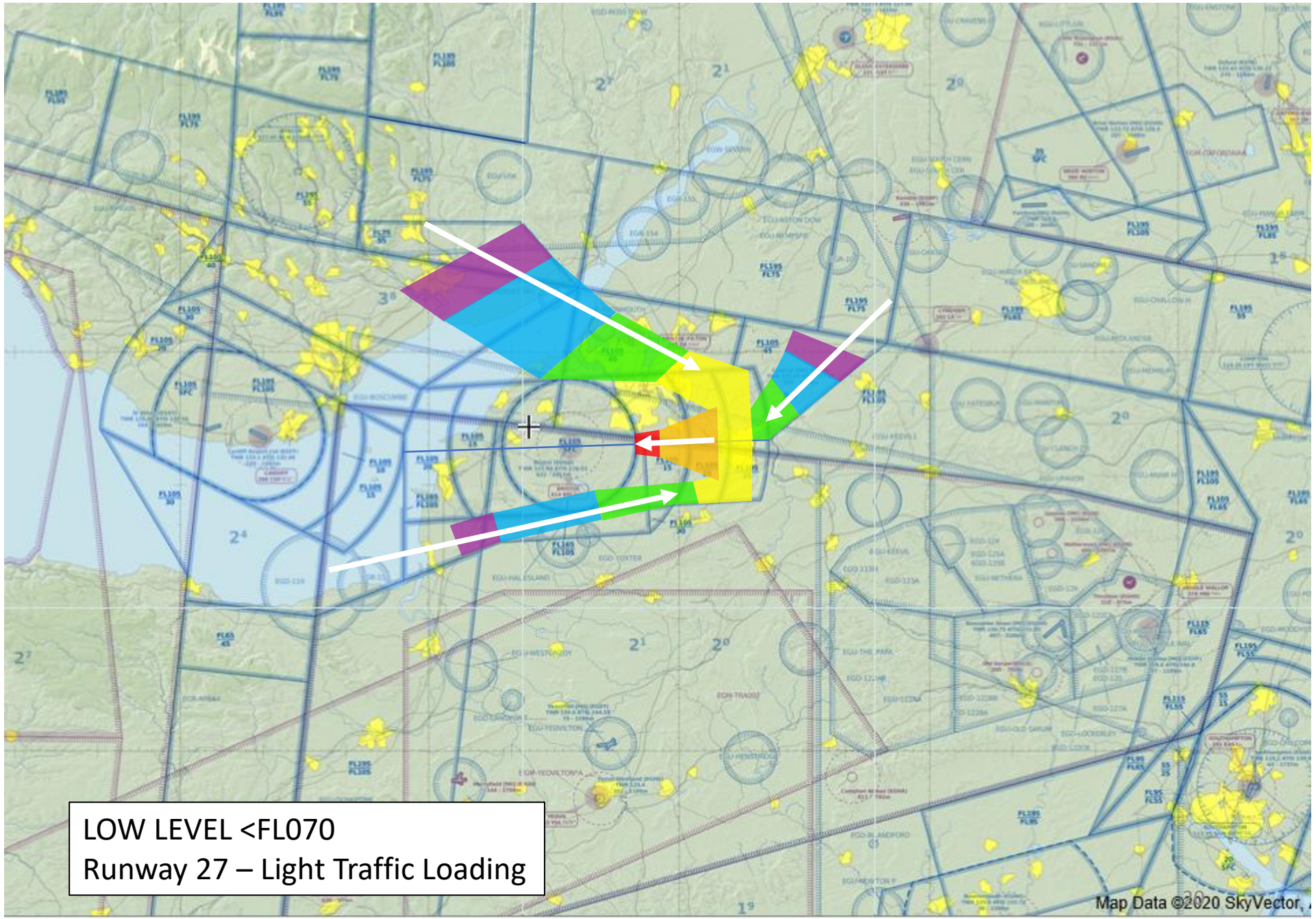
KEY	
→	Bristol STARs
→	Generic Traffic Flow
- - →	Alternate Traffic Flow
	FL120+
	FL110+
	FL100+
	FL090+
	FL080+
	FL070+



Bristol Airport
Amazing journeys start here

KEY	
→	Bristol STARs
→	Generic Traffic Flow
→	Alternate Traffic Flow
	FL070+
	6A+
	5A+
	4A+
	2.5A+
	2A+



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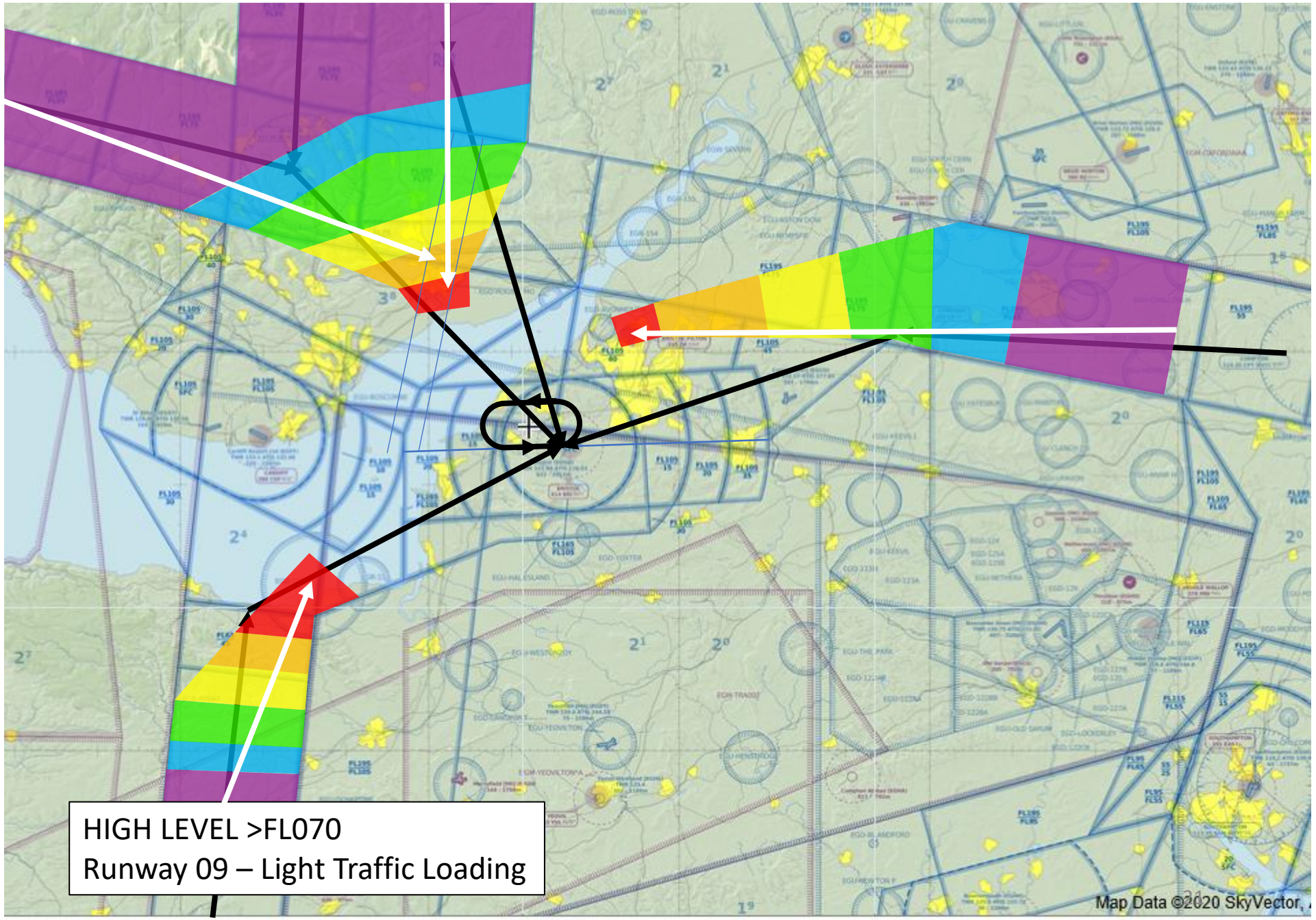

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Bristol Airport
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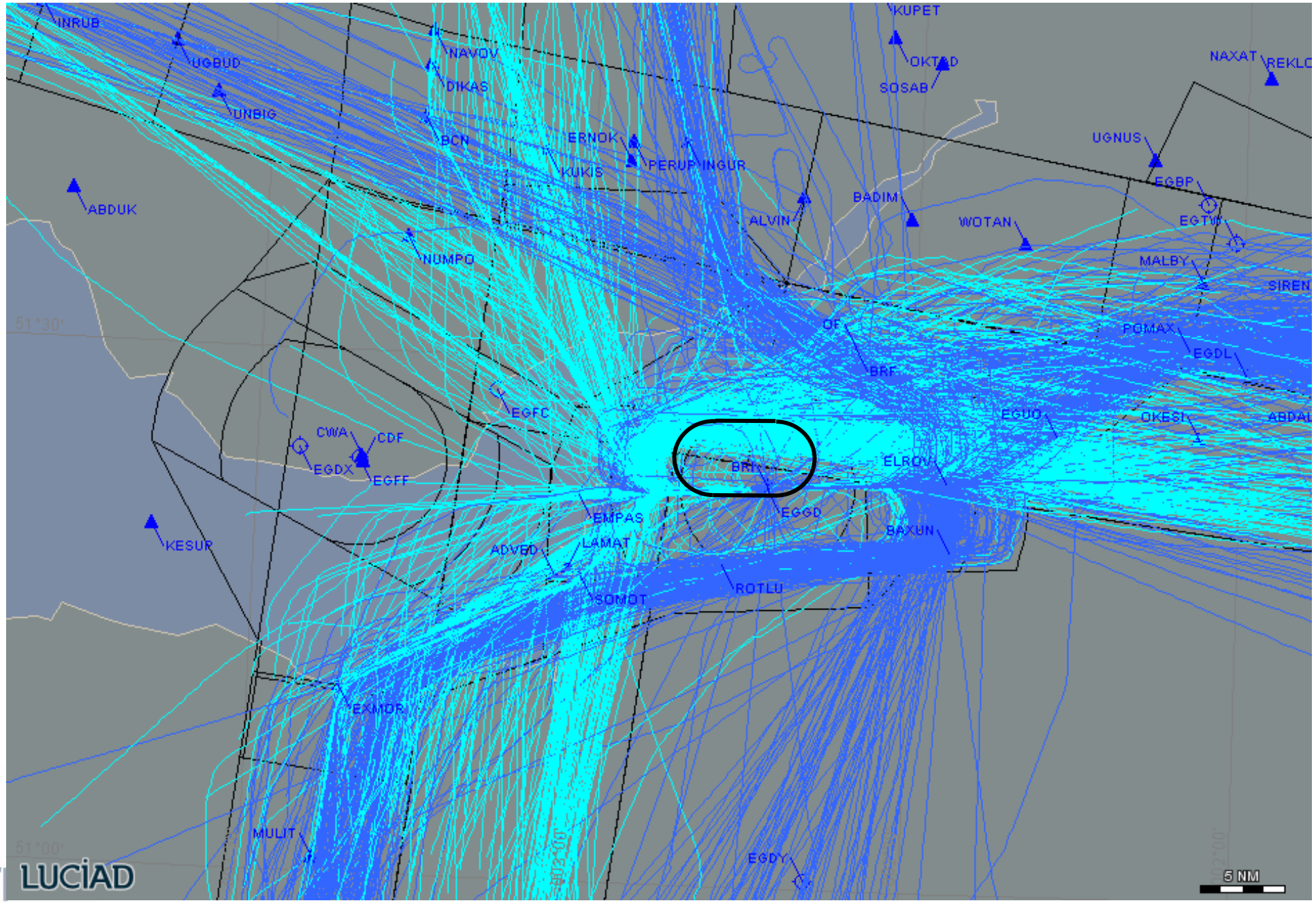

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LUCIAD

Design elements

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Key design elements of Bristol ACP

- Two new Holds; one North one South
- RNAV Transitions from each Hold to each runway, with Continuous Descents
- Continuous climb departures (where possible)
- SIDs aligned to/linked with the network
- SIDs to allow 1 minute departure intervals
- Maximise efficiency, minimise impact on environment and other airspace users (re Design Principles), e.g.
  - Peak period off-load route(s)
  - respite SIDs
  - maintain/improve GA access

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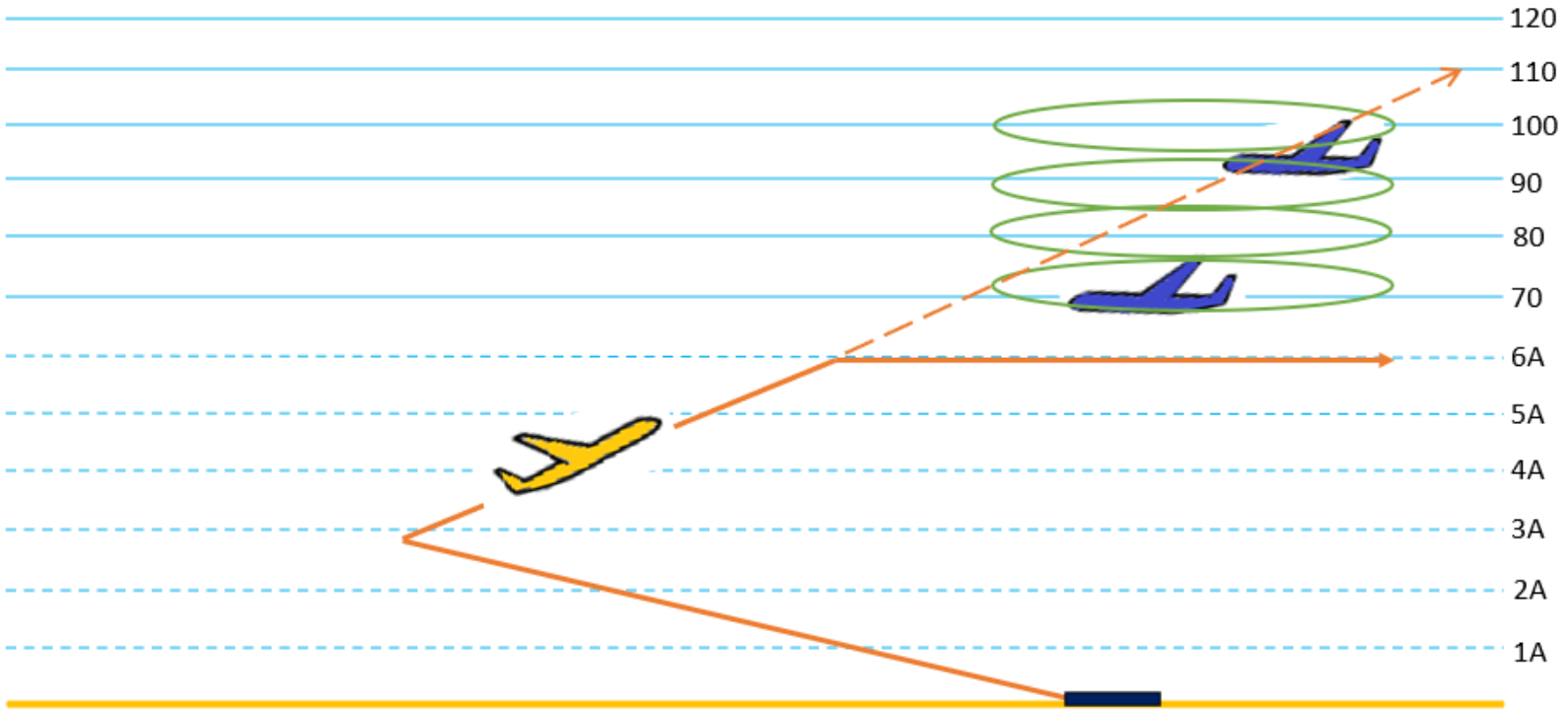
Position of current Holding pattern prevents continuous climbs

Aircraft levelling off increases emissions and spreads noise further



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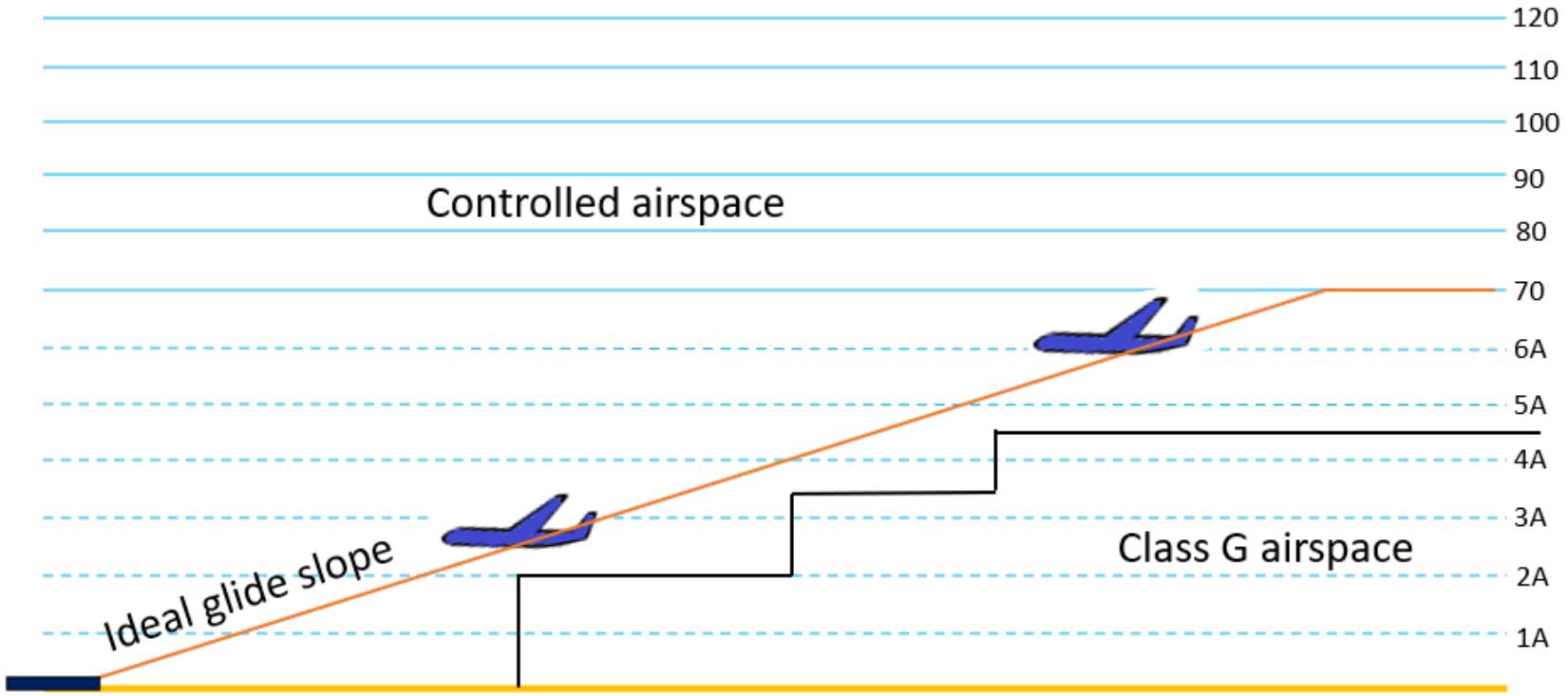
Controlled airspace containment - vertical

Typical design of Controlled Airspace



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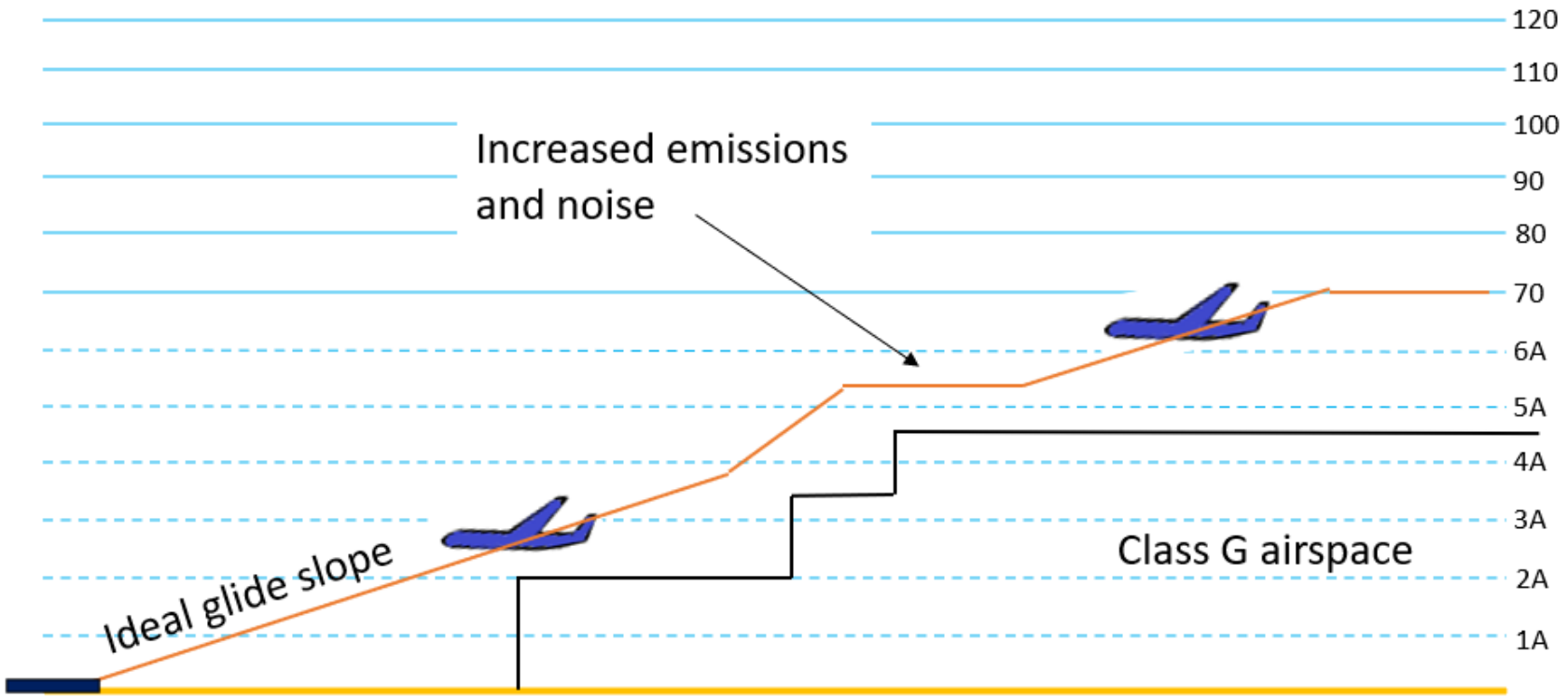
Controlled airspace containment - vertical

Situation today:
North East of
the airport



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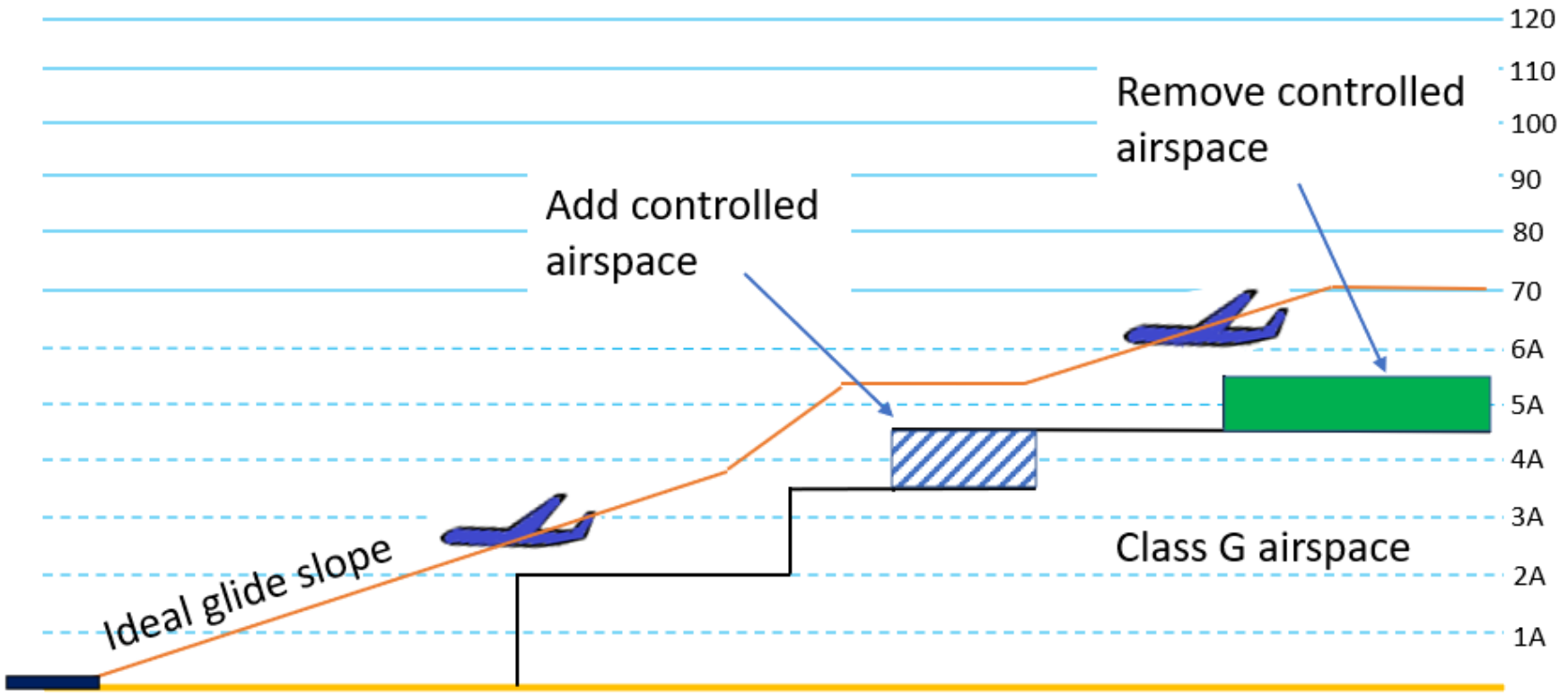
Controlled airspace containment - vertical

Potential solution



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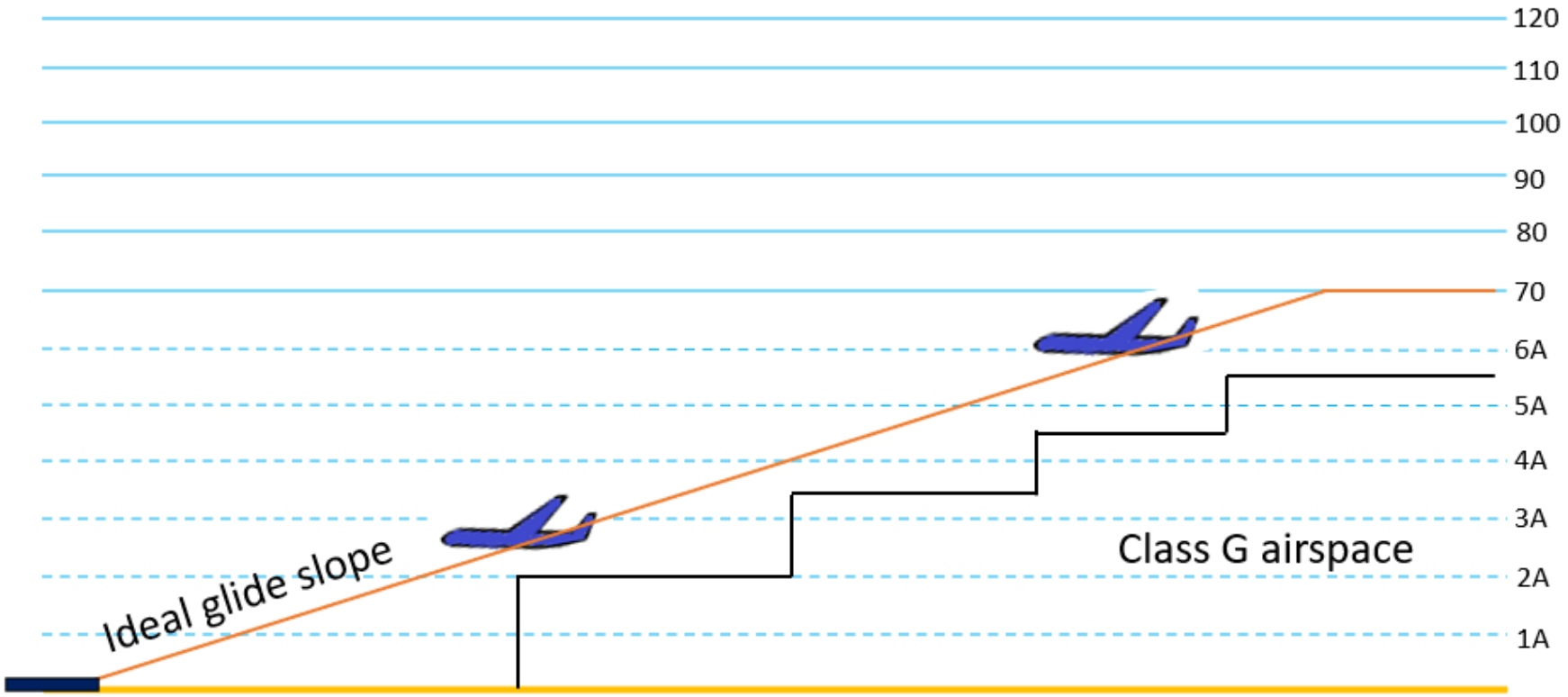
Controlled airspace containment - vertical

Resulting design



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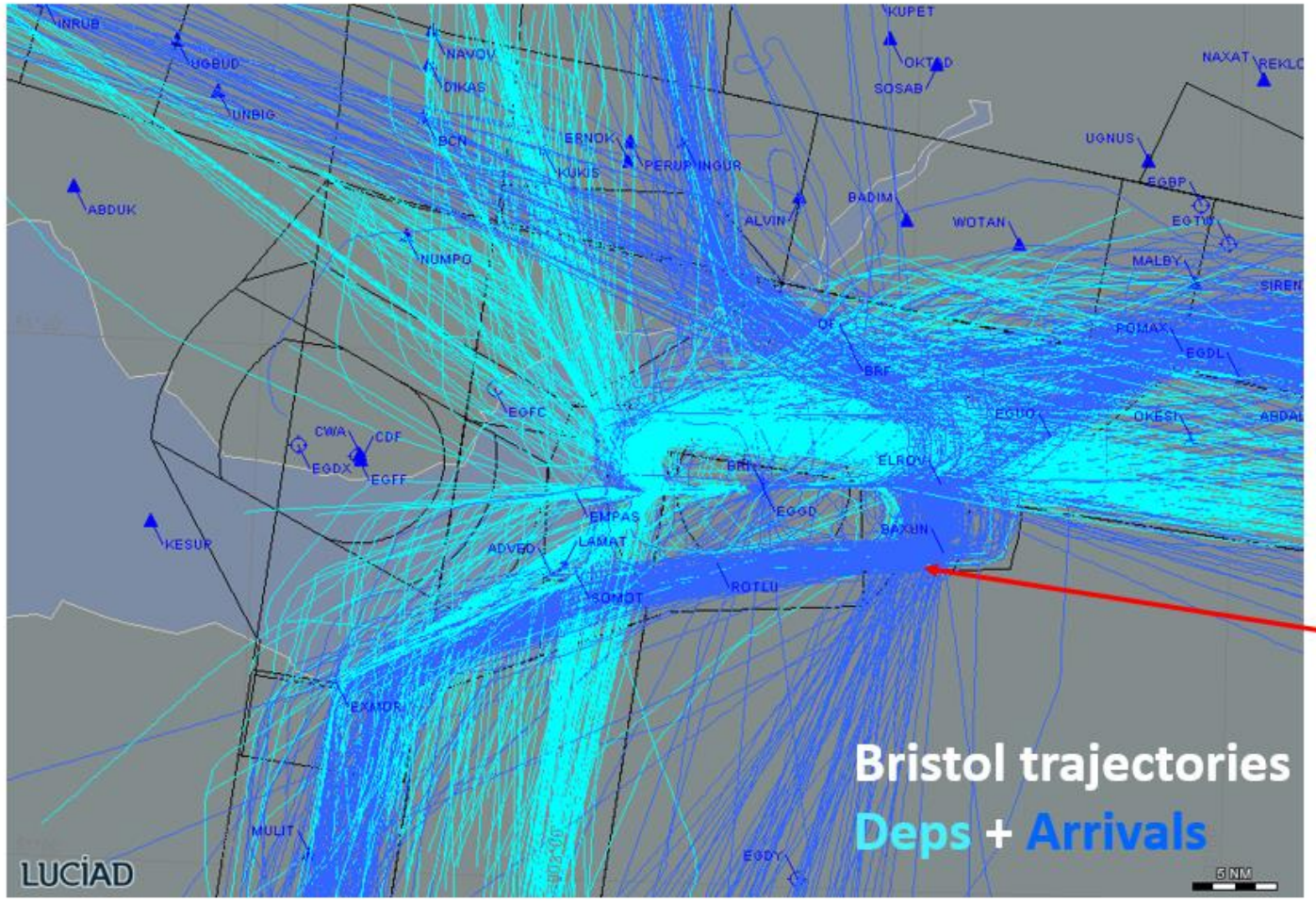
Controlled airspace containment - horizontal



Insufficient separation
From the boundary of
controlled airspace

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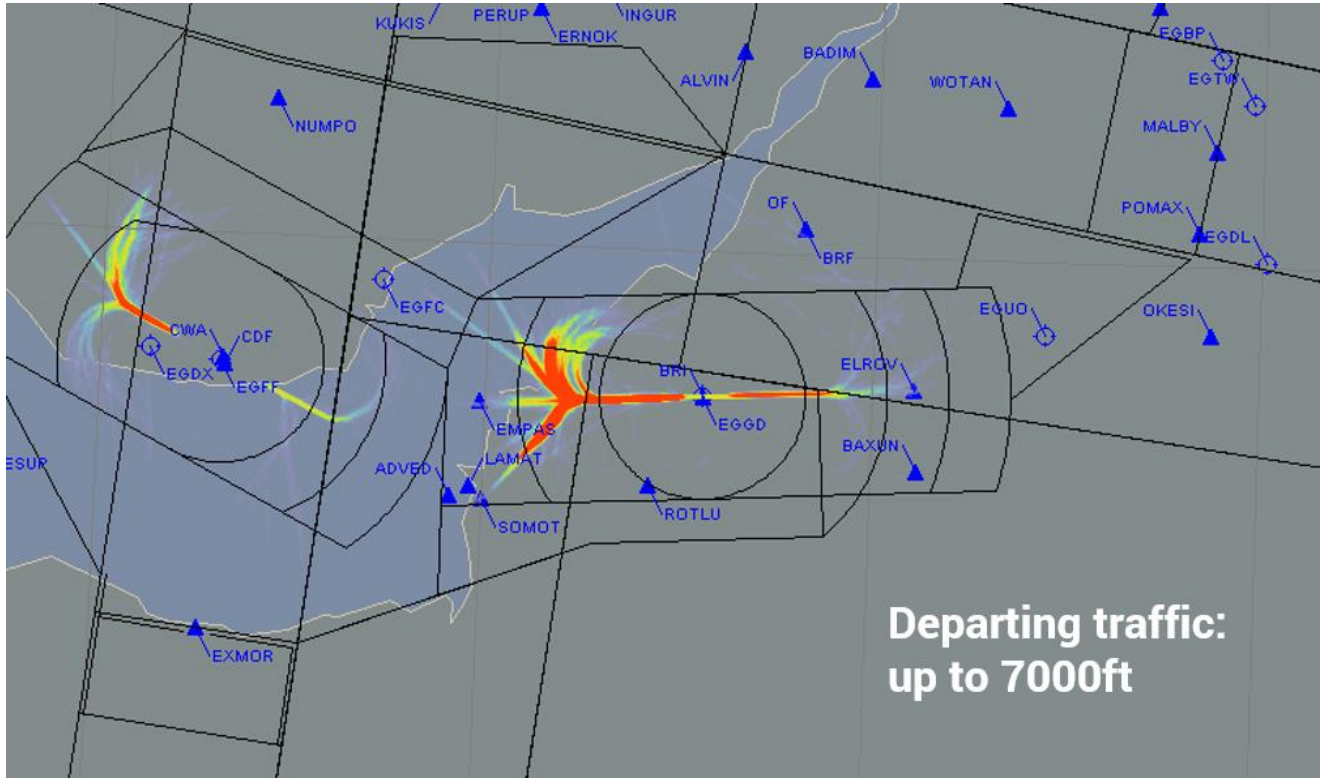
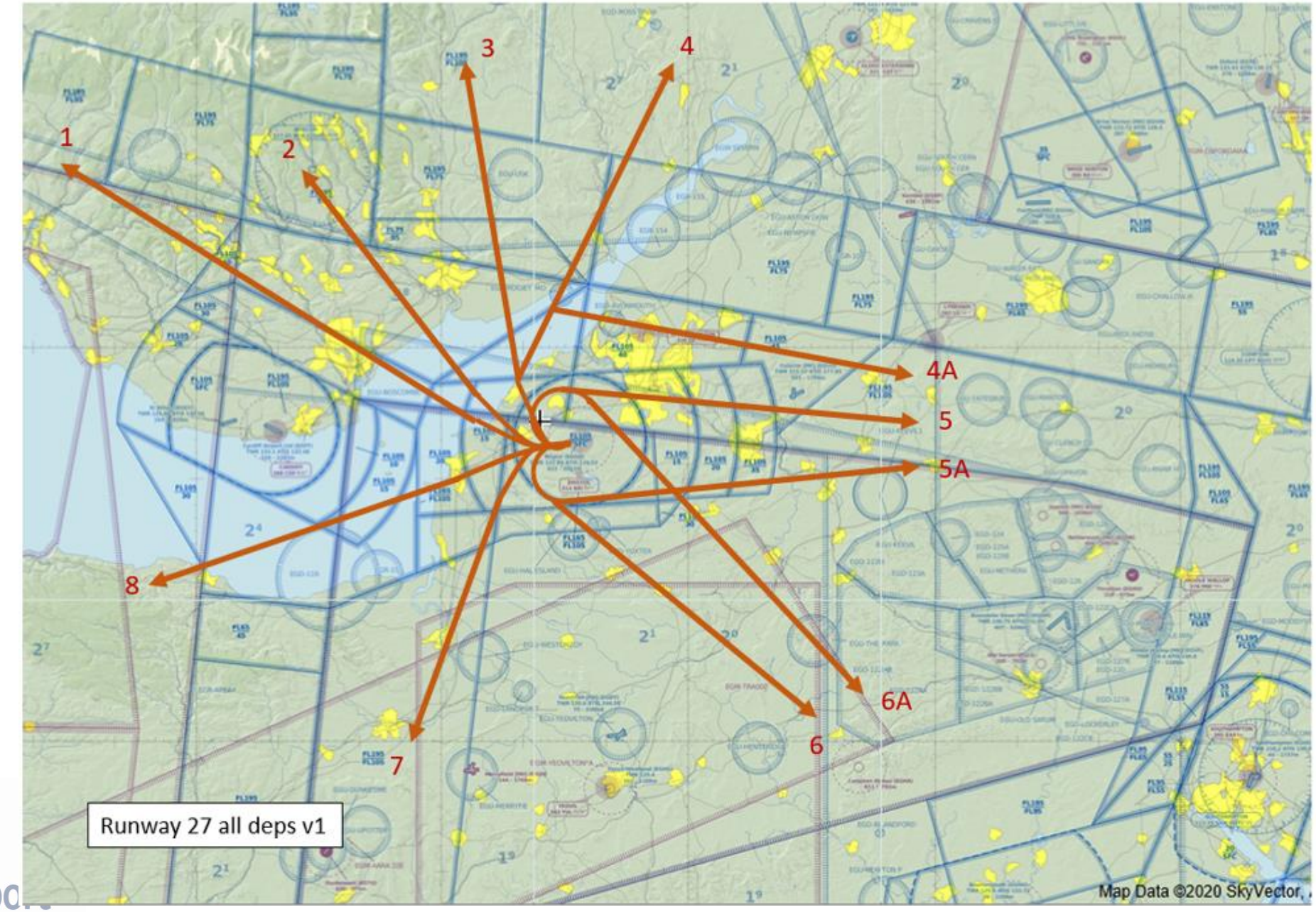
Departure separations

- Aircraft currently climb straight ahead for approx 5 miles before turning
- The minimum interval between departures is therefore 2 minutes
- This creates ground and taxying delay during departure peaks, with associated noise and emissions
- We will look at options for earlier track divergence after take-off to achieve 1 minute intervals



Development of design options

Jan 2020 to date…



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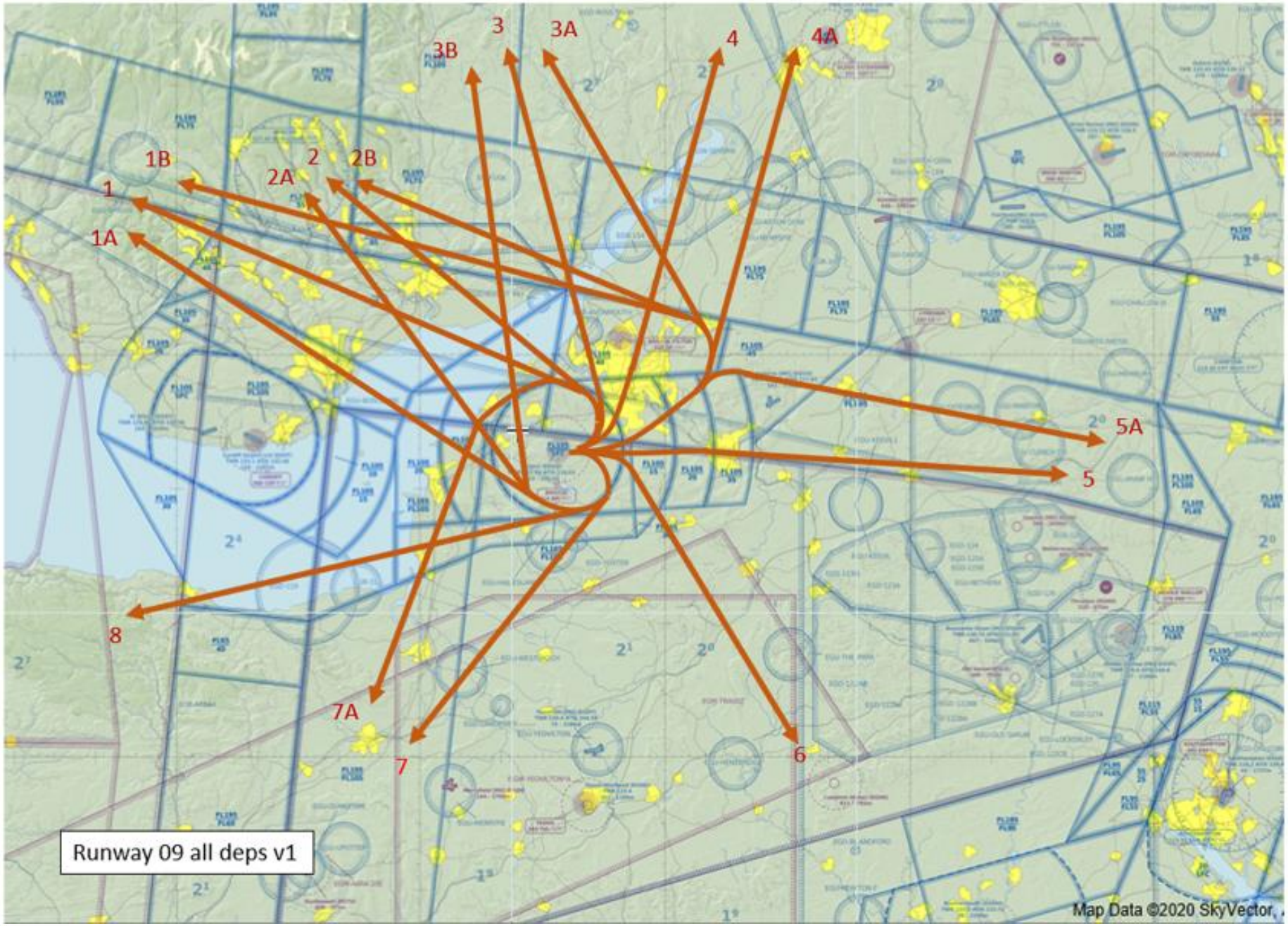

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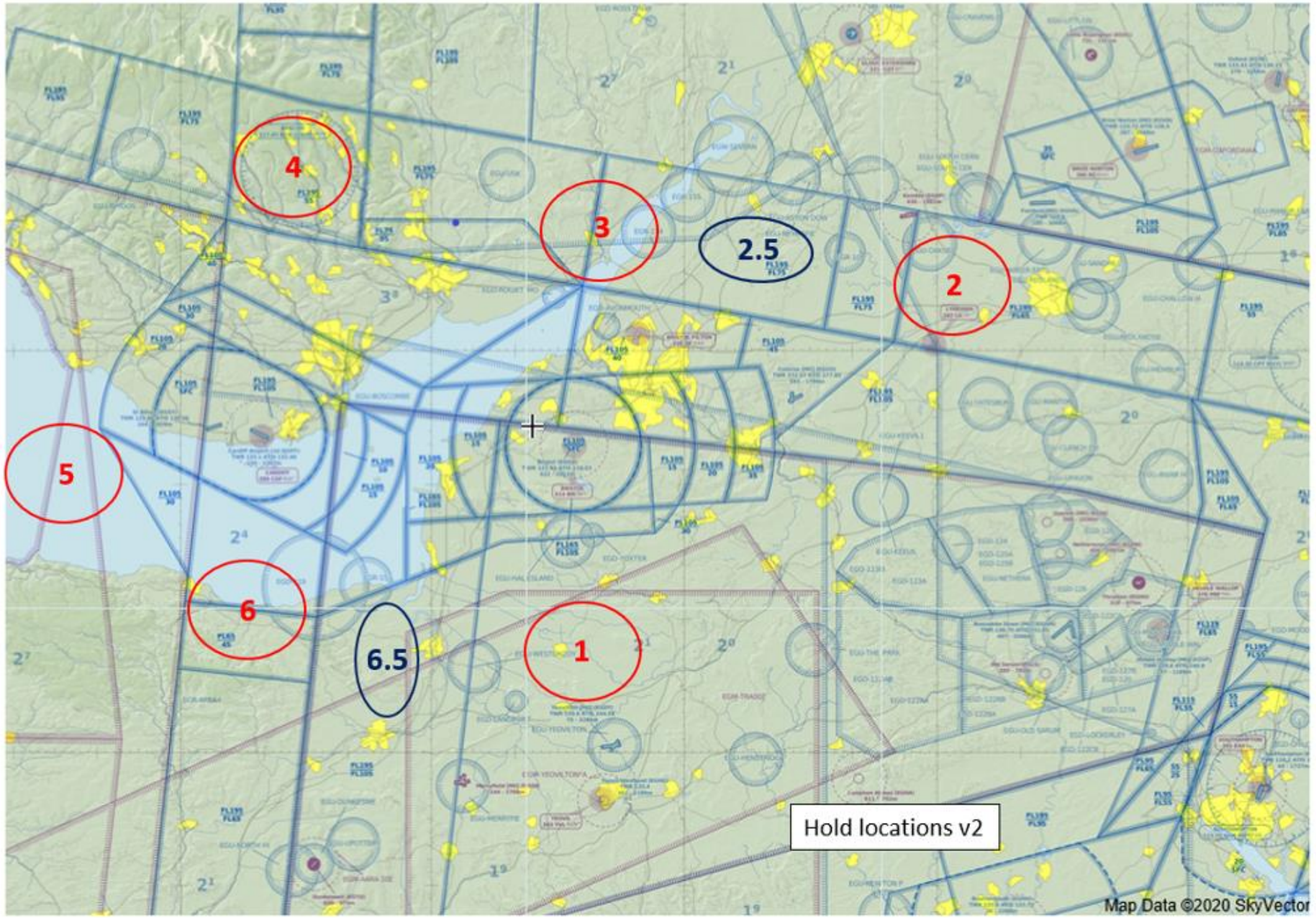

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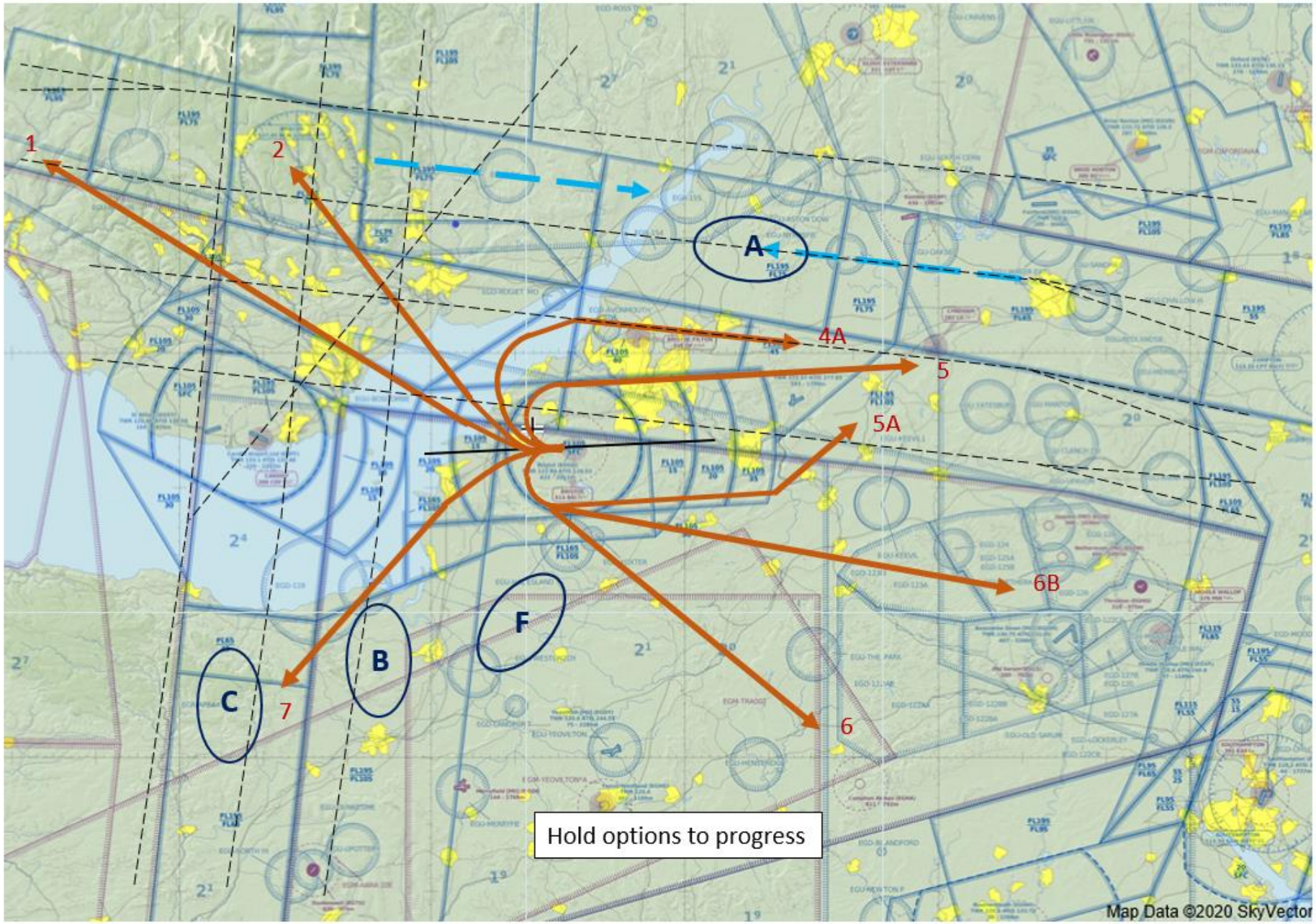

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Runway 27 scenarios

NOTE: All aircraft tracks shown are indicative pending further detailed work

(LD1.1 network routes shown for clarity)

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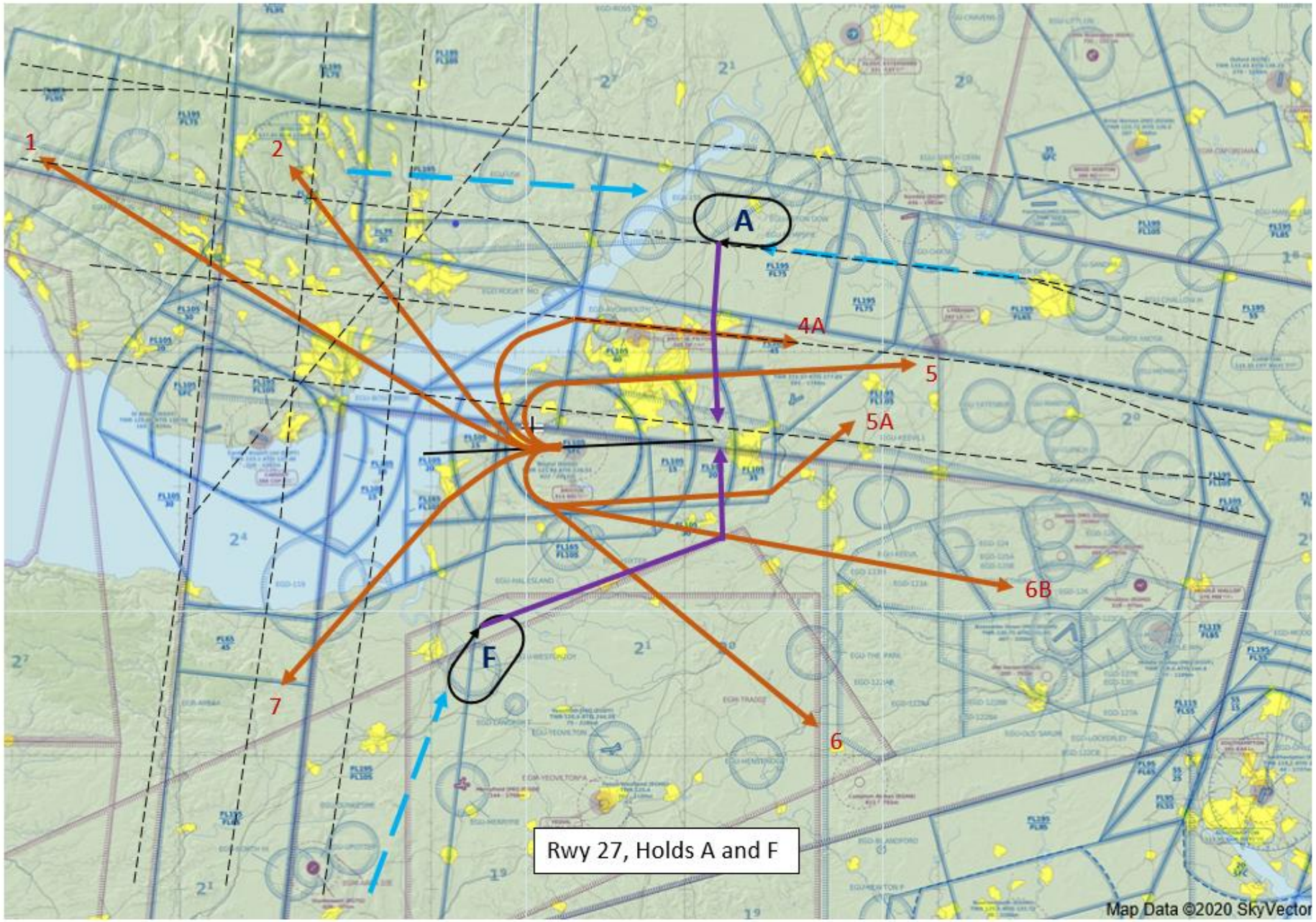

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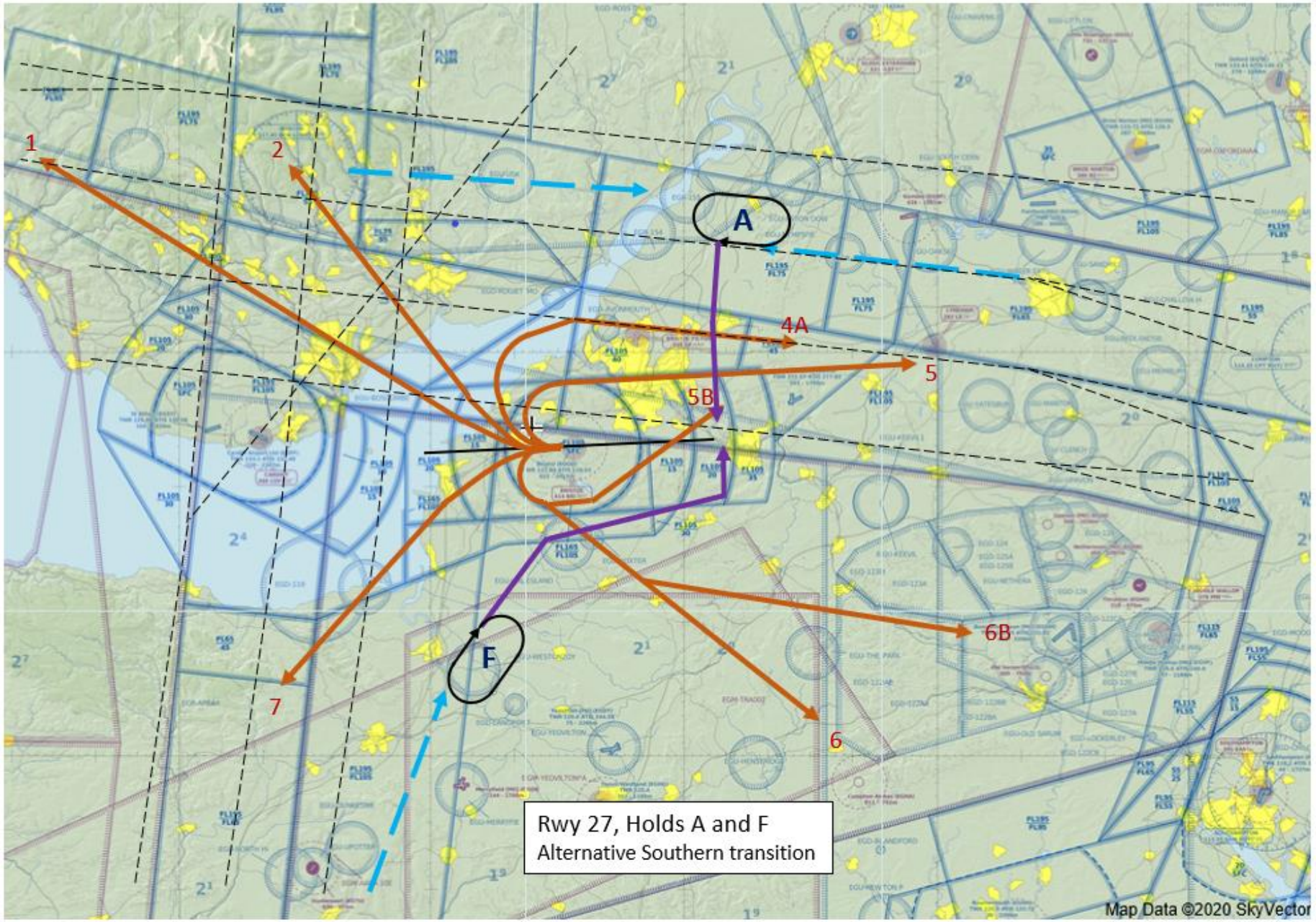

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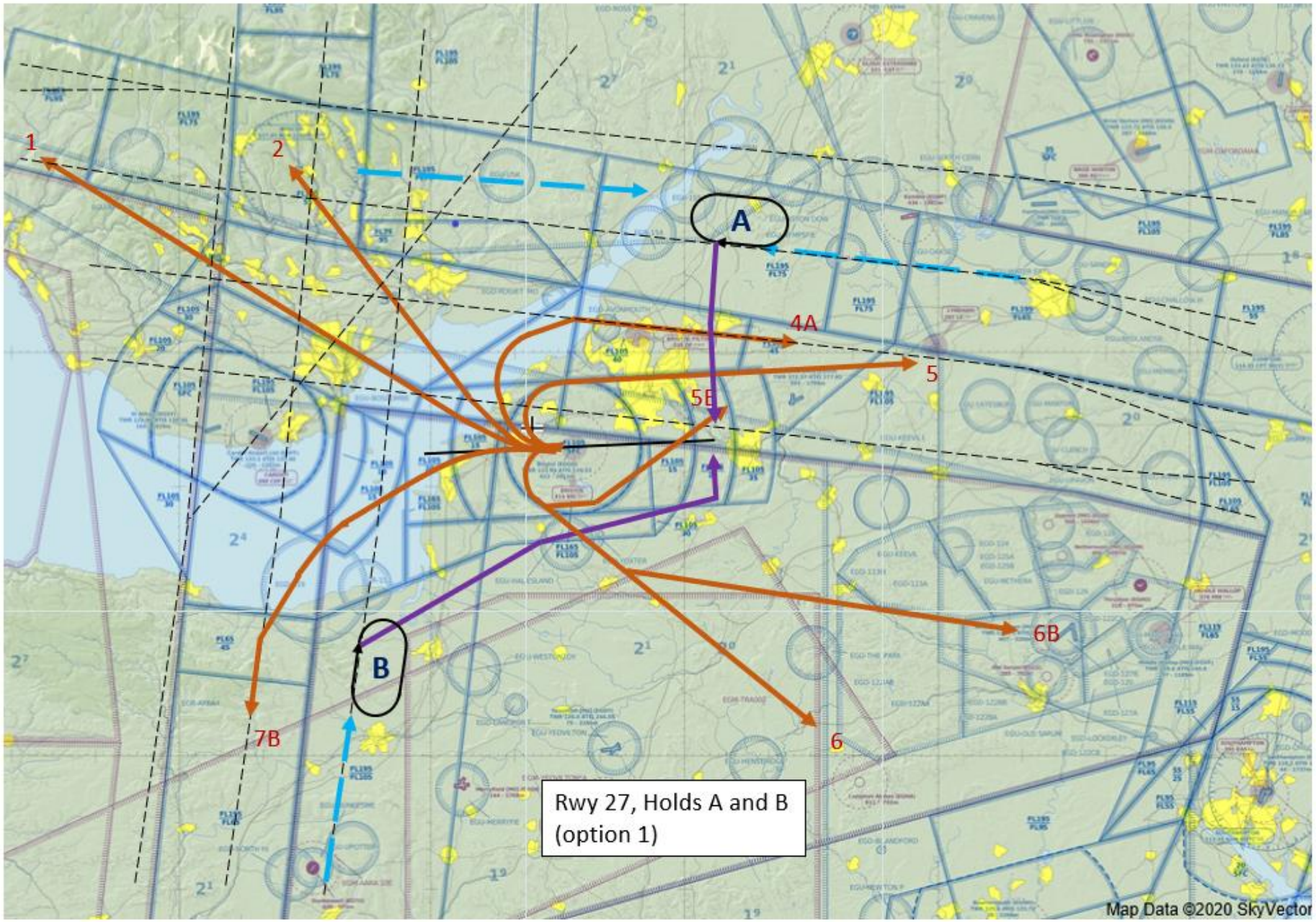

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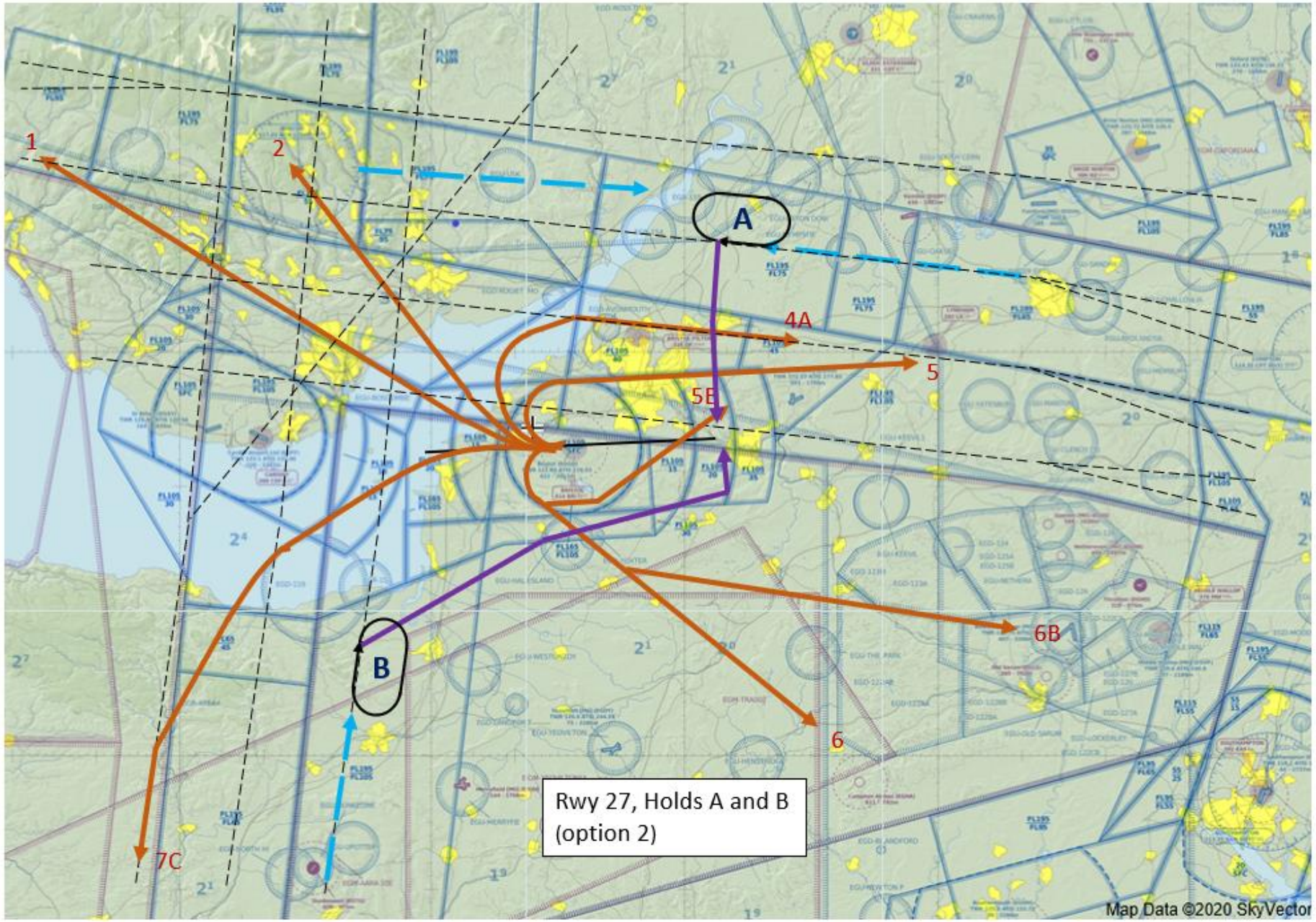

Bristol Airpc
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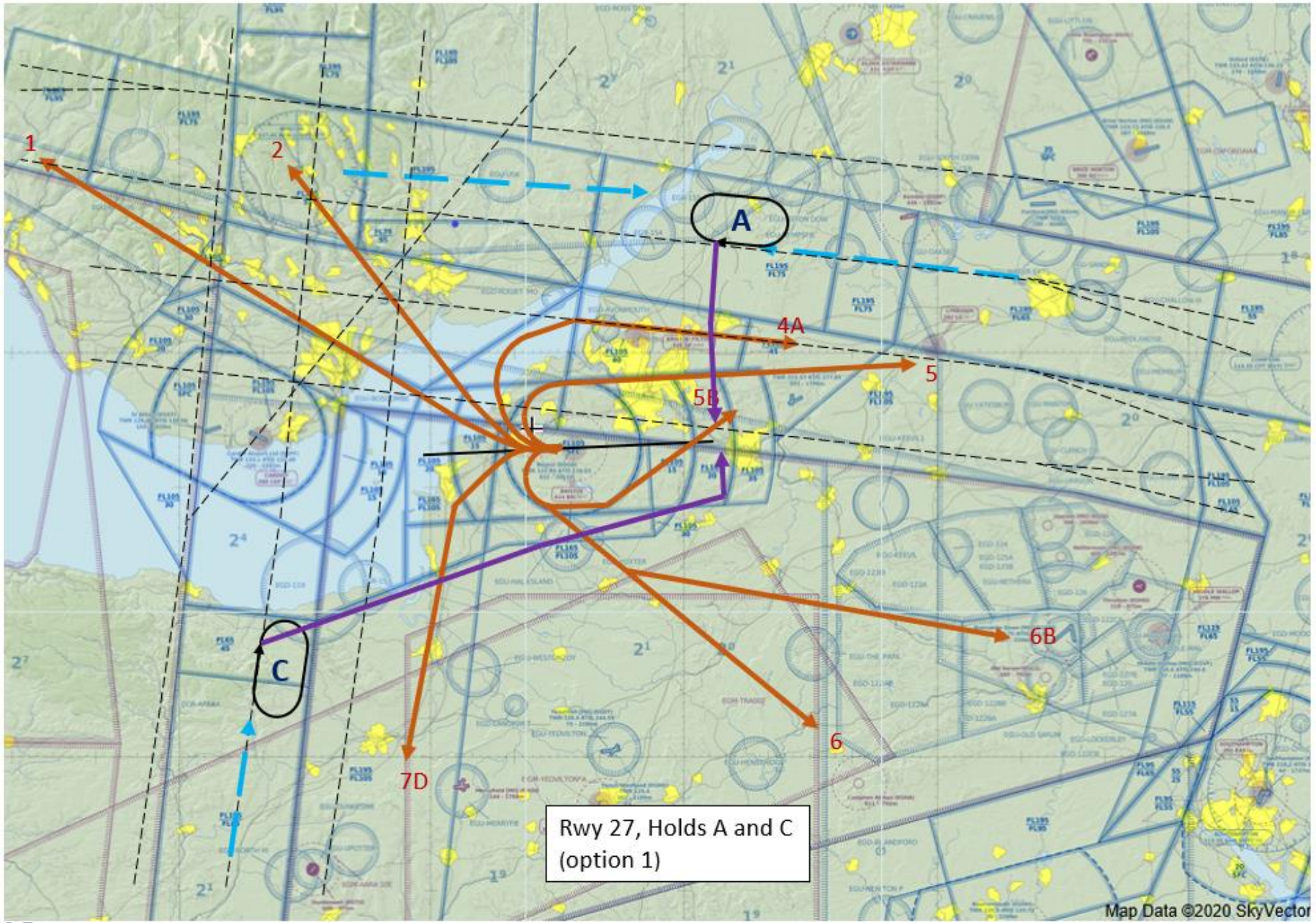

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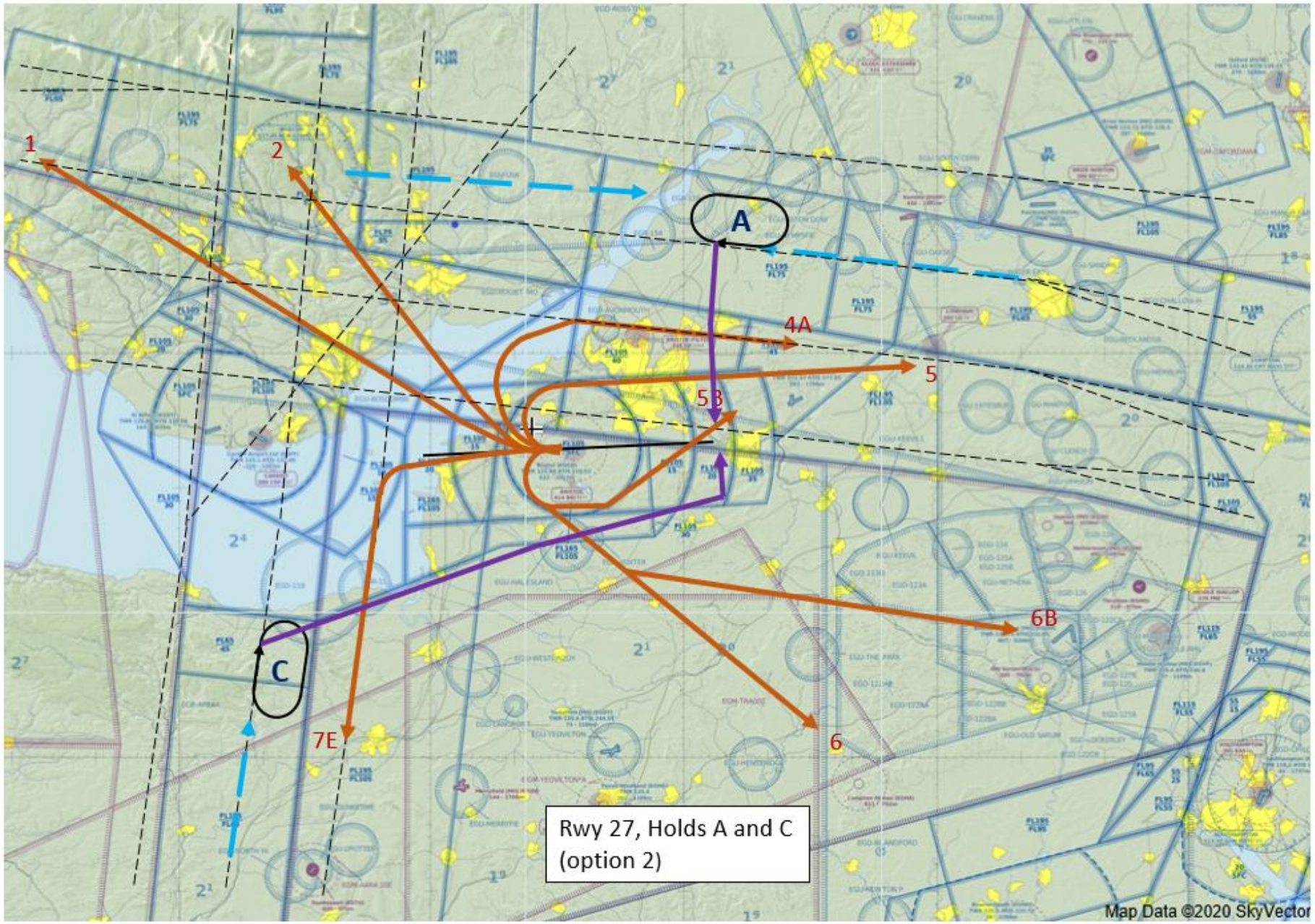

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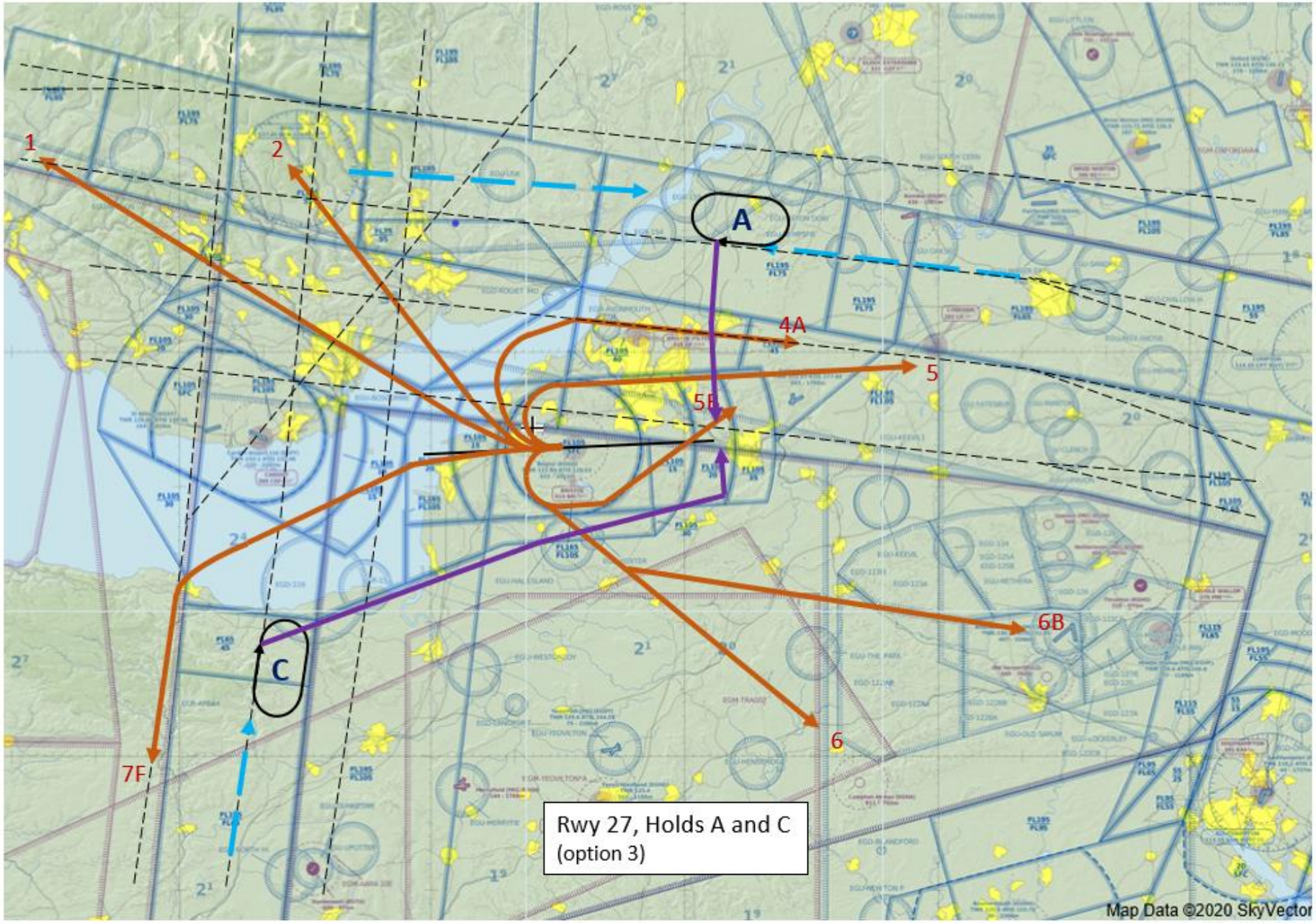

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Runway 09 scenarios.

NOTE: All aircraft tracks shown are indicative pending further detailed work.

(LD1.1 network routes shown for clarity)

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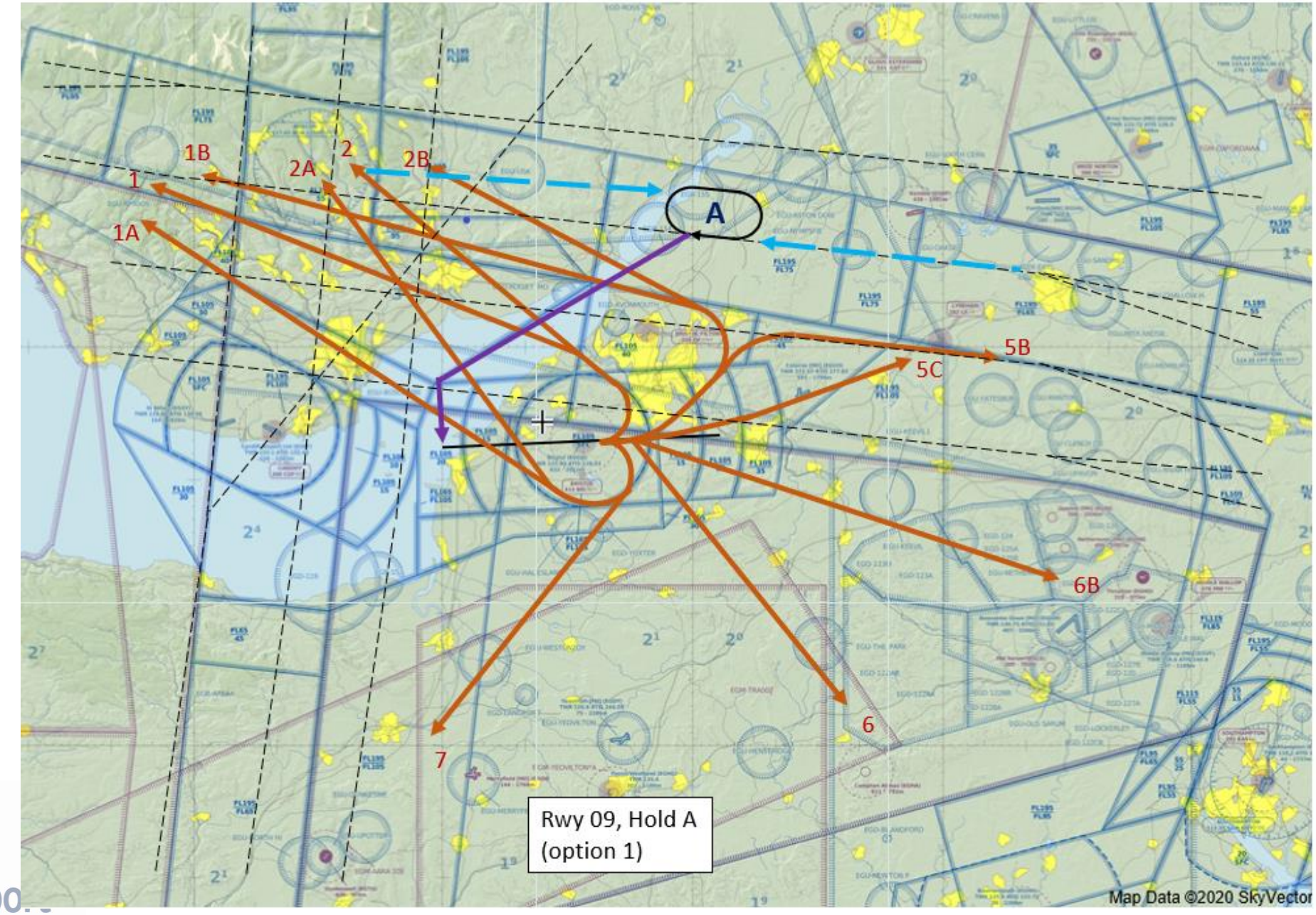

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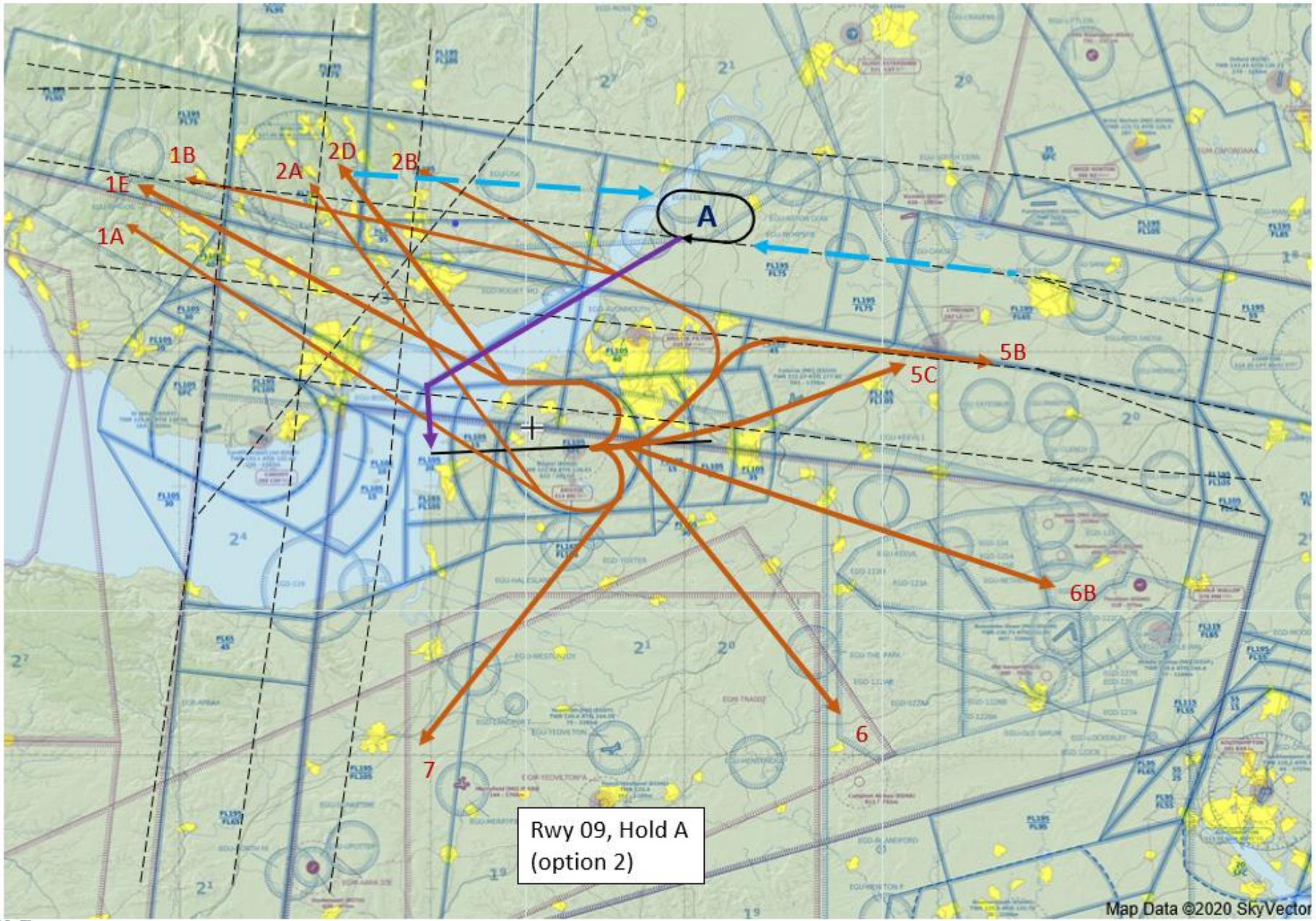

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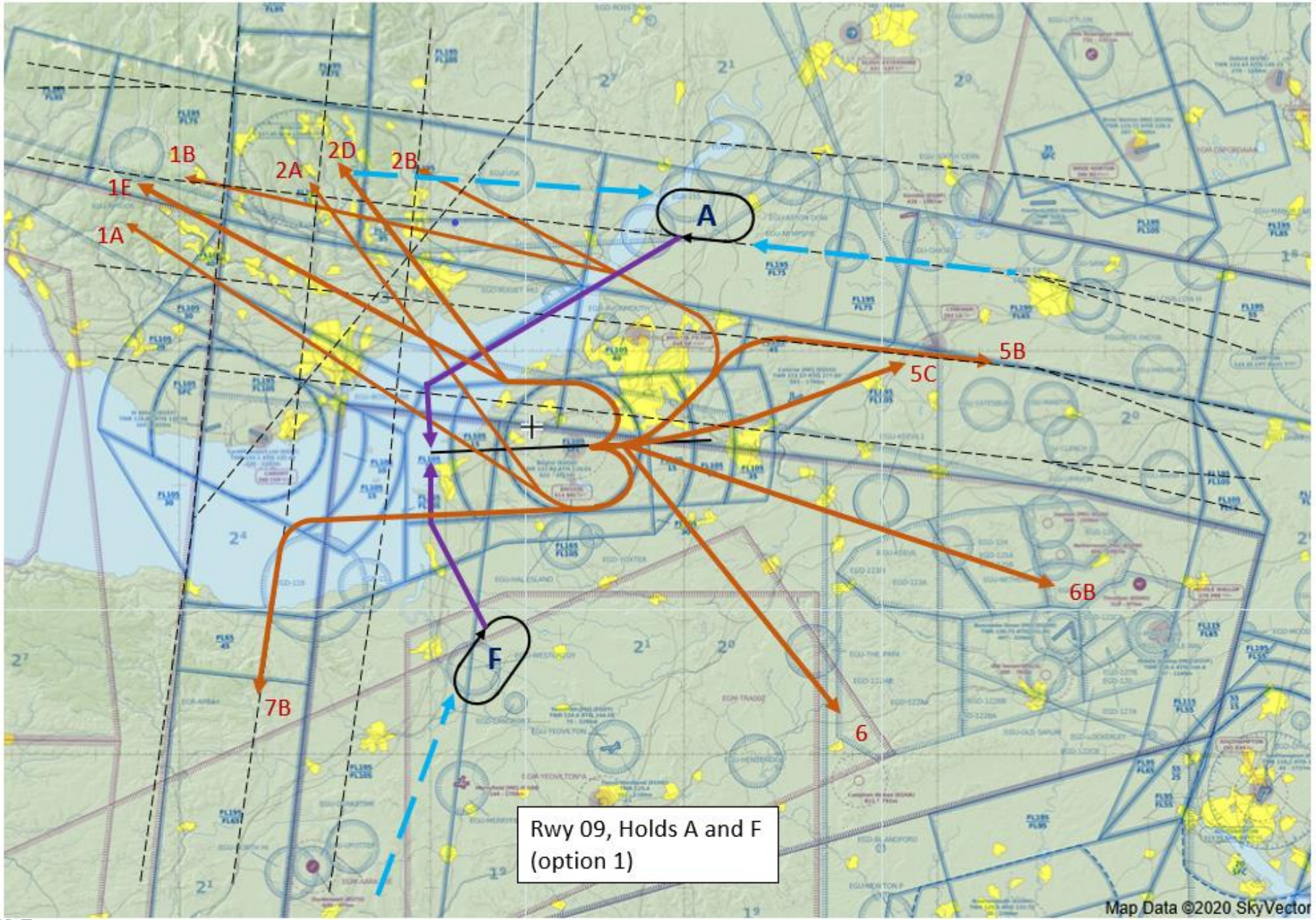

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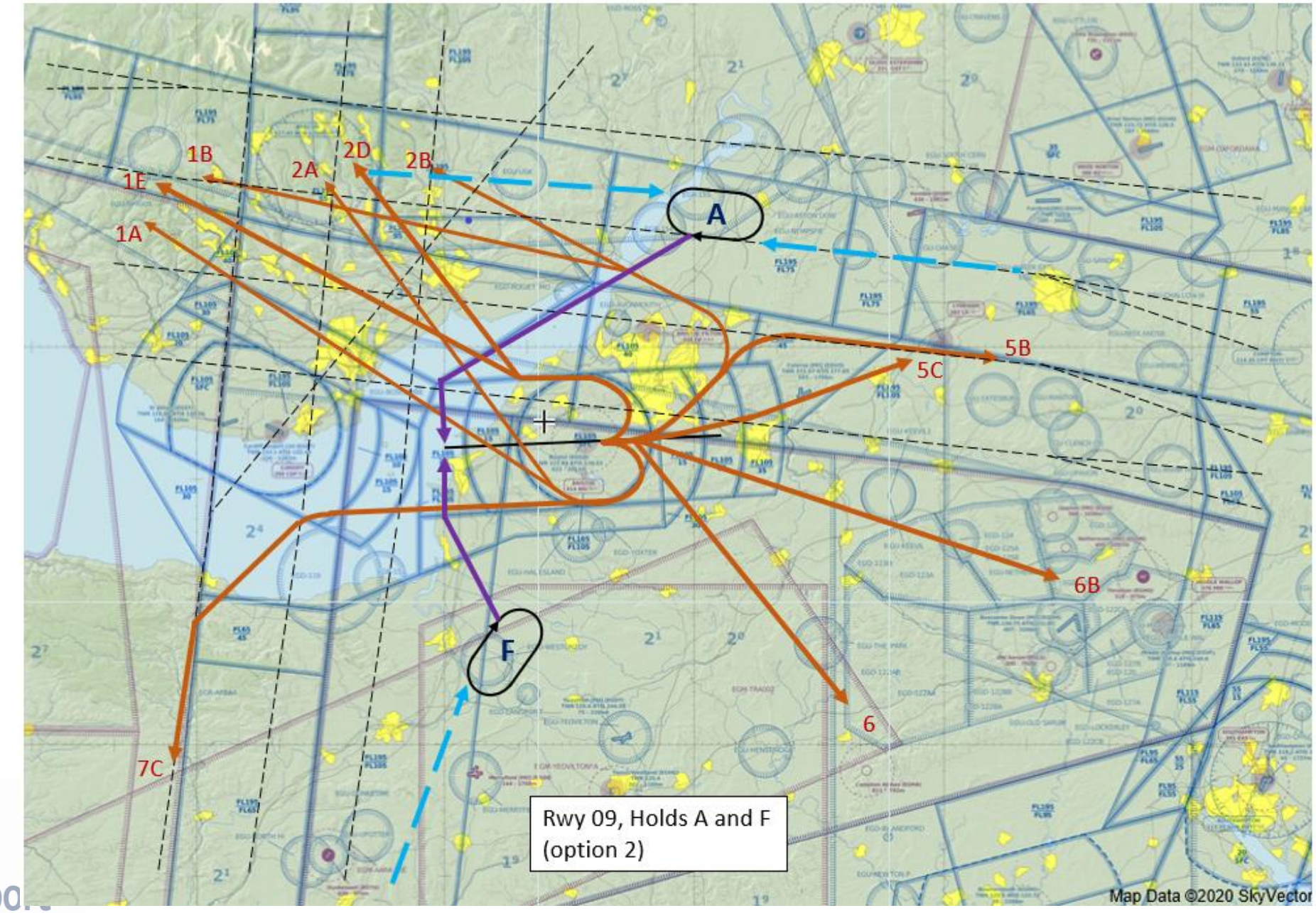

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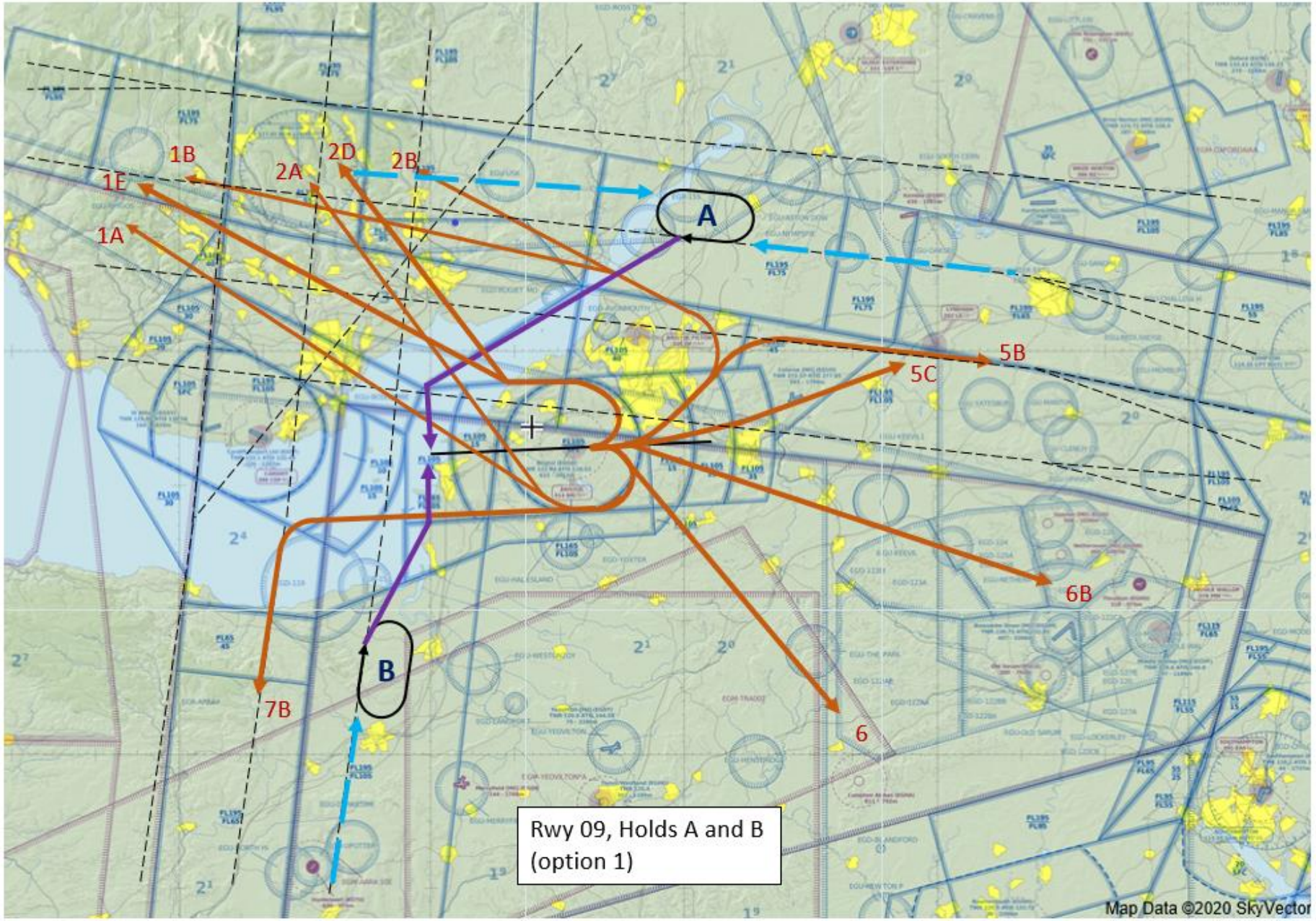

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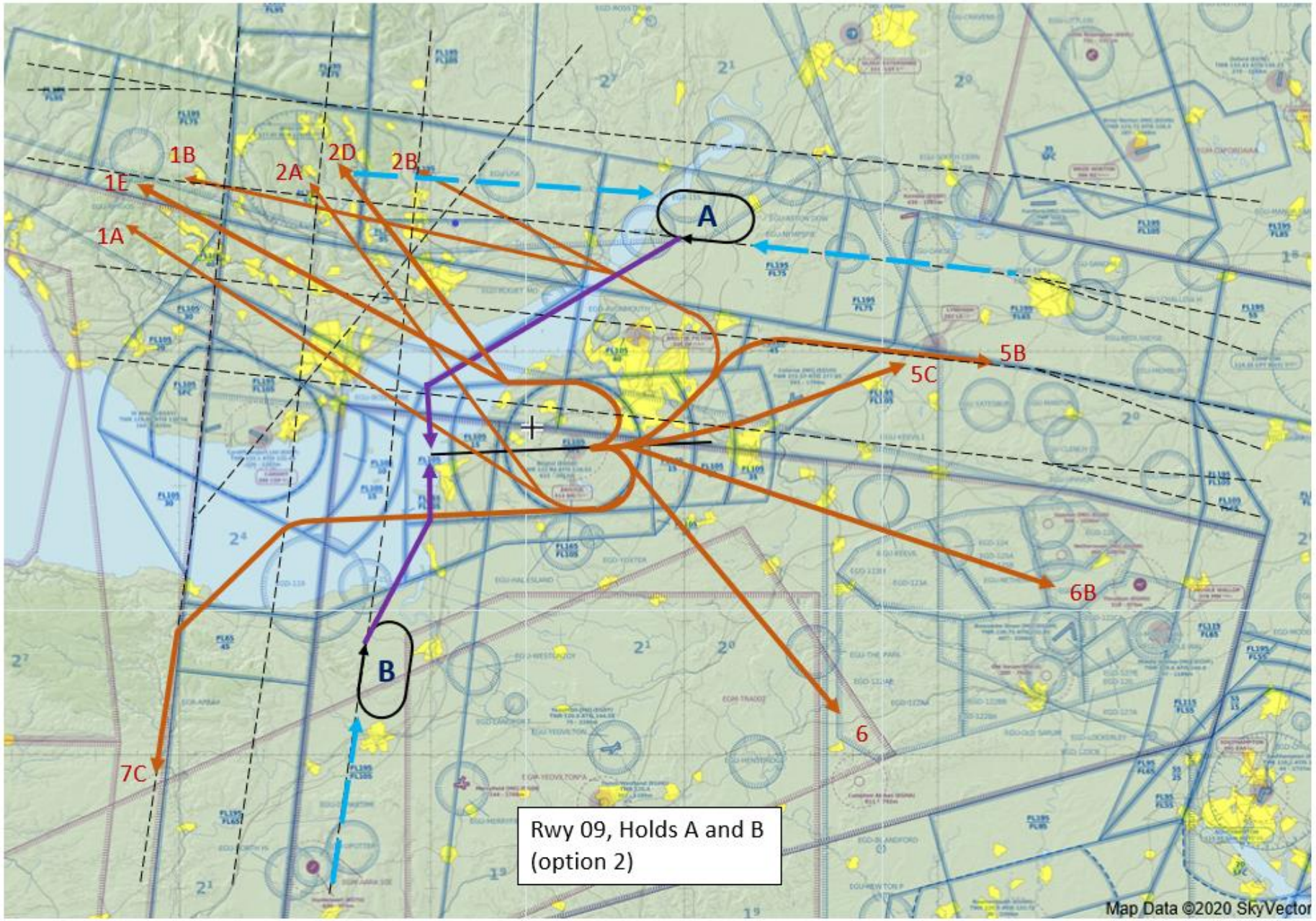

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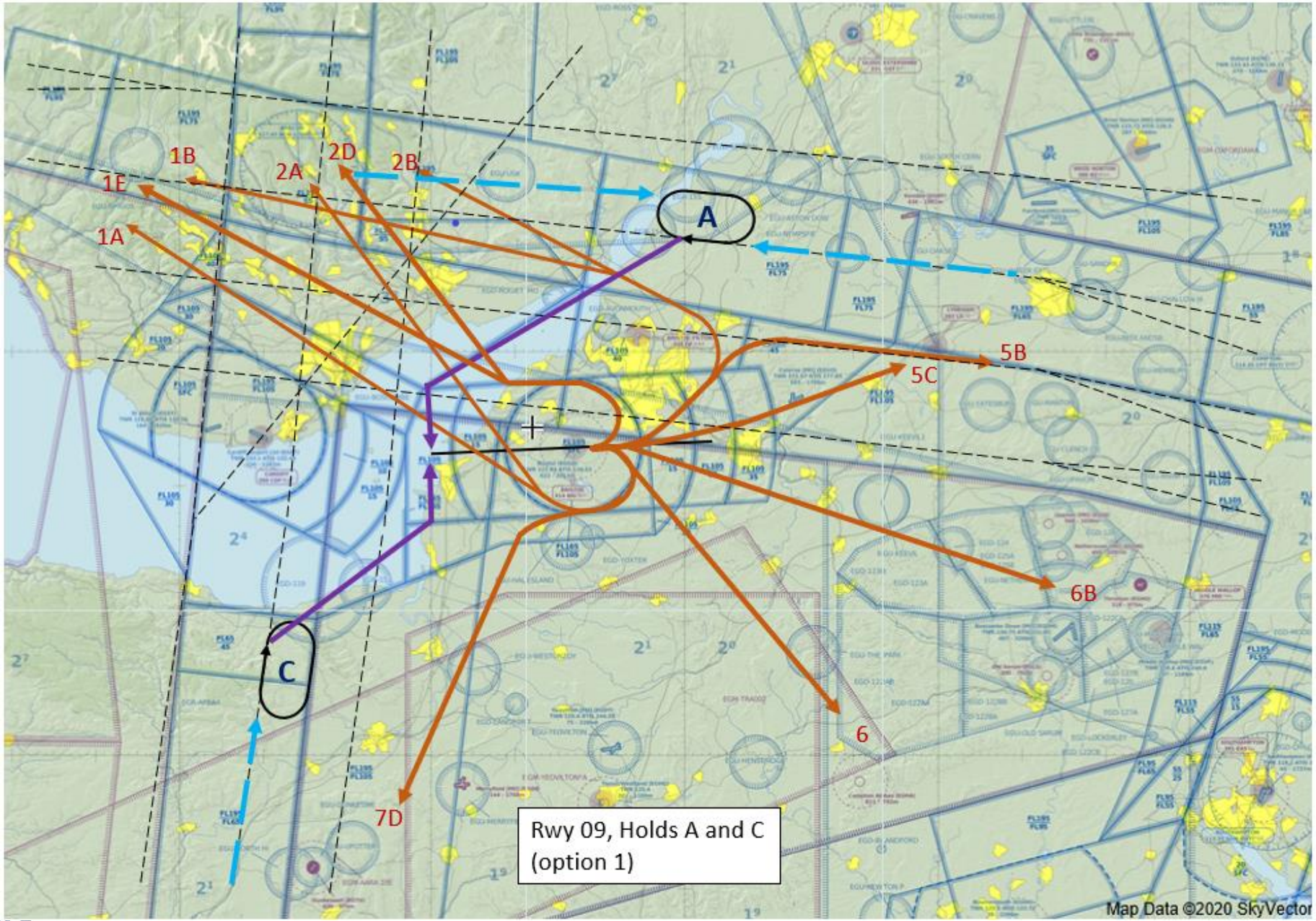

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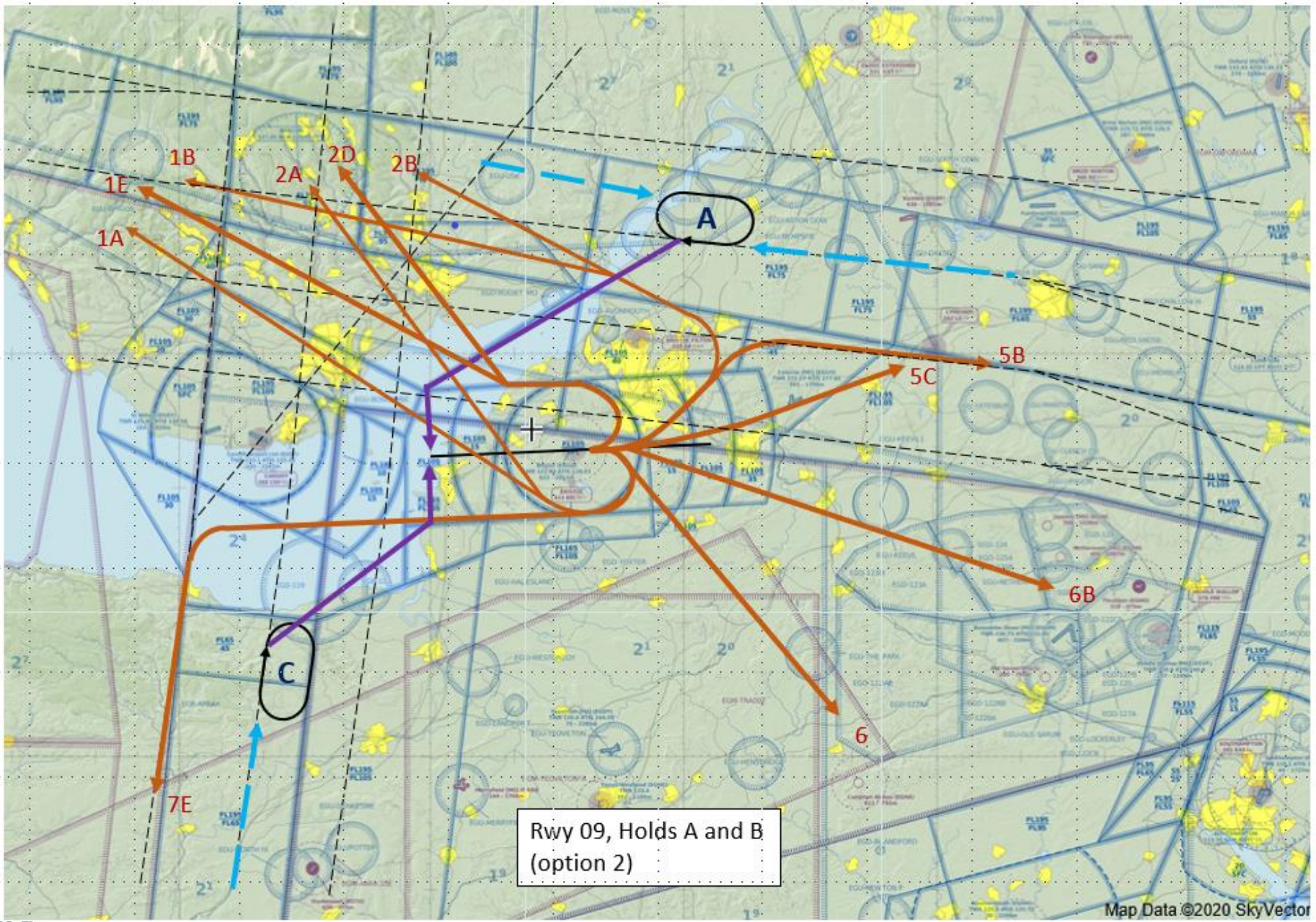

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Next Steps

- **January 2021**: submission of *Stage 2 Develop and Assess* material to the CAA

- **March 2021**: presuming approval of Stage 2, we will commence *Stage 3 Consult*

- **Early 2022**: 12-week public consultation

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Questions?

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