GLASGOW AIRPORT

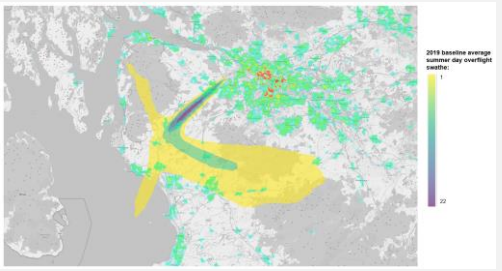
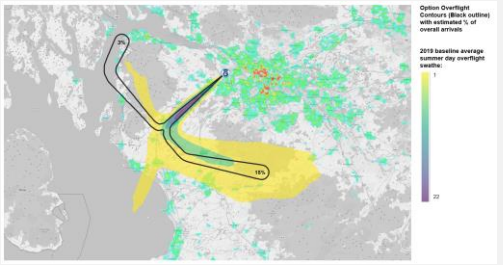
PROUD TO SERVE SCOTLAND

Glasgow Airport FASI-North Airspace Change Proposal

Stage 2B IOA Technical Appendix A

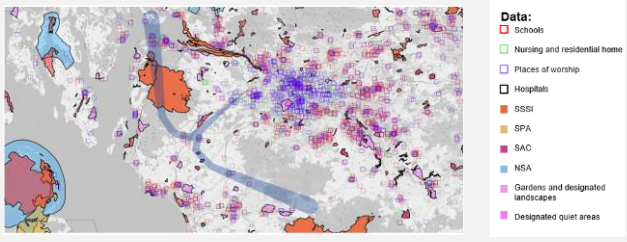
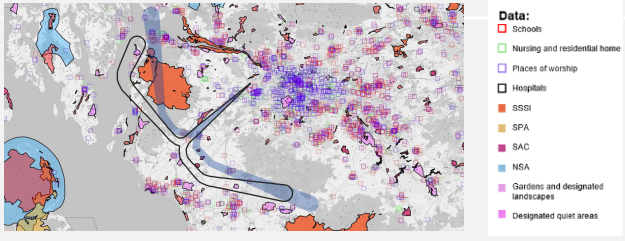
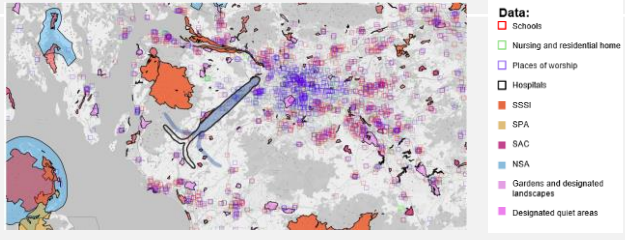
INFORMATION WITHIN THIS TECHNICAL APPENDIX

For more information around the methodology, please see our Stage 2B Initial Options Appraisal document on the CAA's Airspace Change Portal.

Data within this Technical Appendix	Overview of Methodology	Example of images/data shown within this document
NTK Vectoring Baseline	Based on actual 2019 NTK 92 day data (Average summer day) Use the CAA's definition of overflight (48.5 degree) Not based on the optioneering tool therefore the data reflects the climb profiles of the full Glasgow fleet mix Presented with population density data	
NTK Vectoring Baseline Overflight counts	Based on actual 2019 NTK 92 day data using the CAA's definition of overflight (48.5 degrees). 2021 CACI and point X data to identify noise sensitive sites and population. Does not consider frequency of overflight Data reflects the climb profiles of the full Glasgow fleet mix. It cannot be directly compared to centerline data due to the differences in calculation however it can be used as an indication of overflight by current vectoring swathe.	Overflight System: RWY 05 Baseline (Vectoring) Area: 691.95 Population: 140596
NTK Vectoring Baseline and Option overflight	Provides a comparison between the overflight contour of an option, and the NTK vectoring baseline. NTK data as per baseline section above Option overflight contour based on a single noise event i.e one departure or one arrival using the CAA's 48.5 degree definition of overflight, Contours are generated using a standard AEDT profile of a 737-800, The contour images include an indication of the anticipated use of each route which has been based on actual 2019 data	

INFORMATION WITHIN THIS TECHNICAL APPENDIX

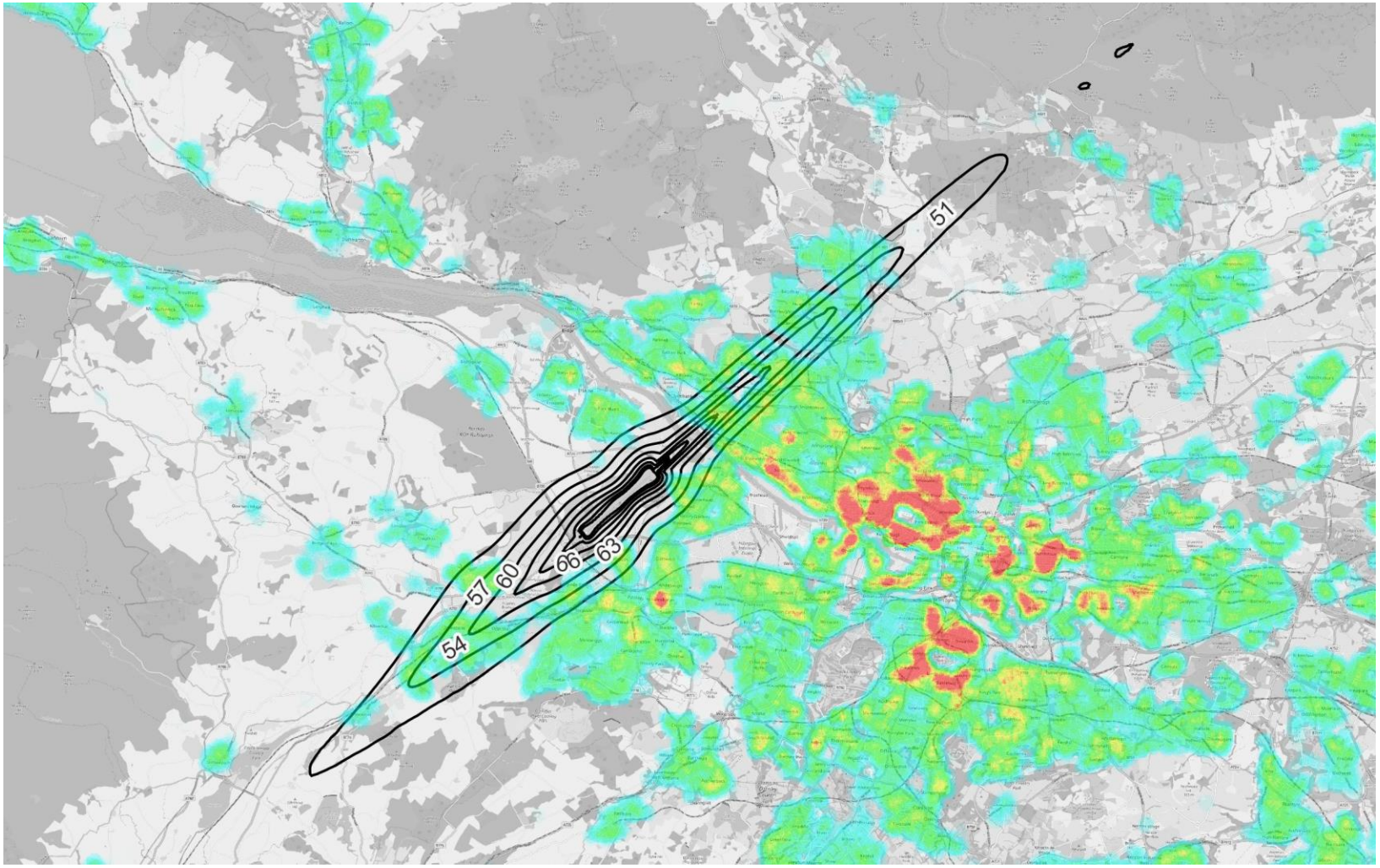
For more information around the methodology, please see our Stage 2B Initial Options Appraisal document on the CAA's Airspace Change Portal.

Data within this Technical Appendix	Overview of Methodology	Example
Centreline Overflight contour Baseline	Based on a single noise event i.e one departure or one arrival using the CAA's 48.5 degree definition of overflight. Contours are generated using a standard AEDT profile of an 737-800. Departure centrelines are based on existing SID centrelines. Arrivals centrelines have been estimated based on NTK data and ATC input. 2021 point X data and the Scottish government spatial database used to identify noise sensitive buildings and sites. The contour image includes details of the overall % use of the route based on 2019 data.	
Centreline baseline compared with option overflight contour	Centerline baseline as per above (Shown shaded blue on the image) Option overflight contour (black outline) based on a single noise event i.e one departure or one arrival using the CAA's 48.5 degree definition of overflight. Uses a standard AEDT profile of a 737-800. This assumes that all aircraft will fly the route centerline to/from 7000ft.	
NTK Vectoring baseline, Centreline Overflight Baseline and Option overflight data	NTK baseline, centerline baseline and option overflight generated as per the above. 2021 CACI and point X data to identify noise sensitive sites and population. Does not consider frequency of overflight	Overflight | System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count
---	---	---	---	---	---	---	---	---	---	---	---	---	---
RWY 05 Baseline (Vectoring)	691.95	140596	0	0	6	11.14	3	1.42	11	32.38	4	28.11	0
RWY05 Baseline (Centreline)	182.63	51256	0	0	1	0	2	0.7	7	26.58	2	23.62	0
RWY05 Option A	174.72	21006	0	0	3	2.34	0	0	1	0.04	0	0	0	 
60dB and 65dB L_{AMax} data	Based on a single noise event i.e. one departure or one arrival using a standard AEDT profile of an 737-800. Only considers centerline baseline data 2021 CACI and point X data to identify noise sensitive sites and population. Does not consider frequency of overflight 65dB L_{AMax} contour images not shown for arrivals owing to an almost indistinguishable difference between the baseline and the options.	

2017 LAeq 16hr Contour
(Source: Glasgow's Noise Action Plan)

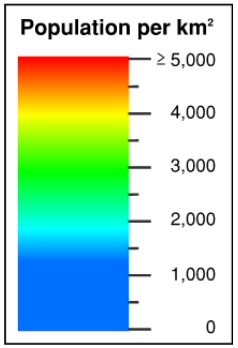
STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

2017 LAeq 16hr Contour



Source: Glasgow Noise Action Plan 2018 – 2023

Population density underlay

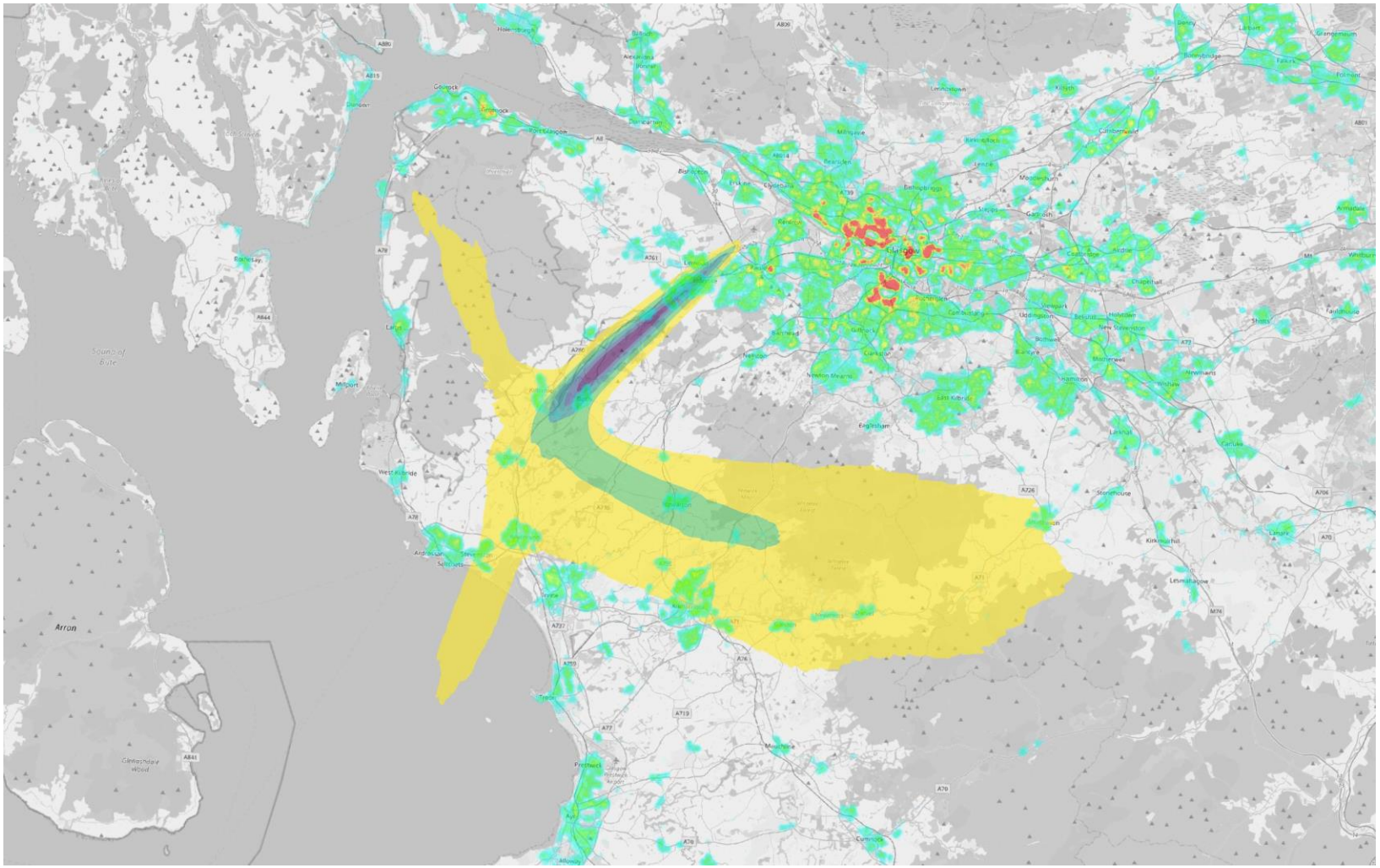


Arrivals

Runway 05 Baseline

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Baseline



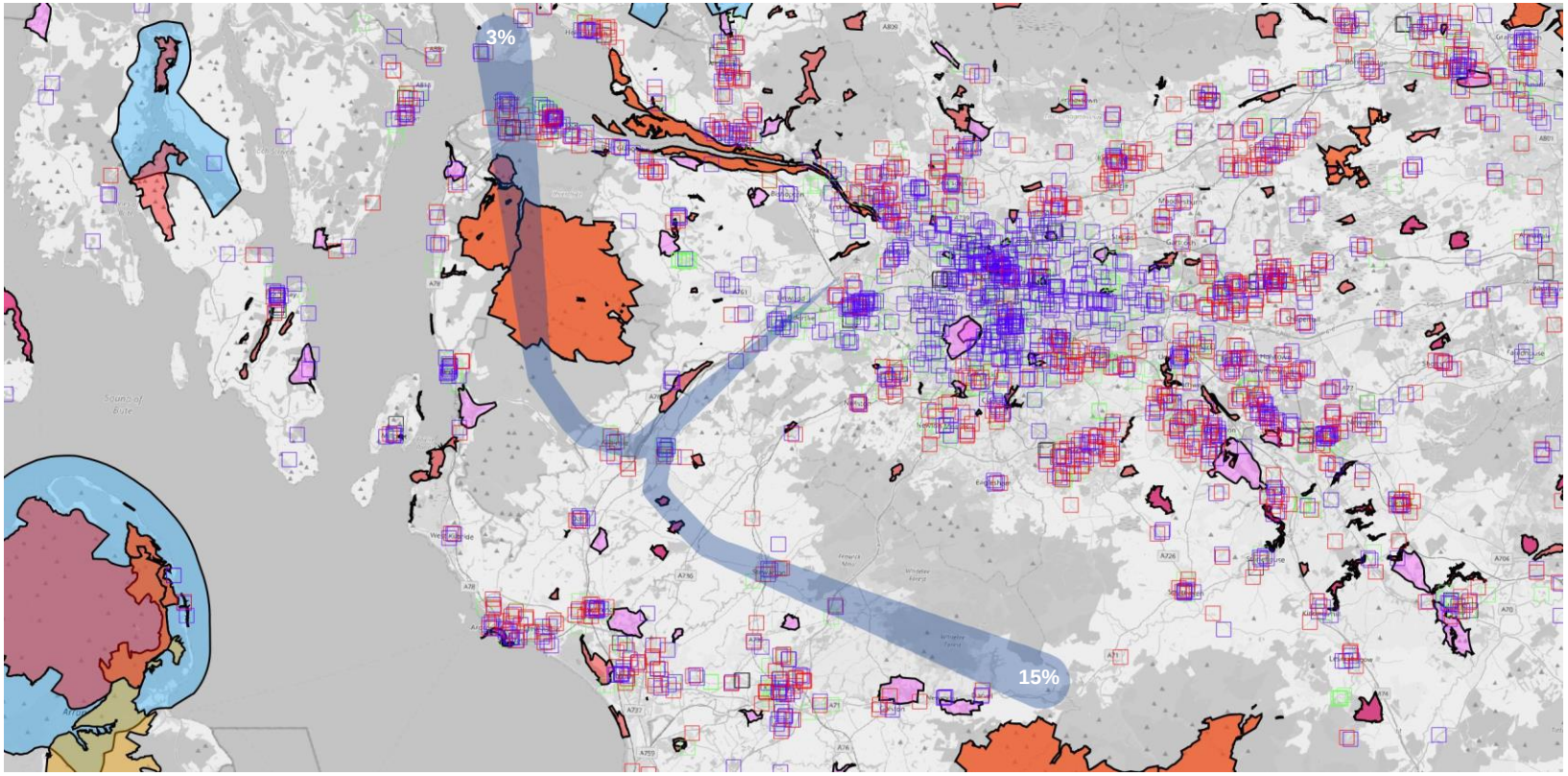
2019 baseline average summer day overflight swathe:

1

22

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Baseline



Baseline centreline overflight contours (Shaded blue)

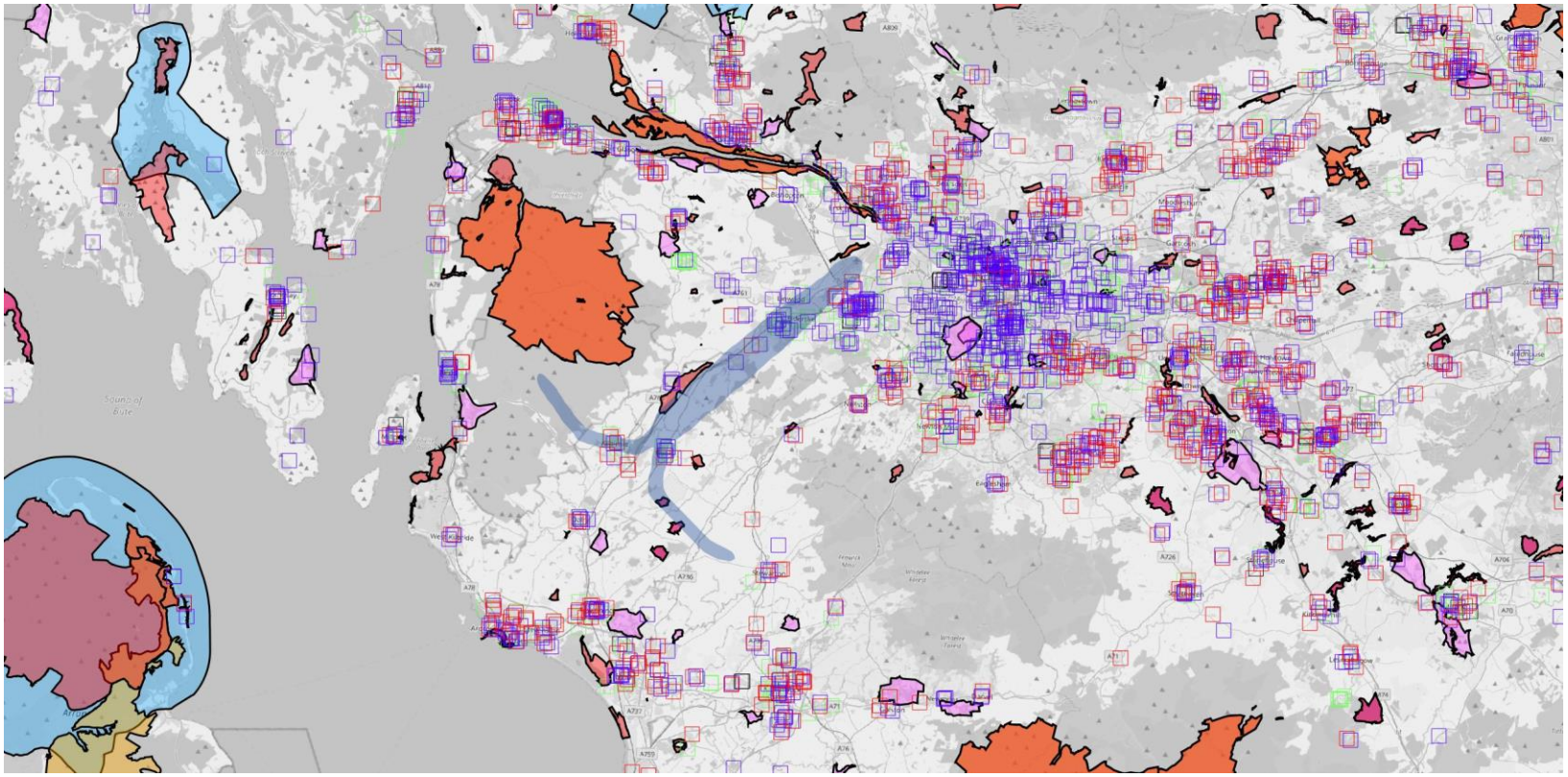
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	691.95	140596	0	0	6	11.14	3	1.42	11	32.38	4	28.11	0	0	0	0	51	0	32	77
RWY05 Baseline (Centreline)	182.63	51256	0	0	1	0	2	0.7	7	26.58	2	23.62	0	0	0	0	19	2	9	26

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Baseline



Baseline centreline 60dB L_{amax} contours (Shaded blue)

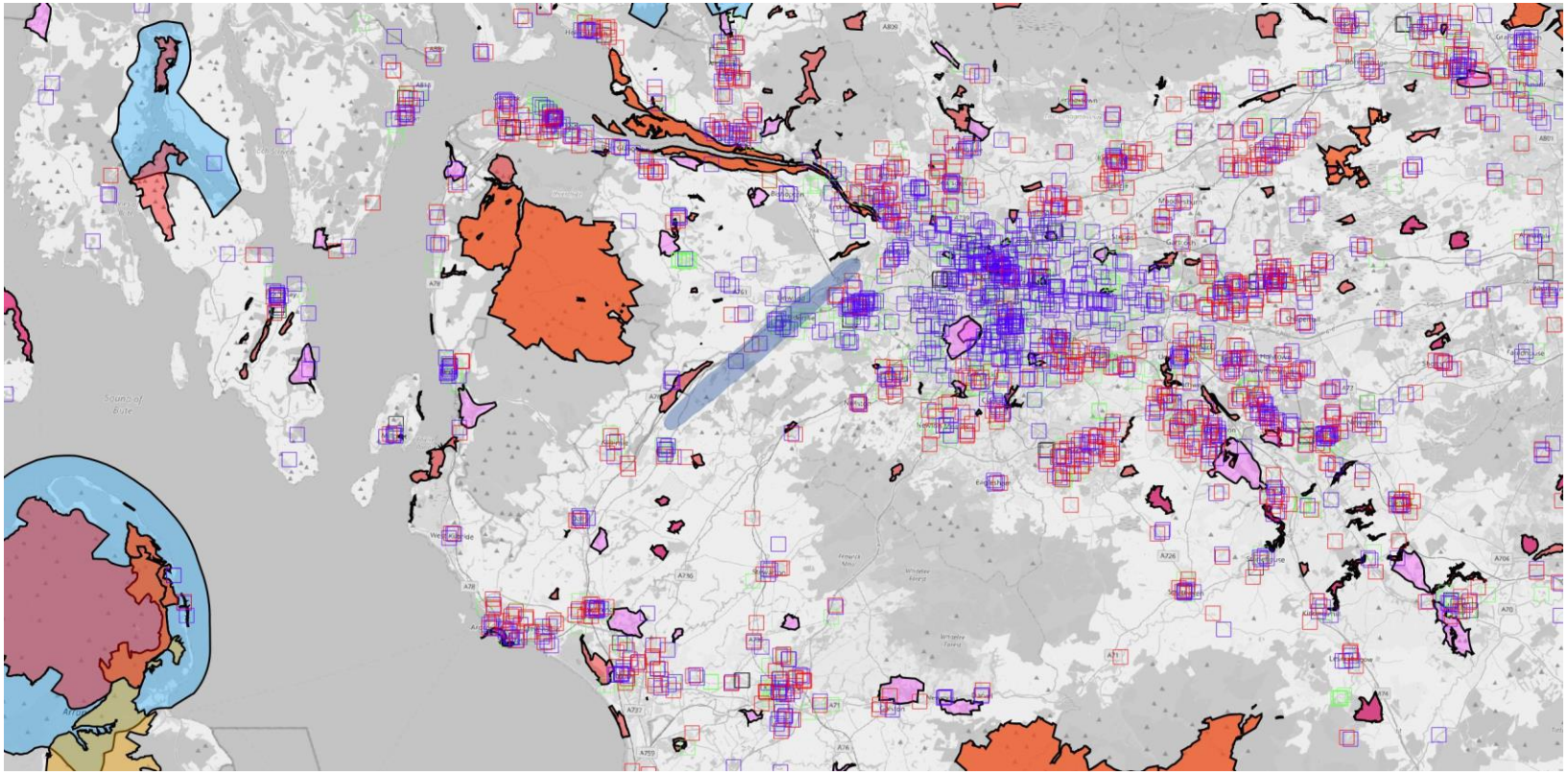
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	60dB L_{amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	56.96	34798	0	0	0	0	2	0.44	3	1	0	0	0	0	0	0	5	0	12	20

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Baseline



Baseline centreline 65dB L_{amax} contours (Shaded blue)

Data:

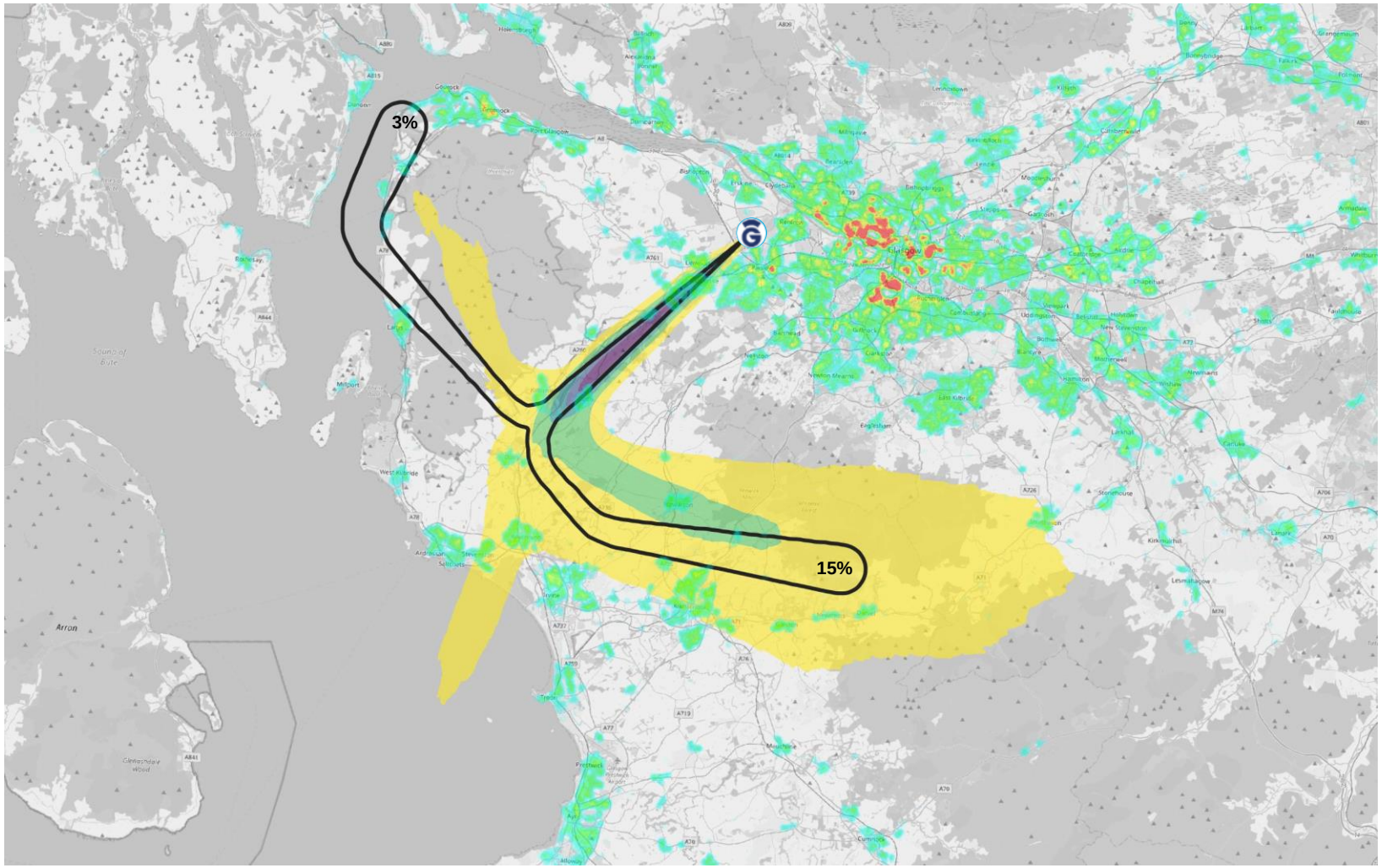
- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Runway 05 PBN Arrival Option A

PBN arrivals from the north and south both joining final approach at approximately 11nm from the runway

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option A



Option Overflight Contours (Black outline) with estimated % of overall arrivals

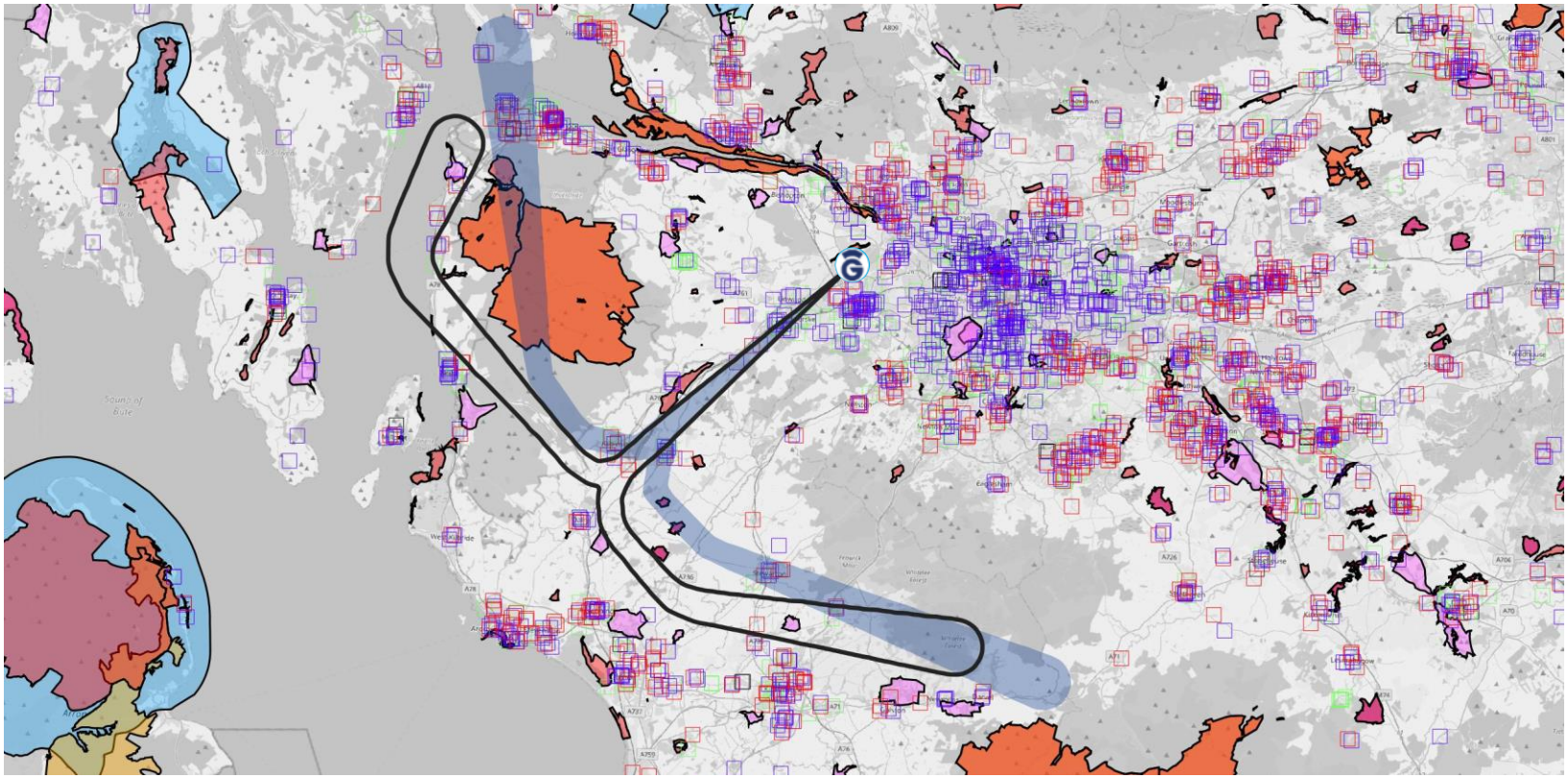
2019 baseline average summer day overflight swathe:

1

22

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option A



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

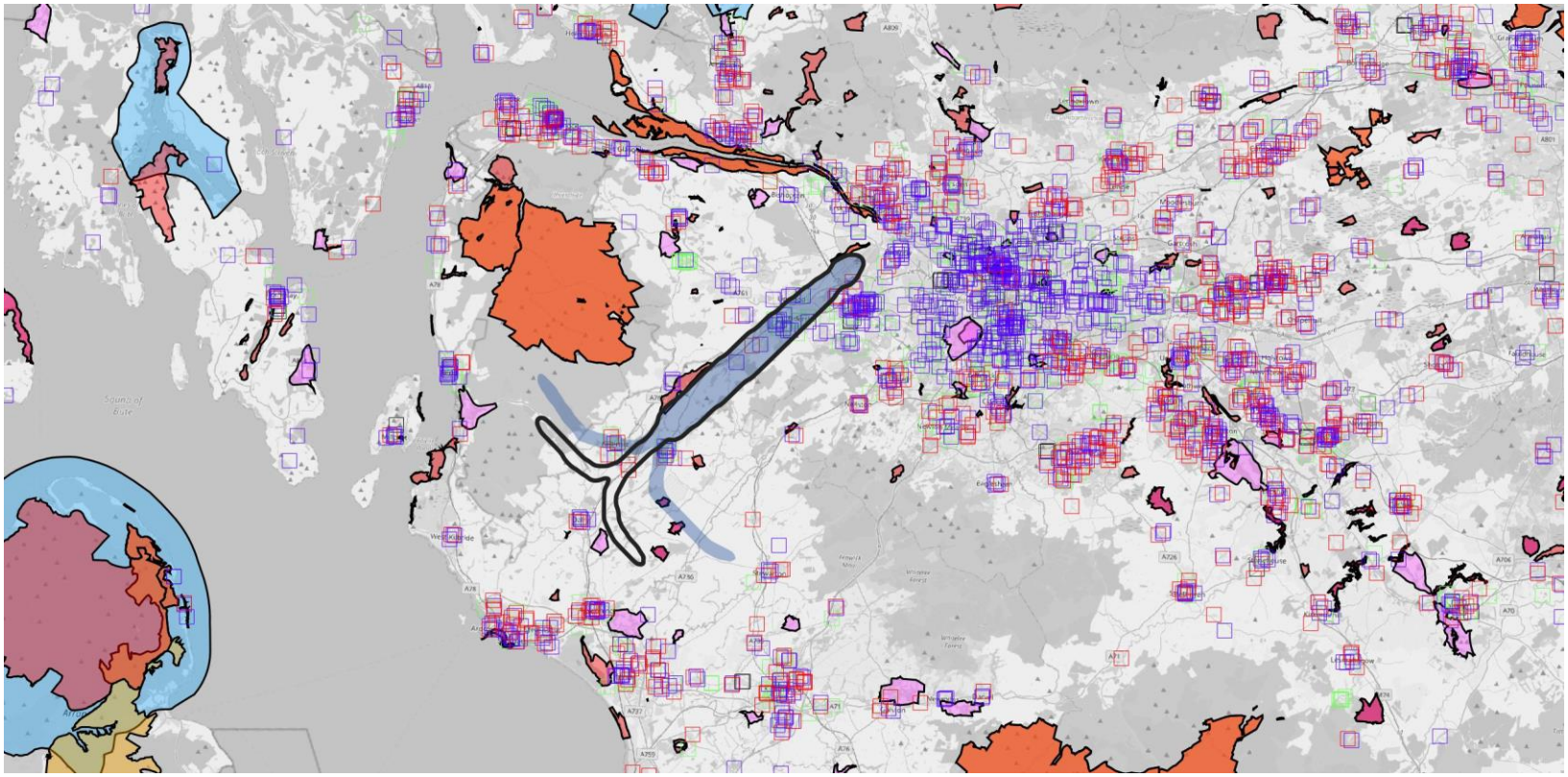
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	691.95	140596	0	0	6	11.14	3	1.42	11	32.38	4	28.11	0	0	0	0	51	0	32	77
RWY05 Baseline (Centreline)	182.63	51256	0	0	1	0	2	0.7	7	26.58	2	23.62	0	0	0	0	19	2	9	26
RWY05 Option A	174.72	21006	0	0	3	2.34	0	0	1	0.04	0	0	0	0	0	0	7	0	5	10

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option A



Option 60dB L_{amax} Contours (Black outline)

Baseline centreline 60dB L_{amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

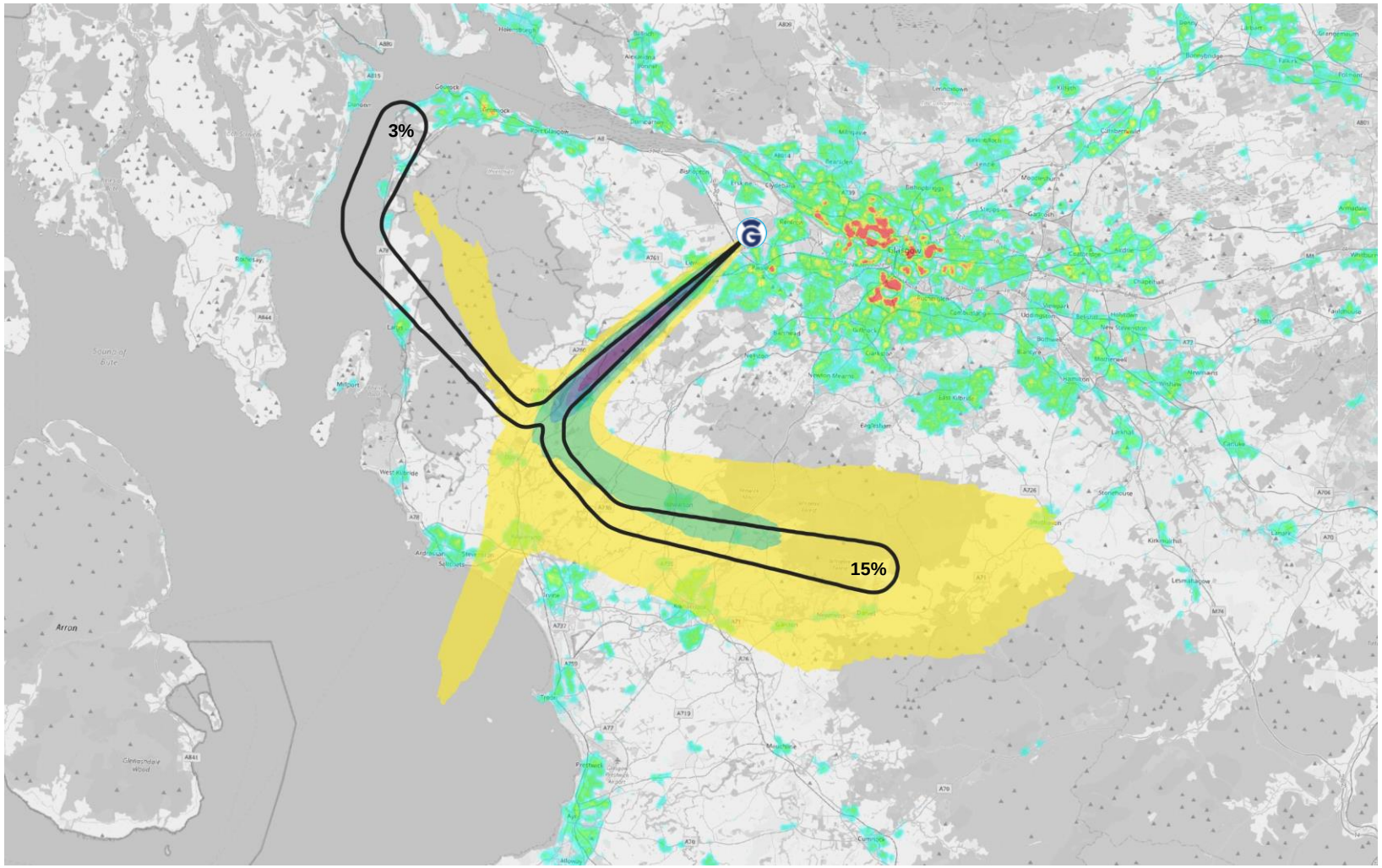
60dB L_{amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	56.96	34798	0	0	0	0	2	0.44	3	1	0	0	0	0	0	0	5	0	12	20
RWY05 Option A	52.74	27292	0	0	0	0	0	0	2	0.32	1	0.02	0	0	0	0	4	0	9	13

Runway 05 PBN Arrival Option B

PBN arrivals from the north joining final approach at approximately 11nm from the runway and from the south at approximately 10nm.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option B



Option Overflight Contours (Black outline) with estimated % of overall arrivals

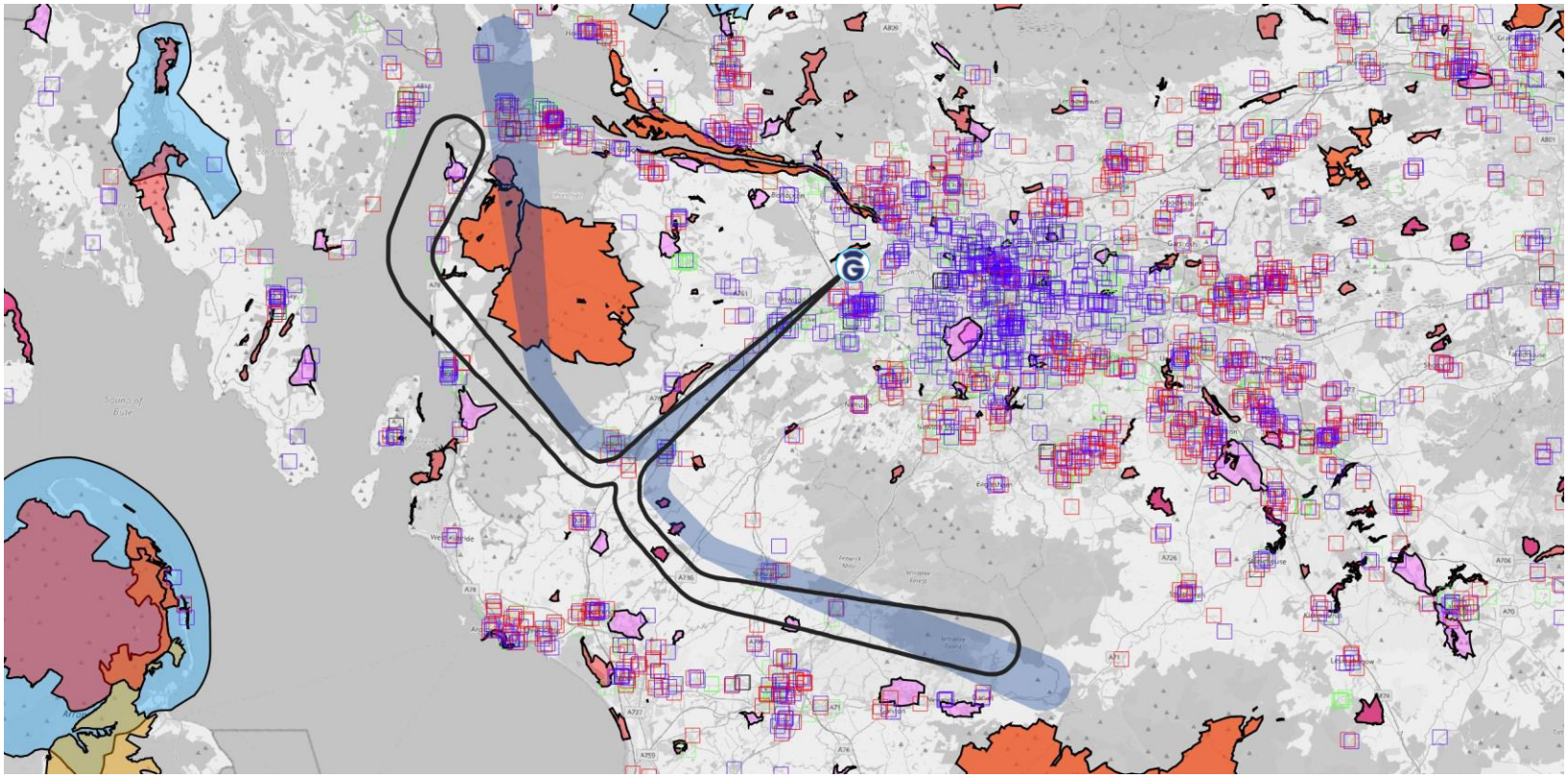
2019 baseline average summer day overflight swathe:

1

22

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option B



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

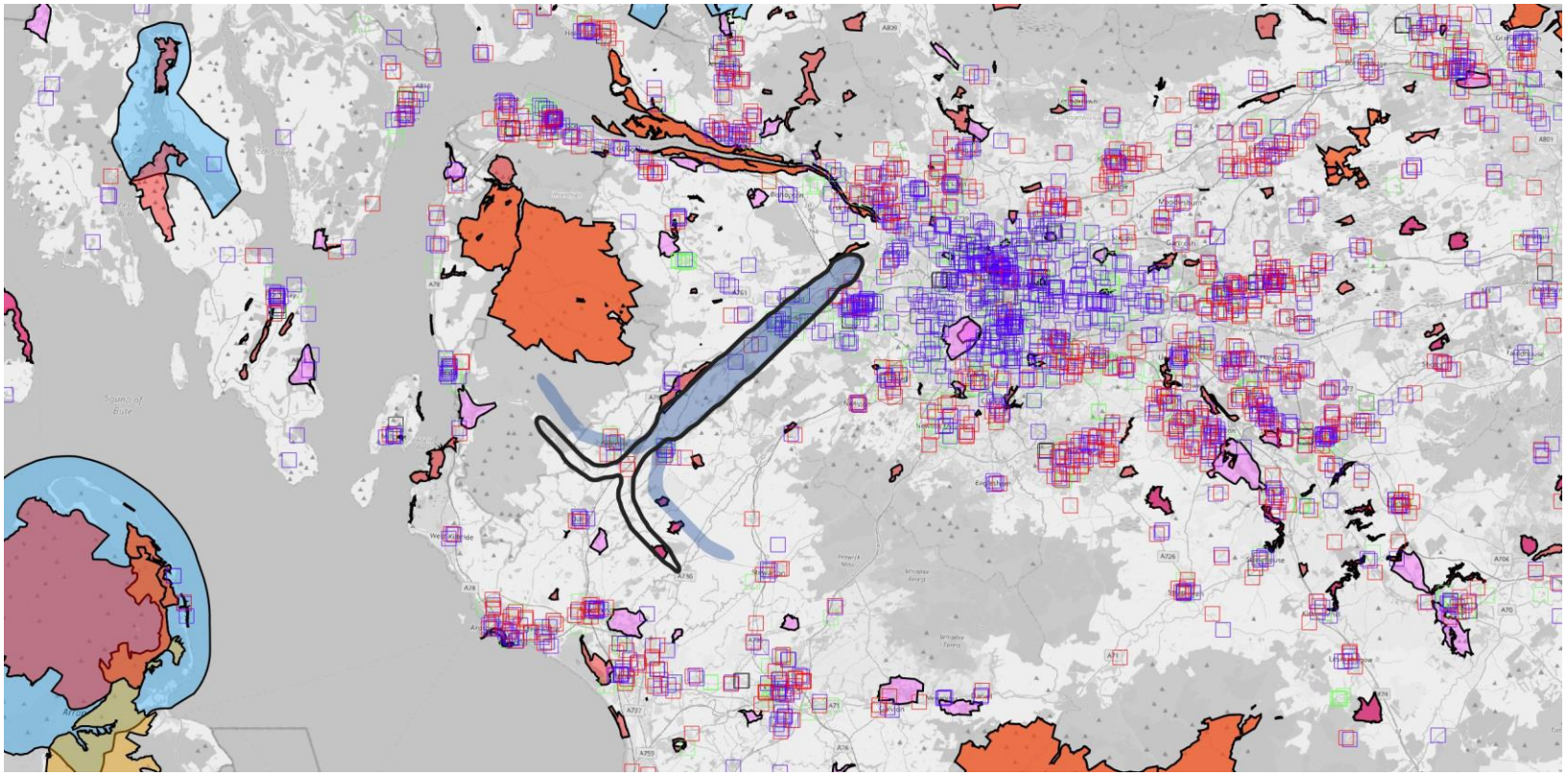
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	691.95	140596	0	0	6	11.14	3	1.42	11	32.38	4	28.11	0	0	0	0	51	0	32	77
RWY05 Baseline (Centreline)	182.63	51256	0	0	1	0	2	0.7	7	26.58	2	23.62	0	0	0	0	19	2	9	26
RWY05 Option B	176.02	21242	0	0	2	1.99	1	0.62	2	0.66	0	0	0	0	0	0	6	0	5	10

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option B



Option 60dB L_{amax} Contours (Black outline)

Baseline centreline 60dB L_{amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

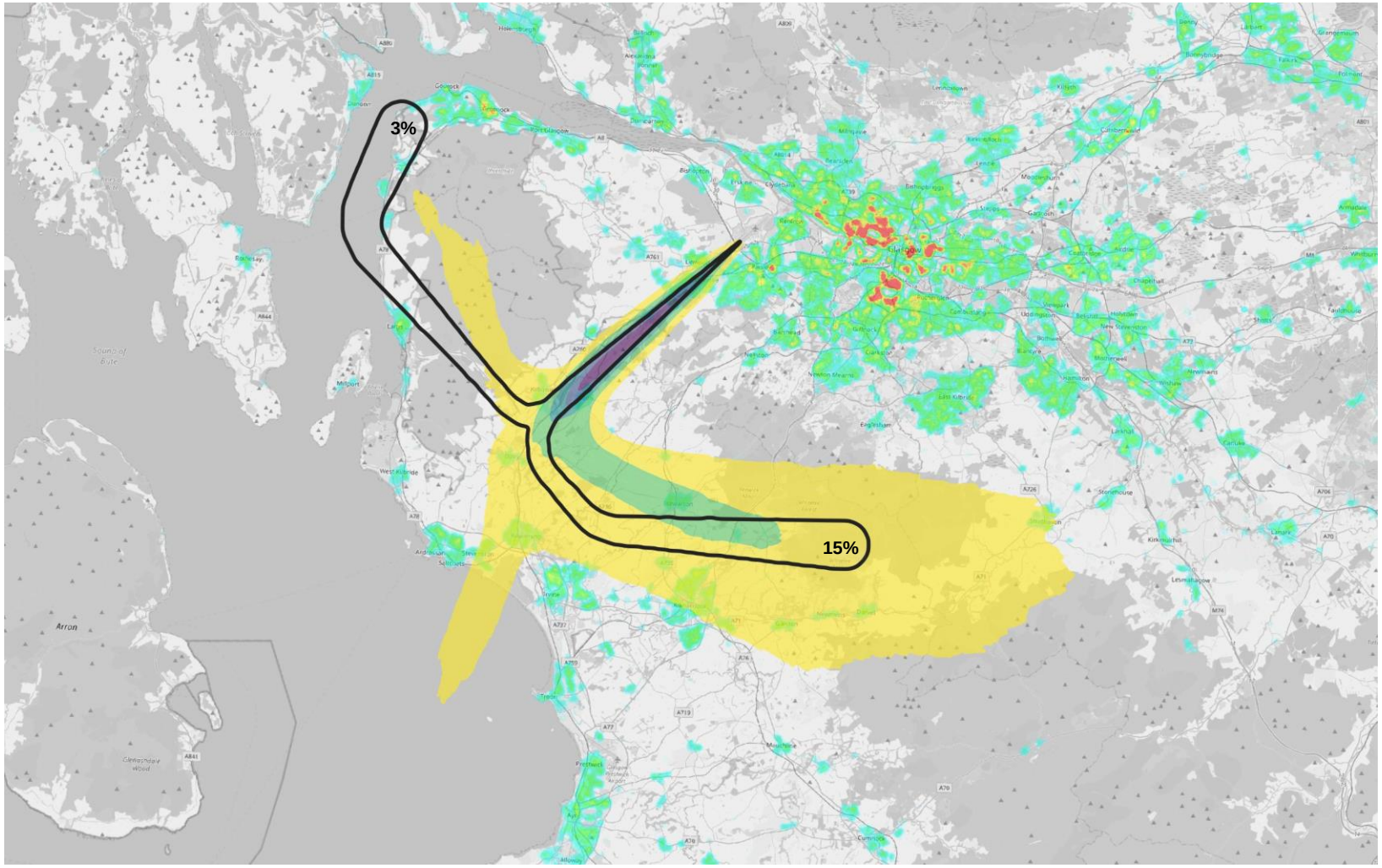
60dB L_{amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	56.96	34798	0	0	0	0	2	0.44	3	1	0	0	0	0	0	0	5	0	12	20
RWY05 Option B	53.79	27446	0	0	0	0	1	0.57	3	0.88	1	0.02	0	0	0	0	4	0	9	13

Runway 05 PBN Arrival Option C

PBN arrivals from the north and south both joining final approach at approximately 11nm from the runway. Slightly different track to Option A above 5000ft.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option C



Option Overflight Contours (Black outline) with estimated % of overall arrivals

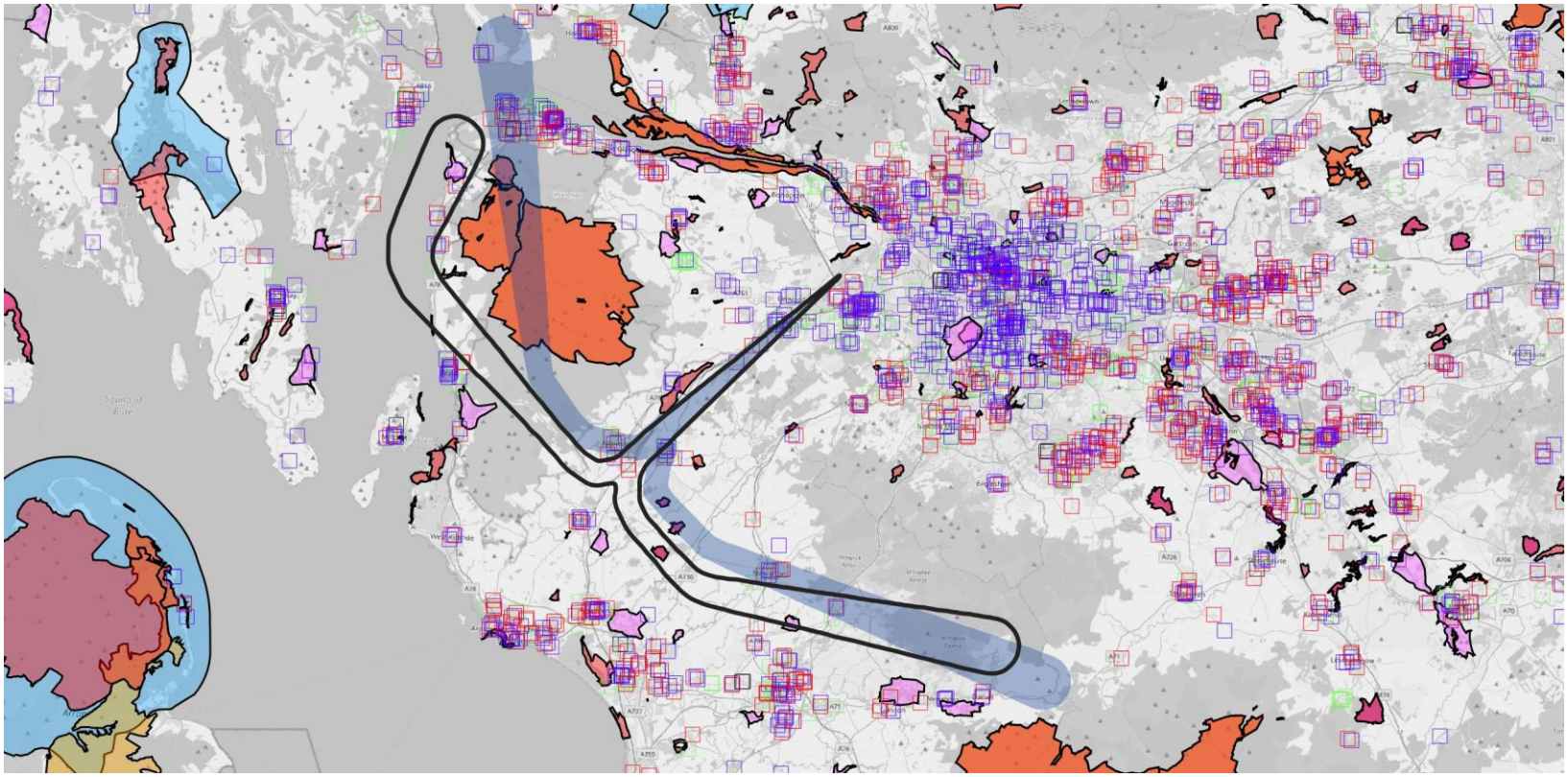
2019 baseline average summer day overflight swathe:

1

22

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option C



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

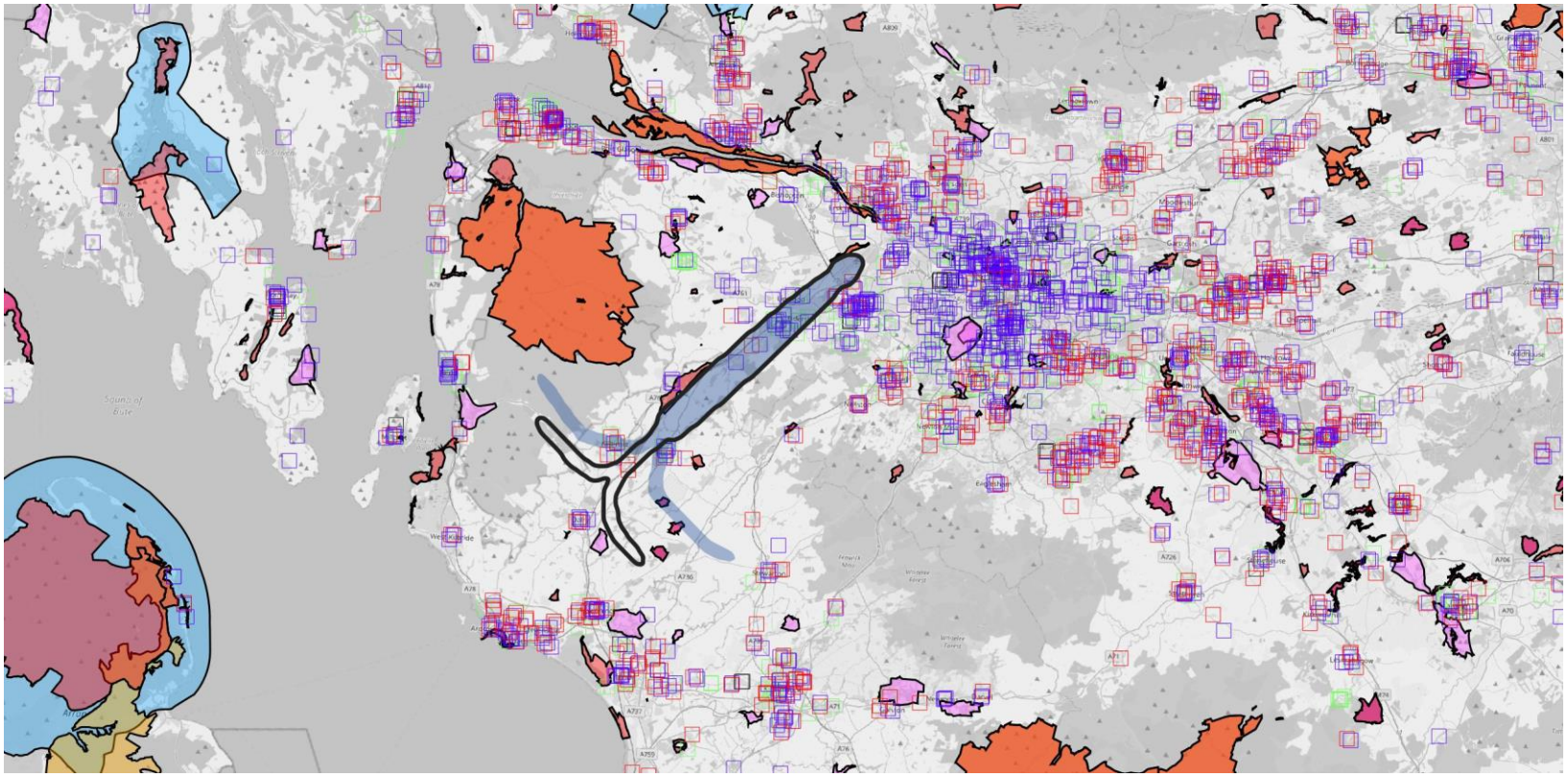
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	691.95	140596	0	0	6	11.14	3	1.42	11	32.38	4	28.11	0	0	0	0	51	0	32	77
RWY05 Baseline (Centreline)	182.63	51256	0	0	1	0	2	0.7	7	26.58	2	23.62	0	0	0	0	19	2	9	26
RWY05 Option C	174.44	21211	0	0	3	2.33	0	0	1	0.04	0	0	0	0	0	0	7	0	5	10

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option C



Option 60dB L_{amax} Contours (Black outline)

Baseline centreline 60dB L_{amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

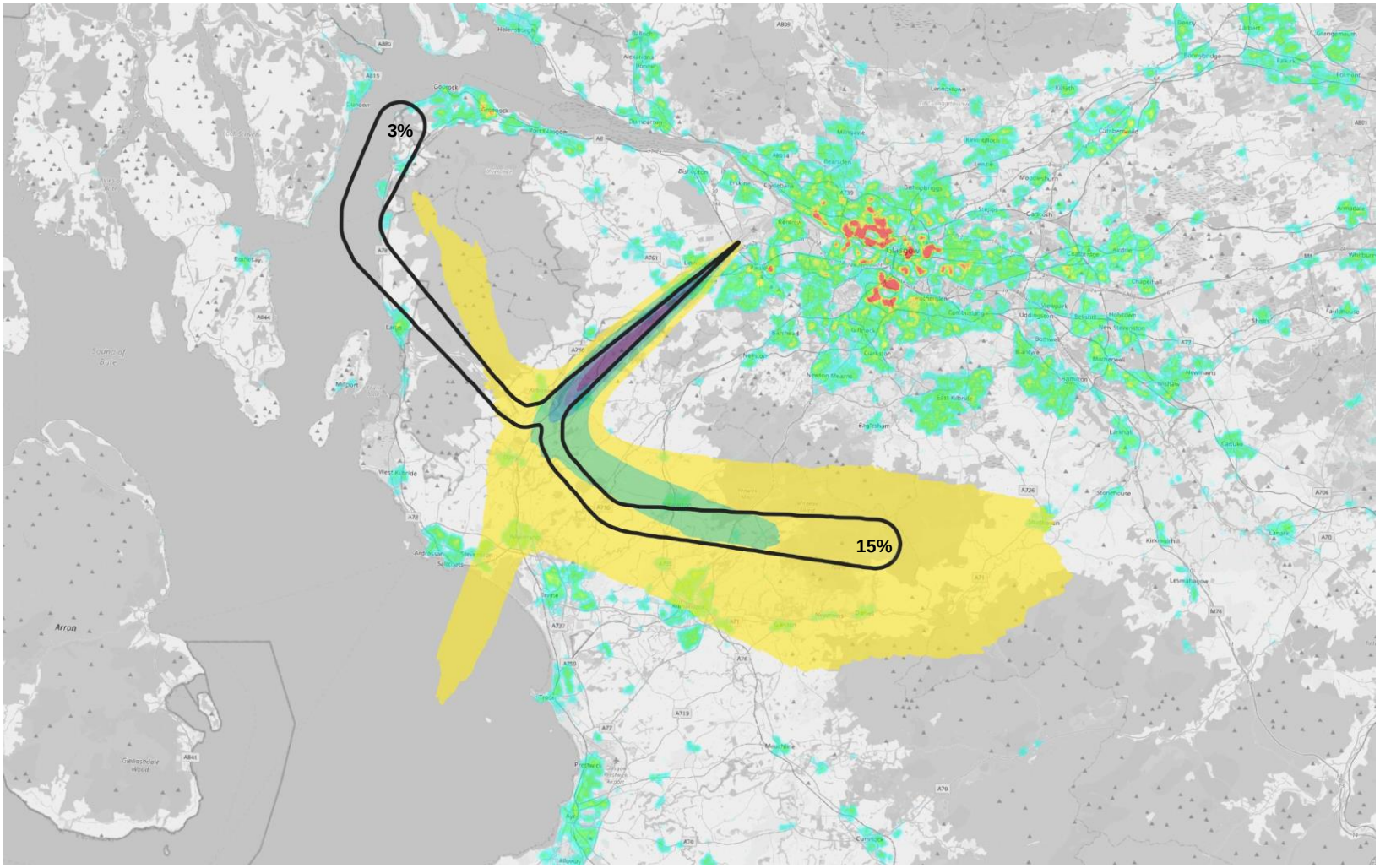
60dB L_{amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	56.96	34798	0	0	0	0	2	0.44	3	1	0	0	0	0	0	0	5	0	12	20
RWY05 Option C	52.74	27292	0	0	0	0	0	0	2	0.32	1	0.02	0	0	0	0	4	0	9	13

Runway 05 PBN Arrival Option D

PBN arrivals from the north joining final approach at approximately 11nm from the runway and from the south at approximately 10nm. Slightly different track to Option B above 5000ft

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option D



Option Overflight Contours (Black outline) with estimated % of overall arrivals

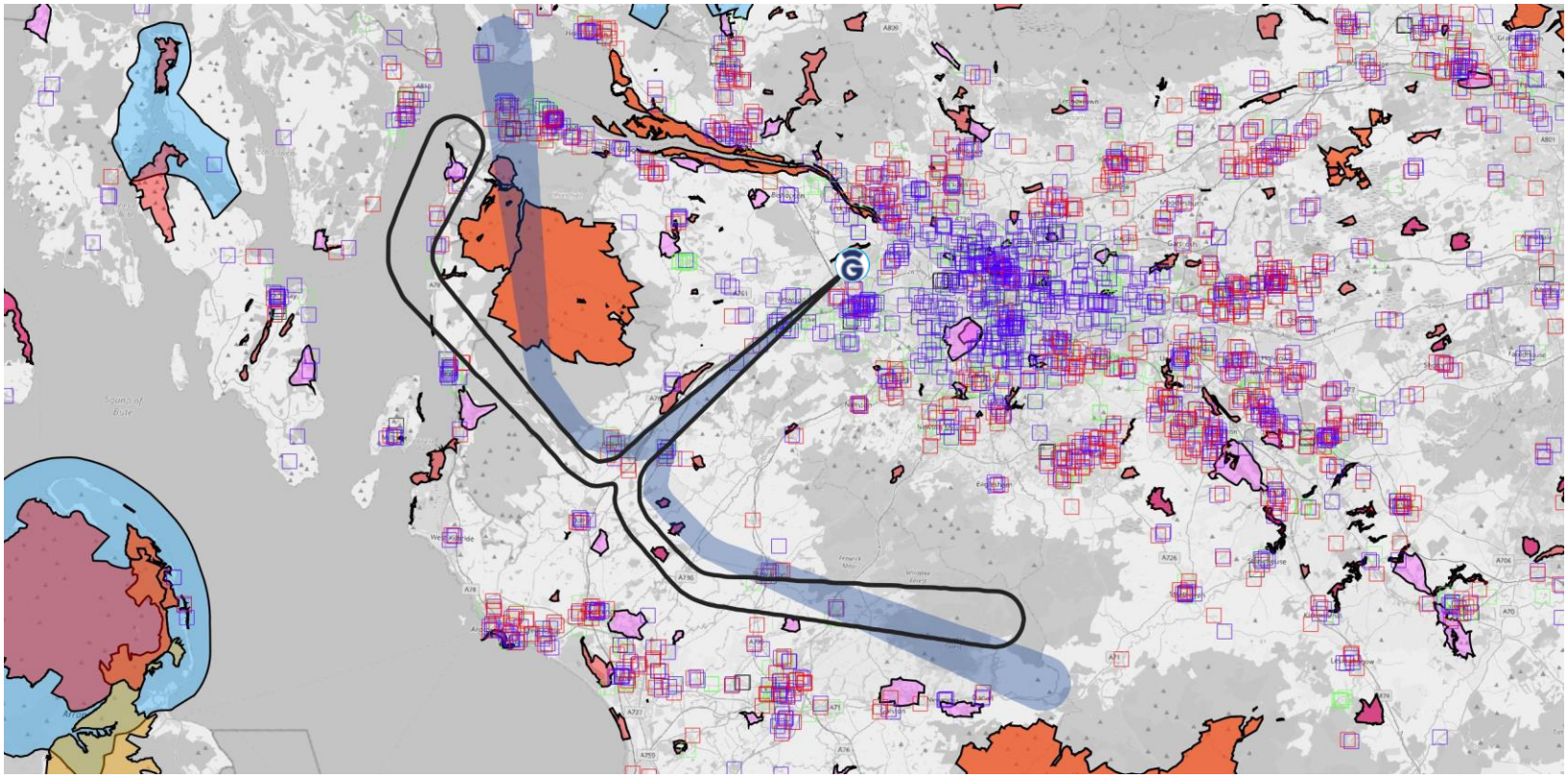
2019 baseline average summer day overflight swathe:

1

22

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option D



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

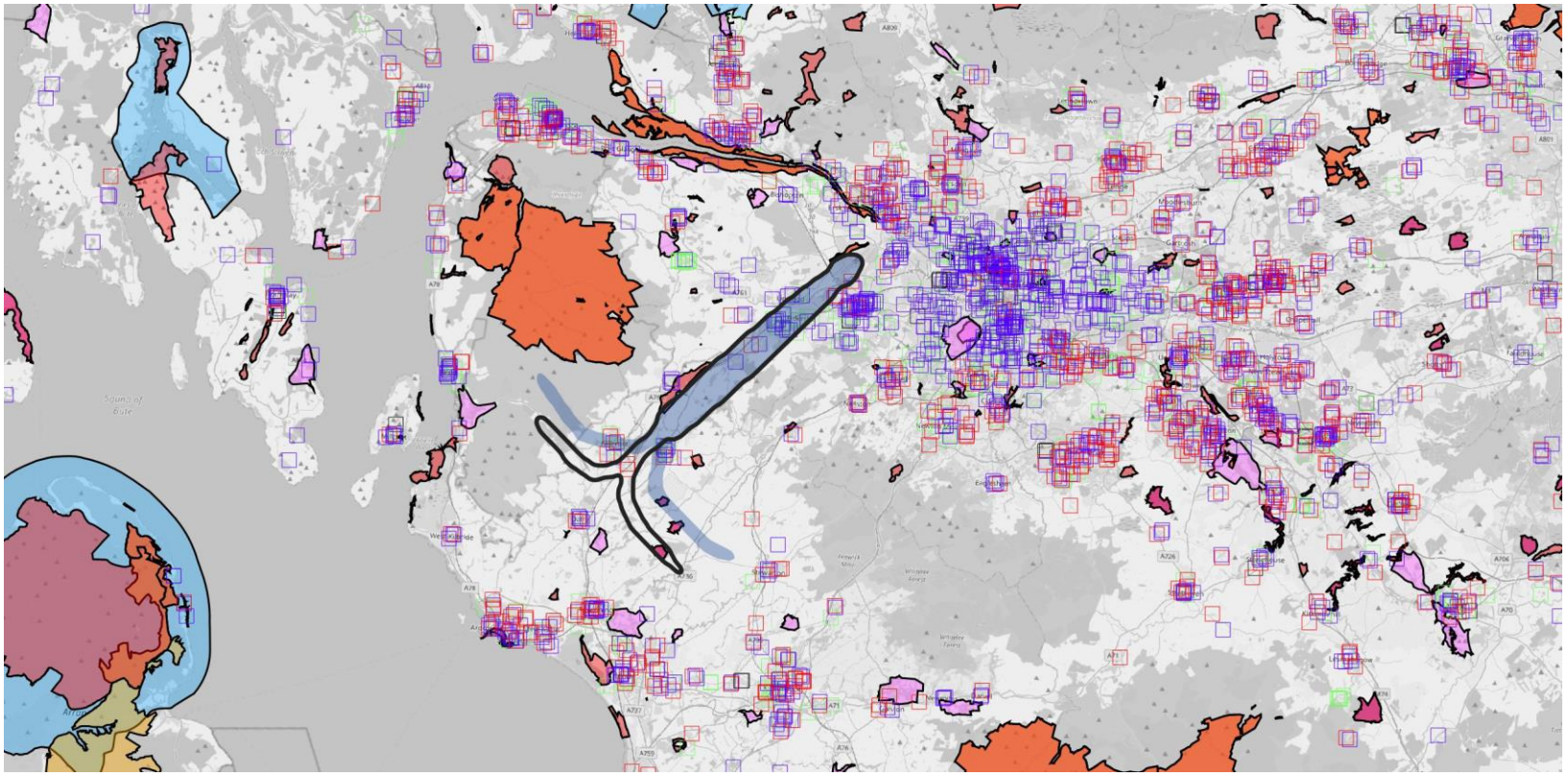
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	691.95	140596	0	0	6	11.14	3	1.42	11	32.38	4	28.11	0	0	0	0	51	0	32	77
RWY05 Baseline (Centreline)	182.63	51256	0	0	1	0	2	0.7	7	26.58	2	23.62	0	0	0	0	19	2	9	26
RWY05 Option D	176.01	21379	0	0	2	1.48	1	0.62	2	0.66	0	0	0	0	0	0	6	0	6	10

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option D



Option 60dB L_{amax} Contours (Black outline)

Baseline centreline 60dB L_{amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	56.96	34798	0	0	0	0	2	0.44	3	1	0	0	0	0	0	0	5	0	12	20
RWY05 Option D	53.88	27446	0	0	0	0	1	0.57	3	0.88	1	0.02	0	0	0	0	4	0	9	13

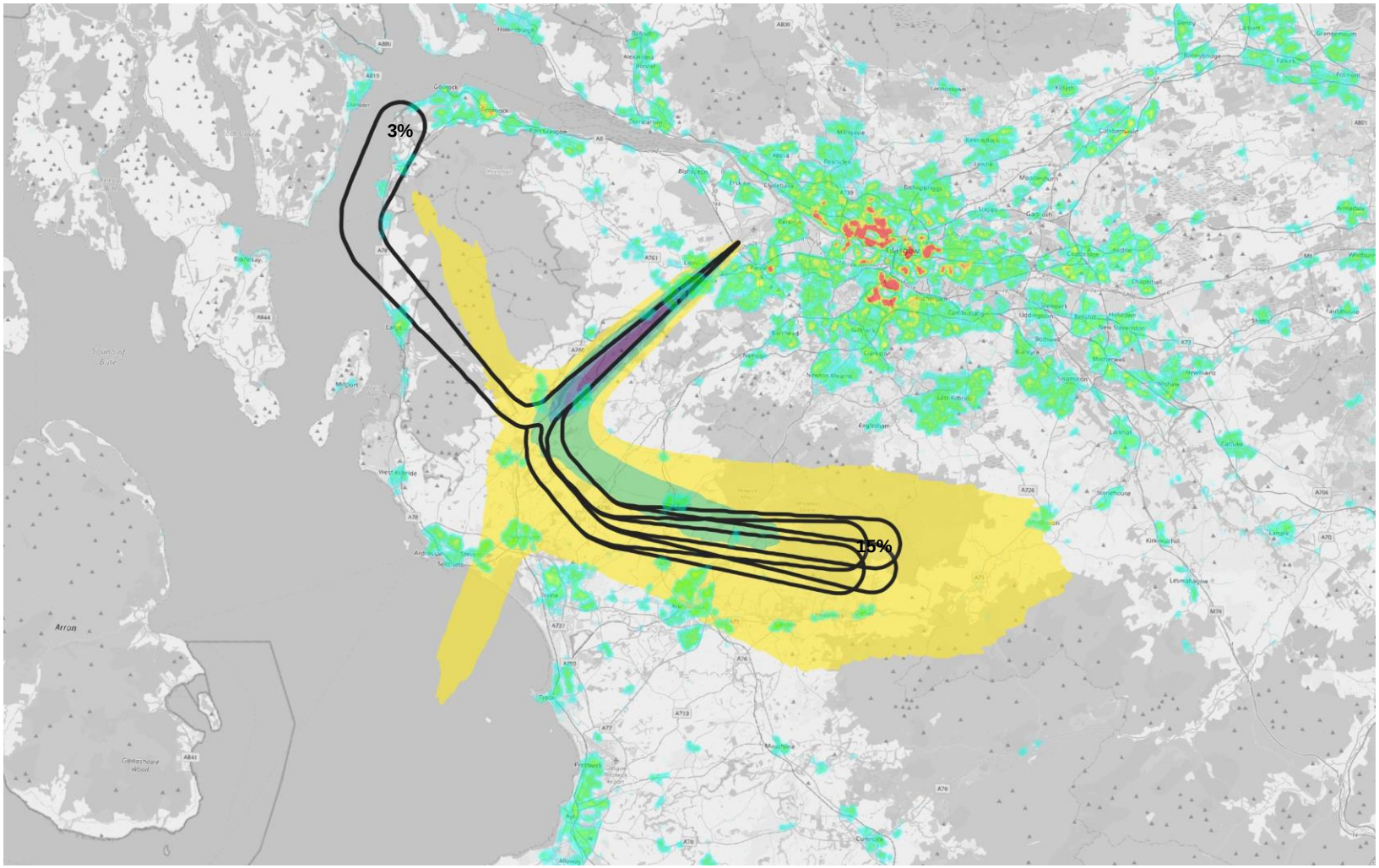
Runway 05 PBN Arrival PBN and Vectoring

This scenario would see the availability of PBN arrivals but with the ability for ATC to still vector arrivals when required to provide the required final approach sequence and spacing.

The PBN arrival(s) would likely be the ‘best performing’ of Options A-D above which are then optimised in Stage 3 to balance CO2, noise impacts and Controlled Airspace containment requirements. The frequency of usage of the PBN route(s) would need to be determined through stakeholder engagement and consultation.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN and Vectoring



PBN Options Overflight Contours (Black outline) with estimated % of overall arrivals

2019 baseline average summer day overflight swathe:

1

22

Runway 05 Arrival Summary Tables

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Overflights (0-4000ft)																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05_BAS	70.98	26335	0	0	0	0	2	0.7	4	8.32	1	7.6	0	0	0	0	7	0	8	13
RWY05_A	63.19	11993	0	0	1	0.05	0	0	0	0	0	0	0	0	0	0	3	0	3	6
RWY05_B	64.52	11966	0	0	0	0	1	0.62	1	0.62	0	0	0	0	0	0	3	0	3	6
RWY05_C	63.2	11993	0	0	1	0.05	0	0	0	0	0	0	0	0	0	0	3	0	3	6
RWY05_D	64.52	11974	0	0	0	0	1	0.62	1	0.62	0	0	0	0	0	0	3	0	3	6
Overflights (0-7000ft)																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05_BAS	182.63	51256	0	0	1	0	2	0.7	7	26.58	2	23.62	0	0	0	0	19	2	9	26
RWY05_A	174.72	21006	0	0	3	2.34	0	0	1	0.04	0	0	0	0	0	0	7	0	5	10
RWY05_B	176.02	21242	0	0	2	1.99	1	0.62	2	0.66	0	0	0	0	0	0	6	0	5	10
RWY05_C	174.44	21211	0	0	3	2.33	0	0	1	0.04	0	0	0	0	0	0	7	0	5	10
RWY05_D	176.01	21379	0	0	2	1.48	1	0.62	2	0.66	0	0	0	0	0	0	6	0	6	10

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

60dB LAmax																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05_BAS	56.96	34798	0	0	0	0	2	0.44	3	1	0	0	0	0	0	0	5	0	12	20
RWY05_A	52.74	27292	0	0	0	0	0	0	2	0.32	1	0.02	0	0	0	0	4	0	9	13
RWY05_B	53.79	27446	0	0	0	0	1	0.57	3	0.88	1	0.02	0	0	0	0	4	0	9	13
RWY05_C	52.74	27292	0	0	0	0	0	0	2	0.32	1	0.02	0	0	0	0	4	0	9	13
RWY05_D	53.88	27446	0	0	0	0	1	0.57	3	0.88	1	0.02	0	0	0	0	4	0	9	13
65dB LAMax																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05_BAS	24.4	21111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	12
RWY05_A	23.36	20790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	12
RWY05_B	23.36	20790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	12
RWY05_C	23.36	20790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	12
RWY05_D	23.36	20790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	12

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

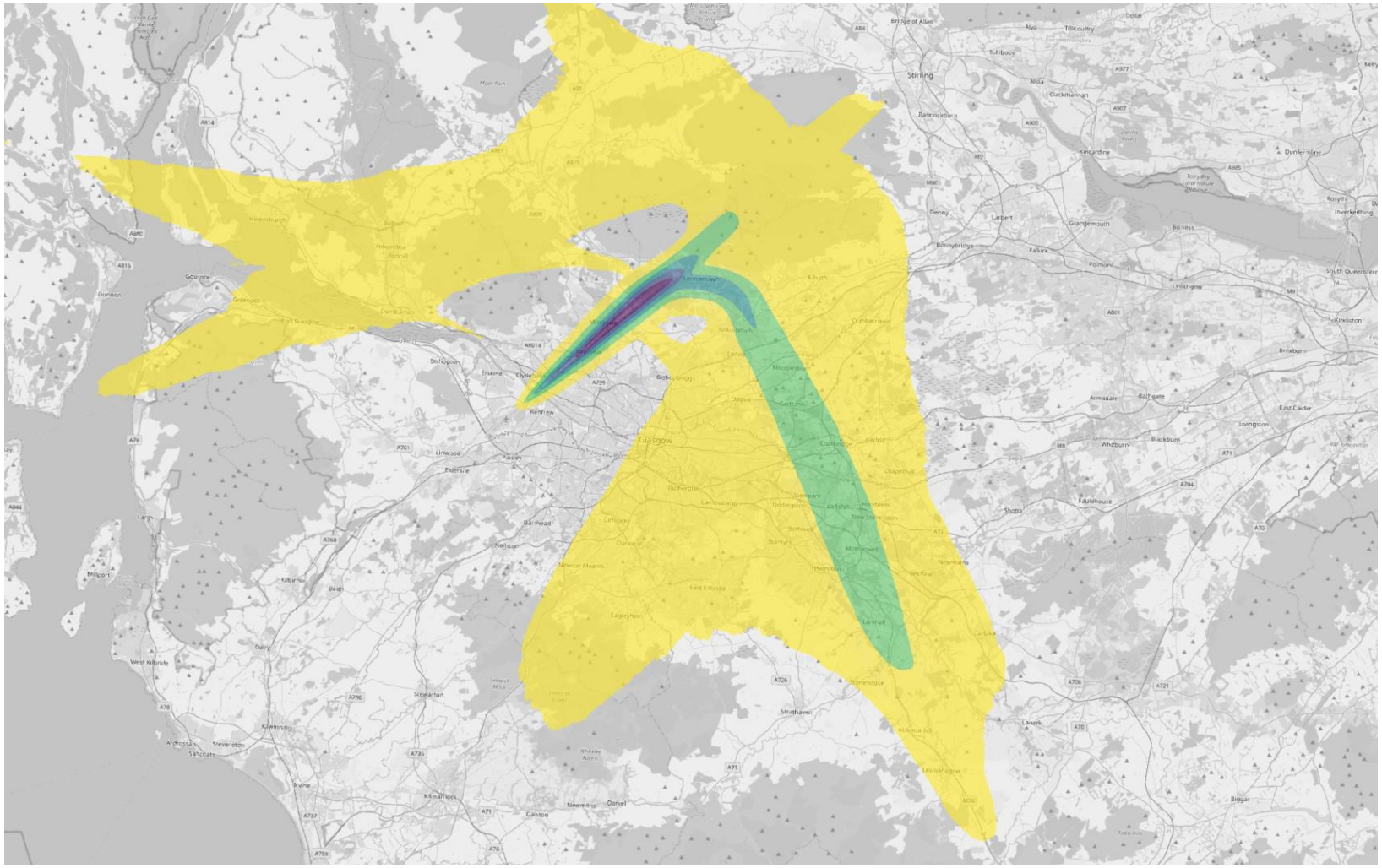
Runway 05 Arrivals: Track Mileage

Track Mileage		
Option	**Track miles (nm)**	**Track miles (Weighted 15% (South), 3% (North) based on 2019 modal split)**
Baseline (centreline)	50	428.4
A	57.5	492.9
B	56.3	474.9
C	57.8	497.4
D	56.5	477.9

Runway 23 Baseline

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Arrival Baseline



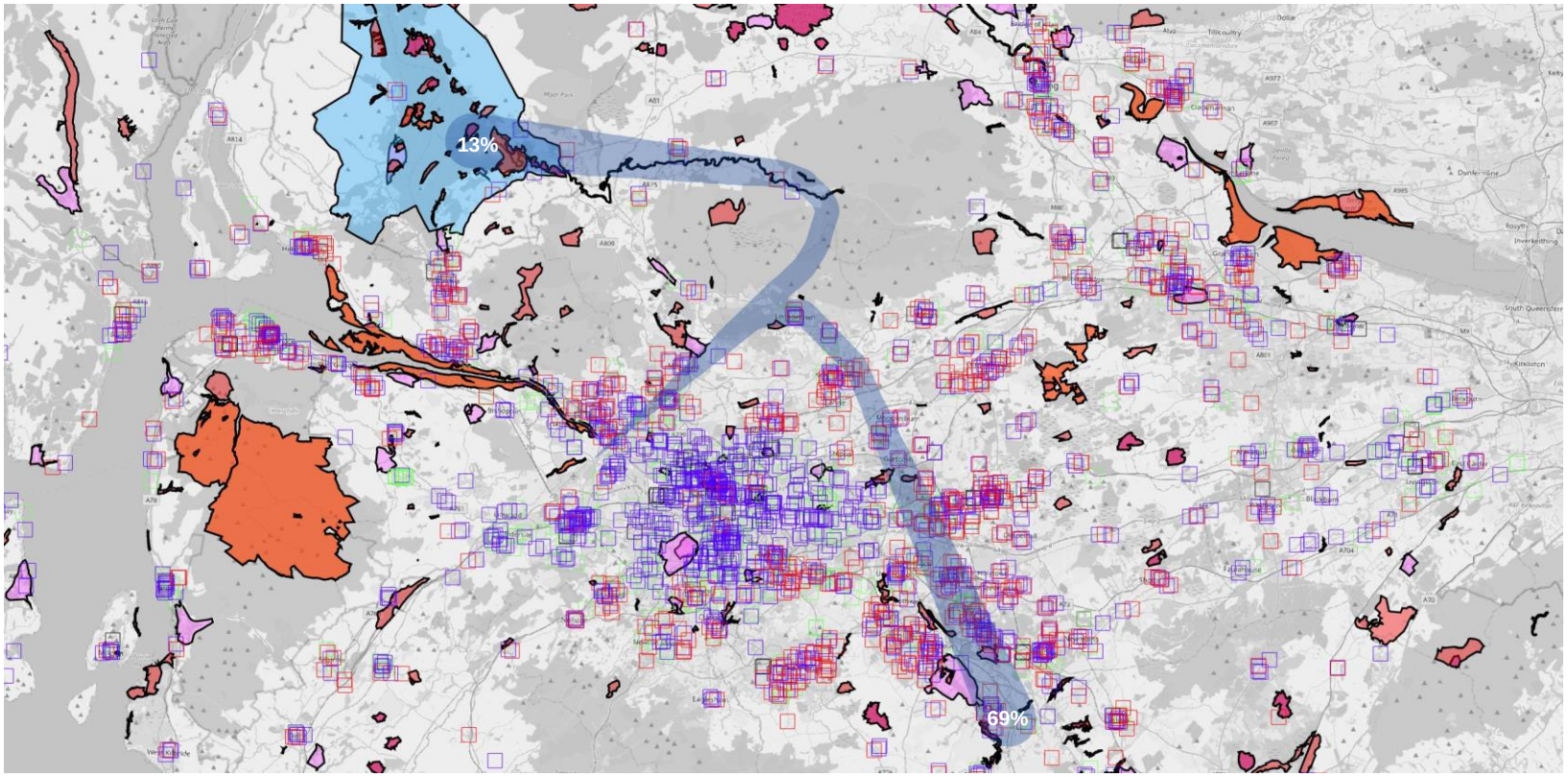
2019 baseline average summer day overflight swathe:

1

98

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Baseline



Baseline centreline overflight contours (Shaded blue)

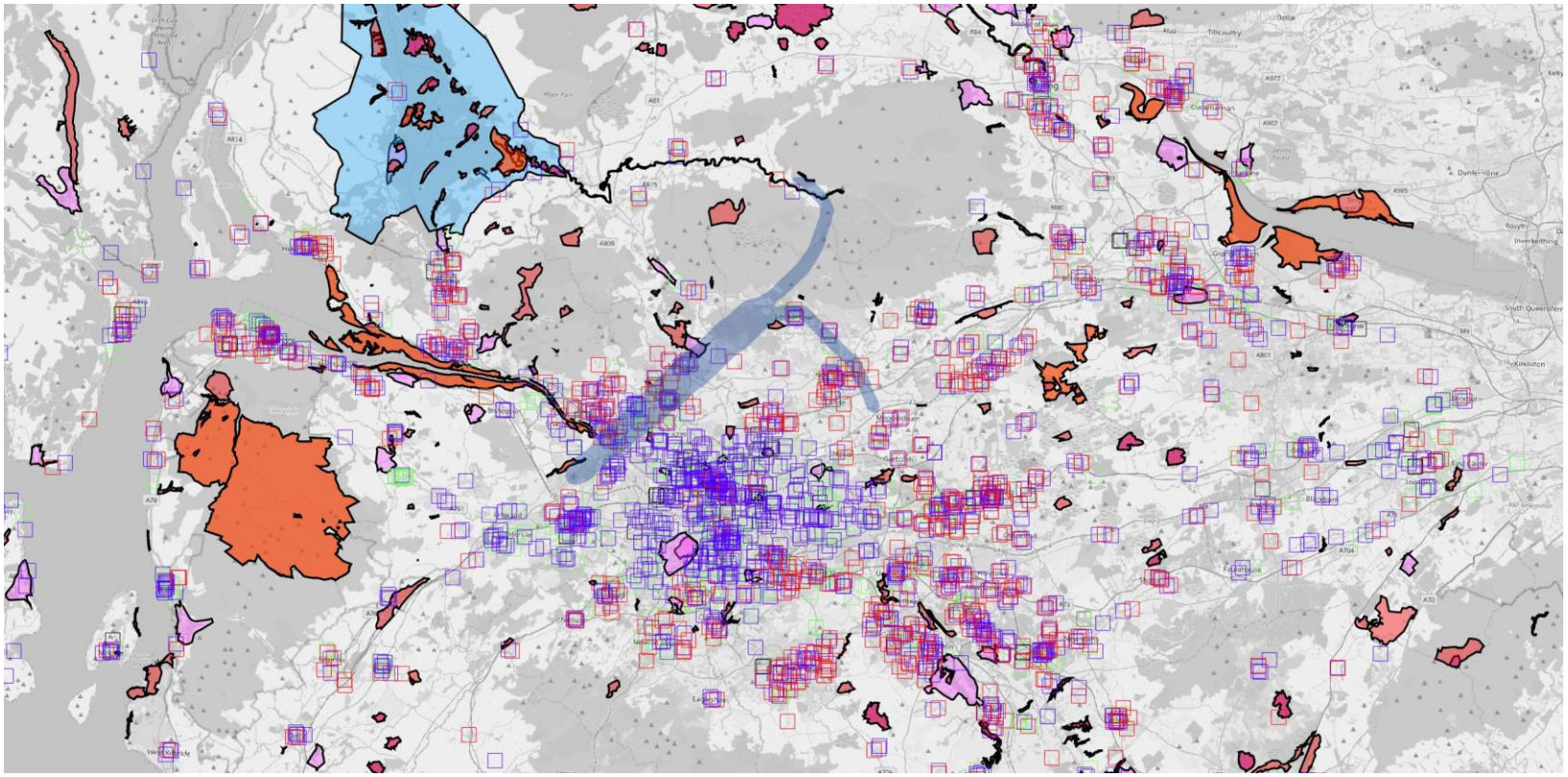
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	1659.74	1250066	1	17.51	16	15.19	15	8.66	87	47.24	15	16.79	5	79.21	8	2.29	399	23	206	695
RWY23 Baseline (Centreline)	184.13	139113	1	23.63	4	2.78	7	3.05	19	7.97	1	3.27	1	34.52	0	0	66	0	22	83

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Baseline



Baseline centreline 60dB L_{amax} contours (Shaded blue)

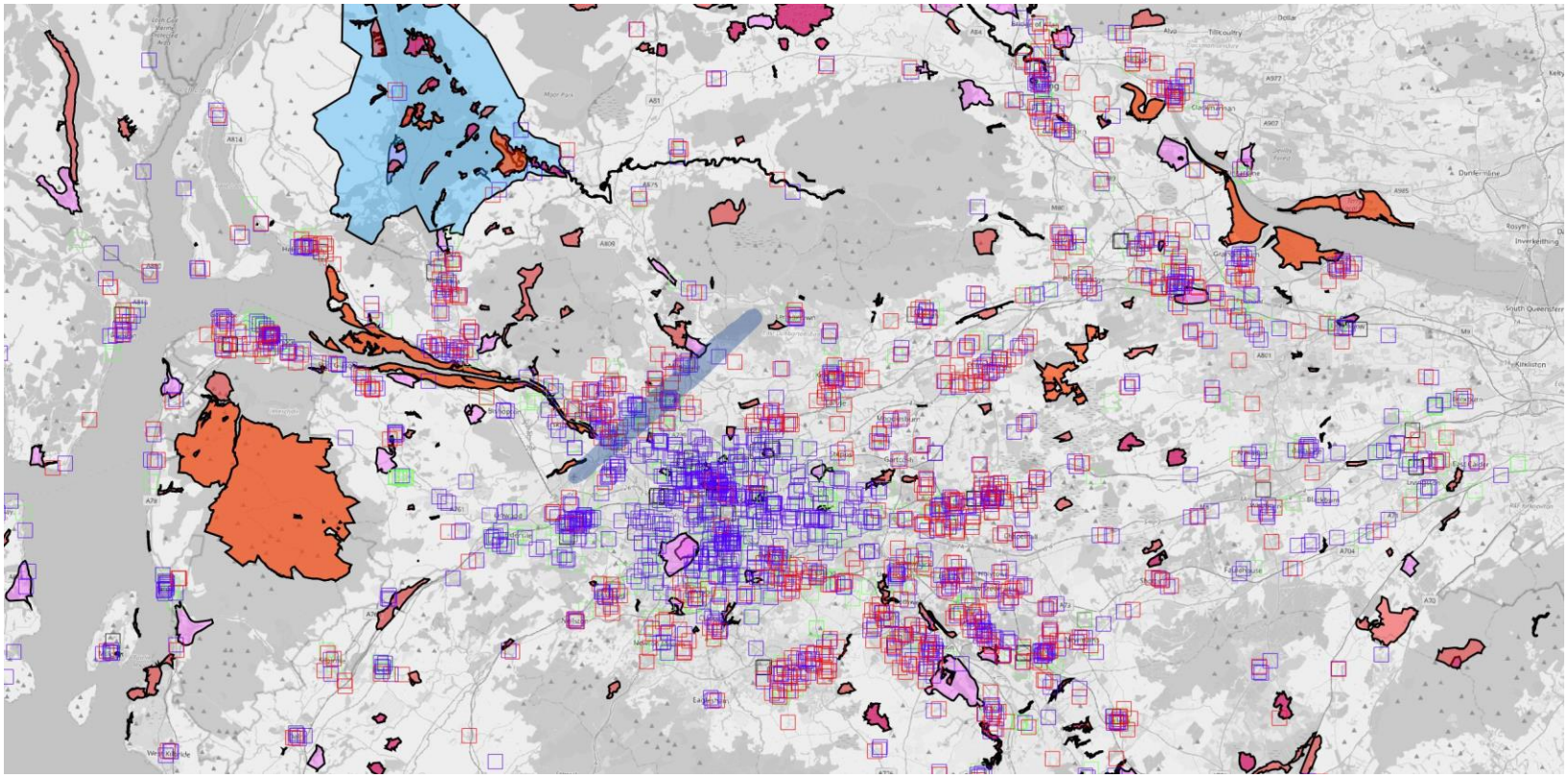
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	57.86	68289	0	0	1	0.67	1	0.04	4	0.29	1	0.18	0	0	0	0	21	0	14	38

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Baseline



Baseline centreline 65dB L_{amax} contours (Shaded blue)

Data:

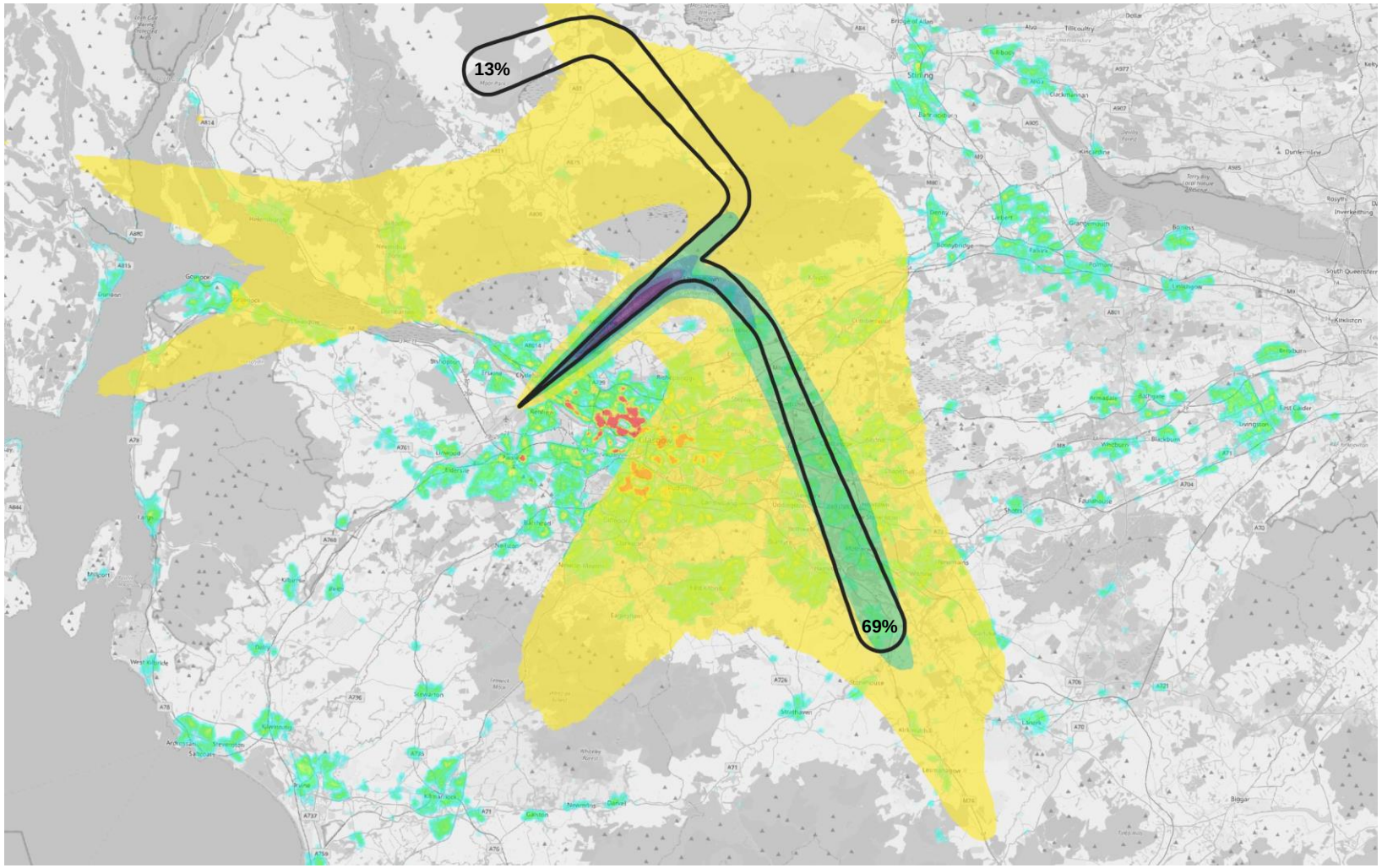
- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Runway 23 PBN Arrival Option C

PBN arrivals from the north joining final approach at approximately 12nm from the runway and from the south at approximately 8nm.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Option C



Option Overflight Contours (Black outline) with estimated % of overall arrivals

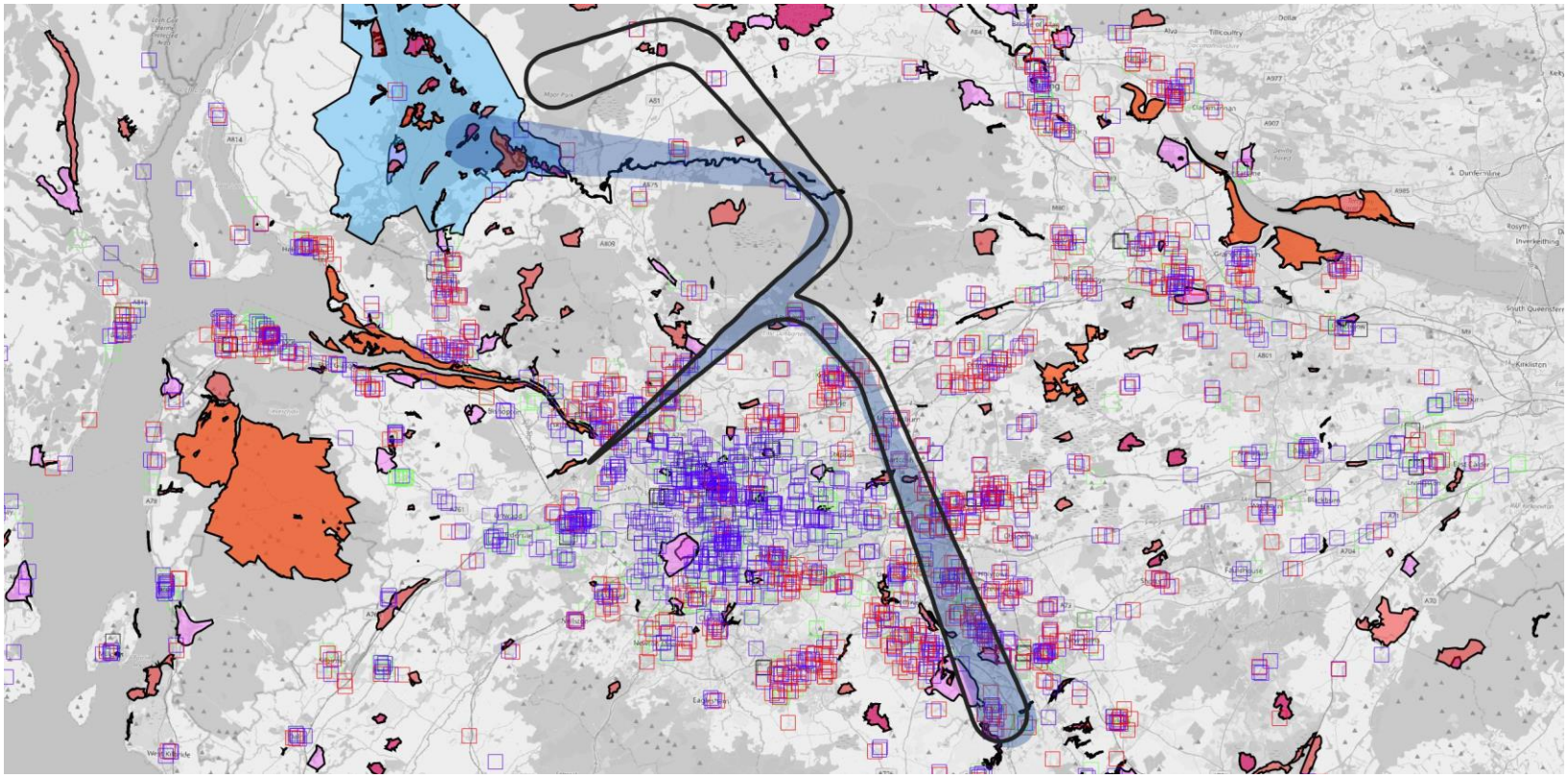
2019 baseline average summer day overflight swathe:

1

98

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Option C



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

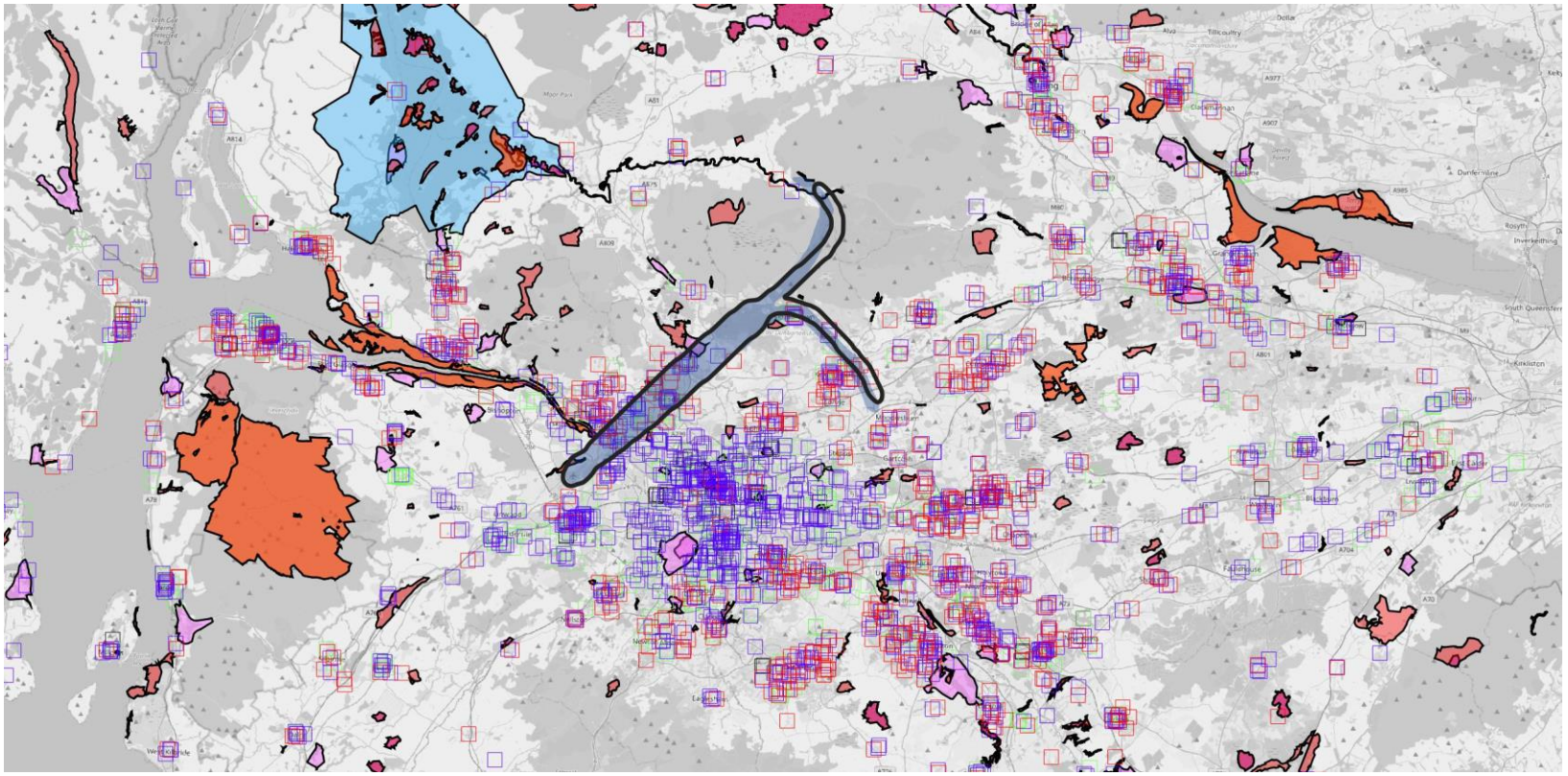
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	1659.74	1250066	1	17.51	16	15.19	15	8.66	87	47.24	15	16.79	5	79.21	8	2.29	399	23	206	695
RWY23 Baseline (Centreline)	184.13	139113	1	23.63	4	2.78	7	3.05	19	7.97	1	3.27	1	34.52	0	0	66	0	22	83
RWY23 Option D	180.49	129769	0	0	3	3.8	3	0.98	11	2.13	0	0	1	26.29	0	0	58	0	20	82

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Option C



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

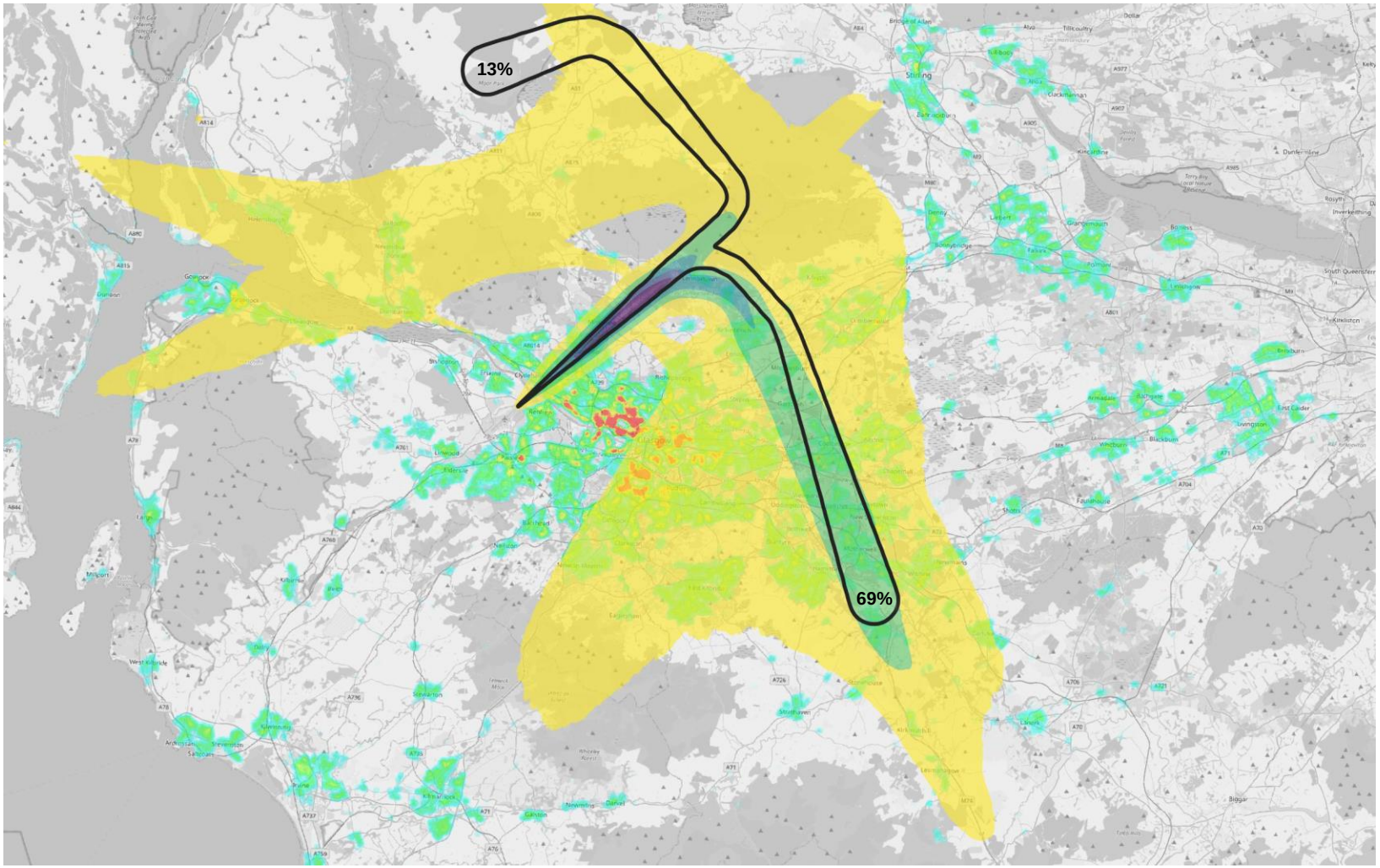
	60dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	57.86	68289	0	0	1	0.67	1	0.04	4	0.29	1	0.18	0	0	0	0	21	0	14	38
RWY23 Option D	55.49	63544	0	0	1	0.68	1	0.04	2	0.28	1	0.24	0	0	0	0	19	0	13	35

Runway 23 PBN Arrival Option D

PBN arrivals from the north joining final approach at approximately 12nm from the runway and from the south at approximately 9nm.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Option D



Option Overflight Contours (Black outline) with estimated % of overall arrivals

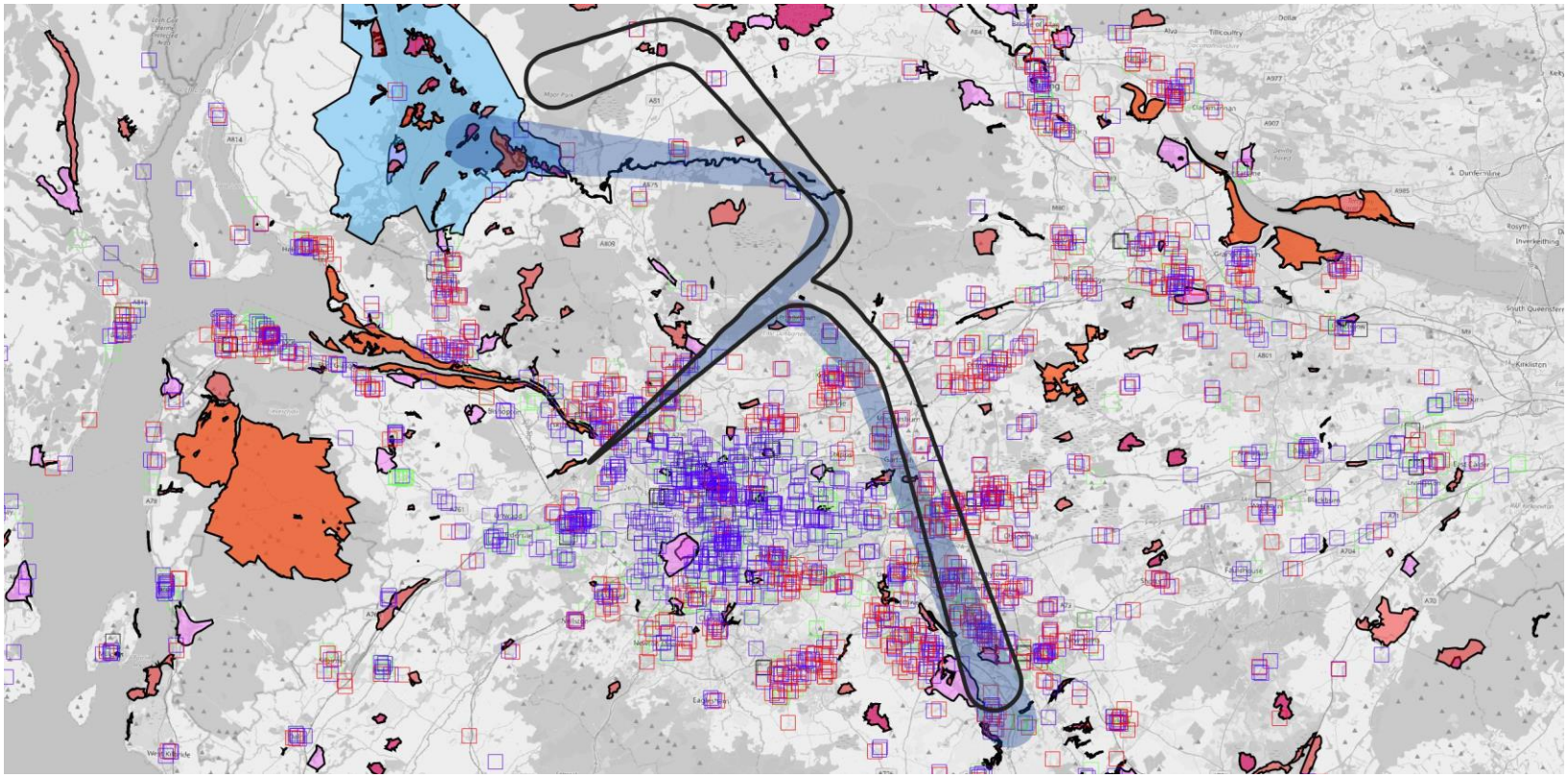
2019 baseline average summer day overflight swathe:

1

98

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Option D



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

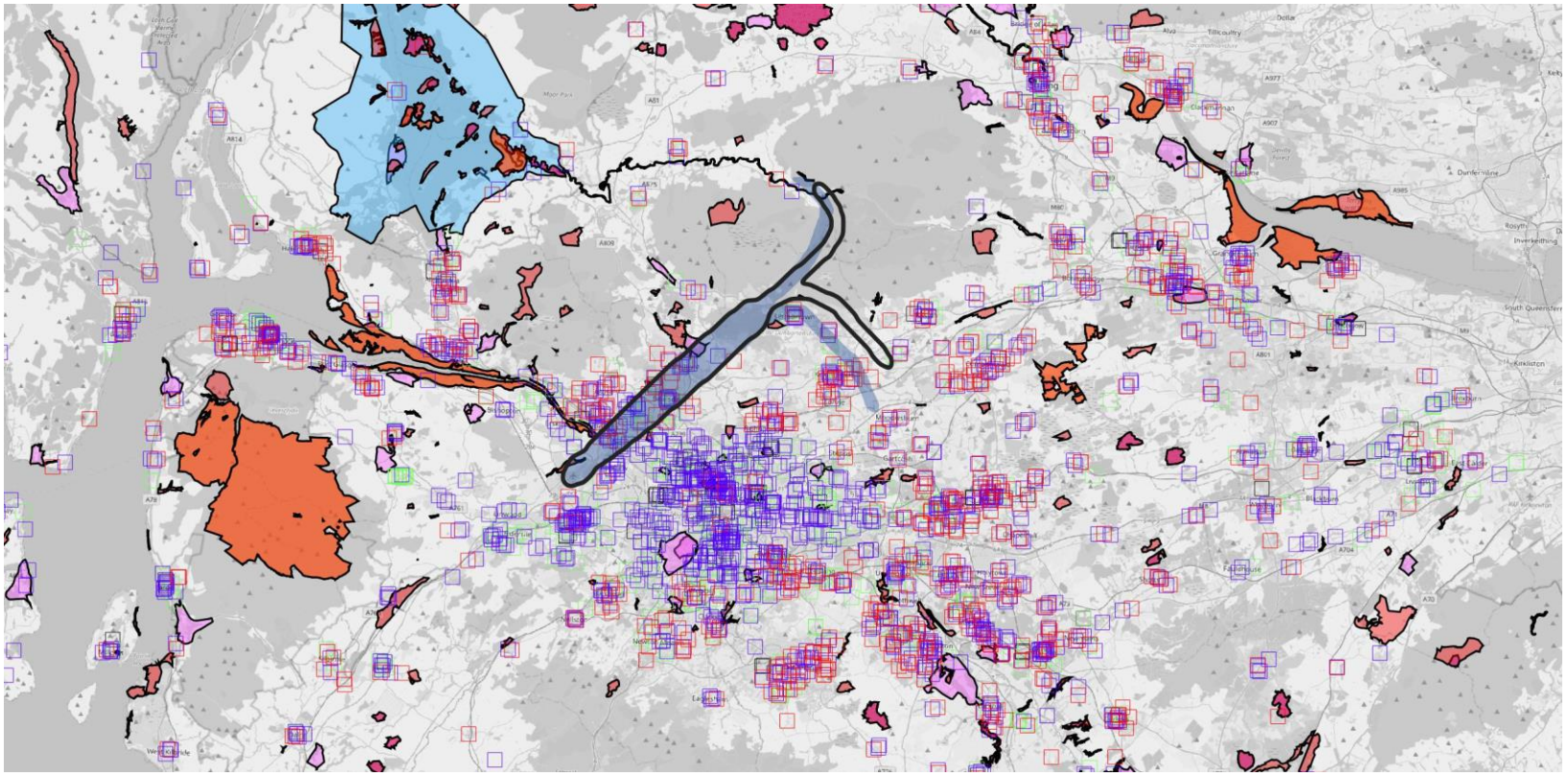
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	1659.74	1250066	1	17.51	16	15.19	15	8.66	87	47.24	15	16.79	5	79.21	8	2.29	399	23	206	695
RWY23 Baseline (Centreline)	184.13	139113	1	23.63	4	2.78	7	3.05	19	7.97	1	3.27	1	34.52	0	0	66	0	22	83
RWY23 Option D	178.24	118103	0	0	3	2.63	2	0.5	10	1.2	0	0	1	26.29	0	0	51	1	18	79

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 PBN Arrival Option D



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

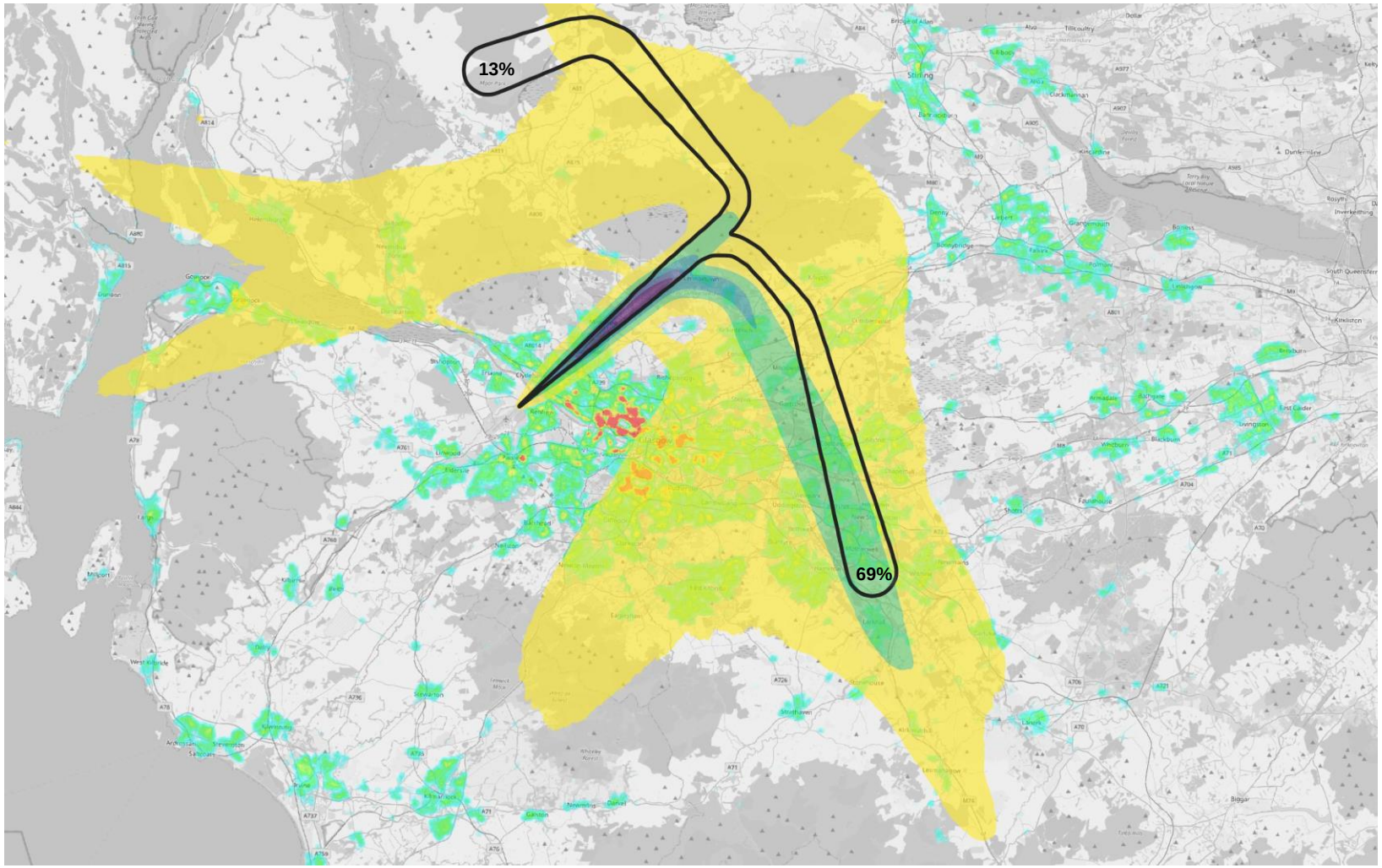
60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	57.86	68289	0	0	1	0.67	1	0.04	4	0.29	1	0.18	0	0	0	0	21	0	14	38
RWY23 Option D	54.55	54040	0	0	1	0.68	1	0.04	3	0.32	1	0.24	0	0	0	0	14	0	11	33

Runway 23 PBN Arrival Option E

PBN arrivals from the north joining final approach at approximately 12nm from the runway and from the south at approximately 10nm.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Option E



Option Overflight Contours (Black outline) with estimated % of overall arrivals

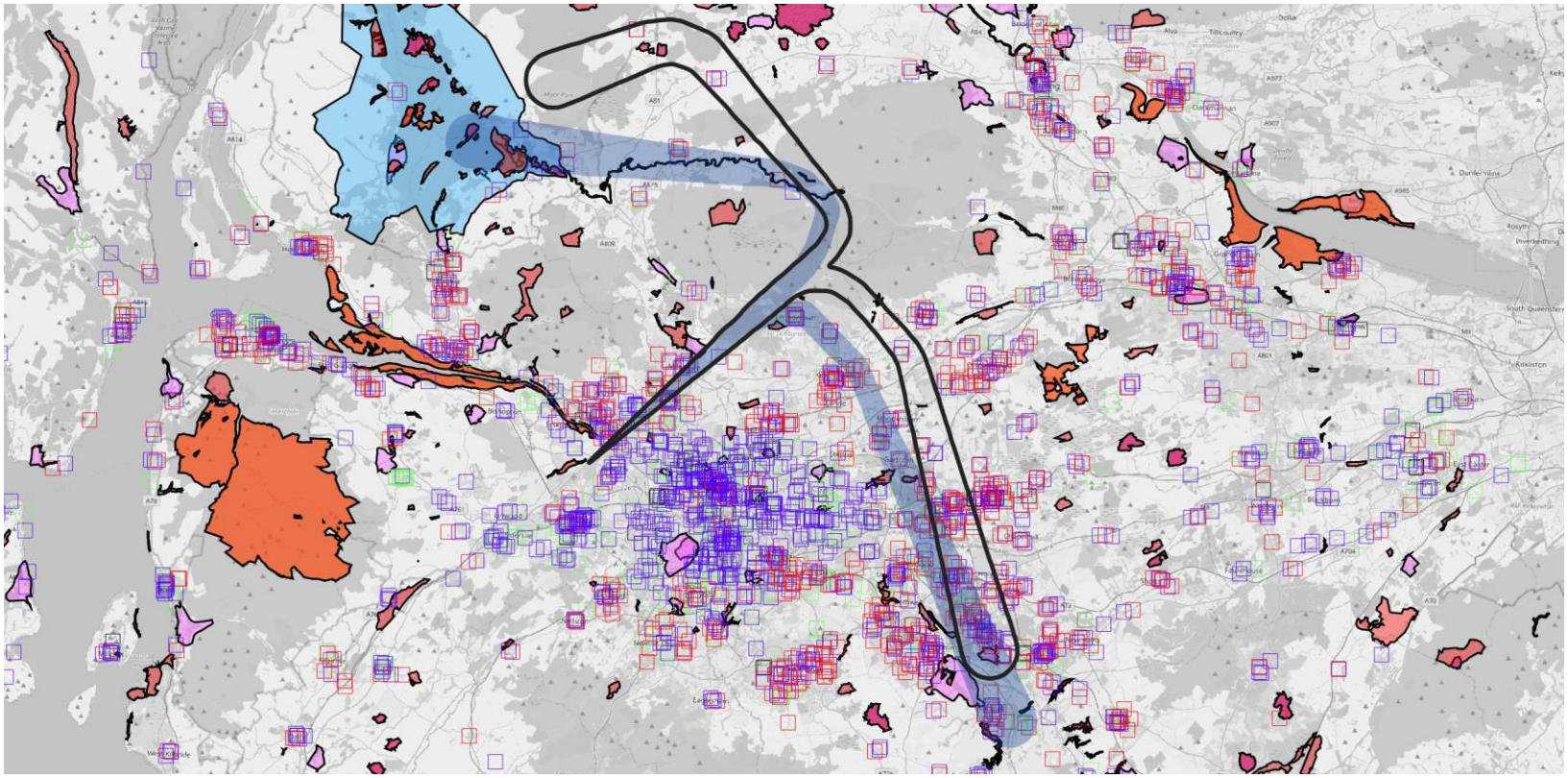
2019 baseline average summer day overflight swathe:

1

98

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Option E



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

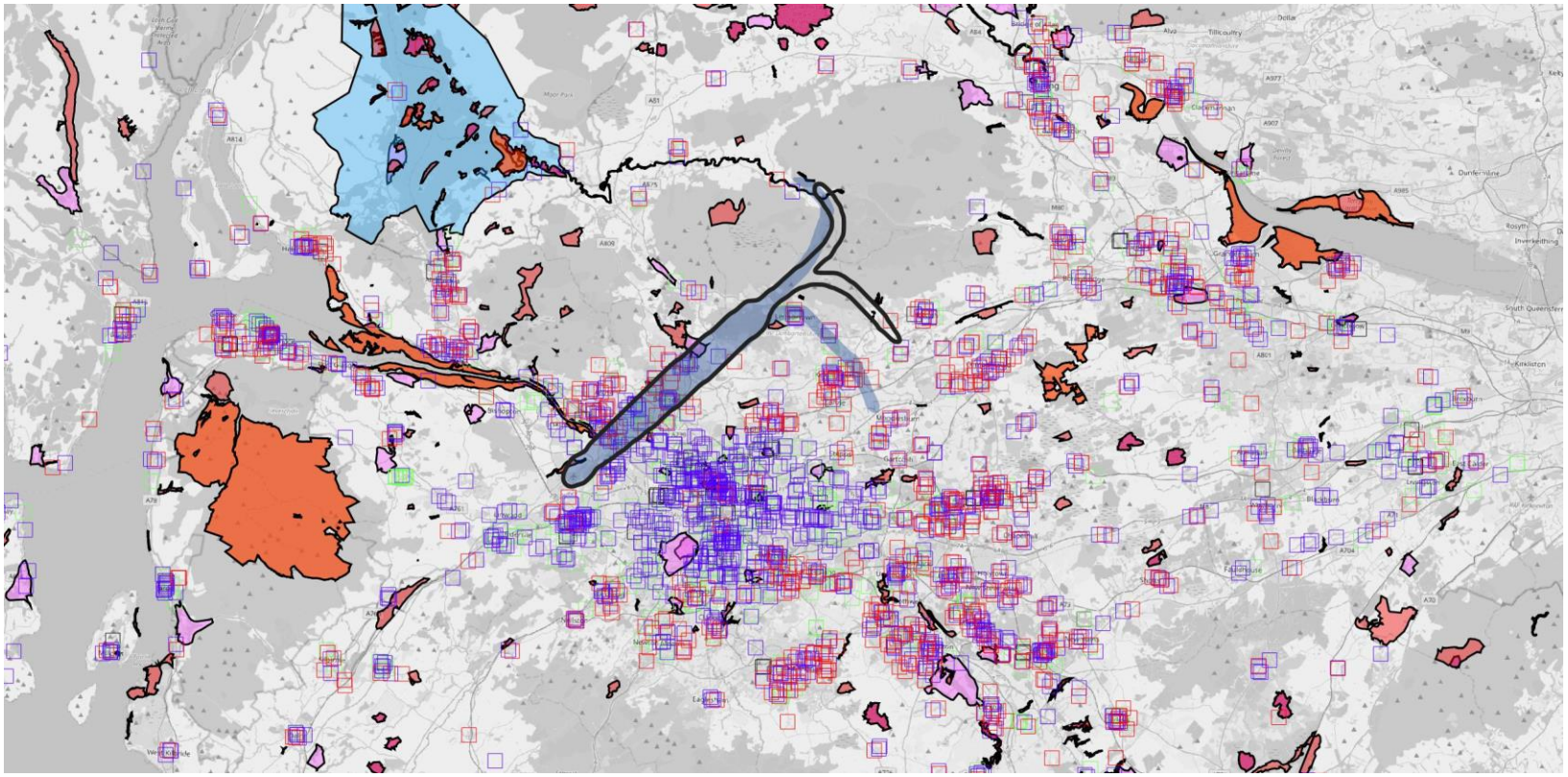
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	1659.74	1250066	1	17.51	16	15.19	15	8.66	87	47.24	15	16.79	5	79.21	8	2.29	399	23	206	695
RWY23 Baseline (Centreline)	184.13	139113	1	23.63	4	2.78	7	3.05	19	7.97	1	3.27	1	34.52	0	0	66	0	22	83
RWY23 Option E	175.89	115858	0	0	2	1	2	0.5	13	1.05	0	0	1	26.29	0	0	50	1	15	80

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN Arrival Option E



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	57.86	68289	0	0	1	0.67	1	0.04	4	0.29	1	0.18	0	0	0	0	21	0	14	38
RWY23 Option E	53.19	53821	0	0	1	0.68	1	0.04	4	0.3	1	0.24	0	0	0	0	14	0	11	33

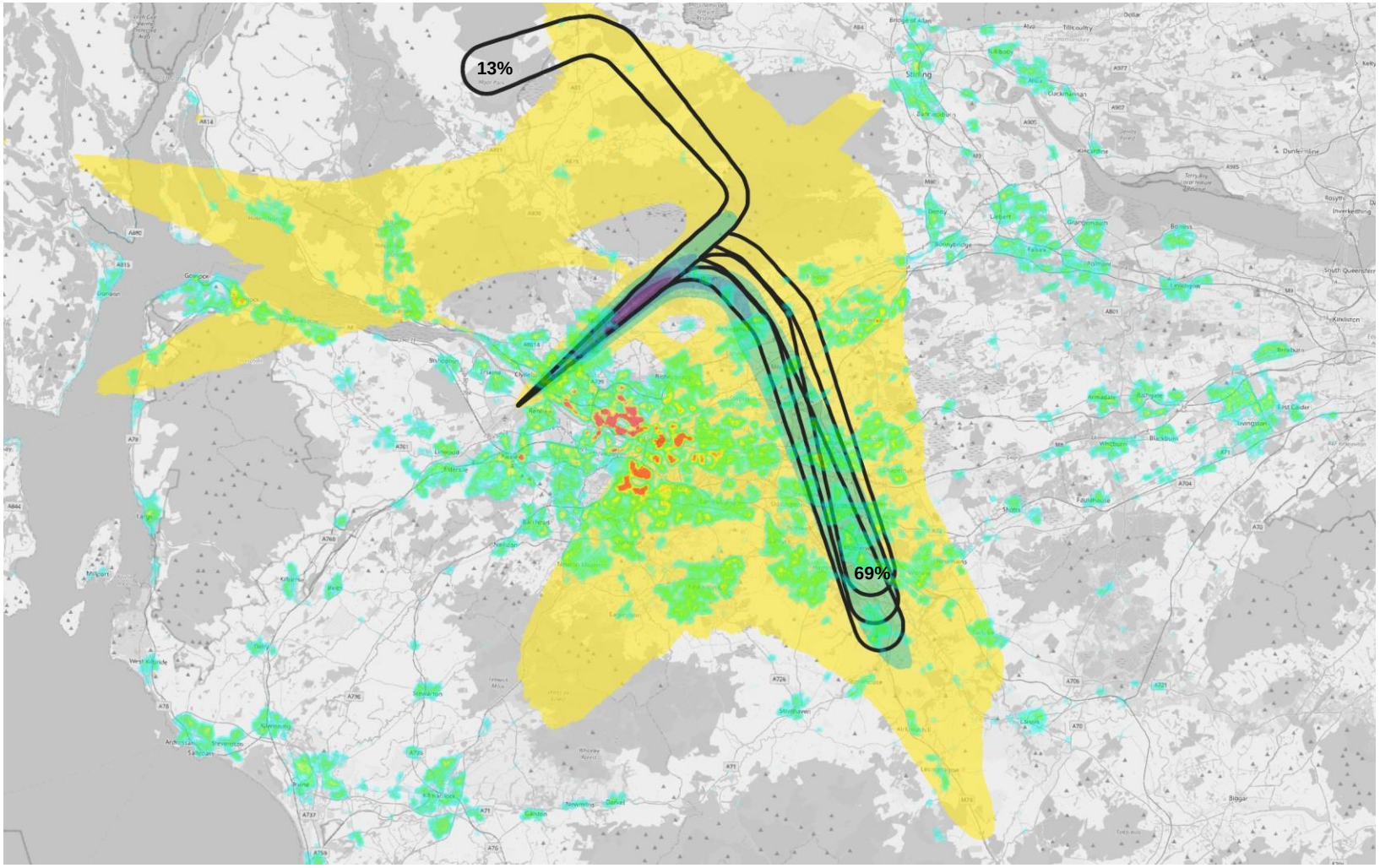
Runway 23 PBN Arrival PBN and Vectoring

This scenario would see the availability of PBN arrivals but with the ability for ATC to still vector arrivals when required to provide the required final approach sequence and spacing.

The PBN arrival(s) would likely be the ‘best performing’ of Options above which are then optimised in Stage 3 to balance CO_2, noise impacts and Controlled Airspace containment requirements. The frequency of usage of the PBN route(s) would need to be determined through stakeholder engagement and consultation.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 PBN and Vectoring



PBN Options Overflight Contours (Black outline) with estimated % of overall arrivals

2019 baseline average summer day overflight swathe:

1

22

Runway 23 Arrival Summary Tables

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Overflights (0-4000ft)																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23_BAS	72.4	44778	0	0	1	0.16	1	0.35	5	1.19	0	0	0	0	0	0	17	0	4	23
RWY23_C	68.89	38368	0	0	1	0.12	1	0.07	5	0.56	0	0	0	0	0	0	12	0	3	18
RWY23_D	66.6	20944	0	0	1	0.12	1	0.07	5	0.22	0	0	0	0	0	0	4	0	1	9
RWY23_E	64.28	16695	0	0	1	0.12	1	0.07	10	0.26	0	0	0	0	0	0	3	0	1	9

Overflights (0-7000ft)																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23_BAS	184.13	139113	1	23.63	4	2.78	7	3.05	19	7.97	1	3.27	1	34.52	0	0	66	0	22	83
RWY23_C	180.49	129769	0	0	3	3.8	3	0.98	11	2.13	0	0	1	26.29	0	0	58	0	20	82
RWY23_D	178.24	118103	0	0	3	2.63	2	0.5	10	1.2	0	0	1	26.29	0	0	51	1	18	79
RWY23_E	175.89	115858	0	0	2	1	2	0.5	13	1.05	0	0	1	26.29	0	0	50	1	15	80

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

N60																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23_BAS	57.86	68289	0	0	1	0.67	1	0.04	4	0.29	1	0.18	0	0	0	0	21	0	14	38
RWY23_C	55.49	63544	0	0	1	0.68	1	0.04	2	0.28	1	0.24	0	0	0	0	19	0	13	35
RWY23_D	54.55	54040	0	0	1	0.68	1	0.04	3	0.32	1	0.24	0	0	0	0	14	0	11	33
RWY23_E	53.19	53821	0	0	1	0.68	1	0.04	4	0.3	1	0.24	0	0	0	0	14	0	11	33

N65																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23_BAS	25.1	38163	0	0	1	0.27	0	0	1	0.1	1	0.1	0	0	0	0	9	0	9	25
RWY23_C	23.32	35960	0	0	1	0.3	0	0	1	0.12	1	0.12	0	0	0	0	12	0	8	25
RWY23_D	23.29	35960	0	0	1	0.3	0	0	1	0.12	1	0.12	0	0	0	0	12	0	8	25
RWY23_E	23.29	35960	0	0	1	0.3	0	0	1	0.12	1	0.12	0	0	0	0	12	0	8	25

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Arrivals Track Mileage

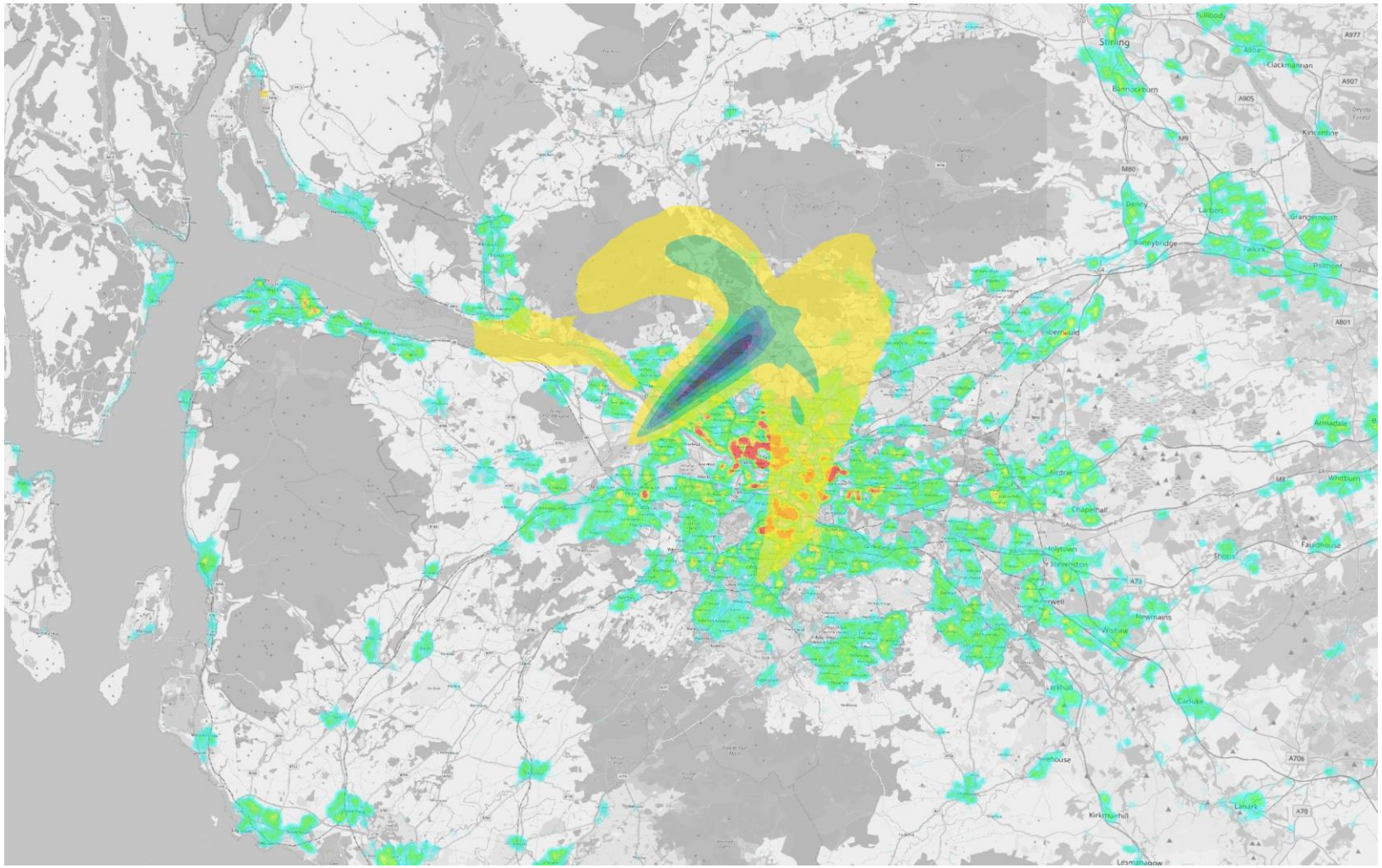
Track Mileage		
Option	**Track miles (nm)**	**Track miles (Weighted 69% (South), 13% (North) based on 2019 modal split)**
Baseline (centreline)	58.2	2380.6
C	62.8	2513.2
D	63.9	2589.1
E	72.8	3203.2

Departures

Runway 05 Baseline

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Baseline



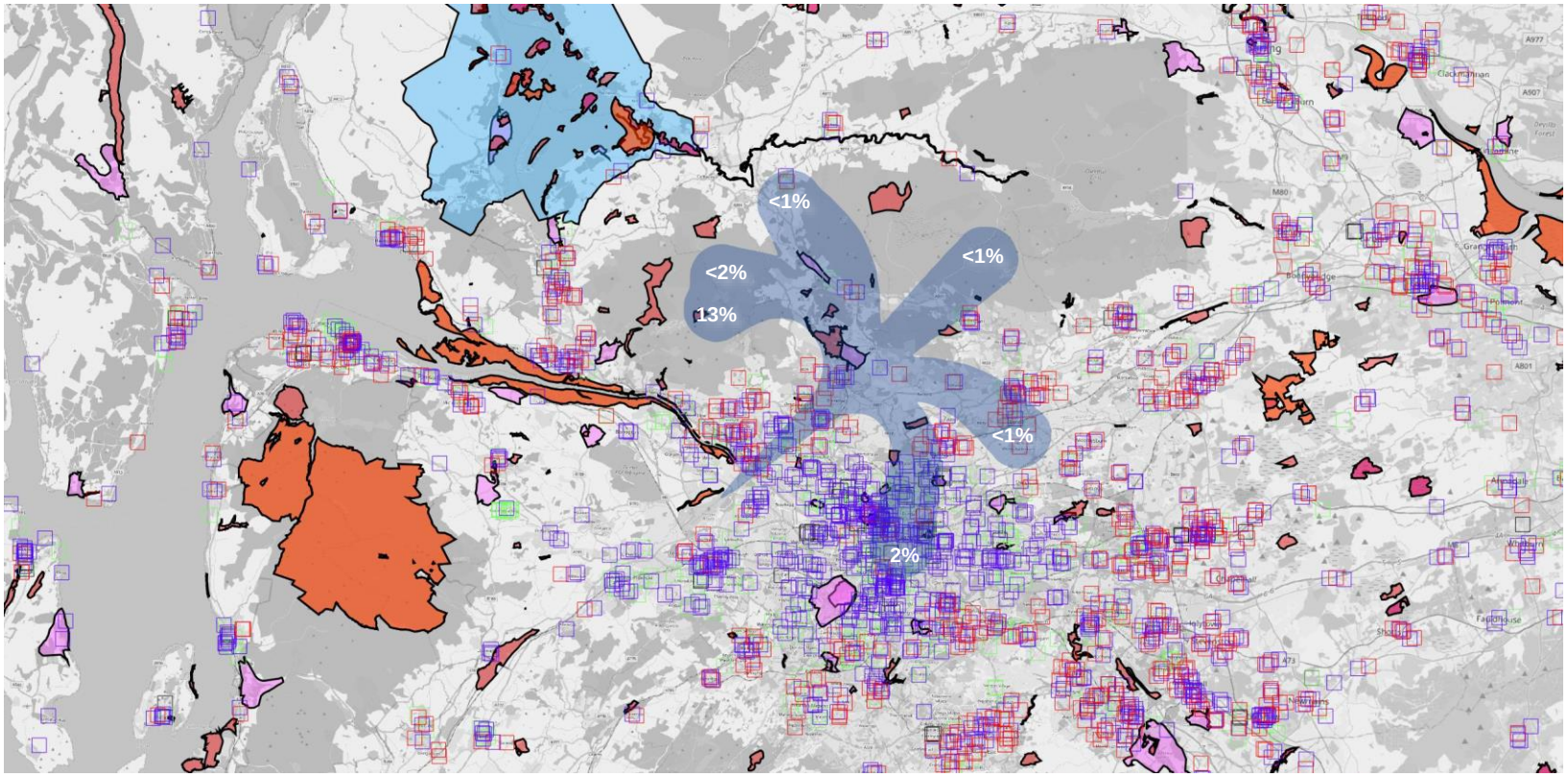
2019 baseline average summer day overflight swathe:

1

20

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Baseline



Baseline centreline overflight contours (Shaded blue)

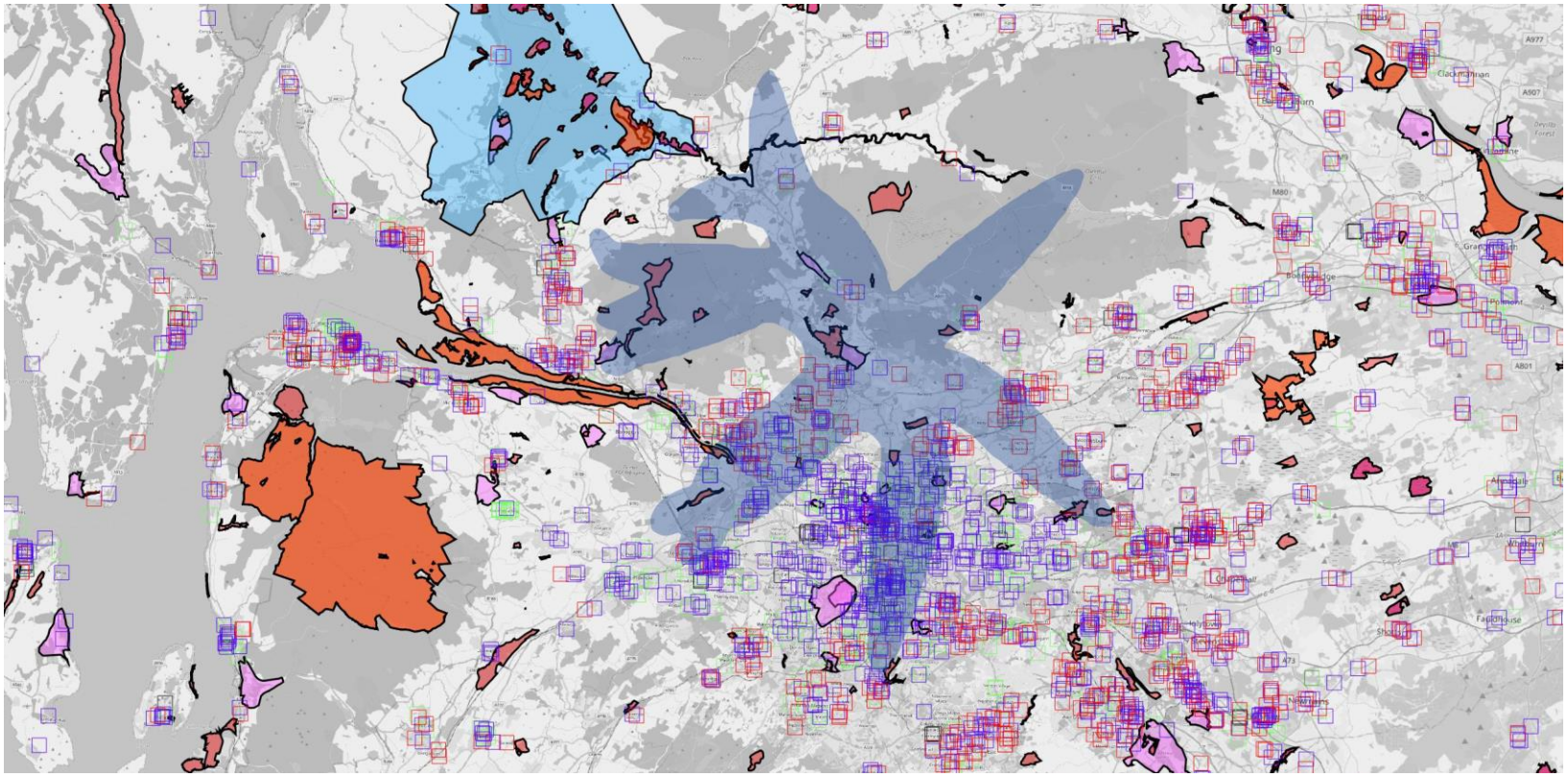
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Baseline



Baseline centreline 60dB L_{Amax} contours (Shaded blue)

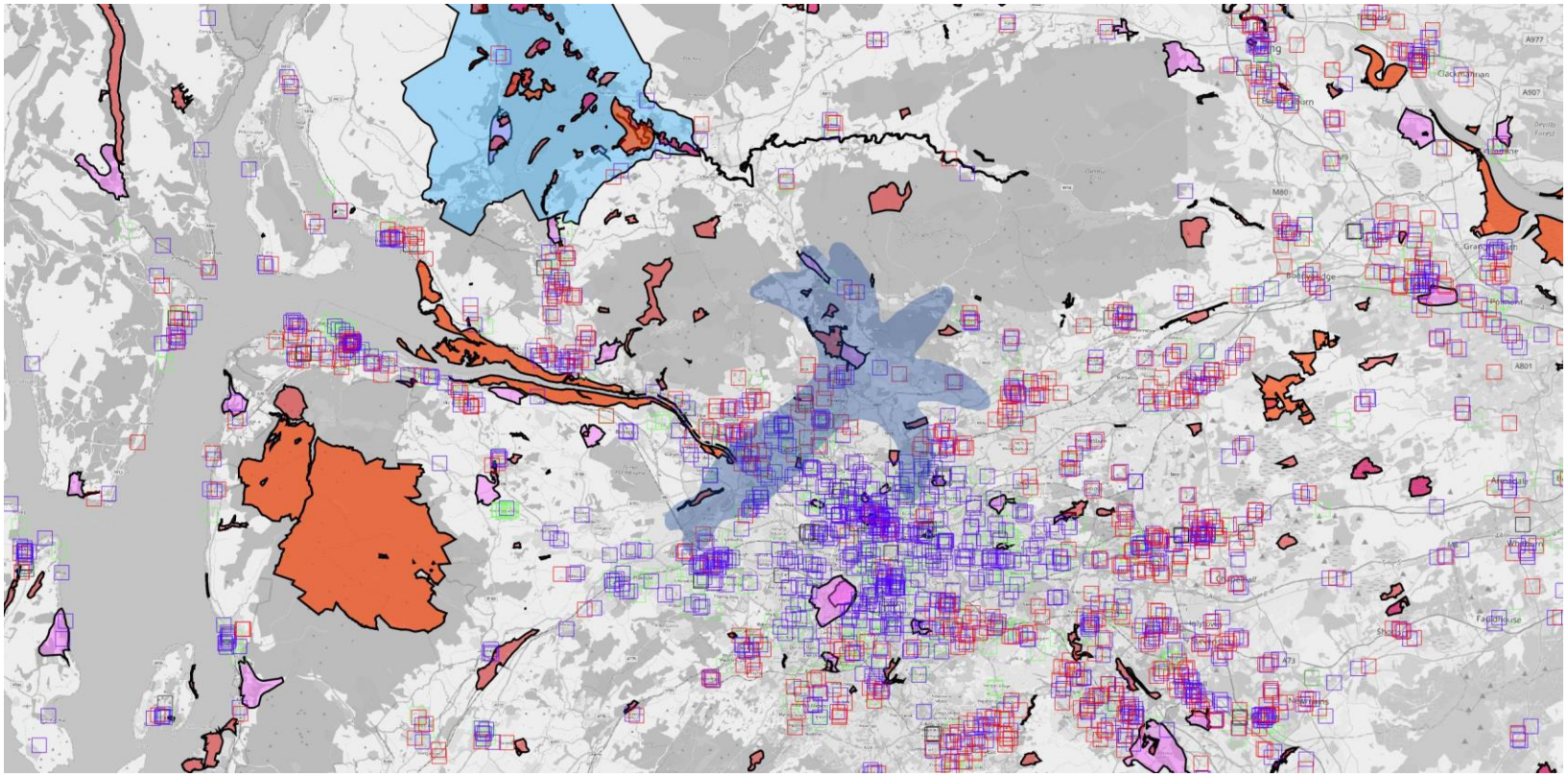
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Baseline



Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

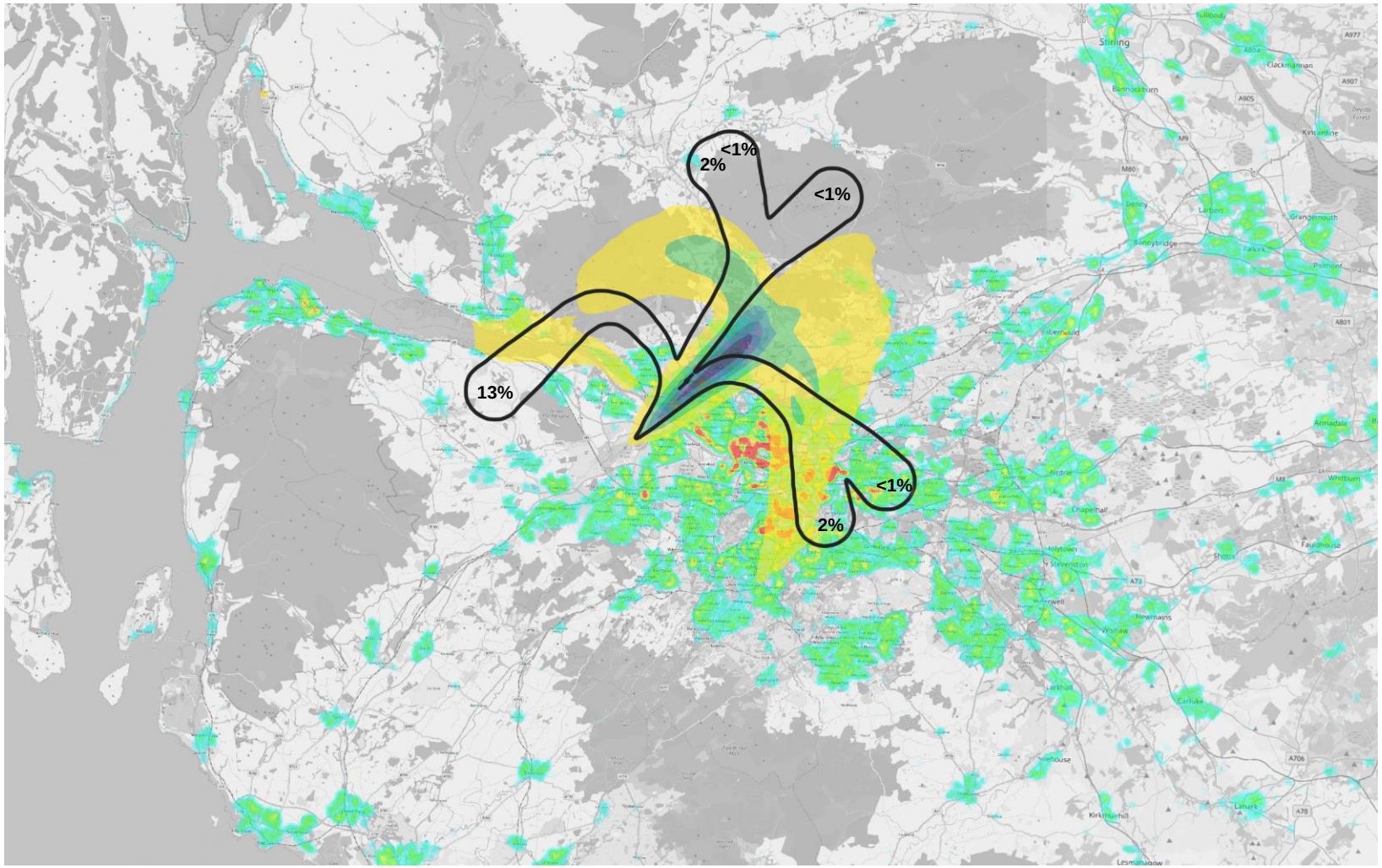
65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69

Runway 05 Departure Option A

Offset left departures with turns at 1nm and 6nm from the runway.
Straight ahead departures with turns at 3nm from the runway.
NORBO is offset left with turn at 1nm

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option A



Option Overflight Contours (Black outline) with estimated % of overall departures

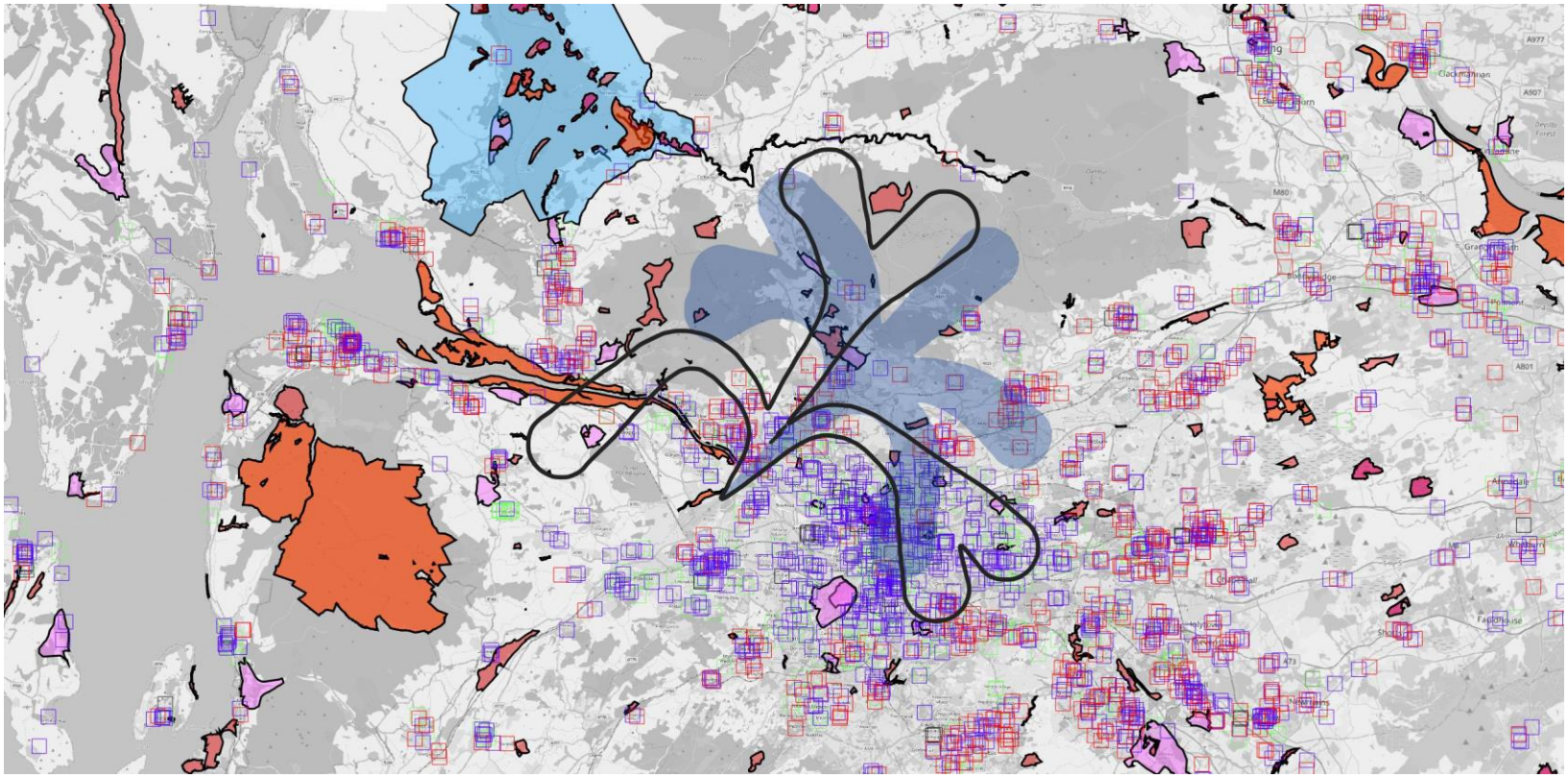
2019 baseline average summer day overflight swathe:

1

20

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option A



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

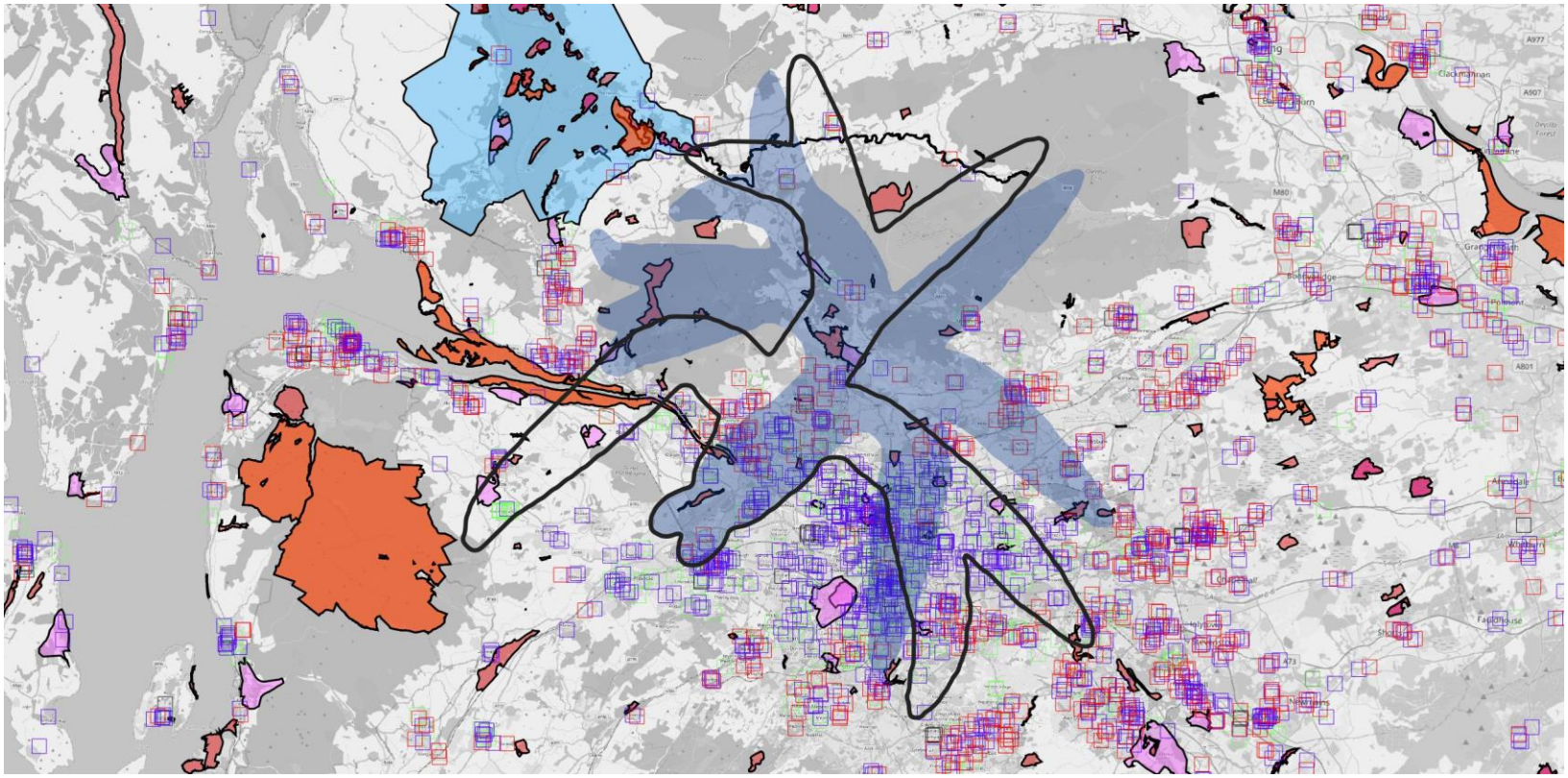
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option A	184.58	254041	0	0	4	1.42	0	0	16	5.84	4	3.25	0	0	3	0.94	26	9	49	143

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option A



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

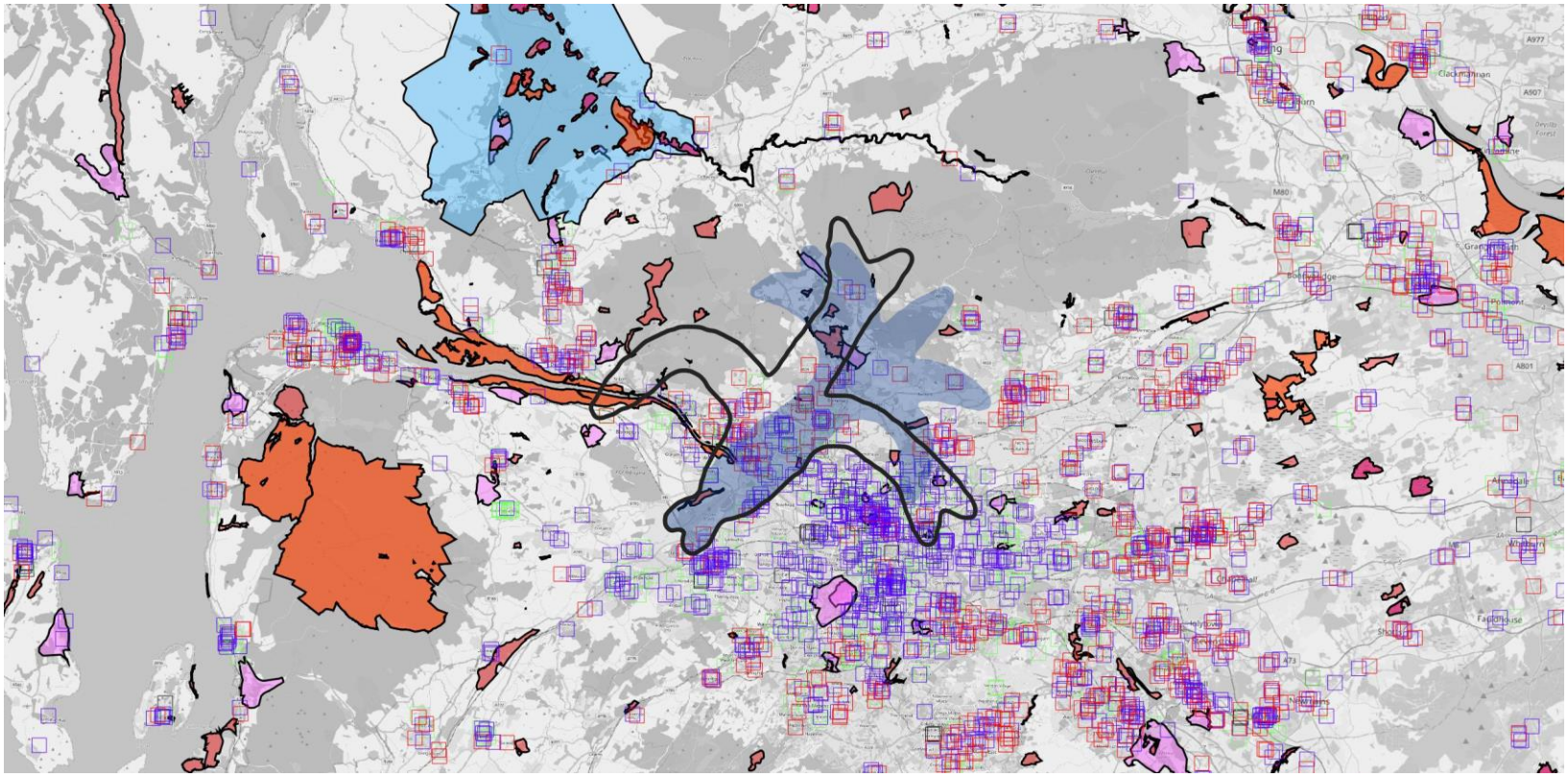
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Option A	363.53	458336	1	0.27	6	4.66	1	0.95	29	9.96	9	5.08	1	4.08	6	1.67	60	10	89	245

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option A



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	65dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Option A	129.97	179689	0	0	3	0.54	0	0	17	5.08	7	2.56	0	0	2	0.46	36	7	30	96

Runway 05 Departure Option B

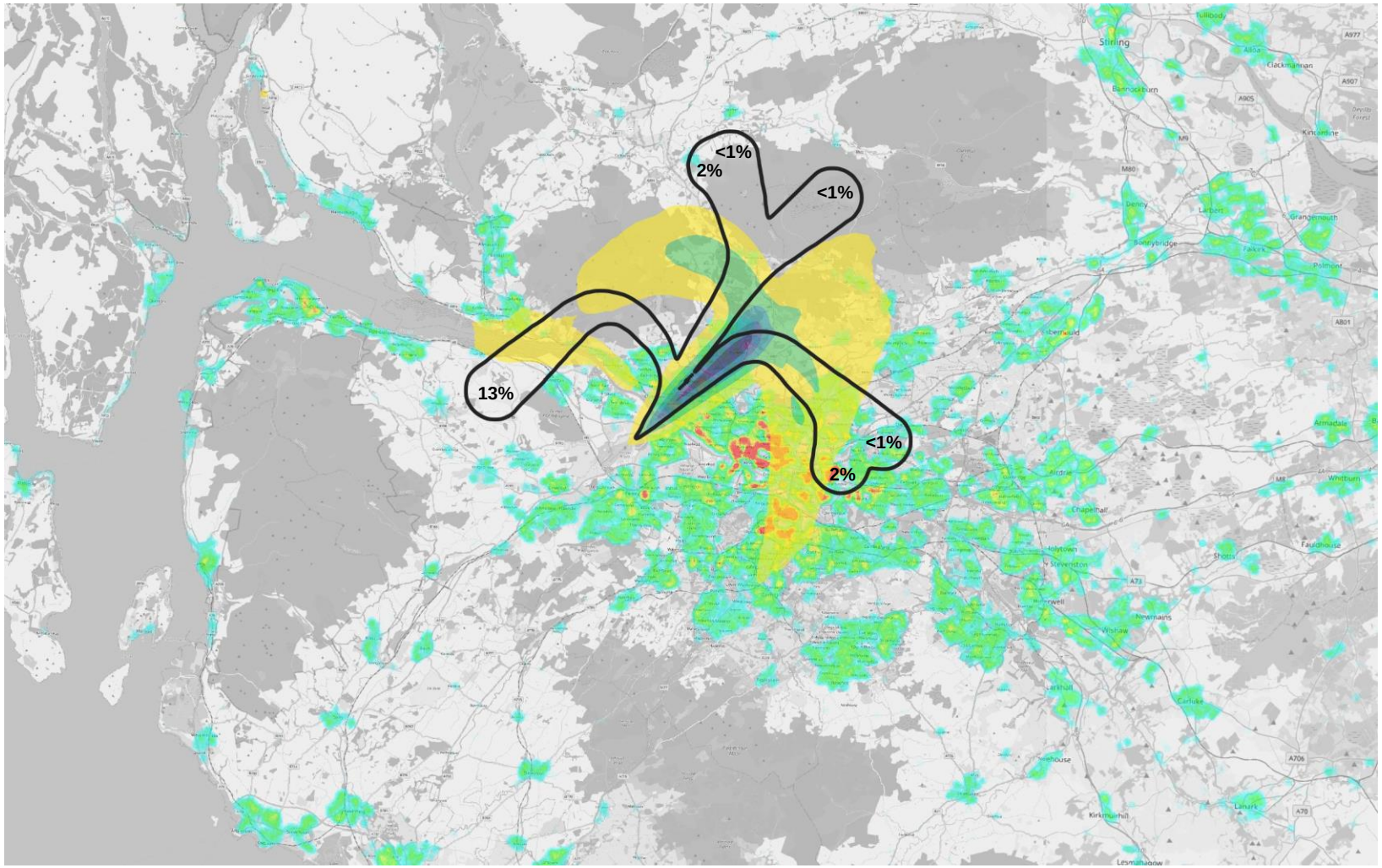
Offset left departures with turns at 1nm and 6nm from the runway.

Straight ahead departures with turns at 4nm from the runway.

NORBO is offset left with turn at 1nm

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option B



Option Overflight Contours (Black outline) with estimated % of overall departures

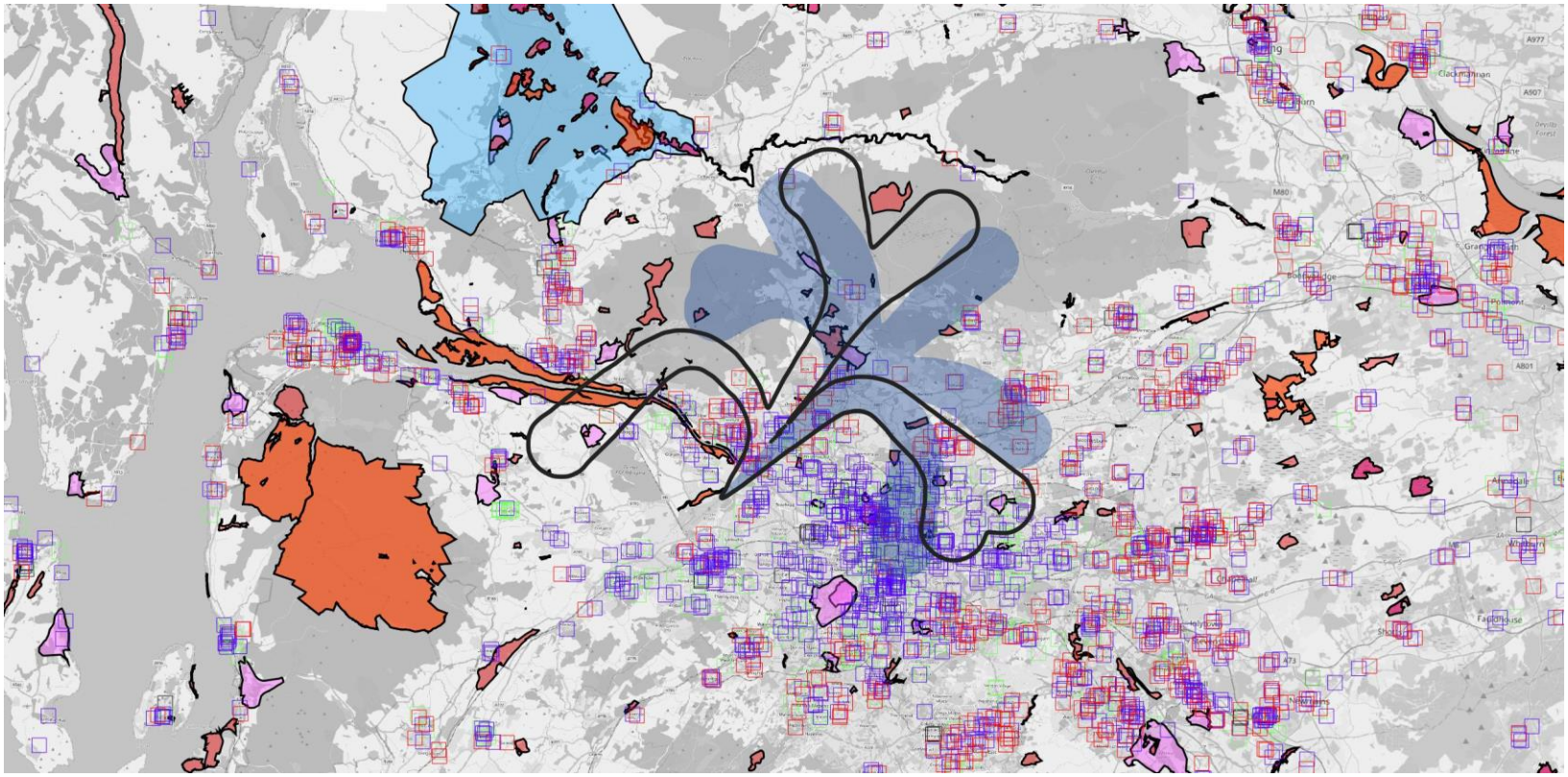
2019 baseline average summer day overflight swathe:

1

20

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option B



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

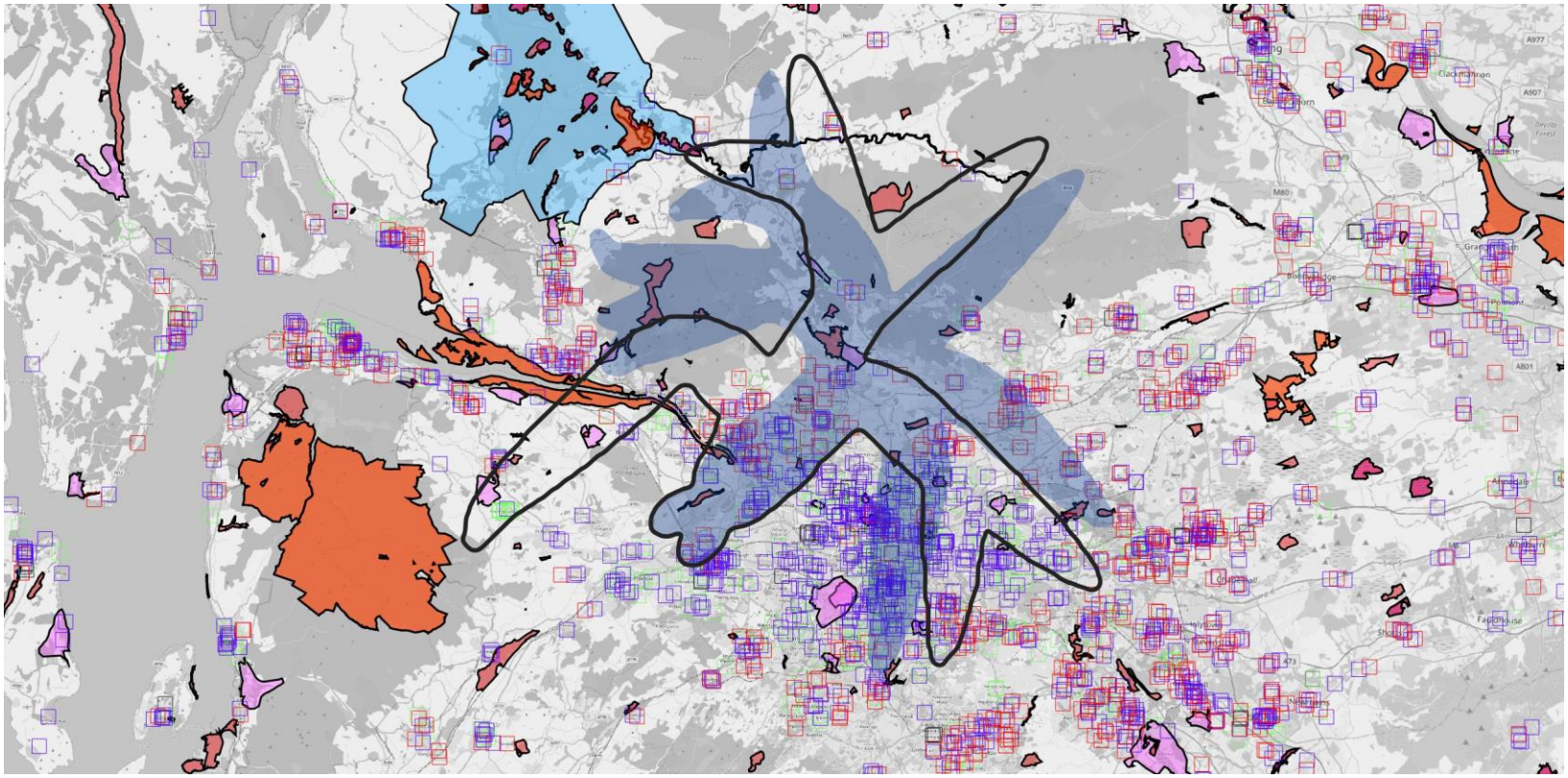
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option B	174.94	169398	0	0	4	1.42	0	0	16	5.93	4	3.25	0	0	3	1.01	32	6	29	94

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option B



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

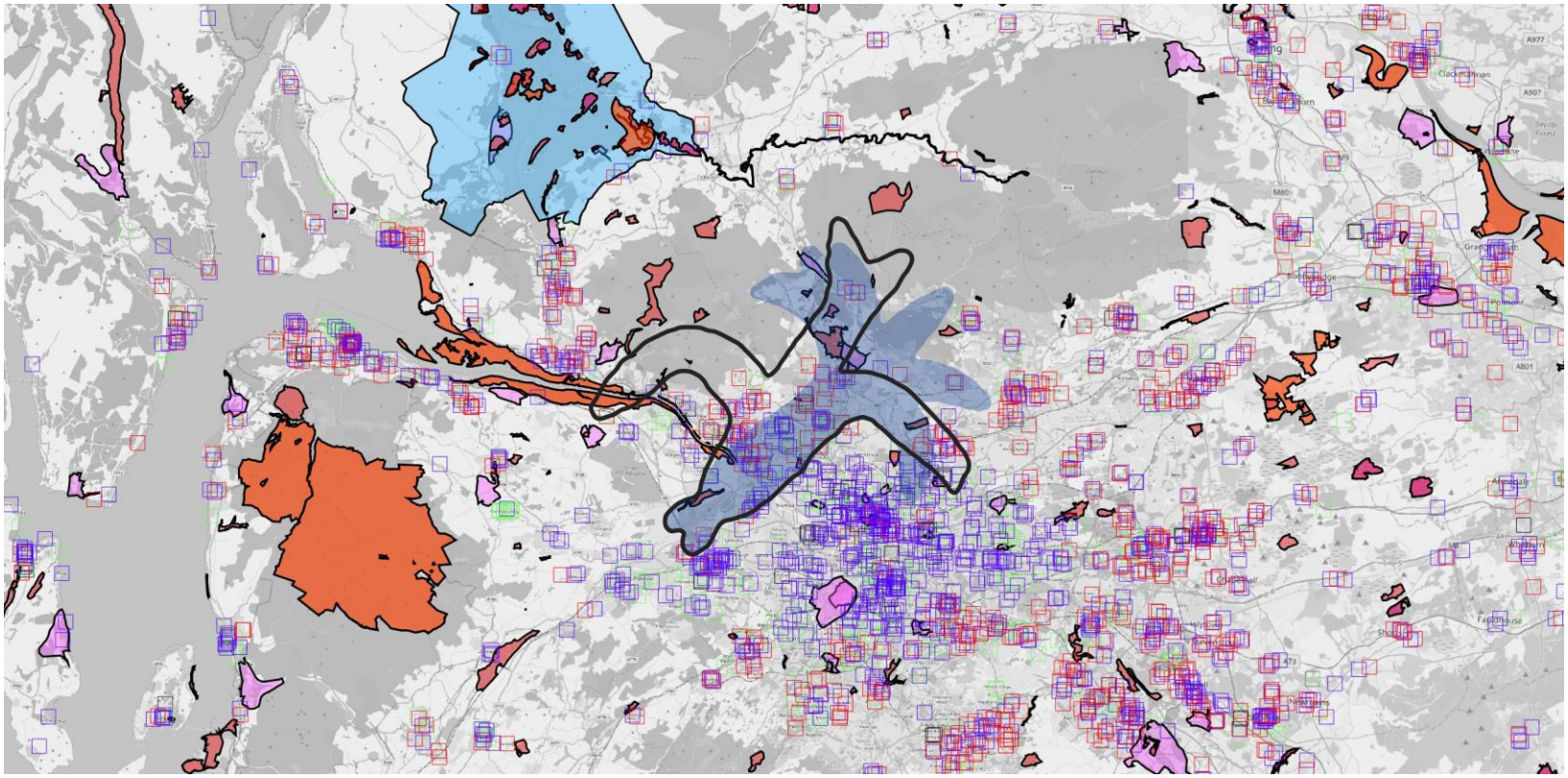
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	60dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Option B	349.85	369502	1	0.27	6	4.8	1	0.95	28	9.77	9	5.08	1	4.08	7	1.24	64	8	69	199

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option B



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

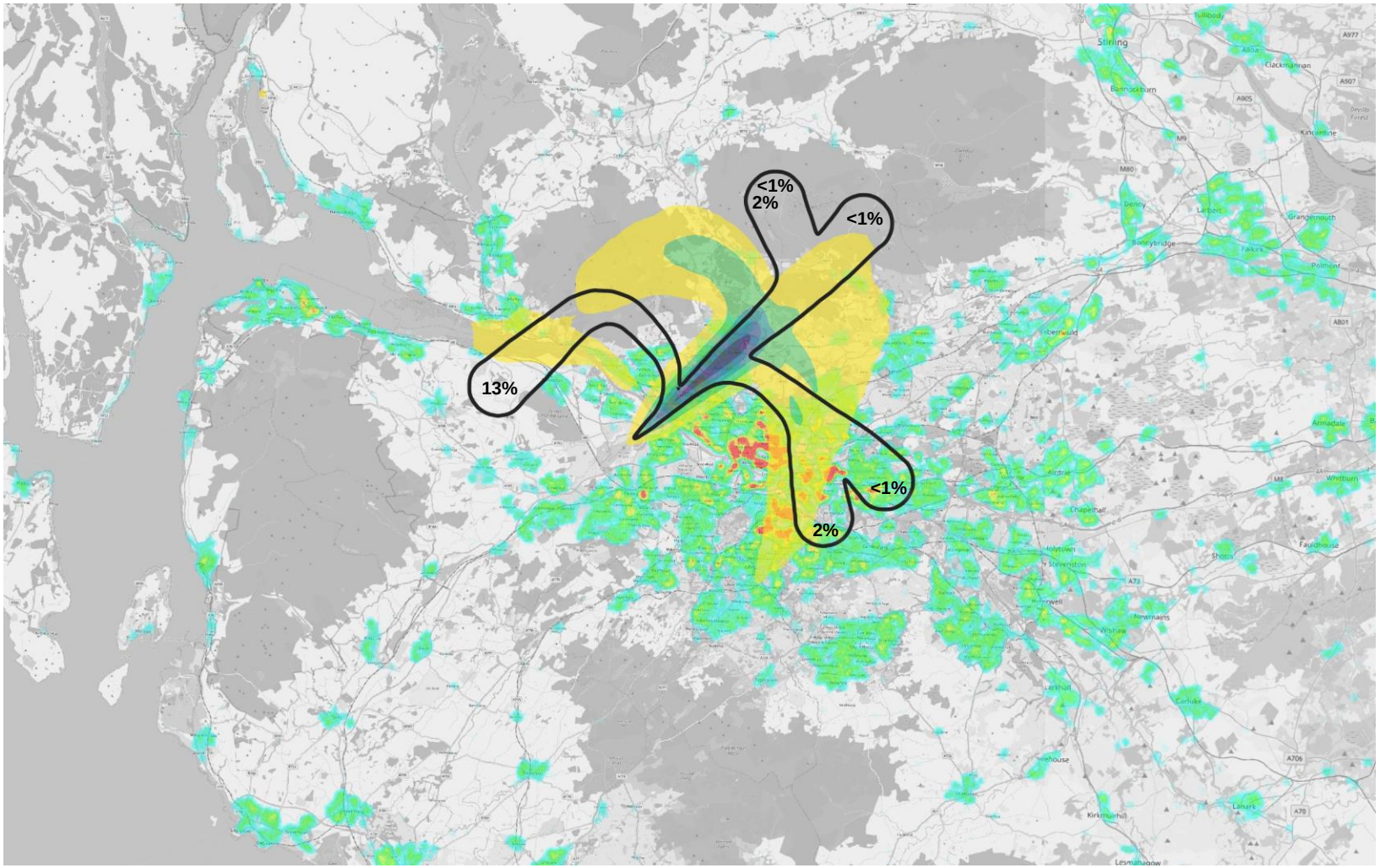
65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Option B	125.22	141512	0	0	2	0.42	0	0	17	5.17	7	2.56	0	0	2	0.15	39	2	20	80

Runway 05 Departure Option C

Straight ahead departures only (no offsets) with turns at 1nm, 3nm and 6nm from the runway.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option C



Option Overflight Contours (Black outline) with estimated % of departures when on westerlies

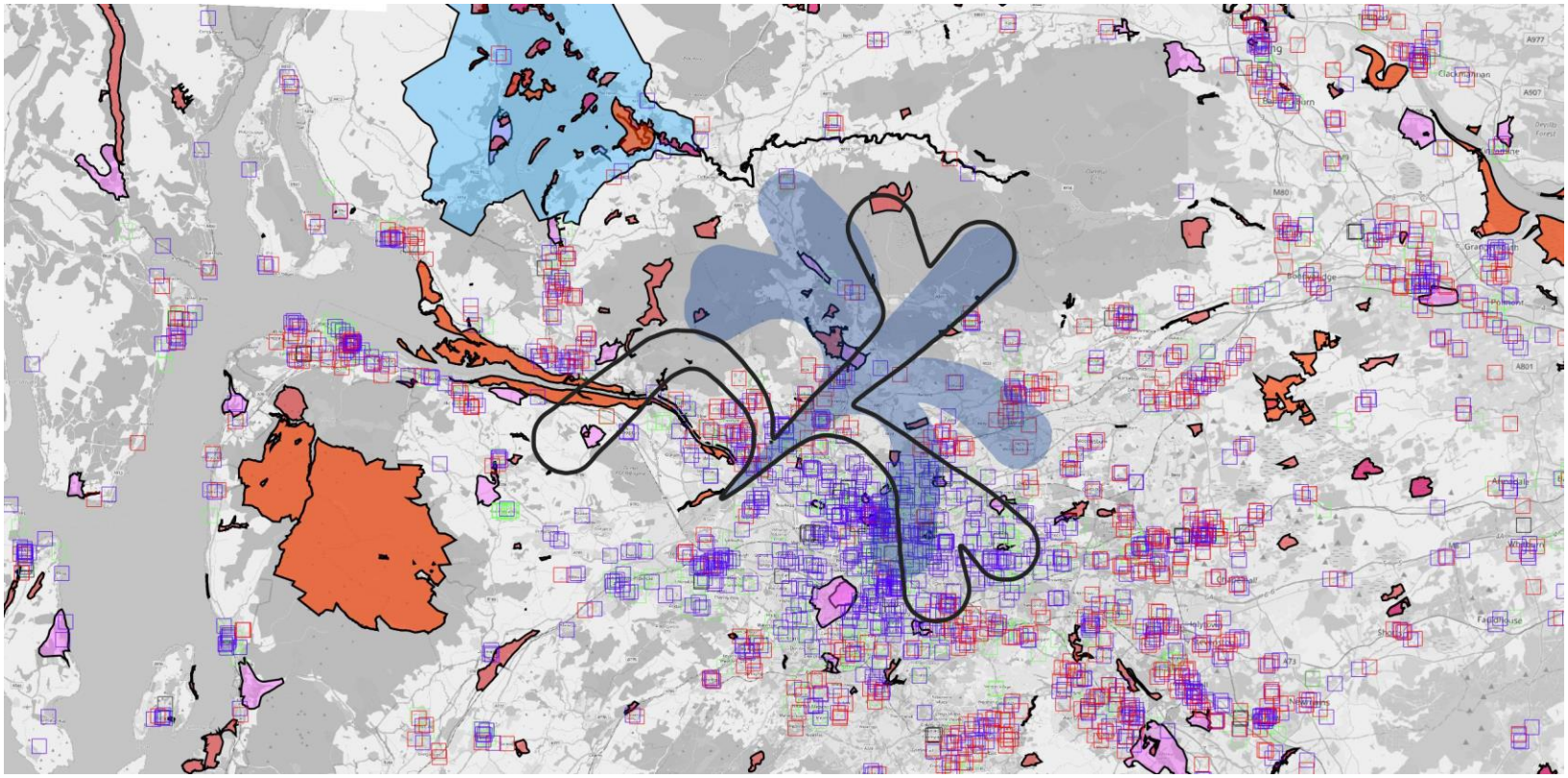
2019 baseline average summer day overflight swathe:

1

20

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option C



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

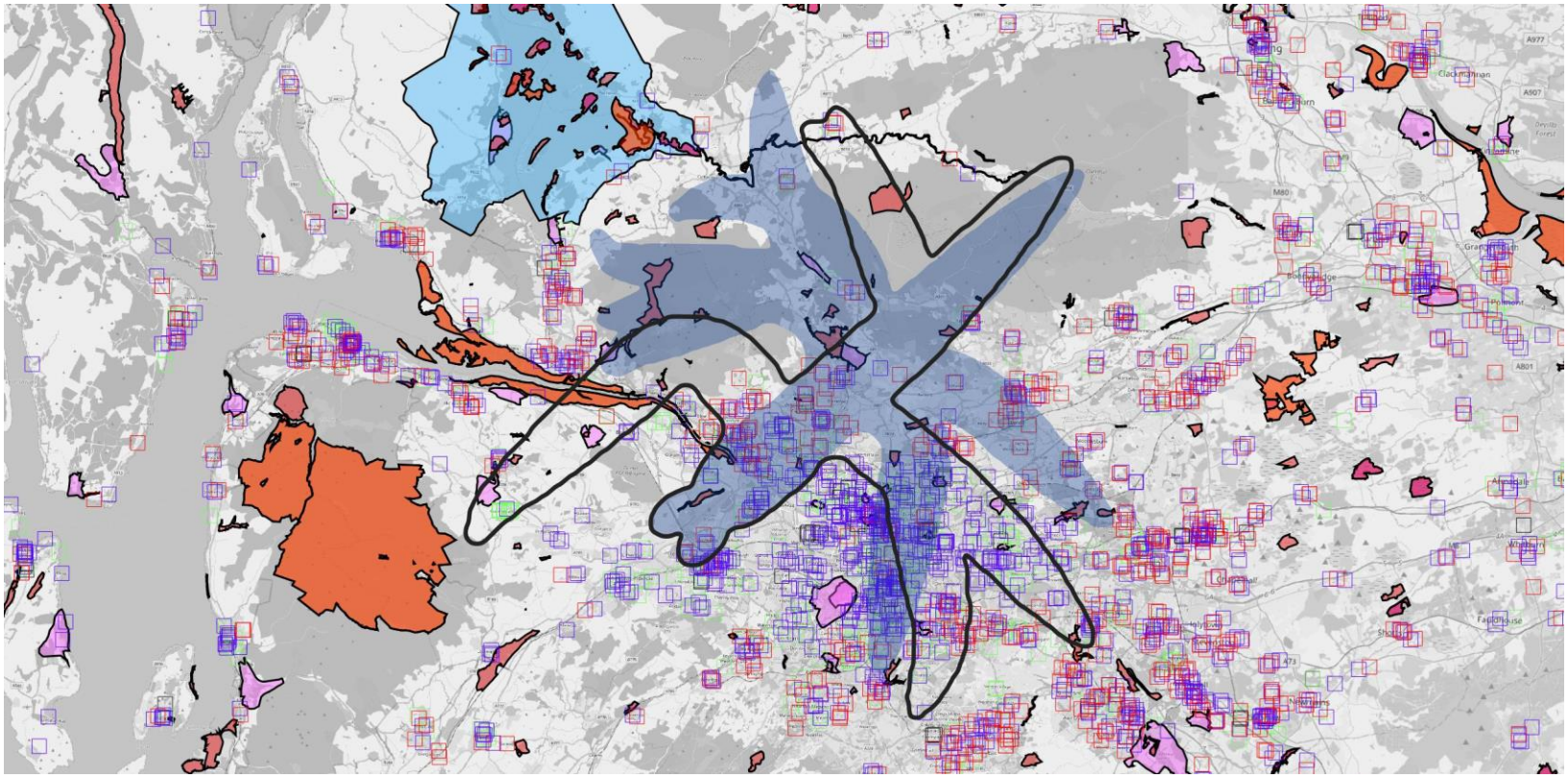
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option C	172.34	251000	0	0	3	1.81	0	0	14	5.57	4	3.32	0	0	3	0.94	23	9	48	139

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option C



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

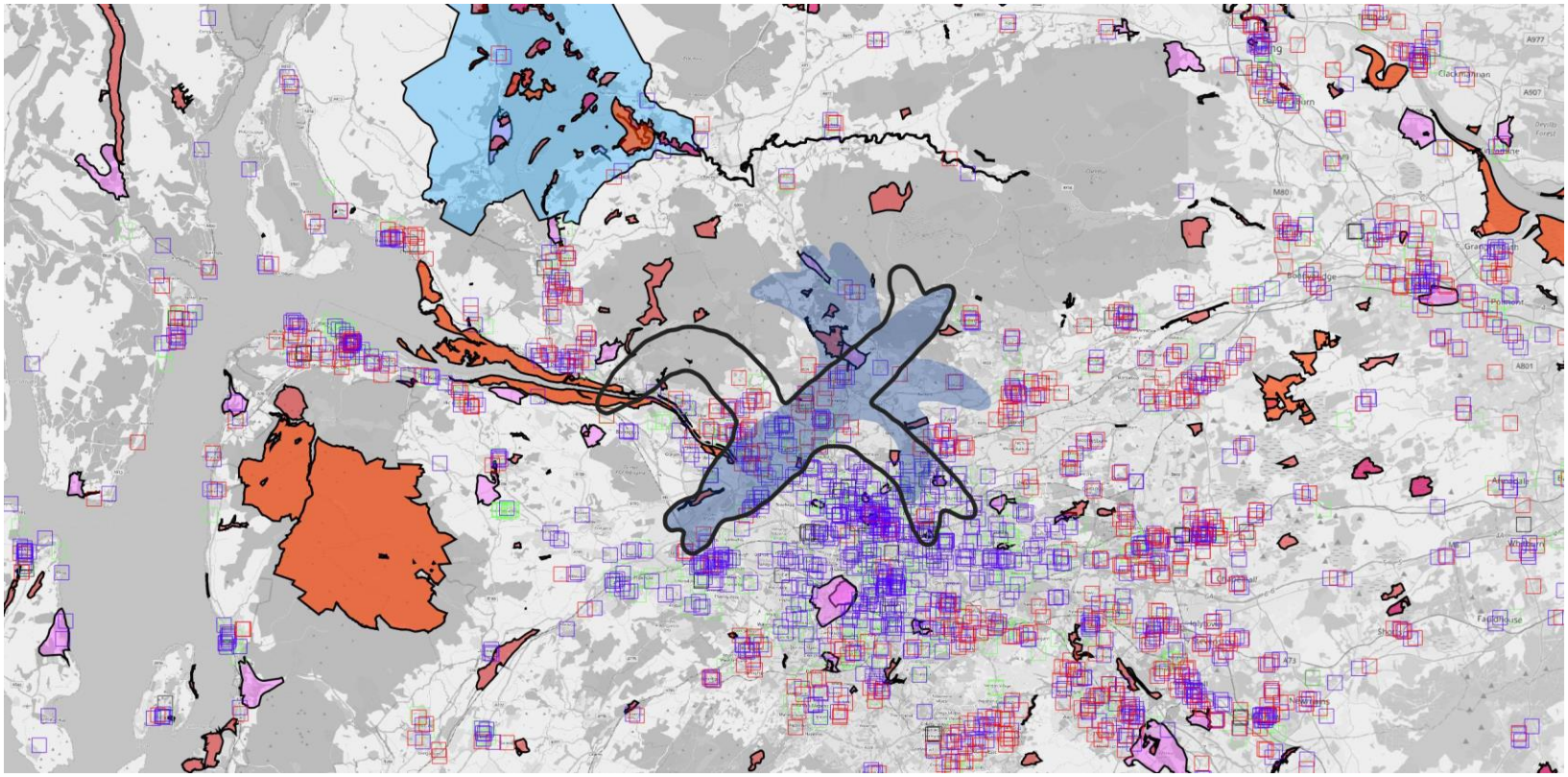
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Option C	339.28	453932	0	0	5	4.27	1	0.13	28	10.05	8	4.97	0	0	6	1.67	59	10	90	242

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option C



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

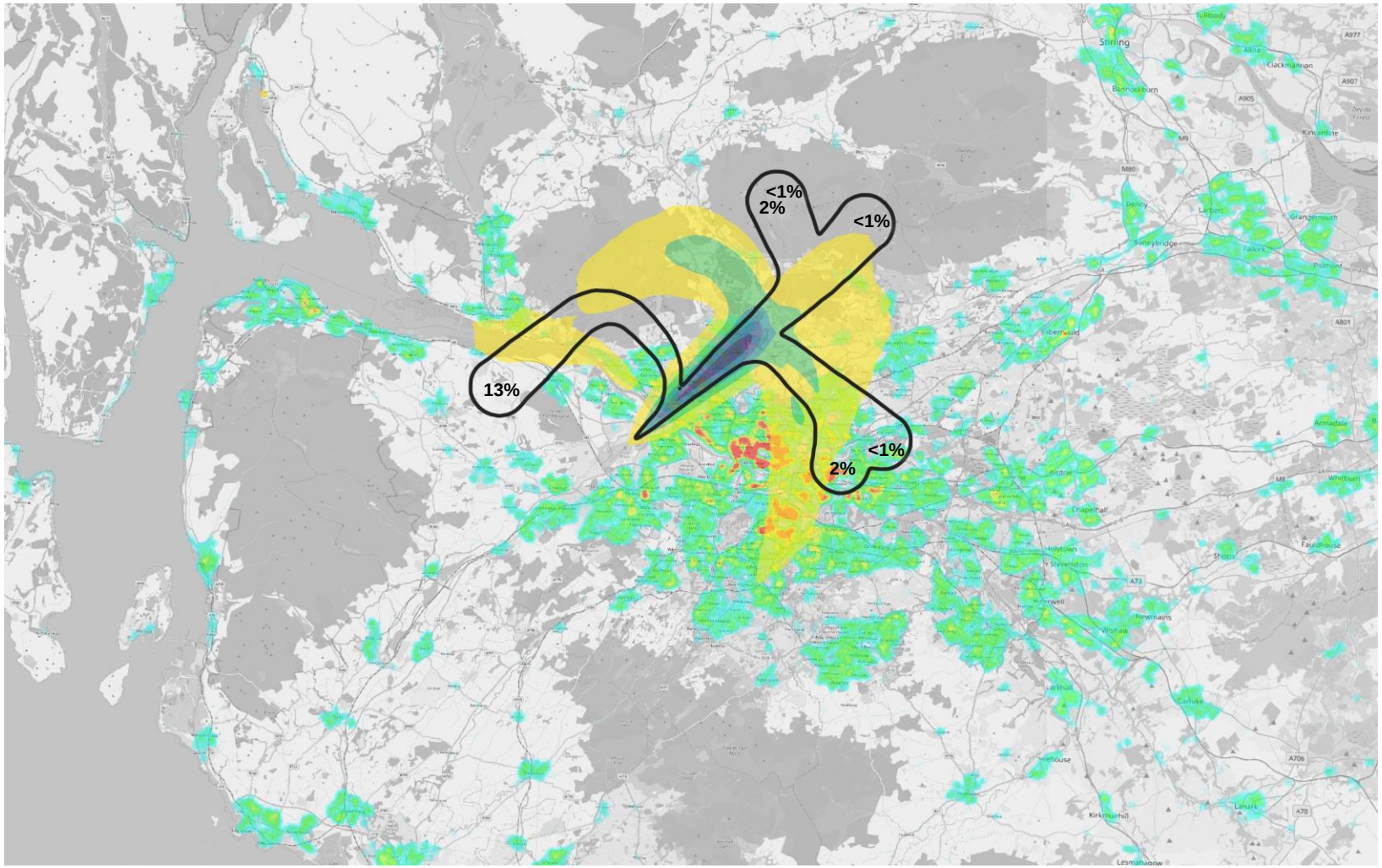
65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Option C	121.06	175911	0	0	2	1.07	0	0	14	2.59	7	2.14	0	0	2	0.46	33	7	30	101

Runway 05 Departure Option D

Straight ahead departures only (no offsets) with turns at 1nm, 4nm and 6nm from the runway

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option D



Option Overflight Contours (Black outline) with estimated % of overall departures

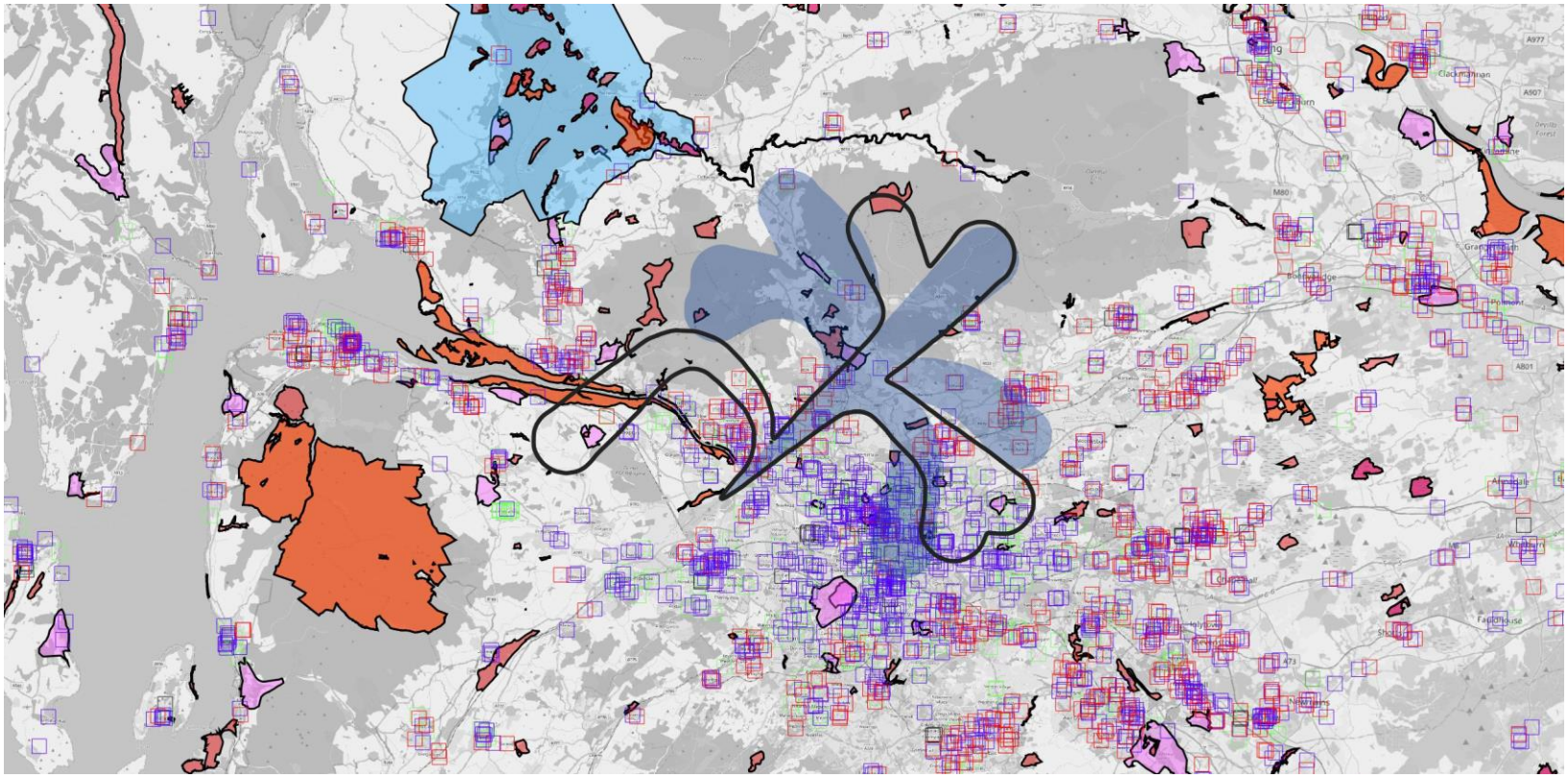
2019 baseline average summer day overflight swathe:

1

20

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option D



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

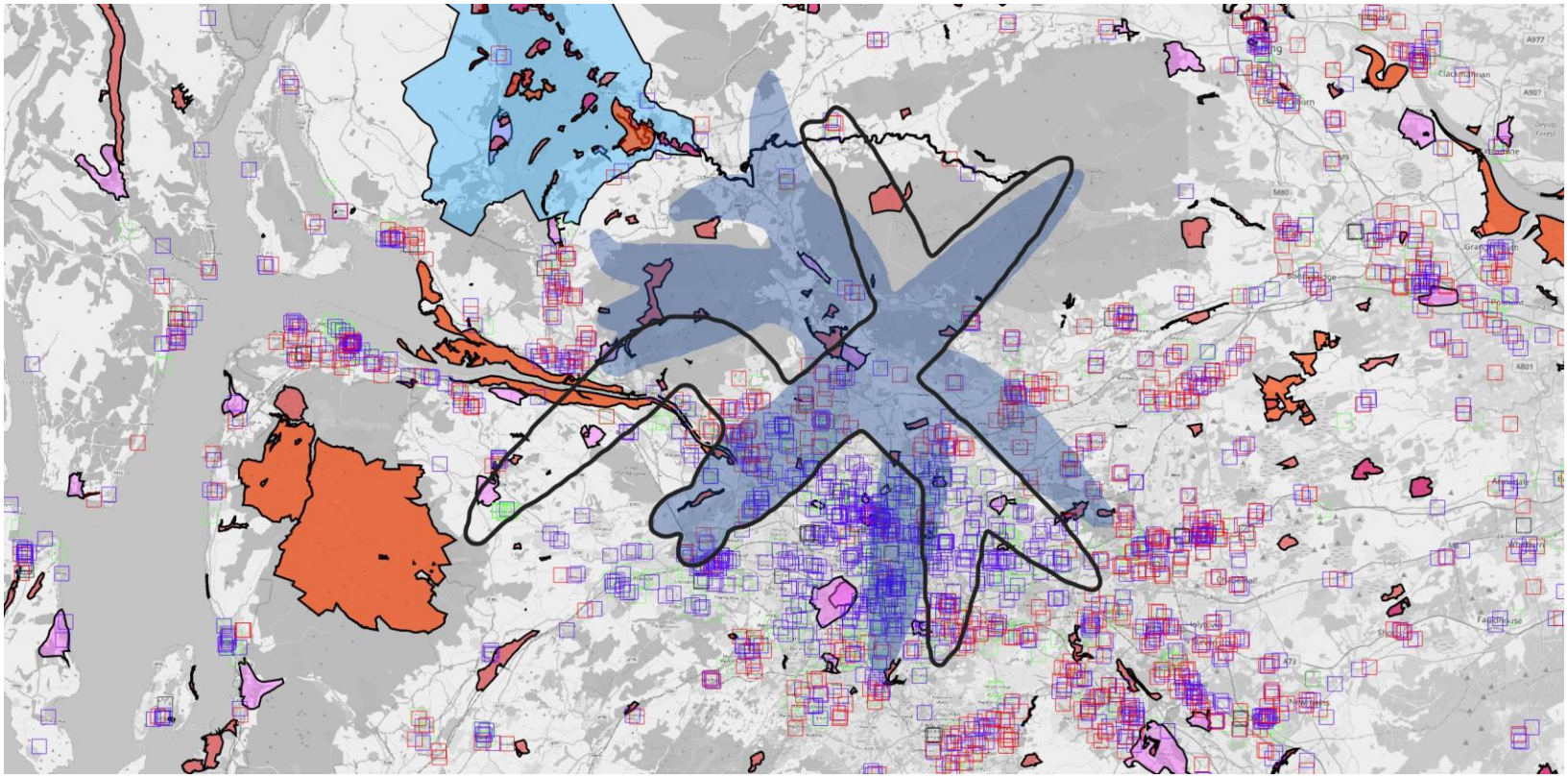
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option D	158.16	158513	0	0	3	1.81	0	0	14	5.66	4	3.32	0	0	3	1.01	26	6	27	89

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option D



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

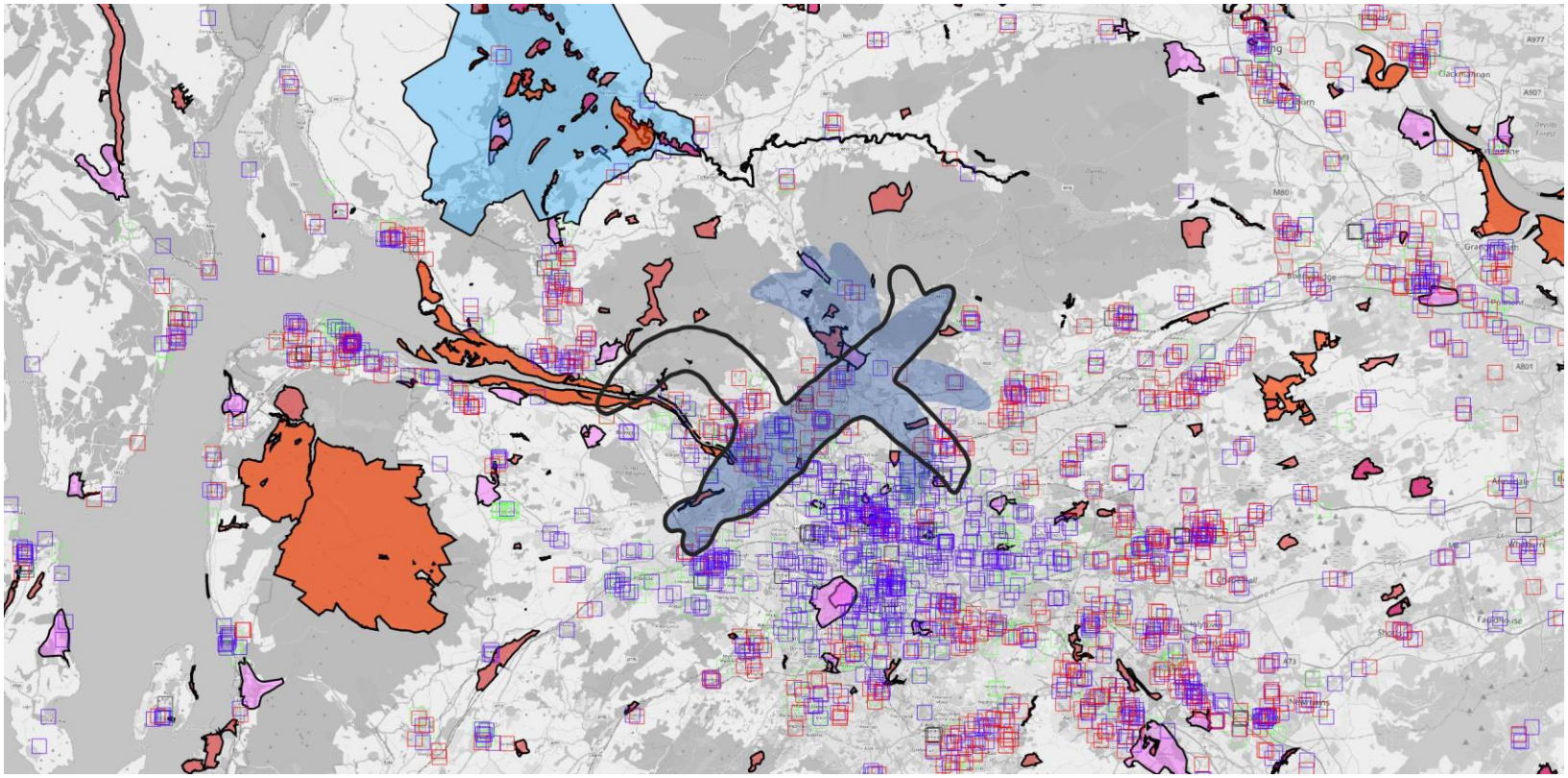
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	60dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Baseline (Centreline)	339.28	453932	0	0	5	4.27	1	0.13	28	10.05	8	4.97	0	0	6	1.67	59	10	90	242
RWY05 Option D	320.66	364573	0	0	5	4.27	1	0.13	27	9.86	8	4.97	0	0	7	1.24	62	8	70	195

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option D



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

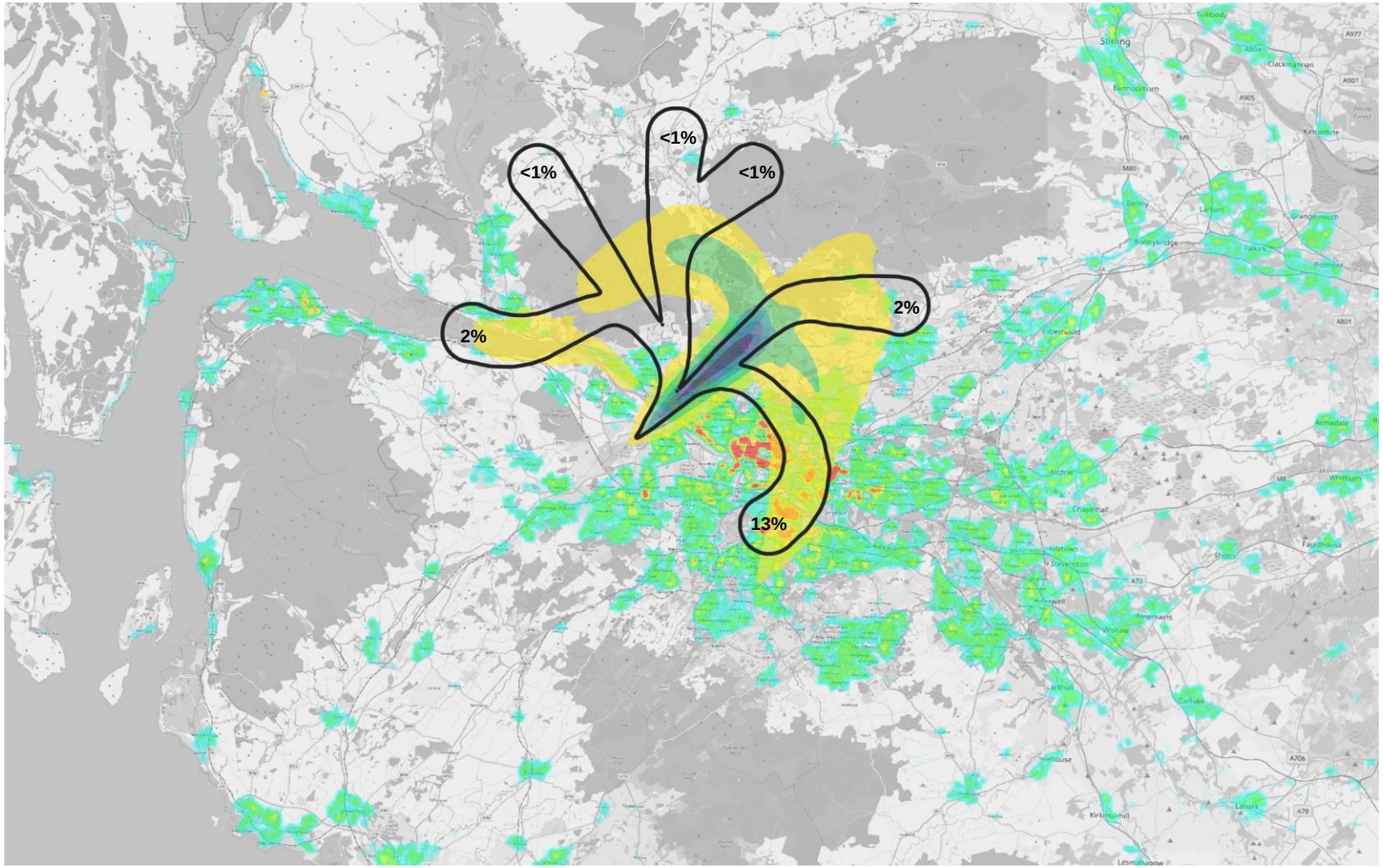
	65dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Baseline (Centreline)	121.06	175911	0	0	2	1.07	0	0	14	2.59	7	2.14	0	0	2	0.46	33	7	30	101
RWY05 Option D	111.91	133584	0	0	1	0.96	0	0	14	2.68	7	2.14	0	0	2	0.15	35	2	20	79

Runway 05 Departure Option E

Offset left departures with turns at 1nm from the runway.
Straight ahead departures with turns at 2nm and 6.5nm from the runway.
NORBO is straight ahead to 2nm with a right turn.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option E

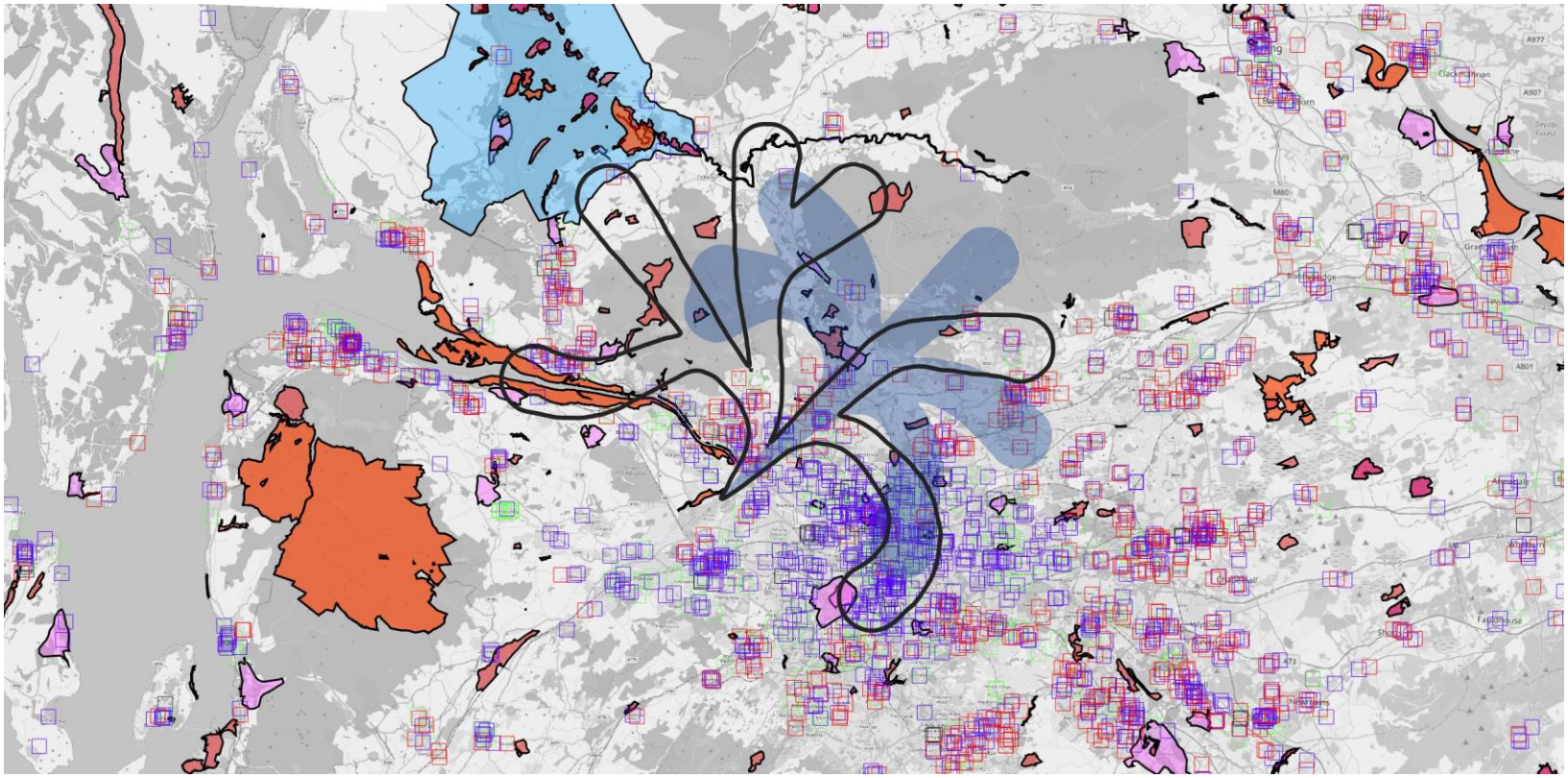


Option Overflight Contours (Black outline) with estimated % of departures when on easterlies

2019 baseline average summer day overflight swathe:

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option E



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

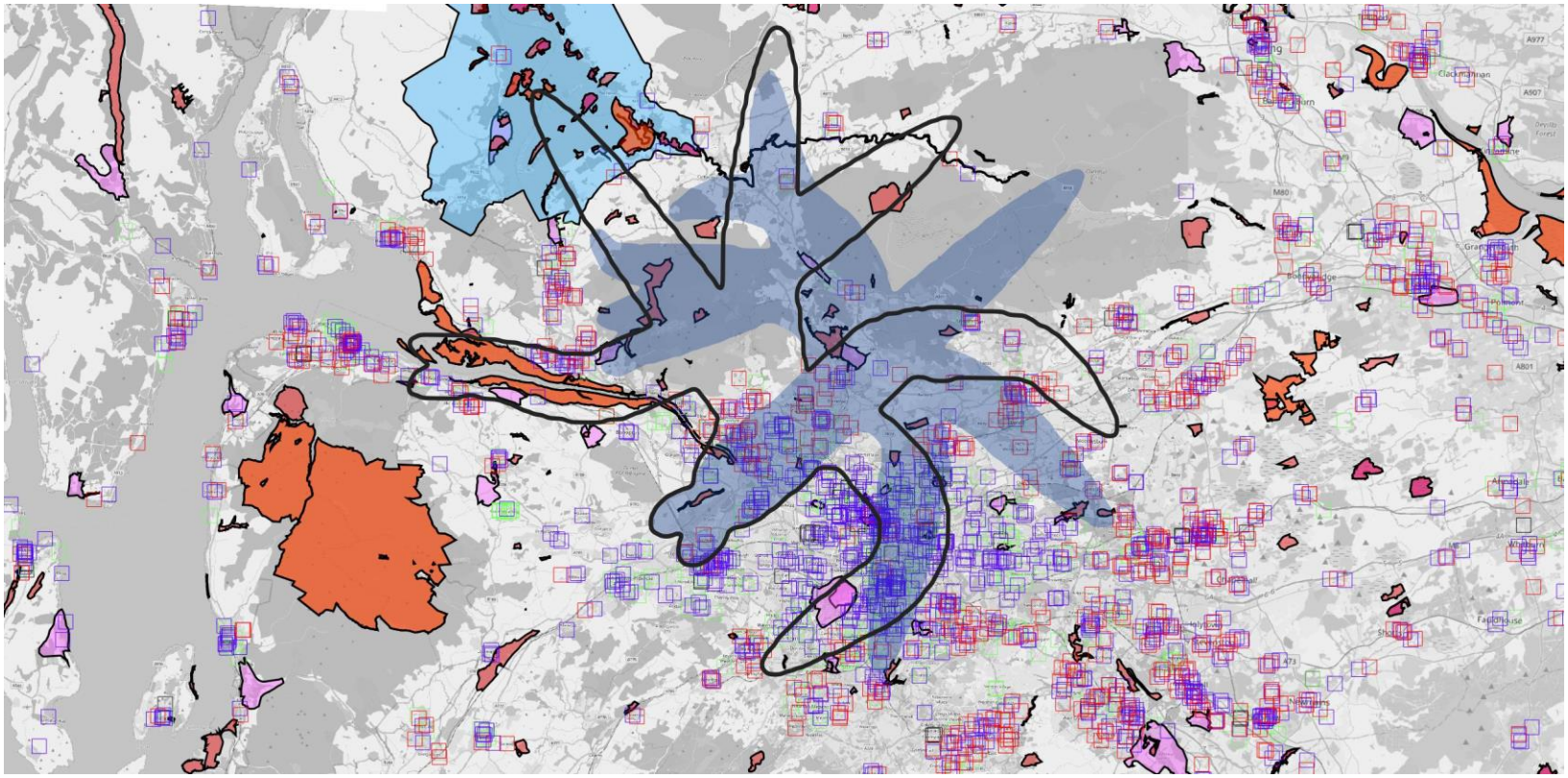
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option E	232.04	249498	1	2.91	6	3.18	1	0.46	22	12.6	9	7.73	1	14.3	2	1.27	32	8	48	157

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option E



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

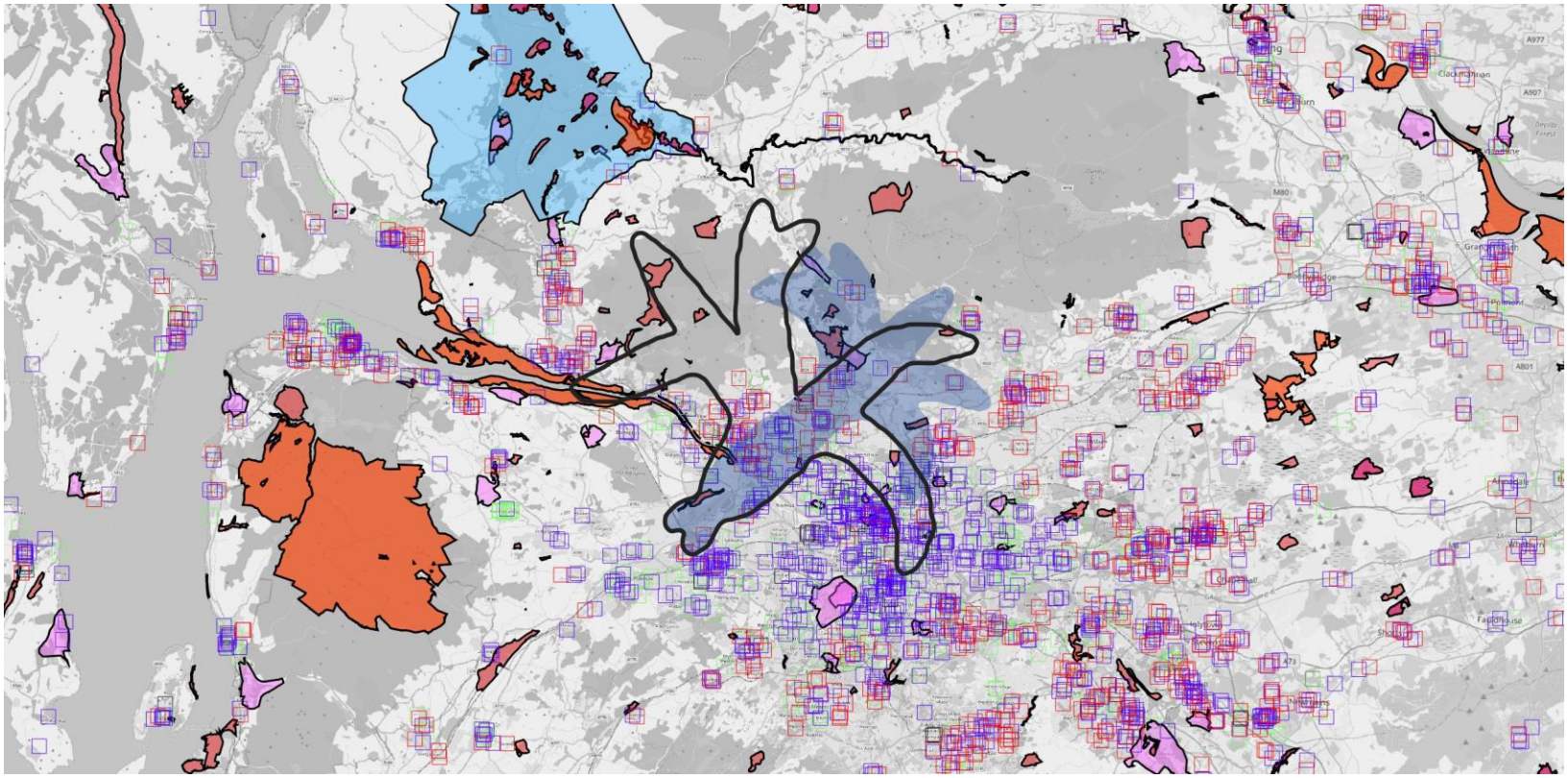
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Option E	427.82	468436	1	16.58	10	8.02	3	0.71	44	23.28	20	15.29	1	28.47	4	2.07	64	10	76	277

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option E



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Option E	162.05	195679	0	0	3	1.03	0	0	15	5.63	6	2.98	0	0	2	0.33	32	4	30	106

Runway 05 Departure Option F (Split Left and Right)

This option shares NORBO traffic between a left and right turn with only one of those routes in use at a time. The rest of the routes remain in the same configuration.

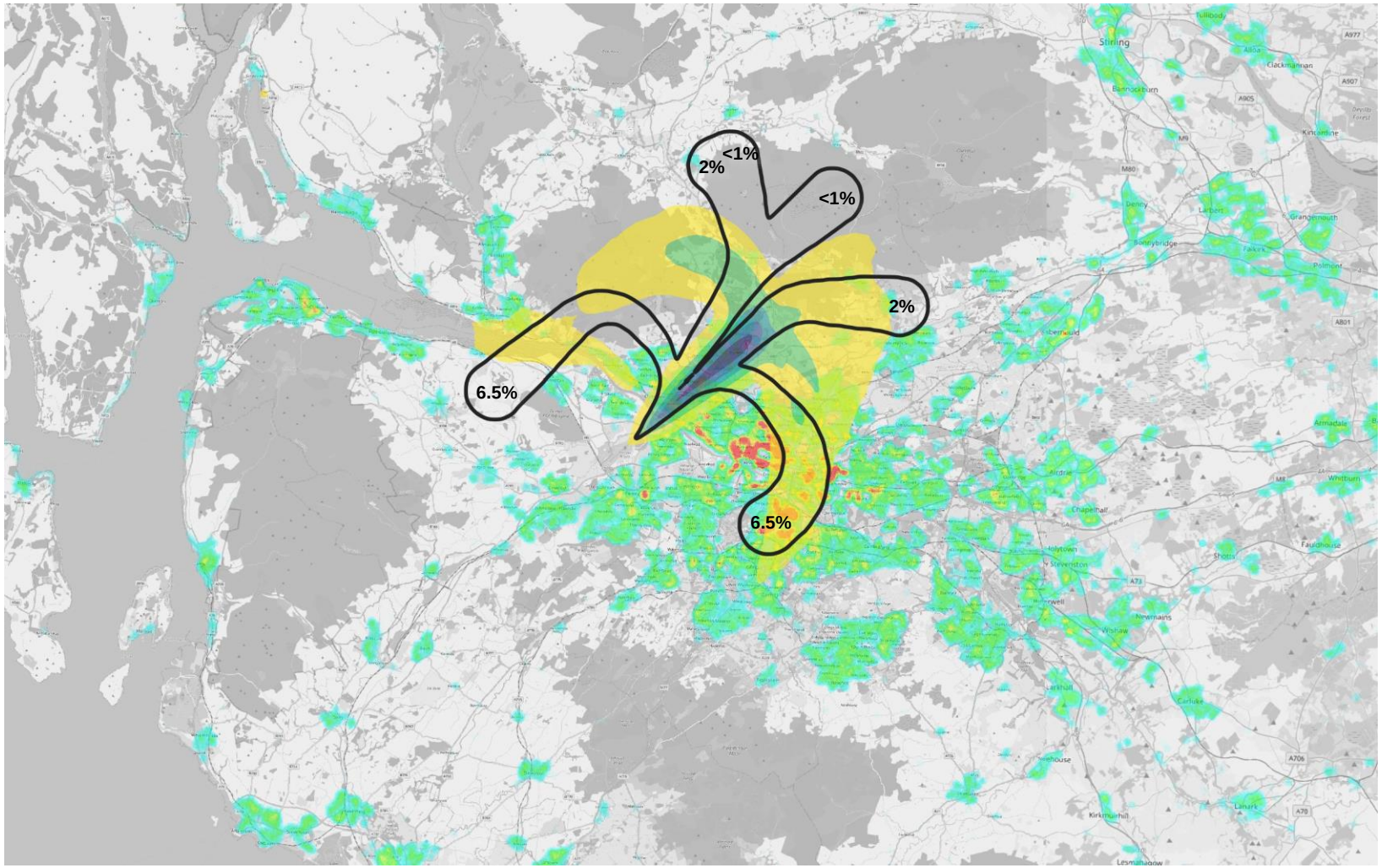
When turning left, the NORBO would offset left then turn further left at 1nm

When turning right, the NORBO would go straight ahead to 2nm then a right turn

Assumes the NORBO route switches at a point each day/night to enable a 50/50 route utilisation.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option F



Option Overflight Contours (Black outline) with estimated % of overall departures

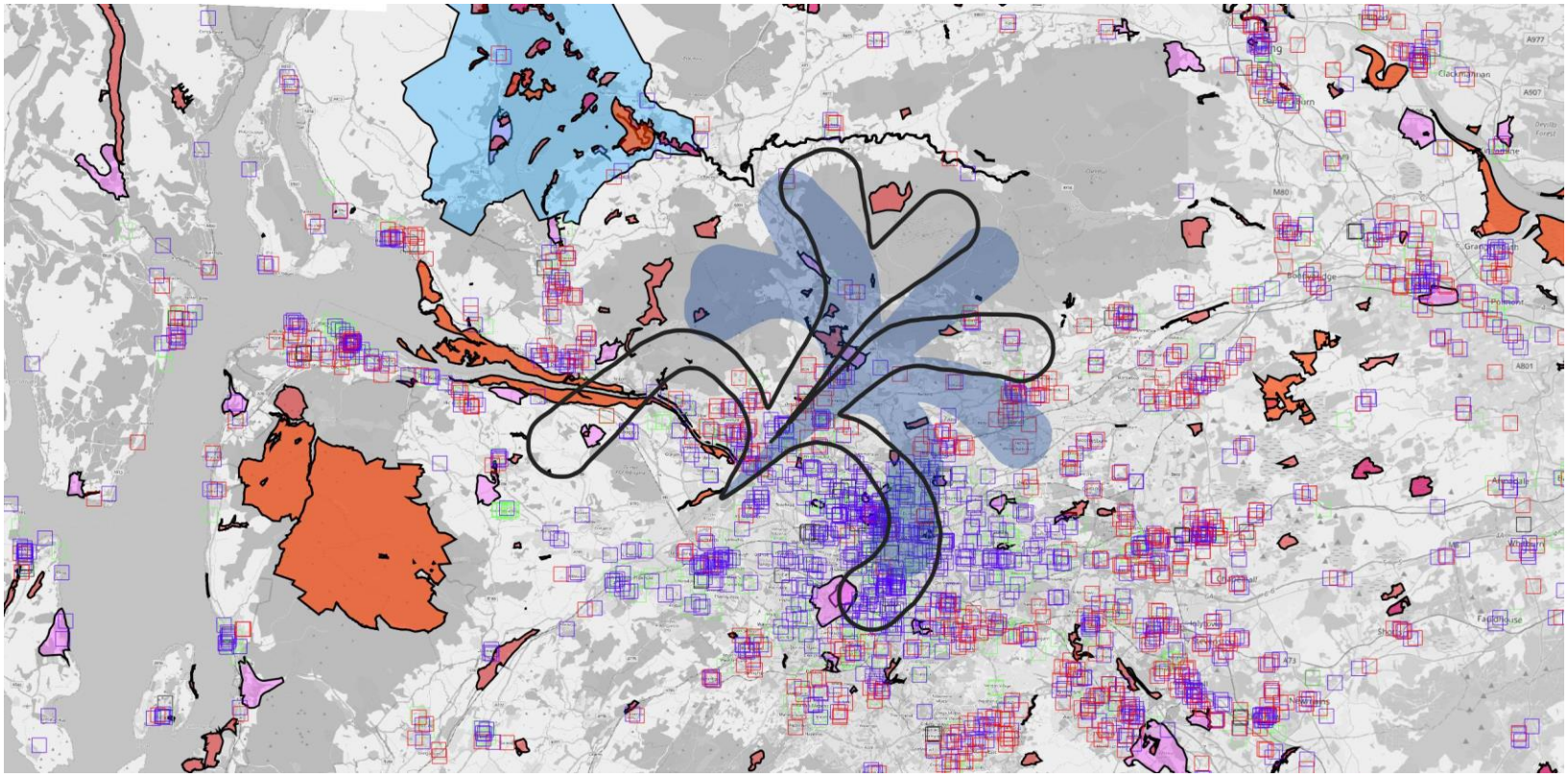
2019 baseline average summer day overflight swathe:

1

20

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option F



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

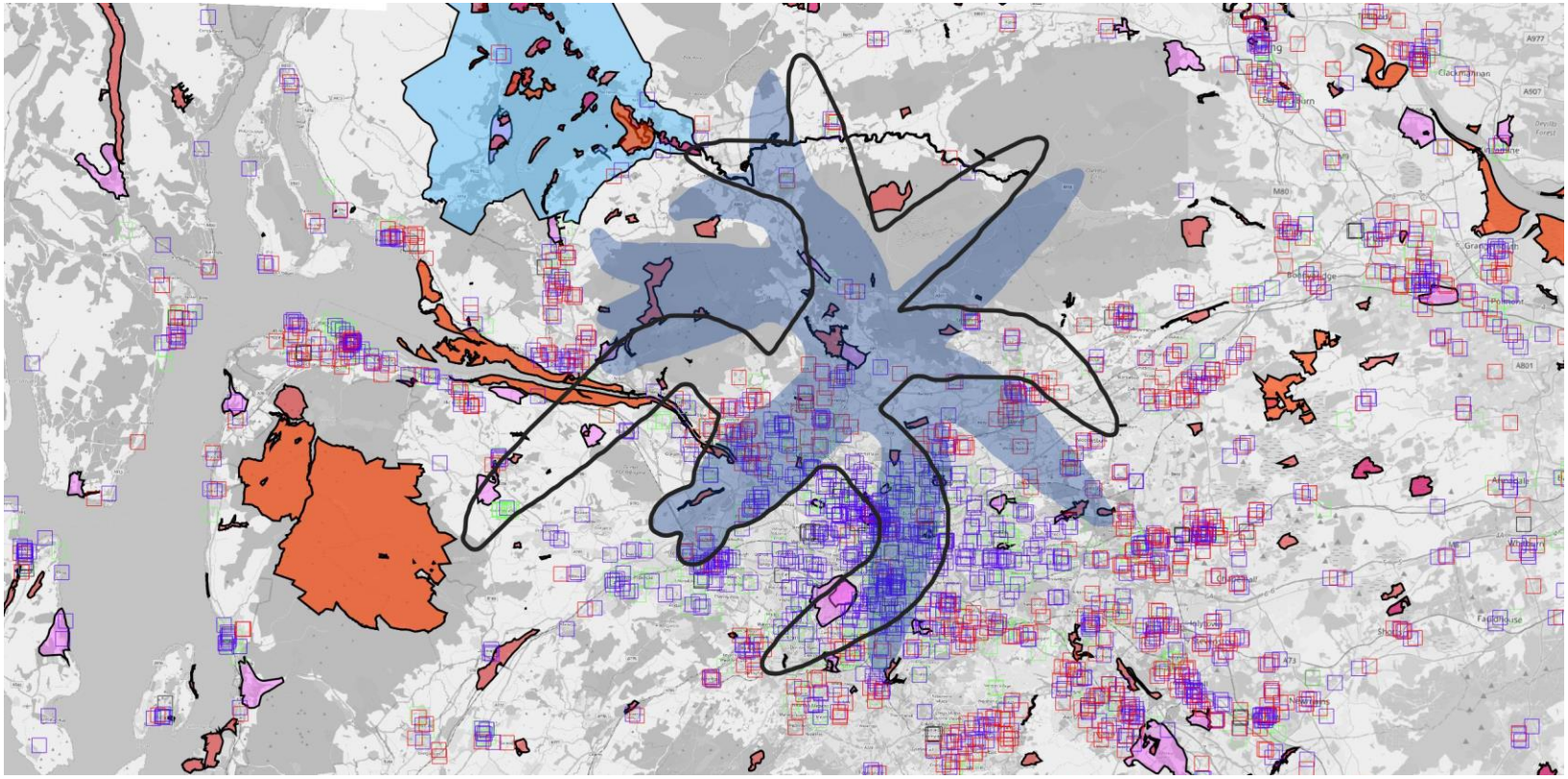
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option F	203.99	246626	0	0	5	3.25	0	0	17	6.16	4	3.25	0	0	2	1.27	31	8	50	152

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option F



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

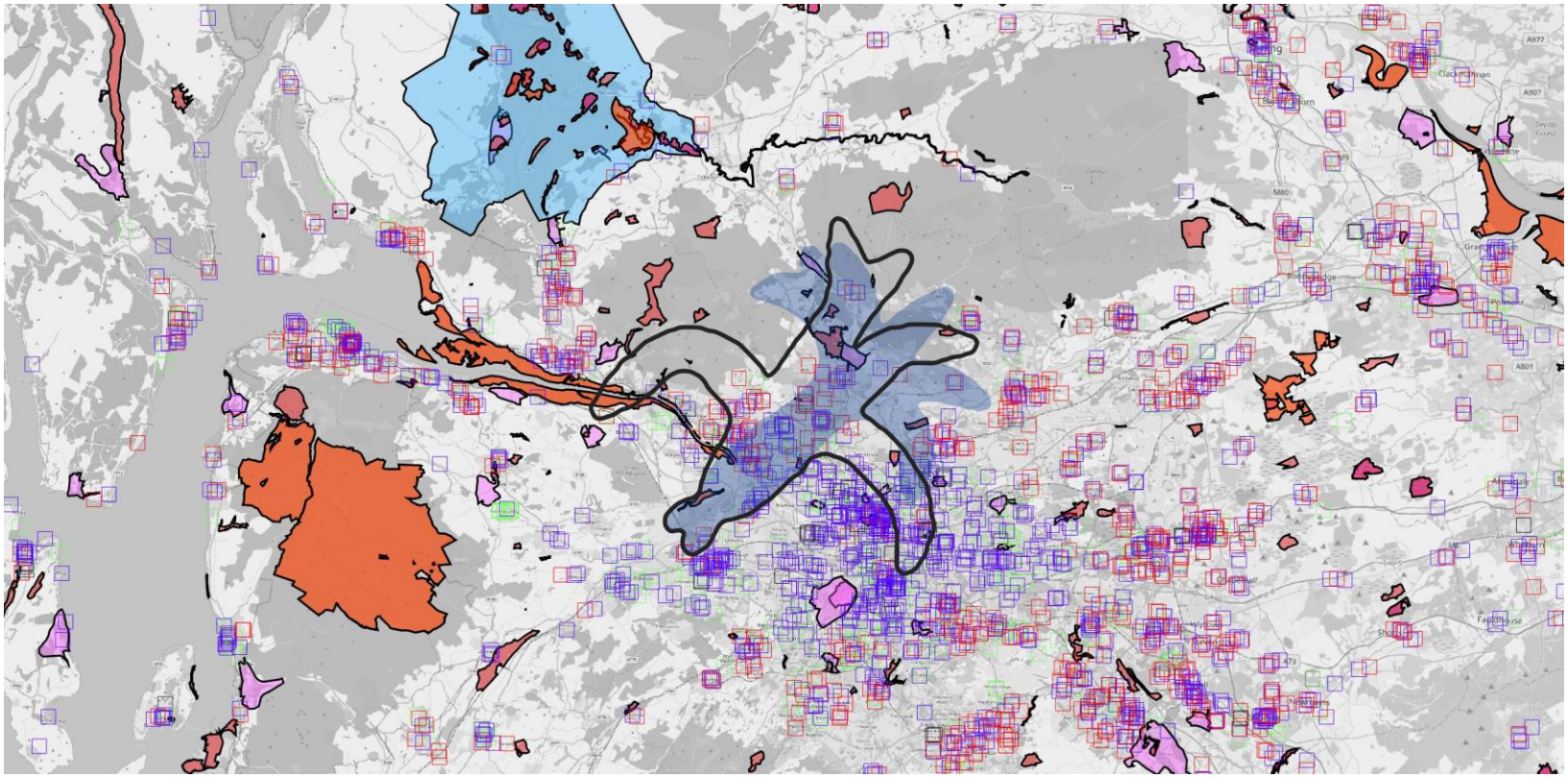
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Option F	386.14	453065	1	0.27	10	8.7	1	0.95	30	9.81	9	5.08	1	4.08	4	2.07	59	10	83	263

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option F



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Option F	147.12	200769	0	0	3	1.33	0	0	18	5.36	7	2.56	0	0	2	0.33	35	4	31	108

Runway 05 Departure Option G (Period 1 and Period 2)

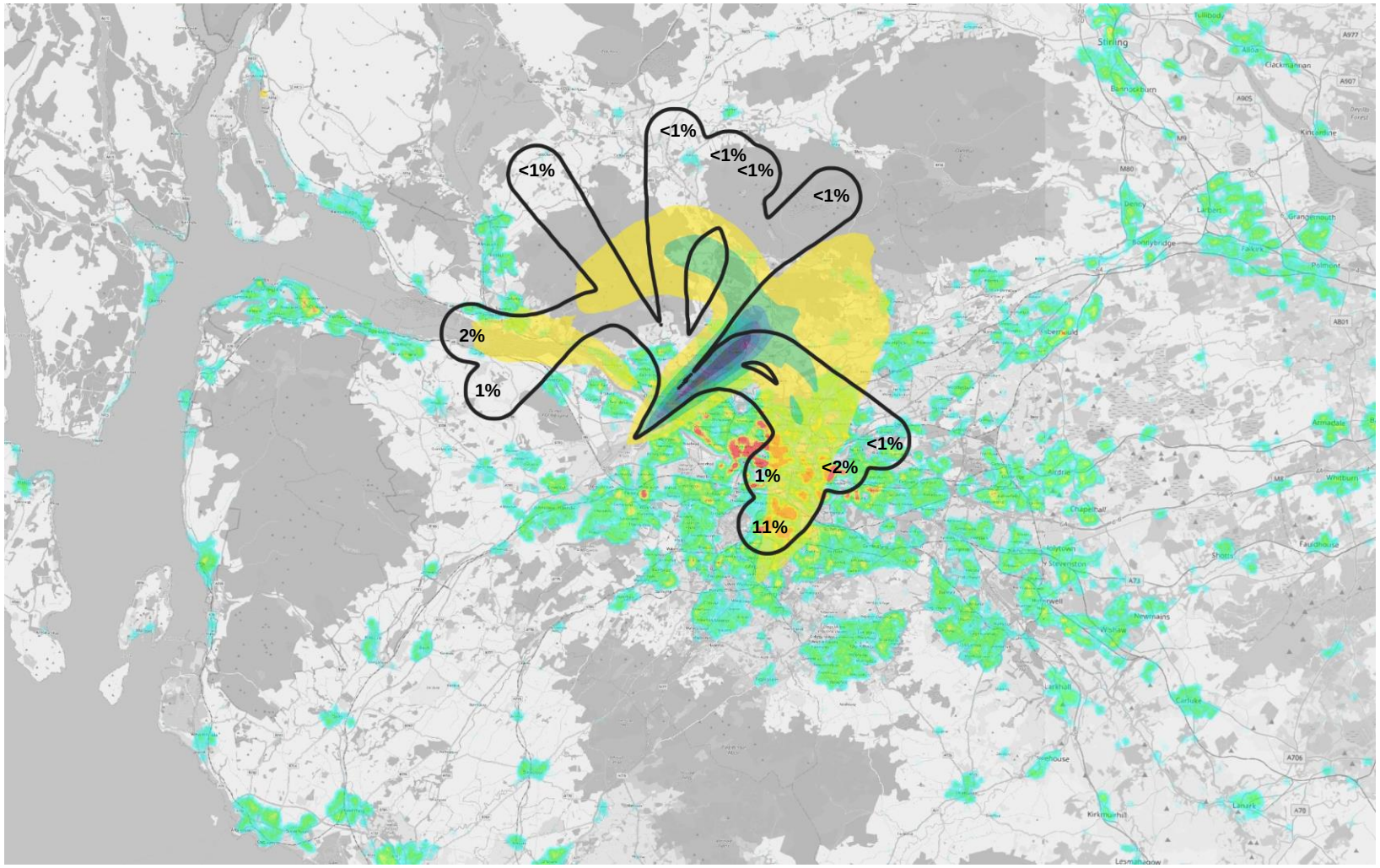
This option has two, quite different route configurations and assumes one configuration would be used for the peak departure period each morning. The configuration would then switch for the rest of the day.

In the morning, the NORBO traffic is shared between a left turn departure and a right turn departure with both routes available at the same time.

For the rest of the day, all the NORBO traffic would then use a single flight path turning right, but that path could be different to the one used for the morning.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option G



Option Overflight Contours (Black outline) with estimated % of overall departures (based on 4 peak hours)

2019 baseline average summer day overflight swathe:

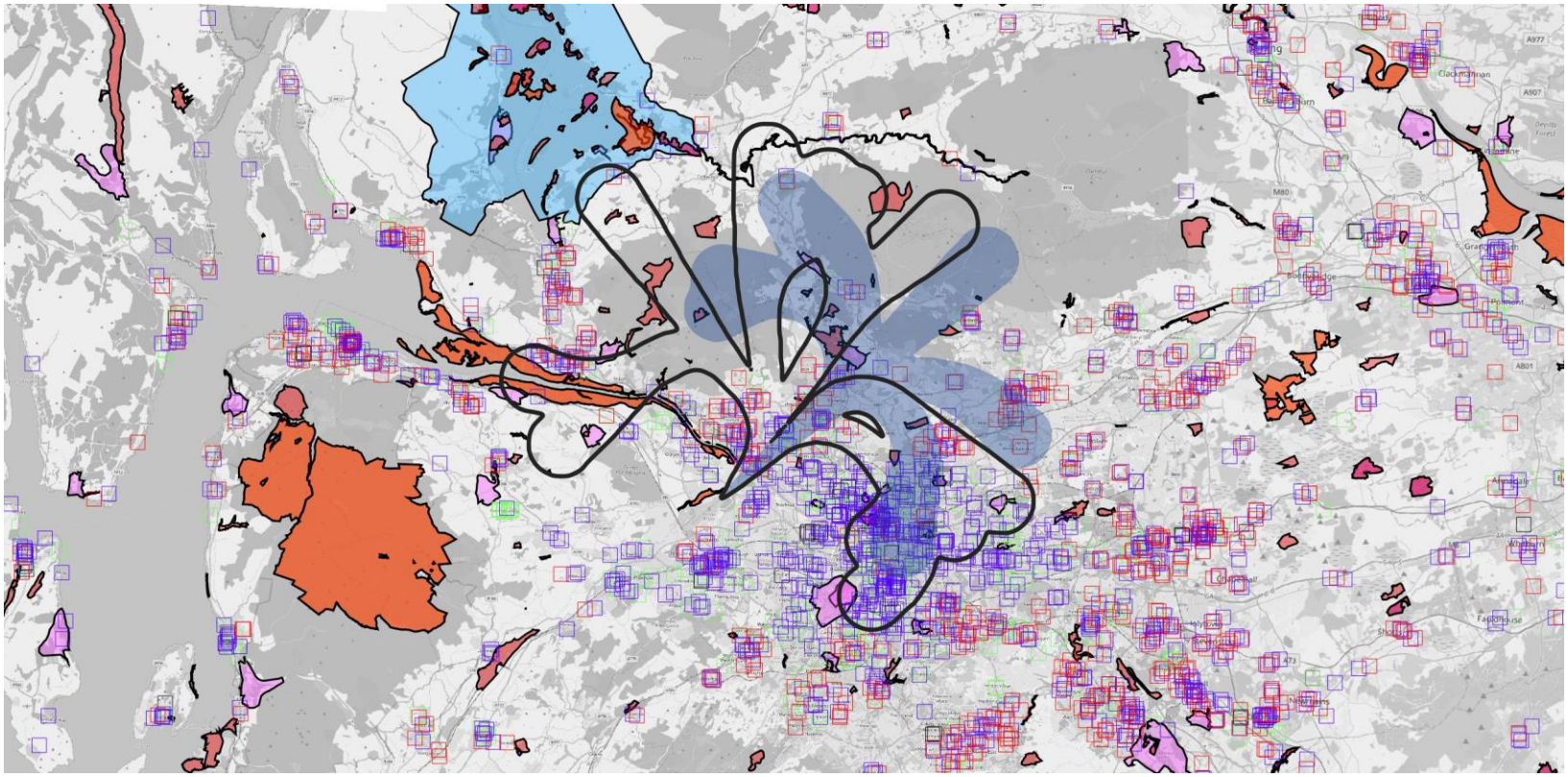
1

20

Based on 4hrs of peak usage per day

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option G



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

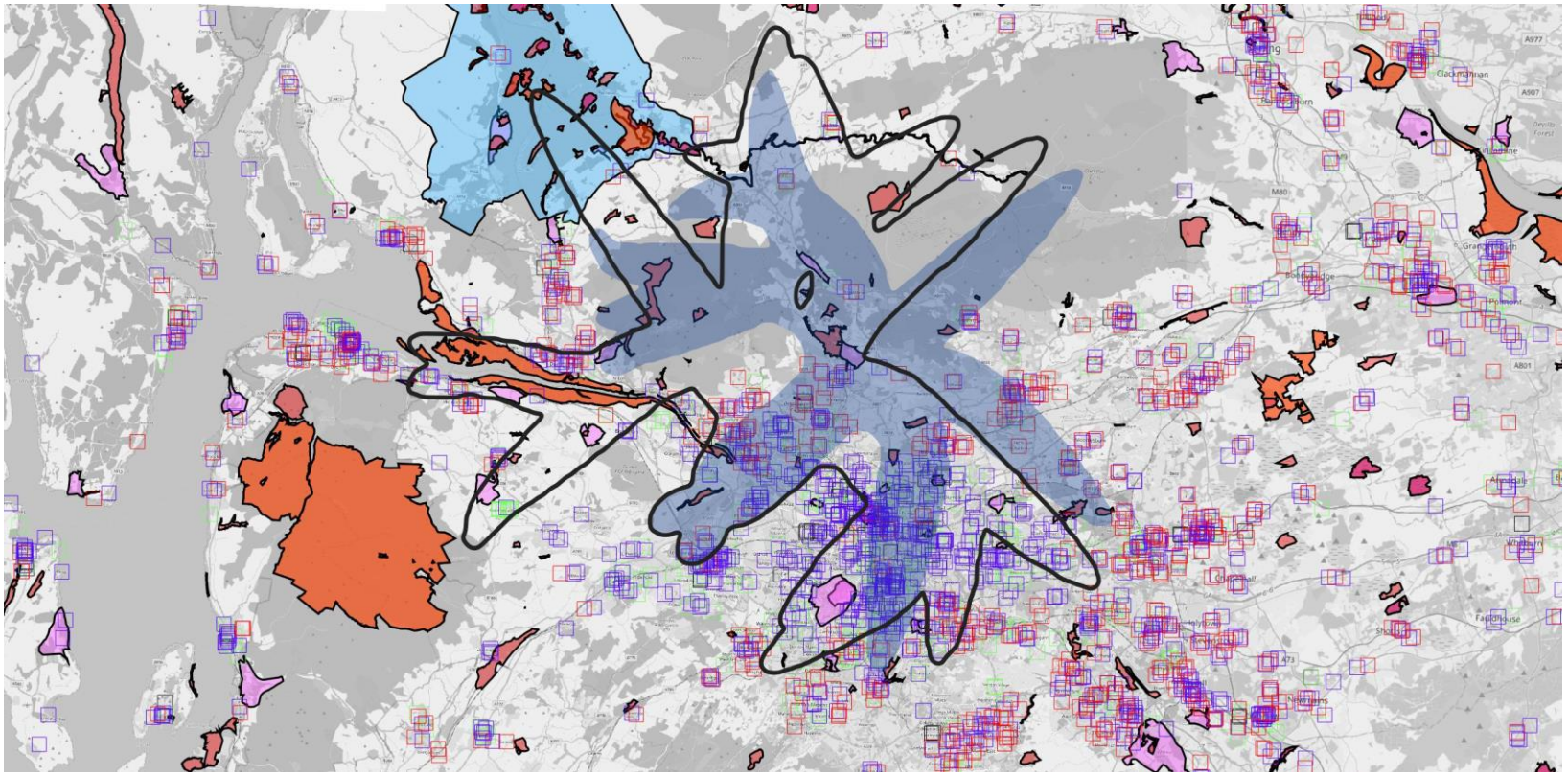
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option G	318.06	398460	1	2.91	7	4.28	1	0.46	28	15.22	9	8.14	1	14.3	5	2.28	46	14	71	253

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option G



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

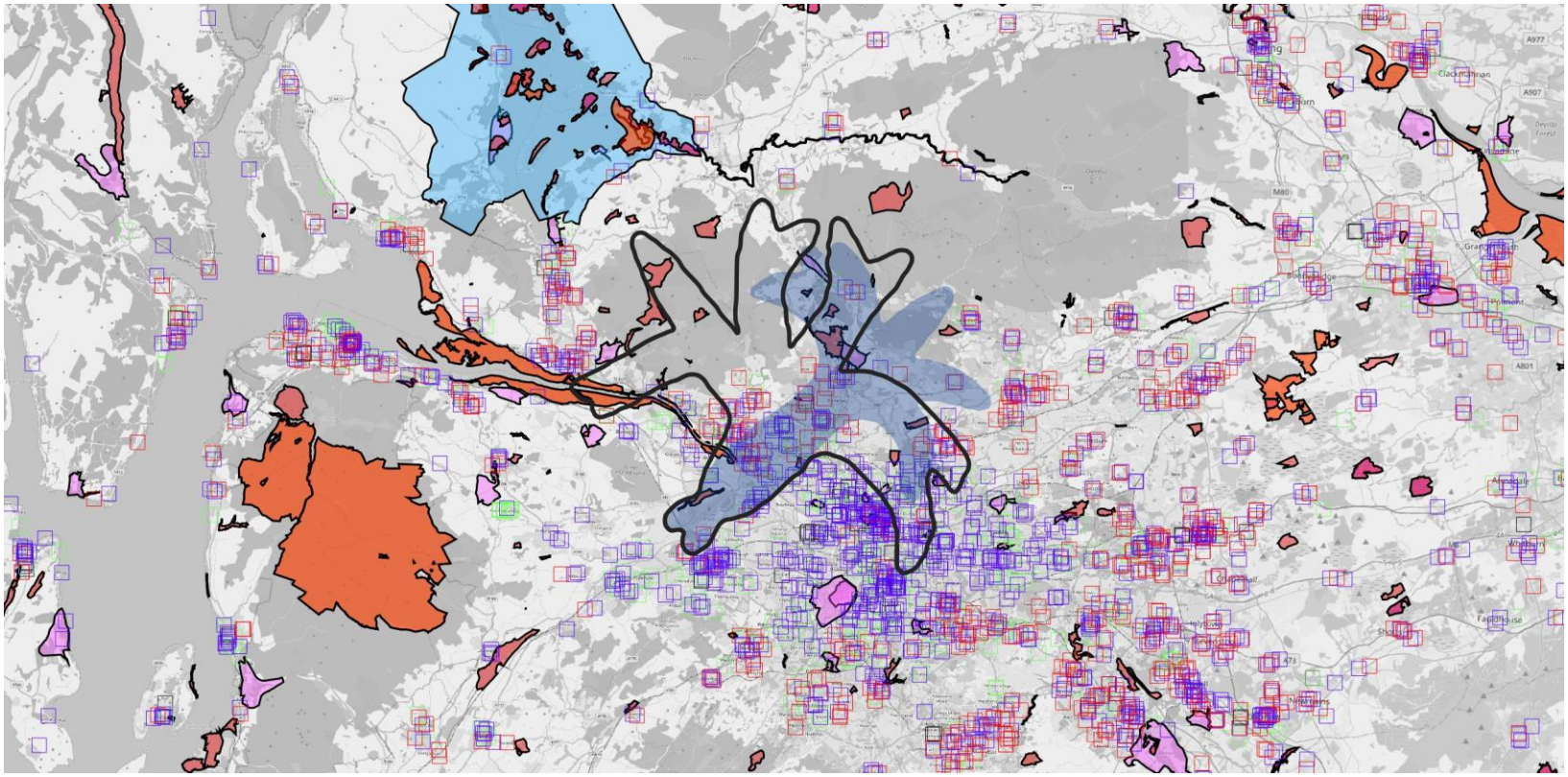
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Option G	566.65	661368	1	16.84	12	11.98	3	1.28	51	26.04	20	15.31	1	32.24	9	2.97	80	15	122	389

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option G



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	65dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Option G	194.89	229233	0	0	3	0.55	0	0	20	8.52	7	3.68	0	0	3	0.34	42	7	34	122

Runway 05 Departure Option H

This option was developed following engagement with ATC. It takes elements of the other options.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option H

Option Overflight Contours (Black outline) with estimated % of overall departures (Based on 4hrs peak usage per day)

2019 baseline average summer day overflight swathe:

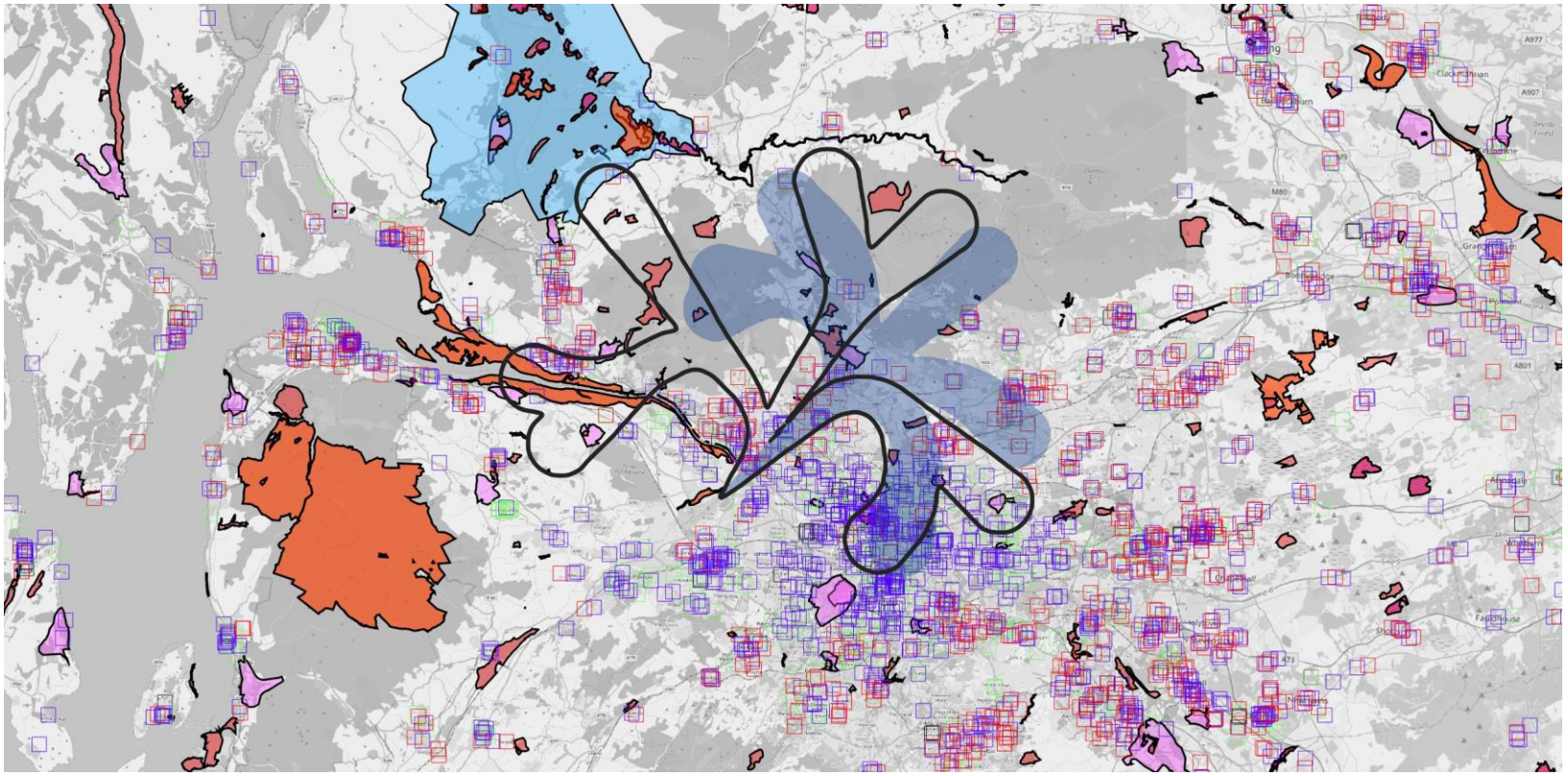
1

20

Based on 4hrs of peak usage per day

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option H



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

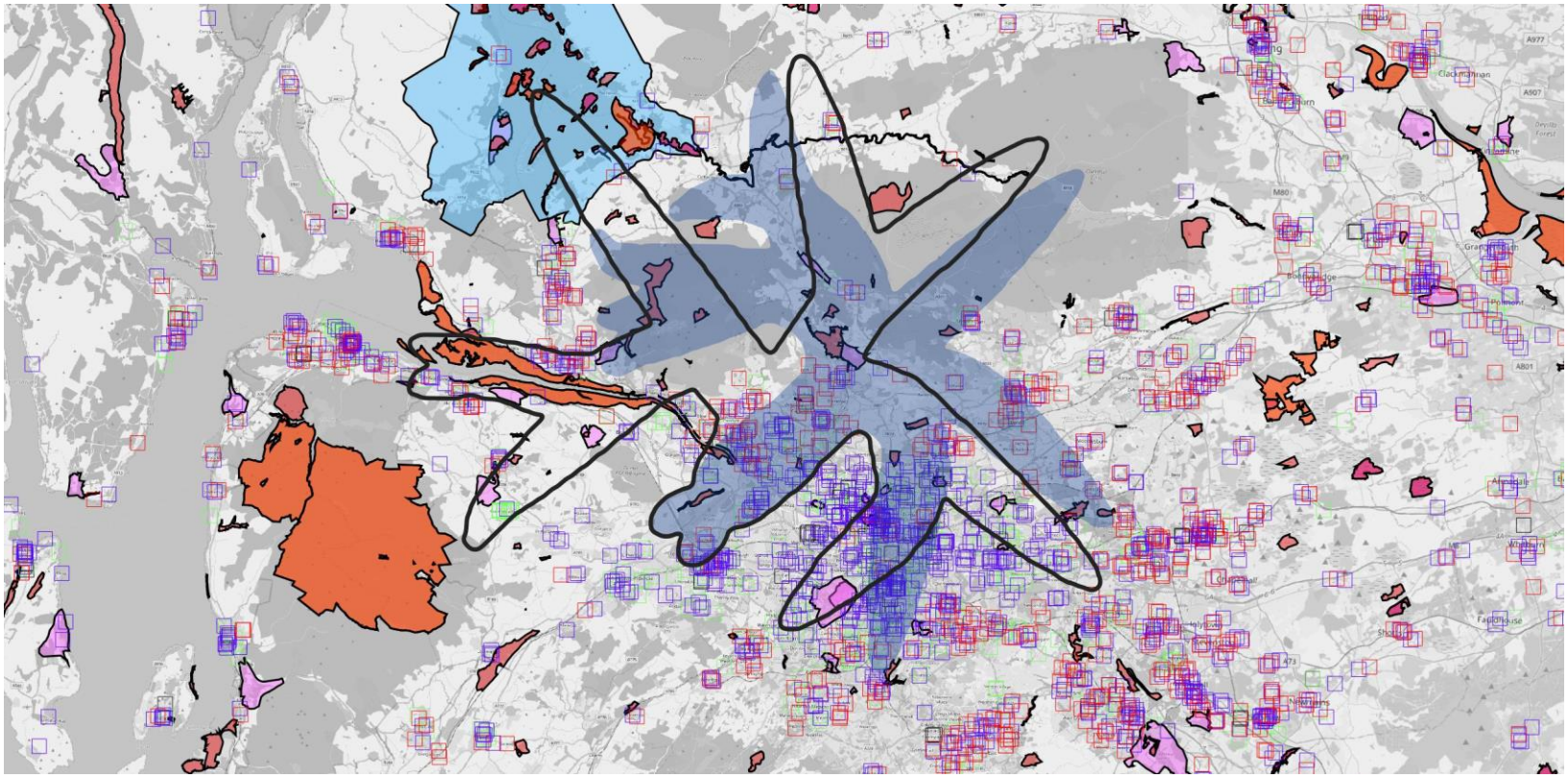
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option H	234.43	248316	1	2.91	7	2.61	0	0	27	13.66	9	8.14	1	13.93	4	1.2	42	10	42	169

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option H



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

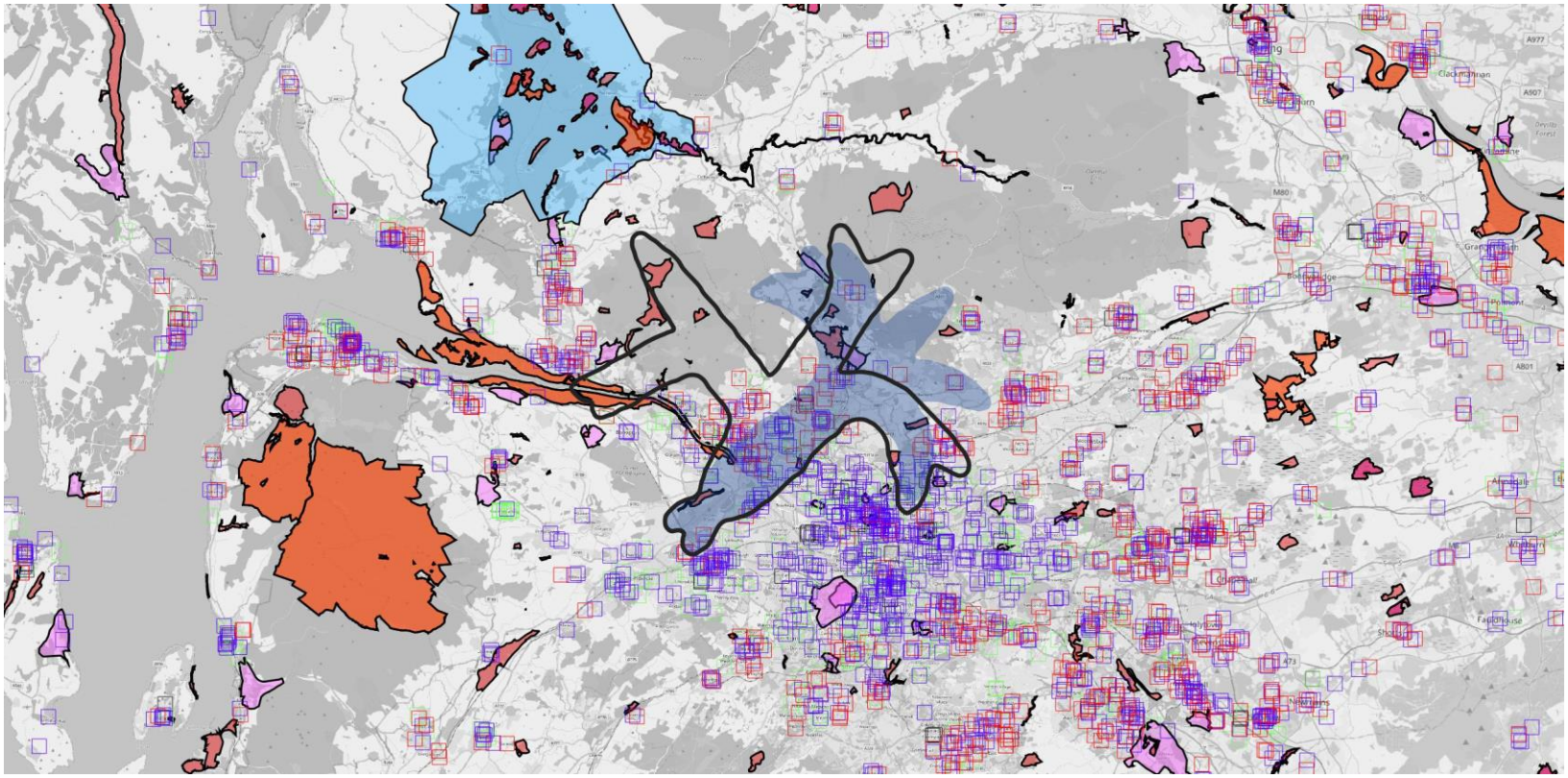
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Option H	433.3	442907	1	16.58	10	10.39	3	0.35	49	22.93	20	15.31	1	28.15	8	2.81	68	12	82	268

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option H



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	65dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Option H	147.96	158079	0	0	1	0.4	0	0	20	8.52	7	3.67	0	0	1	0.13	39	2	23	88

Runway 05 Departure Option I

This option was developed following engagement with ATC. It takes elements of the other options.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option I

Option Overflight Contours (Black outline) with estimated % of overall departures

2019 baseline average summer day overflight swathe:

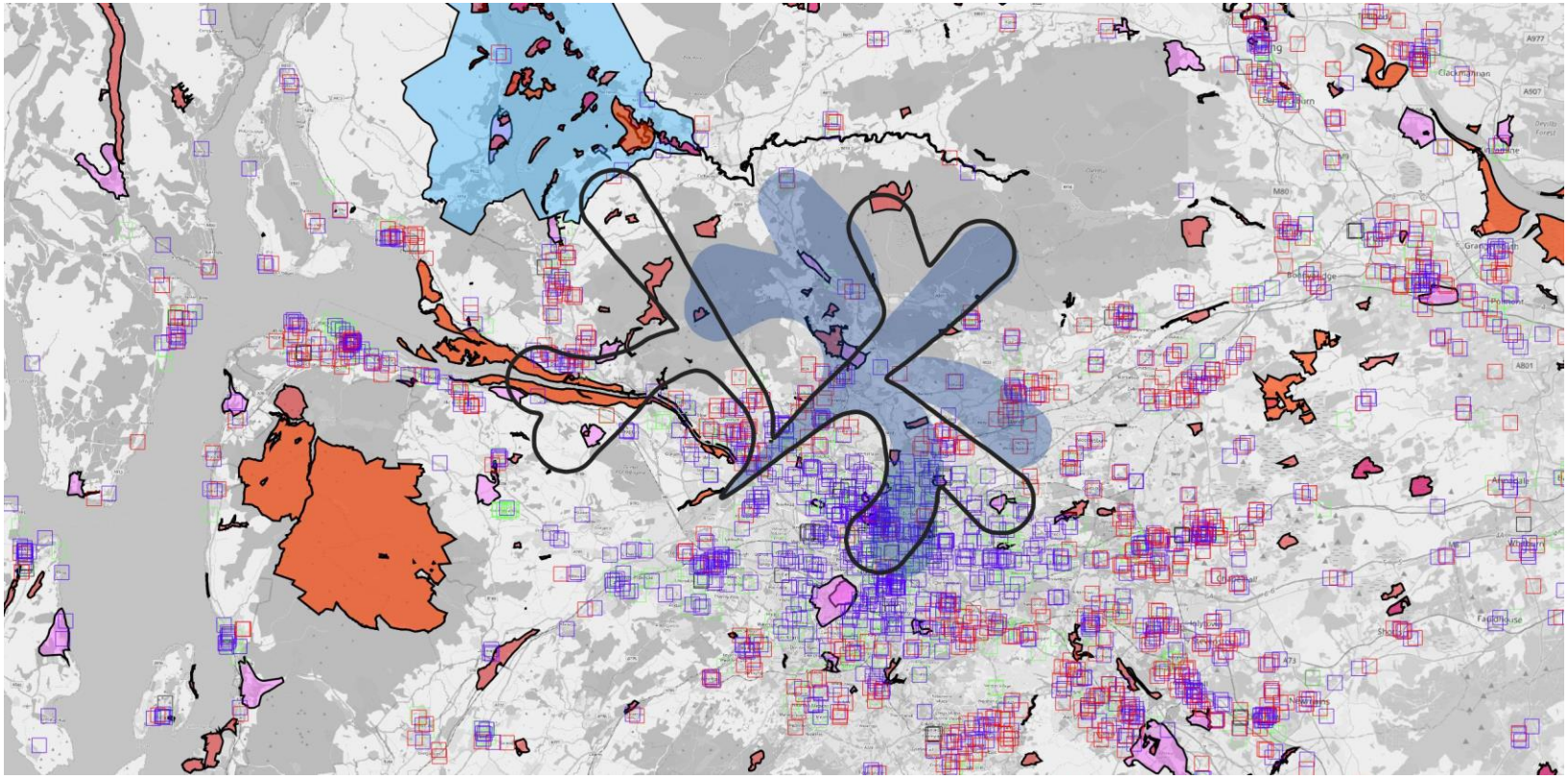
1

20

Based on 4hrs of peak usage per day

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option I



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

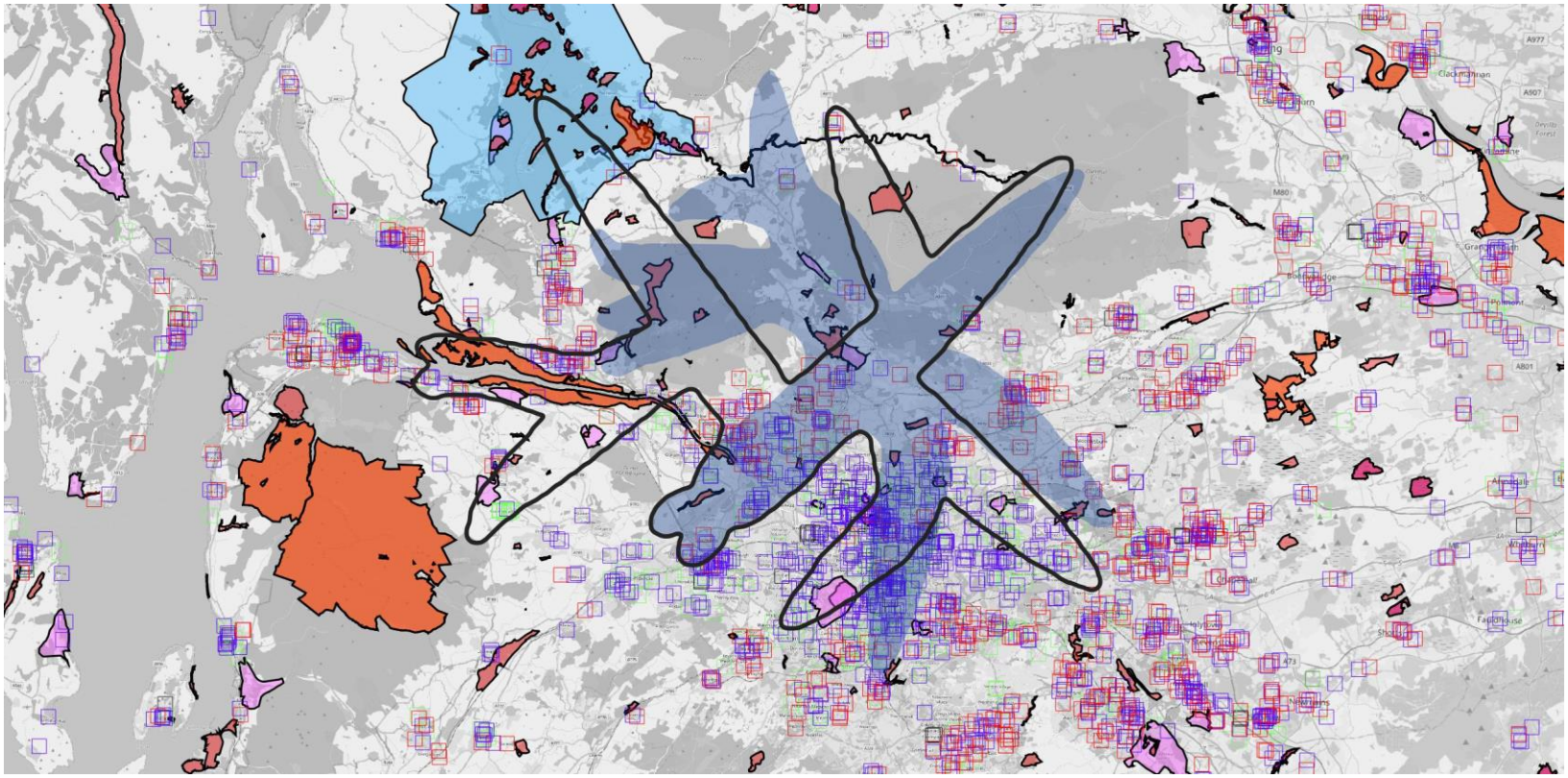
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 05 Baseline (Vectoring)	246.99	364763	0	0	5	2.58	0	0	24	10.46	11	6.37	0	0	4	0.66	47	11	62	213
RWY05 Baseline (Centreline)	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05 Option I	217.71	235019	1	1.62	6	2.84	0	0	25	12.99	9	7.86	1	12.7	4	1.19	37	10	41	163

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option I



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

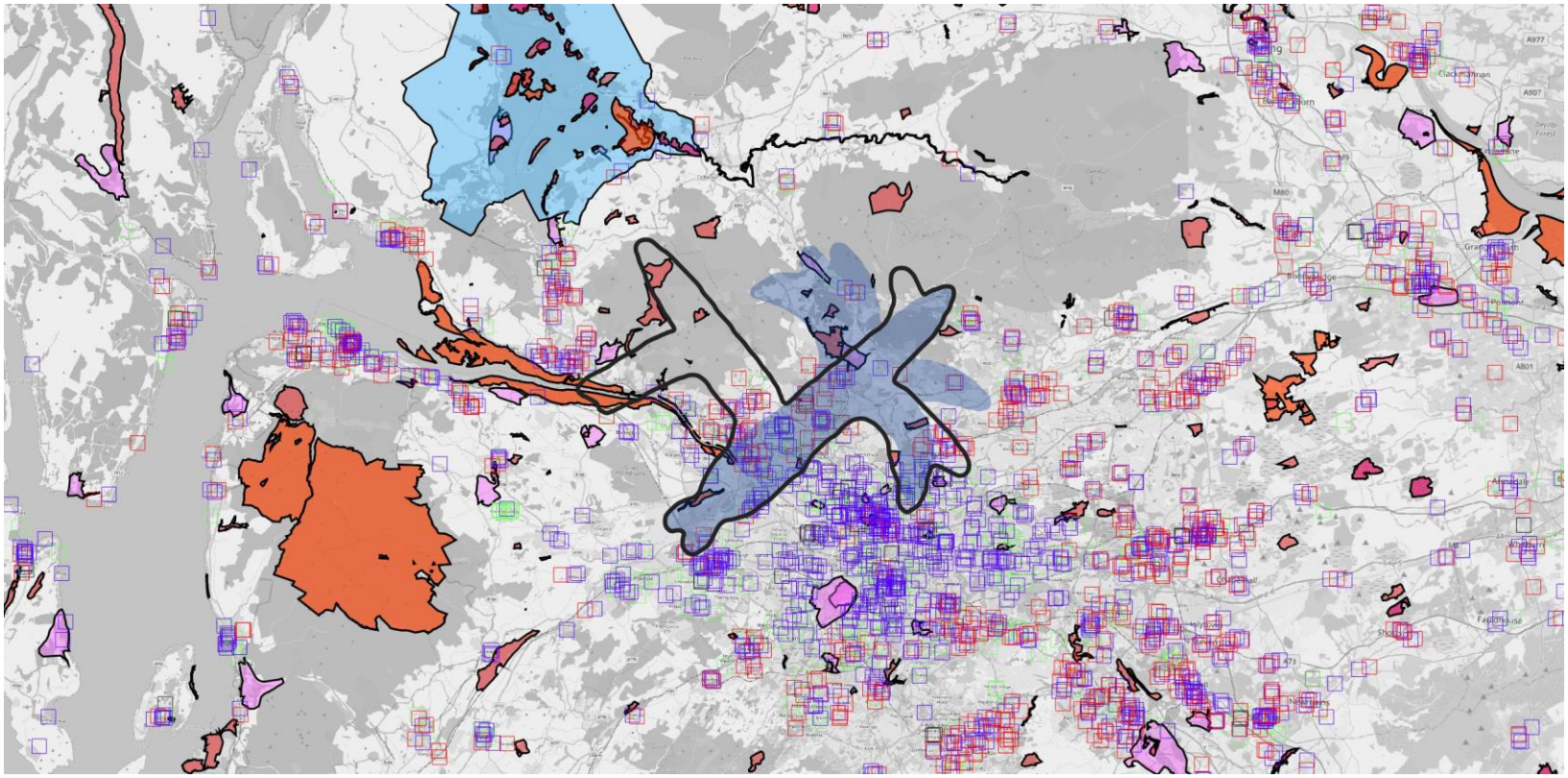
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05 Option I	411.04	433493	1	15.14	9	9.78	3	0.17	47	23.17	19	14.85	1	26.66	8	2.77	67	12	83	263

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 05 Departure Option I



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05 Baseline (Centreline)	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05 Option I	132.97	147678	0	0	1	0.94	0	0	16	5.66	7	2.94	0	0	1	0.13	35	2	22	85

Runway 05 Departure Summary Tables

4. COMPREHENSIVE LIST OF OPTIONS: RUNWAY 05 DEPARTURES

Overflights (0-4000ft)																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05_BAS	27.97	35883	0	0	1	1.23	0	0	1	1.37	0	0	0	0	0	0	7	0	8	22
RWY05_A	46.48	55411	0	0	1	0.08	0	0	6	2.12	0	0	0	0	0	0	17	0	9	30
RWY05_B	46.51	53374	0	0	1	0.08	0	0	5	1.81	0	0	0	0	0	0	17	0	9	30
RWY05_C	40.74	54112	0	0	1	0.58	0	0	2	0.32	0	0	0	0	0	0	16	0	9	29
RWY05_D	36.23	44231	0	0	1	0.58	0	0	1	0.01	0	0	0	0	0	0	13	0	8	28
RWY05_E	59.2	73248	0	0	1	0.55	0	0	3	0.65	0	0	0	0	1	0	18	0	11	32
RWY05_F	56.67	82635	0	0	1	0.63	0	0	6	2.12	0	0	0	0	1	0	21	0	13	39
RWY05_G	72.6	81123	0	0	1	0.08	0	0	7	2.45	0	0	0	0	1	0	21	0	12	33
RWY05_H	51.3	53869	0	0	1	0.07	0	0	6	2.13	0	0	0	0	0	0	18	0	9	29
RWY05_I	40.28	44529	0	0	1	0.57	0	0	2	0.3	0	0	0	0	0	0	14	0	8	28

Overflights (0-7000ft)																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05_BAS	186.52	173213	0	0	4	2.15	0	0	10	3.31	0	0	0	0	2	0.38	28	6	34	115
RWY05_A	184.58	254041	0	0	4	1.42	0	0	16	5.84	4	3.25	0	0	3	0.94	26	9	49	143
RWY05_B	174.94	169398	0	0	4	1.42	0	0	16	5.93	4	3.25	0	0	3	1.01	32	6	29	94
RWY05_C	172.34	251000	0	0	3	1.81	0	0	14	5.57	4	3.32	0	0	3	0.94	23	9	48	139
RWY05_D	158.16	158513	0	0	3	1.81	0	0	14	5.66	4	3.32	0	0	3	1.01	26	6	27	89
RWY05_E	232.04	249498	1	2.91	6	3.18	1	0.46	22	12.6	9	7.73	1	14.3	2	1.27	32	8	48	157
RWY05_F	203.99	246626	0	0	5	3.25	0	0	17	6.16	4	3.25	0	0	2	1.27	31	8	50	152
RWY05_G	318.06	398460	1	2.91	7	4.28	1	0.46	28	15.22	9	8.14	1	14.3	5	2.28	46	14	71	253
RWY05_H	234.43	248316	1	2.91	7	2.61	0	0	27	13.66	9	8.14	1	13.93	4	1.2	42	10	42	169
RWY05_I	217.71	235019	1	1.62	6	2.84	0	0	25	12.99	9	7.86	1	12.7	4	1.19	37	10	41	163

4. COMPREHENSIVE LIST OF OPTIONS: RUNWAY 05 DEPARTURES

N60																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05_BAS	356.82	382113	0	0	5	2.99	1	0.37	23	9.2	4	1.05	1	0.66	4	0.68	60	11	65	238
RWY05_A	363.53	458336	1	0.27	6	4.66	1	0.95	29	9.96	9	5.08	1	4.08	6	1.67	60	10	89	245
RWY05_B	349.85	369502	1	0.27	6	4.8	1	0.95	28	9.77	9	5.08	1	4.08	7	1.24	64	8	69	199
RWY05_C	339.28	453932	0	0	5	4.27	1	0.13	28	10.05	8	4.97	0	0	6	1.67	59	10	90	242
RWY05_D	320.66	364573	0	0	5	4.27	1	0.13	27	9.86	8	4.97	0	0	7	1.24	62	8	70	195
RWY05_E	427.82	468436	1	16.58	10	8.02	3	0.71	44	23.28	20	15.29	1	28.47	4	2.07	64	10	76	277
RWY05_F	386.14	453065	1	0.27	10	8.7	1	0.95	30	9.81	9	5.08	1	4.08	4	2.07	59	10	83	263
RWY05_G	566.65	661368	1	16.84	12	11.98	3	1.28	51	26.04	20	15.31	1	32.24	9	2.97	80	15	122	389
RWY05_H	433.3	442907	1	16.58	10	10.39	3	0.35	49	22.93	20	15.31	1	28.15	8	2.81	68	12	82	268
RWY05_I	411.04	433493	1	15.14	9	9.78	3	0.17	47	23.17	19	14.85	1	26.66	8	2.77	67	12	83	263
N65																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY05_BAS	114	120793	0	0	2	1.99	0	0	12	3.35	4	0.77	0	0	1	0.13	25	2	20	69
RWY05_A	129.97	179689	0	0	3	0.54	0	0	17	5.08	7	2.56	0	0	2	0.46	36	7	30	96
RWY05_B	125.22	141512	0	0	2	0.42	0	0	17	5.17	7	2.56	0	0	2	0.15	39	2	20	80
RWY05_C	121.06	175911	0	0	2	1.07	0	0	14	2.59	7	2.14	0	0	2	0.46	33	7	30	101
RWY05_D	111.91	133584	0	0	1	0.96	0	0	14	2.68	7	2.14	0	0	2	0.15	35	2	20	79
RWY05_E	162.05	195679	0	0	3	1.03	0	0	15	5.63	6	2.98	0	0	2	0.33	32	4	30	106
RWY05_F	147.12	200769	0	0	3	1.33	0	0	18	5.36	7	2.56	0	0	2	0.33	35	4	31	108
RWY05_G	194.89	229233	0	0	3	0.55	0	0	20	8.52	7	3.68	0	0	3	0.34	42	7	34	122
RWY05_H	147.96	158079	0	0	1	0.4	0	0	20	8.52	7	3.67	0	0	1	0.13	39	2	23	88
RWY05_I	132.97	147678	0	0	1	0.94	0	0	16	5.66	7	2.94	0	0	1	0.13	35	2	22	85

4. COMPREHENSIVE LIST OF OPTIONS: RUNWAY 05 DEPARTURES

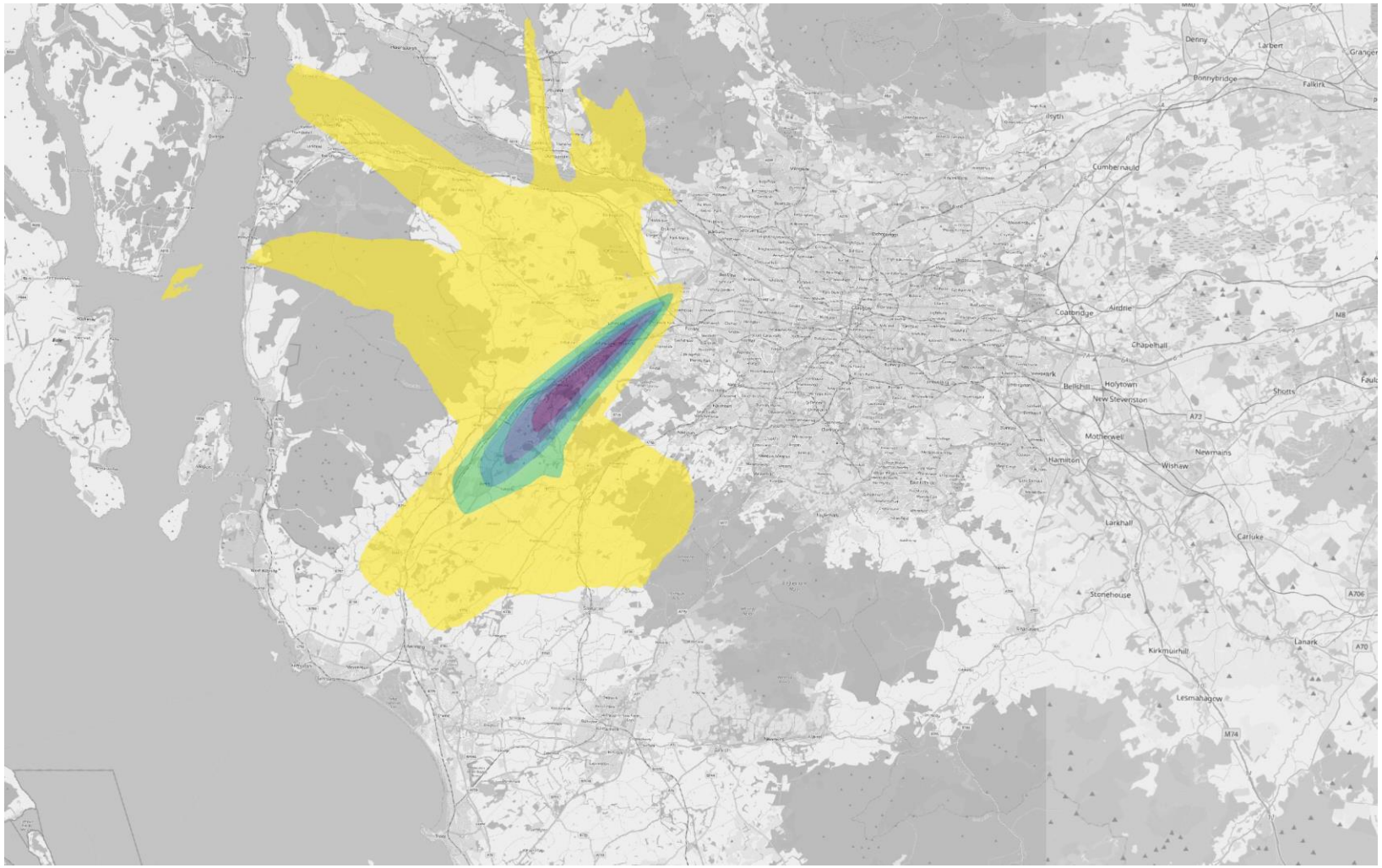
Runway 05 Departures: Track Mileage

RWY 05		Baseline (Centreline)			A		B		C		D		E		F				G				H		I	
		nm	% Weighting	Score	nm	Score	nm	Score	nm	Score	nm	Score	nm	Score	nm P1	nm P2	Average	Score	nm P1	nm P2	Average	Score	nm	Score	nm	Score
DEPS	TRN	50.00	0.81	40.50	49.20	39.85	49.20	39.85	49.40	40.01	49.40	40.01	50.70	41.07	49.20	50.70	49.95	40.46	49.20	49.70	49.45	40.05	49.20	39.85	49.10	39.77
	NORBO - SUBUK	112.00	5.75	644.00	103.60	595.70	103.60	595.70	103.90	597.43	103.90	597.43	104.20	599.15	103.90	104.20	104.05	598.29	97.30	103.15	100.23	576.29	103.60	595.70	103.90	597.43
	NORBO - LAKEY	112.00	7.03	787.36	103.60	728.31	103.60	728.31	103.90	730.42	103.90	730.42	104.20	732.53	103.90	104.20	104.05	731.47	96.50	96.00	96.25	676.64	96.50	678.40	96.50	678.40
	LUSIV-DCS	88.80	2.34	207.79	87.25	204.17	89.10	208.49	87.25	204.17	89.10	208.49	104.20	243.83	98.00	98.00	98.00	229.32	88.80	88.80	88.80	207.79	96.50	225.81	96.50	225.81
	TLA	49.20	0.09	4.43	47.25	4.25	48.20	4.34	47.25	4.25	48.20	4.34	51.10	4.60	51.10	51.10	51.10	4.60	48.20	48.20	48.20	4.34	48.20	4.34	48.20	4.34
	PERTH	50.30	0.27	13.58	50.50	13.64	50.50	13.64	50.30	13.58	50.30	13.58	52.20	14.09	50.50	50.50	50.50	13.64	50.50	52.20	51.35	13.86	50.50	13.64	50.20	13.55
	FOYLE	19.10	0.18	3.44	18.50	3.33	18.50	3.33	20.40	3.67	20.40	3.67	17.60	3.17	17.60	17.60	17.60	3.17	18.50	17.60	18.05	3.25	18.50	3.33	20.30	3.65
	LOMON	20.00	0.45	9.00	20.30	9.14	20.30	9.14	24.10	10.85	24.10	10.85	20.30	9.14	20.30	20.30	20.30	9.14	20.30	20.30	20.30	9.14	14.60	6.57	14.80	6.66
	CLYDE	25.00	0.63	15.75	28.80	18.14	28.80	18.14	33.10	20.85	33.10	20.85	19.10	12.03	28.80	28.80	28.80	18.14	28.80	19.10	23.95	15.09	18.40	11.59	19.00	11.97
	ROBBO	33.50	0.45	15.08	34.60	15.57	34.60	15.57	39.00	17.55	39.00	17.55	23.30	10.49	34.60	34.60	34.60	15.57	34.60	23.30	28.95	13.03	22.80	10.26	23.00	10.35
Total				1740.92		1632.09		1636.51		1642.77		1647.19		1670.09				1663.79				1559.48		1589.48		1591.93

Runway 23 Baseline

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Baseline



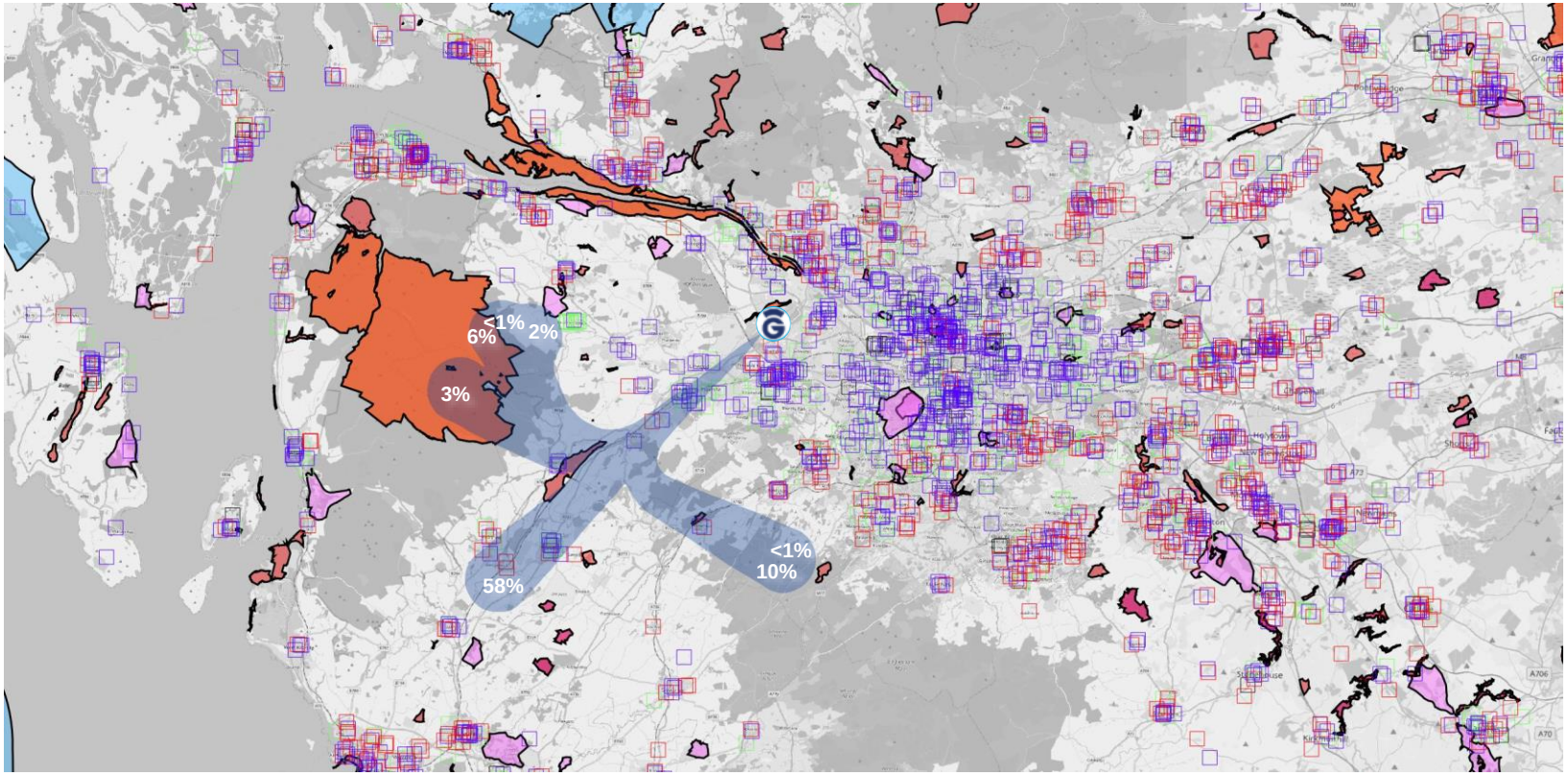
2019 baseline average summer day overflight swathe:

1

94

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Baseline



Baseline centreline overflight contours (Shaded blue)

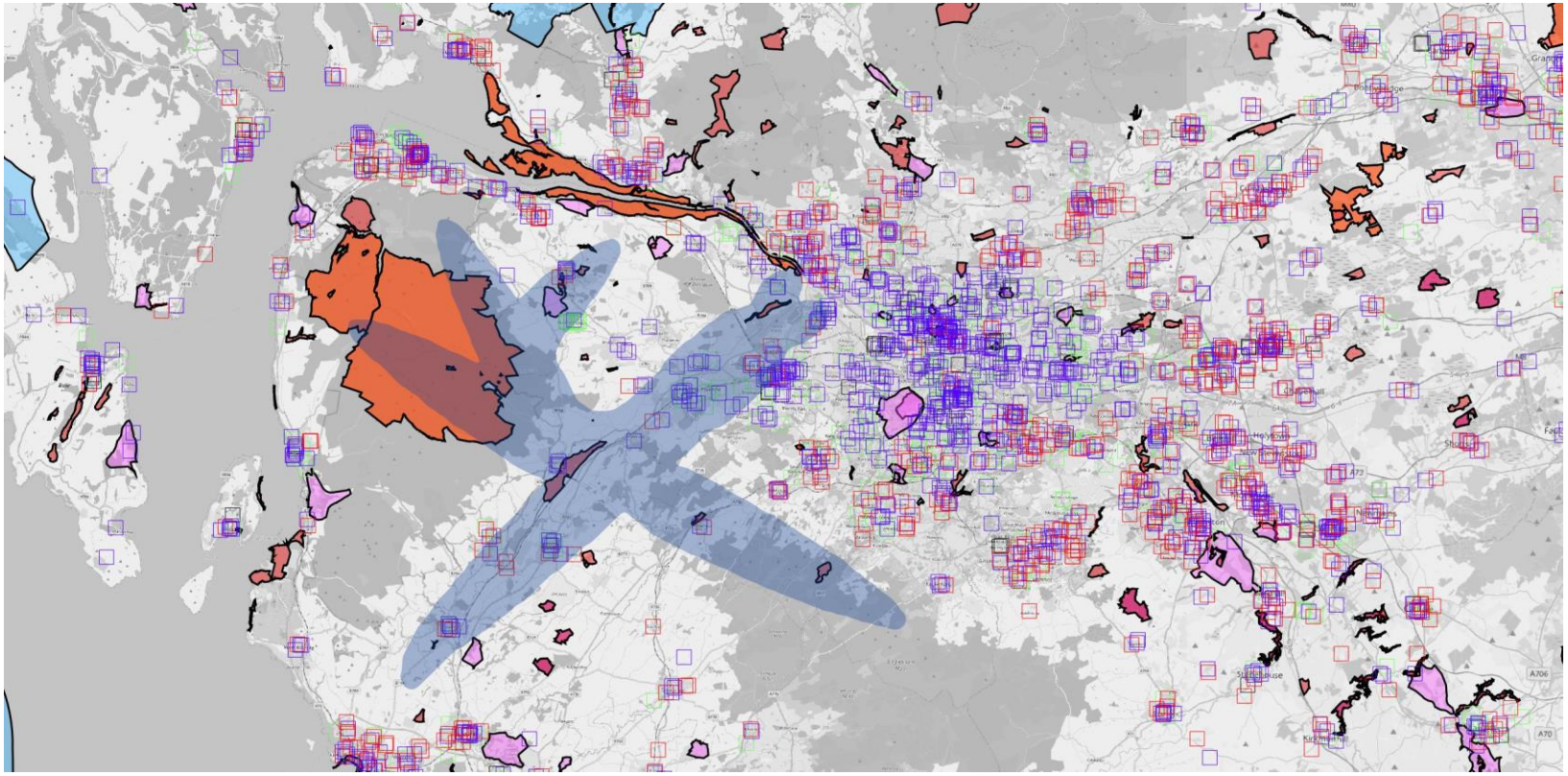
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	547.32	163216	1.00	0.02	5	5.29	3	1.42	32	65.82	12	58.95	1	1.68	0	0	43	1	47	109
RWY23 Baseline (Centreline)	141.18	29838	0	0	1	0.13	0	0	3	23.69	1	21.89	0	0	0	0	6	0	9	22

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Baseline



Baseline centreline 60dB L_{Amax} contours (Shaded blue)

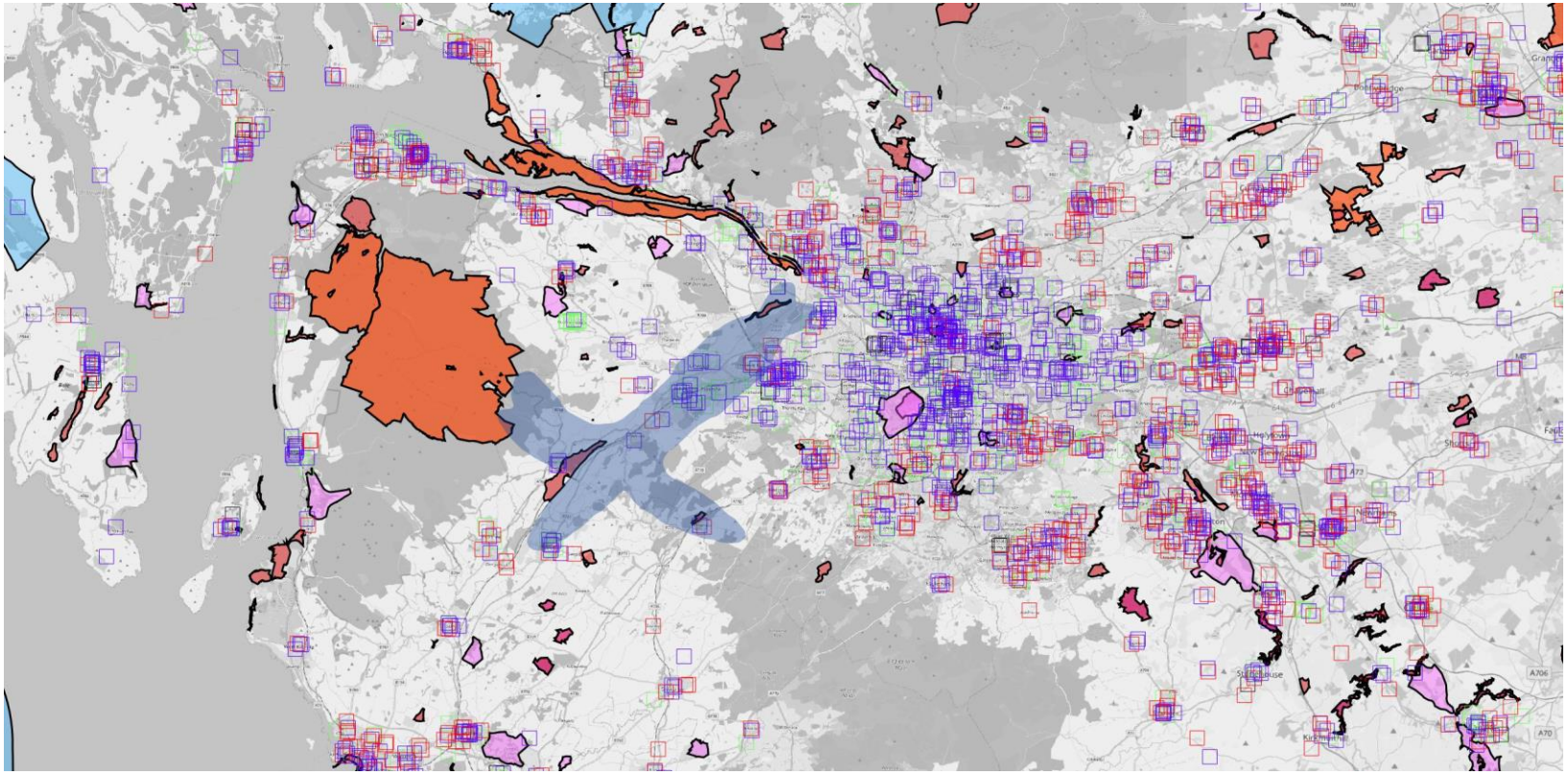
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	285.37	99120	0	0	2	1.8	0	0	11	43.89	4	40.28	0	0	0	0	14	0	28	58

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Baseline



Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	95.69	53704	0	0	0	0	0	0	4	2.62	2	1.01	0	0	0	0	5	0	14	30

Runway 23 Departure Option A

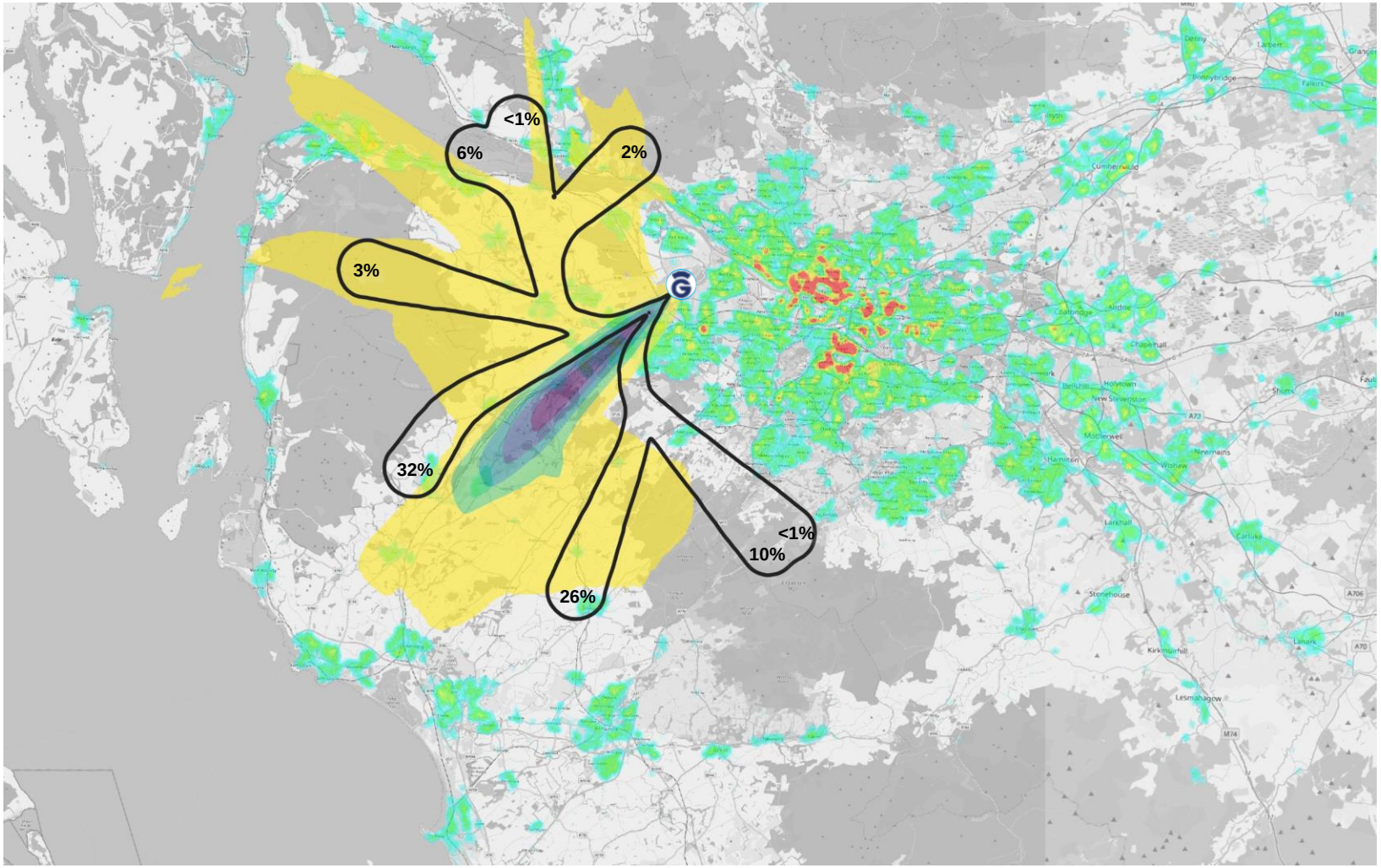
Offset right departures with turns at 2nm and 7nm from the runway.

Offset left departures with turns at 1nm from the runway.

NORBO traffic is shared between a left turn departure route and the departure route that offsets right and then turns left at 7nm with both routes available at the same time.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option A



Option Overflight Contours (Black outline) with estimated % of overall departures

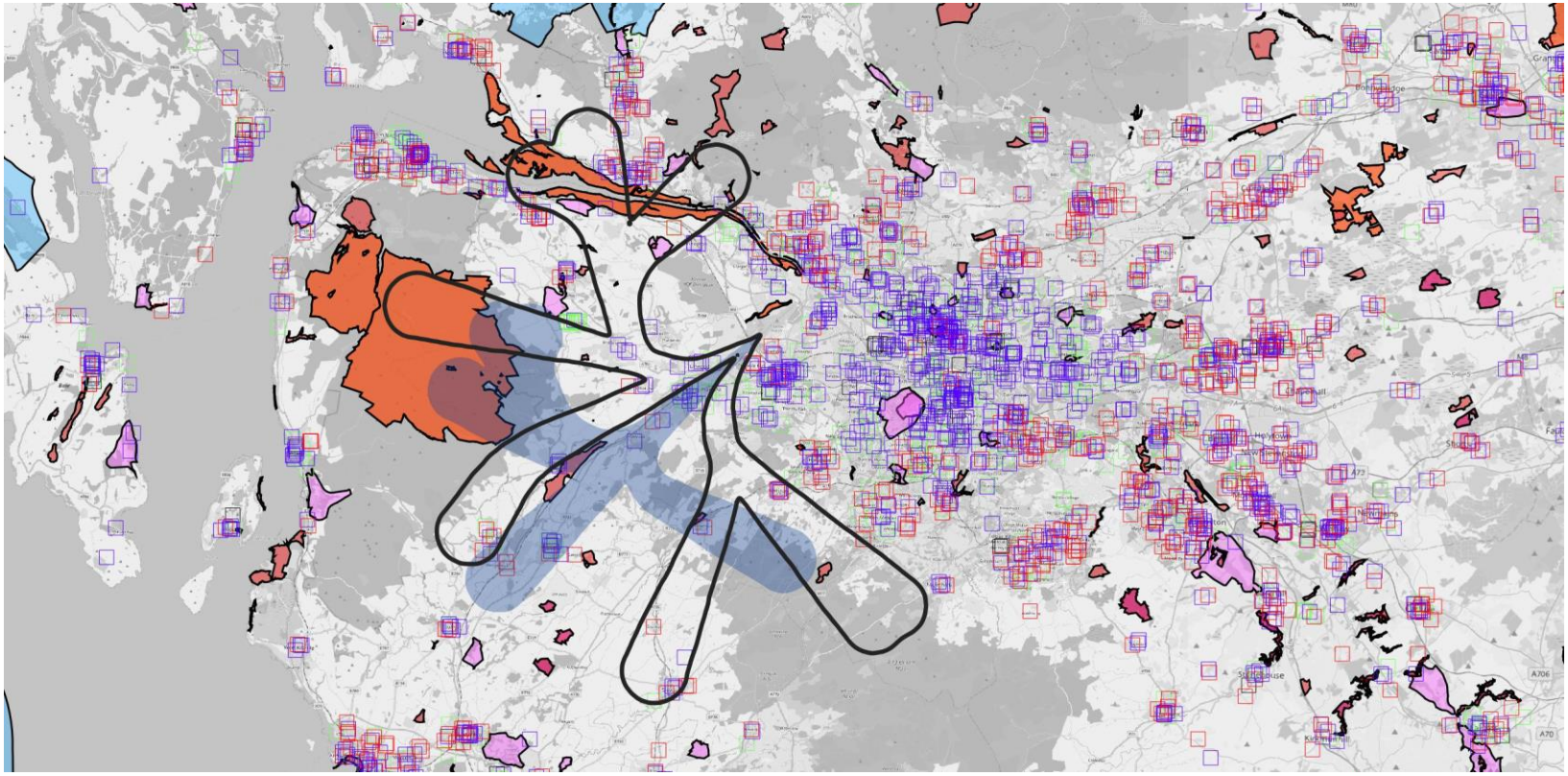
2019 baseline average summer day overflight swathe:

1

94

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option A



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

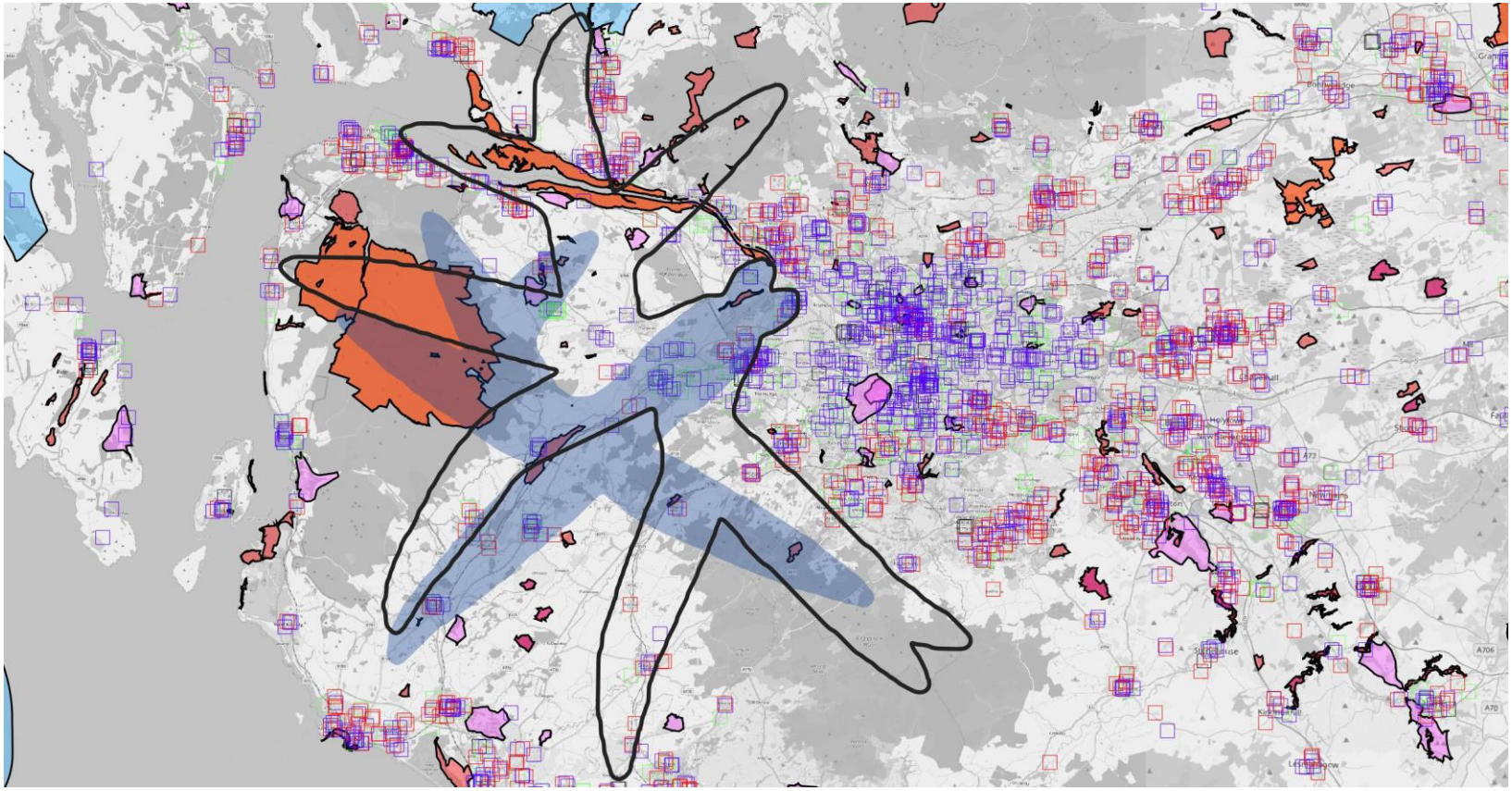
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	Overflight																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	547.32	163216	1.00	0.02	5	5.29	3	1.42	32	65.82	12	58.95	1	1.68	0	0	43	1	47	109
RWY23 Baseline (Centreline)	141.18	29838	0	0	1	0.13	0	0	3	23.69	1	21.89	0	0	0	0	6	0	9	22
RWY23 Option A	262.55	58671	0	0	4	2.25	0	0	26	34.66	13	33.33	0	0	0	0	14	0	10	30

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option A



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

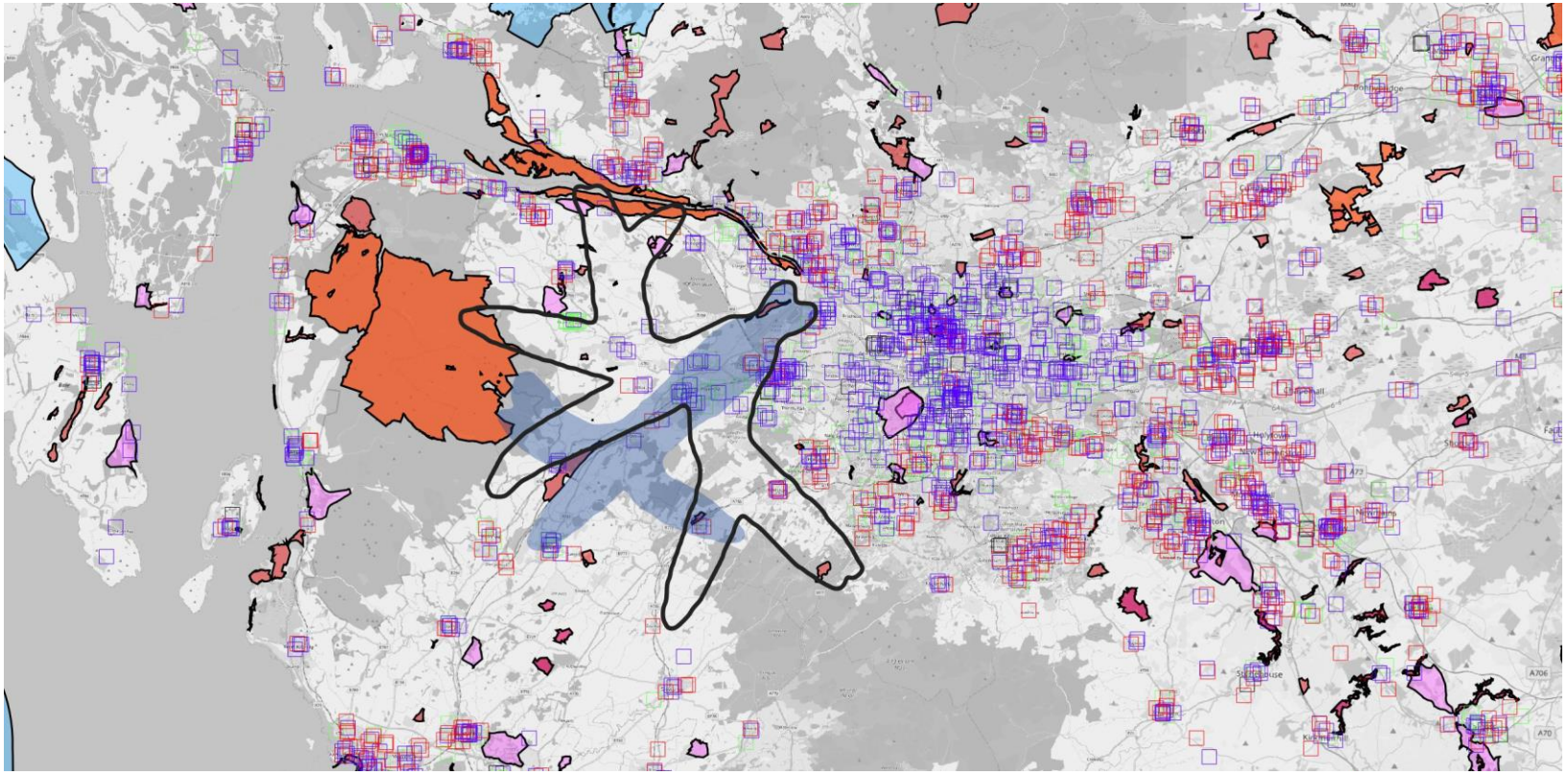
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	60dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	285.37	99120	0	0	2	1.8	0	0	11	43.89	4	40.28	0	0	0	0	14	0	28	58
RWY23 Option A	493.41	143425	1	0.43	4	3.31	0	0	36	55.1	19	51.32	1	5.46	0	0	24	2	33	78

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option A



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	95.69	53704	0	0	0	0	0	0	4	2.62	2	1.01	0	0	0	0	5	0	14	30
RWY23 Option A	178.62	77760	0	0	3	1.34	0	0	14	6.88	4	5.73	0	0	0	0	9	0	22	39

Runway 23 Departure Option B

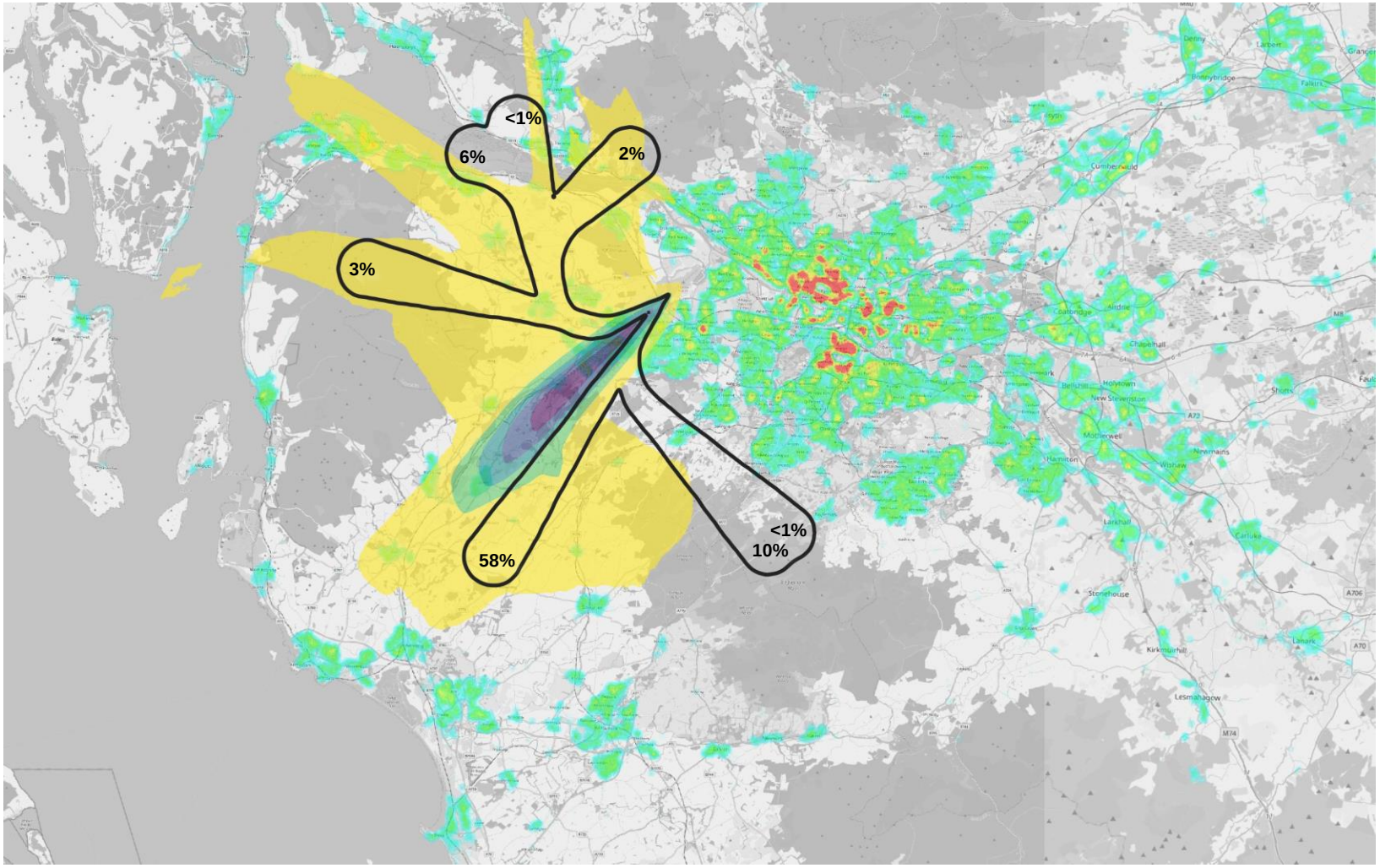
Offset right departures with turns at 2nm from the runway.

Offset left departures with turns at 1nm and 5nm from the runway.

NORBO traffic is shared between two departure routes however they are the same route until 5nm from the runway.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option B

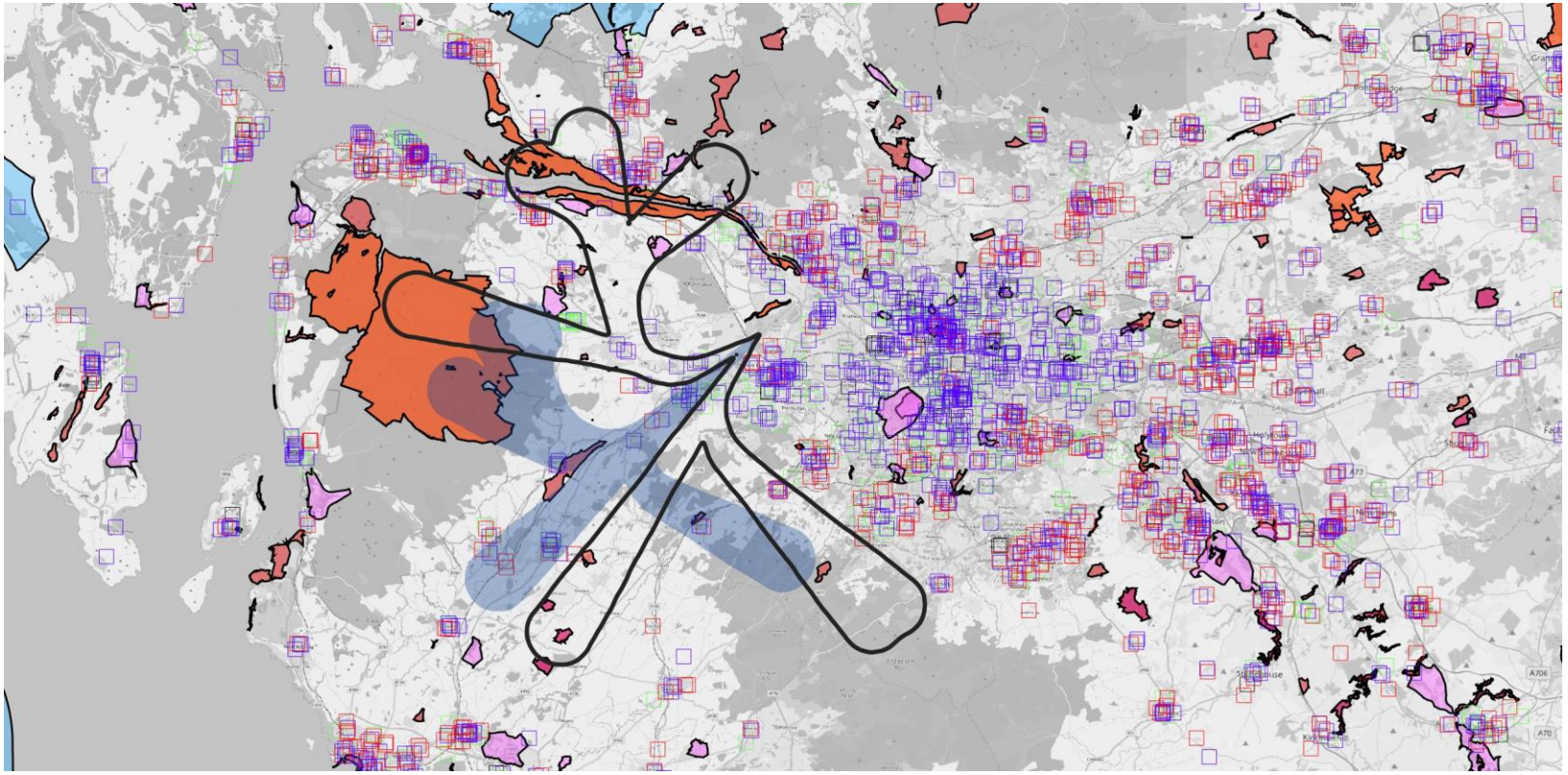


Option Overflight Contours (Black outline) with estimated % of overall departures

2019 baseline average summer day overflight swathe:

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option B



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

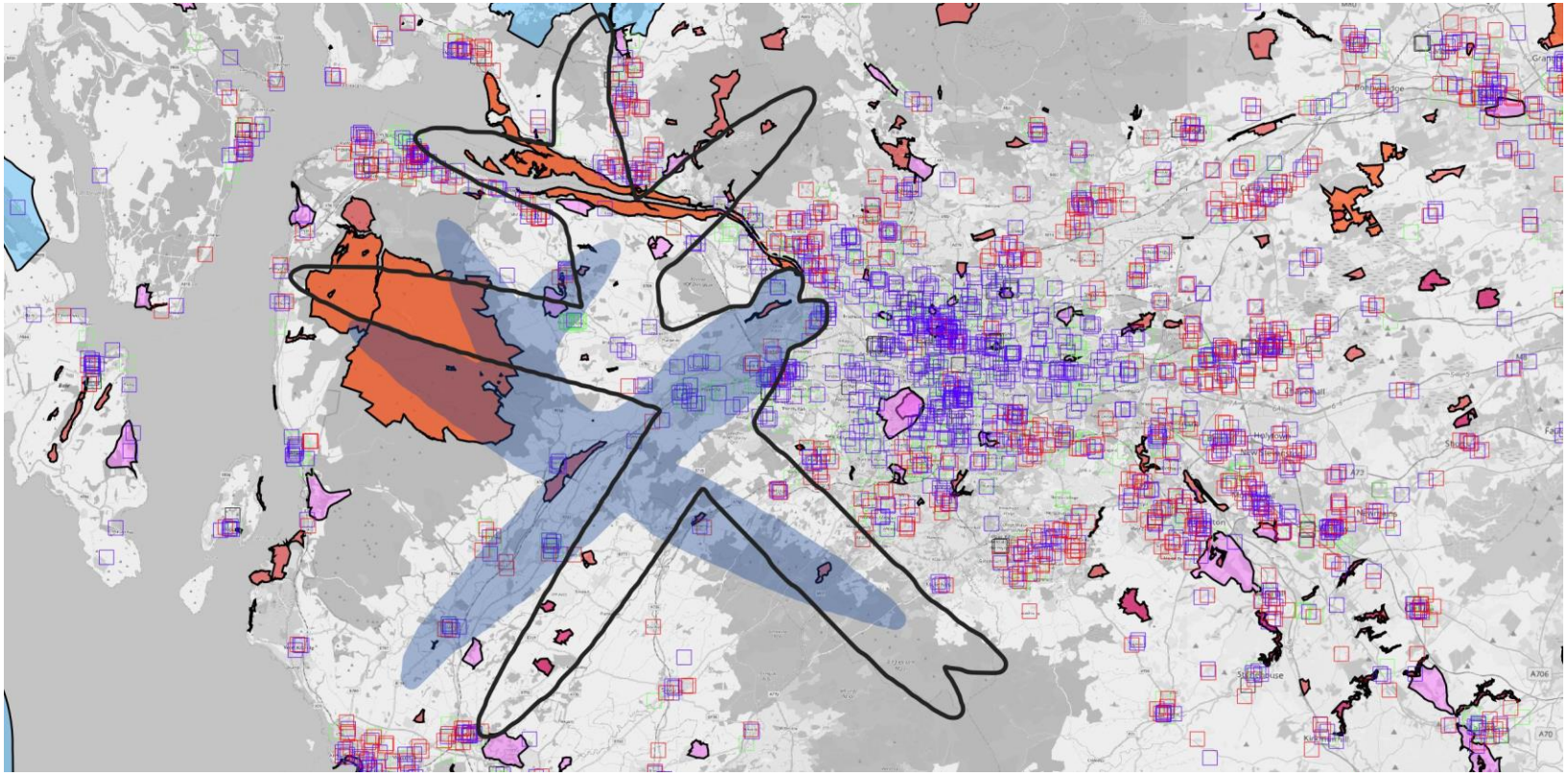
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	547.32	163216	1.00	0.02	5	5.29	3	1.42	32	65.82	12	58.95	1	1.68	0	0	43	1	47	109
RWY23 Baseline (Centreline)	141.18	29838	0	0	1	0.13	0	0	3	23.69	1	21.89	0	0	0	0	6	0	9	22
RWY23 Option B	225.76	37664	0	0	4	2.25	3	0.87	27	35.78	13	33.33	0	0	0	0	8	0	5	20

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option B



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

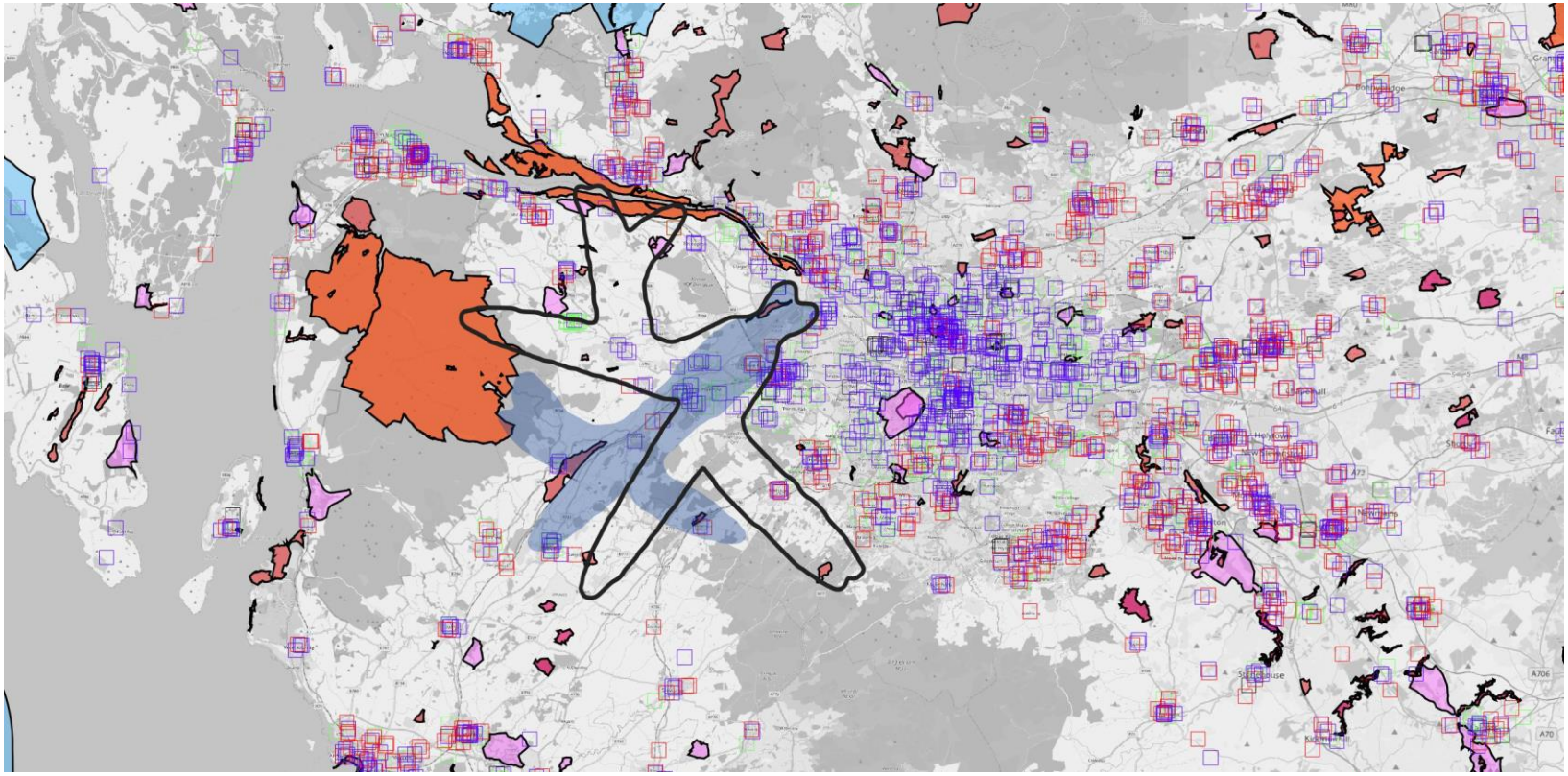
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

60dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	285.37	99120	0	0	2	1.8	0	0	11	43.89	4	40.28	0	0	0	0	14	0	28	58
RWY23 Option B	434.35	121890	1	0.43	5	3.38	3	1.42	37	54.43	19	50.77	1	5.46	0	0	18	2	29	65

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option B



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	95.69	53704	0	0	0	0	0	0	4	2.62	2	1.01	0	0	0	0	5	0	14	30
RWY23 Option A	160.28	70853	0	0	3	1.34	0	0	12	6.71	4	5.73	0	0	0	0	6	0	22	37

Runway 23 Departure Option C

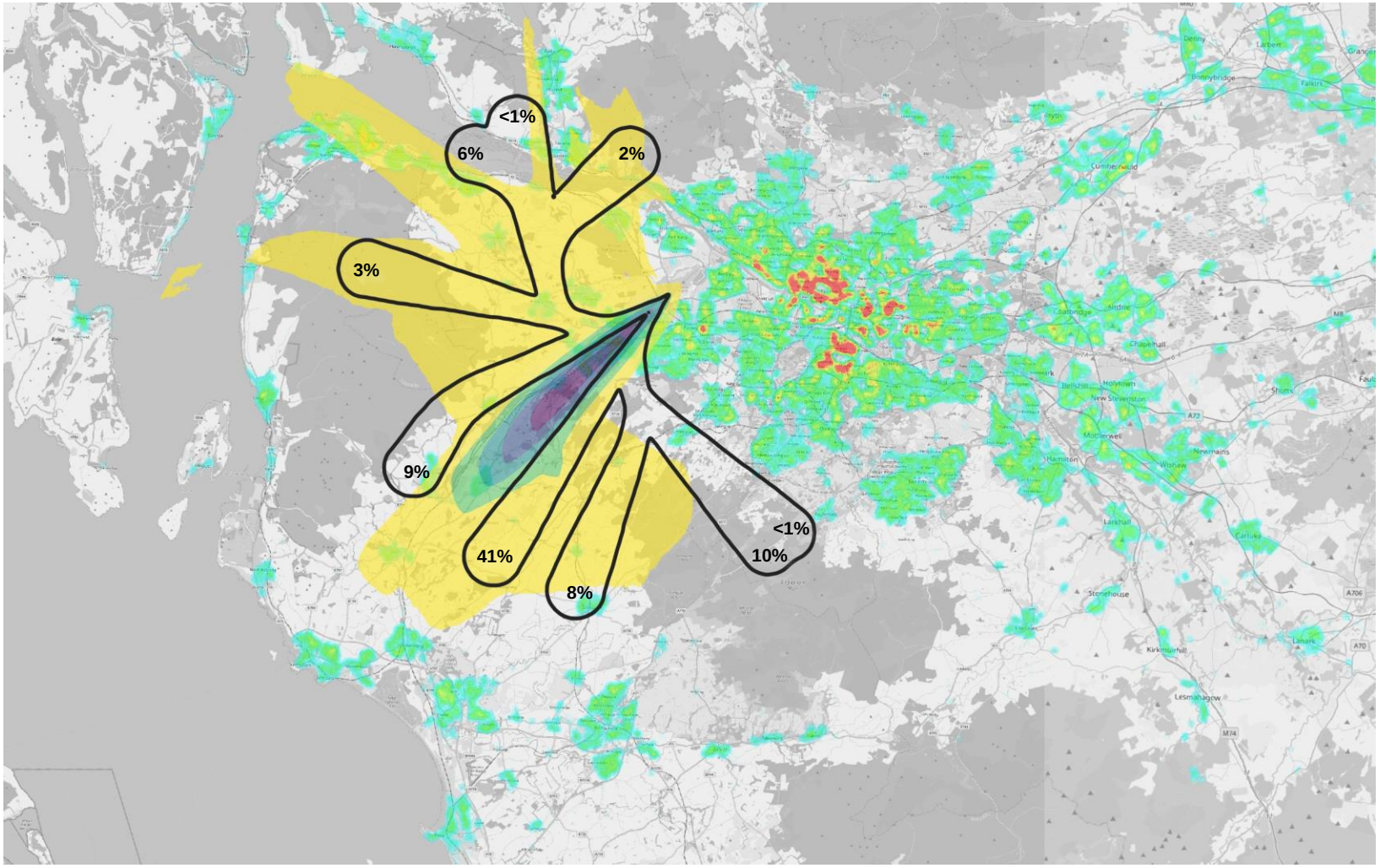
This option has two, slightly different route configurations and assumes one configuration would be used for the peak departure period each morning. The configuration would then switch for the rest of the day.

In the morning, the NORBO traffic is shared between an offset left turn departure and an offset right turn departure with both routes available at the same time.

For the rest of the day, all the NORBO traffic would then use different flight path which offsets to the left, with the rest of the routes remaining the same.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option C

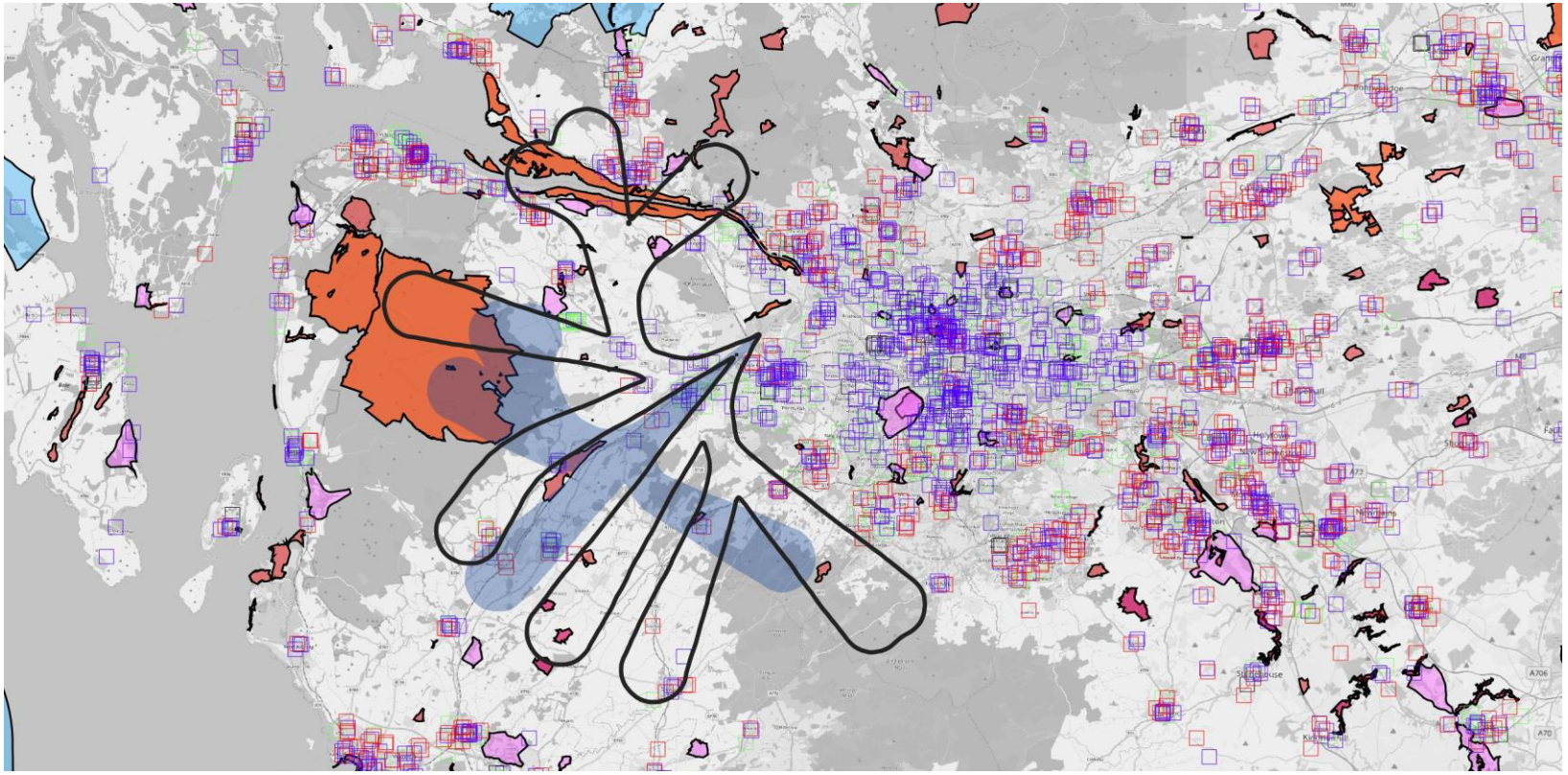


Option Overflight Contours (Black outline) with estimated % of overall departures (based on 4 peak hours a day)

2019 baseline average summer day overflight swathe:

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option C



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

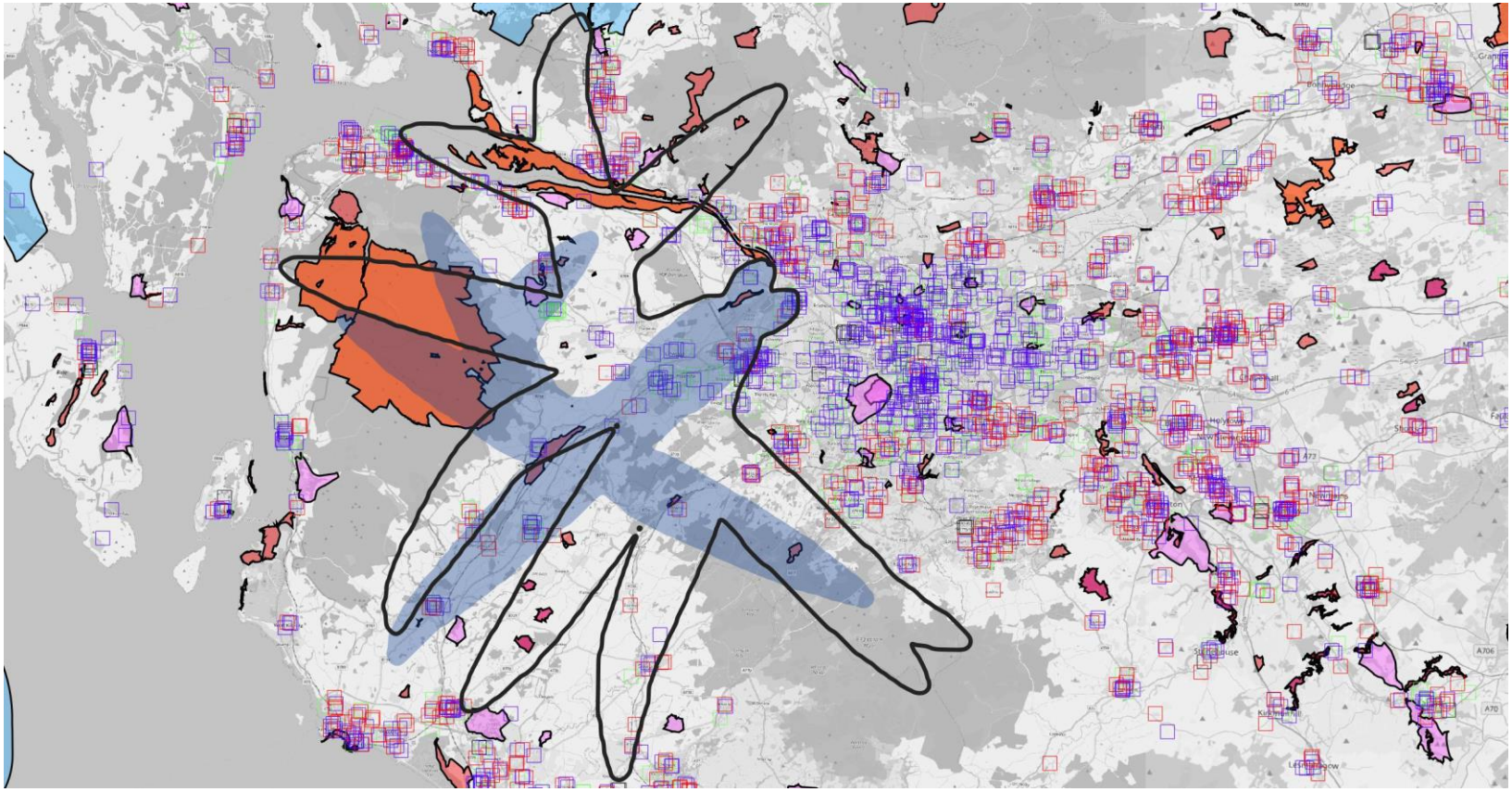
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	547.32	163216	1.00	0.02	5	5.29	3	1.42	32	65.82	12	58.95	1	1.68	0	0	43	1	47	109
RWY23 Baseline (Centreline)	141.18	29838	0	0	1	0.13	0	0	3	23.69	1	21.89	0	0	0	0	6	0	9	22
RWY23 Option C	305.53	60931	0	0	4	2.25	3	0.87	30	35.97	13	33.33	0	0	0	0	14	0	10	30

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option C



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

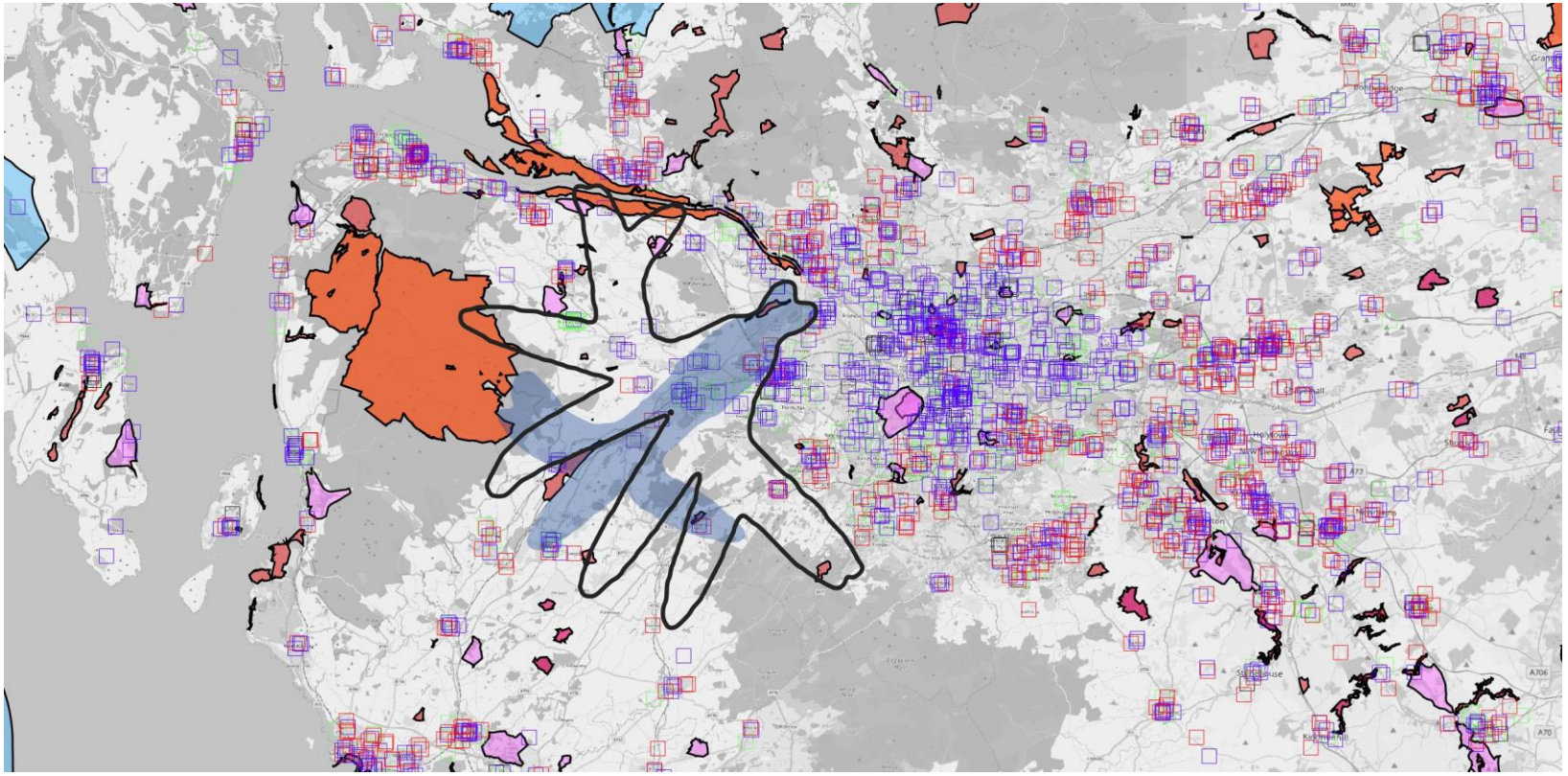
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	60dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	285.37	99120	0	0	2	1.8	0	0	11	43.89	4	40.28	0	0	0	0	14	0	28	58
RWY23 Option C	563.66	146232	1	0.43	5	3.38	3	1.42	40	56.96	19	51.32	1	5.46	0	0	26	2	33	78

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option C



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	95.69	53704	0	0	0	0	0	0	4	2.62	2	1.01	0	0	0	0	5	0	14	30
RWY23 Option C	206.59	80377	0	0	3	1.34	0	0	15	7.11	4	5.73	0	0	0	0	9	0	22	39

Runway 23 Departure Option D

This option has two, slightly different route configurations and assumes one configuration would be used for the peak departure period each morning. The configuration would then switch for the rest of the day.

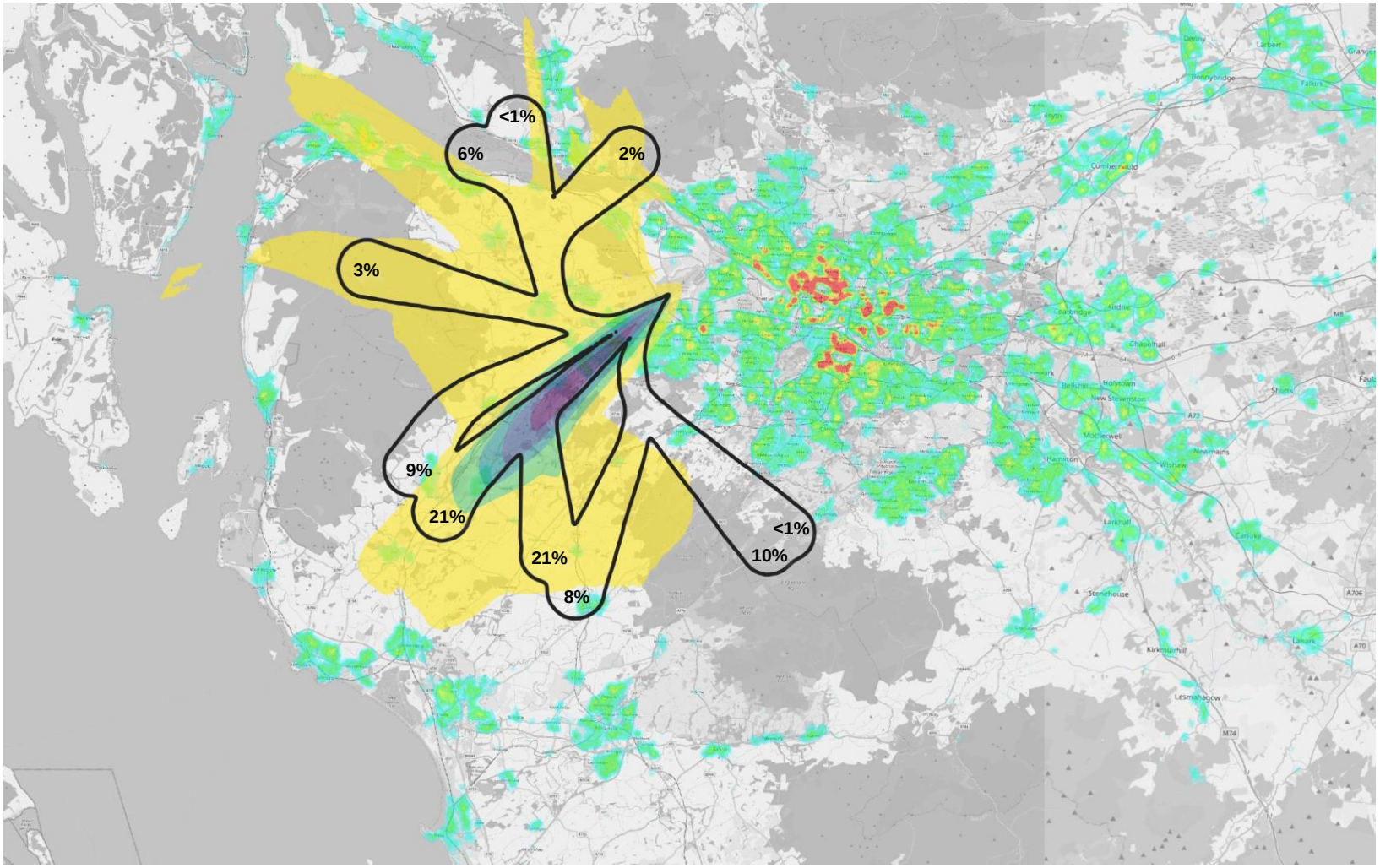
In the morning, the NORBO traffic is shared between an offset left turn departure and an offset right turn departure with both routes available at the same time.

For the rest of the day, all the NORBO traffic would then use a different flight path which follows a straight line from the runway until splitting at 5nm, with the rest of the routes remaining the same.

This option is similar to Option C except that the daytime (non-peak) NORBO route is different.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option D

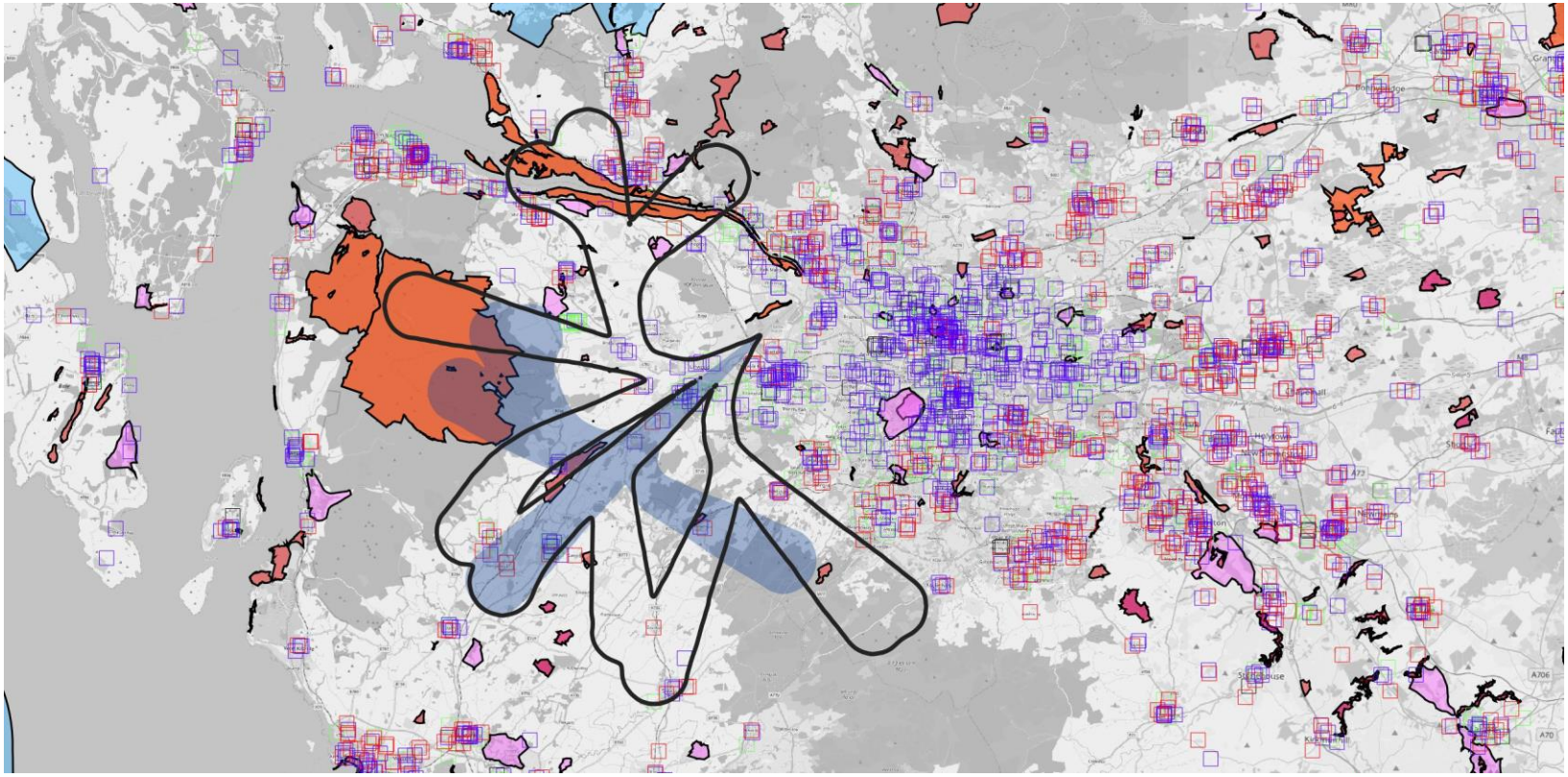


Option Overflight Contours (Black outline) with estimated % of overall departures (based on 4 peak hours a day)

2019 baseline average summer day overflight swathe:

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option D



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

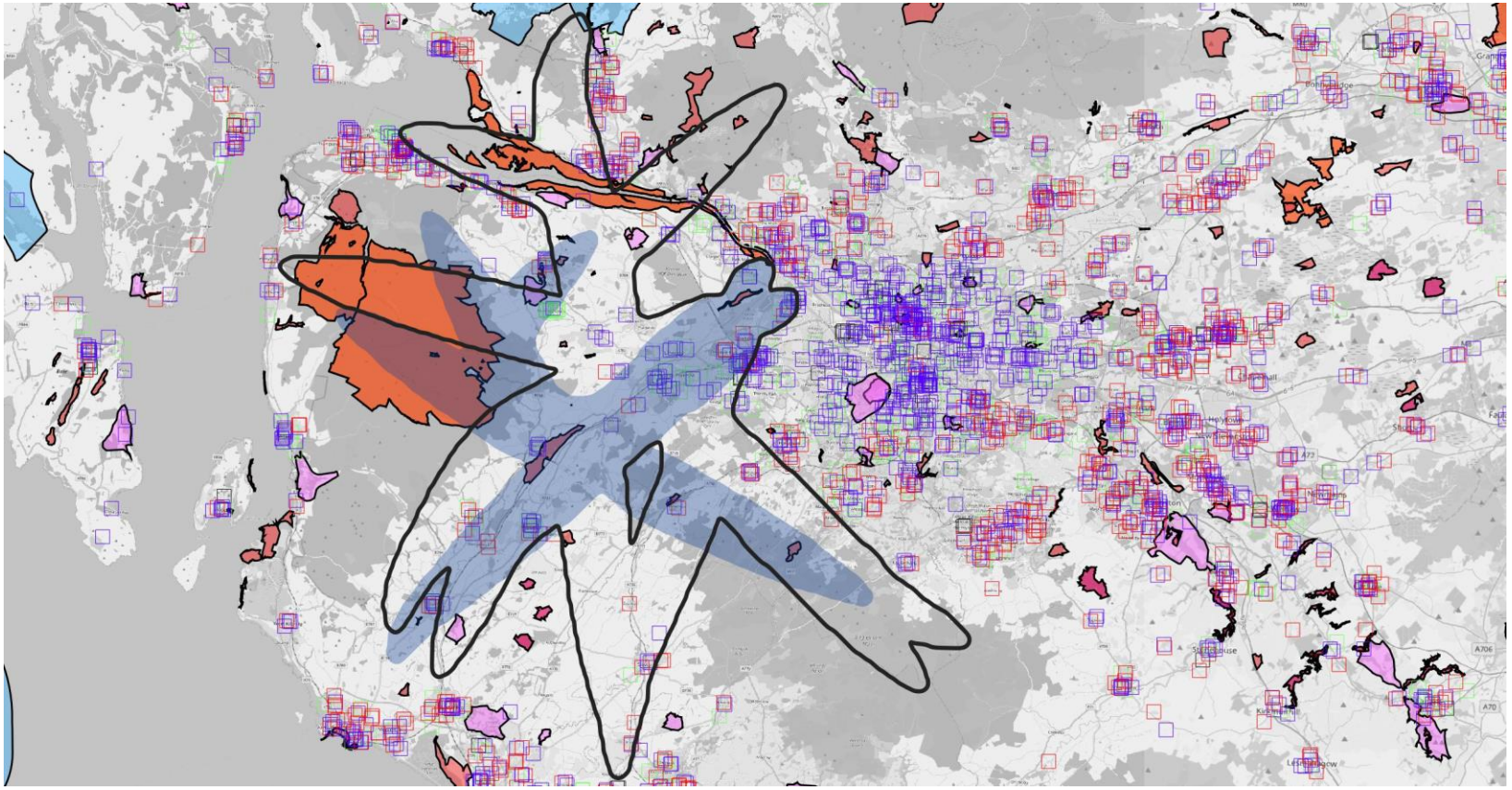
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	547.32	163216	1.00	0.02	5	5.29	3	1.42	32	65.82	12	58.95	1	1.68	0	0	43	1	47	109
RWY23 Baseline (Centreline)	141.18	29838	0	0	1	0.13	0	0	3	23.69	1	21.89	0	0	0	0	6	0	9	22
RWY23 Option D	332.84	82804	0	0	4	2.25	0	0	25	35.37	13	33.33	0	0	0	0	18	0	18	46

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option D



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

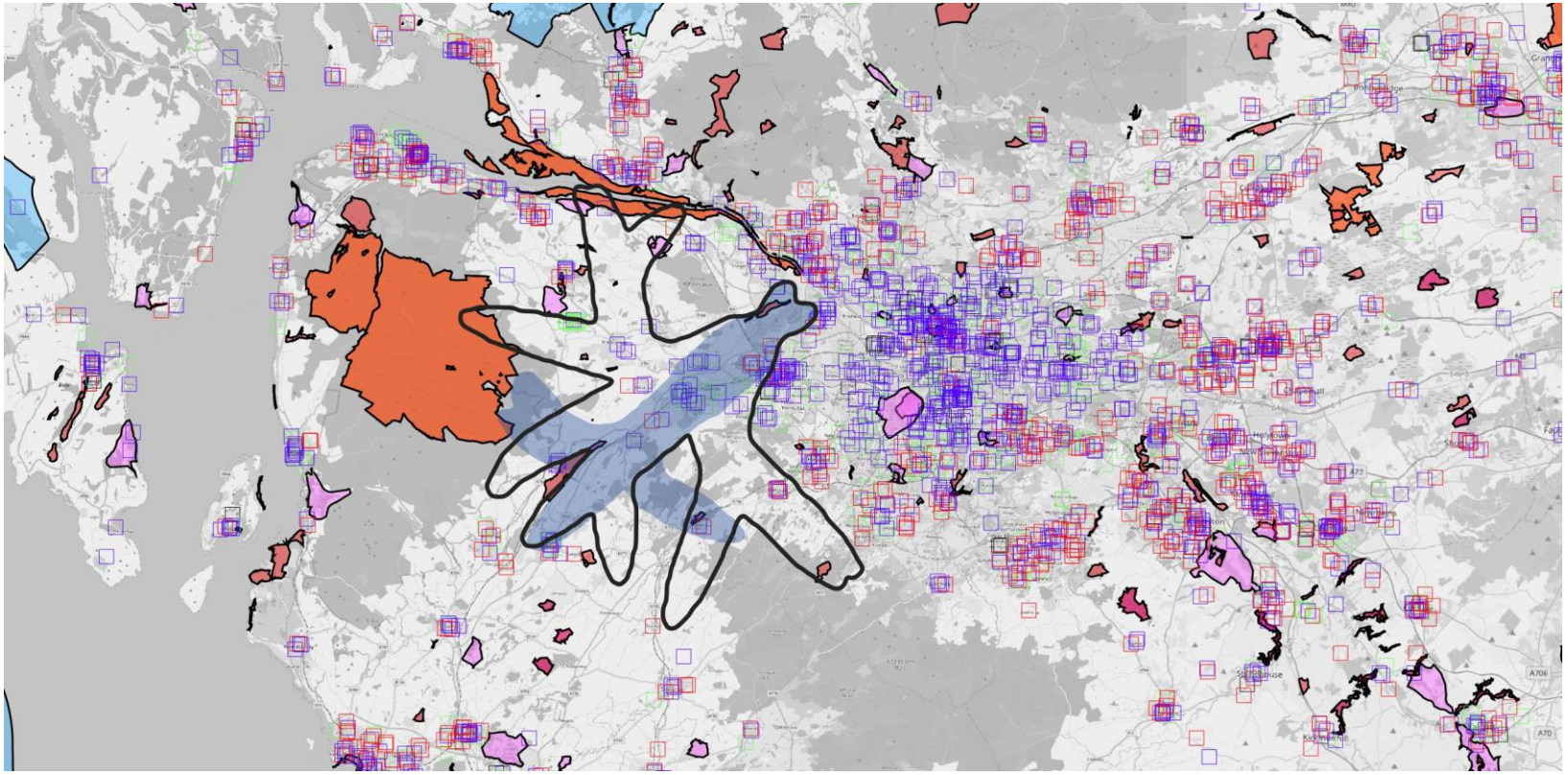
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	60dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	285.37	99120	0	0	2	1.8	0	0	11	43.89	4	40.28	0	0	0	0	14	0	28	58
RWY23 Option D	583.18	153095	1	0.43	5	4.38	0	0	37	56.43	19	51.32	1	5.46	0	0	27	2	37	85

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option D



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

65dB L_{Amax}																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	95.69	53704	0	0	0	0	0	0	4	2.62	2	1.01	0	0	0	0	5	0	14	30
RWY23 Option D	214.24	84120	0	0	3	1.34	0	0	14	7.39	4	5.73	0	0	0	0	9	0	22	41

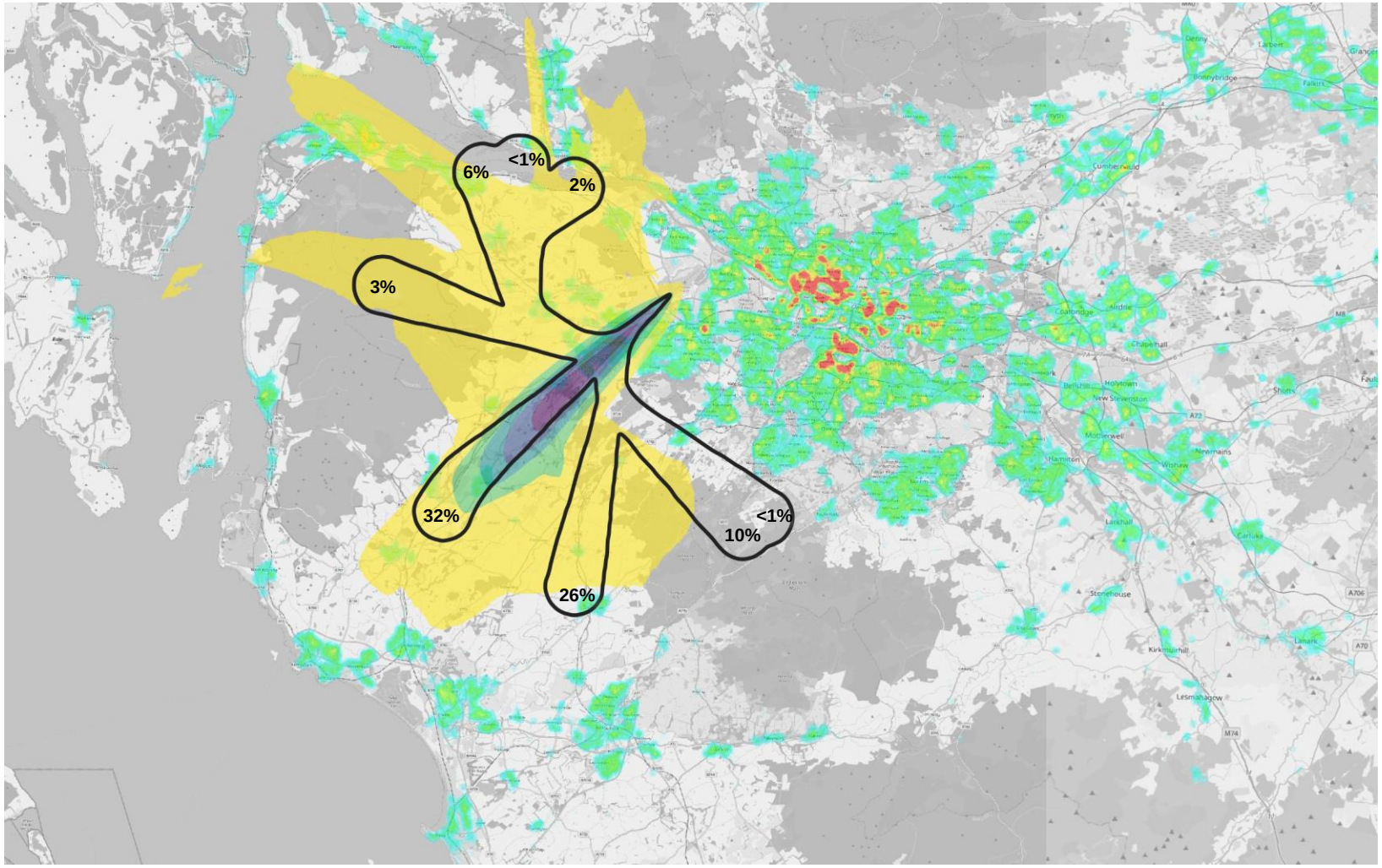
Runway 23 Departure Option E

Straight ahead departures only (no offsets) with turns at 1nm, 2nm and 9nm from the runway

NORBO is traffic is shared between a route that turns left at 2nm and one that doesn’t turn until 9nm from the runway.

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option E



Option Overflight Contours (Black outline) with estimated % of overall departures

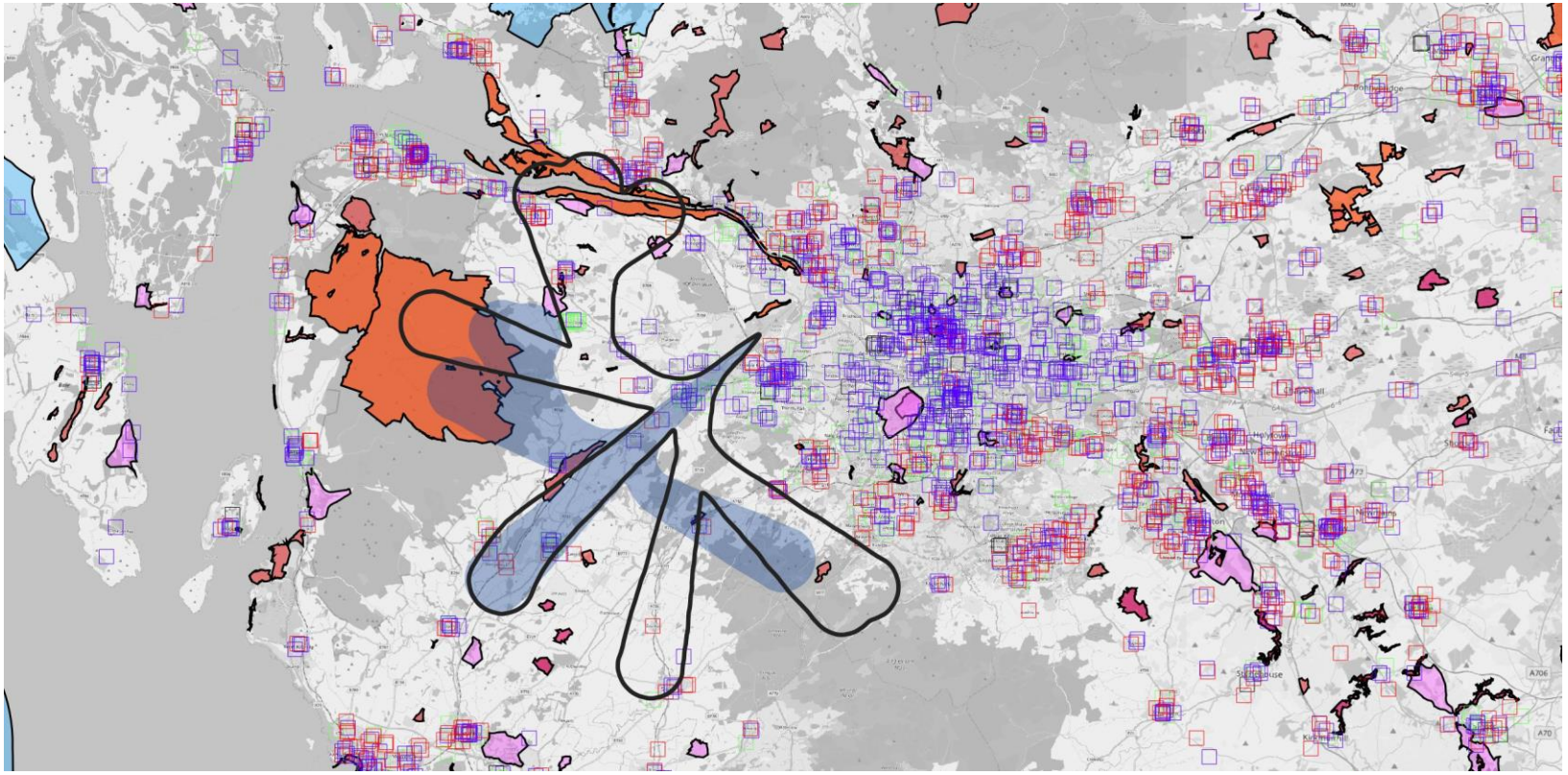
2019 baseline average summer day overflight swathe:

1

94

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option E



Option Overflight Contours (Black outline)

Baseline centreline overflight contours (Shaded blue)

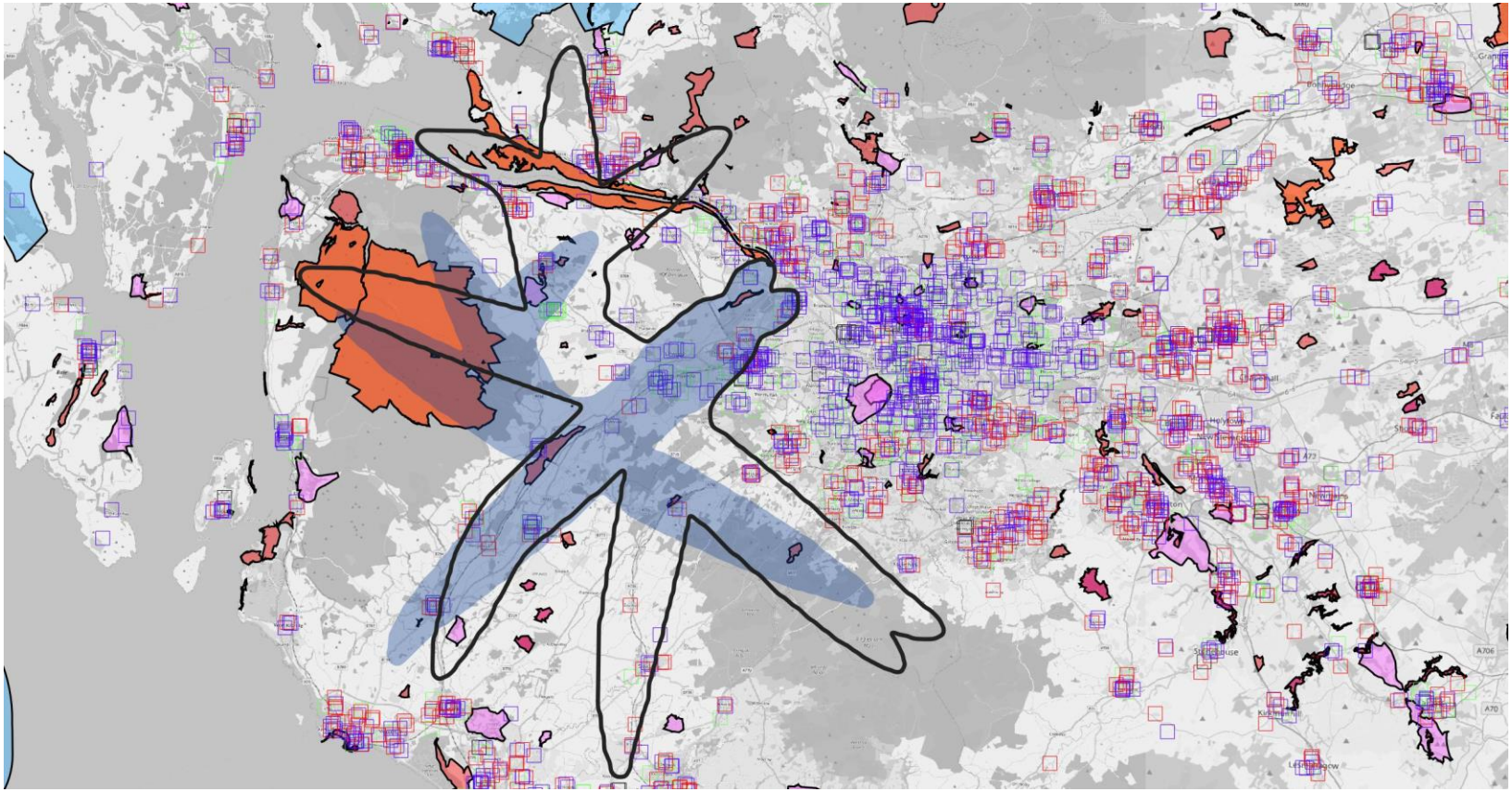
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

Overflight																			
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY 23 Baseline (Vectoring)	547.32	163216	1.00	0.02	5	5.29	3	1.42	32	65.82	12	58.95	1	1.68	0	0	43	1	47	109
RWY23 Baseline (Centreline)	141.18	29838	0	0	1	0.13	0	0	3	23.69	1	21.89	0	0	0	0	6	0	9	22
RWY23 Option E	248.01	69308	0	0	3	2.39	0	0	22	31.4	11	29.64	0	0	0	0	16	0	26	37

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option E



Option 60dB L_{Amax} Contours (Black outline)

Baseline centreline 60dB L_{Amax} contours (Shaded blue)

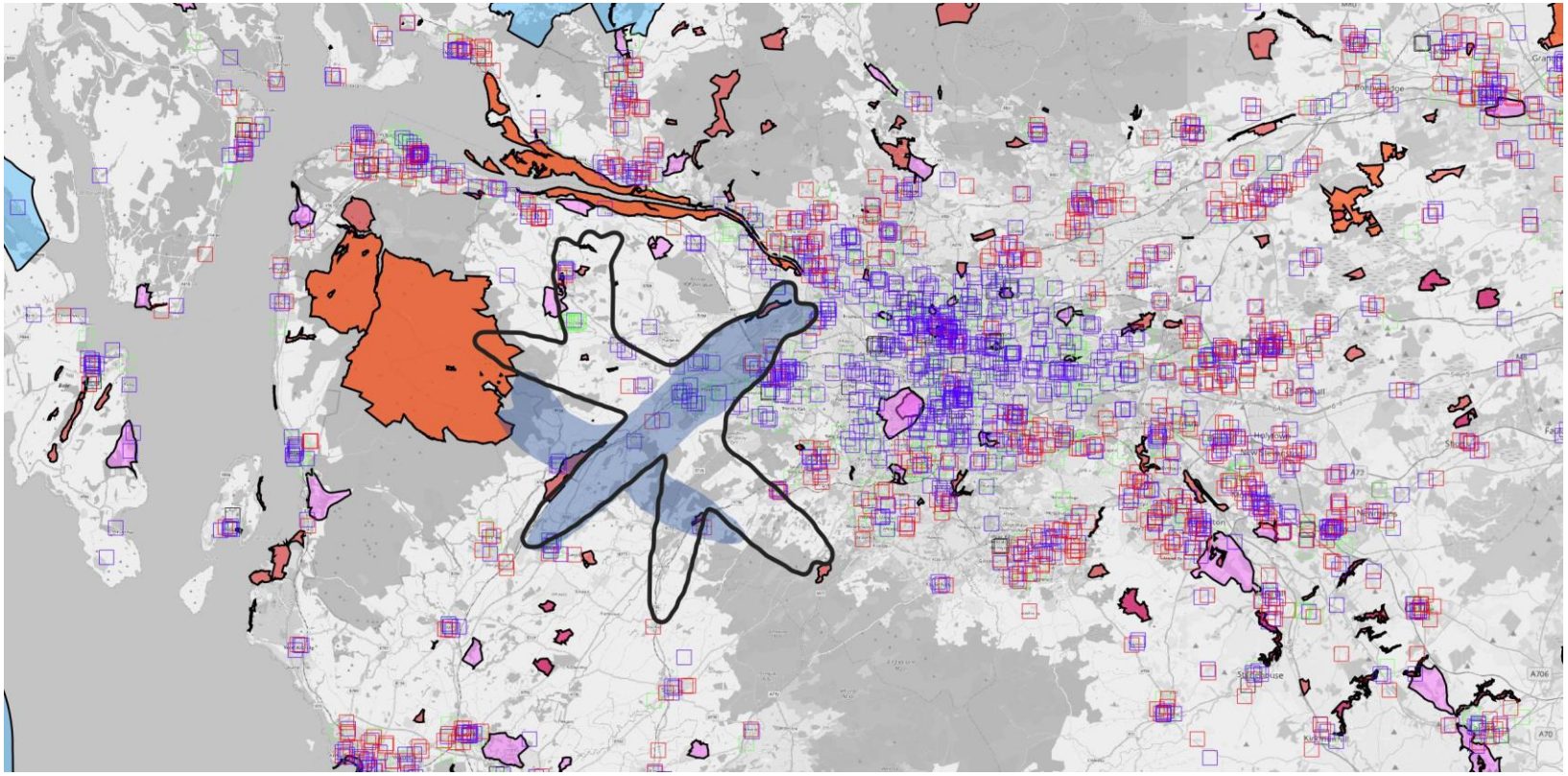
Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	60dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	285.37	99120	0	0	2	1.8	0	0	11	43.89	4	40.28	0	0	0	0	14	0	28	58
RWY23 Option E	458.27	139426	0	0	5	5.2	0	0	30	53.18	17	49.05	1	0.87	0	0	29	0	34	80

STAGE 2B INITIAL OPTIONS APPRAISAL TECHNICAL APPENDIX

Runway 23 Departure Option E



Option 65dB L_{Amax} Contours (Black outline)

Baseline centreline 65dB L_{Amax} contours (Shaded blue)

Data:

- Schools
- Nursing and residential home
- Places of worship
- Hospitals
- SSSI
- SPA
- SAC
- NSA
- Gardens and designated landscapes
- Designated quiet areas

	65dB L_{Amax}																		
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23 Baseline (Centreline)	95.69	53704	0	0	0	0	0	0	4	2.62	2	1.01	0	0	0	0	5	0	14	30
RWY23 Option E	161.26	64472	0	0	1	0.63	0	0	10	4.68	2	3.5	0	0	0	0	8	0	22	36

Runway 23 Departure Summary Tables

4. COMPREHENSIVE LIST OF OPTIONS: RUNWAY 23 DEPARTURES

Overflights (0-4000ft)																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23_BAS	25.12	16550	0	0	0	0	0	0	1	0.53	0	0	0	0	0	0	1	0	4	11
RWY23_A	64.15	30192	0	0	0	0	0	0	6	0.32	0	0	0	0	0	0	3	0	5	14
RWY23_B	56.86	25187	0	0	0	0	0	0	4	0.13	0	0	0	0	0	0	2	0	3	11
RWY23_C	76.74	31864	0	0	0	0	0	0	6	0.32	0	0	0	0	0	0	3	0	5	14
RWY23_D	80.18	46494	0	0	0	0	0	0	6	0.32	0	0	0	0	0	0	4	0	9	25
RWY23_E	57.78	27981	0	0	0	0	0	0	4	0.22	0	0	0	0	0	0	2	0	8	13

Overflights (0-7000ft)																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23_BAS	141.18	29838	0	0	1	0.13	0	0	3	23.69	1	21.89	0	0	0	0	6	0	9	22
RWY23_A	262.55	58671	0	0	4	2.25	0	0	26	34.66	13	33.33	0	0	0	0	14	0	10	30
RWY23_B	225.76	37664	0	0	4	2.25	3	0.87	27	35.78	13	33.33	0	0	0	0	8	0	5	20
RWY23_C	305.53	60931	0	0	4	2.25	3	0.87	30	35.97	13	33.33	0	0	0	0	14	0	10	30
RWY23_D	332.84	82804	0	0	4	2.25	0	0	25	35.37	13	33.33	0	0	0	0	18	0	18	46
RWY23_E	248.01	69308	0	0	3	2.39	0	0	22	31.4	11	29.64	0	0	0	0	16	0	26	37

4. COMPREHENSIVE LIST OF OPTIONS: RUNWAY 23 DEPARTURES

N60																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23_BAS	285.37	99120	0	0	2	1.8	0	0	11	43.89	4	40.28	0	0	0	0	14	0	28	58
RWY23_A	493.41	143425	1	0.43	4	3.31	0	0	36	55.1	19	51.32	1	5.46	0	0	24	2	33	78
RWY23_B	434.35	121890	1	0.43	5	3.38	3	1.42	37	54.43	19	50.77	1	5.46	0	0	18	2	29	65
RWY23_C	563.66	146232	1	0.43	5	3.38	3	1.42	40	56.96	19	51.32	1	5.46	0	0	26	2	33	78
RWY23_D	583.18	153095	1	0.43	5	4.38	0	0	37	56.43	19	51.32	1	5.46	0	0	27	2	37	85
RWY23_E	458.27	139426	0	0	5	5.2	0	0	30	53.18	17	49.05	1	0.87	0	0	29	0	34	80
N65																				
System	Area	Population	NSA count	NSA area	Parks and gardens count	Parks and gardens area	SAC count	SAC area	SSSI count	SSSI area	SPA count	SPA area	National Parks count	National Parks area	DQA count	DQA area	Schools count	Hospitals count	Carehomes count	Places of worship count
RWY23_BAS	95.69	53704	0	0	0	0	0	0	4	2.62	2	1.01	0	0	0	0	5	0	14	30
RWY23_A	178.62	77760	0	0	3	1.34	0	0	14	6.88	4	5.73	0	0	0	0	9	0	22	39
RWY23_B	160.28	70853	0	0	3	1.34	0	0	12	6.71	4	5.73	0	0	0	0	6	0	22	37
RWY23_C	206.59	80377	0	0	3	1.34	0	0	15	7.11	4	5.73	0	0	0	0	9	0	22	39
RWY23_D	214.24	84120	0	0	3	1.34	0	0	14	7.39	4	5.73	0	0	0	0	9	0	22	41
RWY23_E	161.26	64472	0	0	1	0.63	0	0	10	4.68	2	3.5	0	0	0	0	8	0	22	36

4. COMPREHENSIVE LIST OF OPTIONS: RUNWAY 23 DEPARTURES

Runway 23 Departures: Track Mileage

RWY 23		Baseline (Centreline)			A		B		C				D				E	
		nm	% Weighting	Score	nm	Score	nm	Score	nm P1	nm P2	Average	Score	nm P1	nm P2	Average	Score	nm P1	Score
DEPS	TRN	38.50	3.69	142.065	39.4	145.386	37.5	138.375	39.4	37.5	38.45	141.8805	39.4	37.8	38.6	142.434	37.8	139.482
	NORBO - SUBUK	93.40	26.2	2447.08	94.3	2470.66	91.6	2399.92	94.3	91.6	92.95	2435.29	94.3	92.5	93.4	2447.08	92.5	2423.5
	NORBO - LAKEY	93.40	32	2988.8	84.4	2700.8	85.1	2723.2	84.4	85.1	84.75	2712	84.4	85.6	85	2720	83	2656
	LUSIV-DCS	84.80	10.66	903.968	81.3	866.658	81.3	866.658	81.3	81.3	81.3	866.658	81.3	81.3	81.3	866.658	81.7	870.922
	TLA	54.70	0.41	22.427	47.9	19.639	47.9	19.639	47.9	47.9	47.9	19.639	47.9	47.9	47.9	19.639	49	20.09
	PERTH	69.80	1.23	85.854	60.2	74.046	60.2	74.046	60.2	60.2	60.2	74.046	60.2	60.2	60.2	74.046	62.6	76.998
	FOYLE	33.00	0.82	27.06	26.3	21.566	26.3	21.566	26.3	26.3	26.3	21.566	26.3	26.3	26.3	21.566	27.7	22.714
	LOMON	26.70	2.05	54.735	18.1	37.105	18.1	37.105	18.1	18.1	18.1	37.105	18.1	18.1	18.1	37.105	19.5	39.975
	CLYDE	19.50	2.87	55.965	16.7	47.929	16.7	47.929	16.7	16.7	16.7	47.929	16.7	16.7	16.7	47.929	17.6	50.512
	ROBBO	19.60	2.05	40.18	17.1	35.055	17.1	35.055	17.1	17.1	17.1	35.055	17.1	17.1	17.1	35.055	17.4	35.67
Total				6768.134		6418.844		6363.493				6391.169				6411.512		6335.863