London Oxford Airport

AIRSPACE CHANGE PROPOSAL ACP-2023-033

Stage 1 Current Day - Noise

70123687_R01_REV02
JUNE 2024

PUBLIC

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London Oxford Airport

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Stage 1 Current Day - Noise

WSP

8 First Street
Manchester
M15 4RP

Phone: +44 161 200 5000

WSP.com

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Prepared by	N Bolton	N Bolton
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Checked by	L Watt	L Watt
Signature		cc Bolton, Nicola (UKNMH003) Digitally signed by Bolton, Nicola (UKNMH003) DN: cn=Bolton, Nicola (UKNMH003), ou=Active, email=Nicola.Bolton@wsp.com Date: 2024.06.13 12:37:35 +01'00'
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Signature		cc Bolton, Nicola (UKNMH003) Digitally signed by Bolton, Nicola (UKNMH003) DN: cn=Bolton, Nicola (UKNMH003), ou=Active, email=Nicola.Bolton@wsp.com Date: 2024.06.13 12:38:43 +01'00'
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1 INTRODUCTION

1.1.1. London Oxford Airport has commenced an Airspace Change Proposal (ACP-2023-033) to be delivered under CAP1616. Stage 1 of the CAP1616 process requires that the ‘current day’ scenario is described. As part of the current-day scenario, environmental impacts relevant to the airspace change proposal should be included. Current-day noise is one such environmental impact to be included.

1.1.2. WSP have been appointed by London Oxford Airport to develop and present the current-day scenario specific to noise.

1.1.3. This report sets out the approach and methodology adopted to develop and define the current-day noise applicable to London Oxford Airport aviation operations.

1.1.4. Aircraft noise modelling has been undertaken, adopting available information on current aircraft operations applicable to the landing and take-off cycle (air noise) at the airport. The outcome of the noise modelling exercise has been used to address the associated requirements of CAP1616 specifically relating to the current-day scenario.

2 SITE DESCRIPTION

2.1.1. London Oxford Airport is located to the north of Oxford on the outskirts of Kidlington. The urban areas of Thrupp, Shipton-on-Cherwell, Bunkershill, Woodstock, Blandon, Begbroke, Yarnton and Kidlington are those closest to the airport and can be seen in Figure 1.

2.1.2. RAF Brize Norton and associated Control Zone is located to the south west of the airport. All aircraft conducting an instrument arrival on runway 01 and all jets and large aircraft conducting a straight-in approach under Instrument Flight Rules (IFR) or Visual Flight Rules (VFR) require a specific permission to enter the Control Zone. All other aircraft operating from / to London Oxford Airport must avoid the Brize Norton Control Zone unless specific permission to enter is granted.

2.1.3. The main airport runway is 1526 m long orientated at an angle of 10 degrees from the geographic north with runway ends designated 01 and 19.

2.1.4. The airport hosts pilot training schools, aircraft maintenance companies, business aircraft and air taxi operators.

2.1.5. Operational hours encompass 06:30 to 22:30, seven days a week. Operations between 06:00 to midnight are permitted where an opening extension has been agreed.

2.1.6. As part of its Airspace Change Proposal, Oxford Aviation Services Limited (OASL) proposes to modernise its air navigation procedures and associated infrastructure. It aims to introduce a 3D instrument Approach to Runway 01 and introduce Required Navigation Performance (RNP) Approaches to runways 01 and 19.

3 GUIDANCE

3.1.1. Guidance applicable to the scope of this report is summarised below.

3.2 UK CIVIL AVIATION AUTHORITY, CAP 1616 AIRSPACE CHANGE PROCESS

3.2.1. CAP 1616 outlines the process for airspace change in the UK. The supporting documents provide guidance on how to develop a submission in accordance with the requirements for assessment by the Civil Aviation Authority (CAA). The guidance documents are:

- CAP 1616f, Guidance on Airspace Change Process for Permanent Airspace Change Proposals, November 2023
- CAP 1616g, Guidance on Airspace Change Process for Temporary and Trial Airspace Change Proposals, February 2024
- CAP 1616h, Guidance on Airspace Change Process for Level 3 and Pre-Scaled Airspace Change Proposals, November 2023
- CAP 1616i, Environmental Assessment Requirements and Guidance for Airspace Change Proposals, November 2023

3.2.2. Permanent airspace change proposals are assigned a 'level' (1 – 3) depending on the characteristics of the change and potential for impacts. The allocation of levels enables the airspace change process to be applied in a proportionate way.

3.2.3. Stage 1 of the process is where the 'change sponsor' defines their requirement for a proposed change to airspace design. As part of this process, the current-day scenario is to be described and design principles developed.

3.3 UK CIVIL AVIATION AUTHORITY, CAP 1616F, GUIDANCE ON AIRSPACE CHANGE PROCESS FOR PERMANENT AIRSPACE CHANGE PROPOSALS

3.3.1. CAP 1616f provides guidance on the airspace change process for permanent airspace change proposals as is relevant in this case. It provides guidance on the specific requirements and activities throughout the seven stages of the airspace change process.

3.3.2. Applicable to Stage 1 of the process, the current-day scenario must be developed as it provides a clear description of the current aviation activity and associated impacts and sets out the context for all stages of the airspace change process. The level of detail to be included is determined by the level of airspace change proposal.

3.3.3. For Level 1 and Level 2 proposals, the current-day scenario and a list design principles must be shared with relevant stakeholders and feedback sought to inform the content and development of these outputs. This Airspace Change Proposal for London Oxford Airport is currently classified as being Level 1.

3.3.4. The current-day scenario is to provide a clear description of the current impacts and will inform the selection and development of relevant design principles to be applied at Stage 2. Of relevance to environmental impacts and noise, the current day scenario must include "*environmental impacts* *relevant to the airspace change proposal including current-day noise and local air quality impacts on people, greenhouse gas emissions, tranquillity and biodiversity*".

3.4 UK CIVIL AVIATION AUTHORITY, CAP 1616i, ENVIRONMENTAL ASSESSMENT REQUIREMENTS AND GUIDANCE FOR AIRSPACE

3.4.1. CAP 1616i provides requirements and guidance on performing environmental assessments that must be undertaken for all airspace change proposals.

3.4.2. Chapter 5 of CAP 1616i relates specifically to noise and prescribes the general principles for noise modelling, referencing CAP 2091, CAA Policy on Minimum Standards for Noise Modelling.

3.4.3. The sophistication with which the CAA require an airport to model noise depends on the number of people exposed to noise at the airport. The category of noise modelling required is based on the highest category calculated for their 51 dB $L_{Aeq,\ 16h}$ daytime and 45 dB $L_{Aeq,8h}$ night-time contours for the 10-year forecast period (either before or after the proposed airspace change, whichever is greater).

3.4.4. It is acceptable to use current noise modelling methodology to undertake the CAP 2091 category assessment, even if the assessment shows that the noise modelling methodology needs to be improved in order to complete the options appraisals.

3.4.5. If there is currently no noise modelling methodology in place, then it will be acceptable to use Category E to demonstrate the correct category that applies to the airport.

3.4.6. The noise contours must be produced using a recognised and validated noise model such as the UK CAA Aircraft Noise Contour Model (ANCON), EUROCONTROL IMPACT or the US Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT).

3.4.7. For runway modal split, given variability from year to year, it is recommended that average summer day contours be produced using long-term average runway usage.

3.4.8. Terrain adjustments must be included to ensure that the height of the aircraft relative to the ground is accounted for.

3.4.9. Account must be taken of lateral flight path dispersion as per the applicable CAP 2091 category. Indications should be provided of the likely lateral dispersion of traffic about centre lines of flight routes.

3.4.10. The change sponsors must provide a description of the vertical distribution of traffic, standard instrument departures, standard arrival procedures, instrument approach procedures, noise preferential routes (NPR) and other arrangements that influence positioning traffic over a particular area.

3.4.11. Effects related to health and quality of life must be assessed above the lowest observed adverse effect level (LOAEL), 51 dB $L_{Aeq,\ 16h}$ daytime and 45 dB $L_{Aeq,\ 8h}$ night-time. Noise exposure contours must be calculated for an average summer day period (16 June to 15 September inclusive) between 0700 and 2300 local time i.e. $L_{Aeq,\ 16h}$. Where changes are proposed during the night-time, aircraft noise must be calculated for an average summer night (16 June to 15 September inclusive), between 23:00 and 07:00 local time i.e. $L_{Aeq,\ 8h}$. The $L_{Aeq,\ 16h}$ and $L_{Aeq,\ 8h}$ are referred to as 'Primary Noise Metrics'. Contours must be presented from 51 dB $L_{Aeq,\ 16h}$ and 45 dB $L_{Aeq,\ 8h}$ at 3 dB intervals.

3.4.12. The $L_{Aeq, 16h}$ and $L_{Aeq, 8h}$ noise contours must be portrayed where proposals are likely to result in a change in traffic patterns, traffic volumes or fleet mix below 7,000 feet.

3.4.13. In order to explain noise exposure, a table must be produced showing the following data for each 3 dB contour interval:

- Area (km^2)
- Population (thousands) – rounded to the nearest hundred
- Noise sensitive buildings (e.g. hospitals, places of worship, schools)

3.4.14. Operational diagrams must be presented portraying a representation of how the airspace is used / is to be used.

3.5 CAA POLICY ON MINIMUM STANDARDS FOR NOISE MODELLING

3.5.1. In this policy, the CAA specifies the minimum acceptable level of sophistication of noise modelling that can be used to provide the CAA with the outputs required.

3.5.2. The level of sophistication required is proportionate to the number of people exposed to noise at a specific airport. The more people exposed, the greater the sophistication required.

3.5.3. The policy refers to five Categories of noise modelling (A to E), with Category A being the most sophisticate and E the least. It provides a description of each category as tabulated as follows:

Table 3-1 - CAA Policy on minimum standards for noise modelling – summary of categories

Category	Aircraft noise		Aircraft Tracks (arrival and departure routes)		
	Noise data	Flight profiles	Centreline (Mean Track)	Dispersion (variation around centreline)	Usage (allocation of traffic to routes)
A	ICAO dataset modified for local noise monitor data for all aircraft types	Local track-keeping data	Local track-keeping data	Local track-keeping data	Local track-keeping data
B	ICAO dataset validated by local noise monitor data for major aircraft types	Local track-keeping data	Local track-keeping data	Local track-keeping data	Local track-keeping data
C	ICAO dataset	Local track-keeping data for major aircraft types	Local track-keeping data	Local track-keeping data	Local track-keeping data
D*	ICAO dataset	ICAO dataset	Local data from airport	ECAC guidance or data from airport	Local data from airport
E	ICAO dataset	ICAO dataset	Local data from airport	ECAC guidance or data from airport	Local data from airport
* The CAA is currently consulting on a new definition of Category D.					

3.5.4. The policy presents tables showing the thresholds for noise modelling categories applicable to $L_{Aeq,\ 16h}$ and $L_{Aeq,\ 8h}$ respectively, these are presented below:

Table 3-2 - Thresholds for noise modelling Categories, average summer day, population exposed to 51 dB $L_{Aeq, 16h}$ or above

Category	Lower threshold	Recommended minimum threshold	Mandated minimum threshold	Maximum threshold
A	0	400,000	500,000	None
B	0	160,000	200,000	500,000
C	0	20,000	25,000	200,000
D	0	1,600	2,000	25,000
E	0	0	0	2,000

Table 3-3 - Thresholds for noise modelling Categories, average night, population exposed to 45 dB $L_{Aeq, 8h}$ or above

Category	Lower threshold	Recommended minimum threshold	Mandated minimum threshold	Maximum threshold
A	0	400,000	500,000	None
B	0	160,000	200,000	500,000
C	0	20,000	25,000	200,000
D	0	1,600	2,000	25,000
E	0	0	0	2,000

4 METHODOLOGY

4.1.1. The airspace change proposal is currently assigned as CAP 1616 Level 1. Considering the size of the airport and associated scale of operations, it is anticipated that Category D / E modelling requirements are appropriate in accordance with the CAA Policy on Minimum Standards for Noise Modelling. Given that there is currently no modelling methodology in place for the airport, this is further support for the appropriate application of Category D / E modelling requirements which have been adopted for the purpose of defining the current-day scenario.

INFORMATION SOURCES

4.1.2. In addition to technical discussions with the airport, the following information sources have been used to inform the noise modelling approach:

- National Air Traffic Services (NATS) Aeronautical Information Publication (AIP) [Ref.1]
- Oxford Airport Noise Abatement Scheme [Ref.2]
- London Oxford Airport – Local Airspace to London Oxford Airport (presentation document) [Ref.3]
- Airspace Change Proposal – ACP – 2023-033, CAP 1616 Design Principles – Stakeholder Engagement, Letter dated 13 March 2024 [Ref.4]
- London Oxford Airport Circuit Pattern, Revision 6 – 2021 [Ref.5]
- Activity logs collected and provided by London Oxford Airport for 2023. [Ref.6]
- Weather data recorded and provided by the airport operator (average 2023 92-day temperature, pressure, dew point, wind speed and wind direction).

PREDICTION METHODOLOGY

4.1.3. Noise propagation from fixed wing aircraft arriving and departing has been assessed using the United States (US) Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT) Version 3f computational noise modelling software. The modelling and assessment considers attenuation due to distance, atmospheric absorption (in accordance with SAE-ARP-866[1]), topography of the surrounding areas and considers prevailing weather conditions (including wind), at the site.

4.1.4. AEDT calculates the noise level in 2-dimensional grids, set to 0.01 x 0.01 nautical miles (20 metres x 20 metres). The noise levels at each grid point are calculated. Grid points with equal noise levels are joined to give a plot of the noise contour for the relevant noise metric.

[1] SAE International Standard SAE-ARP-866 Standard Values of Atmospheric Absorption as a Function of Temperature and Humidity, published 2012

4.1.5. The noise model adopts standard noise data and flight profiles embedded within the AEDT software for each aircraft type. This approach corresponds with noise modelling category D set out within the CAA policy on minimum standards for noise modelling.

4.1.6. The AEDT software includes noise information for a wide selection of common aircraft types, but does not include every aircraft type. Therefore, the logged aircraft types have been mapped to aircraft types in the AEDT software. For most aircraft, if not directly available in the software, substitutions are proposed by the software, where a similar alternative aircraft type is used to model the actual type. Where the AEDT database has no guidance, an aircraft type has been assigned based on the aircraft size and engine details.

4.1.7. Fixed wing aircraft movements for the latest full 92 day summer period (2023) have been modelled.

4.1.8. Helicopters have been excluded from the noise model, but have been considered separately in terms of spot noise levels at a sample of sensitive receptor locations.

4.1.9. The information sources listed above have been used to define model input parameters for the airport geometry, namely runway end and helipad coordinates. This information is summarised in Table 4-1.

Table 4-1 – Airfield Geometry

RUNWAY END	COORDINATES
Runway End 19	-1.3180060386657,7 51.8433570861816
Runway End 01	-1.3220579624176, 51.8300514221191

4.1.10. The noise model incorporates terrain data using publicly available 2m LiDAR topography data. To ensure compatibility with AEDT, the terrain was projected into the WGS84 geographic projection system.

AIRCRAFT ROUTES

4.1.11. The current-day scenario has been modelled to reflect the airport's existing airspace arrangements.

4.1.12. The airport does not implement defined routes for arriving and departing aircraft and does not collect noise and track keeping data.

4.1.13. The information and diagrams set out within the available information sources for noise abatement routes and circuits have been used, along with input from the airport operator, to generate a set of routes which best approximate arrival and departure routes.

4.1.14. The published procedures set out within the Noise Abatement Scheme 2023 [Ref.2] have been used to define routes included within the AEDT model. These procedures are either regulated by law (the Air Navigation Order) or imposed by the airport in an effort to reduce the effect of aircraft noise on the local community. The routes include circuits, fixed wing departures, fixed wing arrivals, and rotary aircraft routes, and have been defined in consultation with London Oxford Airport and are presented in Figure 9. The defined routes do not cover all situations and are not mandated but are considered to be the best representation for noise modelling purposes.

4.1.15. When Runway 01 is in use, most aircraft arriving from the north and undertaking visual landings under VFR will turn to avoid the Brize Norton Control Zone. All jets, large aircraft and instrument arrivals must however enter the Brize Norton Control Zone and are therefore assumed to be in line with the runway from 6 to 8 nm out.

4.1.16. When Runway 19 is in use, approaches join the instrument approach typically 6 to 8 nm out from the runway (i.e. straight approaches in line with the runway). All jets and large aircraft not on instrument approaches will similarly be assumed to be in line with the runway from 6-8 nm out.

4.1.17. Flight routes refer to ground tracks followed by aircraft. Given that all aircraft do not precisely follow defined tracks, allowance has been made for divergence from the defined tracks. For modelling purposes, it is considered sufficient to model each route using a backbone track, as well as a number of sub-tracks either side of the backbone tracks to represent the variation in actual routes flown. Tracks have therefore been dispersed within the AEDT model applying 7 tracks (3 each side of a backbone track) which cover a broad swathe. A standard percentage distribution of flights has been applied on each sub-track (65% backbone, 25% closest to backbone, 10% furthest from backbone). Applied dispersion has been informed by consultation discussions with London Oxford Airport and applying a normal distribution about the sub-tracks.

4.1.18. Using the operational data provided by London Oxford Airport, fixed wing aircraft movements have been assigned to tracks adopting the following approach:

- Circuits have been identified by London Oxford Airport using a set of rules relating to the operational data, considering aircraft registrations, movement times, and the order of movement type (arrivals and landings). Circuits have been included within the AEDT model as touch and go movements.
- 4% of circuit flights have been assigned to the western circuit with the remainder (96%) to the east.
- Direction of circuits have been assigned based on the provided operational data.
- Arrivals on Runway 19 have been assigned based on the operational data with all aircraft using a straight approach.
- Arrivals on Runway 01 have been assigned based on aircraft type with instrument approaches, jets and large aircraft taking a straight approach and remaining aircraft taking a curved approach so as to avoid the Brize Norton control zone.
- Departures on Runway 19 – 5% of large aircraft and jets have been assigned a straight departure route. Remaining air traffic movements have been assigned evenly between remaining departure routes
- Departures on Runway 01 – All large aircraft and jets have been assigned a straight departure. Route. Remaining air traffic movements have been assigned evenly between remaining departure routes.
- Modal split has been assigned based on the provided operational data.

CURRENT DAY ACTIVITY

4.1.19. A current-day scenario for 2023 has been modelled. This has been based on airfield activity logs provided by London Oxford Airport. These logs have provided the following information with respect to each aircraft operation:

- Date and time
- Arrival / Departure designation
- Aircraft type
- Runway direction / mode
- Flight number
- Movement type (i.e. test & training, private, positioning.
- Flight rules (i.e. Instrument or Visual)

4.1.20. The flight logs do not provide specific information on use of circuits. Consequently, aircraft movements have been assigned to circuits using information provided by the airport and therefore informed by detailed understanding of operations undertaken.

4.1.21. Using the 2023 activity logs and available track information, a current-day noise model has been prepared for fixed wing aircraft movements. Appendix A presents the total number of average day (07:00 – 22:59) and night (23:00 – 06:59) fixed wing aircraft movements incorporated within the model and depicts the 2023 92-day summer period (16 June – 15 September inclusive).

4.1.22. Runway modal split has been applied directly based on the flight log data provided by London Oxford Airport.

4.1.23. Arrivals on Runway 19 have been modelled in line with the runway from a distance of 8 nm. Arrivals on Runway 01 for instrument approaches and jets and large aircraft on visual straight-in approaches have been modelled in line with the runway from a distance of 8 nm. All remaining approaches on Runway 01 have been assigned a route so as to avoid the Brize Norton Control Zone.

4.1.24. A summary of model inputs and assumptions is presented in Table 4.2.

Table 4-2 – Summary of model inputs and assumptions

Parameter	Description	Assumptions
Assessment Year	2023	
Hours of operation	06:30 – 22:30 hour 06:00 – 00:00 for special events	
Total aircraft movements (fixed-wing & rotary) 16 June – 15 September 2023 (inclusive)	Daytime (07:00 – 22:59): 17,683 Night-time (23:00 – 06:59): 32	
Total helicopter movements 16 June – 15 September 2023 (inclusive)	Daytime (07:00 – 22:59):1,899 Nighttime (23:00 – 06:59): 3	
Total fixed wing movements (including circuits) 16 June – 15 September 2023 (inclusive)	Daytime (07:00 – 22:59): 15,784 Nighttime (23:00 – 06:59): 29	
Total fixed wing circuit movements 16 June 15 September 2023 (inclusive)	Daytime (07:00 – 22:59): 2,914 Nighttime (23:00 – 06:59):0	Assumed that circuits won't be used at night 96% on circuit to east of runway, 4% on circuit to west of runway
Total fixed wing departing South, arriving North (excluding circuits) – Runway 19	Daytime (07:00 – 22:59): 10,602 (82%) Nighttime (23:00 – 06:59):27(93%)	Aircraft not on circuits split between Runway19 departure routes
Fixed Wing Departing North, Arriving South (excluding circuits) – Runway 01	Daytime (07:00 – 22:59): 22,67 (18%) Nighttime (23:00 – 06:59): 2 (7%)	Aircraft not on circuits split between Runway 01 departure routes

4.1.25. Appendix A presents the total number day / night movements in the 2023 92-day period (16 June – 15 September)

NOISE METRICS

4.1.26. In line with CAP1616, the AEDT noise model has been used to prepare the following standard noise metrics representing 2023 current-day (daytime and night-time) operations:

- L_{Aeq} noise contours representing actual runway modal split (fixed wing)
- L_{Aeq} noise contours representing 100% runway mode operations (fixed wing)
- N_x contours (fixed wing)

- L_{AFmax} spot levels for a selection of the noisiest and most frequent aircraft types (fixed and rotary wing) at representative residential receptor locations (see Figure 1)

4.1.27. Noise contour plots representing the above calculated metrics are presented in Figures 2 to 8 of this report.

5 RESULTS

5.1.1. The results of the 2023 average summer day modelling for London Oxford Airport are shown below. Results are presented for households, population, places of worship and educational facilities identified in each contour band. It has been identified that there are no hospitals falling within the generated noise contours:

Table 5-1 – 2023 average summer day $L_{Aeq, 16hr}$ contours – estimated areas, populations, households, places of worship and educational facilities – mixed runway mode

dB $L_{Aeq, 16hr}$	Area (sq. km)	Population*	Households	Places of worship	Schools / education facilities
>51	16.3	1300	600	3	2
>54	10.0	500	200	3	2
>57	6.3	300	100	3	1
>60	3.8	100	100	1	0
>63	2.3	<100	<100	0	0
>66	1.4	<100	<100	0	0
>69	0.8	<100	<100	0	0
>72	0.5	<100	<100	0	0

* Population calculated based on national average household size of 2.3.2

Note: Population and household numbers are rounded to nearest 100.

2 Department for Transport, Transport Analysis Guidance (TAG) Unit A3 Environmental Impact Appraisal, No60vember 2023

Table 5-2 – 2023 average summer day $L_{Aeq, 8hr}$ contours – estimated areas, populations, households, places of worship and educational facilities – mixed runway mode

dB $L_{Aeq, 8hr}$	Area (sq. km)	Population	Households	Places of worship	Schools / education facilities
>45	0.7	<100	<100	0	0
>48	0.4	0	0	0	0
>51	0.2	0	0	0	0
>54	0.1	0	0	0	0
>57	0.1	0	0	0	0
>60	0.0	0	0	0	0
>63	0.0	0	0	0	0
>66	0.0	0	0	0	0

* Population calculated based on national average household size of 2.3.

Note: Population and household numbers are rounded to nearest 100.

Table 5-3 – 2023 average summer day $L_{Aeq, 16hr}$ contours – estimated areas, populations, households, places of worship and educational facilities – 100% runway mode 01

dB $L_{Aeq, 16hr}$	Area (sq. km)	Population	Households	Places of worship	Schools / education facilities
>51	17.8	800	300	1	3
>54	10.5	500	200	0	2
>57	6.5	300	100	0	0
>60	4.1	200	<100	0	0
>63	2.6	100	<100	0	0
>66	1.6	100	<100	0	0
>69	1.0	<100	<100	0	0
>72	0.6	<100	<100	0	0

* Population calculated based on national average household size of 2.3.

Note: Population and household numbers are rounded to nearest 100.

Table 5-4 – 2023 average summer day $L_{Aeq, 8hr}$ contours – estimated areas, populations, households, places of worship and educational facilities – 100% runway mode 01

dB $L_{Aeq, 8hr}$	Area (sq. km)	Population	Households	Places of worship	Schools / education facilities
>45	0.9	<100	<100	0	0
>48	0.5	<100	<100	0	0
>51	0.3	<100	<100	0	0
>54	0.1	0	0	0	0
>57	0.1	0	0	0	0
>60	0.0	0	0	0	0
>63	0.0	0	0	0	0
>66	0.0	0	0	0	0

* Population calculated based on national average household size of 2.3.

Note: Population and household numbers are rounded to nearest 100.

Table 5-5 – 2023 average summer day $L_{Aeq, 16hr}$ contours – estimated areas, populations, households, places of worship and educational facilities – 100% runway mode 19

dB $L_{Aeq, 16hr}$	Area (sq. km)	Population	Households	Places of worship	Schools / education facilities
>51	18.0	1500	600	4	3
>54	10.8	700	300	3	2
>57	6.8	300	100	3	2
>60	4.3	200	100	1	0
>63	2.6	100	<100	0	0
>66	1.6	<100	<100	0	0
>69	0.9	<100	<100	0	0
>72	0.5	0	0	0	0

* Population calculated based on national average household size of 2.3.

Note: Population and household numbers are rounded to nearest 100.

Table 5-6 – 2023 average summer day $L_{Aeq, 8hr}$ contours – estimated areas, populations, households, places of worship and educational facilities – 100% runway mode 19

dB $L_{Aeq, 8hr}$	Area (sq. km)	Population	Households	Places of worship	Schools / education facilities
>45	0.7	<100	<100	0	0
>48	0.4	0	0	0	0
>51	0.2	0	0	0	0
>54	0.1	0	0	0	0
>57	0.1	0	0	0	0
>60	0.0	0	0	0	0
>63	0.0	0	0	0	0
>66	0.0	0	0	0	0

* Population calculated based on national average household size of 2.3.

Note: Population and household numbers are rounded to nearest 100.

Table 5-7 – 2023 N65 daytime contours – estimated areas, populations, households, places of worship and educational facilities – mixed runway mode

No of events	Area (sq. km)	Population	Households	Places of worship	Schools / education facilities
5	66.4	22000	9600	26	28
10	55.7	16700	7300	23	21
20	22.1	3000	1300	11	6
50	7.8	700	300	3	2
100	2.1	100	<100	0	0
200	0	0	0	0	0

* Population calculated based on national average household size of 2.3.

Note: Population and household numbers are rounded to nearest 100.

Table 5-8 – L_{AFmax} spot levels at representative sensitive receptors

Representative receptor location	Location Ref	L_{AFmax}, dB		
		Piper PA28	Embraer EMB505	Augusta Westland AW109
Hall Farm Paddocks	Location 1	74	87	85
Shipton Slade Farm, Upper Campsfield Road	Location 2	73	79	82
Bunkers Hill	Location 3	71	84	70
Cassington Road Yarnton	Location 4	66	65	67
28 Valentia Close	Location 5	56	51	57
Church Street	Location 6	37	47	82
Bens Close	Location 7	55	57	80
Main Road Blandon	Location 8	67	55	82
Presented levels represent highest calculated LAFmax considering all rotary tracks (see Figure 9)				

5.1.2. Noise contours applicable to the noise metrics presented in the tables above are provided in the following figures appended to this report:

- Figure 2 – Average summer daytime $L_{Aeq,16h}$
- Figure 3 – Average summer night-time $L_{Aeq, 8h}$
- Figure 4 – 100% mode summer daytime $L_{Aeq, 16h}$ Runway 19
- Figure 5 – 100% mode summer daytime $L_{Aeq, 16h}$ Runway 01
- Figure 6 – 100% mode summer night-time $L_{Aeq, 8h}$ Runway 19
- Figure 7 – 100% mode summer night-time $L_{Aeq, 8h}$ Runway 01
- Figure 8 – N65 daytime

5.1.3. From the above results it can be concluded that Category E is expected to be the appropriate level for modelling both daytime and night-time noise levels.

Appendix A

FIXED WING AIRCRAFT MOVEMENTS - 92-DAY

Aircraft Type	Daytime (07:00 - 23:00)	Night-time (23:00 - 07:00)	Total
A22	4	0	4
A319	2	0	2
AA5	6	0	6
AC11	17	0	17
AC95	1	0	1
B350	65	0	65
B737	8	0	8
BDOG	2	0	2
BE20	141	1	142
BE33	8	0	8
BE36	4	0	4
BE40	43	0	43
BE76	1	0	1
BE9L	4	0	4
BN2T	17	0	17
C150	2	0	2
C152	361	0	361
C172	88	0	88
C182	204	0	204
C206	16	0	16
C208	32	0	32
C210	4	0	4
C25A	168	2	170
C25B	41	0	41
C25C	55	0	55
C303	2	0	2
C310	3	0	3
C340	19	0	19
C42	2	0	2
C421	8	0	8

Aircraft Type	Daytime (07:00 - 23:00)	Night-time (23:00 - 07:00)	Total
C510	65	0	65
C525	95	0	95
C550	59	0	59
C56X	135	0	135
C650	2	0	2
C680	101	1	102
C700	4	0	4
C750	36	0	36
CL30	80	2	82
CL60	87	0	87
COL4	11	0	11
D140	1	0	1
D228	5	1	6
DA40	3215	2	3217
DA42	2038	0	2038
DA50	48	0	48
DA62	149	1	150
DECA	2	0	2
DHC1	15	0	15
DR40	26	0	26
DV20	4	0	4
E300	22	0	22
E35L	4	0	4
E50P	10	0	10
E545	4	0	4
E550	44	0	44
E55P	173	1	174
EA50	2	0	2
ERCO	2	0	2
EUPA	6	0	6

Aircraft Type	Daytime (07:00 - 23:00)	Night-time (23:00 - 07:00)	Total
EV97	2	0	2
F2TH	18	0	18
F406	6	0	6
F900	4	0	4
FA7X	48	2	50
FA8X	7	0	7
G115	15	0	15
G280	4	0	4
GA5C	13	1	14
GA6C	2	0	2
GA7	8	0	8
GL5T	12	0	12
GL6T	45	4	49
GL7T	56	0	56
GLEX	47	0	47
GLF5	14	2	16
GLF6	11	1	12
GX	2	0	2
H25B	14	1	15
HAWK	1	0	1
HDJT	30	0	30
J3	5	0	5
JAB4	4	0	4
KODI	20	0	20
LJ31	2	0	2
LJ40	1	1	2
LJ45	8	0	8
LJ75	2	0	2
M20P	17	0	17
M20T	17	0	17

Aircraft Type	Daytime (07:00 - 23:00)	Night-time (23:00 - 07:00)	Total
M7	2	0	2
MCR4	2	0	2
P180	6	0	6
P208	1665	1	1666
P210	2	0	2
P28A	3273	1	3274
P28R	27	0	27
P46T	72	2	74
P68	17	0	17
PA24	1	0	1
PA28	29	0	29
PA30	166	0	166
PA31	36	0	36
PA32	8	0	8
PA34	1235	0	1235
PA46	38	1	39
PC12	153	0	153
PC24	58	0	58
PRM1	4	0	4
PTS1	22	0	22
PTS2	14	0	14
PUP	4	0	4
R200	14	0	14
RBEL	2	0	2
RV10	3	0	3
RV12	2	0	2
RV4	3	0	3
RV7	8	0	8
RV9	4	0	4
SC7	4	0	4

Aircraft Type	Daytime (07:00 - 23:00)	Night-time (23:00 - 07:00)	Total
SF25	2	0	2
SF50	47	1	48
SIRA	10	0	10
SLG2	6	0	6
SLG4	2	0	2
SPIT	64	0	64
SR20	67	0	67
SR22	223	0	223
ST75	1	0	1
SUBA	4	0	4
T67	122	0	122
TAMP	1	0	1
TB10	8	0	8
TB20	2	0	2
TBM7	6	0	6
TBM8	35	0	35
TBM9	35	0	35
TL20	4	0	4
TRIN	15	0	15
TWEN	16	0	16
ULAC	27	0	27
WA50	2	0	2
WT9	2	0	2
XL2	1	0	1

Appendix B

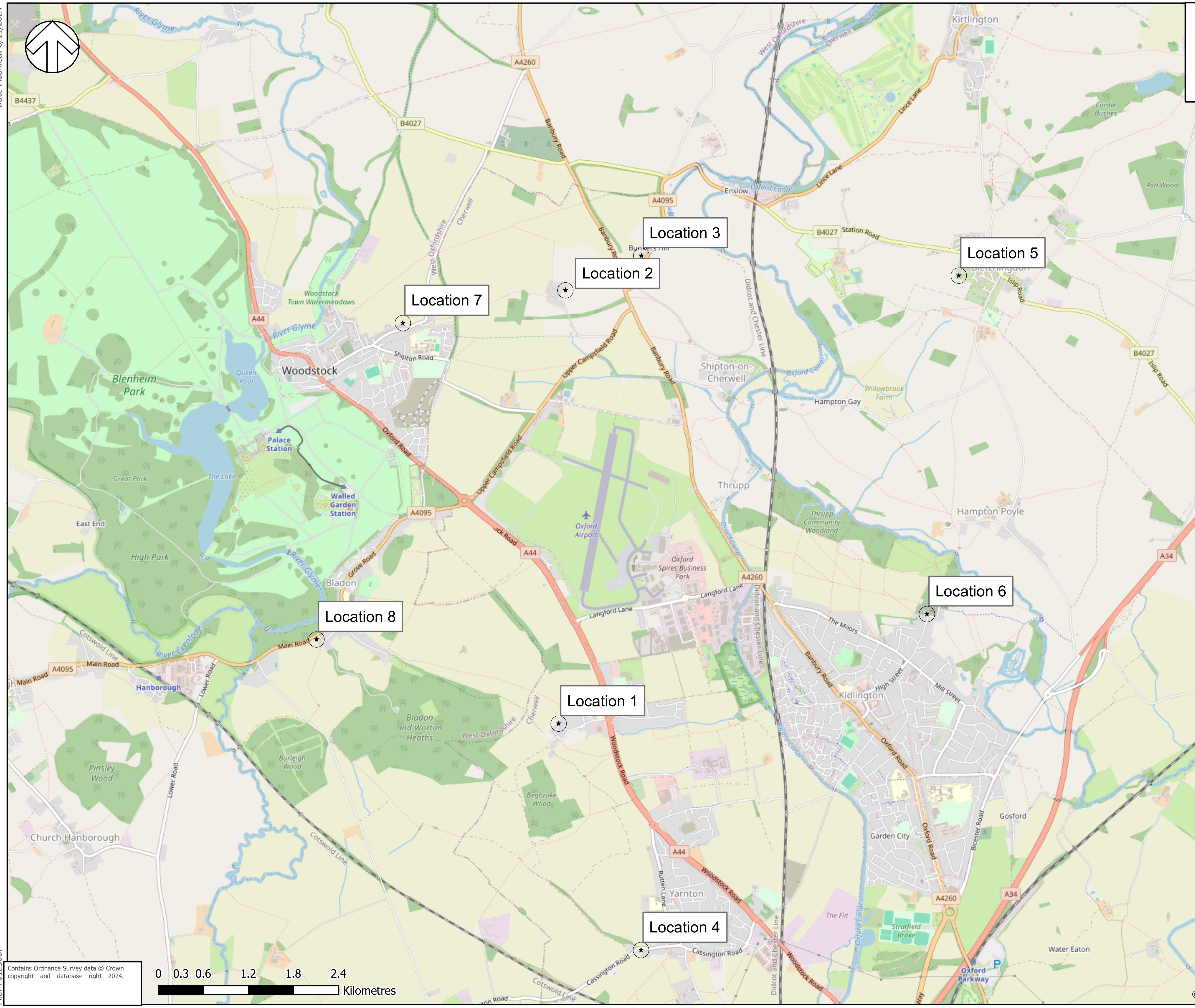
GLOSSARY OF TERMINOLOGY

Term	Definition
A-weighting	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by 20 $\log_{10}$ (s_1 / s_2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{Amax,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
Modal Split	Aircraft will usually take-off and land into a headwind to maximise lift. Wind direction varies throughout the year and therefore has an impact on the usage of runways – i.e. which direction aircraft land and take off from. The ratio of northerly and southerly operations is referred to as the runway modal split.
N65	Nx contours define the area exposed to a number of events with a maximum noise level of x dB L_{ASmax} or greater. For example, an N65,100 contour is the area exposed in a given period to 100 noise events each of which had a maximum noise level of at least 65 dB L_{ASmax}.
Educational facilities	Taken from 'Ordnance Survey Address Base' count of education facilities.
Flight Path	The routes taken by aircraft within airspace
Places of Worship	Taken from 'Ordnance Survey Address Base' count of places of worship.

Appendix C

FIGURES

Date Modified: 6/11/2024



wsp

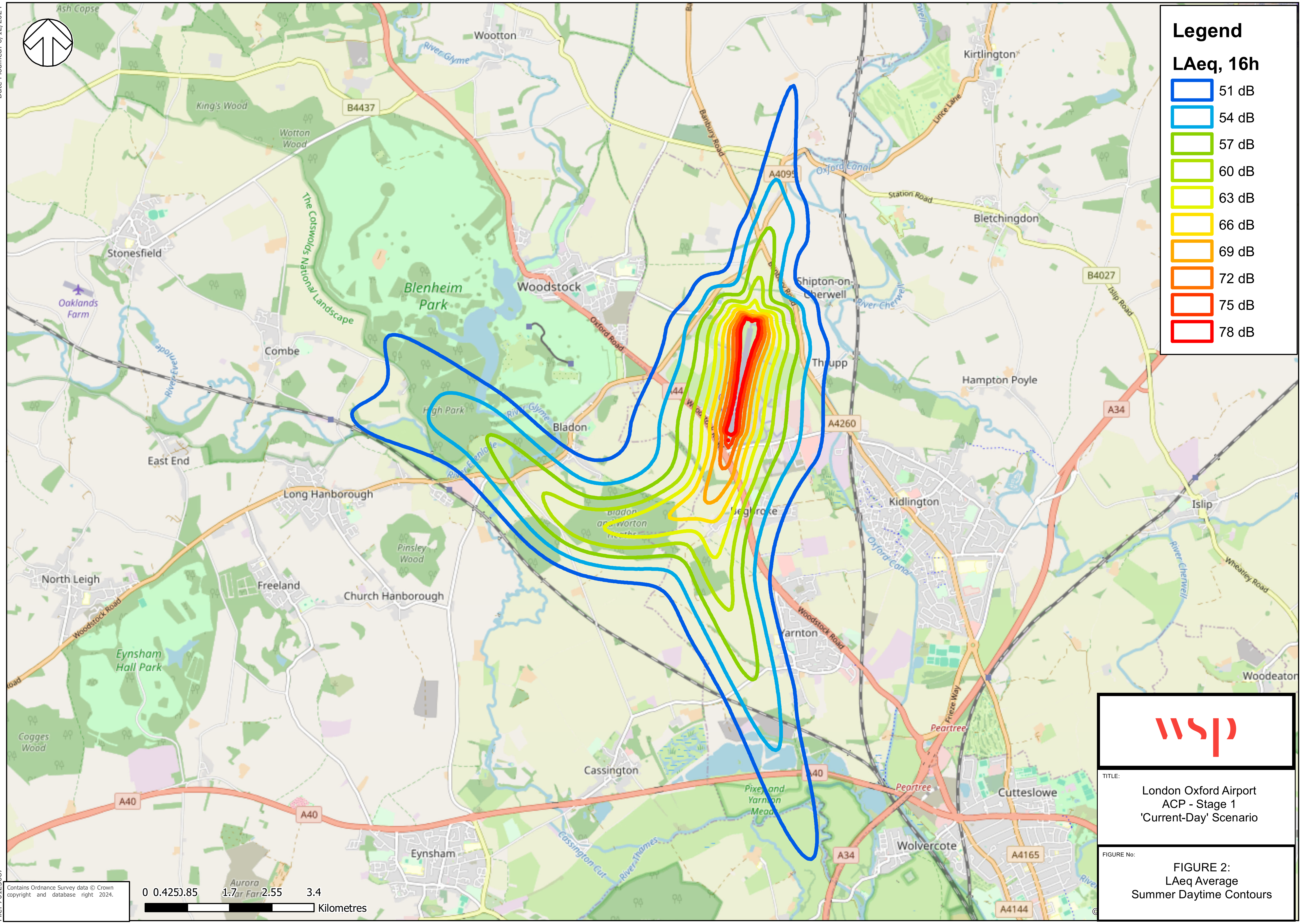
TITLE:

London Oxford Airport
ACP - Stage 1
'Current-Day' Scenario

FIGURE No:

FIGURE 1:
Site Location

File: 70123687



Date Modified: 6/12/2024

File: 70123687

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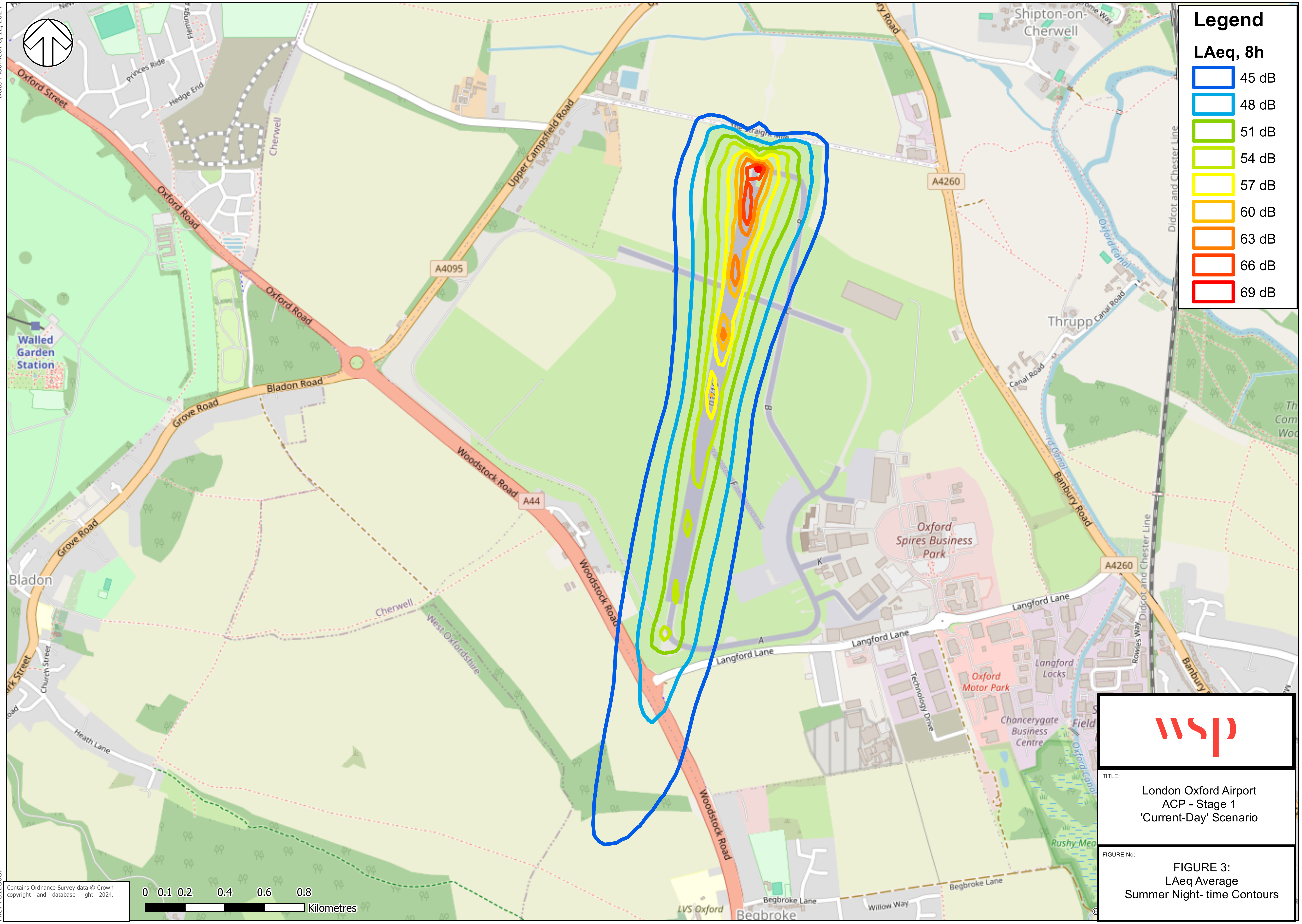
FIGURE No:

FIGURE 2:
LAeq Average
Summer Daytime Contours



TITLE:

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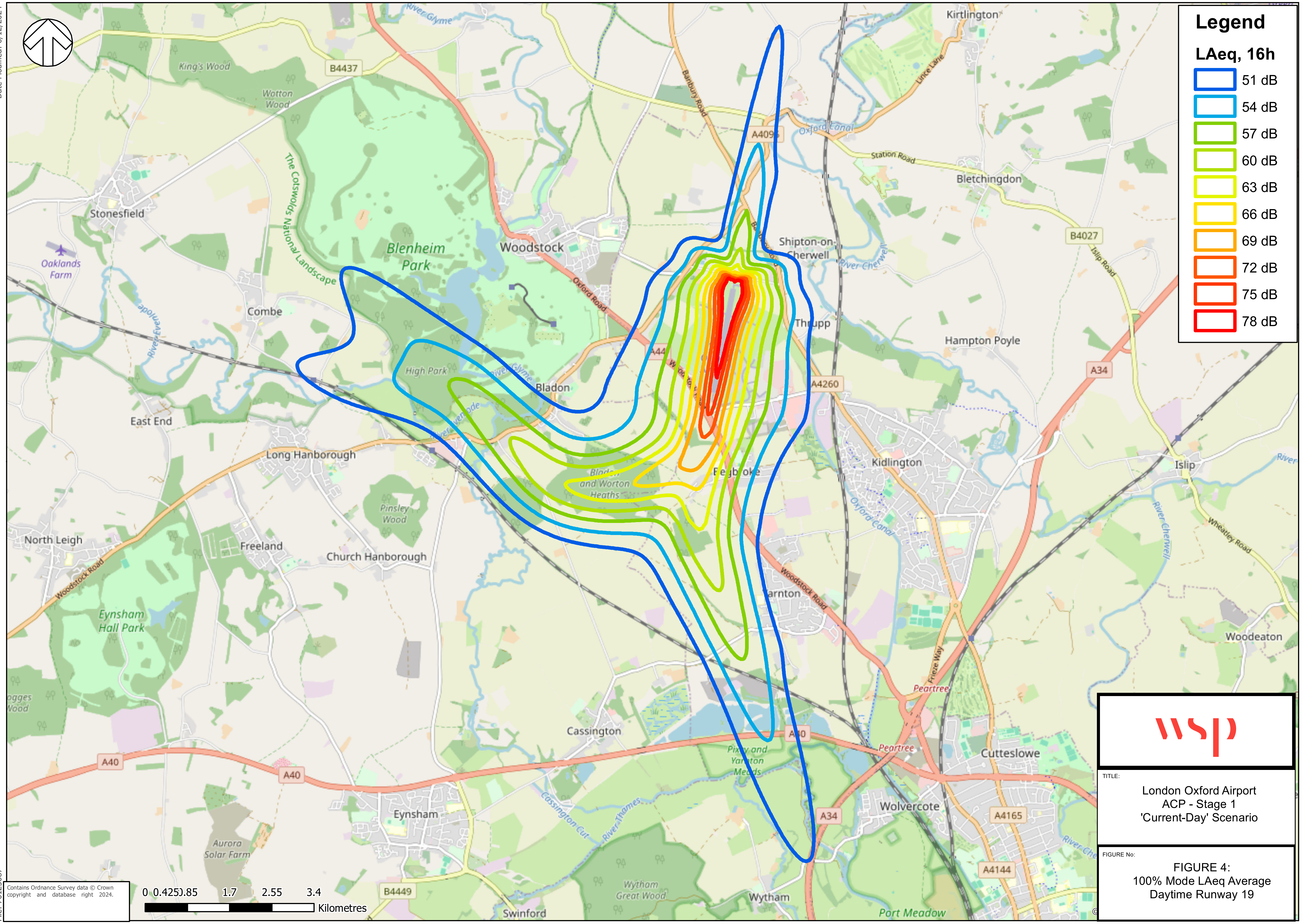
FIGURE No:

FIGURE 3:
LAeq Average
Summer Night- time Contours

Date Modified: 6/12/2024

File: 70123687



wsp

TITLE:

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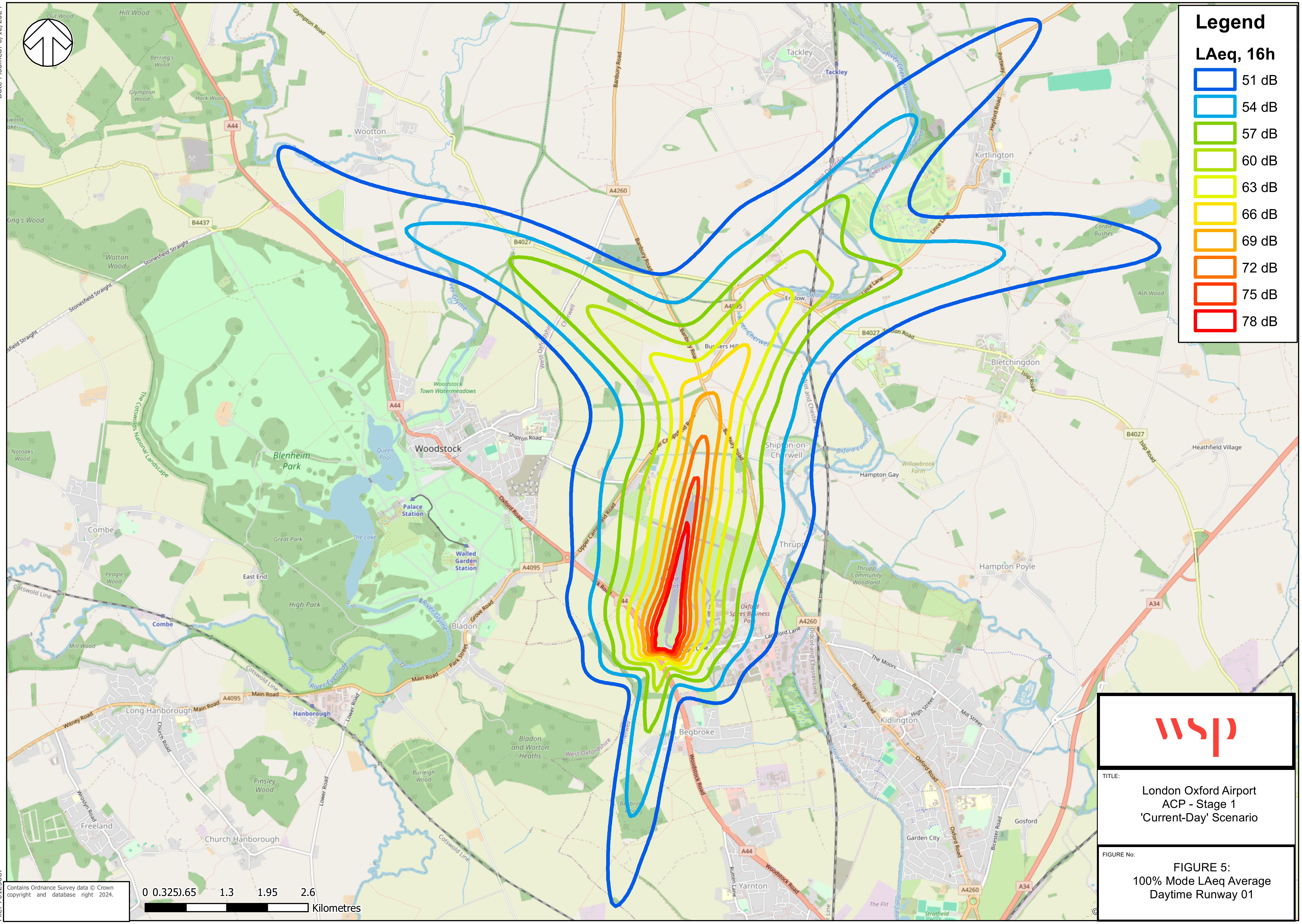
FIGURE No:

FIGURE 4:
100% Mode LAeq Average
Daytime Runway 19

Date Modified: 6/12/2024



TITLE:

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FIGURE No:

FIGURE 5:
100% Mode LAeq Average
Daytime Runway 01

File: 70123687

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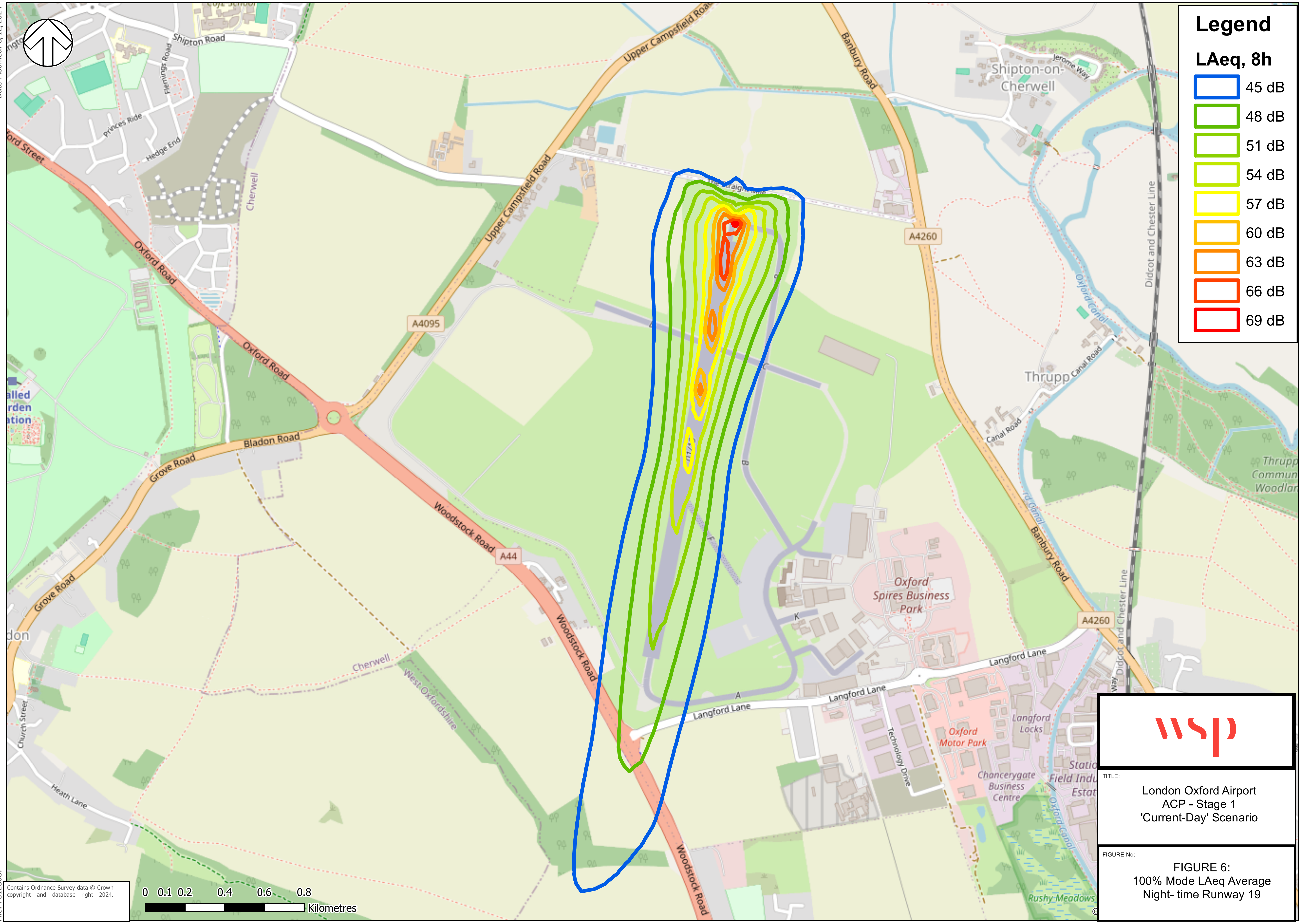

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TITLE:

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'Current-Day' Scenario

FIGURE No:

FIGURE 6:
100% Mode LAeq Average
Night- time Runway 19

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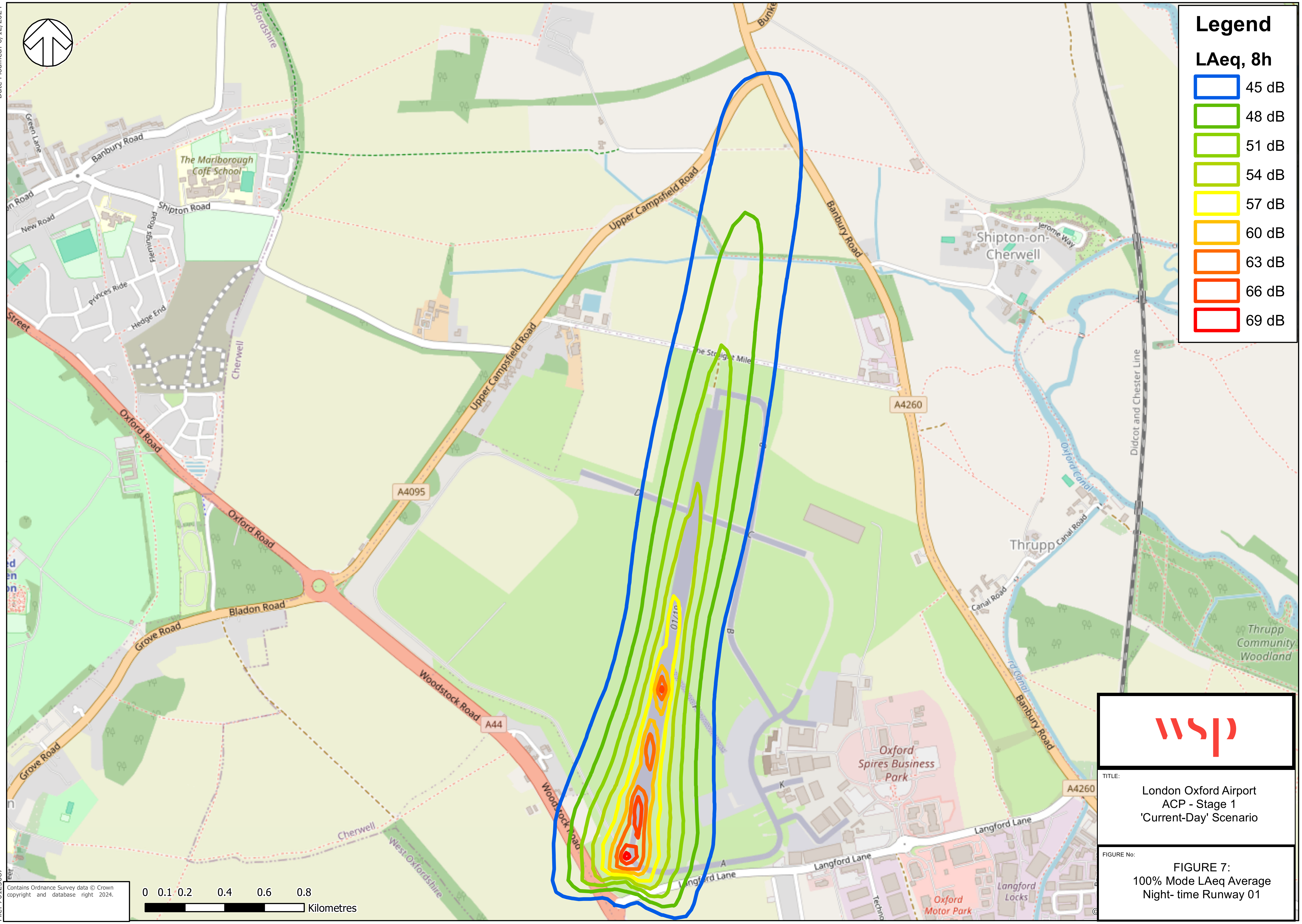


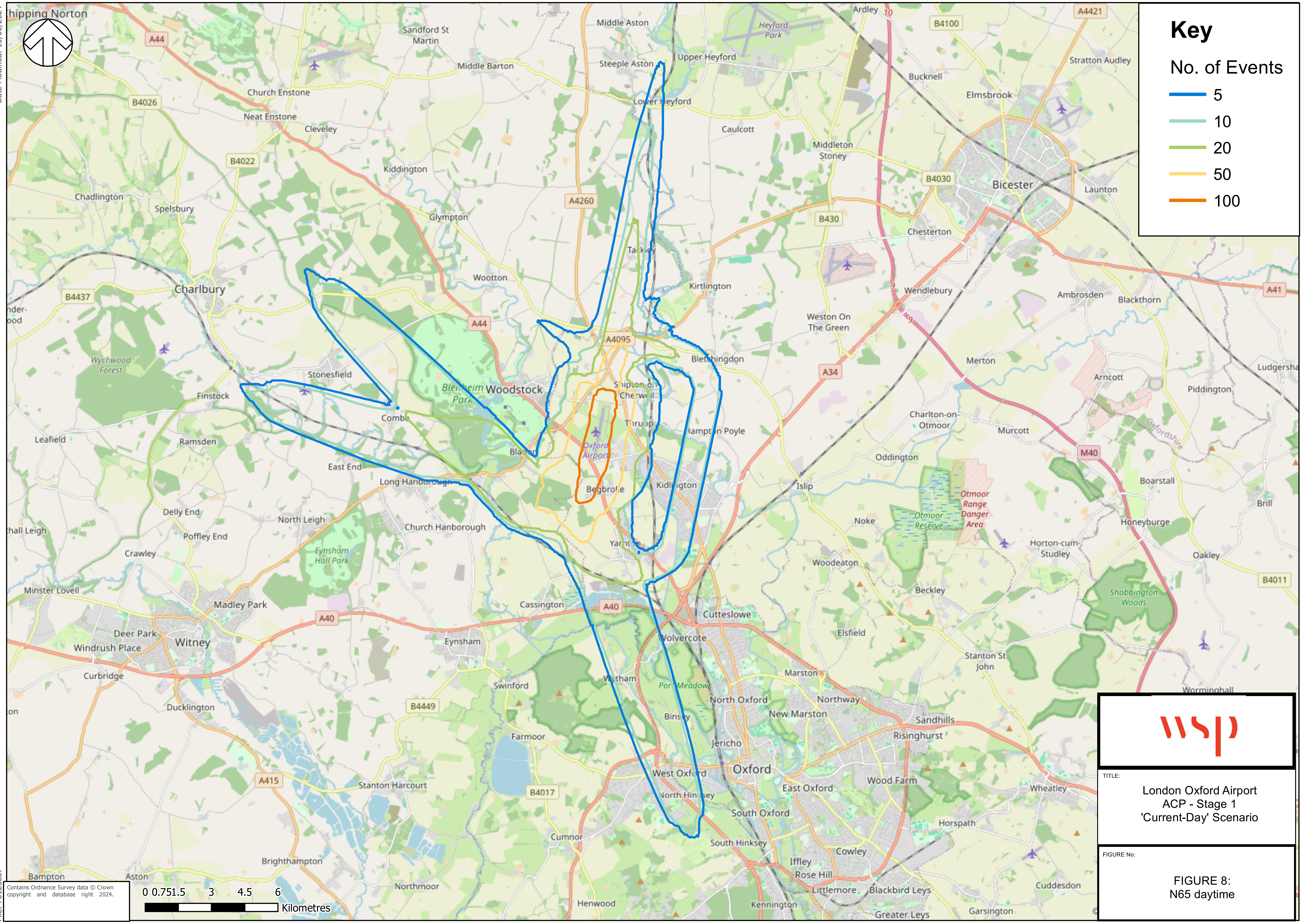
TITLE:

London Oxford Airport
ACP - Stage 1
'Current-Day' Scenario

FIGURE No:

FIGURE 7:
100% Mode LAeq Average
Night- time Runway 01

File: 70123687



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TITLE:

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FIGURE No:

FIGURE 8:
N65 daytime

Date Modified: 13/06/2024
File: 70123687

Date Modified: 12/06/2024

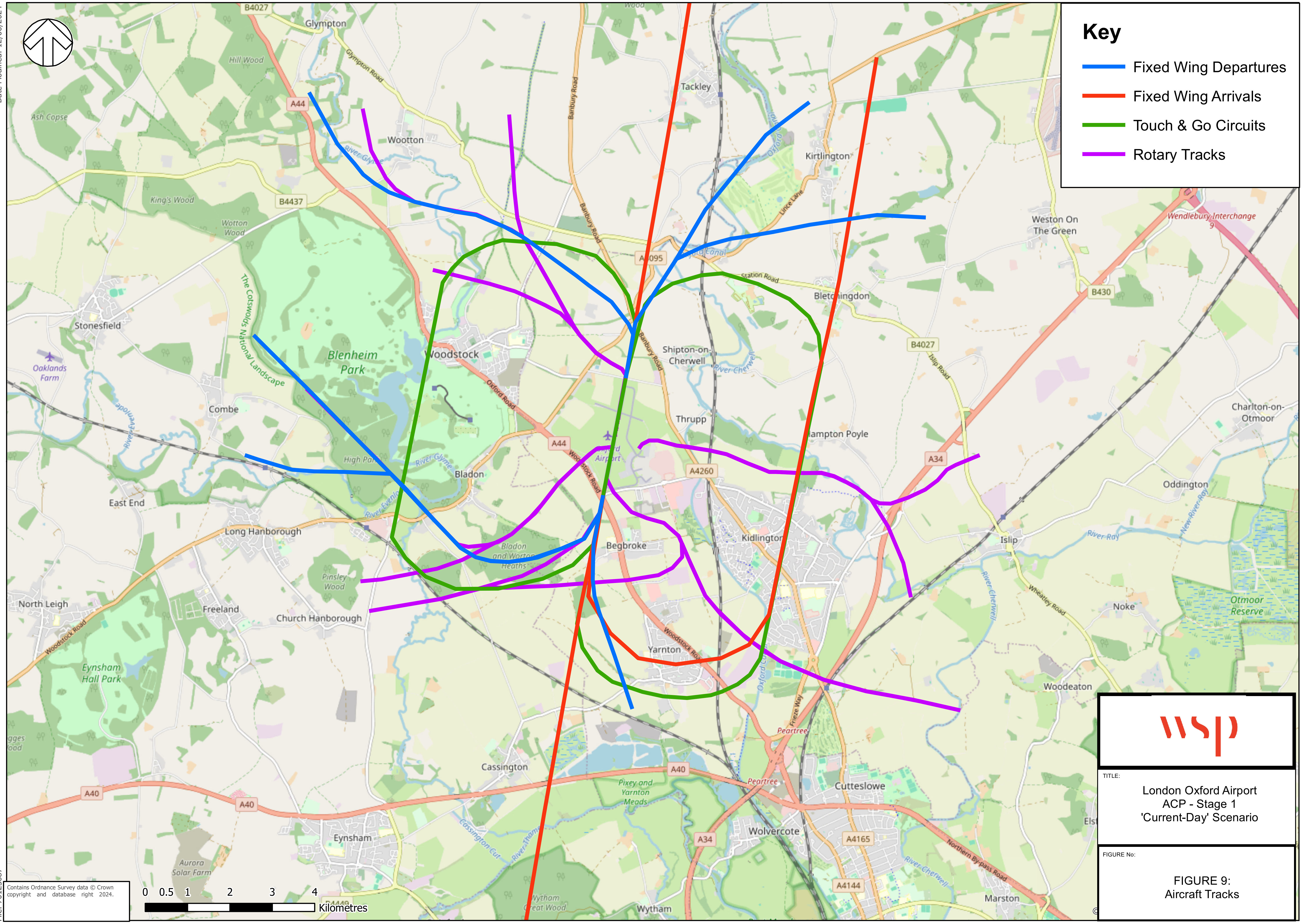

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FIGURE No:

FIGURE 9:
Aircraft Tracks

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