STAKEHOLDER ENGAGEMENT REPORT

STAGE 2 DEVELOP AND ASSESS

February 2022

London Stansted Airport
Future Airspace

MAG London Stansted Airport

Contents

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Version history	Report version 1 February 2022

Glossary

ACOG	Airspace Change Organisation Group
'Listening to Stakeholders – Our Proposed Design Principles for Airspace Change'	A document that formed part of London Stansted Airport's Stage 1 submission to the CAA https://airspacechange.caa.co.uk/documents/download/2156
ABBOT	One of two existing hold stacks used at London Stansted Airport.
ACP	The Airspace Change Proposal at London Stansted Airport.
Agl	Above ground level.
AIP	Aeronautical Information Publication. A document published by the UK CAA which contains information essential to air navigation. https://www.aurora.nats.co.uk/htmlAIP/Publications/2021-11-04-AIRAC/html/index-en-GB.html
AMS	Airspace Modernisation Strategy (CAP1711). This is the Government's strategy and plan for the use of UK airspace, including the modernisation of airspace. www.caa.co.uk/cap1711
Amsl	Above mean sea level.
ANSP	Air Navigation Service Provider: An organisation which operates the technical system, infrastructure, procedures and rules of an air navigation service system, which includes air traffic control.
AONB	Area of Outstanding Natural Beauty: An area of countryside which has been designated for conservation because of its significant landscape value, recognising its national importance.
AQMA	Air Quality Management Area: Designated by a local authority and subject to a Local Air Quality Management Plan.
ATC	Air Traffic Control: Service from an air navigation service provider providing guidance to aircraft through controlled airspace.
ATM	Air Transport Movement: An aircraft operation for commercial purposes, as opposed to flight for recreational or personal reasons.
ATS	Air Traffic Services
Biodiversity	The variability among living things from all ecosystems (including terrestrial, marine, and other aquatic among others) and the ecological complexes of which they are part; including diversity within species, between species and of ecosystems (ref: www.caa.co.uk/cap1616).
BKY	Abbreviation for the Barkway navigation beacon and routes that use that as a navigation point.
CAA	Civil Aviation Authority: the aviation industry's regulator.
CAP	Civil Aviation Publication: A document published by the UK CAA which can provide information, guidance or policy depending on the subject covered. The list of all CAPs is published on the CAA website at www.caa.co.uk An ICAO document that stands for Procedures for Air Navigation Services. This outlines the rules and criteria for designing aircraft flying procedures.
CAP1616	The CAA's Airspace Change guidance document. It sets out the regulatory process which all airspace change proposals must follow. www.caa.co.uk/cap1616
CCO	Continuous Climb Operations: Allows departing aircraft to climb continuously, which reduces the level of noise heard on the ground and also reduces fuel burn and emissions.
CDA	Continuous Descent Approach: Allows arriving aircraft to descend continuously which reduces the level of noise heard on the ground and also reduce fuel burn and emissions.
Change sponsor	An organisation that proposes, or sponsors, a change to the airspace design in accordance with the CAA's airspace change process.
CLN	Abbreviation for the Clacton navigation beacon and routes that use that as a navigation point.
Comprehensive List	The full list of design options that are viable designs as required by Stage 2 of the CAP1616 process and which are detailed in the Design Options Report.
CONOPS	Concept of Operations: A document that outlines how we want the airspace system to work in the future and the standards that we will use.
Controlled airspace	Controlled airspace is airspace within which air traffic control services are provided. There are different classifications which define the air traffic control service provided and the requirements of aircraft flying within it. All commercial (passenger) flights fly within controlled airspace.
COVID-19	A disease caused by a new strain of Coronavirus.
CP	Country Park: Areas of land designated and protected by local authorities to provide access to the countryside.
dB	Decibels: a unit used to measure noise levels.
DEFRA	Department for the Environment, Food and Rural Affairs (UK Government).
DER	Departure End of Runway. A term that, when used in PANS-OPS 8168, determines the start point for the design of a departure procedure.
Design option	An output from the route design process that responds to the design principles and the Statement of Need (SoN). Design options are a requirement of the CAP1616 process. During the engagement carried out at Stage 2, design options were also referred to as "route options".
Design principles	The principles encompassing the safety, environmental and operational criteria and the strategic policy objectives that the change sponsor seeks to achieve in developing the airspace change proposal. They are an opportunity to combine local context with technical considerations, and are therefore drawn up through discussion with affected stakeholders and in Stansted's case – members of the public. The design principles at London Stansted Airport were established during Stage 1 of the CAP1616 process.
DET	Abbreviation for the Detling navigation beacon and routes that use that as a navigation point.
DfT	Department for Transport
DME	Distance Measuring Equipment
DOR	Design Options Report: This responds to the requirements of CAP1616 to develop a comprehensive list of options that address the Statement of Need (SoN) and that align with the design principles. It details the design process and the output of that process in the form of design options for both departures and arrivals.
DPE	Design Principles Evaluation: The document that undertakes an evaluation of the Viable and Good fit options described in this report against the Design Principles.
FAF	Final Approach Fix: The point at which an aircraft starts its final approach to land.
FASI-S	Future Airspace Strategy Implementation – South: The programme of airspace changes across the southern part of the UK, including London, that is implementing the Governments Airspace Modernisation Strategy.
FIR	Flight Information Region: Airspace delegated to a country by ICAO. In the UK there are two FIRs, London and Scottish.
Flight path	The routes taken by aircraft within airspace.
FOA	Full Options Appraisal: The options appraisal carried out at Stage 3 of the CAP1616 process.
Focus group	Group of representative stakeholders brought together to discuss proposals and offer feedback.
Ft.	Feet

GA	General Aviation
GDPR	The General Data Protection Regulations
GIS	Geographic Information System
GNSS	Global Navigation Satellite System: A term used to describe a system that uses satellites for position fixing.
IAF	Initial Approach Fix: The start of the approach phase of flight. For the Stansted arrival design options, the IAF is at 7,000ft unless stated otherwise.
ICAO	International Civil Aviation Organisation: an agency of the United Nations.
IFP	Instrument Flight Procedure
ILS	Instrument Landing System: A radio navigation system that provides vertical and horizontal guidance to arriving aircraft to help them land safely, especially in bad weather.
IOA	Initial Options Appraisal: The document that is the first iteration of the three option appraisals required by CAP1616 – the design options appraised within the IOA are the outputs from the Design Principles Evaluation (DPE).
LAM	Abbreviation for the Lambourne navigation beacon and routes that use that as a navigation point.
LNAV	Lateral Navigation: A term for lateral navigation used within Performance Based Navigation.
LOREL	One of two existing hold stacks used at London Stansted Airport.
LTMA	London Terminal Manoeuvring Area: The designated area of controlled airspace surrounding the London airports.
m	Metres
MAGIC Map	Interactive map managed by DEFRA containing authoritative geographic information about the natural and built environment from across Government.
MAP	Missed Approach Procedure: A documented procedure for an aircraft to follow if a safe landing cannot be completed.
Masterplan	The strategic plan for the coordinated national programme of airspace change, created by the Airspace Change Organising Group (ACOG) under the direction of the CAA and DfT.
MSD	Minimum Stabilisation Distance: A design criteria within PANS-OPS 8168 that ensures aircraft stability when flying a procedure.
NATS	The air navigation service provider for the UK, formerly National Air Traffic Services. NATS 'en-route' manage the traffic in the upper airspace and also climbing and descending to land in the London area.
NERL	NATS En-Route Ltd: The part of NATS that delivers en-route air traffic control.
Nm	Nautical Miles
NNR	National Nature Reserves: Designated under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 to protect important habitats, species or geology.
Noise-sensitive receptors	Specific locations identified as likely to be adversely affected by noise from or due to aircraft operations. Individual locations will have varying degrees of sensitivity (measured noise exposure levels) depending upon their use.
NP	National Park: Designated areas under the National Parks and Access to the Countryside Act 1949 to protect landscapes because of their special qualities
NUGBO	A navigation fix to the NW of Stansted used by STN departures that exit UK to the south west.
PANS-OPS 8168	An ICAO document that stands for Procedures for Air Navigation Services. This outlines the rules and criteria for designing instrument flight procedures for aircraft.
PBN	Performance Based Navigation: Which is a range of specifications that requires aircraft to navigate to specific accuracy standards, mainly by using satellite-based navigation systems. It is designed to improve track-keeping accuracy for departing and arriving aircraft. The transition to PBN is a foundation to the Airspace Modernisation Strategy and this ACP.

RAG	Red, Amber, Green
Ramsar	Wetlands of international importance designated under the Ramsar Convention 1976.
RNAV1	Area Navigation 1 is one of the specifications within Performance Based Navigation (PBN). Aircraft must maintain specific navigational accuracy within the flight.
RNP APCH	Required Navigation Performance Approach: A type of RNP procedure used in the descent phase of flight.
RNP1	Required Navigation Performance: One of the specifications under Performance Based Navigation (PBN). Aircraft must maintain specific navigation accuracy, and in RNP are aided by on board performance monitoring and alerting. It provides slightly more predictable track keeping when compared to RNAV1.
Route options	A term used in engagement to describe the Design options that have been created in this step of the airspace change process.
SAC	Special Area of Conservation: Designated under the Conservation of Habitats and Species Regulations 2017 as making a significant contribution to the conserving of the habitats of protected species.
SID	Standard Instrument Departure: A pre-determined flightpath set by Air Traffic Control that aircraft follow when departing an airport.
SoN	Statement of Need: The means by which the change sponsor sets out what airspace issue or opportunity it is seeking to address and what outcome it wishes to achieve, without specifying solutions, technical or otherwise. London Stansted Airport's SoN can be found at https://airspacechange.caa.co.uk/documents/download/514.
SPA	Special Protection Area: Protected areas for birds classified under the Wildlife and Countryside Act 1981 and protected under the Conservation of Habitats and Species Regulations 2017.
SSSI	Sites of Special Scientific Interest: Areas of importance designated and protected by Natural England under the Wildlife and Countryside Act 1981 to recognise the land's wildlife, geology or landform is of special interest.
STAR	Standard Terminal Arrival Route
Tranquillity	There is no universally accepted definition of tranquillity and therefore no accepted metric by which it can be measured. In general terms it can be defined as a state of calm. The consideration of impacts upon tranquillity for airspace change is with specific reference to National Parks and Areas of Outstanding Natural Beauty (AONB), plus any locally identified 'tranquil' areas that are identified through community engagement and are subsequently reflected within an airspace change proposal's design principles (ref: www.caa.co.uk/cap1616).
Transition	The part of the arrival route from the Initial Approach Fix (IAF) prior to joining the final approach at the Final Approach Fix (FAF).
Unviable	Options which would not comply with the rules or for flight procedure design, specifically the requirements of ICAO PANS-OPS 8168, or if they are not compliant with these rules, did not have a supporting safety justification.
UTAVA	A navigation fix to the NW of Stansted used STN departures that exit UK to the west and north west.
VHF	Very High Frequency
Viable and good fit	Options that are viable to design and which would be expected to meet the three design principles with which all design options 'must' comply (Safety, Policy and Demand).
Viable but poor fit	Options that are viable to design but which would not be expected to meet the requirements of the Safety, Policy or the Demand Design Principles.
VNAV	Vertical Navigation. A term used in Performance Based Navigation.
VOR	VHF Omni-directional Range (Beacon)

1. Introduction

This document details the stakeholder engagement undertaken by London Stansted Airport to meet the engagement requirements of Stage 2 of CAP1616, the Civil Aviation Authority's (CAA) guidance on the regulatory process for airspace change. This document forms part of the suite of documents submitted to the CAA at Gateway 2 of the CAP1616 process and is intended to be read alongside those documents. The purpose of the engagement at Stage 2 is to test the route options with stakeholders to ensure that they are satisfied that these are aligned with the design principles and take into account stakeholder concerns. The way that this was achieved at Stansted is described in this document and reflected in the other Stage 2 submission documents.

The full suite of Stage 2 Submission documents is:

- Stage 2 Summary Document, which draws together the key points from the Stage 2 submission;
- Design Options Report (DOR), which sets out Stansted's approach to the design process and the output of that process in the form of design options for both departures and arrivals at the airport. It presents the design options identified and describes how those options were refined to provide the comprehensive list of options to be progressed to the Design Principles Evaluation;
- Design Principles Evaluation Report (DPE), which assesses how the design options have responded to the Design Principles and identify those that warrant further analysis at the next step;
- Initial Options Appraisal Report (IOA), which is the first iteration of the three option appraisals required by CAP1616 - the design options appraised within the IOA are the outputs from the Design Principles Evaluation (DPE). The purpose of the IOA is to provide, at a minimum, a qualitative assessment of each option providing stakeholders and the CAA with the relative differences between impacts, both positive and negative; and
- The Stakeholder Engagement Report (SER), which explains how engagement has been used in the processes described in the other Stage 2 documents and records its outputs.

The Summary Document provides details of the Government's national programme of airspace change, the process under CAP1616 and the progress to date of the Airspace Change Programme (ACP) at Stansted. This information is not repeated in this report.

The full suite of reports, together with their supporting appendices, will be published on the CAA Airspace Change Portal www.airspacechange.caa.co.uk.

2. Stakeholder engagement during Stage 2 'Develop and Assess'

2.1 Overview

As explained in sections 1 to 3 of the Stage 2 Summary Document, Stage 2 (Develop and Assess) of the CAP1616 process focuses on the development of route options and is divided into two Steps: Step 2A – Options Development, and Step 2B – Options Appraisal. CAP1616 requires that stakeholder engagement is carried out as part of Step 2A.

Step 2A requires the creation of a comprehensive list of route options to address the Statement of Need and respond to the design principles established at Stage 1. These options must then be tested with stakeholders and evaluated against the design principles to establish the list of options to be progressed to Step 2B. The process followed at Step 2A to develop initial design envelopes, refine those design envelopes and then design route options within the design envelopes is summarised at sections 6 to 18 of the Summary Document.

As for Stage 1, stakeholder input is an important component of Stage 2, and CAP1616 requires the demonstration of how stakeholders' views and feedback have informed the development of the route options. A full chronology of the engagement activities completed by London Stansted during Stage 2 is contained in appendix 2.

2.2 Stakeholder engagement strategy

Stakeholder engagement to support Stage 2 was split into two phases – in relation to the identification of design envelopes and in relation to revision to design envelopes as well as creating specific route options. This approach allowed us to explain and test our initial design work with stakeholders, before refining and developing specific route options that took account of their feedback.

The purpose of the first phase of engagement was to explain the initial part of the design process and present the resulting design envelopes, which are the broad areas where it would be possible to place routes, taking account of identified constraints, operational requirements and our design principles. This allowed us to hear stakeholders' thoughts on the process we had followed and the envelopes that had been created and take account of this feedback in the next part of the design process, where the specific route options were developed.

At the second phase of engagement, we were then able to seek further feedback from stakeholders to ensure they were content that we had correctly interpreted and taken account of feedback from the previous discussions. Further detail on the content covered in both phases of engagement can be found later in this document and in appendices 3, 4 and 5.

We were particularly conscious of the technical nature of the design work required at Stage 2, as well as the differing levels of experience between different stakeholder categories. By splitting engagement into two distinct phases as part of Stage 2, we were able to ensure that all stakeholders, as well as members of the public, who might not previously have had any exposure to or knowledge of the Airspace Change Programme, were comfortable and understood the content shown.

CAP1616 requires that engagement at Stage 2 is undertaken with the same stakeholders who were engaged at Step 1B. Therefore, all stakeholders who were invited to take part in Step 1B were invited to take part in Stage 2. In addition, our stakeholder list (appendix 1) was updated to take account of any organisational changes and to include those that had requested to be kept informed of any developments in our ACP. In relation to engagement with members of the public, at Step 1B most respondents had been recruited by YouGov, with a smaller number responding directly to us. YouGov invited all those Step 1B participants remaining on their panel to Stage 2 engagement. Those whose details were held by us were contacted by us and directed to contact YouGov to take part.

Due to the continued restrictions as a result of the COVID-19 pandemic, it was necessary to undertake phase one engagement using online methods only. Online engagement was successfully employed at Step 1B of the CAP1616 process due to COVID-19 restrictions, and this was found to offer some important benefits in terms of participation levels, due to the added level of convenience and accessibility. Given the duration of the restrictions, we also felt that stakeholders were likely to be more familiar and comfortable with engaging online during Stage 2. As a result, the phase one engagement during Stage 2 was conducted online, although we also offered other methods of participation such as postal or telephone communication for any stakeholders who could not take part in online sessions. We did not receive any requests for additional support from any stakeholders. At phase two, as restrictions were beginning to ease, we were able to employ a blend of online and in person engagement activity.

Figure 1: Stage 2 process

Step 1

Engagement one – Sharing the design envelopes

Feedback considered, routes developed

June

In discussion sessions like this one, we shared the design envelopes together with the details of how these have been developed, for feedback and input.

July – September

Taking account of the feedback, design envelopes were further enhanced and specific route options developed.

Step 2

Engagement two – Sharing route designs and design principle assessment

Feedback considered, options further developed

Initial options appraisal

November

Potential route options were shared at another round of discussion sessions in November.

November – December

Taking account of feedback, options refined further and subject to DPE.

December – February

The options were subject to an initial options appraisal to determine the likely impact of each. Once complete, full details of all the work undertaken at Stage 2 will be submitted to the CAA for assessment.

As the content to be shared at Stage 2 of the CAP1616 process was more technically complex, our engagement during both phases consisted of a blend of independently facilitated engagement sessions and briefing sessions held by our own team. This flexible approach was devised to take account of the wide range of prior knowledge and expertise on the subject matter, with the general public sessions being independently facilitated. This provided independent assurance that general public participants with potentially less technical knowledge had been supported to understand the content shown and were able to engage with it. The image below shows how engagement during Stage 2 fed into the wider Stage 2 process.

We established an independent Stakeholder Reference Group (SRG) during Stage 1. Their role is to provide advice on the communication, engagement and subsequent consultation plans for the duration of the ACP. The SRG is designed to be reflective (but not necessarily representative) of local businesses, community and voluntary groups, and other interests.

The SRG met in April 2021 to review and comment on the suitability of the approach to engagement we proposed for Stage 2. In addition, the SRG were asked to review and comment on the draft materials to be presented at both phases of engagement, in order to test them for ease of understanding.

The SRG will remain central to the development and monitoring of a full consultation plan for subsequent stages of the ACP, including during the full consultation exercise to be carried out at Stage 3.

3. Phase one engagement

3.1 Overview

The purpose of the first phase of engagement was to explain the initial part of the design process and to introduce stakeholders to the resulting design envelopes. We then sought feedback on the process followed and the envelopes to help inform the next stage of design work.

Given the COVID-19 restrictions, all our engagement events during phase one were held virtually. When inviting stakeholders, we asked them to let us know if they would have any issues taking part in this way so that we could make alternative arrangements for any stakeholders that required it. This did not prompt any such requests.

Our phase one engagement took place in June 2021 and consisted of 11 discussion sessions facilitated by us and two three-day forums facilitated by research specialists, YouGov. We chose YouGov to deliver this research as they had successfully facilitated the focus groups held at Step 1B and were therefore familiar with the programme, the technological considerations applicable to airspace change and our requirements for engagement as part of CAP1616.

The discussion sessions that we facilitated included stakeholders from aviation, business, community, national organisations, special interest groups and elected representatives. These events were 1.5 hours long and were facilitated by Stansted's airspace team online using Microsoft Teams. Each session contained stakeholders with similar interest and knowledge levels to ensure a fully inclusive discussion. Prior to the event we sent all stakeholders a pack of pre-read information (which can be found in appendix 3). This contained useful information to help set the scene for the discussion, including how aircraft currently arrive and depart from Stansted and a reminder of the programme and progress so far. In addition, during the discussion sessions we reprised the information shared in the pre-read to enable stakeholders to ask any questions they may have had.

The format of our discussion sessions consisted of a presentation from our team followed by a Question and Answers (Q&A) session. The content shared in these sessions can be found in appendix 3. The main content of the presentation was pre-recorded to ensure all stakeholders received the same information. Stakeholders were able to post questions into the meeting chat throughout the presentation which the team would then respond to in real time. After the event, we forwarded the presentation and a Q&A document containing all the questions that stakeholders had asked within all the sessions. Stakeholders were also able to send any further comments or feedback after the session; and the deadline for receipt of any additional feedback arising from phase one was communicated at the end of the presentation and in the post event email that was sent.

Invitations to the phase one sessions were sent to all those that took part in our Step 1B engagement and those that had been invited but didn't attend. In total over 800 stakeholders received an invitation to take part, with regular reminders being sent leading up to the sessions. In total, 72 stakeholders representing 64 organisations attended our discussion sessions in phase one. Full details of stakeholders invited and those that attended can be found in our stakeholder list in appendix 1.

For general public engagement, two three-day online forums facilitated by YouGov were held. With YouGov's extensive experience in facilitating engagement on complex material in a more manageable format, this method allowed audiences with potentially limited knowledge of the subject to provide a full and considered response. Information was provided over three days, building up their knowledge over this time and enabling YouGov to ensure their understanding. Participants were asked to log in for a period of time each day, when they were presented with the engagement materials and then asked to provide their answers to a series of questions. The forum was 'open', enabling participants to see and comment on other individuals' answers to encourage discussion and debate. The airport team were able to watch the conversations each day, such that any questions not answered in the sessions could be addressed subsequently.

YouGov recruited a mix of participants from the areas within the design boundary, and all general public participants that attended Step 1B engagement and remained on YouGov's panel were also invited to attend. The particular forum that people were invited to was dependent on their location, meaning that each forum contained people from nearby areas allowing participants the ability to discuss the material with other stakeholders located close to them. A total of 69 local general public participants took part in the forums with 45 of these completing all three days. Further detail can be found in appendix 6.

3.2 Material shared during phase one engagement

As set out on page 11, the purpose of phase one engagement was to guide stakeholders through the process behind the production of the initial design envelopes, being the lateral polygons within which it would be possible to design route options that complied with the Statement of Need and responded to the design principles. To ensure the best possible understanding of the process, a detailed explanation of background information was provided, including how we currently operate, how airspace works, how the design principles would influence our proposals and the constraints that had been applied to the development of the design envelopes. Whilst to some of the audience this material might be very familiar, for participants drawn from the general public this was felt vital to facilitate their ongoing engagement and understanding of the complexities faced.

Prior to the engagement sessions, pre-reading material was circulated to remind participants of Stage 1 of the CAP1616 process at Stansted and set out some brief details on current operations (appendix 3). In addition, a short, animated video was produced to support our engagement activity, a link to which has been provided here. This set out the wider programme, outlined the work to be completed in Stage 2 and explained how stakeholder engagement formed part of it. This video was intended to act as an initial introduction and was both sent to participants within the invitations to the engagement events and used at the start of the discussion sessions.

3.2.1. Material for engagement purposes

We felt it was important for stakeholders to understand how we currently operate arrivals and departures in the airspace serving Stansted to enable them to provide a comprehensive response to any potential changes. We started with an explanation of how aircraft currently depart from and arrive at the airport. Stakeholders were provided with maps demonstrating where aircraft currently fly, how frequently each departure route is used, arrival patterns and the location of the holding stacks. We then outlined the restrictions and local procedures that affect the way aircraft are currently flown, including existing local agreements such as avoiding overflight of St Elizabeth's (a residential care centre for children and adults with epilepsy and other complex medical conditions), and the particular areas where we have existing agreed overflight restrictions.

We have provided below a summary of the content presented in the engagement sessions, while full details of all the materials provided can be found at appendix 3.

3.2.2. Current operations

Stakeholders were shown maps demonstrating the distribution of departing aircraft over a typical summer's day on Runway 22 and Runway 04. For departures these displayed:

- The three Noise Preferential Routes (NPRs) on each runway end and the Standard Instrument Departure Routes (SIDs) that these encompass.
- The percentage of total departure movements for each NPR (for 2018).
- The altitude reached by aircraft along each route.

For arrivals, it was explained that although there are some similarities in routes for approaches, unlike departing aircraft there are no fixed flight paths for arriving aircraft until they are established on the instrument landing system (ILS), or 'final approach'. We described how, when the airport is busy, arriving aircraft may be held by ATC in a 'holding stack' before being instructed to make their final approach. Maps showing arrivals on a typical busy summer's day onto each runway end were shown to demonstrate;

- The typical pattern of arrival traffic onto each runway end.
- The location of the two holding stacks, which serve arriving flights and enable them to await runway availability.
- The percentage of total arrivals approaching from each direction.
- The altitude reached by aircraft along each route.

3.2.3. Airspace

Stakeholders were then introduced to the concept of airspace and its relevance to this programme. As part of this, we explained:

- What airspace is;
- How it is divided into distinct vertical layers;
- The difference between controlled and uncontrolled airspace;
- What controls and restrictions apply within the different layers;
- How multiple climbing and descending flights between different airports interact.

We explained that Stansted's responsibility is from the ground to 7,000ft and that level above that it is the responsibility of National Air Traffic Services (NATS). We explained that identifying the points at which arrivals descend below 7,000ft and departures reach 7,000ft gave us what we have described as a "design boundary" to work within (see further below). We also explained how Stansted's airspace fits into the complex London airspace network and how any proposals that emerge for Stansted will have to take account of the proposals emerging at other airports sharing that airspace.

3.2.4. Defining the design boundary

It was explained that within the design boundary there were other factors that would influence what could be considered when creating our design envelopes and our comprehensive list of route options. These factors included:

- The international and national rules governing airspace and flight procedure design;
- The physical capabilities of aircraft;
- Connecting to the upper airspace; and
- Objectives for the future operational requirements of the airport.

Section 4 of the DOR sets these factors out in more detail and the materials presented to stakeholders can be found at appendix 3.

In addition, it was explained that these factors would also be considered in the evaluation of the route options against what we have described as 'must have' design principles, namely Safety (S), Policy (P) and Demand (D).

With reference to the above factors, we were able to demonstrate to participants how we devised our design boundaries and mapped our constraints, explaining that this process gave us an outer omni-directional boundary showing where aircraft could be expected to reach 7,000ft from each end of the runway.

We explained that we had applied a similar omni-directional process to arrivals that would allow for Continuous Descent Approach (CDA) from 7,000ft with the outer edge representing the furthest point away from the airport that the shallowest gradient CDA could be achieved by the aircraft operating into and out of the airport.

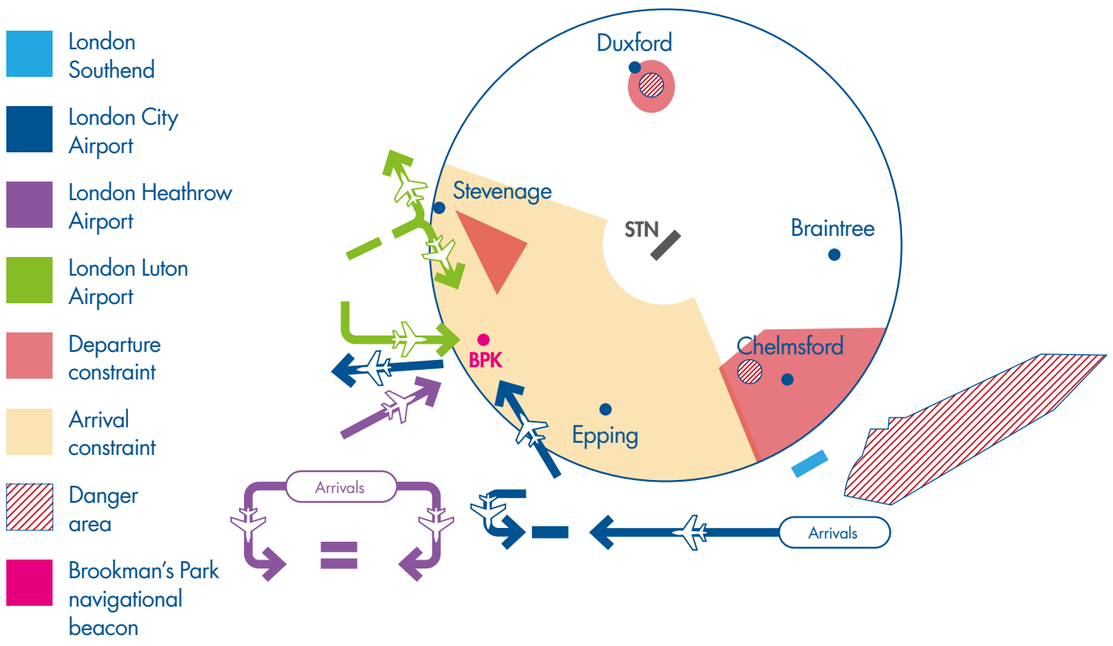
Appendix 3 gives further details of how the creation of the design boundary for departures and arrivals was explained and presented to stakeholders

3.2.5. Identifying constraints

We explained that, having defined the design boundary, we had identified local factors that may constrain our designs. We then outlined the three identified danger areas - the Shoeburyness danger area to the south east and two notified gas venting stations, one to the north and another to the south east.

The other major constraint described to participants was the congestion within the London terminal airspace and the proximity of other airport operations to our own as illustrated by Figure 2 below. We explained that this congested area currently prevents CDAs to Runway 04 and that, in addition, we had identified the Brookman's Park (BPK) navigation beacon to the south west as being an area of crowded airspace.

Figure 2: Constraints and considerations



3.2.6. Envelope design options

We then highlighted that CAP1616 requires that we consider the possibility of 'do nothing' and 'do minimum' scenarios, as well as exploring a range of other options that would enable us to meet our Statement of Need and our design principles.

More detail can be found in section 4 of the DOR and the materials presented to stakeholders can be found at appendix 3.

3.2.7. Initial departures design envelopes

We presented the initial departure design envelopes for Runway 22 and Runway 04 that had been prepared for phase one engagement purposes. It was explained that each design envelope was designed to address the Statement of Need and align with the design principles. Further details of the explanation provided of the process followed to design the initial departure design envelopes, details of the initial departure design envelopes and how each design envelope had considered the Statement of Need and design principles, is set out in appendix 2.

It was also explained that there are already two existing departure routes designed to PBN standards which were consulted upon in 2018, and that these routes are still required to be part of the CAP1616 process.

3.2.8. Initial arrivals design envelopes

In describing the initial arrivals design envelopes, we communicated the two principles that had guided our design:

- The need to provide for CDA to both runway ends; and
- The need to minimise the interactions with other airports' operations.

We detailed the constraints and considerations that influenced where the 7,000ft starting point for arrivals could be placed. We then explained that this led us to consider four alternative areas where the 7,000ft starting point for arrivals could be located; east of the airport and incorporating the current ABBOT hold, west of the airport and including the current LOREL hold, at 90 degrees to the runway from the east and at 90 degrees to the runway from the west.

From these envelopes we explained how aircraft would descend from differing 7,000ft starting points from within these envelopes. We then described the initial arrival design envelopes for both eastern runway ends, both western runway ends, centre west and centre east.

Full details of the materials provided during this engagement can be found in appendix 2.

4. Phase one engagement stakeholder feedback

The first phase of engagement provided valuable stakeholder feedback via four main channels:

- Responses were recorded through the chat function and dialogue from the engagement sessions.
- The sessions were recorded, and transcripts produced to enable full a review of the feedback received.
- YouGov created a report of the forum discussions, and this report was discussed with, and presented to, the Stansted team (appendix 6).
- For the sessions facilitated by us, the team documented the feedback received and created a report outlining this feedback (appendix 8).

All stakeholders were provided with copies of the presentation and a Q&A document after the event (appendix 11). The Q&A document listed all the questions asked in all the engagement sessions, together with our responses to each. Stakeholders then had the opportunity to absorb the content and provide any additional feedback after the event. This feedback was then incorporated into the reports referred to above.

4.1 Feedback overview

As set out in appendices 6 and 8, feedback indicated that stakeholders broadly understood the initial design process and agreed it was a logical approach to creating both arrivals and departures envelopes. Additionally, stakeholders acknowledged the complexity of designing within the London terminal airspace and the constraints and considerations created by the wider network, particularly to the south west of the airport. Overall, feedback from a range of stakeholders from members of the public to airline stakeholders agreed that we had followed a logical process. In addition, stakeholders including change sponsors at other airports told us they felt we had identified the right constraints and considerations. A number of stakeholders cited the importance of Stansted's airspace aligning with other airspace proposals and the network efficiency that could be delivered. They were keen to understand more about the wider programme and particularly the NATS proposals and what impact this would have, which was then outlined during the phase two engagement sessions.

Stakeholders could see how the design envelopes responded to the design principles created in Stage 1. However, some raised concerns that environmental considerations such as air quality had not been sufficiently captured and were keen to understand where in the process these factors would be addressed. It was explained that further assessment would follow in later phases of Stage 2 and in Stage 3.

Managing noise impacts was raised by stakeholders as a key concern. The importance of creating options for respite and relief was the most common feedback theme particularly with the general public, elected representatives and community stakeholders. There was broad consensus that noise impacts should be shared. For arrivals, respite and relief also featured heavily in feedback and some concerns were raised that the arrivals design envelopes that were presented would lead to a higher concentration of noise than is currently experienced. In response to this feedback an additional envelope was created and some existing envelopes were repositioned and extended to offer greater potential to provide respite. These changes are outlined on page 18. In addition, further discussion on respite was included in the phase two engagement sessions in order to understand stakeholder views on this topic more fully.

The creation of the additional design envelopes was widely supported by community stakeholders as a means of providing opportunities for respite. In addition, airline stakeholders were particularly supportive of the proposed Runway 22 South West envelope and supported the efficiency-based rationale for its inclusion.

Many stakeholders commented on the amount of housing development within the local area. It was broadly felt that consideration should be given to future housing developments when designing routes within the envelopes. We explained that consideration of local plans was already required within the CAP1616 process. However, in response to this feedback, committed housing developments of 50 or more housing units contained within local plans and 5 year housing land supply statements falling within the 'Area of Potential Impact' for our Airspace Change Programme were mapped and included in the route options maps shared at the phase two engagement sessions. These maps can be found in appendix 3.

Stakeholders raised the importance of noise sensitive sites and wanted reassurance that these would be taken account of in the designing of route options. In response to this feedback, the location of sites such as AONBs and SSSIs were highlighted on the options maps shown in the phase two engagement materials. It was also explained that this issue would be considered later in Stage 2 as part of the DPE in relation to our Design Principle Noise (N3).

In respect of the arrivals design envelopes, our feedback from phase one engagement was very clear that noise, respite from noise, minimising emissions and the use of CDA were stakeholders' priorities.

As a result, any route option that would not provide for CDAs would not align with stakeholder feedback, in addition to being incompatible with the Design Principle Policy (P). For these reasons, any such route options were classed as 'viable but poor fit' in the classification of route options referred to in section 5.2 of this document and described in more detail at section 5 of the DOR. This approach and the associated revisions to the arrivals design envelopes were presented during the phase two engagement, with a map shown of the area within which an aircraft at 7,000ft could make a CDA to either runway end using optimal descent gradients from a noise generation and fuel burn perspective. This included the constraints that were identified to the south west, and this had the effect of removing some areas from the extremities of the design envelopes that had been shared in the first phase of engagement.

Full details of the feedback received during the phase one engagement and how this informed our development of design envelopes and route options is presented in the reports at appendices 6 and 8.

4.2 Refining the design envelopes and creating route options

Feedback collected in the first phase of engagement informed the revision of the design envelopes for departures and arrivals and influenced the creation of route options within the design envelopes. The changes made to the design envelopes are set out below.

4.2.1. Changes to the design envelopes following phase one engagement stakeholder feedback

Amendments were made to the design envelopes following stakeholder feedback from phase one engagement. Figures 3 and 4 show where envelopes have been extended with black shading or where they have been reduced with red shading. Additionally, minor changes were made to the 22 East and 04 East envelopes to correct a presenting error in how they were shown in the phase one engagement.

In the case of Runway 22, an additional design envelope was introduced in response to stakeholder feedback. This new envelope, referred to as Runway 22 North East, was included in response to feedback about creating an alternative for the current 22 East departure envelope, presenting the opportunity to provide noise relief and thereby aligning with Design Principle Noise (N2). As this envelope was designed for routes to climb at 6% it also provides a lower climb to that of the 22 East envelope to meet our Design Principle Alternatives (A).

In addition, both the 22 West A and 22 West B envelopes were repositioned in response to feedback. This aligned them more closely to the Design Principle Efficiency (E) to potentially reduce interaction with London Luton traffic, to provide greater opportunities to avoid overflying communities in line with Design Principle Noise 1 (N1), to provide more opportunity to create respite in line with Design Principle Noise 2 (N2) and to reduce fuel burn by reducing track miles in line with Design Principle Balance (B).

In a similar way to Runway 22, both 04 West A and 04 West B design envelopes were repositioned to widen them. This was in response to feedback from aviation stakeholders that this could have the potential to create a more direct route avoiding Luton traffic and create further respite opportunities. This aligned these design envelopes more closely to the Design Principle Efficiency (E) to potentially reduce interaction with London Luton traffic, to provide greater opportunities to avoid overflying communities in line with Design Principle Noise 1 (N1), to provide more opportunity to create respite in line with Design Principle Noise 2 (N2) and to reduce fuel burn by reducing track miles in line with Design Principle Balance (B).

Extensions were also made to 04 North East and 04 South East design envelopes in response to overall feedback from aviation to increase the opportunity of multiple route options for respite purposes in line with Design Principle Noise 2 (N2) and to assist with runway throughput in line with Design Principle Demand (D).

Figure 3: Revised departure design envelopes Runway 22

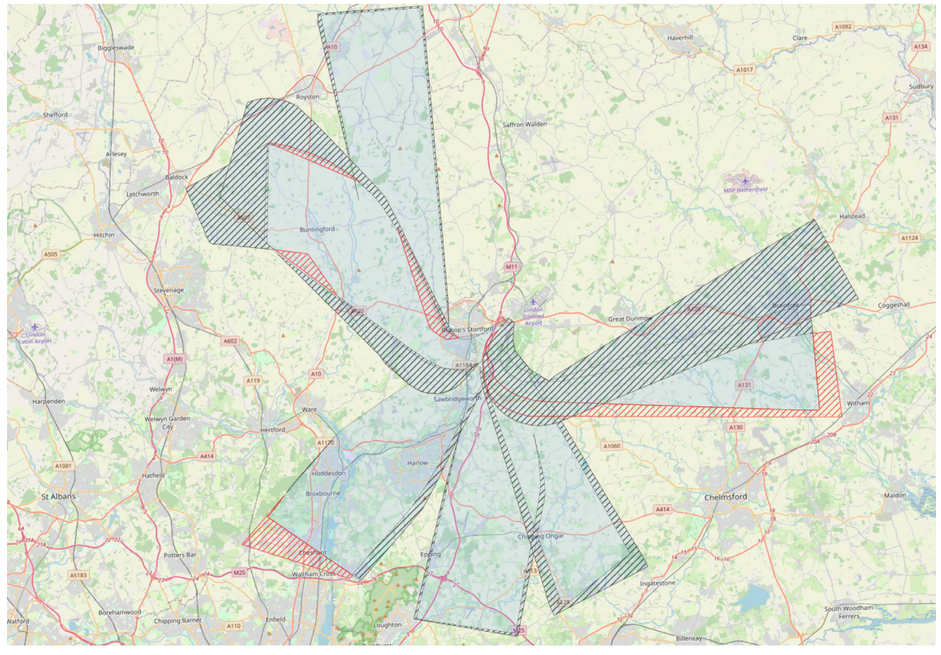
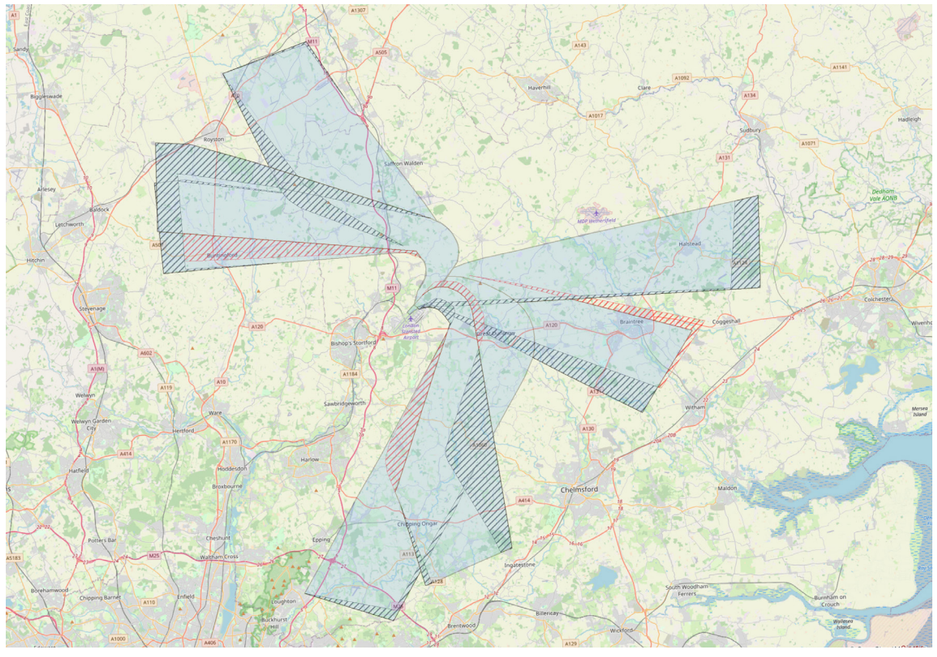


Figure 4: Revised Runway 04 departure design envelopes



4.2.2. Mapping of additional constraints or factors to consider

It was clear from our phase one engagement that stakeholders wanted proposed options to avoid certain buildings, features or areas. Existing centres of population were expressed by stakeholders as being of the uppermost importance, as was the need to protect noise sensitive buildings such as educational and healthcare establishments.

It was also clear from stakeholder feedback that there are significant new and proposed areas of housing development that need to be considered. Whilst mapping new developments is a requirement of CAP1616 at Step 2B, in response to this stakeholder feedback we mapped these sites and developments and included them on the maps shown to stakeholders at the second phase of engagement to make these clear to stakeholders. We consulted all of the existing Local Plans in the area of potential impact and map all sites of 50 or more housing units. We chose this as a figure because it accords with the +/- unit that the CAA use when calculating households and therefore population levels within airport noise contours. Where Local Plans have not been available or are demonstrably out of date, we have used Local Authorities' five-year housing land supply statements to identify areas/sites that have a realistic proposition of being developed.

Many requests were received during the phase one engagement to avoid overflying of specific locations, including: noise sensitive buildings (health and care establishments, educational facilities and places of worship); ecological designations, from nationally protected sites such as Sites of Special Scientific Interest (SSSI) to locally protected sites; landscape designations such as National Parks and Areas of Outstanding Natural Beauty (AONB) to locally identified areas of recreational value; and historical designations from scheduled monuments, registered parks and gardens, registered battlefields and individual listed buildings. We have mapped all of these where they are recorded on the Department for Environment, Food and Rural Affairs MAGIC map and where we have been able to use address point data to identify noise sensitive buildings.

During the phase two engagement, we explained that we would identify these assets with reference to our Design Principle Noise 3 (N3) which states that "where practical, our route designs should avoid, or minimise effects upon, noise sensitive receptors". While in the process of showing route options to stakeholders we did not show all of the designations on the base plans as it would have rendered them illegible, they have been identified and considered as part of the over-flight analysis conducted as part of the DPE. Further detail can be found in section 4.11 of the DPE.

4.2.3. Generation of route options

Having amended the design envelopes and considered the additional factors identified by stakeholders at phase one of engagement, a set of route options was then created within the design envelopes.

It was clear from our phase one engagement that providing opportunities to create respite within the overall design was of great importance to all stakeholder groups. For departures, this feedback influenced the creation of the additional design envelope, as well as the extending and widening of other design envelopes to give greater scope for respite for overflown communities. For arrivals in response to concerns about the level of concentration and the impact this could have on overflown communities, options were created that provide different final approach joining point heights to create a level of relief. In addition, for phase two engagement we prepared alternative concepts for how we might build further respite opportunities into the arrivals options and gathered feedback on these concepts to influence future development.

In response to specific aviation feedback regarding the potential to improve 04 operations, it was suggested that an additional route option was created that headed to the south west to create an opportunity for a more efficient direct routing in this direction, in line with the envelope created for Runway 22. This feedback was incorporated into the development of the route options for 04 South West envelope.

Stakeholders told us that they were concerned about noise impacts on overflown communities and specific locations that, due to proximity to the airport, were included in all the envelopes. This feedback influenced the inclusion of options that take account of areas that are more highly populated and options to provide noise relief.

The extent of housing development locally was raised by stakeholders as something they wanted to be considered in our route options. Local plans were reviewed and committed housing developments of over 50 dwellings available as of 31st October 2021 were mapped to show stakeholders their location in relation to the proposed route options.

Stakeholders reiterated the importance of taking account of noise sensitive sites such as green spaces and AONBs. Route options were created that took account of these and these sites were highlighted in the maps provided to stakeholders at phase two to show proximity to route options.

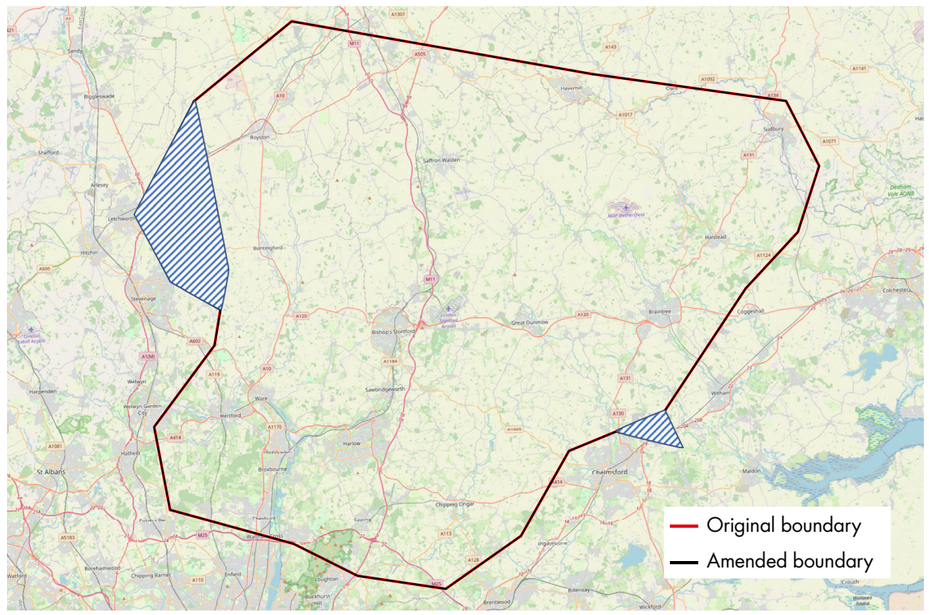
4.2.4. Area of potential impact

As part of the refinement of design envelopes described above and the creation of route options ahead of the phase two engagement, it was established that there were viable route options that would extend marginally beyond the 'Area of Potential Impact' identified at Stage 1 of the CAP1616 process (see our Stage 1 Design Principles Report for further details). As a result, it was considered necessary to expand this area marginally, as shown by the blue hatching in Figure 5 below.

As the Area of Potential Impact informed the stakeholder engagement carried out at Stage 1, a further process of stakeholder identification was undertaken to account for the expansion of the Area of Potential Impact in case additional stakeholders would be affected and to take account of additional members of the public who might be affected. This highlighted a small number of additional stakeholders within the categories set out in CAP1616, comprising 25 additional Parish Councils. Eleven of these Parish Councils had already been invited to previous engagement, as Parish Councils bordering the original Area of Potential Impact had already been included at Stage 1. However, all identified parish councils within the additional areas were invited to a specific engagement session.

During that engagement session, an overview of the design principles established in Stage 1 and the first part of the Stage 2 work was shared, to give stakeholders an opportunity to share their views. While take up was limited with one parish council responding, the stakeholder that attended reported that they appreciated the opportunity to engage. They fed back that they understood the content and as they felt they were quite a distance from the airport they did not have further comments that they wished us to take account of. All the additional parish councils were also invited to take part in the second phase of Stage 2 engagement.

Figure 5: Revised area of potential impact



5. Phase two engagement

5.1 Overview

The purpose of the second phase of engagement was to update stakeholders on the development of the design envelopes following the phase one engagement and to outline the route options that had subsequently been developed within the design envelopes.

As this phase would contain a higher degree of complexity than phase one, we used slightly different engagement methods. We undertook two different methods of engagement, this consisted of discussion sessions for stakeholder groups and focus groups for our general public participants. We wanted to ensure that stakeholders were given the opportunity to fully question and discuss the materials, despite the detailed nature of the content. For this reason, we decided to hold smaller group sessions than during phase one, which entailed a greater number of sessions to allow all participants to take part. In addition, due to the relaxation of COVID restrictions, we were able to offer a choice of both online and in person sessions so that stakeholders could choose to engage in the way that suited them best.

For all other stakeholder groups, we held a number of discussion sessions, led by the Stansted Airspace team. Due to the volume of material, separate sessions were held for departures and arrivals across two weeks. These stakeholders were therefore all invited to attend two sessions. Each engagement session lasted 1.5 hours and stakeholders were invited to the session with other similar stakeholders so that the conversations and questions raised would likely be most relevant to their specific areas of interest and knowledge levels. Again, the main presentation was pre-recorded to ensure consistency of content. A pre-read and glossary document was sent to stakeholders in advance in order to give them some background to the session.

All content shared in during the phase two engagement can be found at appendices 4 and 5.

In total, 14 discussion sessions were held over the course of November 2021, comprising both online and in-person sessions. After the session, stakeholders were sent copies of the presentation, a Q&A document setting out our answers to questions raised by stakeholders during the sessions and a feedback survey. Stakeholders were given time to consider the content more fully before sending any additional comments and the survey acted as a reminder of the questions posed in the discussion sessions. Stakeholders were also given the opportunity to receive a printed copy of the materials and a video version of the presentation was also made available to help stakeholders to digest the content in the way best suited to them.

In total 69 stakeholders attended the discussion sessions. Further details on the stakeholder mix and feedback received can be found in appendix 9.

For general public participants, we held a number of focus groups which were again facilitated by YouGov. This ensured that those stakeholders who would be likely to have less knowledge of the subject matter could be fully supported to understand the content. Facilitation by YouGov provided independent assurance that stakeholders had understood the material and that it was presented to them in a way that enabled them to fully engage. The other aim of this approach was to enable us to gather feedback from a broad range of the general public, in terms of demographic mix, perception of the airport and aircraft noise and also geographic spread across the potentially affected area. YouGov, as research experts, were well positioned to enable us to engage with a broad cross section of the public.

Each focus group was 2.5 hours long and presented both departures and arrivals options. We understood that these participants would primarily be interested, and were most likely to have more knowledge of, the local factors in the envelopes and options located closest to them. Participants were therefore split by location so that each group would have a mix of stakeholders broadly located around the same area. In each session YouGov emphasised the envelopes that were most relevant to the location of the participants in that group. However, all participants were sent the full presentation of options after the event and sent a feedback survey allowing them to view and comment on all the envelopes.

A mix of online and in person focus groups were held giving participants the option of which format suited them best. A member of the Stansted airspace team attended each group in order to support YouGov with any technical questions raised.

In total, 54 general public participants attended the focus groups. Further details on the participant mix and feedback received can be found in appendices 7 and 10.

5.2 Material shared during phase two engagement

For consistency, engagement materials for the second phase of engagement followed the same format as the first. However, due to the increased volume and complexity of information to be shared, separate departures and arrivals presentations were produced. In addition, as in-person events were permitted, large-scale maps and printed copies of the presentations were also created. To further support those attending the online sessions, a video recording of the presentation was also circulated after the events for those that may wish to listen again to the narrative alongside the presentation, before responding to the feedback survey.

Both departures and arrivals presentations provided a recap of the content that had been shared at phase one. This was important both for any stakeholders that may not have attended the earlier phase but also as a reminder to those that had. An overview of the feedback stakeholders gave us at phase one was then outlined with details of how this had influenced the next phase of design. This enabled us to check with the stakeholders that we hadn't missed any pertinent feedback and had interpreted stakeholder comments correctly.

We then took stakeholders through the next steps of the design process that had been completed to create the route options. This centred on two main elements, the stakeholder feedback from phase one engagement and the changes made in response to that feedback, and the application of our three 'must have' design principles, Safety (S), Policy (P) and Demand (P) to the route options.

Full details of the materials presented to stakeholders during the phase two engagement can be found at appendices 4 and 5.

5.2.1. Developing the route options

We explained to stakeholders that, having incorporated the design envelope changes, our route designers then created route options within the amended design envelopes. The design process for the development of those route options, as described in detail at sections 6 and 20 of the DOR was explained. Details of the methodology for classifying the potential route options were provided, with an explanation of the three categories. These classifications are explained fully in section 5 of the DOR, but are summarised in table 1.

Table 1 – Viability classification

Classification	Criteria	Outcome
Unviable	Would not comply with the requirements of ICAO Procedure for Air Navigation Services (PANS-OPS 8168) or did not have a supporting safety justification for non-compliance.	These options were not designed, due to a lack of compliance with the required standards. As a result, no such options were progressed to the DPE.
Viable but poor fit	Fail to meet the requirements of the three design principles with which all route options 'must' comply (Safety (S), Policy (P) and Demand (D)).	These are identified as **lettered** options and were not progressed to full DPE, although an initial evaluation against the three 'must have' design principles is included in the DPE.
Viable and good fit	Expected to meet the three design principles with which all route options 'must' comply (Safety (S), Policy (P) and Demand (D)).	These are identified as numbered options and were progressed to full DPE.

5.2.2. Describing the route options

For each of the 15 departure envelopes and 6 arrivals envelopes we showed stakeholders a graphic of each envelope with constraints mapped and initial 'viable and good fit' route options shown.

Each individual route option was numbered and the rationale for the numbering regime not always running sequentially was explained, as some route options were designed but then failed the test against the 'must have' design principles and so were classified as 'viable but poor fit'. The end of each departures route option was shown to be the point at which that route option achieved 7,000ft when applying the relevant climb rate for that design envelope. For each of the arrivals route options, the start was shown at a height of 7,000ft before showing the route the aircraft would use before landing at Stansted.

It was explained that all departure route options within a design envelope had a consistent climb gradient of 8% or 6% to ensure that our Design Principle Safety (S) was met. In relation to arrivals, it was explained that aircraft could join final approach at 2,000ft, 2,500ft or 3,000ft but that when shown on a map this would

show a large amount of arrival route options within close proximity of each other. We therefore explained to stakeholders that our maps only illustrated routes with a 2,000ft joining point to prevent confusion. We have reported these at sections 20-30 of the DOR.

We explained that most departure design envelopes contained an existing route and that these existing routes rely on ground-based navigation aids. As these ground based navigation aids are to be removed from service, we had designed a replication of these existing routes, by applying PBN standards, to act as a 'do-minimum' option against which to compare other route options. It was explained that within these envelopes further route options had been designed, over and above the replication of the existing route.

We explained that these further route options were designed to align with the agreed design principles. By summarising the rationale for each of these further route options, we were able to explain which design principles we had sought to align with in designing a particular route option and the benefit that this was intended to secure. It was highlighted to stakeholders that there are two slightly different technologies that we applied to PBN route design, RNAV1 and RNP1, as our fleet survey showed that all aircraft flying into Stansted could use RNAV1 and 80% could utilise RNP1. It was explained that the technologies are similar, but that some slightly different design rules apply and they produce slightly different tracks.

In relation to the arrivals design envelopes, it was explained that these did not contain existing routes due to the structure of the current operations. It was explained that a number of arrivals design envelopes contain an option which encompasses the position of one of the current LOREL holding stacks.

5.2.3. The route options presented at phase two engagement

The next section of the phase two engagement presented maps showing the design envelopes individually. The design envelopes contained the 'viable and good fit' route options that met the 'must have' design principle(s). The relevant design principles were outlined for each route option and additional information was provided through the narrative.

The envelopes and corresponding route options summarised below were presented to stakeholders in the sessions with accompanying explanatory narrative. All the materials presented to stakeholders at phase two engagement is provided in appendices 4 and 5.

A. Departure route options

Runway 22 North Envelope

- This design envelope corresponds to the current Barkway SID which is seldom used at present and is restricted to aircraft seeking to exit the controlled airspace to the north. Removing these restrictions would have the effect of spreading noise more equally in accordance with our Design Principle Noise 2 (N2).
- 22 North utilises an 8% climb gradient that could provide alternative route options to those set out in 22 West A.

Runway 22 North East Envelope

- Runway 22 North East was created following phase one engagement and is intended to provide an alternative to the current Clacton SID which is represented by the 22 East envelope. Routes in this envelope were designed at a 6% climb gradient to provide a departure option for lower performing aircraft in line with the Design Principle Alternatives (A).
- This was a new design envelope, so no replicated route options were designed.
- It seeks to create a net reduction of the current Clacton SID within the 22 East envelope by taking traffic off that route in line with Design Principle Noise 2 (N2).

Runway 22 East Envelope

- This envelope is based on the current Clacton SID (which represents the 'do minimum' scenario) and is designed to route traffic to Northern, Eastern and South East Europe. It currently operates utilising PBN and was implemented a number of years ago.
- The existing route operates at a 3% climb gradient, and this was amended to an 8% climb gradient to align it with the design minimum for the new NATS network airspace and to potentially reduce noise exposure to communities that might be currently overflown at a lower level.

Runway 22 South East Envelope

- The Runway 22 South East envelope is based on the current Detling SID (which represents the 'do minimum' scenario) which currently has daytime constraints applied to it resulting in aircraft having to use the alternative Clacton SID in the 22 East envelope.
- These constraints were imposed a number of years ago to reduce interactions with traffic to and from London City and London Heathrow. If it is possible to remove those constraints, options within this envelope would offer the ability to spread southbound traffic over alternative routes to accord with Design Principle Noise 2 (N2), and to provide more direct routings reducing fuel burn and emissions in accordance with Design Principle Balance (B).
- A climb gradient of 8% was applied for the five route options identified in this envelope.

Runway 22 South Envelope

- This envelope represents the current Lambourne SID (which represents the 'do minimum' scenario), which is currently limited to London Heathrow traffic only. If these restrictions were removed, these routes offer an alternative to spread southbound air traffic over alternative routes to create noise relief or respite in accordance with Design Principle Noise 2 (N2) and to reduce track miles/fuel burn in accordance with Design Principle Balance (B).
- The utilisation of these routes would be complicated because of the interaction with London Heathrow traffic so close co-ordination would be required with London Heathrow and NATS airspace change processes to realise any of the benefits that might arise from their use.
- The climb rate assumed for this envelope was 8% and 6% alternative route options were developed.

Runway 22 South West Envelope

- This is a new design envelope and is the third of three alternatives for south west and south bound traffic from Runway 22. It is more direct than the current routing for this traffic using the 22 West B envelope and provides benefits in terms of reduced track miles and fuel burn according with Design Principle Balance (B).
- We created options that take into consideration Design Principle Noise 1 (N1) by avoiding large villages and towns and, depending on the use of the route options, there is the potential to create respite or relief aligning with Design Principle Noise 2 (N2).
- As with the 22 South envelope the use of this route would be complex because of the interaction with traffic inbound and outbound to and from London Heathrow.
- As it is a new design envelope there were no replicated route options and the six identified routes within this envelope all assume a climb rate of 8%.

Runway 22 West A Envelope

- Six options were described for Runway 22 West A, two of which represented a replication of the existing NUGBO SID (which represents the 'do minimum' scenario). The routes within this envelope followed an identical track to that of the 22 West B envelope for the first 8-10 miles to avoid London Luton traffic.
- Following feedback in the first phase of engagement, this envelope was repositioned to orientate aircraft more in the north westerly direction after they reach 7,000ft. This aims to reduce fuel burn in accordance with the Design Principle Balance (B), to reduce interaction with London Luton traffic in accordance with Design Principle Efficiency (E) and to create noise relief from the 22 West B envelope traffic in accordance with Design Principle Noise 2 (N2).
- All routes shown within this envelope assumed a climb gradient of 6% in line with our Alternatives (A) design principle.

Runway 22 West B Envelope

- The Runway 22 West B envelope is currently used by all traffic that routes to the south and south west. The current design requires all traffic to head north after departure, before resuming a track to the west and then south because of the interaction with traffic from London Luton and other airports in the London area.
- Because of the additional track miles and therefore fuel burn, these options sought to improve the track miles for aircraft following this routing to address Design Principle Balance (B).
- It was explained that achieving this aim would require close co-ordination with London Luton and the NATS network.
- In addition, the current routes are shared by traffic we have separated out in the 22 West A envelope, which currently results in noise concentration in the early part of the shared route and creates congestion. Addressing these points would accord with Design Principle Noise 2 (N2) and Design Principle Demand (D). Nine route options were developed in this envelope, in addition to the two replications of the existing route (which represents the 'do minimum' scenario).
- All assumed a climb gradient of 6% in line with our Design principle Alternatives (A).

Runway 04 North Envelope

- The Runway 22 North envelope utilises a climb gradient of 8% and is designed for flights to the north of the UK and beyond.
- The foundation for the route options is the current Barkway SID (which represents the 'do minimum' scenario) which has operational constraints applied to it at present and is seldom used. It is generally restricted to non-commercial aircraft seeking to exit the controlled airspace to the north. Removing those constraints would have the effect of spreading noise more equally in accordance with our Design Principle Noise 2 (N2). 04 North could provide alternative routes options to those set out in the 04 West A envelope, in line with Design Principle Alternatives (A).

Runway 04 North East Envelope

- Runway 04 North East is a new design envelope and is an alternative to the current Clacton SID within the 04 East envelope.
- The route options in this envelope were designed at a 6% climb gradient to provide a departure option for lower performing aircraft in line with the Design Principle Alternatives (A).
- As it is a new design envelope, there are no replicated route options and four of the options created have applied the Design Principle Noise 1 (N1), by seeking to avoid overflying large towns and villages, whilst also seeking to create noise relief on the current Clacton SID within the 04 East envelope, in line with Design Principle Noise 2 (N2).

Runway 04 East Envelope

- Similar to the Runway 22 East envelope, this envelope is based on the current Clacton SID.
- It is intended to route traffic to Northern, Eastern and South East Europe. Unlike the 22 Clacton SID this route has not been designed to PBN standards.
- The existing SID (which represents the 'do minimum' scenario) operates at a 3% climb gradient. This envelope utilises an 8 % climb gradient, to potentially reduce noise exposure to communities that might be currently overflown at a lower level.

Runway 04 South East Envelope

- This envelope is based on the current Detling SID (which represents the 'do minimum' scenario) and this has been designed to PBN standards and was implemented a number of years ago.

Runway 04 South Envelope

- The Runway 04 South envelope has an 8% climb gradient and is based upon the current Lambourne SID (which represents the 'do minimum' scenario).
- This is presently limited to the use of traffic to London Heathrow only.
- The basis for developing this envelope was the Design Principle Noise 2 (N2) to create options for noise relief or respite as it provides an opportunity to spread some southbound traffic across additional routes. It is also more direct than the current southbound route in line with the Design Principle Balance (B) and has the potential to create a fuel and CO_2 saving.
- It was explained that the use of this route would be complex because of the interaction with traffic inbound and outbound to and from London Heathrow.

Runway 04 West A Envelope

- The Runway 04 West A envelope is primarily used by traffic routing to the north and north west. It shares an identical track to that of the 04 West B envelope for the first 8-10 miles.
- Our design rationale for this envelope was to seek ways to create track dispersal from this in accordance with the Design Principle Noise 2 (N2). Secondly, the track of the current NUGBO SID routes traffic to the west and as with the reciprocal envelope for Runway 22, feedback from the first engagement led us to reorientate this envelope in a north westerly direction to align with the direction that aircraft will be heading after they reach 7,000ft.
- The aim is to reduce fuel burn in accordance with the Design Principle Balance (B), to reduce interaction with London Luton traffic in accordance with the Design Principle Efficiency (E) and to create noise relief from the 04 West B envelope traffic in accordance with Design Principles Noise 2 (N2).

Runway 04 West B Envelope

- The Runway 04 West B envelope contains a replication route and represents the 'do minimum' scenario. It is currently used by all Stansted traffic that routes to the south and south west.
- As with the 22 West B envelope, this routes traffic to the north and then west after departure in order to reduce interaction with traffic from London Luton and other airports in the London area. As with the 22 West B option, any changes to this route would require close coordination with London Luton and the NATS network.
- In addition, the current routes are shared by the 04 West A envelope and a number of the options here seek to reduce that interaction.
- All routes within this envelope were designed to 6% as an alternative to other southbound route options that were designed at 8%. This is consistent with Design Principle Technology (T).

B. Runway 04 and Runway 22 arrival route options

Runway 22 West Envelope

- This envelope closely aligns to the position of the current LOREL holding stack which would represent the 'do minimum' scenario. In addition, it considers Design Principle Noise 1 (N1) as it seeks to avoid towns and villages, Design Principle Balance (B) as it provides fuel efficient routes.
- Some routes are optimally placed for operations to both runway ends in line with our Design Principle Policy (P).

Runway 04 West Envelope

- The Runway 04 West envelope closely follows the same route direction flown by aircraft today and closely aligns to the position of the current LOREL holding stack to the north of the airport, which represents the 'do minimum' scenario.
- However, in line with the Design Principle Policy (P) it allows a CDA operation to Runway 04 which is currently unachievable due to network interactions to the south west of the airport. This envelope shares the same 7,000ft start point as Runway 22 providing optimal operations for both runway ends in line with Design Principle Policy (P) and Design Principle Balance (B). In addition, it aligns with the Design Principle Noise 1 (N1) as it seeks to avoid overflying towns and villages.

Runway 22 East Envelope

- Unlike the West envelopes, the Runway 22 East envelope has a 7,000ft start point to the east of the airport. This is different to how aircraft are flown today. This is because the existing ABBOT holding stack is outside of the 'viable and good fit' design area as a CDA cannot be achieved to both runway ends from its location. There is no 'do minimum' scenario in this option. Routes within this envelope were designed to avoid towns and villages where possible in line with Design Principle Noise 1 (N1) and provide a fuel-efficient approach in line with Design Principle Balance (B). The envelope contains routes that can provide a CDA to both runway ends in line with Design Principle Policy (P).

Runway 04 East Envelope

- This envelope shares the same 7,000ft start point as 22 East and provides optimal operations for both runway ends in line with Design Principle Policy (P) and Design Principle Balance (B). Due to the location of the start point, it does not encompass an existing holding stack and is different to how aircraft are flown today therefore there is no 'do minimum' scenario in this envelope. In addition, to align with the Design Principle Noise 1 (N1) routes within this envelope were designed to avoid overflying towns and villages where possible.

Centre options Envelope

- These envelopes result in aircraft approaching Stansted close to or overhead the airfield before making a turn and commencing the approach. The Centre West option for both runway ends for aircraft arriving from the west or north west and the Centre East option for both runway ends for aircraft arriving from the east and south east. Both centre options align with Design Principle Balance (B) as they provide approaches to Runway 04 and Runway 22 with identical fuel burn to each runway end.

5.2.3. Respite

This section summarises the information presented during the phase two engagement in respect of respite, in line with our Design Principle Noise 2 (N2). We felt it was important to include this information within our phase two engagement as the opportunity for our ACP to share noise to provide respite from aircraft noise was one of the most frequently requested outcomes from the first phase of engagement.

During the phase two engagement we felt it was important to understand stakeholder views more fully, to inform how we could best create potential respite opportunities as our design proposals mature. Therefore, a section of the presentation at the second phase of engagement was dedicated to discussing respite. This also helped to inform our DPE assessment criteria for Design Principle Noise 2 (N2).

Stakeholders were asked a number of questions to help drive the discussion, including whether they agreed with our definition of respite and relief, what they felt would constitute a sufficient period of respite and whether there were preferable times to have a period of respite. These questions are set out in appendices 4 and 5.

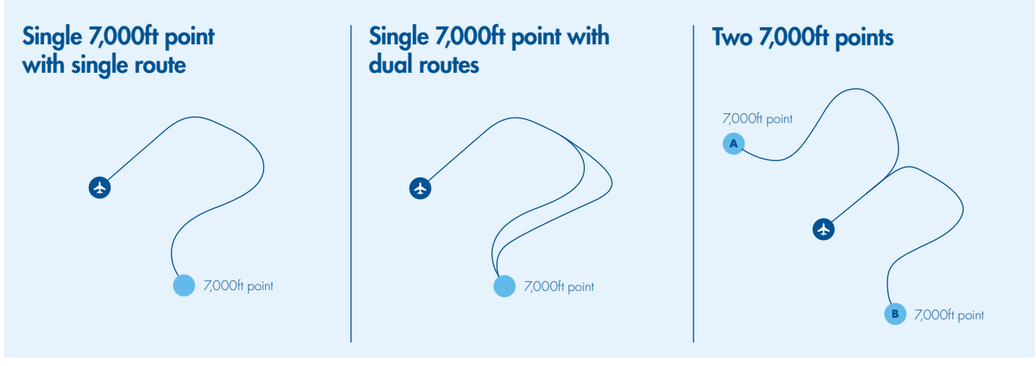
It was explained that, in response to the feedback received during phase one engagement, we had created two additional design envelopes for departures and extended other design envelopes to increase the opportunity for sharing noise.

For arrivals, it was explained that, in response to earlier feedback on respite, we had created three alternative concepts to provide different joining points which could create a degree of noise sharing. We also highlighted that, in line with our Design Principle Noise 2 (N2), we had designed options that have a range of joining points onto final approach either at 2,000ft (which is the minimum), 2,500ft or 3,000ft.

As an example to support discussion, stakeholders were shown an illustration of three arrival concepts (summarised below) along with the related description. They were asked which concept they preferred. It was explained that this illustration was for discussion and that the concepts discussed might not be operationally viable in all cases. A range of factors, including the need to integrate with the wider airspace network, and also to ensure our arriving and departing aircraft remain safely separated from each other would likely limit our choices in some instances.

- **Single 7,000ft point with single route** – This concept concentrates flights in a small area either side of the route.
- **Single 7,000ft point with dual routes** – The second option uses a single 7,000ft point but creates dual routes on the principle of spreading the noise across a wider area and creating a degree of noise relief.
- **Two 7,000ft points** – This final concept is to use two 7,000ft points with a single route from each.

Full details of the discussion points presented to stakeholders regarding respite are set out in appendices 4 and 5.



6. Phase two stakeholder feedback

Stakeholder feedback was collected from the second phase of engagement was shared during the discussion sessions through the chat function and dialogue from the engagement sessions. The sessions were also recorded, and transcripts produced to enable review of the feedback received. YouGov created a report of the focus group discussions, and this was discussed and presented to the London Stansted team appendix 7. For the airport facilitated sessions, we documented the feedback received and created a report outlining this feedback (appendix 9). Outputs from both were discussed and investigated. Feedback received during the phase two engagement is summarised in this section, while the full reports at appendices 7, 9 and 11 should be referred to for further detail.

Using the Q&A and an online feedback survey referred to in section 5.1 of this SER, all stakeholders were given the opportunity to submit any additional feedback after having considered the information shared with them. Due to the complexity of the information shared in the sessions, the use of an online survey offered a simple way for stakeholders to provide responses to a number of multiple choice and free text questions. In addition, some stakeholders provided more general feedback via email. All feedback was logged and carefully considered by the airspace team and any potential design amendments were investigated in detail to ascertain feasibility.

As demonstrated in responses to our feedback survey appendix 11, feedback indicated that stakeholders understood the design process and appreciated the volume of information and level of detail shared. Responses to our post engagement survey found that a wide range of stakeholders, including elected representatives and other change sponsors, felt that the process we had followed to develop the route options was clear and logical. Stakeholders again acknowledged the complexity of designing within the LTMA and the constraints and considerations around the design boundary. But some stakeholders queried some of the constraints and wanted more information to understand the implications of them. In response to these queries, further information has been developed and included in appendix A of the DOR.

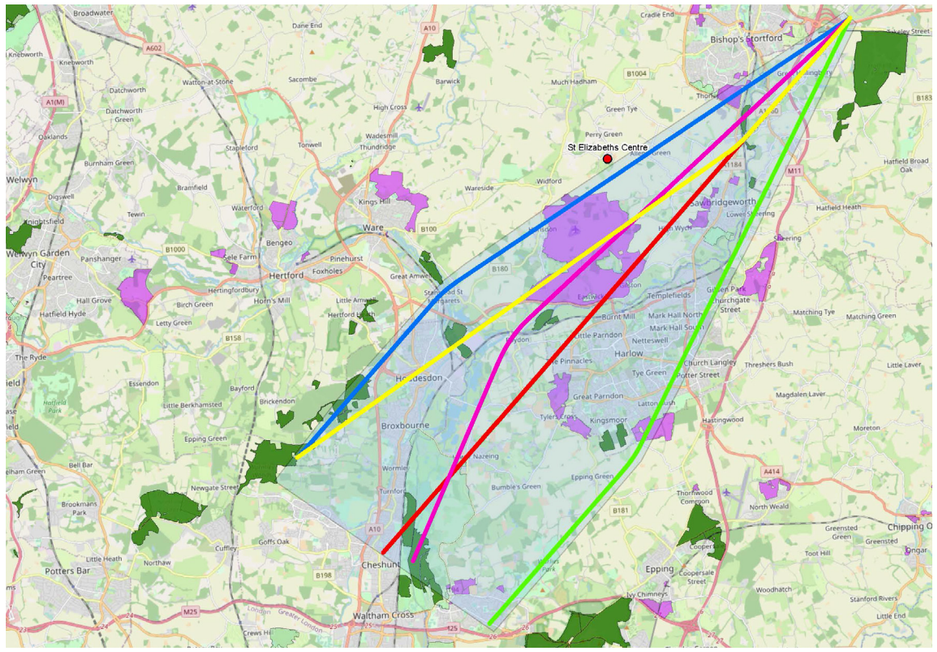
Overall stakeholders that had taken part in the first phase of engagement could see how feedback from those earlier sessions had influenced the development of the route options as evidenced in appendices 7 and 9. In particular, members of the public were pleased to see that environmental concerns had been recognised including fuel burn and the associated carbon emissions.

Responding to feedback received during phase one, route options maps had been created to highlight proposed committed housing sites of over 50 dwellings. Some stakeholders suggested that this data was incomplete and, in response, the mapping of housing developments within each of the local plans was double checked. This resulted in a small number of revisions, which were incorporated as part of a fully updated review of committed housing developments as of 24th December 2021 to inform the IOA. In addition, where overflight of specific large developments was mentioned by stakeholders, the individual applications were examined further to understand any potential impacts more fully, as part of the DPE.

A number of stakeholders, primarily elected representatives, highlighted the need to consider additional potentially sensitive sites as part of Design Principle Noise 3 (N3), with scheduled monuments and conservation areas being the most frequently raised categories of sites. These comments were considered and our approach in response is set out in appendix 11.

Specific feedback was given by stakeholders with regards to the placement of route options within the Runway 22 SW departure envelope. In particular, stakeholders, queried whether there could be an additional or amended option that would avoid both highly populated existing areas (Harlow, Bishop's Stortford) and also avoid the proposed new Gilston housing development. In response to this feedback, the detail of the Gilston development was examined and it was noted that the northern and western part of the proposed site is proposed as protected open space and will therefore not include housing. It was considered therefore that the envelope did already include an option that avoids both Harlow and the proposed housing development at Gilston. In order to avoid overflight of significant housing development to the south of Bishop's Stortford however, part of one route option (option 3, Runway 22 SW) was repositioned to reduce the impact of direct overflight of that area.

Figure 6: Amended Runway 22 South West envelope, incorporating repositioned option 3



Stakeholders also asked whether it might be possible to consider a 4,000ft joining point for arrivals as this was seen to have the potential to offer a noise benefit. This was considered but it was concluded that the resulting final approach of approximately 15 miles for each runway end would have placed these route options outside the area within which a CDA would be possible to both runway ends (further detail can be found in section 20.7 of the DOR). Consequently, this would not align with Design Principle Policy (P) and therefore was categorised as a 'viable but poor fit' option and is discussed in the DOR. In addition, an extended 15 mile final approach would concentrate traffic which would not align with stakeholder feedback, which has consistently favoured sharing of noise.

Also on the subject of arrivals, it was queried whether runway dependent holds could be feasible to provide greater flexibility. This was a concept that had previously been explored; however, it was established that both safety and airspace considerations had led this to be considered 'unviable'. This is considered more fully in the appendix A of the DOR.

With regard to respite, the broad consensus from stakeholders was a preference for longer periods of respite and longer periods of overflight. Respite at night was most frequently raised as desirable but aside from this there was little consistency in the response we received. Overall, stakeholders expressed a preference for creating multiple routes and the feasibility of implementing multiple routes within a departure envelope and multiple arrival points was explored during the engagement sessions. This feedback has been noted and will be further considered at the next stages of the process when we come to examine how routes could best work together as an integrated network.

Further detail on the feedback received at phase two can be found at appendices 7, 9, 10 and 11.

7. Engagement next steps

The design process we have undertaken has enabled us to bring forward a comprehensive set of route options for both departing and arriving aircraft. These route options have been tested with stakeholders and, as appropriate, refined and clarified to take account of the feedback we have received.

At Stages 1 and 2 of the CAP1616 process we have demonstrated our commitment to ensure that our ACP is informed by affected stakeholders and members of the general public and, as we approach the next stage of the process, we will carefully prepare a plan and supporting materials to allow our proposals to proceed to a full public consultation at Stage 3.

Our work to date has been guided by an independent SRG and we will continue to look to this group to help us adopt an inclusive approach, that ensures stakeholders' views remain at the heart of our developing proposals, and that we work within the confines of the CAP1616 process.

Further detail on the next steps within the CAP1616 process can be found in the 'Next steps' section of the DPE and IOA.

The completion of the work required at Stage 2 has developed and refined the route options available at Stansted, as well as expanding the understanding of stakeholders' views on those options. While it is not a requirement of the CAP1616 process, all stakeholders that have participated in engagement activities to date will be provided with the information submitted to the CAA at the conclusion of Stage 2, to ensure that they remain informed of the development of the ACP at Stansted ahead of the full public consultation exercise at Stage 3. This will include details of the feedback gathered at phase two of engagement, the revised route options and the assessments undertaken as part of Step 2B. This will ensure they are fully updated on our latest work as we move towards Stage 3.

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