London Southend Airport Consultation Feedback Report

Introduction of New Approach Procedures

Issue 1.1

Prepared by:
NATS

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Acronyms

ACC	Airport Consultative Committee
ACP	Airspace Change Proposal
AONB	Area of Outstanding Natural Beauty
B-o-C	Burnham-on-Crouch
CAA	Civil Aviation Authority
CAS	Controlled Airspace
CDA	Continuous Descent Approach
DA	Danger Area
DAATM	Defence Airspace and Air Traffic Management
FAF	Final Approach Fix
FAS	Future Airspace Strategy
FRT	Fixed Radius Turn
IAF	Initial Approach Fix
IAP	Instrument Approach Procedures
ICAO	International Civil Aviation Organisation
IF	Intermediate Fix
ILS	Instrument Landing System
LNAV	Lateral Navigation
LPA	Local Planning Authority
LPV (SBAS)	Localiser Procedure with Vertical guidance (Satellite Based Augmentation System)
LSA	London Southend Airport
LSACC	London Southend Airport Consultative Committee
LTMA	London Terminal Manoeuvring Area
MP	Member of Parliament
NATMAC	National Air Traffic Management Committee
NATS	National Air Traffic Services
PBN	Performance Based Navigation
PIR	Post Implementation Review
RAMSAR Site	Wetland site designated of international importance
RF Turn	Radius-to-Fix Turn
RNAV	Area Navigation
RNP-APCH	Required Navigational Performance – Approach
SAC	Special Area of Conservation
SARG	Safety and Airspace Regulation Group
SID	Standard Instrument Departure
SPA	Special Protection Areas
SRA	Surveillance Radar Approach
SSSI	Sites of Special Scientific Interest
STAR	Standard Terminal Arrival Routes
VNAV	Vertical Navigation

1. Introduction

1.1. Project Overview

Following on from the implementation of Controlled Airspace (illustrated in Figure 1) in April 2015 and the project to introduce Standard Instrument Departures, which is still underway, London Southend Airport (LSA) has started the process to introduce RNAV (Area Navigation) Approach Procedures. RNAV is a method of precise navigation which does not limit aircraft to following an inefficient flight path by flying beacon-to-beacon.

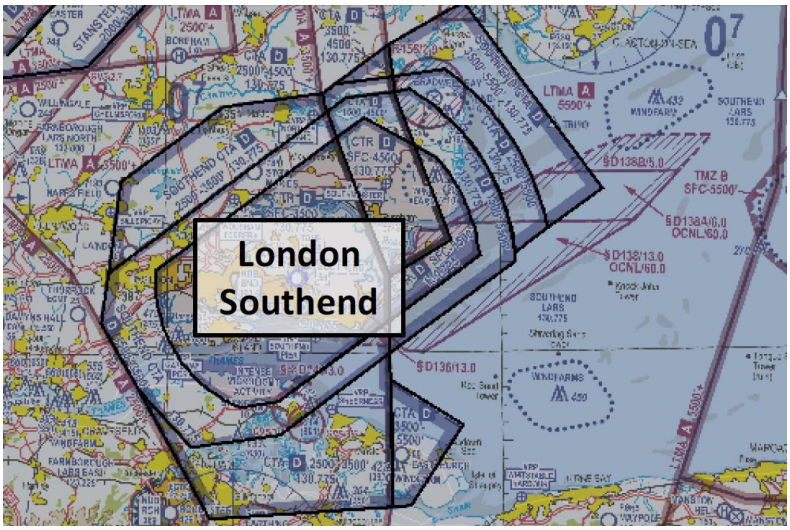


Figure 1 - Image illustrating London Southend CAS (incl. Danger Areas)

Between 16:00 on Tuesday 6th June 2017 and 23:59 on Wednesday 13th September 2017, and extended to 23:59 on Saturday 30th September 2017 for some stakeholders, who required further time to formulate their responses, LSA carried out a consultation seeking to gather feedback on the introduction of new approach procedures at LSA, and the impact they may have.

The proposed procedures do not replace any existing procedures; instead they offer an alternative type of route onto final approach for aircraft operating into LSA. The final approach tracks themselves would not change (yellow tracks in Figure 2) – this consultation is about a new way for aircraft to join the final approaches.

LSA is following the Civil Aviation Authority (CAA) process CAP725 'CAA Guidance on the Application of the Airspace Change Process' to introduce these procedures. This 14 week consultation, increased to 16 weeks for some, is a key part of that airspace design process.

The proposed procedures are known as Performance Based Navigation (PBN) and utilise newer technology which allows aircraft to reliably follow air routes with a greater level of accuracy than they do today.

The implementation of PBN at LSA is consistent with the Government's objectives to improve the efficiency of the UK airspace network and to mitigate the environmental impact of aviation as part of the Future Airspace Strategy (FAS). This would make UK airspace more predictable whilst providing the potential to route aircraft over rural areas with the aim of minimising aircraft noise over large towns.

It is expected that there will be a gradual migration towards the use of these procedures but it is difficult to provide any firm/accurate timescales for this. However, there would be no change to the final approach tracks themselves, within about 7 nautical miles[1] and 2000ft from the runways.

The procedures have been designed to reflect as closely as possible existing routings flown by aircraft on approach to LSA. Where this hasn't been possible, environmental, operational and technical design criteria have been taken into account throughout the design process.

We consulted with several types of stakeholders varying from airspace users to the public and local councils, whilst assessing changes to the design based on their feedback.

This document describes the consultation process and identifies key themes stated by stakeholders. LSA is now proceeding with the project, having taken account of the feedback received. We intend to submit an ACP (Airspace Change Proposal) to the CAA, with a provisional plan to implement these RNAV approaches in Winter 2018.

This document should be read in conjunction with the Consultation Document[2]. All technical terms and acronyms are explained in full in the Consultation Document.

The proposed routes, and the local Controlled Airspace (CAS) within which they have been designed, are illustrated in Figure 2 below, which also illustrates the straight-in sections of the approach (Yellow). These are a direct replication of today's operation. This segment of the procedure is currently being assessed by the CAA for introduction in advance of the wider PBN procedures (the design of which is the subject of this consultation).

The subjects of this consultation are the proposed PBN routes to runway 05 and 23, from the north (in Red), from the south (in Green) and straight in from the east (in Purple), shown below in Figure 2.

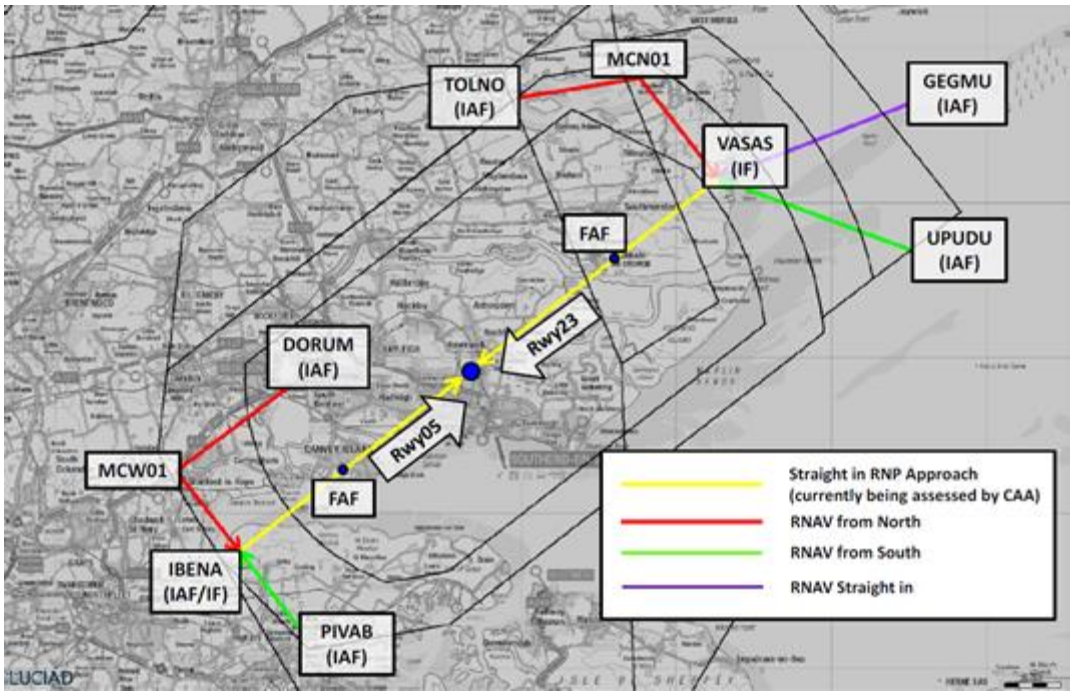


Figure 2 - Image illustrating proposed RNAV routes & CAS

[1] A nautical mile is the standard unit of distance in the aviation industry. It is 1852m, which is 15% longer than a statute (road) mile of 1609m.
[2] The Consultation Document can be viewed on the LSA website here, along with information directly from LSA on the proposed procedures: http://southendairport.com/corporate-and-community/proposed-arrival-routes

Figure 3 illustrates the remaining aspects of the change, namely the missed approach procedures for each runway (represented by dashed lines in pale Blue) and a transition route (represented in Red) which ensures that aircraft inbound from the east for runway 05 remain within the boundaries of LSA CAS.

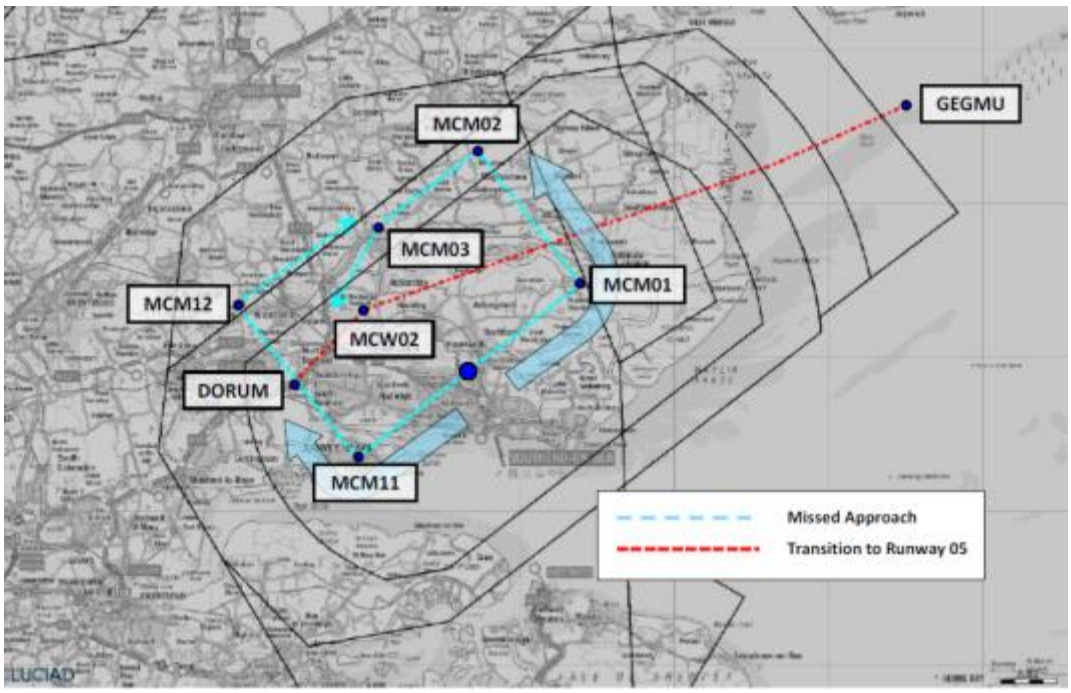


Figure 3 - Image illustrating missed approach and Runway 05 transition routes & CAS

1.2. Consultation Overview

Listed below are key dates from the consultation which captures meetings, start/end dates and issue dates.

- Meeting with LSA Consultative Committee regarding the RNAV project – 30th Nov 2016, 17th May 2017, 16th Aug 2017
- Meeting with Essex Local Planning Authorities (LPAs) – 1st March 2017
    - Essex County Council
    - Rochford District Council
    - Southend-on-Sea Borough Council
    - Castle Point Borough Council
    - Chelmsford Borough Council
- Consultation start date – 6th June 2017
- LSA website information issued – 6th June 2017
- Echo newspaper article & online article issued – 20th July 2017
- Meeting with Burnham-on-Crouch Town Council – 11th Sept 2017
- Meetings with stakeholders from the Hoo Peninsula / North Kent – 15th Sept 2017
    - Friends of North Kent Marshes
    - Cliffe & Cliffe Woods Parish Community
    - High Halstow PC
    - Friends of the Earth
    - All Hallows PC
    - Medway Council
- Consultation end date – 13th Sept 2017
- Extended consultation end date for organisations requesting more time – 30th Sept 2017

2. Confidentiality

The CAA Safety and Airspace Regulation Group (SARG) requires that all consultation material, including copies of responses from stakeholders, is included in any formal Airspace Change Proposal (ACP) submission to the CAA. Where specifically requested, details which may identify an individual will be removed before submission.

London Southend Airport (LSA) undertakes not to disclose the personal details or content of responses and submissions to any third parties, apart from the necessary submission of material to the CAA and essential use by our consultants for analysis purposes in developing this report and subsequent ACP material.

3. Stakeholder Engagement

3.1. Introduction

This section outlines the following:

- methods that were used to engage with the public/stakeholders;
- members of various organisations that were invited to take part in this consultation;
- number of responses received from the consultation.

A detailed Consultation Document ("London Southend Airport Flight Path Consultation – Consultation Concerning the Introduction of New Approach Procedures") was prepared by London Southend Airport Company Limited with the assistance of NATS Limited. The document explained the proposed RNAV procedures in detail, along with how it may affect various stakeholders. The CAA requires each airport seeking to introduce new routes to put forward a case which justifies their application, and shows that all interested parties have had an opportunity to make their views known. Accordingly, LSA's Consultation Document was available to view or download from their website.

The formal consultation period for the proposed approach procedures began on the 6th June 2017, and was open for comments during the 14 week duration.

On 30th November 2016, members of the London Southend Airport Consultative Committee (LSACC) were advised that LSA had begun the process to introduce RNAV Approaches. During subsequent meetings LSA were asked to provide LSACC members with access to the RNAV Consultation Document. Following general publication of the Consultation Document on the 6th June 2017 via the LSA website, a copy was sent to the LSACC Chairman which was subsequently circulated by email to all members of the LSACC on the 7th June 2017.

The Consultation Document was also circulated to members of the National Air Traffic Management Advisory Committee (NATMAC) on 6th June 2017 via an email which linked to the LSA website. The email outlined the proposal and gave guidance on how to access the document and how to respond.

Emails were also sent to National Bodies, Kent Councils, Essex Councils and Members of Parliament (MPs) for their comments.

Local airspace users were requested to provide feedback on the suggested RNAV Approach procedures, such as neighbouring aerodromes, flying clubs, and airlines/private jets that operate in the area. The consultation was also publicly advertised in both The Echo[3] (a regional newspaper – Appendix A) and the LSA website for comments by members of the public.

Comments were invited by the close of the consultation, formally agreed to be the 13th September 2017; due to further questions from the public and certain organisations, stakeholders who requested additional time were provided an extension until 30th September 2017.

[3] The Echo (Essex) is well known a daily newspaper serving South Essex, England, specifically reaching Basildon, Canvey & Southend. The newspaper is distributed throughout Essex, which reaches 118,925 in print and considerably more online. The online article can be viewed here: http://www.echo-news.co.uk/news/15423256.Airport_wants_to_hear_your_views_on_changes_to_flight_plans/

Complete details of these engagement channels are provided below along with the list of organisations invited to respond to the consultation and details of other organisations which responded. They have been categorised according to the following colour chart:

- Stakeholder Response - Objection — Writing in red
- Stakeholder Response - Support — Writing in green
- Stakeholder Response - No Objection — Writing in salmon
- Stakeholder Response - No Comment — Writing in blue
- Stakeholder Provided Information Only Feedback — Writing in turquoise
- Stakeholder Not Submitting Formal Response — Writing in purple
- Stakeholder Noted Consultation (no further response) — Writing in brown

3.2. National Air Traffic Management Advisory Committee

The National Air Traffic Management Advisory Committee (NATMAC) is a non-statutory advisory body sponsored by the CAA, consisting of a representative group of airspace stakeholders who may be asked to comment on major airspace changes.

The group aids the CAA in the development of airspace changes and procedures by providing an understanding of requirements from individual representatives speaking for all users of UK airspace, civil and military. Consultation invitations were sent out to 43 members of NATMAC representing 37 organisations, of which 5 responded. See the list below, colour coded as per the Section 3.1:

- Aircraft Owners and Pilots Association UK (AOPA)
- Airfield Operators Group
- Airlines UK
- Airport Operators Association (AOA)
- Aviation Environment Federation (AEF)
- BAE Systems
- British Airways (BA)
- British Airline Pilots' Association (BALPA)
- British Balloon and Airship Club (BBAC)
- British Business and General Aviation Association (BBGA)
- British Gliding Association (BGA)
- British Hang Gliding and Paragliding Association (BHPA)
- British Helicopter Association
- British Microlight Aircraft Association (BMAA) & GASCo
- British Model Flying Association
- British Parachute Association (BPA)
- CAA Safety and Airspace Regulation Group (SARG)
- Defence Airspace and Air Traffic Management (DAATM)
- Future Airspace Strategy VFR Implementation Group (FASVIG)
- General Aviation Alliance (GAA)
- Guild of Air Traffic Control Officers (GATCO)
- Heavy Airlines
- Helicopter Club of Great Britain (HCGB)
- Honourable Company Air Pilots
- Isle of Man
- Light Aircraft Association (LAA)
- Light Airlines
- Low Fares Airlines
- Military Aviation Authority (MAA)

- NATS
- Navy Command HQ (NCHQ)
- Aviation Division Navy Command HQ (NCHQ)
- PPL/IR Europe
- UAVS
- UK Airprox Board (UKAB)
- UK Flight Safety Committee (UKFSC)
- 3 AF-UK/A3

DAATM responds on behalf of all NATMAC Military stakeholders, ensuring a single consolidated military response is provided. These include the MAA, NCHQ, Aviation Division NCHQ, and 3AF-UK/A3. In addition, Safety and Airspace Regulation Group, which is part of the CAA, also form part of NATMAC but the CAA are not permitted to respond to Sponsor Consultations.

Reflecting this, the invitee numbers were adjusted with the removal of 5 NATMAC organisations. Thus the final list of NATMAC stakeholders was 38 individuals representing 32 consulted organisations.

The pie chart in Figure 4 represents the responses from NATMAC to this consultation.

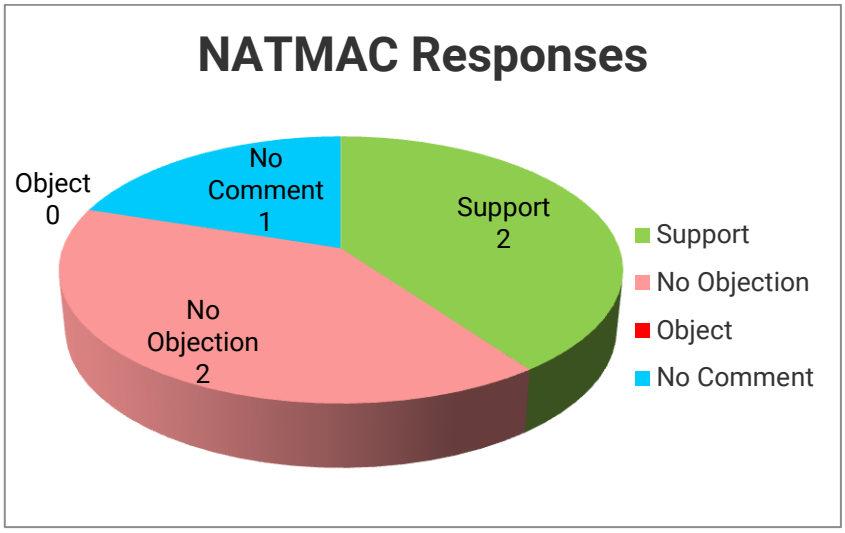


Figure 4 - Chart showing NATMAC responses

Key themes arising from NATMAC:

- The introduction of PBN routes and procedures should improve accuracy & predictability of tracks
- No impact if the organisation and LSA continue to coordinate as in current operations
- An understanding that the part of the procedure falling within the Danger Area will not be available if the Shoeburyness Danger Area, D138 complex, is active, see Figure 1

3.3. London Southend Airport Consultative Committee

At the LSACC meeting on 30th November 2016, the Committee was provided with an understanding of the difference between Instrument Landing System (ILS) operations and Area Navigation (RNAV) operations.

A question was raised asking if an automatic landing system was already operational at the airport. It was confirmed that in today's operation only an ILS (Category 1) or a Surveillance Radar Approach (SRA) was currently available, neither of which support automatic landing at LSA.

It was proposed to the LSACC that following on from the implementation of Controlled Airspace in April 2015 and the project to implement SIDs which was still underway; LSA had started the process to introduce RNAV Approach Procedures.

At a subsequent LSACC meeting on 17th May 2017, the Committee were informed that LSA had been developing route designs and were preparing for a consultation with identified stakeholders; these included airspace users to parish/district/borough councils and the ACC. It was highlighted that the Noise Abatement Procedures currently in place at LSA for departing aircraft would not change as a consequence of this proposal. It was also emphasised that the RNAV approaches had been structured over the least populated areas as much as possible, whilst following the required design criteria.

The Consultation Document was sent to the Chairman of the LSACC on 6th June 2017 and circulated to members on 7th June 2017. The LSACC was advised that the RNAV approaches would be implemented alongside the ILS, not as a replacement procedure.

Finally at 16th August 2017 LSACC meeting, the Committee was reassured that the procedures would be coded within the flight management system of aircraft, supported by a robust safety case, developed to ensure that hazards would be identified and mitigated. At this meeting the Chairman confirmed that LSACC would respond to the Consultation Document confirming its support for the proposed procedures.

The meeting minutes indicated that the decision was influenced by a greater precision in the aircraft approach that will have the additional benefit of reducing the spread and impact of noise pollution on the local community.

Members were also encouraged to respond to the consultation individually if they so wished.

The organisations represented on the London Southend Airport Consultative Committee are:

- Borough/District Councils
    - Essex County Council
    - Castle Point Borough Council
    - Maldon District Council
    - Southend-on-Sea Borough Council
    - Rochford District Council
    - Leigh Town Council
- Community Associations
    - West Leigh Residents Association
    - Rochford Hundred Assoc. of Local Councils
- Regional Businesses and Business Organisations
    - Thames Gateway South Essex
- Rochford Chamber of Commerce
    - Essex Chambers of Commerce
    - Southend Trades Council
- Airside Users of Airport
    - easyJet
    - Jota Aviation
- Airport Tenant Companies
    - Flying Clubs / Southend Flying Club
- UK Border Force

The pie chart in Figure 5 represents the response from LSACC on this consultation.

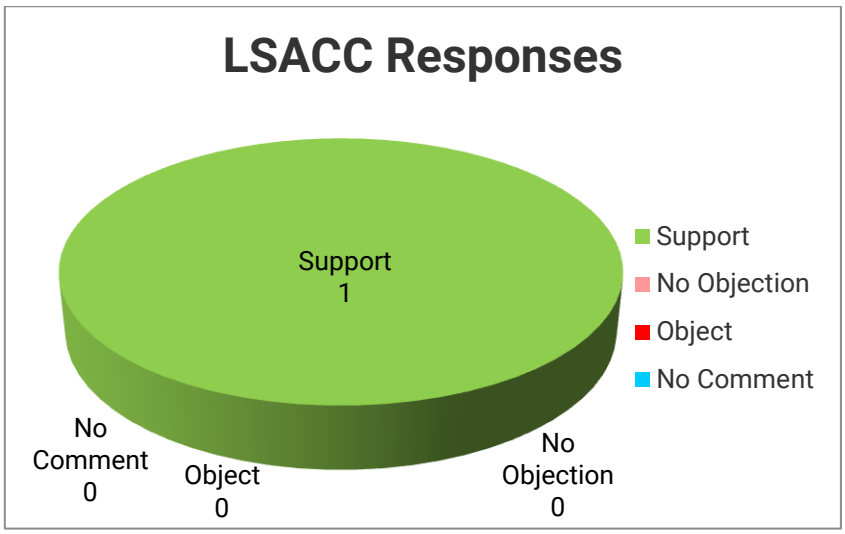


Figure 5 - Chart showing LSACC responses

Key themes that arose from LSACC were:

- Introduces greater precision in aircraft approaches
- Additional benefit of reducing the spread and impact of noise pollution on the local community

3.4. Local Authorities

County, borough, district, unitary authorities and parish councils were consulted in both Kent and Essex on the proposed changes. This was to ensure that all councils affected had the opportunity to comment on the proposed RNAV Approach procedures. A total of 70 councils were contacted to comment on the Consultation Document, of which 36 responded.

3.4.1. Kent Councils

Nine councils in Kent who fall under the flight paths were invited to respond to the consultation, of which five responded. See the list below denoting the invitees and the coloured responses (which correspond to the chart in Figure 6):

- Kent County Council
- Gravesham Borough Council
- Medway Council
- Higham Parish Council
- Cliffe and Cliffe Woods Parish Council
- Cooling Parish Council
- Frindsbury Extra Parish Council
- High Halstow Parish Council
- Hoo St Werburgh Parish Council

The pie chart in Figure 6 represents the responses from the Kent Councils to this consultation.

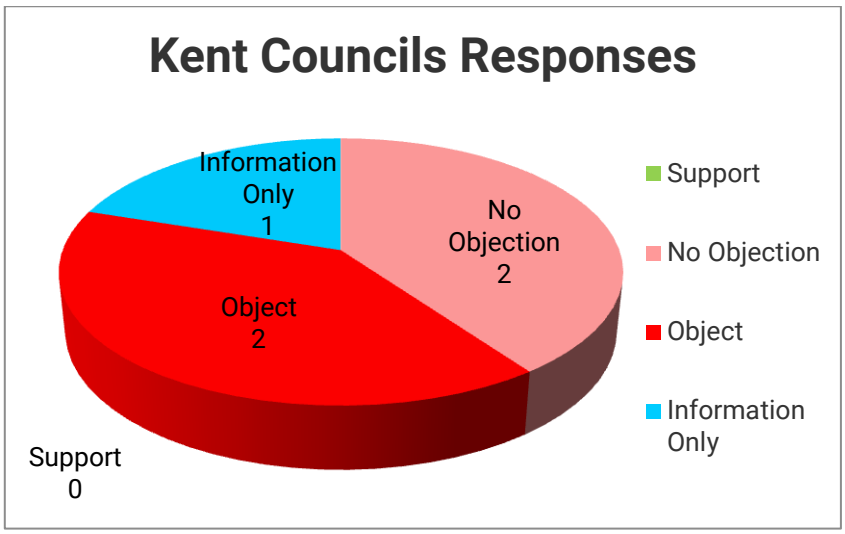


Figure 6 - Chart showing Kent Councils responses

Key themes which arose from Kent Councils were:

- An increase in noise over Hoo Peninsula
- PBN brings benefits of continuous descent, reducing fuel usage and noise impact
- LSA should ensure that affected communities are engaged with to understand unforeseen impacts, post implementation
- It is unsatisfactory that stakeholders must gauge noise contour impacts themselves as this can be difficult (additional guidance was offered by LSA where requested)
- PIVAB/IBENA track is unsuitable ("PIVAB" and "IBENA" are navigation waypoints which define segments of the proposed route, see Figure 2 and the Consultation Document)
- PBN enhances safety for aircraft approaching LSA

3.4.2. Essex Councils

61 County, Borough, City, District, Town and Parish councils in Essex who fall under the flight paths were invited to respond to the consultation, of which 31 responded; seven of which are also represented on the Airports Consultative Committee. See the list below denoting the invitees and the coloured responses (which relate to Figure 7):

- Essex County Council
- Southend Borough Council
- Rochford District Council
- Castlepoint Borough Council
- Basildon District Council
- Chelmsford City Council
- Maldon District Council
- Thurrock Council
- Leigh Town Council
- Canvey Island Town Council
- Ashingdon Parish Council
- Barling Magna Parish Council
- Canewdon Parish Council
- Foulness Parish Council
- Great Wakering Parish Council
- Hawkwell Parish Council
- Hockley Parish Council

- Hullbridge Parish Council
- Paglesham Parish Council
- Rawreth Parish Council
- Rayleigh Town Council
- Rochford Parish Council
- Stambridge Parish Council
- Sutton Parish Council
- Billericay Town Council
- Bowers Gifford and North Benfleet Parish Council
- Great Burstead and South Green Village Parish Council
- Noak Bridge Parish Council
- Ramsden Bellhouse Parish Council
- Ramsden Crays Parish Council
- Shotgate Parish Council
- Althorne Parish Council
- Asheldham Dengie Parish Council
- Bradwell on sea Parish Council
- Burnham-on-Crouch Town Council
- Cold Norton Parish Council
- Goldhanger Parish Council
- Hazeleigh & Woodham Mortimer Parish Council
- Heybridge Parish Council
- Latchingdon Parish Council
- Little Totham Parish Council
- Maldon Town Council
- Mayland Parish Council
- Mundon Parish Council
- North Fambridge Parish Council
- Purleigh Parish Council
- Southminster Parish Council
- St Lawrence Parish Council
- Steeple Parish Council
- Stow Maries Parish Council
- Tillingham Parish Council
- Tollesbury Parish Council
- Tolleshunt D'Arcy Parish Council
- Tolleshunt Major Parish Council
- Danbury Parish Council Parish Council
- East Hanningfield Parish Council
- Rettendon Parish Council
- Runwell Parish Council
- South Hanningfield Parish Council
- South Woodham Ferrers Town Council
- Woodham Ferrrers and Bicknacre Parish Council

The pie chart in Figure 7 represents the responses from Essex Council on this consultation.

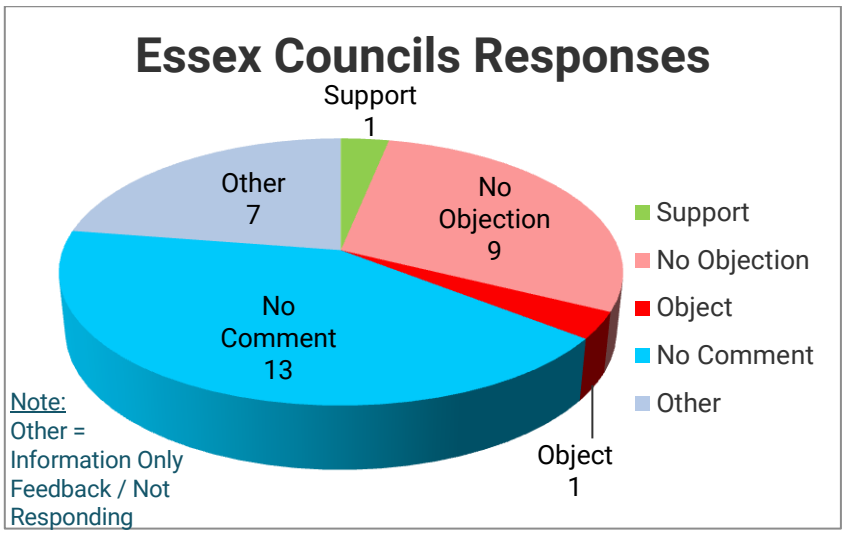


Figure 7 - Chart showing Essex Councils responses

Key themes that arose from Essex Councils were:

- They support the general approach taken by LSA to replicate the current aircraft tracks where possible
- This change aligns with European traffic modifications and the Future Airspace Strategy (FAS)
- A majority of councils foresee no or minimal impact from these proposed changed
- Concentration of routes may become an issue in the future as LSA aircraft improve their RNAV capabilities
- Improves aircraft precision, predictability and flight efficiency
- Detrimental effect to Burnham-on-Crouch with a potential increase in noise pollution
- Proposed future residential developments may be affected by this proposal

3.5. National Bodies

10 National Bodies with an interest in environmental matters in the vicinity of the airport were invited to respond to the consultation, of which four responded. These organisations were consulted as the areas they represent fall under the newly proposed flight paths or are within the local vicinity of the airport. See the list below denoting the invitees and the coloured responses (which relate to Figure 8):

- Natural England
- CPRE - Essex
- CPRE Kent
- English Heritage
- Environment Agency
- Friends of the Earth
- National Trust
- SAEN
- RSPB - Wallasea
- Friends of North Kent Marshes

The pie chart in Figure 8 represents the responses from National Bodies to this consultation.

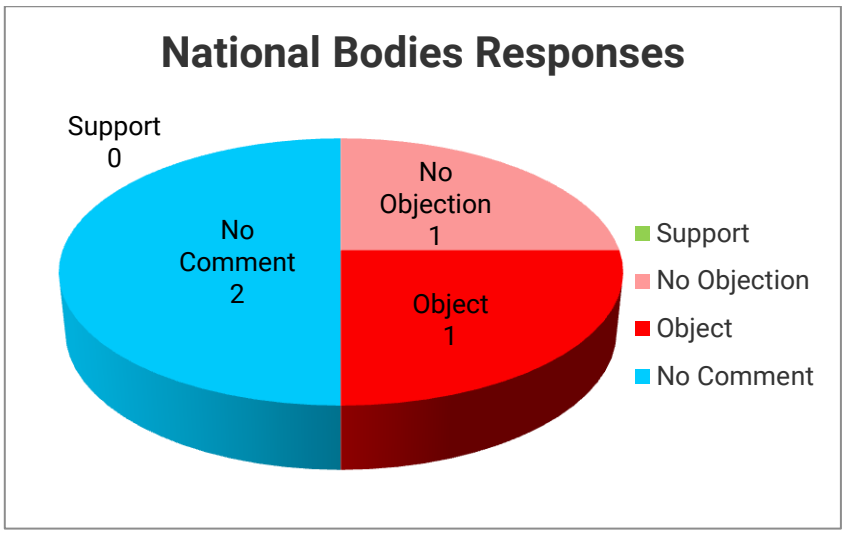


Figure 8 - Chart showing National Bodies responses

Key themes that arose from National Bodies were:

- Future consultations should map the following sites:
  - Special Protection Areas (SPAs)
  - Special Areas of Conservation (SACs)
  - Wetland Conservation (RAMSAR)
  - Sites of Special Scientific Interest (SSSIs)
- Proposed flight paths could impact:
  - Hoo Peninsula
    - North Kent Marshes
    - Cliffe Pools
    - Hoo St Werburgh
    - Cliffe & Cliffe Woods

3.6. MPs

12 Members of Parliament (MPs) were invited to respond to the consultation, of which 1 responded. These MPs were selected as their constituency may be affected by the proposed changes to LSA. LSA also included MPs where their constituency falls under the straight-in segment of the routes, even though this is outside of the scope of this consultation, to ensure they were aware of the proposed RNAV routes. See the list below denoting the invitees and the coloured responses (which relate to Figure 9):

- MP for Southend East	Mr James Duddridge
- MP for Rayleigh	Mr Mark Francois
- MP for Southend West	Mr David Amess
- MP for Castle Point	Ms Rebecca Harris
- MP for Maldon	Mr John Whittingdale
- MP South Basildon & East Thurrock	Mr Stephen Metcalfe
- MP for Basildon and Billericay	Mr John Baron
- MP for Gravesham	Mr Adam Holloway
- MP for Chelmsford	Ms Vicky Ford
- MP for Thurrock	Ms Jackie Doyle-Price
- MP for Rochester and Strood	Ms Kelly Tolhurst
- MP for Witham	Ms Priti Patel

The pie chart in Figure 9 represents the responses from MPs to this consultation.

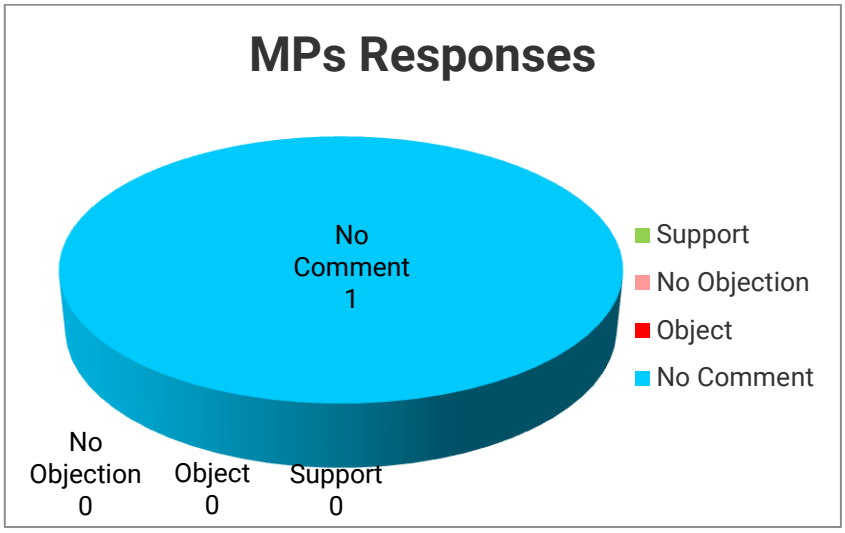


Figure 9 - Chart showing MPs responses

3.7. Airspace Users

Airspace users who operate either at LSA or in the local vicinity were invited to comment on the proposed RNAV Approach procedures. These airspace users were split into the following groups:

- Flying Clubs
- Private Jets
- Airlines
- Local Aerodromes

A total of 36 representative airspace users across the groups mentioned above were contacted to comment on the Consultation Document, of which 14 responded.

The pie chart in Figure 10 represents the responses from Airspace users to this consultation.

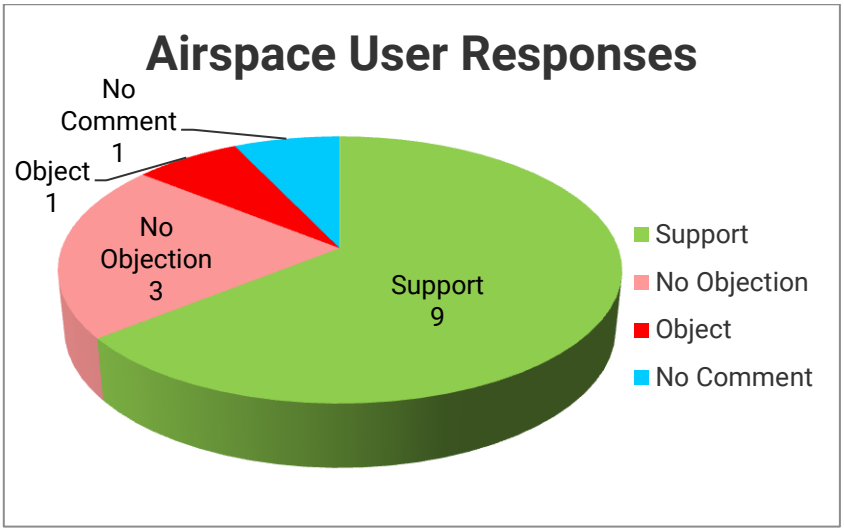


Figure 10 - Chart showing Airspace User responses

Key themes that arose from Airspace Users were:

- This change will be an improvement on current Surveillance Radar Approach (SRA) procedures

- No detrimental impact to most local aerodrome operations
- Runway 05 approach could affect Rochester Airports future RNAV implementation plans
- Aligns with the FAS whilst introducing modern systems for operational and training purposes
- Supports the use of RNAV capabilities alongside the retention of the ILS
- Improves flight safety and efficiency

3.7.1. Flying Clubs

Two local flying clubs that are based at LSA were contacted to comment on the consultation. Both responded, one of which is also represented on the Airport's Consultative Committee. See the list below denoting the invitees and the coloured responses incorporated within Figure 10 above:

- Seawing Flying Club
- Southend Flying Club

3.7.2. Private Jets

A total of 12 private jet operators who are frequent visitors to LSA were contacted to comment on the Consultation Document, of which two responded; one of which responded with a letter in conjunction with Thurrock Airfield. See the list below denoting the invitees and the coloured responses incorporated within Figure 10 above:

- Select Plant
- London Executive Aviation / Execujet
- Kings Aviation
- Net Jets
- JOTA
- Terry Holding
- Air Hamburg
- Excel Charter
- Woodgate
- Capital Air Ambulance
- Apollo Air Services
- Flightworx

3.7.3. Airlines

Consultation invitations were sent out to eight local aircraft operators, of which two responded. See the list below denoting the invitees and the coloured responses incorporated within Figure 10 above:

- easyJet
- Stobart Air
- Flybe
- Essex Air Ambulance
- ESSEX PASU
- BA CityFlyer
- Volotea
- CityJet

Both easyJet and Stobart Air responded in support of the RNAV Approach proposal. Their comments reflected this stating they strongly support the proposal. It was also mentioned that

the introduction of RNAV at LSA provides an alternative to the current non-precision approach procedure and a more efficient redundancy for when the ILS is unavailable.

3.7.4. Aerodromes

Consultation invitations were sent out to 14 local aerodromes which are located under or near the proposed RNAV routes, of which eight responded. One of which was a response in conjunction with Terry Holding (a private jet operator) as mentioned in Section 3.7.2 See the list below denoting the invitees and the coloured responses incorporated within Figure 10 above:

- Barling
- Biggin Hill Airport
- Laindon (Bensons Farm)
- London City Airport
- London Stansted Airport
- Rochester Airport
- St Lawrence
- Stapleford Aerodrome
- Stoke
- Stow Maries
- Thurrock
- Tillingham Strip
- London Luton Airport
- London Heathrow Airport

3.8. Others

An engineering organisation at LSA and QinetiQ who operate the neighbouring Danger Area at Shoeburyness, see Figure 1, were asked to provide feedback on the proposed changes at LSA. One invitee replied, QinetiQ, mentioning that the Ministry of Defence (MOD) will be responding on their behalf. See the list below denoting the invitees:

- QinetiQ
- Avionicare

The response from the MOD (DAATM) on behalf of QinetiQ and other military organisations was in support of the proposed RNAV approach routes. The key themes that arose from the MOD (DAATM) response was an understanding that the part of the procedure falling within the Danger Area will not be available if the Shoeburyness Danger Area, D138 complex, is active, see Figure 1.

The QinetiQ response has been categorised as “Stakeholder Not Submitting Formal Response” for the purposes of this consultation report.

3.9. Members of the Public

Further to the responses from organisations directly invited to consult on the proposed procedures, there were several members of public who responded to the Consultation Document, either as a result of local council discussions or through the advertising in The Echo / the LSA website.

Responses were received directly from 12 members of the public. The responses varied with one supporting the implementation, one with a response of no objection, one providing information only feedback neither stating support nor objecting to the proposal, and nine members of the public objecting to the proposal. The majority of these objections were due to the proposed routes

flying over the Hoo Peninsula. Further objections referred to noise pollution and an understanding that whilst the situation is not optimal in current operations, the effect on the community would get worse with future growth at LSA if unchanged.

Further to this, there were questions raised around the technical detail of RNAV / RNP-APCH capabilities. The member raising these questions was in favour of the environmental benefits but would have liked more detail on how the technology can be assured. These questions have been answered in Section 5.2.

Members of public who didn't object to the procedures stated that they are currently affected by aircraft approaching LSA, although the proposal is a "serious attempt at improving the impact of LSA on the local community". See the list below denoting the invitees and the coloured responses (see Figure 11):

- Member of public (Westcliff –On-Sea)
- Member of public (Thundersley)
- Member of public (Hockley)
- Member of public (High Halstow)
- Member of public (Burnham-on-Crouch)
- Member of public (Cliffe)
- Member of public (Cliffe Woods)
- Member of public (Cliffe)
- Member of public (Cliffe Woods)
- Member of public (Cliffe)
- Member of public (Cliffe)
- Member of public (Cliffe)

The pie chart in Figure 11 represents the responses from members of the public on this consultation.

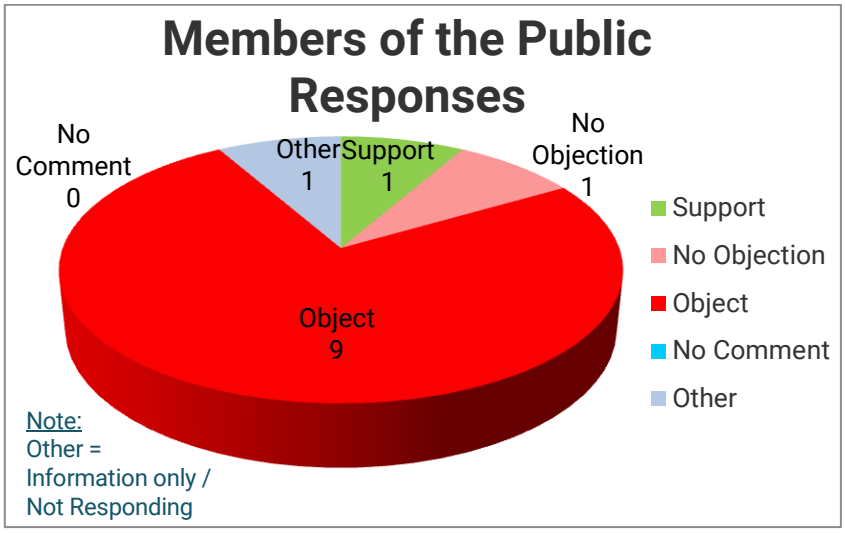


Figure 11 - Chart showing Member of the Public responses

Key themes which arose from the members of the public were:

- This change should improve the impact of LSA on the community
- Increase in noise / pollution to the Hoo Peninsula & Burnham-on-Crouch
- Consultation was not well enough publicised to those on the Hoo Peninsula
- Over time aircraft will be concentrated over Cliffe
- Increases to noise & environmental impact in Hockley

4. Summary of Consultation Feedback

4.1. Stakeholder Invitees

Table 1 below shows a breakdown of invitees in the sub-categories defined from Section 3. Figure 12 graphically illustrates the ratio of invited stakeholders.

Table 1 - Breakdown of stakeholder invitees

Stakeholder Invitees	Number of Invitees
NATMAC	32
Airport Consultative Committee	1
National Bodies	10
Airspace Users	36
Local Councils	70
MPs	12
Other	2

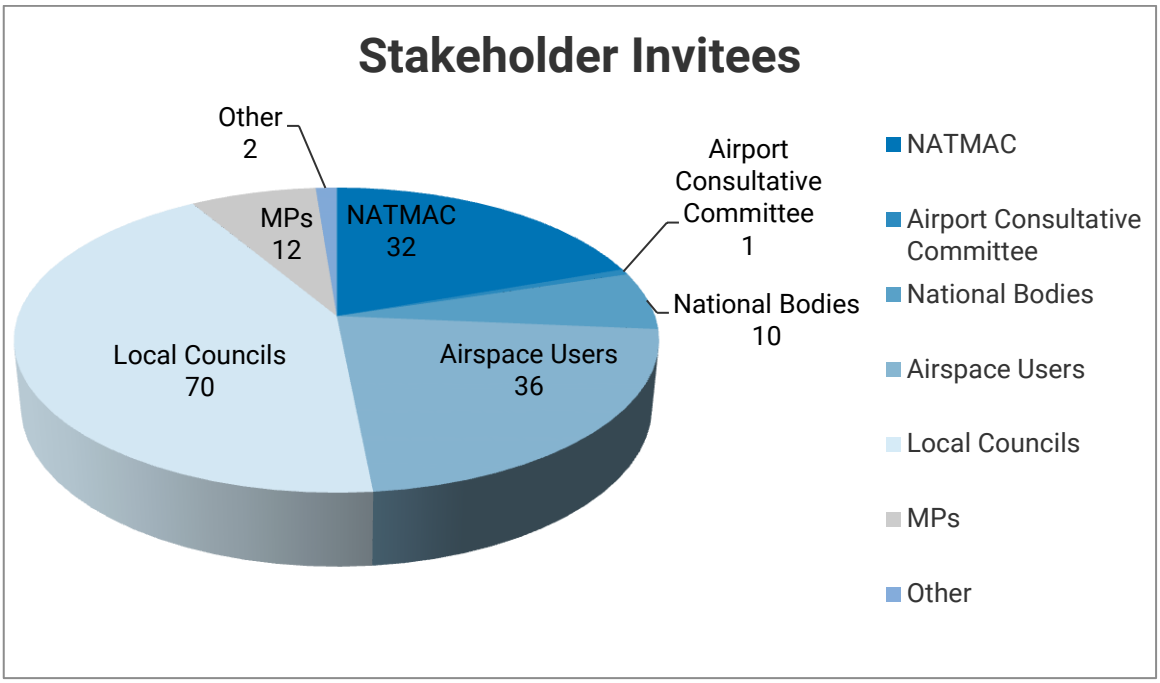


Figure 12 - Chart displaying breakdown of consultation invitees

4.2. Stakeholder Responses

Table 2 below shows a breakdown of invitee responses per sub-category defined from Section 3. Figure 13 illustrates the ratio of stakeholders that responded to the consultation.

Table 2 - Breakdown of responses received compared to stakeholders invited

Stakeholders	Number of Invitees	Number of Responses	%
NATMAC	32	5	15.6
Airport Consultative Committee	1	1	100
National Bodies	10	4	40
Airspace Users	36	14	38.9
Local Councils	70	36	51.4
MPs	12	1	8.3
Other	2	1	50
TOTAL ORIGINAL STAKEHOLDERS	**163**	**62**	**38.0**
Members of Public	0	12	N/A
TOTAL COMBINED	**163**	**74**	**N/A**

***Note** - The total combined % of responses has not been calculated as the number on invitees does not include members of the public responses due to not being a clear representation of stakeholders invited to consult vs. stakeholder responses.

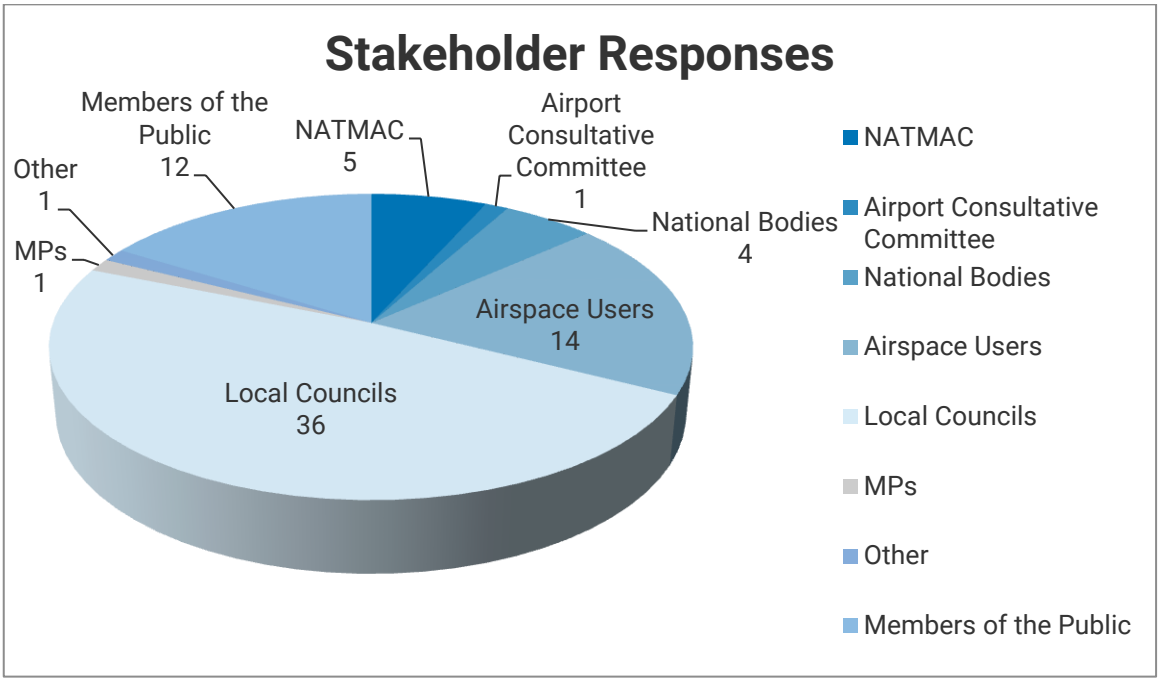


Figure 13 - Chart displaying breakdown of consultation responses

4.3. Responses and Key Themes

Table 3 below shows a breakdown of the nature of responses to this consultation into support, no objection, no comment, object and other categories. The 'Other' category refers to those providing 'information only feedback' or 'not responding'.

Table 3 - Breakdown consultation response nature

Response Themes	Number of Responses	%
Support	14	18.9
No Objection	18	24.3
No Comment	18	24.3
Object	14	18.9
Other	10	13.5
TOTAL	**74**	**100**

Figure 14 graphically illustrates the data given in Table 3, where the 'Other' category again refers to those providing 'information only feedback' or 'not responding'. The data presented is also inclusive of members of the public responses.

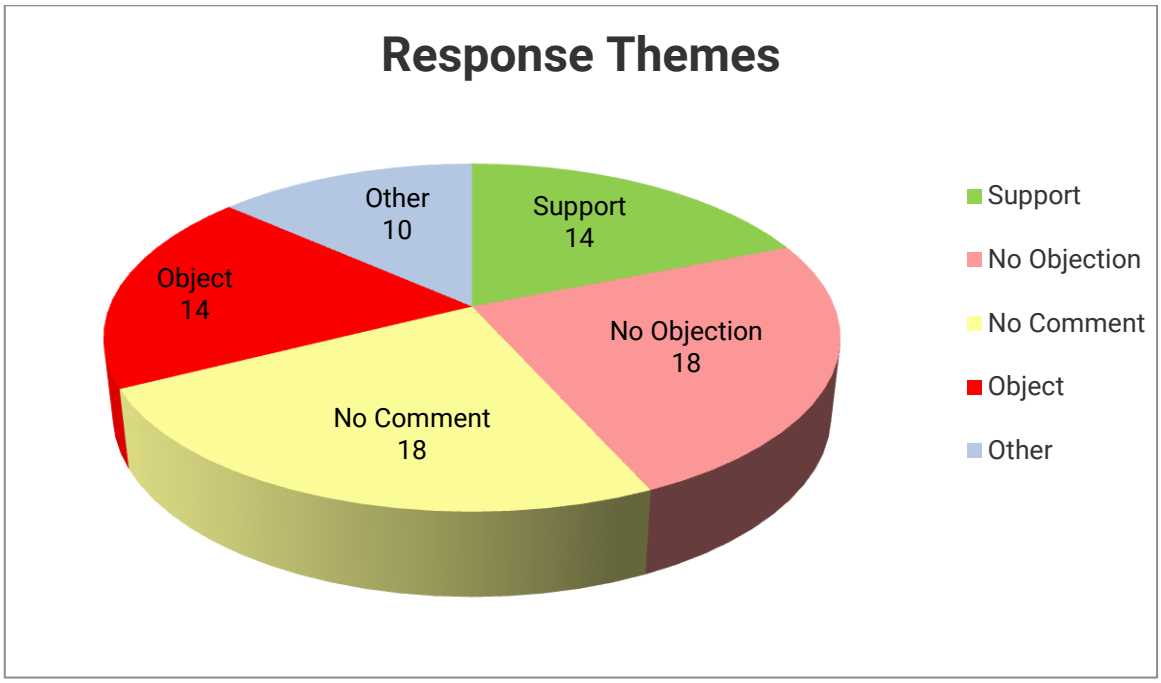
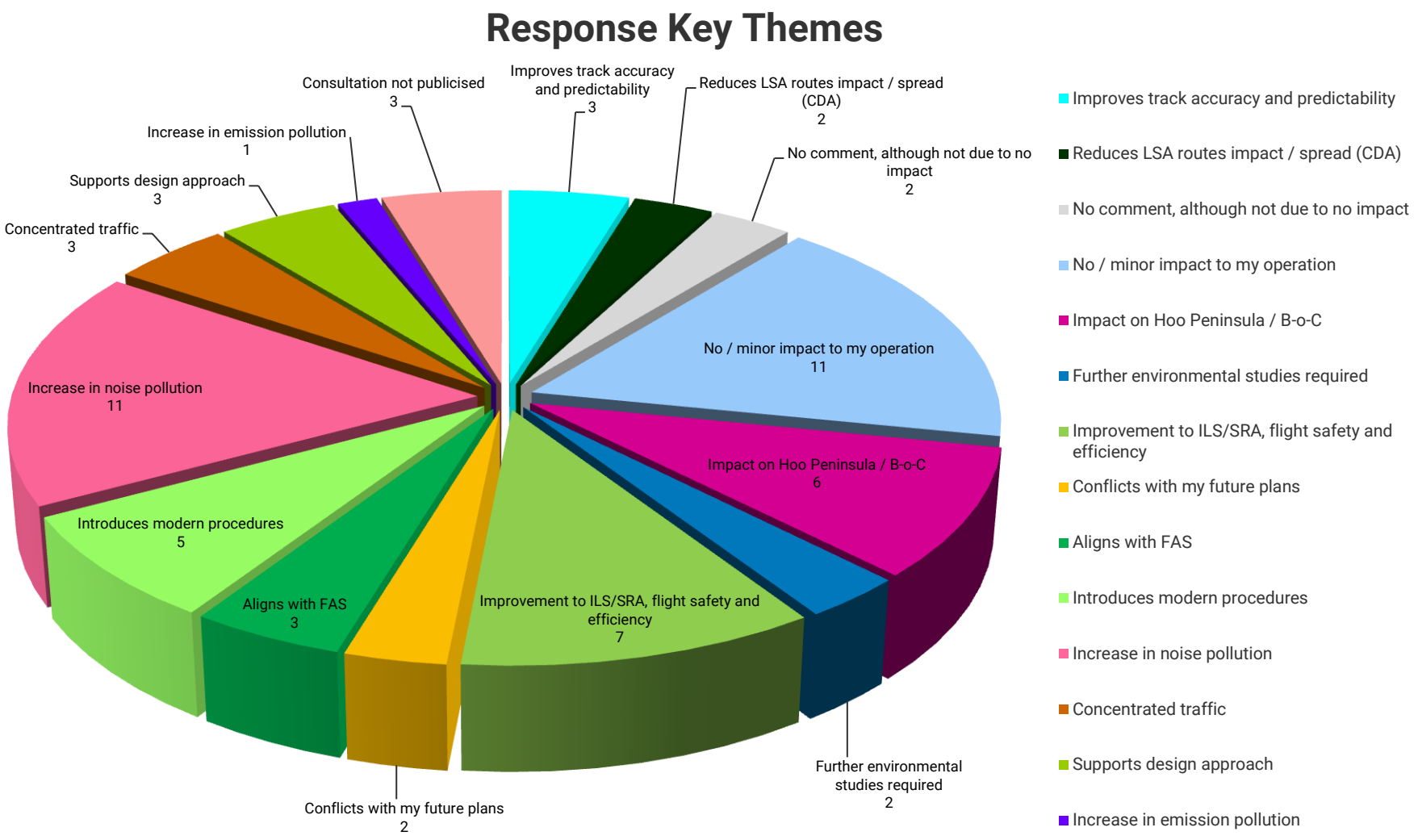


Figure 14 - Chart displaying breakdown of consultation response nature

Figure 15 illustrates a high level analysis of common themes from consultation responses.



Note:

CDA – Continuous Descent Approach

B-o-C – Burnham-on-Crouch

SRA – Surveillance Radar Approach

FAS – Future Airspace Strategy

ILS – Instrument Landing System

Figure 15 - Chart displaying breakdown of consultation response themes

5. Stakeholder Responses

Further to Section 4, the key concerns raised have been assessed and answered below.

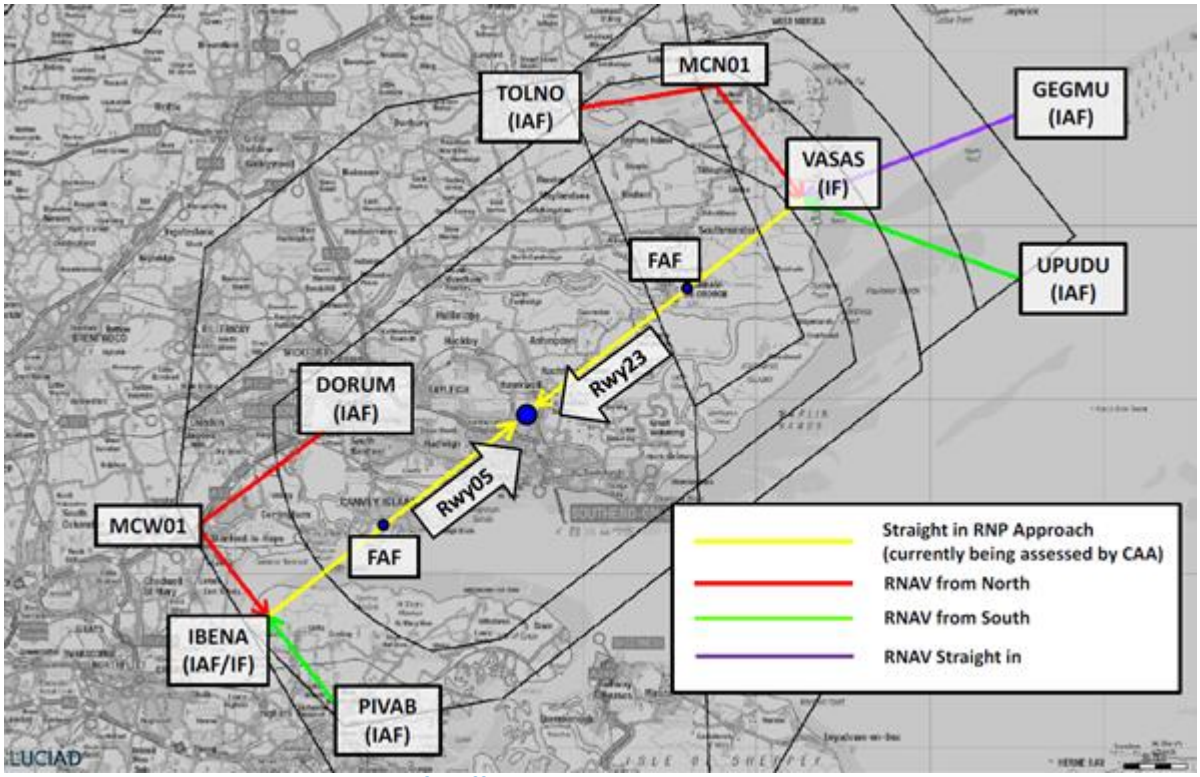


Figure 16 - Image allowing comparison for affected areas in relation to proposed routes

5.1. Key Themes Raised by Stakeholders

Issues raised by those objecting to the proposal as well as general comments querying the proposed RNAV routes have been summarised as follows:

1. Is there a way to minimise the impact on the Hoo Peninsula?
2. Can the route be offset as to avoid the Burnham-on-Crouch area? Can other noise minimisation procedures be considered to reduce the LSA impact on the Burnham-on-Crouch community?
3. Noise data provided was not sufficient enough to understand the impact on my town and/or local authority.
4. The Consultation Document for the introduction of RNAV approach routes was not publicised enough.
5. Further environmental studies are required / should be part of future consultations to ensure new routes will not have a degrading impact to protected areas of conservation.
6. This proposal conflicts with future plans for the operation I represent.

5.1.1. Responses to Key Themes Raised by Stakeholders

Consultation engagement with stakeholders was carried out to inform stakeholders of the proposed changes at LSA and provide them with the opportunity to consider any potential impacts and voice those opinions to LSA.

LSA has carefully considered the themes identified by the consultation and these are addressed below:

- The objective of this proposal is to maintain the legacy of current routes, to reduce the number of people exposed to aircraft noise and to avoid, where possible, introducing new noise to communities. This is achieved by replicating the current aircraft tracks as much as possible, albeit with a level of concentration occurring over time.

- Planned variance of routes or creating routes which are different to the concentrations of aircraft tracks would increase the number of people affected by noise. It is preferable to concentrate aircraft along the fewest number of routes avoiding densely populated areas as much as possible. It is not possible to design non-linear tracks which weave between settlements in this case.

- The Hoo Peninsula is a large area to the Southwest of LSA with arriving aircraft currently overflying it during their approach from the south to Runway 05. This runway is only used on average 30% of the time due to prevailing wind conditions in the UK. Nonetheless, designs for the RNAV routes have been created with the intention to cause minimal impact on local communities while meeting the required design criteria.

  Options were considered to try to reduce the impact of the proposed routes on Cliffe & Cliffe Woods, see Figure 17. The route options available are constrained by the London Terminal Manoeuvring Area (LTMA), the area in which aircraft inbound to London's other major airports fly, which surrounds LSA's airspace.

  - Moving IBENA West along the extended runway centreline creates two issues:

    1. places traffic flows closer to the LTMA boundary, reducing the margin of safety;

    2. requires that the turn at IBENA becomes greater than 90°. This is more demanding on the aircraft and has the effect of requiring the aircraft to begin the turn earlier, which negates most of the benefit of moving IBENA.

    3. see Figure 17 below illustrating this, where:
       - The Western **red** line illustrates the LTMA;
       - The **green** line shows the current procedure, with **white** lines showing an expected aircraft trajectory;
       - The **yellow** line & circle show moving IBENA to the West which lead to airspace coordination issues with London City Airport traffic and the complexity of the LTMA;
       - The **cyan** line shows adjusting the angle of the Southern approach to the East routing towards the new Western IBENA (**yellow** circle) overflying Hoo St Werburgh.

  - Moving IBENA East along the extended runway centreline reduces the distance between IBENA and the Final Approach Fix (FAF) below that permitted by ICAO design criteria.

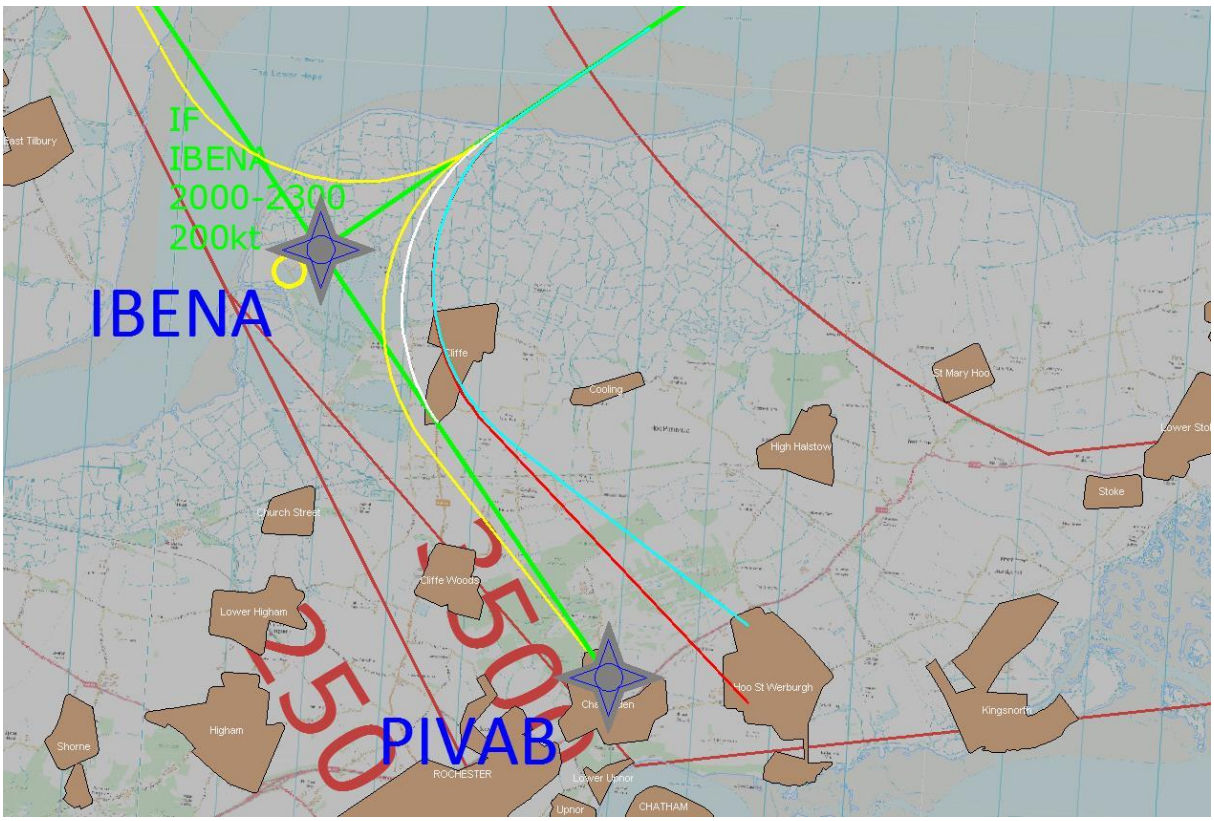


Figure 17 - RNAV design from the south to Runway 05

- Whilst the straight-in segments of these approach procedures are outside of the scope of this consultation as they are currently already being considered by the CAA for implementation, options were considered as several respondents from the consultation enquired if they could be adapted. These options included offset approaches and an increased descent gradient which have been investigated and discounted below.

  In response to offset approaches to mitigate Burnham-on-Crouch impact; while PANS-OPS[4] does allow for offset approaches within RNAV procedures, the criteria is quite clear that offset approaches shall not be established as a noise abatement measure whilst on the final straight-in segment of approach. This therefore excludes offset approaches as an option to aid Burnham-on-Crouch.

  Other noise mitigation procedures include techniques where aircraft hold at a higher altitude over large communities before making a steep approach to the runway threshold. This was considered as an option to reduce the impact on Burnham-on-Crouch but again the RNAV criteria states that the highest gradient of descent allowed is 3.5°, as opposed to the current 3° descent in operation to LSA Runway 23. The option to increase the gradient to 3.5° would require current ILS approaches to also be changed, which is outside the scope of this proposal.

- As the new RNAV procedures aim to replicate current tracks where possible, LSA concluded that noise contour investigation would not be required due the expectation of

[4] PANS-OPS, (Doc 8168), Procedures for Air Navigation Services — Aircraft Operations can be found here: https://www.icao.int/safety/airnavigation/OPS/Pages/flsannex.aspx

similar results to current procedures at LSA. The CAA was supportive of this conclusion. To enable stakeholders to make an informed decision on noise impacts LSA provided current routes and proposed routes with respective altitudes, along with a reference to different aircraft types and their noise at a given altitude. Section 5.1.3 in the Consultation Document specifically covered aircraft noise.

Figure 18 illustrates the process to be followed within the consultation document to understand the potential noise impact under the proposed routes. This was passed to stakeholders who expressed difficulty in gathering the data from the document.

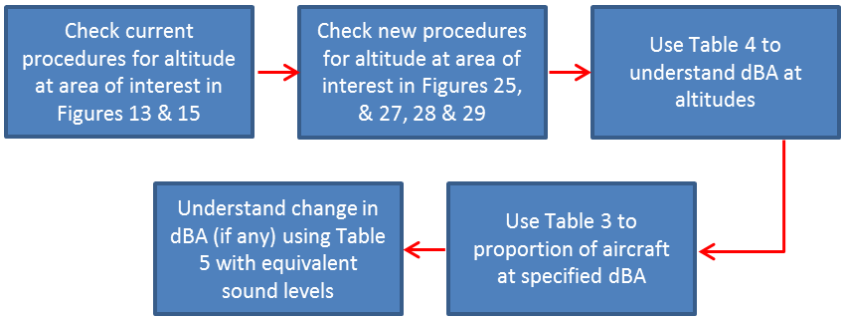


Figure 18 - Flowchart explaining noise data process within the Consultation Document

It is anticipated that the noise impact will be very much as it is today for the aircraft that approach over the peninsular, however the proposed track is located slightly to the West of the current tracks.

- As mentioned in Section 3, the Consultation Document was publicised both through the LSA website, and the Echo newspaper. A copy of the article in the paper can be seen in Appendix A. The newspaper reaches 118,925 in print. An article was also published on the Echo website, which reaches considerably more. In addition, due to unforeseen circumstances where certain Stakeholders were unable to respond to the Consultation within the original deadline, an extension to the consultation was offered. This extended the consultation end date from 13th September 2017 to 30th September 2017 for those who requested additional time to formulate their response.

- LSA has complied with airspace change process requirements regarding consulting stakeholders with environmental interests – there is no Area of Outstanding Natural Beauty (AONBs) or National Parks affected by this proposal, which some may value for their tranquillity. This proposal is designed to be similar to today's operation, meaning that there is unlikely to be a noticeable impact on tranquillity.

- Airspace changes such as this are not considered impactful to flora and fauna. The current impact on SSSIs and other similar sites is unlikely to noticeably change under this proposal. If a flightpath changes below 1000ft, there is a CAA requirement to consider the influence on local air quality. This proposal would not change flightpaths below 1000ft.

- Proposed developments for councils that are beyond the implementation date of this project are considered to be outside of the scope of this proposal, as airspace designs cannot take into account uncertain developments. In addition, routes have been attempted to be replicated where possible.

- As the RNAV routes will enable a greater application of Continuous Descent Approaches (CDAs), aircraft are expected, on average, to be higher over the ground than they are today which should offer an improvement over today's operation. Concentration over time

should reduce the extent of the area overflown and should reduce the number of people exposed to noise from aircraft. However it may also concentrate noise for those people directly underneath the proposed routes.

5.2. Direct Questions Raised & Answers

1. Could day and night traffic movement figures be included within the consultation?

    a. Night flights are usually categorised as any flight operating between 11pm – 7am, although LSA classify night flights as operating between 11:00pm – 6:30am. As per the LSA website, under current departures and arrivals, the range of passenger arrival aircraft is roughly 07:30 - 23:20 and the range of passenger departure aircraft is roughly 06:30 – 19:45. Data from the LSA annual report 2016/17[5] show that air traffic movements (Mar 16 – Feb 17, excluding exempt traffic) was 23,917, whilst the night-time movements were 666 for the same sample. This shows under 3% of non-exempt aircraft arriving/departing from LSA were a night flight, therefore not high enough to be part of this consultation. See the definition of 'exempt' in the LSA annual report referenced above.

2. There appear to be a number of almost 90° turns at different points during the approach for both runways. Taking into account the use of PBN, what sort of accuracy/aircraft behaviour is LSA expecting for those turns?

    a. These 90° fly-by turns are permitted and preferred in RNAV design provided sufficient distance is provided on the legs before and after the waypoint in accordance with ICAO PANS-OPS 'minimum segment length' criteria. The criteria provides sufficient distance for the fastest/highest aircraft expected to anticipate the turn in advance of the waypoint and make the turn onto the next leg. These turns are not a fixed radius, but will differ in execution depending on the speed of the aircraft making the turn, with slower aircraft getting closer to the waypoint before turning. While the turn is sufficiently protected by PANS-OPS protection areas, there is no track keeping requirement in the turn. This is because ICAO fixed radius (FRT) or radius-to-fix (RF) turns are not part of the RNAV1 specification. Future specifications such as Advanced RNP (A-RNP) will bring this capability to the design of procedures, but as yet there is no certification or CAA mandate to compel operators to be equipped thus and we have to design to the lowest common standard available to the aircraft population.

3. Assuming the proposed routes will require RNAV 1 capability, what is the reason behind the inclusion of an RNP APCH route for the straight in approach and has this type of approach been implemented elsewhere within UK airspace before?

    a. The departures and approach transitions are specified as RNAV 1. RNAV final approaches cannot use RNAV 1 and thus approach design beyond the FAF uses the specification 'RNP APCH' which is a more restrictive (for instance requiring

[5] London Southend Airport Annual Report 2016 – 2017: https://d1z15fh6odiy9s.cloudfront.net/files/lsa-ar-2017-final-updated-p49-149eb85a.pdf

GPS). This covers the LNAV approach, while additional specifications cover the LNAV/VNAV (Baro-VNAV) and LPV (SBAS) approach types also listed. This is standard application of the term 'RNAV approach' and you will find all RNAV approaches in the UK using RNP-APCH for the final approach segment. Appendix B shows the ICAO navigation specification table displaying the tolerances for each flight phase.

4. Is an 'automatic landing system' already operational at London Southend Airport; if so, why do new procedures need to be in place?

    a. LSA currently operate the ILS (Category 1) and SRA, a non-precision approach procedure, with no 'Autoland' approach system being implemented to date. LSA operates ILS as their primary landing system, although to comply with European PBN requirements and employ a higher precision procedure for redundancy, RNAV/RNP APCH for transitions and approaches are being implemented at LSA.

5. Will the European wide air traffic changes (introduction of PBN technology) remain important given the UK decision to leave the EU?

    a. PBN will continue to be adopted / mandated throughout the UK post leaving the EU and through the delivery of the UK Future Airspace Strategy (FAS).

6. Can the new procedure avoid flying over Bowers Gifford? (point DORUM Initial Approach Fix)

    a. From Figures 34 – 36 in the Consultation Document, it can be seen that LSA did try to move the track, however due to airspace constraints it had to be repositioned. If the start of the track was to be moved it would end up overflying other communities and it would cause the 05 transition track to move thus overflying currently unaffected communities. Moving one element of the design can have knock-on impacts. Any change to the point DORUM (i.e. a change to the angle at which the line joins MCW01) would require a longer length of line between MCW01 and IBENA to accommodate the turn; again pushing the line too close to the boundary of the LTMA and buffer zones.

7. Will the introduction of the Arrival Transition for Runway 05 result in an element of aircraft concentration as currently there is an amount of dispersion? If so, can LSA provide information to offer context for the impact of the introduction of the new procedures on the Essex community?

    a. The proposed PBN procedure would concentrate traffic over time; however this will initially be very slight and dependent on how often the arrival transition is used. This route is in addition to the existing procedures, therefore traffic using the ILS would continue to operate in the same way as they do today and the tracks flown will be dispersed across the same area / swathe as today. ATC will still tactically vector aircraft as in current operations, whether they are flying the ILS procedure or the PBN procedure. Not all aircraft operators will be equipped to fly the PBN routes so will continue to use the existing ILS procedure. The ILS will still remain the primary procedure for the majority of aircraft operators into LSA. In terms of numbers using the route, this is difficult to quantify for the reasons provided above. As discussed in the Consultation Document we expect a gradual migration towards these procedures over time but it is difficult to put a timescale on this.

8. Will the new procedures fall within any danger areas or interact with the D138 military complex? (See Figure 1)

    a. The South IAF for Runway 23 falls within the D138A danger area but has been designed to ensure that is does not interact with the D138 / D138B / D138C Danger Areas. If D138A is in use, the UPUDU route will not be available.

9. Point IBENA (IAF/IF) is unsuitable due to the need to route air traffic over local villages and designated countryside. Can a new point be established further East, over the Thames Estuary for final approach to the FAF (matching the current ILS arrival routes), whilst also relocating PIVAB (IAF) further East too?

    a. Point IBENA on the Runway 05 approach cannot be relocated over the Thames Estuary due to the minimum distance permitted between the IF and the FAF according to RNAV design criteria.

10. The proposal covers RNAV and RNP equipment, can additional information of the lateral tolerances be explained?
    a. See Appendix B for the lateral tolerances as explained in the ICAO PANS-OPS Manual Volume II. Typically, flights remain far closer to the track centreline than the defined tolerance.
    b. RNAV approaches will be used during the transition and intermediate approach segments of the procedure. RNAV 1 shall be used for this approach, where lateral deviation is tolerated up to 1nm from the centreline 95% of the time.
    c. RNP APCH part A & part B can be used during the straight in approach segment of the procedure where the tolerances are much lower depending on aircraft on-board capabilities:
        i. Part A (LNAV & LNAV/VNAV) has a tolerance of 0.3nm 95% of the time.
        ii. Part B (LPV) has an angular tolerance, therefore being better than 0.3nm.

11. Can the control of the height of the aircraft using this new operating system be explained in further detail?
    a. During the transition and intermediate approach segments, the RNAV 1 procedure uses LNAV for altitude capabilities. During the straight-in segment, the RNP APCH procedure will use one of the 3 altitude functions shown below:
    b. LNAV states that the altitude will be managed by pilot input.
    c. LNAV/VNAV has a vertical path created by the aircraft's on-board computer and will be guided by barometric pressure.
    d. LPV has a vertical path created by the aircraft and guided by GPS at a better tolerance.

5.3. Concerns Raised & Answers

1. The implementation of these new procedures will cause an increase in noise and pollution around Hockley.

    a. All routes that have been designed do not directly overfly Hockley as shown in Figure 19.

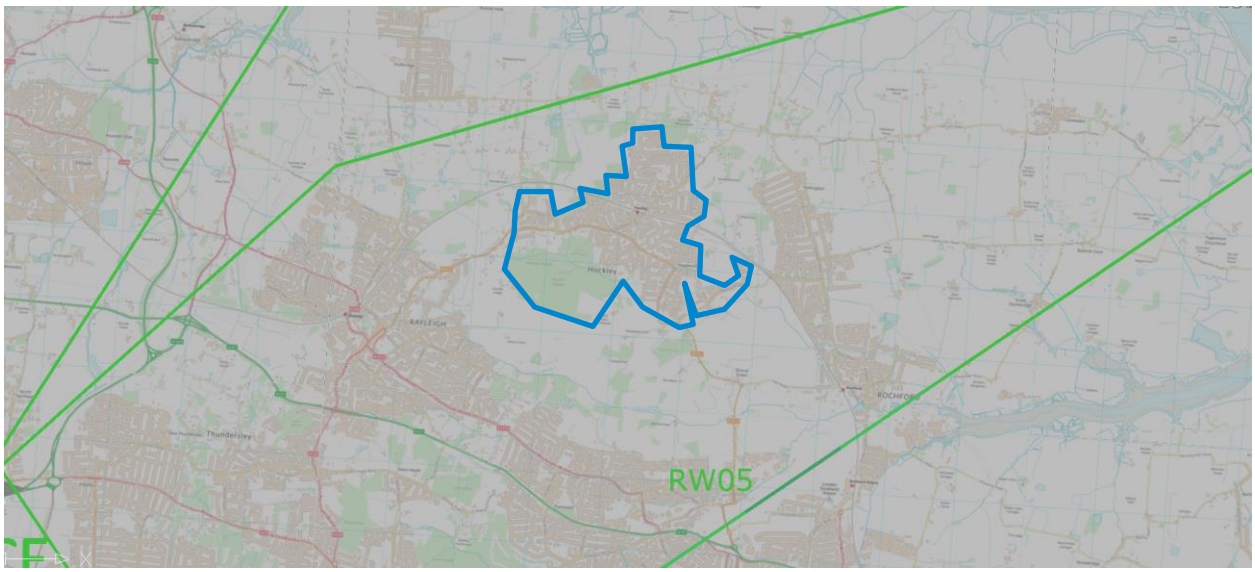


Figure 19 - Image showing new procedures around Hockley

2. The local planning authority should be determining whether or not this application is consistent with national and local policies on the natural environment.

    a. The local authorities were consulted and no key issues were raised regarding any detrimental impact on the natural environment.
    b. The airspace change process defines the consultation requirement with environmental stakeholders – LSA has complied with that process.

3. Non-CO_2 emissions should have been mentioned in the Consultation Document.

    a. The route design aims to minimise the noise impact on populated areas, although does not consider air quality. The reason for this is that air quality is only assessed for routes below 1,000ft (the straight-in approach segment), which is outside of the scope of this consultation, as there is no change to tracks below 1000ft.

4. Once operational if there are complaints of noise, an opportunity should be taken to redesign certain arrival routes.

    a. According to the CAA airspace change process in CAP725, the change (if approved) will be evaluated during the Post Implementation Review (PIR) conducted 12 months after implementation. The aim of this exercise is to assess if the designed benefits are met, and ensure that the proposal is, in practice, operating as intended.

5. In the past two months alone, noise from the aircraft overflying Hoo Parish airspace seems to be about every two minutes, and will get worse with the implementation of these new routes.

    a. Hoo Parish is regularly overflown by inbound and outbound flights to London City Airport as well as London Southend Airport. Regarding Southend traffic relevant to this proposal, Hoo Parish is predominantly impacted by Easterly arrivals (30% of the time). In the short term there would continue to be a dispersal, but as the procedure gets used more often there would tend to be more concentration around the defined centreline.

6. Concerns regarding the small sample used in the consultation and a lack of clarity into the future use and take up of the PBN routes.

    a. Showing the busiest month's worth of flight data was acceptable to the CAA as part of the consultation preparation process. The pictures that were supplied in the Consultation Document illustrated the typical arrival flight patterns to the airport, portraying the current impacts. We also supplied pictures of the proposed flight patterns, to illustrate the predicted impacts this proposal would have, presuming all relevant flights follow their new routes. We stated that the take-up of these new routes is likely to be gradual, moving from a semi-dispersed pattern and tending to concentrate over time. Thus, the changes in impacts have been portrayed in the consultation material.

7. The proposal quotes RNAV 1 being within "1nm of the centre line of the prescribed track for more than 95% of the time", equating to a channel 2nm wide maximum. It then states a typical accuracy of 0.2nm along straight segments; please explain how these relate further.

    a. The RNAV 1 type of approach is used only for the transition and intermediate approach up to points IBENA and VESAS on the individual runways. This type of approach states that the tolerance will be within 1nm 95% of the time. The straight-in segment will take over from the intermediate fixes named above to the runway threshold. As mentioned previously, RNAV approaches to the runway cannot use RNAV 1 as the variance allows for up to 1nm deviation from the centreline; thus approach design beyond the FAF uses the specification 'RNP APCH' which is more restrictive (for instance requiring GPS). This will have a typical accuracy of 0.2nm variance from the centreline, providing confidence that the system will guide the aircraft to the runway threshold.
    b. The RNP APCH function can be split into LNAV & LNAV/VNAV approaches and LPV (SBAS) approach types. LNAV & LNAV/VNAV approaches have a typical accuracy of 0.3nm variance whilst more equipped aircraft using LPV (SBAS) will have an angular variance (better than 0.3nm); therefore the typical accuracy of 0.2nm statement remains valid. See Appendix B for the ICAO navigation specification providing further detail on this.

6. Intention to Proceed with the Airspace Change Proposal

Following careful consideration of all consultation responses, LSA intends to submit the Airspace Change Proposal (ACP) to introduce RNAV Approach Procedures to the CAA. The basis of this proposal will be for the introduction of new RNAV transitions & Instrument Approach Procedures (IAPs) which replicate the existing conventional arrival tracks as closely as possible (as described in the Consultation Document and below in Figure 20 and Figure 21). There have been no changes to the routes following the responses from the consultation due to reasons highlighted in Section 5.

All consultation responses will be forwarded to the CAA Safety and Airspace Regulation Group (SARG), with personal details removed where requested. CAA SARG will consider the merits of this proposal. It is expected that they will reach their decision by Summer 2018.

The ILS approaches will remain as the primary method for arriving aircraft in the coming years, although gradual migration towards RNAV is expected due to the increase in PBN technology available. To allow for aircraft which are not RNAV equipped, the current tactically managed transitions will remain available. This will facilitate a gradual, managed transition to the use of PBN at LSA. The proposed implementation date for the RNAV procedures is Winter 2018. However this is dependent on many factors, including CAA approval of the proposed changes.

If you have any further comments you may wish to make, these may still be accepted, and if they present new evidence, may still influence the final airspace change proposal (see Section 8 for details on submitting further responses).

Alongside the conventional approach routes available today, a specific RNAV procedure will be implemented, if approved, for Runway 05 as illustrated in Figure 20.

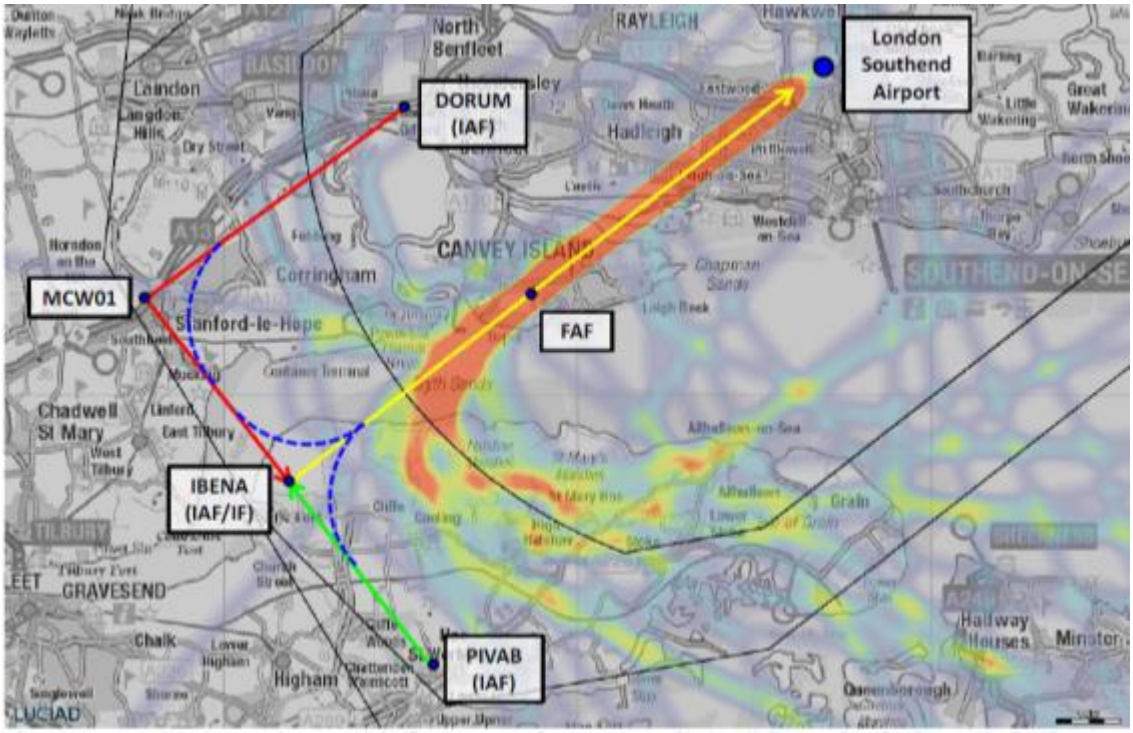


Figure 20 - Runway 05 RNAV Approach Route

Alongside the conventional approach routes available today, a specific RNAV procedure will be implemented, if approved, for Runway 23 as illustrated in Figure 21.

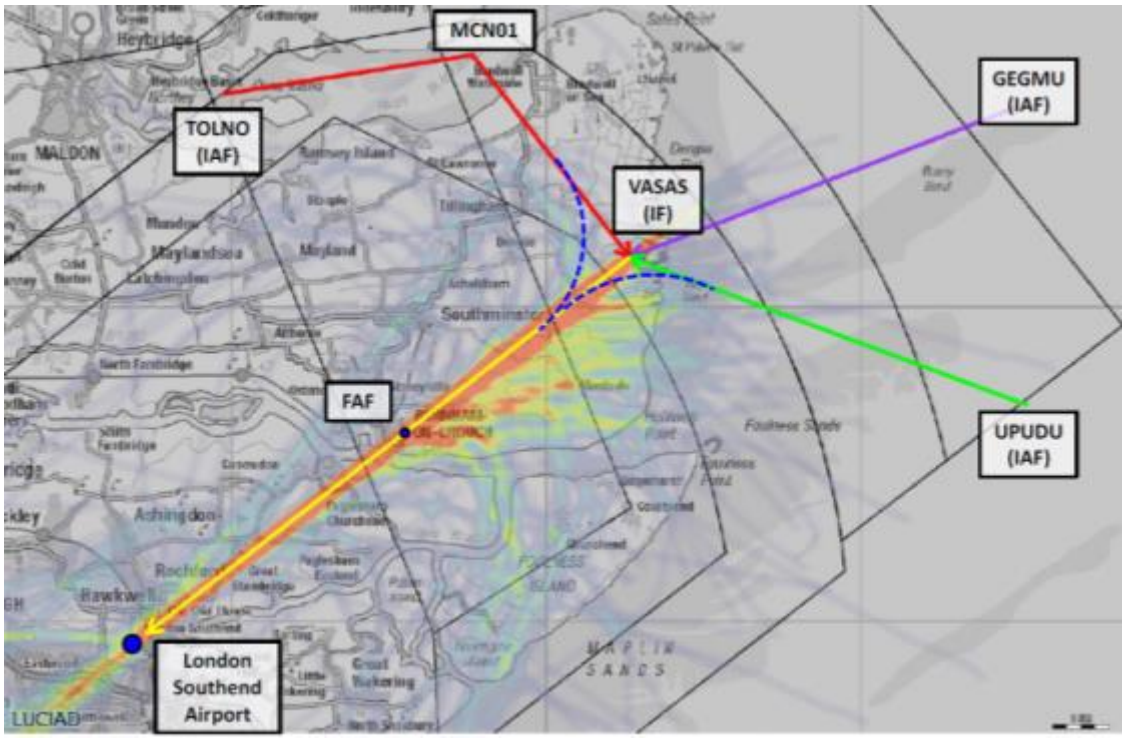


Figure 21 - Runway 23 RNAV Approach Route

7. Post-Consultation Steps

7.1. Feedback to Stakeholders

This consultation feedback report will be made available to download on the LSA website and an email will be sent to all stakeholders and members of the public who responded directing them to the download page.

7.2. Airspace Change Proposal

We will submit and Airspace Change Proposal to the CAA, detailing the intention to introduce RNAV procedures, as outlined in Section 6 above.

This proposal is expected to be submitted in Spring 2018.

The CAA will study and evaluate the proposal to decide if it has merit and is fit for purpose. Their decision will be published on the CAA website.

If the CAA approves this proposal, implementation is expected to occur in Winter 2018.

7.3. Post-Implementation Review

Approximately twelve months after implementation of any airspace change, the sponsor (in this case London Southend Airport) will be expected to carry out a post-implementation review of the change to assess and validate the success of the new arrangements. The purpose of the review will be to confirm that the RNAV routes are working as anticipated in the change proposal and have had the desired effect on the modified airspace. The post-implementation review also provides an opportunity to identify any unforeseen issues that might have arisen which need to be addressed.

This review is governed by the CAA CAP725 process and is conducted in conjunction with the CAA.

LSA is committed to ensuring that any change represents the best possible solution and takes into account concerns of stakeholders, operational constrains and the CAP725 regulatory framework.

LSA is confident that the proposal put forward, following the existing traffic patterns where feasible, represents the best possible solution.

8. Further Correspondence & Feedback

In the event that a representative organisation wishes to present new evidence, data or comments regarding the conduct of the consultation to the Safety and Airspace Regulation Group Director (CAA), for consideration prior to making their regulatory decision regarding this proposal, the representative organisation must submit, in writing or via email, the information to the following address:

Head of Airspace Policy, Coordination & Consultation
Re: **LSA Introduction of New Approach Procedures**
Safety & Airspace Regulation Group,
CAA House,
45-49 Kingsway,
London,
WC2B 6TE

Email: airspace.policy@caa.co.uk

Appendix A

Image from Echo newspaper, Thursday July 20th 2017.

New technology to improve flight landings at airport

NEW technology which will make landings more accurate and efficient is on its way to Southend Airport.

In a bid to comply with Government legislation, the airport will be introducing a new performance based navigation system - which allows planes to land with greater accuracy.

The technology is inspired by GPS – which is used to power sat navs – rather than traditional ground based air traffic control.

To take advantage of the improved technology, some additional flight paths have been drawn up by airport bosses. They want hear feedback from people living under the flight paths and others who may be affected.

Where it has not been possible to replicate existing routes, new designs have been drawn up.

They have been created with a balance between efficiency and environmental impact in mind.

By KATIE FEEHAN
katie.feehan@newsquest.co.uk

Where possible, routes have been diverted from heavily populated areas in a bid to minimise disruption for people living in the area.

In the consultation document, an airport spokesman said: "We seek to take advantage of the improved navigational capabilities to introduce additional route options which minimise impact to people on the ground.

"In essence we have maintained current flight paths where possible and minimised the number of new people impacted."

The benefits of the new navigation system mean that the airport will operate with a safer, more efficient traffic control system – requiring less intervention from air traffic controllers.

It will also allow planes to land more efficiently – leading to reduced costs, reduced flying times and reduced greenhouse gas emissions.

The more predictable flight paths over populated areas will generate less noise.

It will also allow planes to use less fuel and stay higher in the air for longer.

Those interested in the proposed changes are invited to take part in the consultation, which will be open until Wednesday, September 13.

The airport is keen to hear from national and local bodies, groups and organisations.

Both Kent and Essex councils and MPs have also been consulted, as well as airlines, airfields, flying clubs, private jet operators and any other airspace users.

To view the documents or take part in the consultation, visit southendairport.com/corporate-and-community/proposed-arrival-routes

Appendix B

Image from ICAO PANS-OPS Manual Volume II[6] – red boxes highlight approach types used as part of this proposal. Numbers are the tolerance in nautical miles.

i) *RNP APCH:* used to support RNP approach operations to LNAV, LNAV/VNAV, LP and LPV minima. Obstacle clearance criteria are detailed in Part III, Section 1, Chapter 2, and Section 3, Chapters 2, 3, 4, 5 and 7.

Table III-1-1-1. Navigation specification per flight phase

	Flight Phase							
	Oceanic/Remote	*En-route*	*Arrival*	*Approach*				*Departure*
				Initial	*Intermediate*	*Final*	*Missed*[1]	
RNAV 10	10							
RNAV 5		5	5[2]					
RNP 4	4							
RNP 2	2	2						
RNAV 2		2	2					2
Advanced RNP[3]	2	2 or 1	1 – 0.3	1 - 0.3	1 - 0.3	0.3	1 - 0.3	1 - 0.3
RNP 1			1	1	1		1	1
RNAV 1		1	1	1	1		1	1
RNP 0.3 (Cat H)		0.3	0.3	0.3	0.3		0.3	0.3
RNP APCH (Part A)[4]				1	1	0.3	1	
RNP APCH (Part B)[4]				1	1	Angular	1 or 0.3 (initial straight MISAP)	
RNP AR APCH				1-0.1	1-0.1	0.3-0.1	1-0.1	

Notes:

1. *RNP requirements do not apply to initial and intermediate missed approach segments.*
2. *RNAV 5 may be used for initial parts of STARs outside 30 NM from the ARP.*
3. *Advanced RNP core requirements are limited to RNP 1 in all flight phases except final approach (RNP 0.3) and RNP 2 in oceanic/remote and en-route continental. A scaleability option will allow accuracy values between 0.3 and 1.0, in 0.1 NM increments, in all flight phases except oceanic/remote/en-route continental (RNP 1 and RNP 2) and final approach (RNP 0.3).*
4. *Part A and B refer to the* Performance-based Navigation (PBN) Manual *(Doc 9613), Volume II, Part C, Chapter 5, Part A* — RNP APCH operations down to LNAV and LNAV/VNAV minima *and Part B* — RNP APCH operations down to LP and LPV minima, *respectively."*

[6] For further information on Navigation Specifications see the ICAO PBN manual (Doc. 9613) and the following Eurocontrol website: https://www.eurocontrol.int/articles/rnav-approaches