



Carlisle Airport Consultation Document

Development of RNAV Procedures

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Foreword by Chief Executive Officer of Stobart Aviation

Welcome to the consultation document outlining the proposed implementation of new Instrument Flight Procedures (IFPs) at Carlisle Airport.

Carlisle Airport has embarked on an exciting programme of development that will see an upgrade to the runway and associated infrastructure, including runway and approach lighting, alongside the construction of a new terminal building. These improvements will ensure that the Airport is ready when it commences passenger services between its sister airport at London Southend, as well as Belfast and Dublin in 2018.

In addition to these planned improvements, we have commenced a project to introduce new IFPs to assist aircraft making approaches to Carlisle Airport during inclement weather. The existing arrangements for poor weather arrivals rely upon Non-Directional Beacon (NDB) and Distance Measuring Equipment (DME) navigational aids. Many airports in the UK are transitioning from conventional navigation equipment, to newer satellite based approaches which use Global Positioning Satellites (GPS) similar to those used for car navigation systems.

Approaches using GPS are referred to Global Navigation Satellite System (GNSS) or 'aRea Navigation' (RNAV). These approaches allow airports to design special procedures for helicopters as well as fixed wing aircraft.

Whilst this technology is relatively new, more and more aircraft are becoming RNAV equipped and more pilots are becoming qualified to fly RNAV approaches. The existing NDB and DME equipment at Carlisle Airport will continue to be utilised but this equipment is becoming obsolete so it is important that we make arrangements now for a more robust and effective system of navigational aid.

The changes proposed have been designed to replicate, as far as practicable, the existing arrangements in order to reduce any adverse impact that new routes might have. However, it is important for us to share with you our proposed changes to ensure that anyone who may be affected by the proposed changes has the opportunity to understand what is being proposed, and can comment or make representations as appropriate.

Carlisle Airport will be hosting a number of information evenings in the New Year where you will have the opportunity to speak to members of the project team who will be able to answer questions that you might have. Details of these sessions will be published on the Carlisle Airport website.

I look forward to receiving your feedback from this consultation; it is important for us to receive feedback to ensure that when the time comes to submitting a formal change request to the CAA we can do so in the knowledge that all stakeholders have had the opportunity to comment on the proposed changes.



Glyn Jones

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1 Background

1.1 Context

The site that Carlisle Lake District Airport now occupies first commenced aviation operations at the outbreak of the Second World War when the Royal Air Force developed a new airstrip at Crosby-on-Eden. Since then Carlisle Airport has developed into a thriving General Aviation Airport with a CAA Public Use Aerodrome Licence that allows for the public transport of passengers or for flying instruction, up to the maximum authorised take-off weight of 12.5 tonnes.

The Airport lies just 6 miles to the east of Carlisle and approximately 20 miles north east of the Lake District National Park. The Airport is home to several fixed wing flying training schools, one microlight school and a gyroplane flying school.

1.2 Stobart Aviation

In 2009, Carlisle Airport was bought by Stobart Aviation. They recognised the strategic position of the Airport and in 2014 work started on a £12M Air Freight Distribution Centre, which is now leased to Eddie Stobart Logistics. In June 2017, the Cumbria Local Enterprise Partnership (LEP) invested £4.75M in order to develop the county's connectivity. The Airport aspires to introduce regular passenger services between London Southend Airport and Belfast and Dublin. The Airport has also recently embarked upon an infrastructure upgrade programme to resurface the runway, improve the Aerodrome Ground Lighting (AGL) to ensure that the Airport meets the latest CAA regulations.

All of these investments have been designed to improve the facilities to existing users of the Airport, but the introduction of regular passenger services will provide a boost to the county's transport infrastructure benefitting many local people and services.

2 What is Carlisle Airport Proposing?

This Section explains what Carlisle Airport is proposing to introduce.

2.1 RNAV (GNSS) Approaches

Carlisle Airport is proposing to introduce RNAV (derived from aRea Navigation) which utilises Global Navigation Satellite System (GNSS) procedures for aircraft landing on Runways 06, 24 and Point in Space (PinS) approaches for helicopters arriving for Runways 01 and 19. The proposed approaches have been designed by a UK CAA approved Procedure Designer in accordance with International Civil Aviation Organisation (ICAO) Document 8168 and CAA policy guidance and regulations, and are in line with best practices and standards across the UK.

2.2 Why is the Airport Proposing New Procedures?

The key drivers for introducing the new procedures are as follows:

- Improvement to existing facilities to support IFR operations;
- To provide resilience to the existing IFR navigational facilities;
- To comply with the UK's commitment to ensure all airports have Performance Based Navigation (PBN) in service by 2024.

2.2.1 Existing Equipment

Most aircraft operating in and out of Carlisle Airport rely on good weather with good visibility. However, during periods of poor weather, including low cloud and poor visibility, pilots arriving at Carlisle Airport have to rely upon their instruments to fly the aircraft. This is known as flying under Instrument Flight Rules (IFR). At Carlisle Airport, pilots will make use of the existing conventional navigational aid, the NDB/DME¹, to navigate safely and make an approach. The NDB is relatively old technology and supporting and maintaining legacy equipment, such as the one in place at Carlisle Airport, is challenging. If the navigational aid is out of service for technical reasons, pilots may not be able to make an approach if the weather conditions do not permit flight under Visual Flight Rules (VFR). There is no intention to remove the NDB equipment since it will continue to be used by the majority of Carlisle Airport operators.

2.2.2 Why RNAV (GNSS) Procedures

The development of RNAV (GNSS) Required Navigation Performance 1 (RNP1) is aligned with UK policy and is a cornerstone of the Future Airspace Strategy² (FAS).

¹ Non-Directional Beacon/ Distance Measuring Equipment. These navigational aids are normally co-located to provide homing information together with range (distance) information useful to the pilot.

² Further details regarding the FAS can be found here: <https://www.caa.co.uk/Commercial-industry/Airspace/Future-airspace-strategy/Future-airspace-strategy/>

At the 2007 36th International Civil Aviation Organisation (ICAO) General Assembly, States agreed to Resolution 36/23, which urges all States to implement routes and airport procedures in accordance with the ICAO Performance Based Navigation (PBN) criteria. EU Legislation, through the Common Pilot Project, instructs States to implement PBN through RNP1 by 2024.

Carlisle Airport has successfully applied for funding from the European GNSS Agency (GSA) to support the implementation of Localiser Performance with Vertical Guidance (LPV) and PinS approaches.

2.2.3 Introduction of Passenger Services

Whilst the Airport has declared its intention to introduce passenger services, the requirement for the introduction of RNAV (GNSS) procedures is not based upon these services. It should be noted that the initial passenger services will on average only represent an extra three arrivals each day as the service will operate between London Southend Airport, Carlisle Airport and Belfast and Dublin. Whilst the new passenger services will undoubtedly benefit from the increased accuracy that the RNAV (GNSS) procedures will provide, the Airport would not need to consult specifically on the introduction of the passenger services alone. The implementation of the passenger services is not dependent upon the successful outcome of this Airspace Change Proposal (ACP).

2.3 Why is the Airport Consulting on These Procedures?

Carlisle Airport understands that any potential alteration of the flight profiles at the Airport might affect the local population, and other aviation stakeholders. Therefore, the Airport is keen to ensure that any stakeholder that might potentially be affected by a proposed change is given the opportunity to see what the Airport is proposing and the rationale behind the proposed changes.

The Civil Aviation Authority (CAA) publishes guidance on Airspace Change proposals within CAP 725 'Guidance on the Application of the Airspace Change Process'. The Airport is utilising this guidance for the project, and specifically for the Consultation Process. The CAA is in the process of implementing changes to how Airspace Change projects are managed; the new process will come into effect in 2018 for projects that have not already commenced Formal Consultation. This project will remain on the existing CAP 725 process.

2.4 What is not Contained Within the Consultation?

This Consultation concerns only the proposed introduction of new RNAV (GNSS) procedures to Runway 24 and Runway 06, and PinS approaches to Runway 01 and Runway 19.

This Consultation is **NOT** about changes to the following:

- Changes to Airport opening hours;
- Changes to the types of aircraft operating at the Airport;
- Changes to the classification of airspace around the Airport;
- The routes or heights of any departing aircraft;
- The number of aircraft operating from the Airport; or
- Airport operating hours.

3 Why Consult?

Carlisle Airport is proposing the introduction of new RNAV (GNSS) arrival procedures and recognises that some aviation and non-aviation stakeholders might be concerned about the nature and extent of the changes. This consultation is an opportunity for anyone to learn more about the changes and be able to comment on those changes.

3.1 Overview

Carlisle Airport has embarked upon a series of improvements at the airport. As well as physical infrastructure upgrades, the Airport requires more redundancy in its approach procedures which will allow aircraft to make more successful approaches during poor weather conditions. The current navigational aid that the Airport relies upon is a Non-Directional Beacon or NDB. This allows a pilot to use information transmitted by the beacon to navigate safely to a position where he can take over visually to continue to landing. This type of navigational aid is gradually being replaced by new technology that utilises satellite positioning information, similar to that used within car navigation systems. These approaches are known as RNAV procedures which utilise GNSS technology.

3.2 Consultation Requirements and Legislation

In developing this Airspace Change Proposal, Carlisle Airport is following a detailed process laid down by the Civil Aviation Authority (CAA) within CAP 725 *CAA Guidance on the Application of the Airspace Change Process* [Reference 1]. Stage 4 of that process requires the Airport to consult widely, allowing a minimum of 12 weeks for written consultation. Feedback from this consultation will inform the final airspace design submitted to the CAA for approval.

The CAA is introducing a new process for managing ACP which will come into effect for new projects in January 2018. This project will follow the process within CAP 725.

In determining whether the proposal should be approved, the CAA must also follow legislation and guidance set by the Government, through the DfT. Its principal functions and duties are set out in primary legislation within the Civil Aviation Act 1982, the Airports Act 1986, the Transport Act 2000 and the Civil Aviation Act 2012³. In exercising its air navigation functions, the CAA must give priority to maintaining a high standard of safety in the provision of air traffic services in accordance with those statutory duties, particularly concerning Section 70(1) of the Transport Act 2000.

³ <https://www.caa.co.uk/Our-work/Corporate-reports/Strategic-Plan/Our-statutory-duties/> [Accessed 4th December 2017].

In order for the CAA to make an informed, evidence-based decision concerning the Carlisle Airport proposal, it is essential that the views of those who may be affected are fully considered.

3.3 Consultation Process Concerns

The CAA's Safety and Airspace Regulation Group will oversee this consultation to ensure that Carlisle Airport adheres to government guidelines and the process detailed within CAP 725. Should you have any complaints regarding our adherence to the consultation process, they should be referred to:

Airspace Regulator (Coordination)
Airspace, ATM and Aerodromes
Safety and Airspace Regulation Group
CAA House
45-59 Kingsway
London
WC2B 6TE

Email: airspace.policy@caa.co.uk

Please note that you should not use these contact details to respond to the consultation itself. These contact details should **only** be used to submit a complaint about **non-adherence to the consultation process**.

Responses to the consultation content (the proposed airspace) should be sent to Carlisle Airport; details for how to do so are provided within Section 4.

4 Who is Being Consulted and How Can I Participate?

Carlisle Airport aims to reach as many people as possible that might be affected by the proposed changes and to make it simple for those who wish to comment to provide their views and opinions of any potential impacts.

4.1 Who is Being Consulted?

Whilst Carlisle Airport believes that the changes to the proposed Instrument Flight Procedures will not be significant, it is important that this consultation reaches as many potentially affected stakeholders as possible. A full list of the individual organisations being contacted directly is provided at Annex A4. This Consultation Document will be available publicly to any other stakeholders or interested parties through the Carlisle Airport website (advertised through local media), public meetings and hard copy by post, on request.

4.2 How Do I Submit My Response?

There are several ways to submit your response:

- Through a dedicated email address (also available through the website);
- By post;
- During one of the public meetings.

A form has been included at Annex A1 is provided should you wish to make use of it.

4.2.1 Email

Osprey Consulting Services Ltd (Osprey) is supporting Carlisle Airport to introduce the changes to the Instrument Flight Procedures. A dedicated email address has been created for responses, as follows:

carlisleairportconsultation@ospreycsl.co.uk

Please entitle your email Carlisle Airport Consultation Response.

Post

Please send your responses to:

Carlisle Airport Consultation Response
Osprey Consulting Services Ltd
Suite 10, The Hub
Fowler Avenue
Farnborough Business Park,
Farnborough,
GU14 7JP

4.2.2 Public Information Meetings

Carlisle Airport will hold a number of public information meetings to present information on the proposed changes to the Instrument Flight Procedures. The submission of written feedback during these meetings would be welcome. Details of exact locations and times will be published on the Carlisle Airport website.

4.3 What Do I Need to Include in My Response?

We welcome any comments that you have on the proposals, both positive and negative. We would also like to know if you have read the consultation material, but have no comments to make; we need to be sure that we have reached a representative proportion of consultees.

4.4 What Will Happen to My Response?

We will treat all responses confidentially; details of respondents will be passed only to our consultants Osprey, and to the Civil Aviation Authority (CAA). The CAA requires a full report on the consultation process and its results, together with copies of responses from all key stakeholders as part of the formal Airspace Change Proposal submission.

We will record, collate and analyse all responses in order to identify any key issues and themes that emerge from the consultation process. An assessment will be made to determine if the proposal can be modified to take these issues into account.

4.5 How Will I Know the Results of the Consultation?

We will collate the results of the Consultation within a Feedback Report. We intend to publish the Feedback Report on the Carlisle Airport website within one month of the closure date of the Consultation Period.

4.6 Deadline for Responses

In accordance with CAA guidelines contained within CAP 725 [Reference 1], the consultation period is a minimum of 12 weeks.

This Consultation will close at 5 pm on Thursday **29th March 2018**.

5 What are the Proposed Changes?

This section will show how aircraft current fly in and around Carlisle Airport and show how this might change if the proposed change to procedures is successful.

5.1 Overview

As explained within Section 2 above, most aircraft that currently operate in and out of Carlisle Airport are small, single or twin engine aircraft operated by one of the flying training organisations based there. In addition, the Airport handles private business aircraft, helicopters and occasionally, military aircraft on practice diversions.

5.2 Current IFR Procedures at Carlisle Airport

Aircraft that cannot make a visual approach are required to make an 'Instrument' Approach and currently that means using the Non Directional Beacon (NDB) and the Distance Measuring Equipment (DME). The existing NDB approach for Runway 25 is pictured in Figure 1 below:

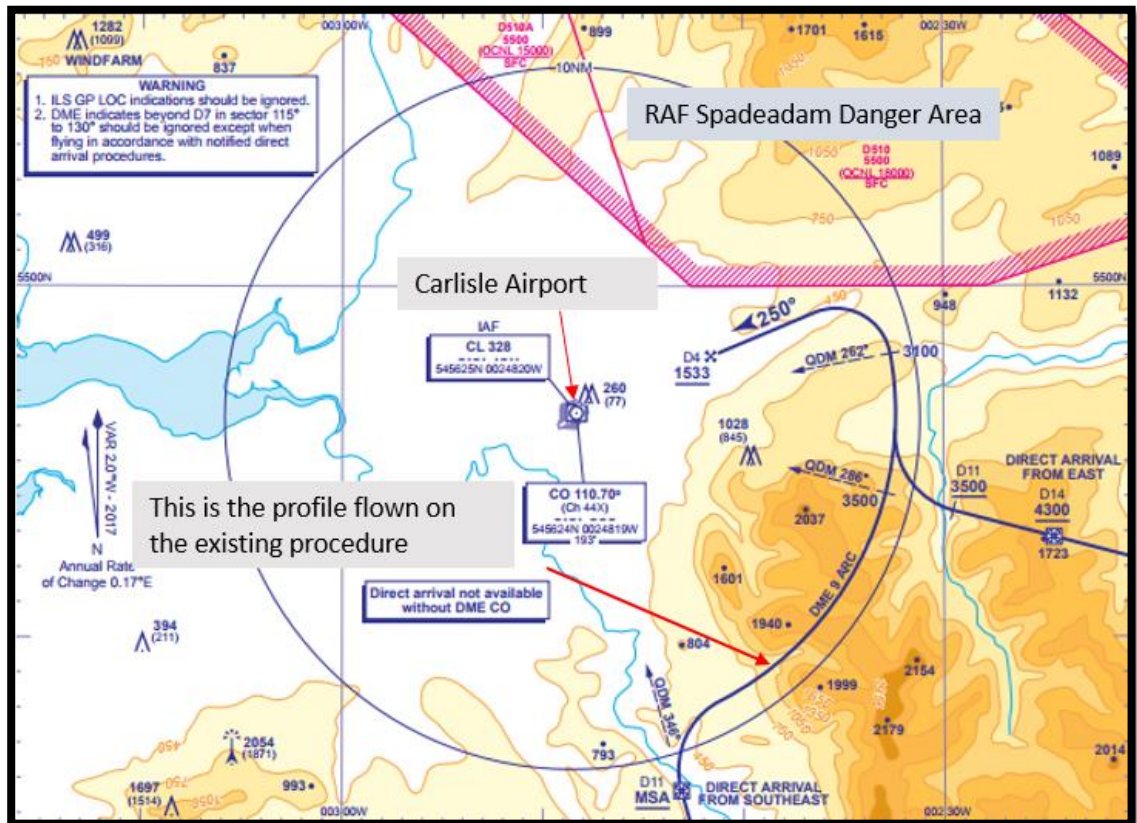
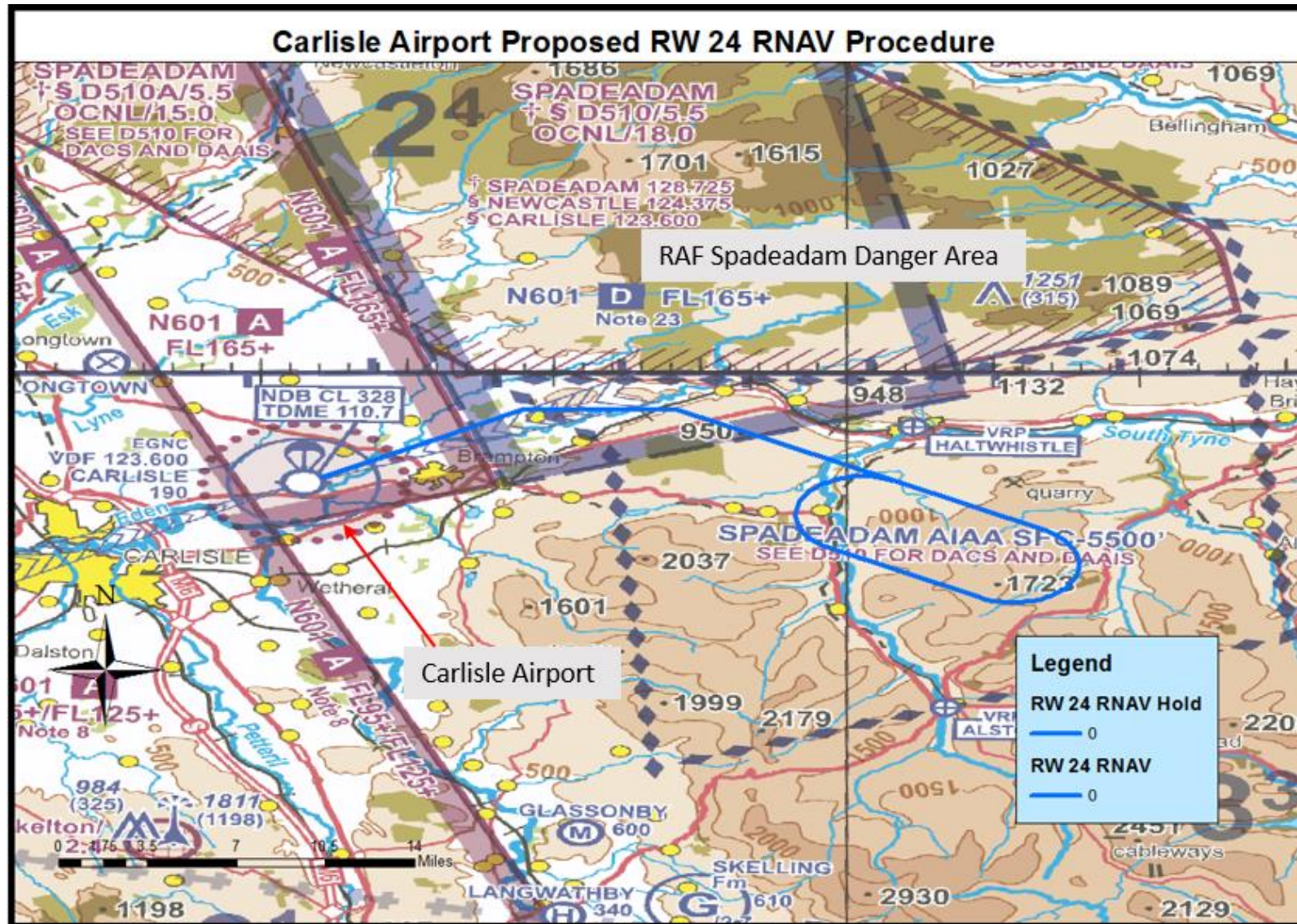


Figure 1 Existing Runway 25 NDB/DME Direct Arrival Procedure at Carlisle Airport

5.3.1 Runway 24

Following the infrastructure work on the runway, Runway 25 will be renamed as Runway 24 due to changes in magnetic variation. This is only a nomenclature change and does not affect any of the routes over the ground that aircraft currently fly. The new RNAV procedure proposed for Runway 24 is shown below:



The Procedure Designer has tried to replicate a similar path to the existing procedure, and has also attempted to avoid any built up areas.

5.3.2 Runway 06

Following the infrastructure work on the runway, Runway 07 will be renamed as Runway 06 due to changes in magnetic variation; this is a nomenclature change and does not affect how aircraft currently fly over the ground. The new RNAV procedure proposed for Runway 06 is shown in Figure 4 below. Whilst this approach overflies the city of Carlisle, the final approach section replicates the existing NDB approach for Runway 07. The infrastructure work proposed for Carlisle Airport will mean that the threshold position for Runway 06 will be slightly closer to the edge of the airfield boundary, meaning that aircraft will touch down approximately 250 metres closer to the city than at present. With this in mind, the Runway 06 RNAV approach has been designed for aircraft to follow a 3.5° approach angle. This is slightly steeper than a conventional approach that would normally follow a 3° approach angle. This has been designed for two reasons:

1. To remain consistent with the new approach designed for Runway 24; and
2. To keep aircraft slightly higher over the final approach whilst flying over Carlisle City.

5.3.3 Aircraft Holds

The Procedure Designer has designed a hold within the location of the existing NDB hold. In addition, the proposal includes two additional holds at the start of each procedure for Runway 06 and Runway 24 respectively. The purpose of these holds is to allow an aircraft that has been unable to make an approach to land to execute a go around (or missed approach procedure) and transit back to the start of the IFP to make a second attempt. These holds will also provide additional flexibility to controllers who will be required to separate and sequence arrivals and departures. If the implementation of the procedures is successful, the hold in the overhead is likely to be the one used most frequently, since aircraft are closer to the Airport.

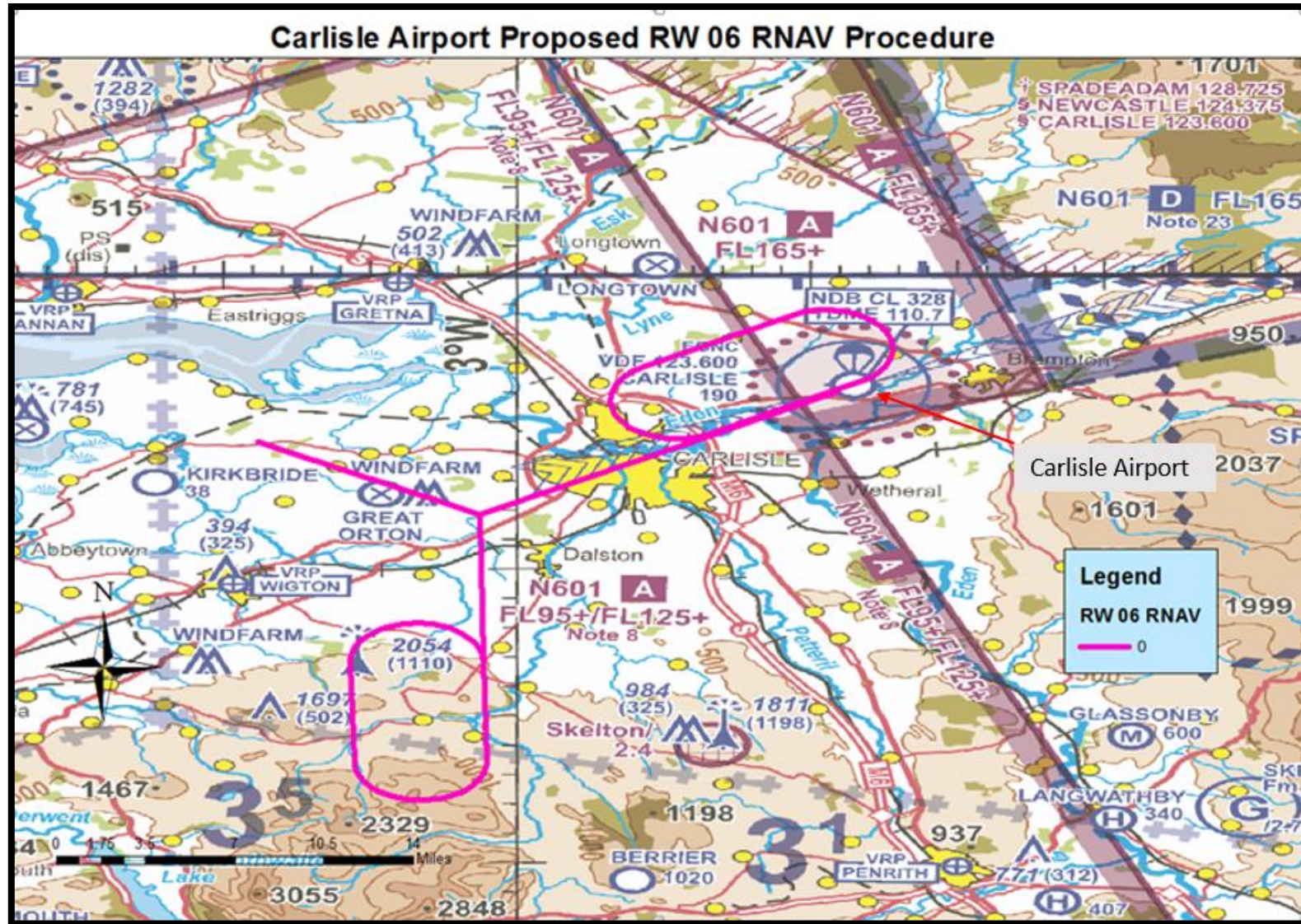


Figure 4 Proposed Runway 06 RNAV Arrival Procedure at Carlisle Airport

5.4 Point in Space (PinS) Approaches

PinS approaches are non-precision approaches designed for use only by helicopters. They allow pilots to follow a set of obstacle cleared GPS waypoints to allow them to position the aircraft to make a safe visual approach to the runway. The Airport has requested that the Procedure Designer develops designs for the PinS approaches to be aligned with the secondary Runways 19 and 01 (Runway 19 is the direction used most frequently). Normally, the procedure would be aligned with the runway to a range of approximately 4 -5 NM to allow a stable approach to be flown. It is also standard to have a ‘T’ design to provide several options for starting the procedure (depending on which direction the helicopter approaches from). However, the Procedure Designer must also consider any other airspace that might affect the viability of the route.

5.4.1 Runway 19

A standard ‘T’ design for Runway 19 is not practicable due to the proximity of the boundary to RAF Spadeadam danger area. In addition, if the approach was fully aligned to the runway, this would bring aircraft closer than is necessary to the boundary of the danger area. This is shown in Figure 5 below.

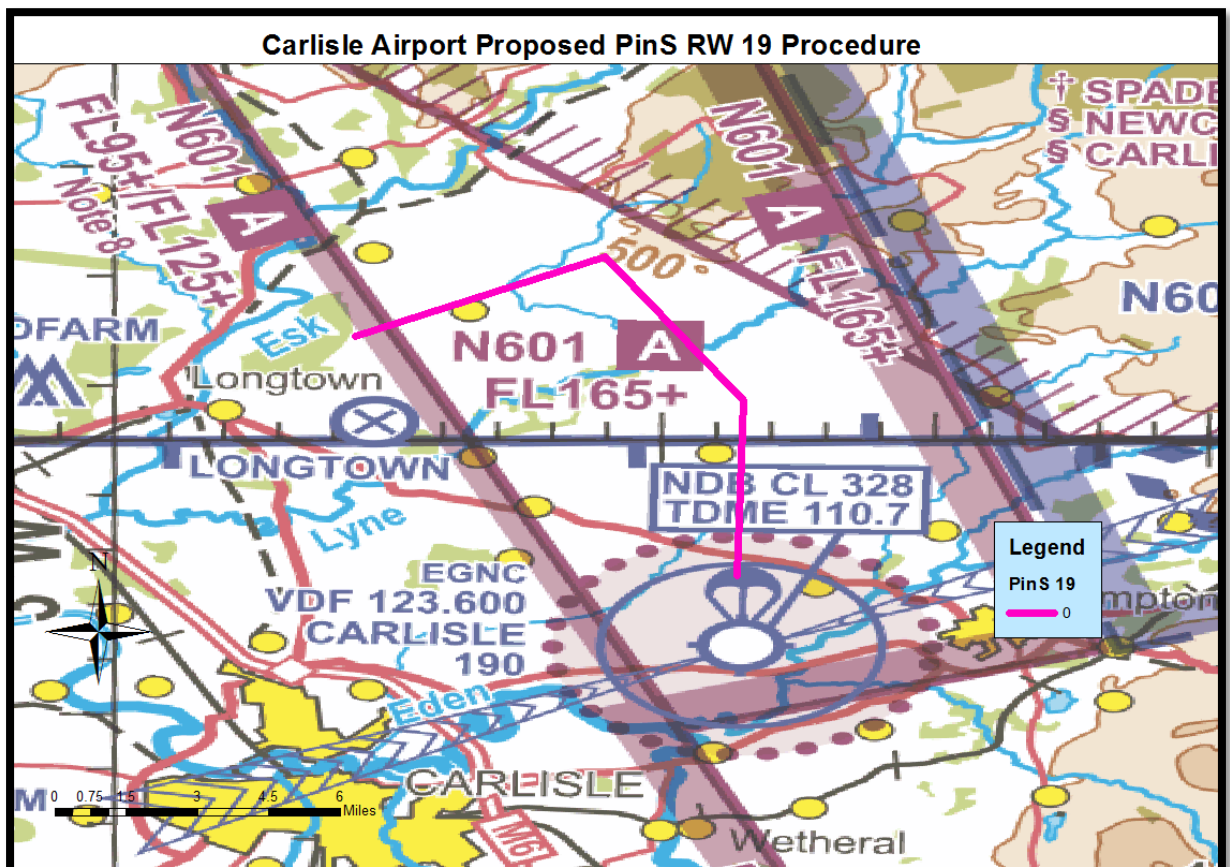


Figure 5 Proposed Runway 19 PinS (Aligned with Runway) Approach (© CAA and NATS)

Therefore an offset approach has been proposed that will ensure that pilots flying this approach will remain well clear of the Danger Area at all times. This approach is

aligned to a 150° track, keeping all helicopters well clear of the RAF Spadeadam Danger Area; see Figure 6 below.

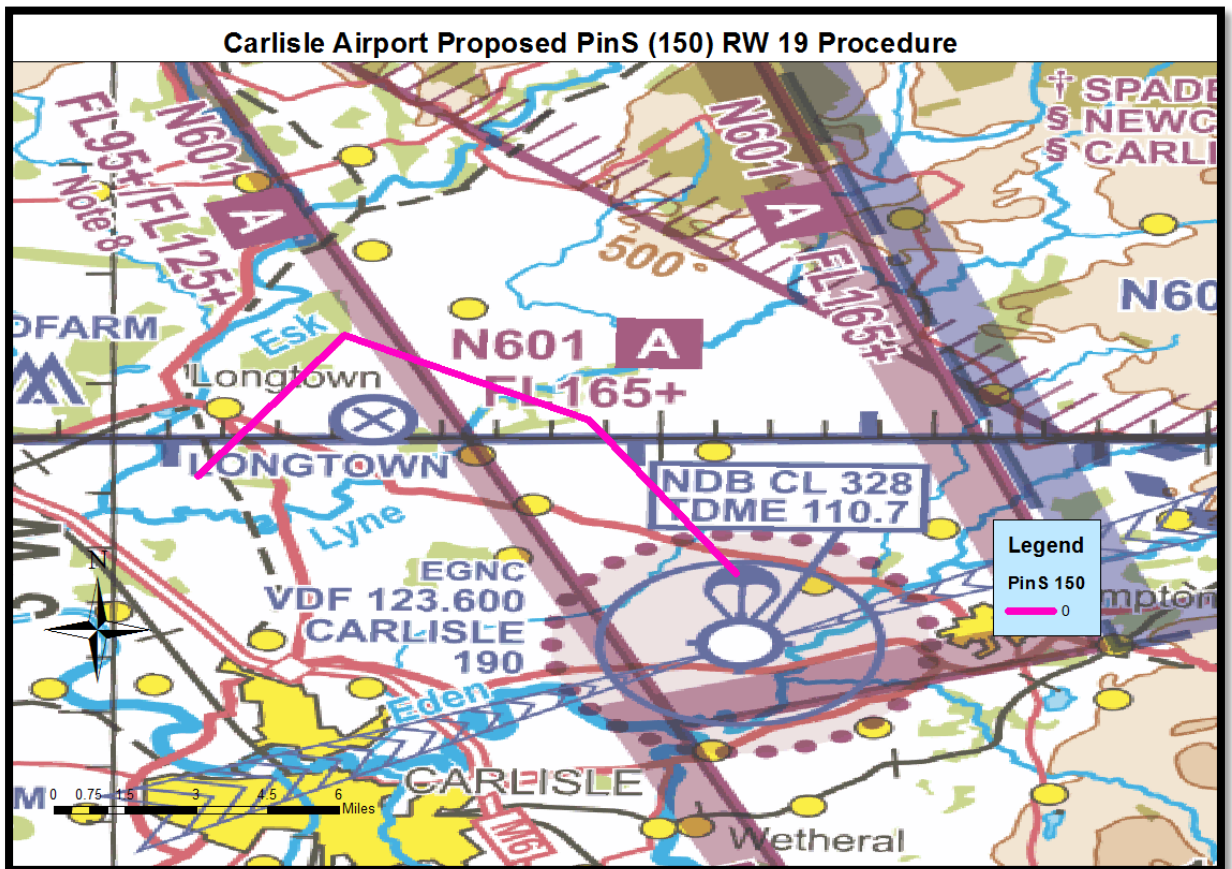


Figure 6 Proposed Runway 19 PinS (Aligned to 150° off-set) Approach (© CAA and NATS)

5.4.2 Runway 01

A standard 'T' design has been used for Runway 01 since this area is sparsely populated and the 'T' design does not need to be modified to avoid other aviation areas. This allows pilots to commence the procedure from one of three points: either end of the 'T' or from the centre of the 'T'. The proposed PinS for Runway 01 is shown at Figure 7 below.

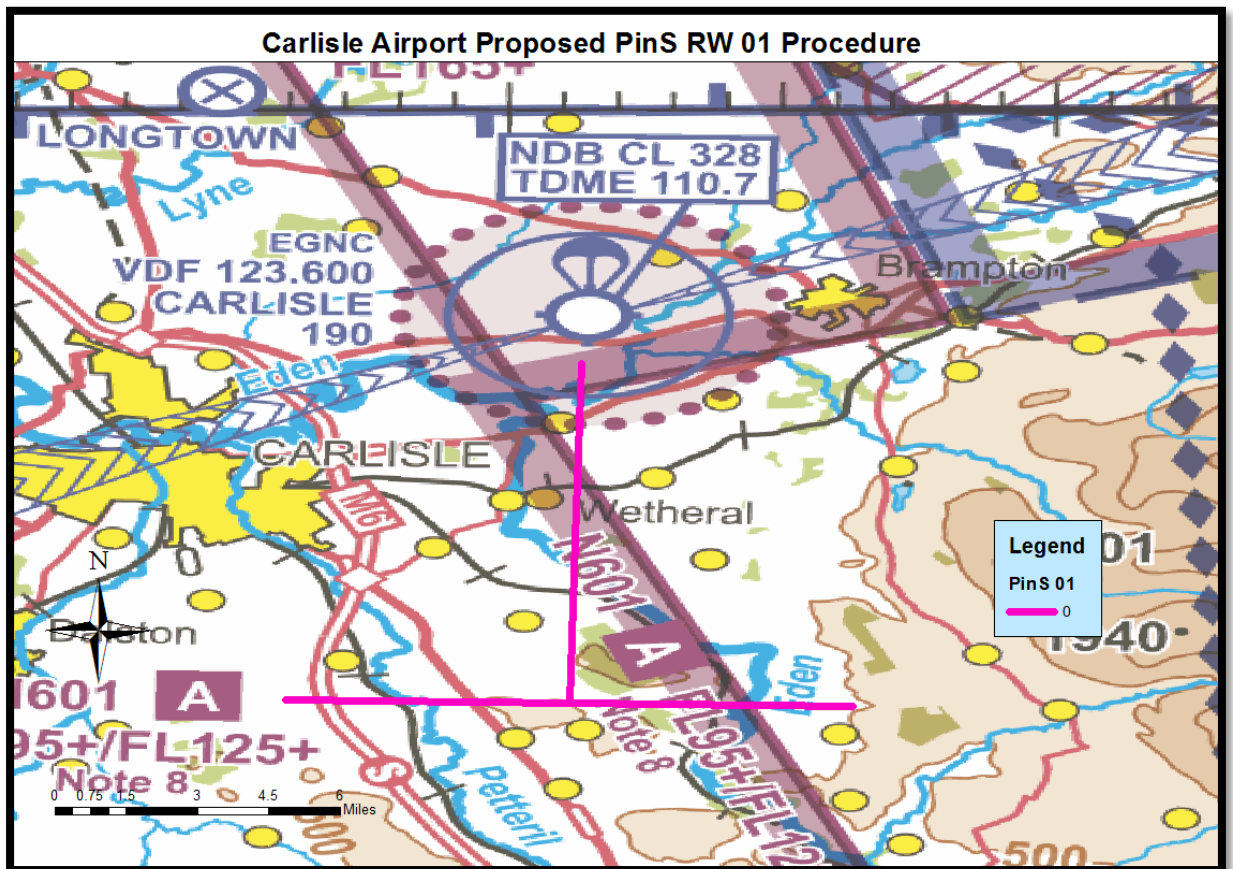


Figure 7 Proposed Runway 01 PinS Approach (© CAA and NATS)

5.5 How Often will these Approaches be Used and by Whom?

Carlisle has four runways available.

The main instrument runways are currently designated as Runway 25 and Runway 07. These will be renamed as Runways 24 and 06 respectively once the infrastructure upgrade has been completed. The shorter runway that supports mainly light aircraft and helicopter operations are designated as Runways 01 and 19. These will remain the same following the infrastructure upgrade. Figure 8 below shows the Aerodrome Layout with the existing runway markings.

Runway 24 is used most frequently due to the wind in the region being mainly from the west. For the UK as a whole, the prevailing wind is usually from the west (or south west) for approximately 70% of the time.

Carlisle Airport is planning to introduce scheduled passenger services between London Southend, Belfast and Dublin, irrespective of the outcome of this project. This is initially expected to increase the number of aircraft movements by approximately six per day (three arrivals and three departures). It is highly likely that if the implementation of these procedures is successful, the aircraft will choose to utilise the RNAV approaches on arrival. The aircraft used for this service are likely to be equivalent in size and performance to an ATR 42, although at the launch, a smaller aircraft may be used such as a JS41. Photos of examples of these aircraft are shown at Annex A3.

The majority of aircraft movements at Carlisle Airport will continue to be light single engine aircraft (General Aviation – GA) that currently utilise the Airport, either as visitors or Carlisle Airport based aircraft from the flying schools.

The number of annual aircraft movements since 2013 is shown within the Table 1 below:

Year	Total	Air Transport	Aero Club	Private	Business Aviation	% Increase (of Total)
2017 ⁴	14,638	532	11,172	2,285	406	N/A
2016	19,826	676	13,515	4,280	567	+7.6%
2015	18,427	570	12,230	4,135	583	+12%
2014	16,427	464	11,019	3,366	475	-4.9%
2013	17,280	558	11,206	3,360	399	N/A

Table 1 Carlisle Airport Aircraft Movement Data

Aircraft movements at Carlisle Airport have remained steady since 2013.

⁴ Data only available up to and including September 2017.

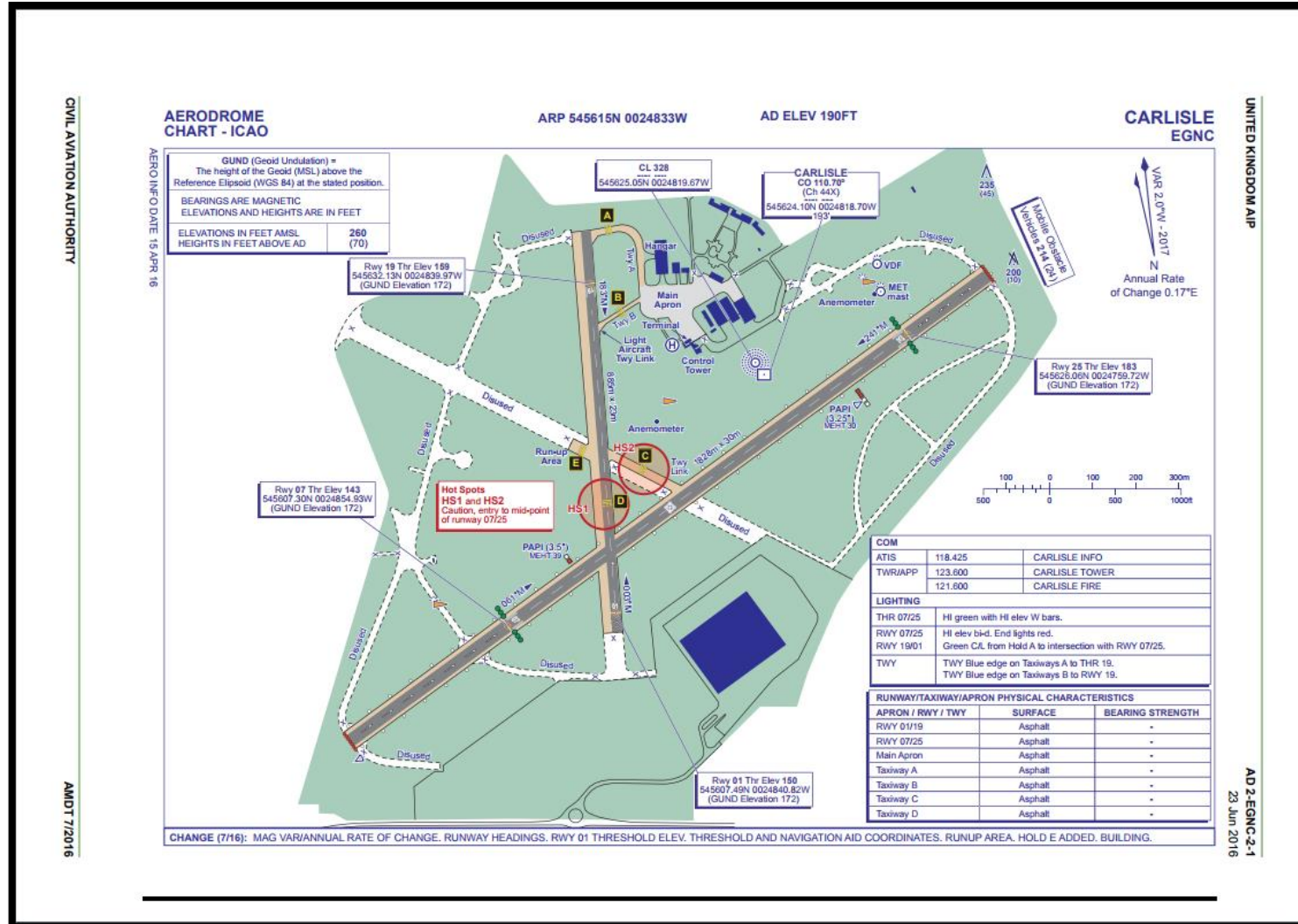


Figure 8 Aerodrome Layout at Carlisle Airport.

6 Consultation Options

The Sponsor of an Airspace Change Proposal must explain what the options are that are being consulted upon. This section provides information.

6.1 Option 1 – the Airport’s Preferred Option

The Airport’s preferred option is to implement the RNAV (GNSS) approaches to Runways 06, 24, and PinS approaches to Runways 01 and 19. This will provide the redundancy required for the existing NDB and will ensure that the Airport complies with the CAA’s commitment to the FAS to implement PBN at UK Airports by 2024. In addition, the (RNAV) GNSS approaches will enhance the reliability of any passenger services that are introduced to the Airport in the future.

6.2 Option 2 – Do Nothing

If the Airport chooses to ‘Do Nothing’ i.e. it chooses not to introduce any RNAV (GNSS) approaches, it will have to rely on the NDB for aircraft to make an approach during inclement weather. The NDB is old technology and sourcing replacement parts in the event of failure will become increasingly more difficult. The European Aviation Safety Agency (EASA) has announced its intentions to include the ability to fly RNAV (GNSS) approaches within the syllabus for pilots studying for an Instrument Rating examination. This will mean that the flying schools that utilise Carlisle Airport for Instrument Flying Training will not be able to fulfil this element of the qualification at Carlisle. Carlisle Airport will not be able to comply with the UK FAS policy to introduce PBN by 2024.

6.3 Mitigations

6.3.1 Designs

The standard layout for RNAV (GNSS) approaches is a ‘T’ shape design where pilots can route to either end of the T before commencing the procedure. For Carlisle, this was not appropriate for either runway. For Runway 24, it was essential that aircraft could fly the approach and remain clear of the RAF Spadeadam Danger Area. The designers also wished to replicate, as far as possible, the existing NDB profile. This is impossible to replicate exactly, since the NDB will be flown differently by different aircraft types, by different pilots in different weather conditions. However, the designer has tried to follow the general area where the constraints of the RNAV design process allows. For Runway 06, the ‘T’ design has been modified to a ‘Y’ design to avoid Kirkbride Airfield and to avoid the Solway Firth Area of Outstanding Natural Beauty (AONB).

6.3.2 Vertical Profile

The RNAV (GNSS) approach for Runway 24 has been designed to include a 3.5° Vertical Path Angle (VPA) to ensure that aircraft remain well clear of the RAF Spadeadam Danger Area. This means that aircraft will fly a slightly steeper approach than a standard approach (which is usually 3°).

For Runway 06, which is used approximately 30% of the time when compared to Runway 24 due to the prevailing wind direction, the threshold will move slightly closer to the Airport boundary. This means that aircraft will be touching down closer to the edge of the Airport and therefore slightly closer to Carlisle city. However, in order to mitigate against aircraft flying lower over the city, the proposed VPA is also 3.5°, which means a slightly steeper vertical path than is standard⁵. A 3.5° vertical path angle will see aircraft descend at an approximate rate of 350 ft per mile⁶ until the touchdown point. Whilst vertical guidance will be provided by the RNAV (GNSS), slight variances to the rate of descent can be expected due to factors such as weather and pilot experience. However, aircraft flying steeper approaches will generally utilise lower power settings and this will help to reduce noise exposure.

6.3.3 PinS for Runway 19

The new PinS approach proposed, for use by helicopters only, has been designed to ensure that helicopters flying the approach, possibly autonomously whilst the Airport is closed, will remain clear of RAF Spadeadam Danger Area. The approach has been modified from a standard 'T' design to a 'Y' design to avoid overflight of any built-up areas, specifically the villages of Longtown and Hethersgill. The track also avoids overflight of Walton Moss National Nature Reserve.

⁵ The standard design of IFPs assumes a 3°.

⁶ This is an approximate rule of thumb.

7 Environmental Impacts

It is important to understand if any proposed change is likely to have any impact on the environment. This section outlines how this has been considered by Carlisle Airport.

7.1 General

Any sponsor that considers implementing a change to how an airport operates must consider the potential impact on the environment. Carlisle Airport has considered the potential environmental impact that the introduction of RNAV (GNSS) approaches might have in relation to the following:

- Air Quality;
- CO₂ Emissions;
- Noise; and
- Tranquillity and Intrusion.

Carlisle has analysed the number of aircraft expected to utilise RNAV (GNSS) approaches and this is likely to equate to less than 10% of aircraft arriving at Carlisle Airport. In 2016 there were a total of 19,826 aircraft movements.

7.2 Air Quality

The Airport has considered the potential impact that the introduction of RNAV (GNSS) approaches is likely to have on local air quality within the vicinity of the Airport, below 1,000 ft.

It is expected that the number of aircraft that will be equipped and capable of utilising these approaches initially will be negligible, although the number that will become equipped and qualified is likely to increase in time. It is impossible to predict how quickly aircraft and pilots will transition, since there is a financial cost involved in both equipment and training.

7.3 CO₂ Emissions

RNAV (GNSS) approaches are subject to stringent constraints during the design process. Each leg of the procedure is designed to ensure that aircraft can accurately position with minimal turns onto the final approach. Aircraft are able to be configured to the optimal settings for landing, all of which help reduce fuel burn, and therefore, CO₂ emissions. RNAV (GNSS) approaches have considerably more accurate guidance than those flying NDB approaches. This should mean that aircraft will have a potentially higher degree of success when positioning for landing, as

aircraft will be guided with a higher precision to a position from which the pilot can continue visually. This should help reduce the number of aircraft that execute a 'go-around' due to an unstable approach.

7.4 Noise

Noise contours have not been produced for Carlisle Airport in respect of this proposal. The introduction of the new RNAV (GNSS) procedures is not likely to attract any increase in traffic. As explained in Section 5 above and in Table 1 (within Section 5), the total number of aircraft movements at the Airport in 2016 was 19,826, of which 13,515 were associated with the Aero Club and would have been light single engine aircraft. There were 4,280 private aircraft, (types unknown) and 567 business aviation aircraft (types unknown). If the assumption is made that all of the private and business aviation aircraft were jet aircraft, this accounts for only approximate 24% of the traffic. At these levels, the calculation of noise contours is not likely to produce a result that would see noise contours extend much beyond the end of the runway. The planned introduction of scheduled passenger services will initially account for approximately three extra arrivals per day (and three departures): this would increase the annual movements by approximately 8%. There is no planned change to the departure arrangements, so this represents an approximate 4% increase in the number of arrivals. Given that the initial aircraft will likely be no larger than ATR 42 (Twin turbo-propeller), this increase is likely to be negligible in terms of noise contours.

The proposal to introduce a 3.5° glide path angle will help to keep aircraft flying this approach higher than would be expected for a 3° VPA. In addition, aircraft flying steeper approaches can utilise lower power settings. This will help to reduce noise exposure to those living under the flight path in Carlisle City when compared to a standard 3° approach. Runway 06 is only used on average 30% of the time due to the prevailing wind being mainly westerly.

7.5 Tranquillity and Intrusion

Carlisle Airport is in a beautiful location, nestled between two designated AONBs. To the west of the Airport is the Solway Coast AONB, which was established to recognise the quality of the landscape and the significant historic and scientific interest. None of the proposed RNAV (GNSS) procedures would cause aircraft to overfly this area.

To the east and southeast of the Airport is the North Pennines AONB. This is the second largest AONB within the UK and it recognises the peaceful, unspoilt landscape of sweeping moorland. This area is also designated as the Spadeadam Area of Intense Aviation Activity (AIAA) which recognises that the area is popular for recreational flying, and also military flying. The new procedure for Runway 24 will overfly the AIAA and the AONB. The Procedure Designer has attempted to replicate the existing NDB procedure, which also currently overflies the AONB. However, due to the design constraints of the RNAV (GNSS) approaches, the start of the new procedure is further to the east than the current procedure. The first waypoint is approximately 8 km (5 miles) to the north west of Whitfield. A hold based on this

waypoint is also proposed. However, it should be borne in mind, that the hold within the overhead will be the preferred hold used by controllers, as it is closer to the Airport.

The chances of a successful approach utilising an RNAV (GNSS) procedure is greater than that of a conventional approach as the information is more accurate. This reduces the number of aircraft that might execute a go-around because they are not correctly aligned with the runway. The presence of a hold will allow an aircraft with an emergency to hold until it is safe to continue the approach. Additionally, the hold at the Initial Approach Fix (IAF) will allow an aircraft that has executed a Missed Approach Procedure (MAP) to attempt the full procedure again.

There is no restricted airspace within the vicinity of the proposed hold, so it is anticipated that aircraft will not hold below the altitude of 5,000 ft above mean sea level (amsl), which due to the high ground within the area, will mean a minimum of 3,400 ft above ground level (AGL). This is only where the ground is higher, which in some areas is 1,600 ft amsl. Since aircraft flying the Runway 24 RNAV (GNSS) arrival will be flying a 3.5° vertical path angle (VPA), the aircraft will be higher when commencing the procedure, than if they fly a 3° VPA.

The Airport will be retaining the existing hold, and for operational reasons, this will be the hold that will continue to be used most frequently.

8 What Happens Next?

8.1 Overview

Once the consultation process closes, we will analyse the responses and produce a Consultation Feedback Report. Consideration will be made to the consultation responses whilst finalising the Proposal Document that will be submitted to the CAA. The finalised Consultation Feedback Report will be available to the public via the CAA website.

The final proposal and consultation feedback report will be submitted to the CAA together with the supporting safety assessments that are required to demonstrate that the changes will be safe.

8.2 CAA Actions

The CAA will use a team of experts to scrutinise the documentation that Carlisle Airport submits throughout a period that is likely to last at least 17 weeks. We will remain responsive throughout this period by submitting further supporting documentation upon request in order to provide any further evidence required by the CAA. Once the CAA has concluded this process Carlisle Airport will be informed and the CAA will publish its decision on the CAA website.

A1 Glossary of Terms

A1.1 Organisational Terms

Abbreviation	Term	Comment
AIAA	Area of Intense Air Activity	A volume of airspace notified in the UKIAIP as being busy with air activity of a civil and/or military nature. Specific warnings apply to aircraft wishing to operate within these areas.
AONB	Area of Outstanding Natural Beauty	An area of outstanding natural beauty is land protected by the Countryside and Rights of Way Act 2000 (CROW Act). It protects the land to conserve and enhance its natural beauty.
AR	Airspace Regulation	The section of the CAA that is responsible for the regulation of changes to UK airspace and airspace agreements.
ATCO	Air Traffic Control Officer	An air traffic controller suitably qualified and experienced to provide air traffic services to aircraft when requested or mandated.
ATZ	Air Traffic Zone	Airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic.
CAA	Civil Aviation Authority	A specialist body appointed by the Government to regulate and oversee all aviation activities within the UK. The CAA has the responsibility to develop and monitor airspace to provide for safe and sustainable usage.
CAS	Controlled Airspace	Airspace of defined dimensions within which ATC services are provided. The level of control varies with different classes of airspace. Controlled airspace usually imposes higher weather minimums than are applicable in uncontrolled airspace. It is the opposite of uncontrolled airspace.

Abbreviation	Term	Comment
CTA	Control Area	A volume of airspace within defined lateral boundaries that extends from a specified limit above the surface to a specified upper limit.
CTR	Control Zone	A volume of airspace within defined lateral boundaries that extends from the surface to a specified upper limit.
DAATM	Defence Airspace and Air Traffic Management	A MoD organisation tasked with the role to monitor and influence international and domestic Air Traffic Management issues, anticipating the risks and opportunities arising from these issues and identifying and coordinating a common Defence response.
DA	Danger Area	Airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times (ICAO Annex 11: Air Traffic Services) Most danger areas are operated by military authorities.
EUROCONTROL	European Organisation for the Safety of Air Navigation	An intergovernmental organisation consisting of 39 member states. EUROCONTROL seeks to support its member states in achieving safe, efficient and environmentally-friendly aviation operations throughout Europe, through the harmonisation of air navigation services for both civil and military operators.
FAA	Federal Aviation Administration	The United States equivalent of the CAA; a national authority with powers to regulate all aspects of civil aviation.
FAF	Final Approach Fix	A specified point on a non-precision instrument approach which identifies the commencement of the final segment.
IAF	Initial Approach Fix	The point where the initial approach segment of an instrument approach begins.
IF	Intermediate Fix	A point between the IAF and FAF.
GA	General Aviation	Civil aviation other than large-scale passenger or freight operations.

Abbreviation	Term	Comment
GNSS	Global Navigation Satellite System	The standard generic term for satellite navigation systems that provide autonomous geo-spatial positioning with global coverage.
GPS	Global Positioning System	A "constellation" of approximately 30 well-spaced satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location. The location accuracy is anywhere from 100 to 10 meters for most equipment.
IAP	Instrument Approach Procedure	A series of predetermined manoeuvres by reference to flight instruments, with specified protection from obstacles, from a specified point to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or other obstacle clearance criteria apply.
ICAO	International Civil Aviation Organization	A specialized agency of the United Nations. It codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth
IFR	Instrument Flight Rules	One of two sets of regulations governing all aspects of civil aviation aircraft operations; the other is visual flight rules (VFR). It is also a term used by pilots and controllers to indicate the type of flight plan an aircraft is flying, such as an IFR or VFR flight plan
MAA	Military Aviation Authority	Regulator for Military Aerodromes within the UK and overseas.
MAP	Missed Approach Procedure	A procedure followed by a pilot when an instrument approach cannot be completed to a full-stop landing. The missed approach procedure normally includes an initial heading or track to follow, and altitude to climb to, typically followed by holding instructions at a nearby navigation fix.
MEDA	Military Emergency Diversion Aerodrome	The only designated military aerodrome to accept at short notice any military aircraft suffering an emergency.

Abbreviation	Term	Comment
NDB	A non-directional (radio) beacon	A radio transmitter at a known location, used as an aviation or marine navigational aid.
PSR	Primary Surveillance Radar	A conventional radar sensor that illuminates a large portion of space with an electromagnetic wave and receives back the reflected waves from targets within that space.
RMZ	Radio Mandatory Zone	A volume of airspace of defined dimensions wherein the carriage and operation of radio equipment is mandatory
RNAV	Area Navigation	A method of navigation which permits the operation of an aircraft on any desired flight path; it allows its position to be continuously determined wherever it is rather than only along track
SSR	Secondary Surveillance Radar	A radar system used in air traffic control (ATC), that not only detects and measures the position of aircraft i.e. bearing, but also requests additional information from the aircraft itself such as its identity and altitude.
TMZ	Transponder Mandatory Zone	A volume of airspace of defined dimensions wherein the carriage and operation of transponder equipment is mandatory
UK IAIP	United Kingdom Integrated Aeronautical Information Publication	This is static information, updated every 28 days, which contains information of lasting (permanent) character essential to air navigation.
VFR	Visual Flight Rules	A set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going. It is also a term used by pilots and controllers to indicate the type of flight plan an aircraft is flying, such as an IFR or VFR flight plan
VPA	Vertical Path Angle	The nominal glide path flown when interpreting a GPS approach.

A2 Consultation Feedback Form

This form is provided for your convenience to respond to the consultation process. Please submit completed forms using of the methods below:

Email: carlisleairportconsultation@ospreycl.co.uk

Post: Carlisle Airport Consultation Response

Osprey Consulting Services Ltd
Suite 10, The Hub
Fowler Avenue
Farnborough Business Park,
Farnborough,
GU14 7JP

Name:

Address:
.....
.....
.....
.....
.....

Email:

A3 Example of Aircraft Planned

Separate to, and irrespective of the outcome of this Airspace Change Proposal, Carlisle Airport is planning to introduce new passenger services. Whilst the implementation of these services is not the subject of this consultation, it is fair to say that if successful, the implementation of the RNAV (GNSS) procedures will be beneficial to the aircraft operating the service.

The types of aircraft that are likely to be introduced are shown below.

A3.1 Jetstream 41



A3.2 ATR 42



A4 Stakeholders

A4.1 National Bodies

National Bodies
Airport Operators Association
Aircraft Owners and Pilots Association UK (AOPA)
Aviation Environment Federation
British Balloon and Airship Club
British Business and General Aviation Association
British Gliding Association
British Hang Gliding and Paragliding Association
British Microlight Aircraft Association
British Model Flying Association
British Parachute Association
British Helicopter Association
Guild of Air Traffic Control Officers
Helicopter Club of Great Britain
FASVIG
NATS
PPL/IR Europe
UAVS
UK AIRPROX Board
UK Flight Safety Committee
Aviation Division NCHQ
Military Aviation Authority (MAA)
SARG
Airfield Operators Group
Natural England
English Heritage
Environment Agency
Friends of the Earth

National Trust
Airport Consultative Committee
RSPB
GASCo - General Aviation Safety Council

A4.2 Aviation Operators

Name	Contact Details
Stobart Air	
FlyBe	
Air Ambulance	

A4.3 Flying Clubs

Name	Contact Details
Carlisle Flight Training	info@carlisle-flight-training.com
Border Air Training	01228 573490
Cumbria Microlight Training Centre	cmdeltapapa@gmail.com
Cumbria Gyroplanes	07771 608767

A4.4 Private Jets

Name	Contact Details
Net Jets	lis-njeslots@ntasa.pt
JOTA	charters@jotaaviation.com
Apollo Air Services	ops@apolloairservices.com
Flightworx (WA Developments)	ops@flightworx.aero
Jet Fly	dispatch@jetfly.com

A4.5 County Councils

Name	Contact Details
Carlisle City Council	
Northumberland County Council	

A4.6 District Councils

Name	Contact Details
Tynedale District Council	Hexham House, <u>Hexham</u> <u>Northumberland</u> , NE46 3NH
Allerdale Borough Council	Allerdale House, Workington, CA14 3YJ
Carlisle City Council	Civic Centre, Carlisle, CA3 8QG
Copeland Borough Council	Catherine Street, Whitehaven, CA28 7NY
Eden District Council	Town Hall, Penrith, CA11 7QF
South Lakeland District Council	South Lakeland House, Lowther Street, Kendal, LA9 4DL

A4.7 Parish Councils

Name	Contact Details
Arthuret Parish Council	karen@carlisle.gov.uk
Beaumont Parish Council	linda_beattie25@hotmail.com
Brampton Parish Council	Mrs A Riddell, Unit 2, The Old Brewery, Craw Hall, BRAMPTON, Cumbria, CA8 1TR
Cummersdale Parish Council	info@cummersdaleparishcouncil.org.uk
Dalston Parish Council	clerk@dalston.org.uk
Hayton Parish Council	clerkhaytonpc@gmail.com
Wetheral Parish Council	wetheralpc@carlisle.gov.uk

A4.8 Members of Parliament

Name	Contact Detail
John Stevenson MP Carlisle	2 Currie Street, Carlisle, CA1 1HH Tel: 01228 550684 Email: office@johnstevensonmp.co.uk
Rory Stewart MP Penrith and the Border	House of Commons, London, SW1A 0AA Tel: 020 7219 7127 Email: rory.stewart.mp@parliament.uk
Sue Hayman MP Workington	House of Commons, London, SW1A 0AA Tel: 020 7219 4554 Email: sue.hayman.mp@parliament.uk