Newcastle International Airport

Airspace Change Proposal

Standard Terminal Arrival Route (STAR)

And

PRNAV – GNSS approaches

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Definitions

ACP	Airspace Change Proposal
AIP	Aeronautical Information Publication
ATC	Air Traffic Control
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CDO	Continuous Descent Operations
CTA	Control Area
DAP	Department for Airspace Policy (see now SARG)
DTVA	Durham Tees Valley Airport
ECAC	European Civil Aviation Conference
FAF	Final Approach Fix
GA	General Aviation
GNSS	Global Navigation Satellite System
H24	24 hours per day
IAF	Initial Approach Fix
ICAO	International Civil Aviation Organisation
LoA	Letter of Agreement
NDB	Non-Directional Beacon
NIALL	Newcastle International Airport Ltd
PANS-OPS	Procedures for Air Navigation Services - Aircraft Operations
PBN	Performance Based Navigation
PRNAV	Precision-Area Navigation
SARG	Safety and Airspace Regulation Group
SARPS	Standards and Recommended Practices
ScATCC	Scottish Area Terminal Control Centre (NATS based in Prestwick)
SES	Single European Sky
SID	Standard Instrument Departure
SMS	Safety Management System
STAR	Standard Terminal Arrival Route
VOR	Very High Frequency Omni-directional Range
WAM	Wide Area Multilateration

Introduction

1.1. This document details a proposal to establish a more accurately defined arrival route, STAR, to Newcastle International Airport Ltd (NIAL) within controlled airspace. The STAR will be suitable for aircraft arriving to either runway at Newcastle from the airway structure to the south. The STAR leads to a transition route for both runways and then a PRNAV (GNSS) approach to LPV200 standard. NIAL is looking to implement these procedures in AIRAC 05/2018 with an implementation date of 26 APR 2018.

1.2. A STAR is a standard ATS route identified in an approach procedure by which aircraft should proceed from the en-route phase to an initial approach fix. STARs are produced with the object of expediting the safe and efficient flow of air traffic operating to the same or different Runways at the same or neighbouring airfields and aims to deconflict potentially conflicting traffic by the use of specific routings, levels and check points. Typically, each Runway will have a number of STARs to ensure that air traffic is not unnecessarily delayed by deviation from the direct route to the aerodrome. The traffic orientation scheme to the south west of Newcastle has dictated the design of only one STAR that will be used for approaches to both runways (Runway 25 and Runway 07).

1.3. CAP 725, "CAA Guidance on the Application of the Airspace Change Process" gives guidance to Sponsors, in this case NIAL, on the stages (1 to 4) for completion of the process for submission of an Airspace Change Proposal (ACP). NIAL has followed this process.

1.4. Stage 1 of the process was completed in January 2015 when NIAL conducted a Framework Briefing Meeting with DAP. As a result of the meeting NIAL decided to proceed with the ACP to establish a STAR and PRNAV (GNSS) approaches for aircraft arriving at NIAL. This decision was confirmed in writing to DAP. There was a further meeting with DAP and our IFP designers (PILDO) on the 14th of June 2017 with a follow up conference call on the 15th of September 2017.

1.5. The STAR and PRNAV (GNSS) approaches have been discussed at length with based airlines through scheduled meetings and numerous conversations. The airlines are very supportive of our plans and we have had offers to flight trial and validate the new procedures in simulators. The advantages to airlines of using PRNAV and low power low drag approaches and we are following current DfT guidance (CAP725) in their implementation.

"easyJet welcomes the opportunity to comment on the ACP having worked alongside the airport for a number of years on this project. The introduction of such procedures will bring Newcastle in line with other regional and larger airports and this type of approach is essential for future airspace management and the most modern aircraft that we fly. The new procedures will allow the use of navigation legs by which the aircraft can fly a fixed and curved path over the ground. The benefits lie in more efficient route spacing and better noise abatement compliance. easyJet fully support this airspace improvement."

Steve Freeman: easyJet Newcastle Base Captain

1.6. The ACP was developed as set out in Stage 2. It was decided that the most appropriate method of consultation would be the publication of a written consultation document with appropriate questions. The Consultation Document "Implementation of a Standard Terminal Arrival Route (STAR) at Newcastle International Airport" was sent to the identified list of consultees, including DAP, in March 2017 with a request to respond by 2nd June 2017. A copy of the Consultation Document is attached as Appendix A.

1.7. All responses to the Consultation have been collated, analysed and recorded. This document complies with Stage 4 of the application of the ACP Process, the submission of a Formal ACP to DAP by detailing a proposal to establish a more accurately defined arrival route, STAR and PRNAV (GNSS) approaches to NIAL within controlled airspace.

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CHAPTER 1: Operational Requirements

1. Justification for the Change and Analysis of Change

1.1. Newcastle International Airport (NIAL) is a major Regional Airport. Notwithstanding the current economic climate and the recent downturn in traffic NIAL is forecast to continue long-term growth. Growth of traffic at NIAL has, in general terms, been sustained throughout the Airport's history. In 2016 the Airport handled 59,000 movements in total.

1.2. Currently, all aircraft on approach to NIAL are guided by verbal instructions from Air Traffic Controllers. Implementation of a STAR will allow aircraft that are suitably equipped to use 'Area Navigation' PRNAV based flight procedures for their approach towards NIAL. These flights will still be monitored by the controllers and the controllers can issue instructions if necessary just as they do now.

1.3. Implementation of a STAR at NIAL will offer the opportunity for more efficient flight by those aircraft that follow the STAR, potentially saving fuel costs and reducing CO2 emissions – a government priority for aviation and one of the CAA's Strategic Objectives by *"Improving environmental performance through more efficient use of airspace and (to) make an efficient contribution to reducing the aviation industry's environmental impacts."*

1.4. Use of a STAR at Newcastle is in accordance with UK and EU policies on Performance Based Navigation (PBN) being "an essential component of delivering the objectives underpinning the Future Airspace Strategy and consequential modernisation of the UK airspace system…..laying the foundations for the airspace system not just of tomorrow, but for years to come…." (CAA – Performance Based Navigation).

1.5. There is no change proposed to the existing airspace infrastructure. The STAR and PRNAV (GNSS) approaches are designed to work within the parameters of currently established airspace.

1.6. The options considered by Newcastle were to do nothing, design and propose 2 STARs, one for each Runway (25 and 07) or design and propose a single STAR with an IAF at the end of the STAR that could be used for either Runway. The "Do Nothing" option was rejected as it would delay compliance with UK and EU policies on PBN. Initially, it was proposed that 2 STARs be designed: one for each Runway. However, as NIAL inbound, and outbound routings via P18 (see Airspace Description below), must conform to a Traffic Orientation Scheme implemented by NATS for high level aircraft overflying the North East Region the difficulties presented to NIAL by the requirement to comply with the Traffic Orientation Scheme, an agreement on airspace usage with the operators of a gliding site 9NM to the South West of the airport and separation from aircraft using the Runway 07 SID which terminates at FL80 it was agreed that a single STAR descending to FL90 presented the best solution.

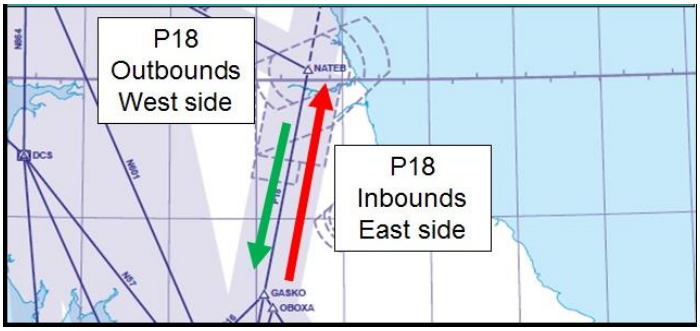

Figure 1: NATS Traffic Orientation Scheme Airway P18

Figure 2: Extract of UK AIP Chart AD 2-EGNT-4-1 (3 Mar 2016) showing location of Currock Hill

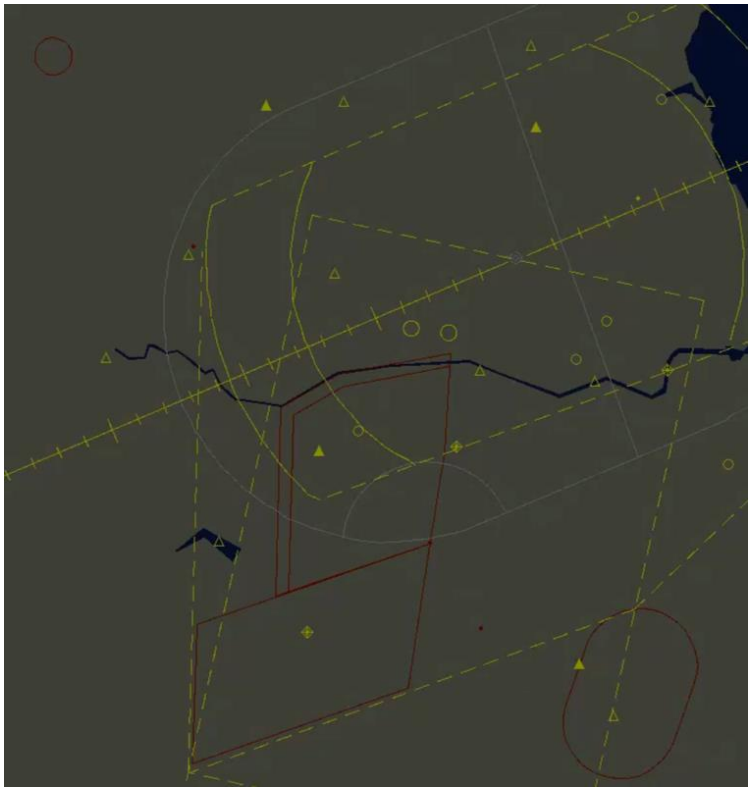

Figure 3: Radar screen shot showing active Currock Hill areas for Runway 07 operations at NIAL

1.7. When considering designs for PRNAV (GNSS) approaches for landing on Runway 07 (from the west,) two options were available:

- The use of a PRNAV (GNSS) approach, which could be used whether the gliding club was active or not;
- The use of a PRNAV (GNSS) approach as above coupled with a second slightly more optimised PRNAV (GNSS) approach that could be used when the gliding club was not active.

1.8. We consulted with the group of airlines who form the Newcastle Airport Airline Technical Committee, and the unanimous decision was to only provide one approach. The reasoning being that for flight-planning purposes, given the predictability that STAR and PRNAV will provide for airlines in the future, having the possibility of two approaches available with no decision being made on which one will be flown until the aircraft is within 45 minutes of landing removes part of that predictability, and the aircraft would have to fuel for a slightly longer routing that may not actually occur. The extra weight of carrying fuel is not fuel efficient for aircraft[1].

1.9. The resultant PRNAV (GNSS) approach for Runway 07 is therefore designed to be flown as if the gliding site were active at all times. This requires that the centreline of the proposed PRNAV route as it passes the gliding site is closer to the edge of controlled airspace to the

[1] A rule of thumb is that carrying fuel uses about 3% of that fuel per hour of flight. So carrying an extra tonne of fuel for landing on a 10 hour flight, would use 300kg of fuel just to carry it - even if it is not used for landing.

West. This means that aircraft will descend from a slightly higher flight level to provide adequate safety margin above the gliding site.

1.10. The PRNAV (GNSS) approach for Runway 25 effectively replicates and more accurately defines the current routing being flown by aircraft inbound from Airway P18. Approaches from the south east, east, north and west, will make an approach to one of the fixes[2] either to the south or north of the final approach fix as appropriate. Again – there would be no change to existing tracks, but these points are further east and offshore than are currently flown, and will therefore be taking aircraft away from those coastal communities currently being overflown.

1.11. The difficulties presented by the requirement to comply with the Traffic Orientation Scheme, the requirement to ensure separation against outbounds and the LoA with Northumbria Gliding Club have all had some effect on the final proposal for the PRNAV (GNSS) approach for Runway 07. During the whole design process, the Airport has worked hard to ensure the minimum potential disruption to communities within the affected areas.

2. Airspace Description

2.1. Airway P18 extends from the Pole Hill VOR (POL) to NATEB. It is 14nm wide and consists of both Class A and Class D airspace and is available H24. Within the parameters of P18, the base of Class A airspace is FL125.

2.2. Between NATEB and UVAVU, P18 consists of Class D airspace with a base of FL75 from TILNI to the boundary of the Newcastle CTA, and a base of FL125 above the CTA to NATEB. Below these portions of P18 are the parts of the Newcastle CTA, also Class D with varying base levels.

2.3. Class A airspace between UVAVU and NATEB is delegated by ScATCC North Upper Sector to Newcastle Radar from FL125 up to FL165.

2.4. The proposal is to establish a STAR within the confines of P18, to the east (right) of the Airway centre line from abeam ABKAT to abeam GIRLI from FL130 to FL90.

2.5. The proposed STAR will be available to aircraft approaching NIAL along Airways P18 and Y250 24 hours per day, 7 days per week.

2.6. The STAR will conform to the requirement to route NIAL inbounds up the east side of Airway P18. There are no airspace buffer requirements. The proposed PRNAV (GNSS) transitions and approaches remain wholly within controlled airspace.

2.7. The STAR complies with the official ICAO definition (PANS-OPS/1 Amendment 9 1996) in that it will be a designated Instrument Flight Rule (IFR) arrival route linking a significant point, on an Air Traffic Service (ATS) route with a point from which a published instrument approach procedure can be commenced, in this case the FAF.

[2] A 'fix' is a point in space that is used to define a position on a route. Often fixes are used to make a point where the next phase of flight will start - for example, the Initial Approach Fix from where their approach will commence.

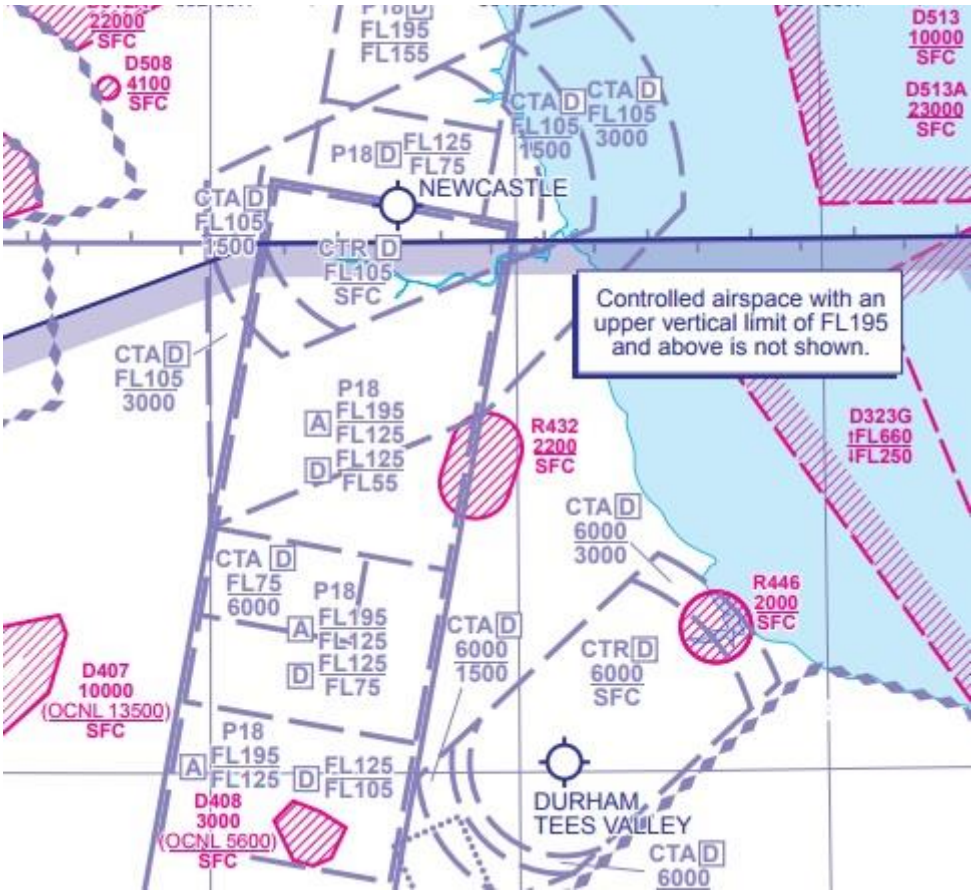

Figure 4: Extract of UK AIP Chart ENR 6-1-6-6 (17 Aug 2017) showing Airway P18

3. Supporting Infrastructure/Resources

3.1. Newcastle ATC is equipped with primary and secondary surveillance sources:

- Primary Radar - Thales Star 2000;
- Windfarm infill radar - Terma Scanter 4002;
- Secondary Radar - ERA WAM.

3.2. Radar is available at Newcastle H24.

3.3. In the unlikely event of radar failure non-radar procedures are implemented. NIAL has designed these non-radar procedures whereby aircraft will be placed in the hold in NIAL overhead, and once within the protection of NIAL controlled airspace, transferred for a procedural arrival.

3.4. There are two inbound frequencies: primary (Newcastle Radar) 124.375 and (Newcastle Director) 125.825. NIAL has two sets of transmitters and receivers and also handheld/base-station back-ups. There are Contingency Procedures which incorporate the current Non-Radar Procedures, but effectively involve ATC relocating to a Contingency Facility which is located in the old ATC tower.

3.5. Newcastle ATC is operational 24 hours per day, 7 days per week and is published as such.

3.6. Manning is in accordance with the guidance given in CAP670. There are 24 Air Traffic Controllers working a standard 5 watch, 10 day cycle shift pattern of 2 earlies, 2 lates, 2 nights, sleep day and 3 days off. There are 7 Air Traffic Support Officers.

3.7. There is also a Manager Air Traffic Control who provides operational cover as required.

4. Operational Impact

4.1. As no new airspace is being proposed there would be no impact on General Aviation, which includes smaller aircraft such as private aircraft or those of flying schools with no restrictions to clearances and routings. Similarly there would be no impact on military aviation. No new airspace is being requested and no restrictions on clearances or routings are being proposed. Existing LoAs between NIAL and GA / Military stakeholders will be unaffected.

4.2. There was an intention to revise our letter of agreement with Durham Tees Valley (DTVA) to allow the STAR to descend to FL130 but this was not achievable as DTVA's departing traffic wishes to join P18 at GASKO climbing to FL130. DTVA couldn't mitigate the risk of our STAR traffic descending to FL130 so the LoA remains as it was and our STAR is designed to not be below FL140 until the aircraft is 5nm north of the extended centreline to Runway 23 at DTVA as detailed in our letter of agreement (see Appendix C).

5. Economic Impact

5.1. Incorporating CDO into the STAR procedures generates a number of benefits. It reduces the amount of fuel burned by approaching aircraft and lower power settings on the engines required for descent as opposed to level flight reduces "wear and tear" thus reducing maintenance costs.

5.2. As a result of lower power settings during descent, it will be anticipated this will reduce the impact of noise and CO2 / fuel burn as described in Chapter 2. This will be of benefit to the airlines using Newcastle Airport.

6. Safety Management

6.1. Newcastle is operating an SMS in accordance with the provisions laid down in *CAP 670 - ATS Safety Requirements* - and in the Single European Sky Common Requirements (CRs)

6.2. The Newcastle Air Traffic Services SMS is a formal organisational system designed to manage operational safety within the ATS department. It integrates a suite of active safety management tools including senior management commitment, hazard identification and risk management, safety reporting, audit, investigations, remedial actions, safety culture and education supported by clear policies and processes.

6.3. There is no change to the dimensions of current airspace. For changes to procedures, as part of the Airport's Change Management process, an impact assessment on the introduction of the proposed STAR and PRNAV (GNSS) approaches has been conducted to ensure compliance with the requirements of the SMS in line with CAP670: ATS Safety Requirements.

6.4. In the event that the primary radar fails the PRNAV (GNSS) approaches will be withdrawn because of their proximity to the boundary of controlled airspace to the west of Newcastle. Aircraft will then be vectored for an ILS It is also in the letter of agreement with Currock Hill that in the event of a primary radar failure Currock Hill glider site will close.

6.5. In the event that an aircraft suffers a radio failure whilst flying the STAR, on reaching ETSES the aircraft is to maintain FL90 route to the NT hold. If the aircraft suffers radio failure during transition or on final approach the aircraft is to continue with the approach. This is to be annotated on the STAR and PRNAV (GNSS) charts.

7. Airspace and Infrastructure Requirements

7.1. The proposed STAR complies with the Airspace and Infrastructure Requirements as derived from SES Regulations, ICAO SARPs and ECAC/Eurocontrol requirements, and any additional requirements to satisfy UK Policy.

7.2. There is no change proposed to the existing airspace infrastructure. The STAR is designed to work within the current structure. As the proposed STAR will be embedded within Airway P18 the airspace will be of sufficient dimensions with regard to expected aircraft navigation performance and manoeuvrability to fully contain horizontal and vertical flight activity in both radar and non-radar environments. Furthermore, since the proposed STAR is contained within an existing route (Airway P18) there is sufficient accurate navigational guidance based on in-line VOR/DME or NDB or use of P-PRNAV to allow aircraft to navigate within the STAR. In addition, it is anticipated that aircraft following the STAR will conduct a CDO to at least the FAF. Indeed, 81.4% of aircraft carried out CDOs during 2016 and the implementation of a STAR will formalise this procedure. The new procedure will be designed to incorporate CDO profiles from the commencement of the STAR. Transitions to the FAF have been designed to facilitate the CDO profiles.

7.3. From CAP 725: The DfT guidance (DTLR, 2002 - paragraph 49) requires DAP to 'ensure that consideration is given to how the use of Continuous Descent Approaches and Low Power/Low Drag (LPLD) procedures can be promoted in the course of developing new procedures and when considering proposals for changes to existing airspace arrangements'.

8. Supporting Maps, Charts and Diagrams

8.1. As the new charts do not show the route in comparison to existing controlled airspace as highlighted by NATS in one of the consultee responses (see Appendix E for all consultee responses), the latitude and longitude of all points on the STAR and PRNAV transitions for both runways were overlaid onto the existing radar video map. These can be seen in Figure 5, page 16 (Runway 07) and Figure 7, page 18 (Runway 25).

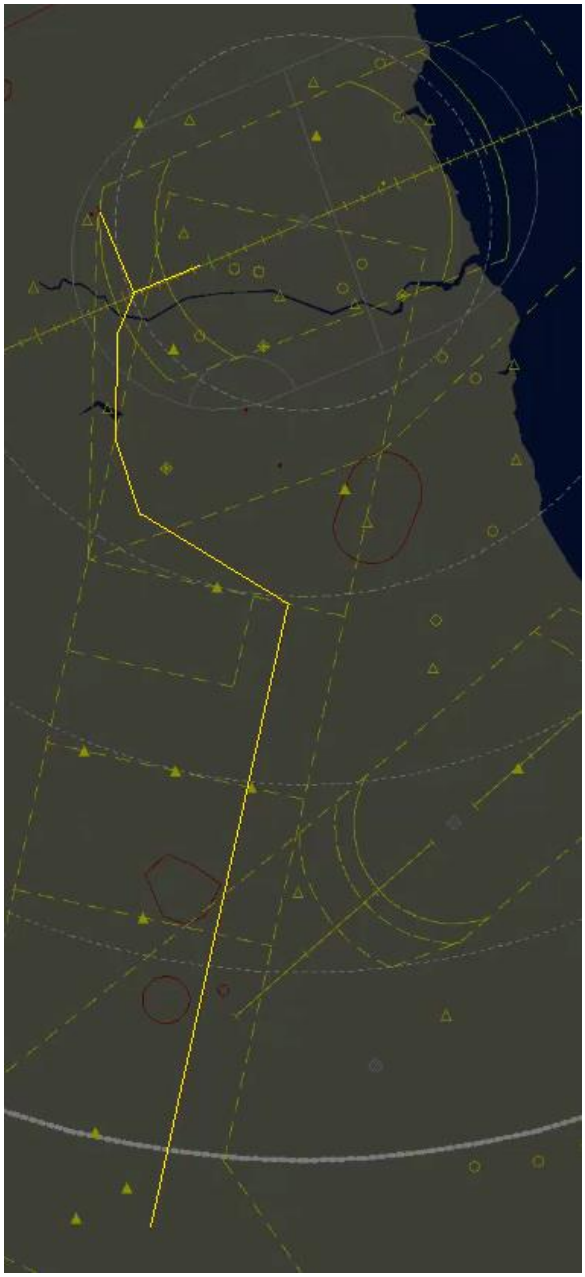

Figure 5: Radar screenshot showing STAR and Runway 07 PRNAV transition

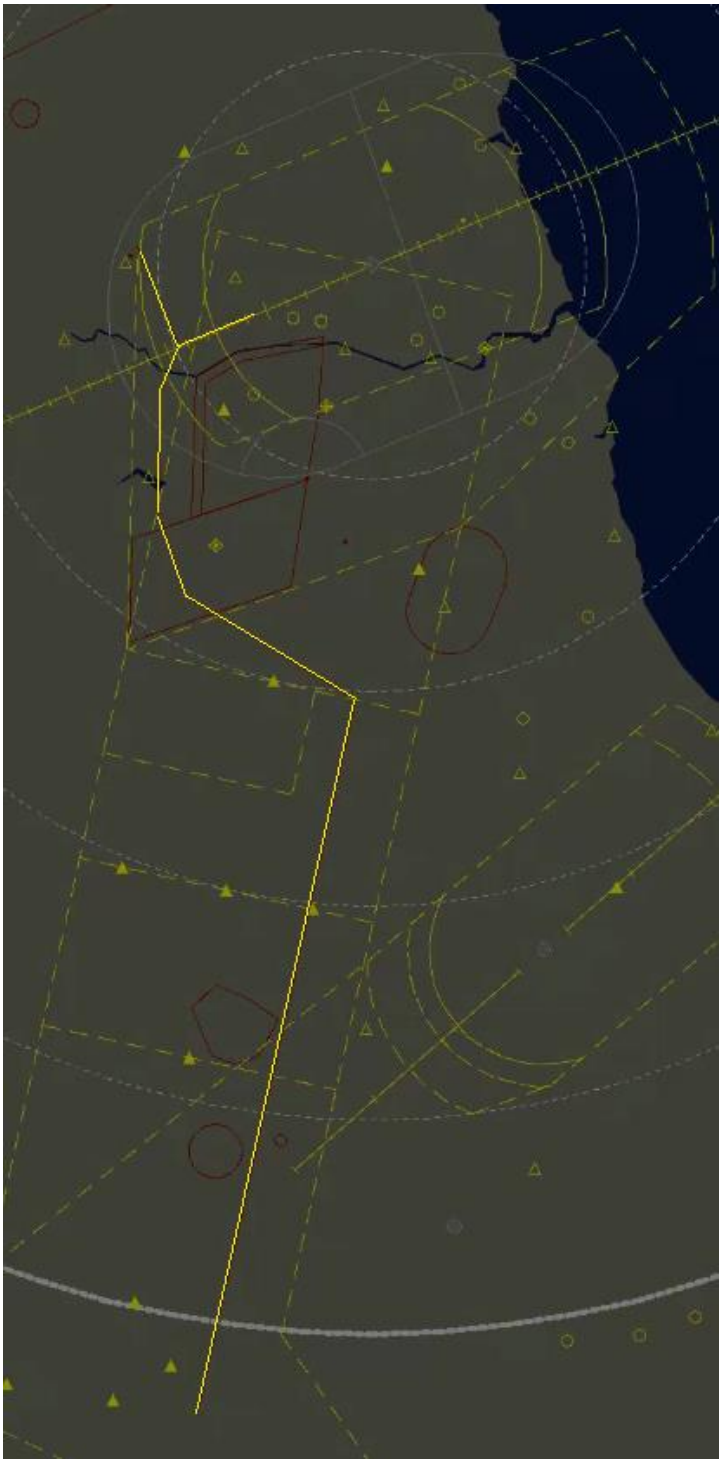

Figure 6: Radar screenshot showing STAR and Runway 07 PRNAV transition (Including Currock Hill Gliding Site)

8.2. The PRNAV approach to Runway 07 was designed to route overhead the most southern area at Currock Hill (referred to as Area 2 in the LoA: see Appendix D), before passing west of the northern area (referred to as Area 1 in the LoA) as shown in Figure 6 on page 17. A close up of this arrangement against a Google Maps overlay is depicted in Figure 11 on page 24.

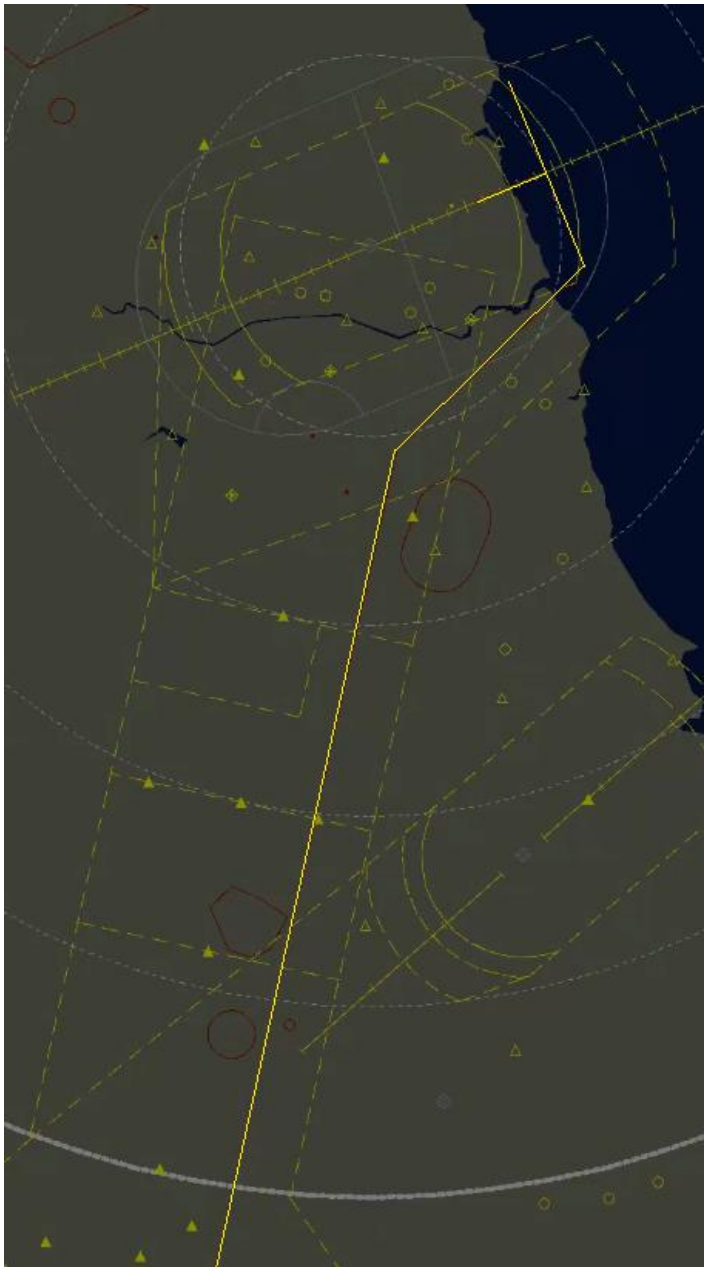

Figure 7: Radar screenshot showing STAR and Runway 25 PRNAV transition

8.3. To show the route of the STAR and PRNAV approaches against built up areas, it was plotted on Google Maps and is shown in Figure 8, page 19 and Figure 9, page 20.

Figure 8: STAR overlaid onto Google Maps

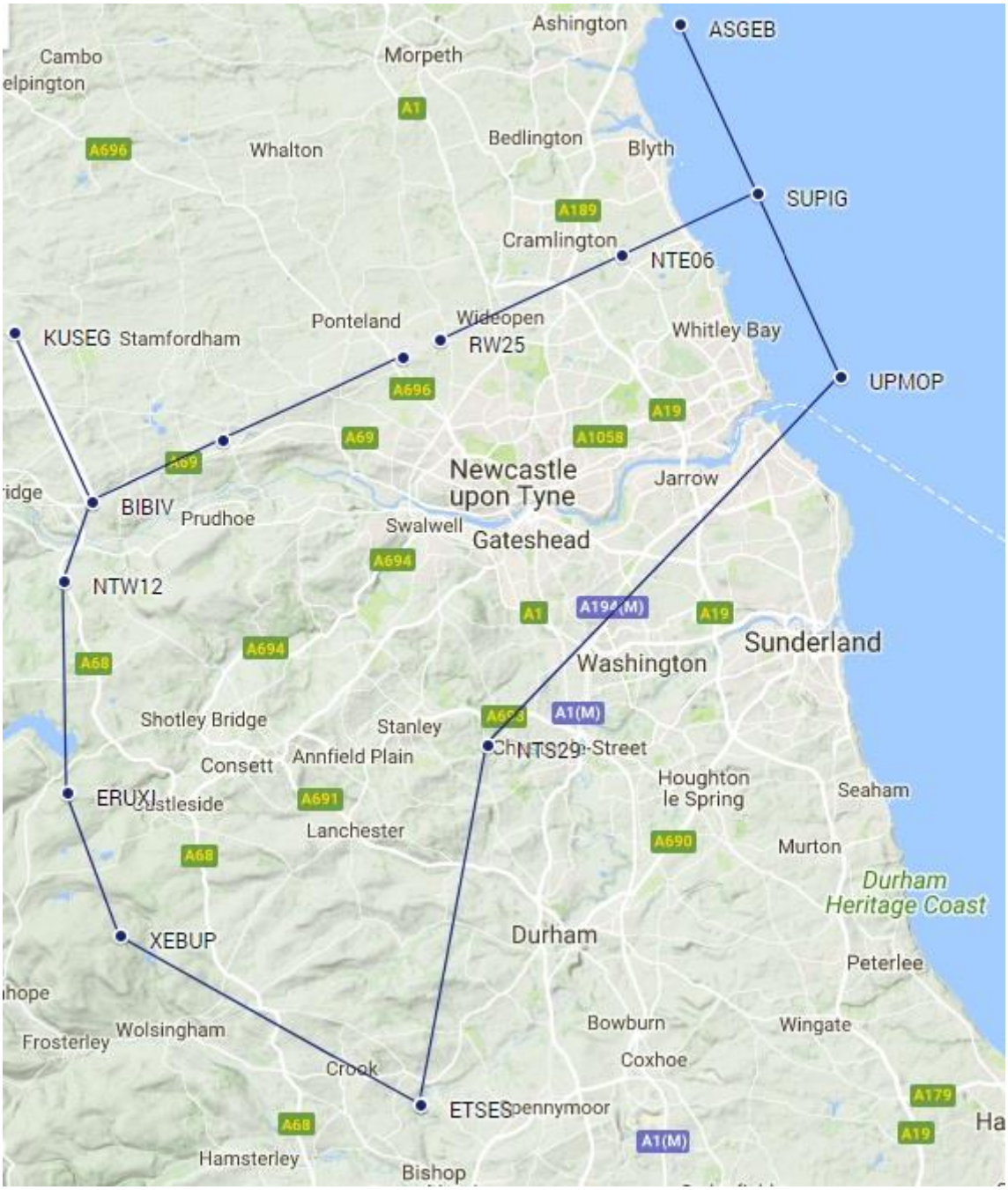

Figure 9: PRNAV approaches to both runways overlaid on Google Maps

8.4. This compares to the existing radar vectors offered by ATC as shown by track data obtained by the NIAL Noise Desk software as seen in Figure 10 below.

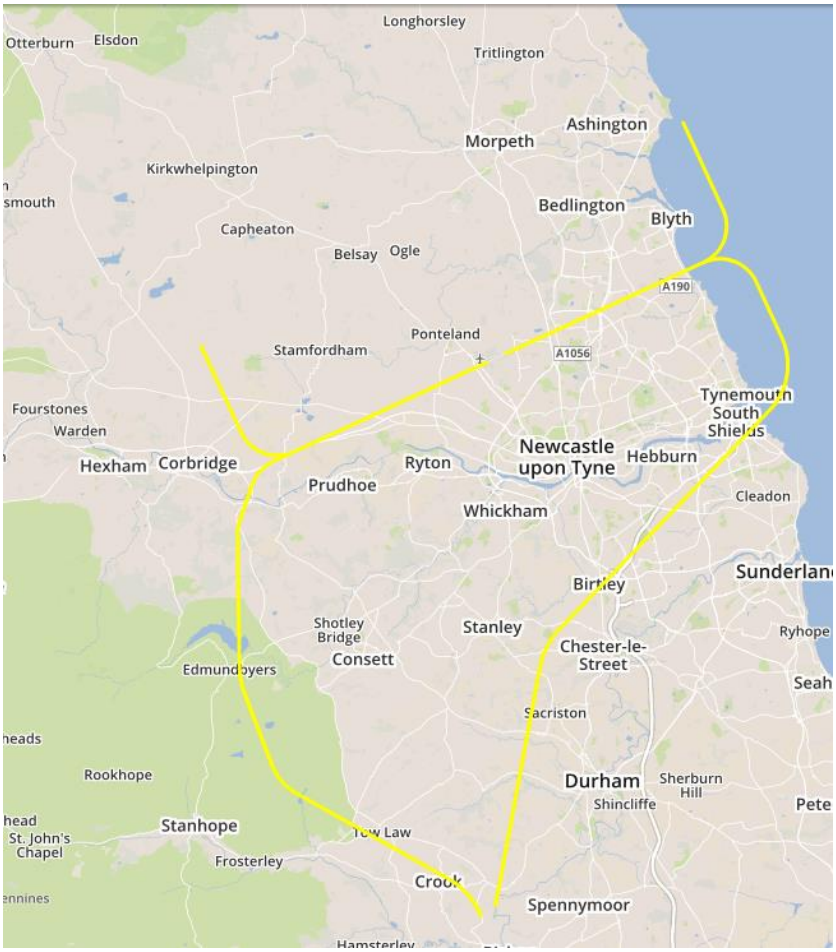

Figure 10: Typical Inbound Routes to NIAL using ATC Vectors

8.5. Comparisons from inbounds to Runway 07 (Figure 11, page 22) and Runway 25 (Figure 12, page 22) i.e. aircraft being vectored for an ILS are shown along with their recorded altitudes. When comparing against the proposed designs for the transitions and PRNAV (GNSS) approaches in Figure 9, the track over the ground is very similar.

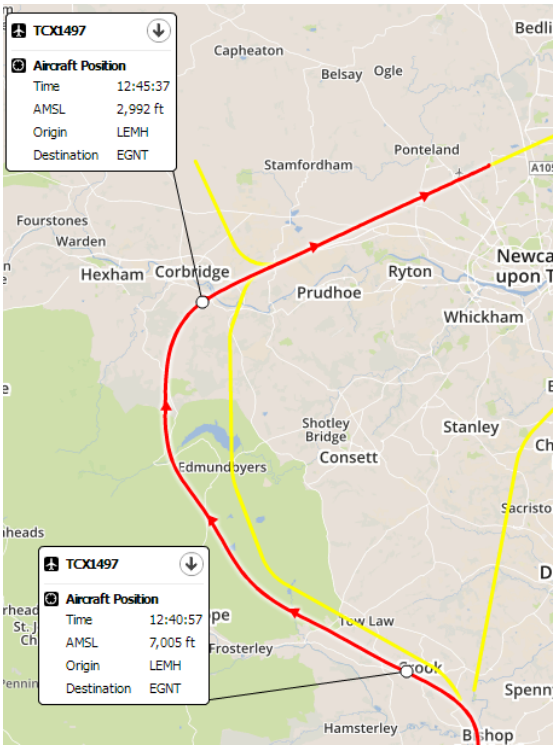

Figure 11: Typical Inbound to Runway 07 (ATC Vectors): October 2017

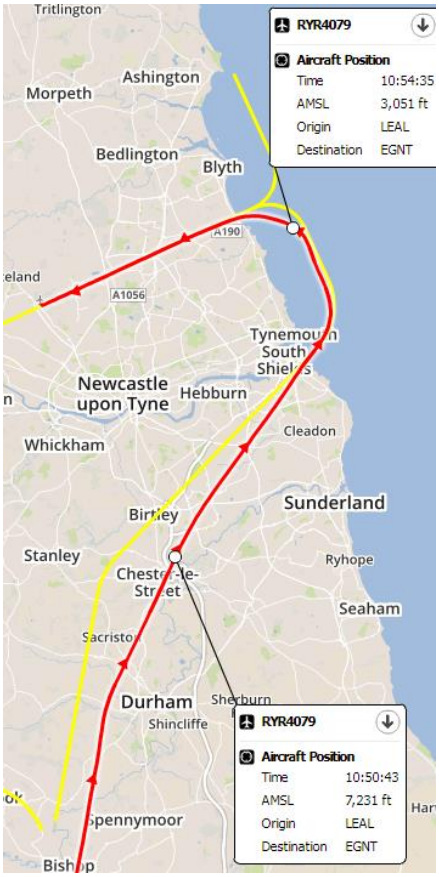

Figure 12: Typical Inbound to Runway 25 (ATC Vectors): October 2017

8.6. One of the consultation responses asked how the route would look over South Shields with particular reference to the City Centre. The navigation points were overlaid onto Google Maps to give this image. Flights would be routing from left to right in Figure 10 below.

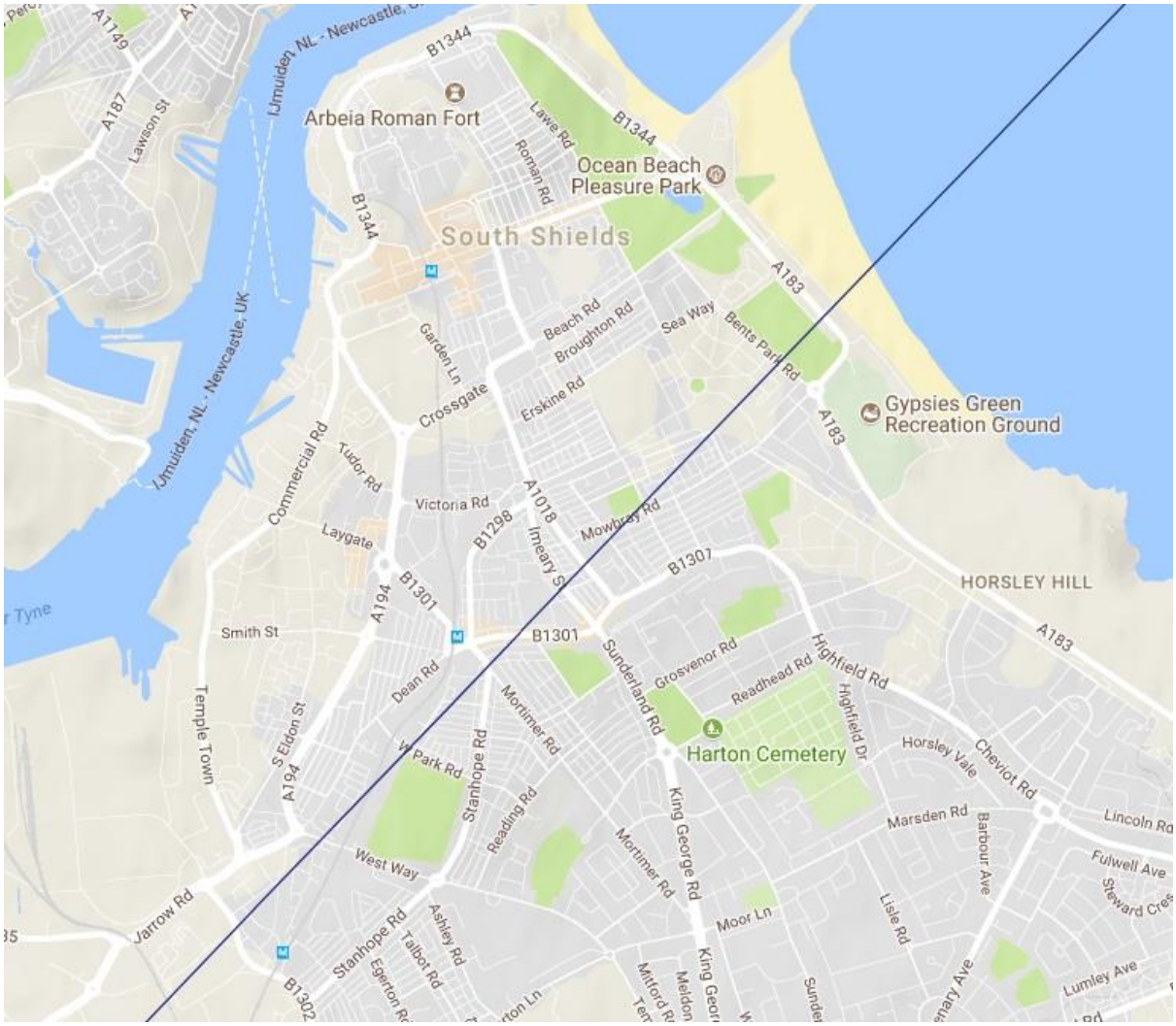

Figure 13: Close up of PRNAV 25 overlaid on Google Maps over South Shields

8.7. Northumbria Gliding Club (Currock Hill) is shown by the glider symbol in Figure 11 below with Area 1 shown in red and Area 2 shown in orange. The maximum height of both areas is 5,000 AMSL on the Newcastle QNH. A local agreement and approval from SARG allows NIAL ATC to descend IFR arrivals to 5,500 feet AMSL until clear of the gliding areas, hence the level restriction of not below 5,500 feet at ERUXI.

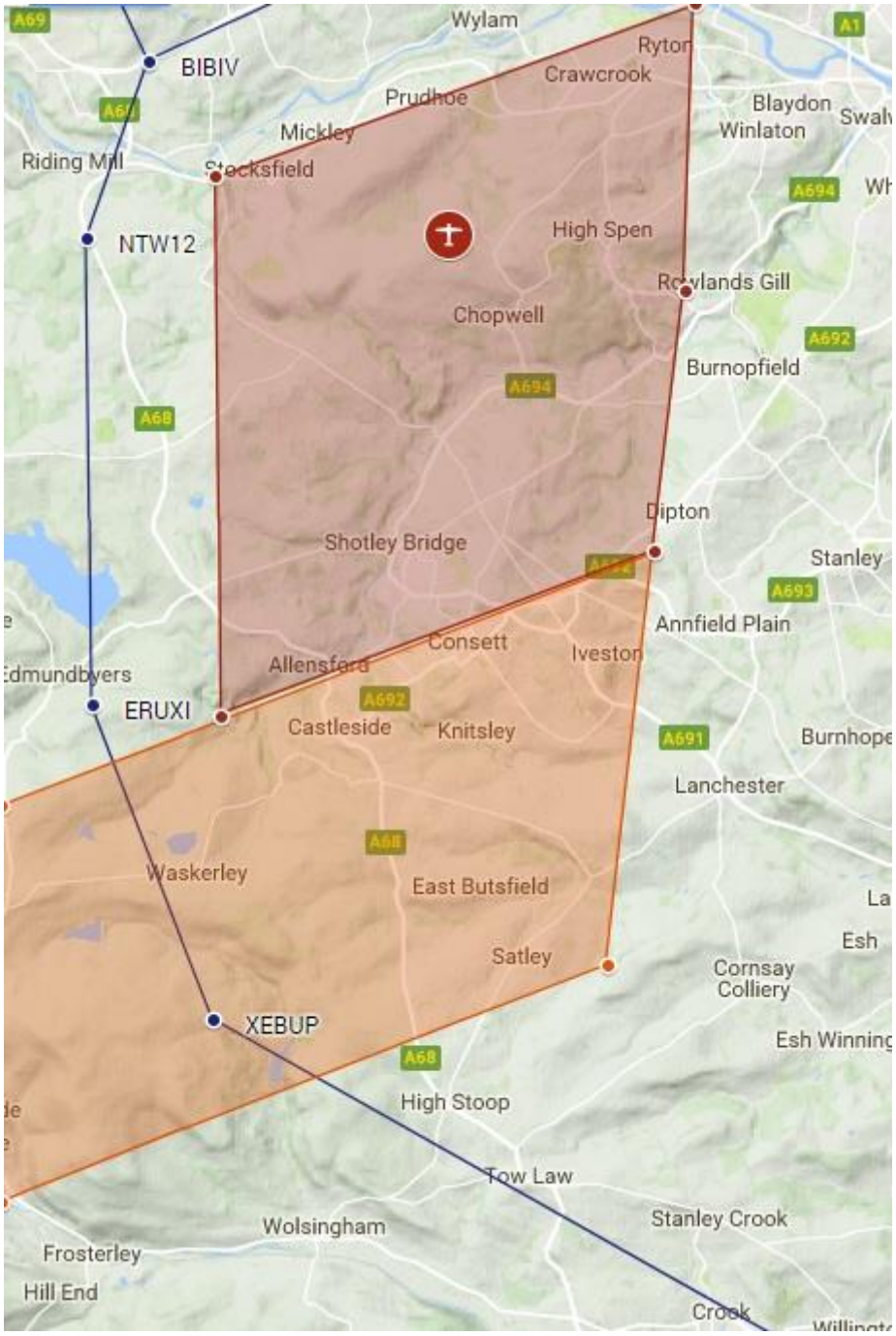

Figure 14: Close up of PRNAV 07 overlaid on Google Maps showing Currock Hill gliding areas

8.8. A complete set of the charts for the proposed procedures can be found in Appendix J.

CHAPTER 2: Environmental Report

1. Description of Airspace Change

1.1. The physical dimensions of controlled airspace are not changing. The proposed STAR and PRNAV approaches to both Runway 25 and Runway 07 mimic the vectors that ATC give to aircraft on approach to Newcastle. They have been designed to remain inside controlled airspace and follow, as much as possible, an optimum route for aircraft to fly CDOs and approach to land safely.

2. Traffic Forecasts

2.1. The graphs below show that movements and therefore associated passenger numbers are both expected to continue with strong growth in the next 18 years. Whilst airports with longer runways could expect larger passenger numbers without much associated movement growth due to larger aircraft being utilised, NIALL does not have a long enough runway to support the larger aircraft on the market hence a correlation growth with aircraft movements against passenger numbers. Having efficient arrival and departure procedures is essential to minimising delays to aircraft and therefore reducing the overall noise and carbon footprint. The tables the data in Figure 12 and Figure 13 are extracted from tables which are available as Appendix B.

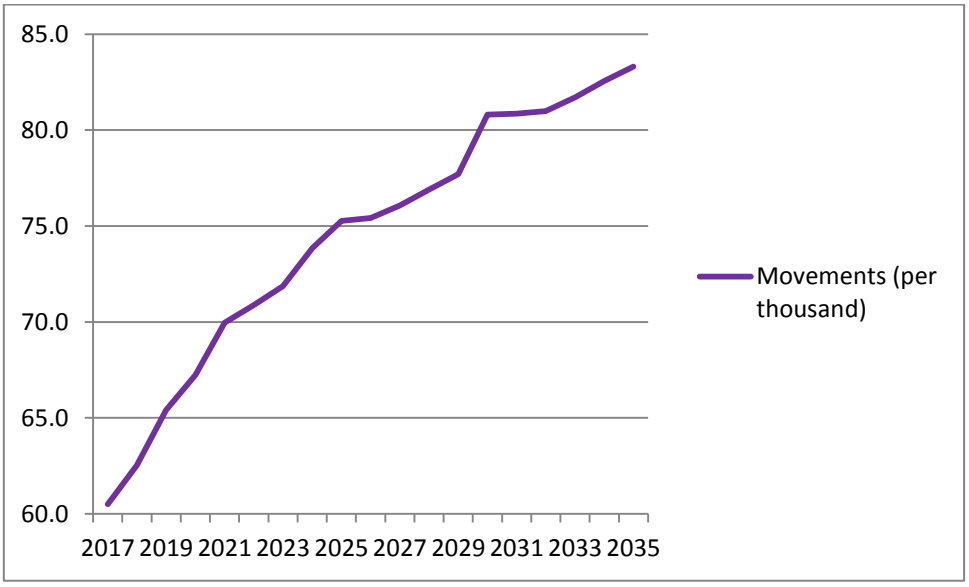

Figure 15: Movement forecast up to 2035

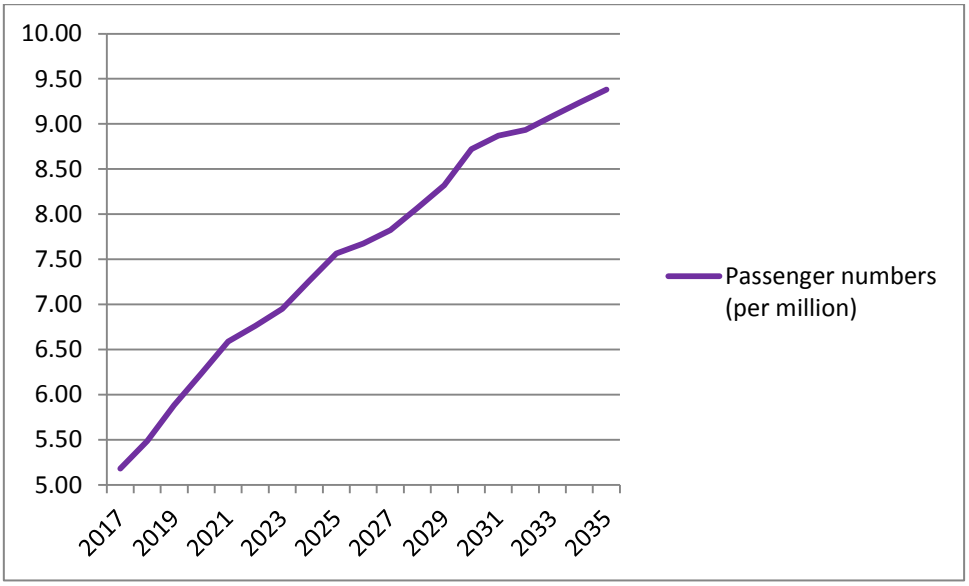

Figure 16: Passenger number forecast up to 2035

3. Effects on Noise

3.1. There will be no noticeable increase in noise as aircraft will be above FL90 at the end of the STAR. When transitioning to the PRNAV arrival, there should be a decrease in noise since CDO is defined (Department for Transport et al, 2006a; NATS, 2006) as "a noise abatement technique for arriving aircraft", "The overall change to average noise impact experienced on the ground being less than 1dB and at some distance from the Runway, is too small to be accurately modelled. Changes of this magnitude (<1dB) to average noise is not normally perceived as noticeable by most people.

3.2. One of the advantages of PRNAV is that those aircraft using PRNAV procedures will fly a more predicable route, reducing the present 'scatter' of aircraft on approach. This will slightly reduce the number of overflight events for the majority of people that are presently overflown by aircraft on approach due to aircraft following a more defined route.

3.3. Those people living directly under the PRNAV procedures will see some additional aircraft that are more directly overhead. The aircraft following the PRNAV procedures however, will be flying higher because they will follow a CDO profile with reduced power settings, thus making less noise than if they had overflown using present techniques.

3.4. The current noise contours remain relevant to this proposal, as the STAR flight path was assumed within the modelling parameters for the contours, which were produced by the Environmental Research and Consultancy Department (ERCD). Therefore, the outcome of this proposal will not have a material impact on the contours. Noise contours were published as part of the last Masterplan in 2013 and forecast developments up to 2030, copies can be seen in Appendix I. A revised Masterplan, with updated noise contours will be published in 2018, as well as an updated Noise Action Plan.

4. Change in Fuel Burn / CO_2

4.1. Climate change is a global concern. Carbon dioxide (CO2) has a half-life in our atmosphere of hundreds of years and any avoidance of man-made contributions to atmospheric CO2 is to be welcomed. CO2 is the principle aircraft emission species that affects climate change. Aircraft CO2 emissions will be reduced if PRNAV is implemented at NIAL – and especially if in combination with the proposed STAR. This is due to more efficient routings and enhancements for CDO achievement. This is fully in-line with UK policy and international commitments on Climate Change as well as NIAL's plan to work towards accreditation to Airport Council International's[3] Carbon Accreditation scheme. Aviation is coming under increasing pressure to demonstrate real action on reducing its carbon emissions as evidenced by the recent inclusion of aviation into the European Emissions Trading Scheme.

4.2. NIAL already monitor CDO performance by the airlines, and Figure 17 below shows the performance from January 2013 to September 2017.

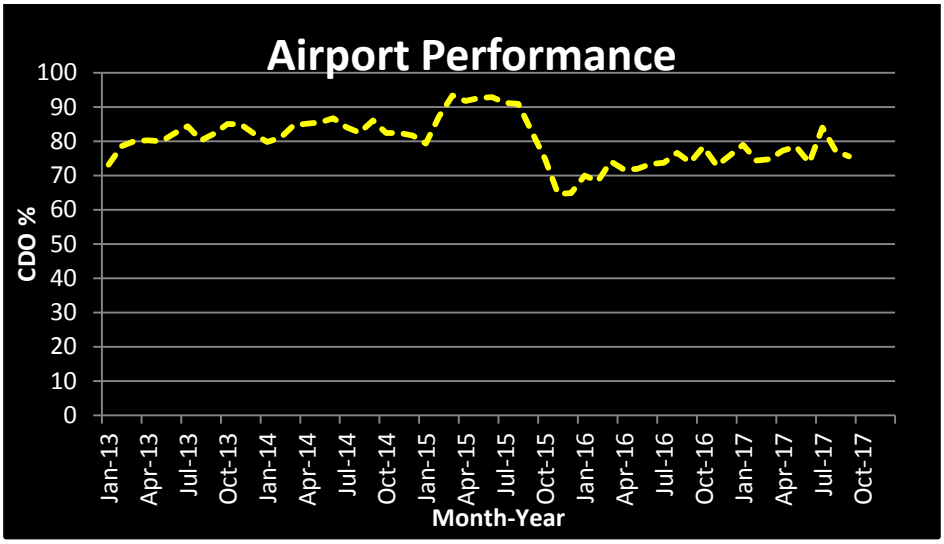

Figure 17: CDO Performance at Newcastle from Jan 2013 to Sept 2017

5. Local Air Quality

5.1. Particulate Matter (PM) and Oxides of Nitrogen (NOx) are the principle aircraft related emissions that can affect local air quality. PRNAV will facilitate CDO and thus more efficient aircraft routing which will reduce these atmospheric aircraft emissions. In following CDO, aircraft can use less engine thrust which drastically reduces NOx generation. For PM it is a little more complex, since the amount of particulates per kilo of fuel burnt actually increases as thrust reduces. The overall effect of fuel reduction however is far more significant and an overall (marginal) reduction of PM can be expected. The main reductions in these types of emissions will arise further out, at above 3,000ft (i.e. beyond 10 miles out).

5.2. The United Nations (International Civil Aviation Organisation) have found that air quality emissions emitted at 3,000ft above the ground or more play no significant part in local or

[3] The main global association for civil airports.

regional air quality. Thus the benefit to air quality can be considered negligible; however NIAL believes that the precautionary principle of reducing pollution whenever and wherever possible is worthwhile at any altitude.

6. Tranquillity and Visual Intrusion

6.1. The PRNAV route will mirror the current operation and as such, aircraft will not be operating in new areas. NIAL operate a Noise and Track Keeping (NTK) system, supplied by Bruel and Kjaer which will provide the opportunity to monitor the PRNAV track. This information will be monitored and shared with the Airline Technical Committee, the key liaison group between NIAL and airlines. The area that would be overflown by the proposed PRNAV procedures has been checked for sites where tranquillity is important such as tourist attractions, hospitals, schools, open air venues etc. This was also discussed with local councils via the NIAL Consultative Committee. Due to the aircraft being at higher levels when following the procedures it is unlikely that there will be significant tranquillity issues.

7. Economic Valuation of Environmental Impact

7.1. For those flights that follow the PRNAV routes fuel and maintenance cost reductions for airlines will arise from:

- Reduced track miles flown;
- Reduced engine thrust;
- Reduced fuel used in carrying extra contingency fuel. Pilots presently fuel for a much less direct route. Since the route using PRNAV can be pre-planned and is more direct, the pilot can reduce how much fuel they need to carry. This improves the fuel efficiency of the whole flight by reducing aircraft weight[4] at take-off;
- Reduced operating hours and wear and tear on aircraft and hence reduced maintenance costs.

7.2. In trials conducted by Eurocontrol and others, fuel savings of up to 40% during the approach phase have been demonstrated. This equates to between 50 and 150 kilogrammes of fuel depending on the level at which CDO is commenced and the aircraft type.

7.3. According to the CDO implementation principles laid down in the ICAO CDO manual, even partial continuous descent within individual sectors and at lower levels are still worthwhile, with savings between 50 to 100 kilogrammes fuel per approach.

8. Economic Benefit to NIAL

8.1. NIAL is a key economic asset and important driver for the North East economy. NIAL facilitates economic benefits including business links, inbound tourism and employment not only at the airport but in all the businesses that rely on us. It also offers a gateway to the world for local people. Operations that can help us to grow in a more sustainable way or to reduce our environmental impact are good for the regional economy. One of the key benefits

[4] As a rule of thumb it uses 3% extra fuel to carry fuel for each hour of flight. So on a 5 hour flight, typically 15kg of fuel is wasted for every 100kgs unnecessary fuel that is carried to landing.

from PRNAV is to significantly reduce the operating costs of airlines using NIAL through fuel savings and shorter flying times.

8.2. The establishment of a STAR and PRNAV approaches will initially cost NIAL in monetary outlay. However, savings may be made long term if the PRNAV approaches become an alternative to our NDB approaches and it is decided that the NT NDB does not need replacing. There are savings here if we do not replace this equipment in the procurement cost, and also flight validation and maintenance costs. The implementation of the STAR may also affect the decisions of airlines to open new routes or increase capacity on existing ones as they can amend fuel calculations during flight planning to their own benefit.

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CHAPTER 3: Consultation Report

1. Executive Summary

1.1. Newcastle International is the UK's 11th busiest airport, serving 5.2 million passengers in 2017. The airport supports 3450 jobs on site and many more across the region and generates £630m annually in to the regional economy.

1.2. The airport is located 6 miles north of Newcastle City Centre and has one east- west Runway designated 07-25 with aircraft making approaches to both ends depending on wind direction. The Runway is 2329m long allowing operations by most aircraft types. Most movements are by Boeing 737 or Airbus A320 size aircraft but aircraft up to Boeing 777 size are regular users. Aircraft arriving at Newcastle are currently directed towards the Runway by the radar controller which means that the aircraft will not always follow the same track across the ground.

1.3. Newcastle prides itself on being the Most Welcoming Airport to our customers and are always looking at new technologies that will improve the service provided, while at the same time looking out for the interests of our neighbours.

1.4. Procedures using GPS signals (similar to a Satellite Navigation in a car) have been developed for aircraft navigation and these are now starting to be rolled out both en-route and in the airport environment. These procedures, known as PRNAV, allow the aircraft to be flown far more accurately than conventional navigation techniques, lowering the fuel burn for operators and reducing the overall noise footprint on the ground. It is the airports intention to introduce these PRNAV procedures for arriving aircraft to take advantage of the efficiency, safety and environmental benefits they offer to our customers and neighbours.

1.5. As key stakeholders the airport wants to give you the facts about what we are implementing and give you a chance to ask questions or comment on any aspect of the project. Your comments will allow us to ensure that what is implemented balances the needs of all our stakeholders and gives the maximum benefits to everyone. Your views are very important to us and we look forward to hearing your comments.

2. Communication Methods

2.1. Direct communication:

2.1.1. An email was sent to key Airport stakeholders (listed in Appendix H), which included Parish Councils, Local Authorities and Airspace users. The email provided a direct link to the consultation holding page on the NIAL website. All of the relevant documents were available on this page and an option, to provide comments on a survey monkey portal.

2.1.2. The method of direct emails was followed up on a number of occasions to ensure that all consultees were aware of the deadline date and the need to respond. We believe best endeavours were made, to encourage responses for the consultation exercise.

2.2. Social media and Website:

NIAL have a strong presence on social media and this method proved very effective in the consultation. A standard message was placed on both Twitter and Facebook, with the main holding page on the NIAL website. The sponsored Facebook post reached 27,000 people and achieved 1,500 link clicks, whilst the NIAL website consultation page had 13,836 total views of which 5,423 were unique views. Examples of the messages received on Facebook can be seen in Appendix G.

2.3. Video message:

2.3.1. A short video interview was produced with the Manager of Air Traffic Control, explaining the aims of the consultation which was viewed 634 times. The following YouTube link was displayed on the social media sites, to signpost the video:

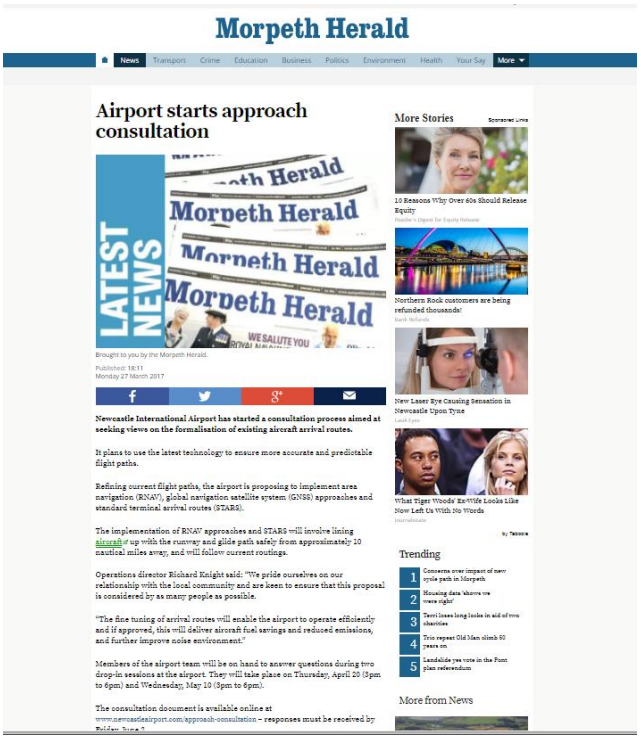
https://www.youtube.com/watch?v=hi2XnbTF8F0

2.4. Libraries:

2.4.1. We accept that not everyone has access to a computer; therefore a brochure version of the consultation was produced and sent to six key libraries in the area. A request was made to have the document on view for local residents.

2.5. Press statement:

2.5.1. A press statement was released at the start of the consultation; however there was limited interest from the media to run a story. An article did appear in the Morpeth Herald (see Figure 15) and Graeme Mason, Planning and Corporate Affairs Director carried out a radio interview with Radio Newcastle.


Morpeth Herald

News Transport Crime Education Business Politics Environment Health Your Say More

Airport starts approach consultation

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Brought to you by the Morpeth Herald.

Published: 18:11
Monday 27 March 2017

Newcastle International Airport has started a consultation process aimed at seeking views on the formalisation of existing aircraft arrival routes.

It plans to use the latest technology to ensure more accurate and predictable flight paths.

Refining current flight paths, the airport is proposing to implement area navigation (RNAV), global navigation satellite system (GNSS) approaches and standard terminal arrival routes (STARS).

The implementation of RNAV approaches and STARS will involve lining aircraft it up with the runway and glide path safely from approximately 10 nautical miles away, and will follow current routings.

Operations director Richard Knight said: "We pride ourselves on our relationship with the local community and are keen to ensure that this proposal is considered by as many people as possible.

"The fine tuning of arrival routes will enable the airport to operate efficiently and if approved, this will deliver aircraft fuel savings and reduced emissions, and further improve noise environment."

Members of the airport team will be on hand to answer questions during two drop-in sessions at the airport. They will take place on Thursday, April 20 (3pm to 6pm) and Wednesday, May 10 (3pm to 6pm).

The consultation document is available online at www.newcastleairport.com/approach-consultation - responses must be received by Friday, June 2.

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2 Housing data 'shows we were right'

3 Tarot loses long locks in aid of two charities

4 Trio repeat Old Man climb 50 years on

5 Landslide yes vote in the Pont plan referendum

More from News

Figure 18: Screenshot of Morpeth Herald Article on Airspace Consultation

2.6. Drop in sessions:

2.6.1. There were two drop in sessions held at the Airport, in total three members of the community attended and they did not object to the proposal.

2.7. Airport Consultative Committee:

2.7.1. As a key stakeholder, the Airport Consultative Committee received regular updates on the ACP process and a presentation outlining the arrival and approach procedures. At the request of Dinnington Parish Council, members of the Airport team presented at their PC meeting.

2.8. Airline Technical Committee:

2.8.1. Again, the Airline Technical Committee (which is made up of based airlines) were given regular updates and a presentation on the ACP.

2.9. Local Authority meetings:

2.9.1. Direct meetings were held with South Tyneside, Durham, North Tyneside, Newcastle and Northumberland Councils. Planning and Environmental Health officers attended the meetings.

3. Overview of Responses

3.1. In total 92 responses were made to the consultation, with the majority of people responding via the survey monkey application. All responses can be viewed in Appendix E.

3.2. Four formal objections were made from NATS, DTVA and two individuals. Correspondence relating to the objections can be seen in Appendix F. Following dialogue with one of the individuals they requested to withdraw their objection, however, for transparency purposes we have noted this objection. The second individual questioned the methodology for SIDS and STARS, rather than the NIAL proposal.

3.3. NIAL remain in close dialogue with NATS and DTVA to resolve their objection and work together to implement the STAR PRNAV proposal and have already modified the proposal as stated in Para 5.

4. Summary of Respondents

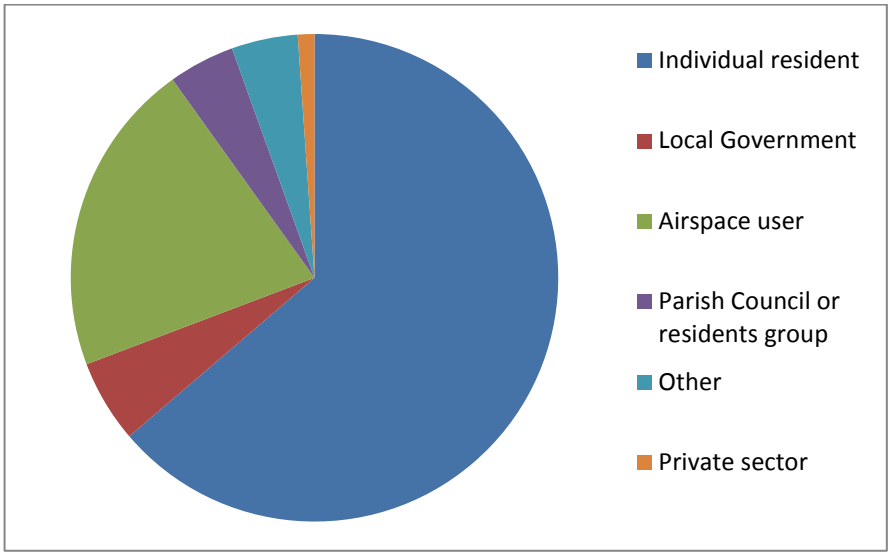

Figure 19: Breakdown of Respondents

4.1. The main based airlines Jet2, easyJet, Emirates, Thomson and Thomas Cook responded with no objection. 20 Airspace users responded, with DTVA and NATS raising concerns.

4.2. A total of 56 individual residents responded with a number of positive comments, including the following:

'The new arrangements will mean that aircraft will no longer fly over my house in Monkseaton. As an aviation enthusiast, this is disappointing. I welcome the sight of overflying aircraft, as it acts as an important reminder to local residents and visitors that Newcastle has an active and busy airport which they should use. Thankfully the views from the beach of arriving aircraft should still be good.'

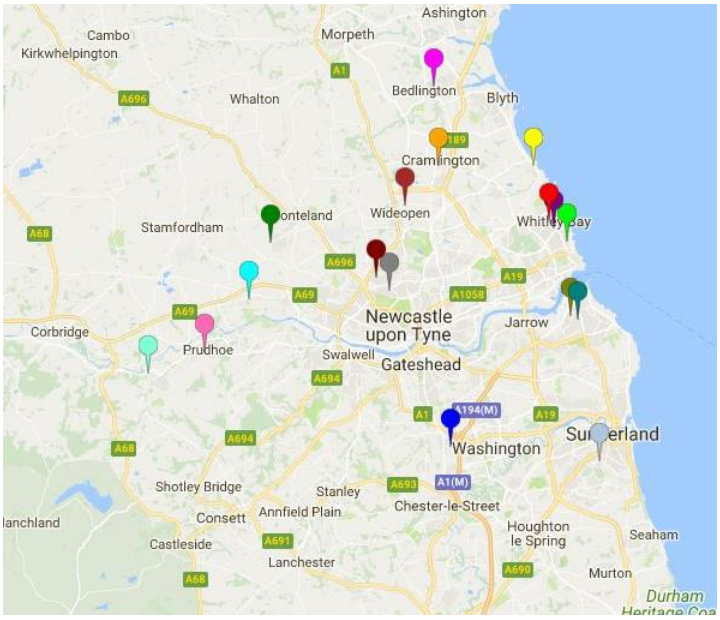

Figure 20: Google Map showing breakdown of Individual Respondents who provided Postcodes

4.3. We received 5 responses from Local Authorities, again all with support and no objection. 4 Parish Council / resident groups replied: this included a response from the Airport Consultative Committee which represents all of the local Parish Councils. We attended a local Parish Council meeting (Dinnington) and no objections were raised, however, they failed to complete the survey response.

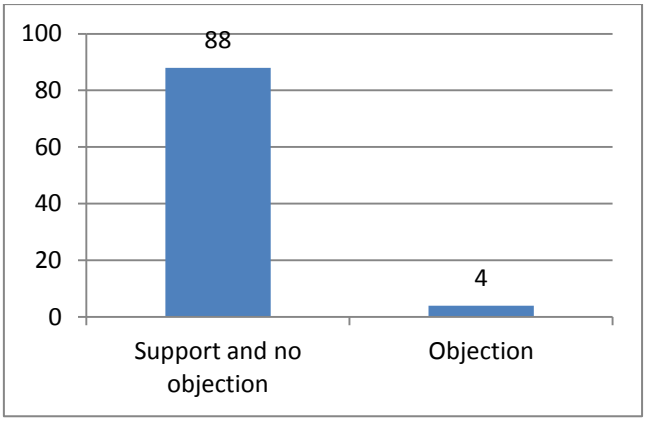

Figure 21: Breakdown of Responses

5. Modifications to the Proposal

5.1. As a result of the response received from Durham Tees Valley Airport, the initial level the STAR commences was amended from FL130 to FL140 to facilitate traffic. The Letter of agreement between Durham Tees Valley Airport and Newcastle airport can be found in Appendix C.

6. Supporting Documentation

6.1. The following supporting documentation is attached as appendices:

- **Appendix A: Arrival and Approach Procedure: Consultation Document (March 2017)**. This is a copy of the original proposal upon which consultation was conducted;
- **Appendix B**: **Passenger and Movements Forecast** *(Commercial In Confidence).* This is an Excel document showing the peak day forecasts for passenger and aircraft movements in 2020, 2025, 2030 and 2035 against the actual figures from 2016 and 2017. The table on the first tab contains the data used for Figure 12 (page 25) and Figure 13 (page 26);
- **Appendix C**: **Letter of Agreement between Newcastle International Airport Ltd & Durham Tees Valley Airport Ltd (Effective 1st April 2017).** This details existing procedures between NIAL and DTVA regarding traffic in Airway P18;
- **Appendix D**: **Letter of Agreement between Newcastle International Airport Ltd and Northumbria Gliding Club (April 2016).** This covers the procedures regarding the activation of Currock Hill Gliding Site and the associated airspace co-ordinates;
- **Appendix E**: **Responses to the NIAL Consultation.** This is a collation of all electronic responses to the consultation in PDF format and NIAL responses where necessary.

- **Appendix F**: **Responses to the NIAL Consultation with objections.** This is a collation of the four responses which raised queries along with the NIAL responses where necessary.
- **Appendix G**: **Examples of Social Media Responses to NIAL Consultation.** This is a selection of comments from the NIAL Facebook page regarding the Airspace Change Consultation.
- **Appendix H: List of Organisations Consulted by Email.** This includes whether responses were received or not.
- **Appendix I**: **Noise Contours.** A PDF document depicting Summer and Winter 2030 noise contours.
- **Appendix J**: **Chart pack relating to the proposed procedures.**