LAND'S END AIRPORT

CAP 1616 – AIRSPACE CHANGE PROPOSAL

FOR THE

LAND'S END TRANSIT CORRIDOR (LETC)

-

STAGE 3 : CONSULT

3A: OPTIONS APPRAISAL (PHASE 2 FULL)

Including safety assessment

ID : ACP-2019-75

LAND'S END AIRPORT

ACP SUBMISSION STEP 3A : OPTIONS APPRAISAL (PHASE 2 FULL)

December 2020 v3.0

CONTENTS

Issue	Month/Year	Change Requests
1.0	Nov 2020	Draft version sent to CAA
2.0	Dec 2020	Draft v2 sent to CAA with updates
3.0	Dec 2020	Final version sent to CAA for Stage 3 Gateway

i Abbreviations & Glossary of Terms

ACAS	Airborne Collision Avoidance System	Equipment fitted to an aircraft that will provide information on other aircraft regarding range, altitude and bearing.
ACP	Airspace Change Proposal	The process by which a sponsor applies for a change to the design of a part of the UK airspace
ADS-B	Automatic Dependant Surveillance Broadcast	A way for an aircraft to determine its position via satellite navigation and periodically broadcast it, enabling it to be tracked
AIAA	Area of Intense Aerial Activity	
ANSP	Air Navigation Service Provider	An organisation that provides the service of managing the aircraft in flight or on the manoeuvring area of an airport.
ATC	Air Traffic Control	
ATCA	Air Traffic Control Assistant	
ATCO	Air Traffic Control Officer	
ATCU	Air Traffic Control Unit	
ATM	Aerodrome Traffic Monitor	A type of radar used to assist in the safe operation of runways and airport utilisation
CAA	Civil Aviation Authority	The UK's aviation regulator ensuring that aviation reaches the highest safety standards
CAP	Civil Aviation Authority Publication	
CAT	Commercial Air Transport	
DP	Design Principle	
EC	Electronic Conspicuity	A means of aircraft transmitting their position to other ground or air-based systems
GA	General Aviation	
HEMS	Helicopter Emergency Medical Service	
IFR	Instrument Flight Rules	A term used to describe a pilot flying and navigating the aircraft with reference to the instruments in the flight deck

ISSC	Isles of Scilly Steamship Company	
ISSG	Isles of Scilly Steamship Group	
LETC	Land's End Transit Corridor	
MLAT	Multilateration	A navigation and surveillance technique used to provide information on the position of an aircraft
PAX	Passengers	
PINS	Point In Space	A non-precision instrument approach mainly used by helicopters
RMZ	Radio Mandatory Zone	A designated piece of airspace that requires all aircraft to be fitted with and operate suitable two-way radio equipment
RNAS	Royal Naval Air Station	
RNAV	Area Navigation	A method of navigation that allows an aircraft to choose any course within a network of navigation beacons
SAR	Search and Rescue	
TCAS	Traffic Collision Avoidance System	Suitably equipped aircraft communicate digitally, between themselves, information regarding range, altitude and bearing to provide advice on airborne collision avoidance
TMZ	Transponder Mandatory Zone	A designated piece of airspace that requires all aircraft to be fitted with and operate electronic conspicuity equipment
UK	United Kingdom	

1 Executive Summary

1.1 Throughout the whole of this ACP process, Land's End Airport has looked at any change as having to have the maximum benefit to increasing safety margins as far as practicable to all users of the LETC.

1.2 Our preferred is

- Option 4 - Combined RMZ/TMZ + alter the size of the LETC to encompass the Instrument Approaches at both Land's End and St Mary's airports.

The reason for this, as explained in detail below, is because it affords the maximum safety benefits for all aircraft flying within the LETC.

1.3 One of our greatest challenges operating within the LETC is that sometimes there are aircraft flying within it that are not in contact with air traffic control. We know they are there because of reports from other pilots or sometimes a local radar unit will see something on their screens for a short while, but no one is talking to them. This is called Unknown Traffic.

1.4 By ensuring that everyone uses suitable 2-way radio equipment when flying within the LETC, we eliminate the unknown traffic, so even if the aircraft doesn't appear on radar at least they are talking to air traffic control.

1.5 To ensure that aircraft show up on radar or collision avoidance equipment fitted in the cockpit they could operate a transponder. A lot of military traffic operates close to the LETC so having traffic appear on radar is a good thing for the neighbouring radar unit at RNAS Culdrose, and if an aircraft has a collision avoidance system installed the transponder will make them electronically visible even if the pilot can't see them.

1.6 Land's End air traffic control cannot make use of information gleaned from transponders, so on the face of it there seems to be no reason to ask for it. However, there are a great number of aircraft flying within the LETC that can make use of it, and so we believe that having it makes sense. There were over 15000 aircraft movements within the LETC during 2019 and approximately 92% of these were carried out by aircraft that have a transponder fitted and can directly make use of transponder information from other aircraft to aid situational awareness and help to avoid mid-air collision. Even if an aircraft isn't fitted with collision avoidance equipment, making itself visible electronically to those that can makes the LETC a safer place to fly.

1.7 We estimate that less than 1% of the remaining aircraft didn't operate transponder equipment whilst in the LETC so the number is quite small.

1.8 Whilst that number may be negligible compared to the number that do, we've identified that by making a change to everyone having a transponder, safety could be improved for every airspace user.

1.9 Finally when an aircraft makes an instrument approach at Land's End it's actually routing outside the LETC for part of that approach. Instrument approaches are usually there to help aircraft make a safe approach and landing at an airport when the weather is bad. So, for some of the flight the aircraft is probably in cloud and therefore relying on instruments and collision avoidance equipment to help keep it safe. If we're going to make things safer then we need to include all the approaches and their associated holding areas within the LETC.

1.10 That's why we prefer the option of RMZ/TMZ + alter the size of the LETC. To ensure that every user is talking to air traffic control, that all aircraft are visible on collision avoidance equipment and the instrument approaches are encompassed within the LETC.

2 Introduction

2.1 This document forms part of the document set required in accordance with the requirements of the CAP1616 airspace change process.

2.2 This document aims to provide adequate evidence to satisfy Stage 3 Consult Gateway, Step 3A Options Appraisal (Phase 2 Full), including Safety Assessment.

2.3 Land's End Airport is proposing to introduce an improved airspace solution to the Land's End Transit Corridor (an existing block of airspace linking the mainland to the Isles of Scilly) that could provide mitigation to the current unknown traffic environment. With an increase in air traffic movements within the Land's End Transit Corridor, the commencement of a second commercial operator (Penzance Helicopters) and the introduction of multiple IFR approaches (with more planned) a need for an Airspace Change was identified.

2.4 The owner of Land's End Airport, the Isles of Scilly Steamship Company (ISSC), has been providing lifeline services between the mainland and the islands for over 100 years. Air services provide a year-round lifeline link between the mainland and the Isles of Scilly and this proposal represents the final stage of a major investment program for the benefit of the island-based community and visitors.

2.5 Land's End Airport also operates as the ANSP for Air Traffic Services at the airport and so, unless specifically stated, when this document refers to ATC, ANSP and Land's End Airport they are one and the same entity.

2.6 This proposal is related to improving the safety of existing services and not about stimulating new traffic or altering any existing routes. Hence, in accordance with the levels as defined in CAP1616, the CAA has categorised this proposal as a Level 2C change. In line with the requirements for a Level 2C change, the environmental impact assessment has been conducted on the basis of CO_2 emissions only. There would be no perceptible change to noise impacts to stakeholders on the ground; hence no noise analysis has been undertaken.

2.7 The Land's End Transit Corridor is situated in the far South-West of England and is an established block of airspace approximately 38nm long and 15nm wide (Surface to 4,000ft altitude) linking the mainland to the Isles of Scilly.

It is situated in Class G airspace and partially within the RNAS Culdrose AIAA. (See Appendix A for diagram)

2.8 The LETC is used predominantly by scheduled passenger and freight carrying flights - both fixed-wing and, as of March 2020 from Penzance Heliport, rotary aircraft. In addition, it is used by military aircraft (both fixed-wing and rotary), SAR & Helimed helicopters, Trinity House helicopters, General Aviation flights and other charter and air-taxi operators.

Aircraft using the LETC become funnelled within a very narrow lateral and vertical area of airspace. In order to provide increased protection for all users, and in particular, the scheduled public transport flights - some of which may be conducting IFR RNAV approaches - a need for an airspace change was identified.

Air Traffic Control Officers (ATCO's) at Land's End Airport and St. Mary's Airport oversee the safe, orderly and expeditious flow of aircraft using the LETC. The current LETC operation is further enhanced by an existing Letter of Agreement made between Operators and Land's End and St. Mary's ATCU's. An additional specific Letter of Agreement between Land's End ATCU and RNAS Culdrose ATCU details the procedures for when the Land's End RNAV approaches are in use.

There are now four Airports/Heliports situated within the LETC – Land's End Airport, St. Mary's Airport, Penzance Heliport and Tresco Heliport. All these destinations are served by commercial air transport and all have, or intend to have, their own IFR RNAV or PIN's approaches.

2.9 Land's End Airport handled 15,042 aircraft movements (11,177 Airport Movements and 3,865 Overflights) and 64,000 terminal pax in 2019 (Jan-Dec). This makes it the 36th busiest Airport in the UK.

St. Mary's Airport handled 12,329 Airport Movements and 94,000 terminal pax in 2019 (Jan-Dec). This makes it the 35th busiest Airport in the UK.

3 Change Level

3.1 The changes in this ACP mainly impact flights over the sea (the majority of the LETC is SW of Land's End Airport) and has been confirmed by the CAA as Level 2C.

3.2 In line with the requirements for a Level 2C change the environmental impact assessment has been conducted on the basis of aviation-related CO_2 emissions.

4 Options Appraisal

4.1 This document is an update of the equivalent Stage 2 document.

4.2 It is expected that the aviation impact on the environment due to any of the proposed changes would be negligible as it is anticipated that no more than a few aircraft may have their routings or levels altered.

4.3 Other than the ordinary fluctuation in traffic levels due to tourism demands year on year, there is no anticipated dramatic increase in the number of flights in the LETC, therefore, we only expect a negligible impact to noise or CO_2 in the local environment. It would not be proportional to attempt a WebTAG greenhouse gas monetisation workbook for these proposals given the negligible aviation impact.

4.4 When researching the relevant costs and benefits of the proposed changes it was found that there would be no real cost, to the ANSP/Airport, of implementing those options being considered. During stage 2 when other options were put forward, some carried a financial cost far too great that the sponsor couldn't afford to implement them and were therefore discounted. The amount of work needed to carry out a cost benefit analysis for the options would be disproportionate to the information gleaned from the report and therefore has not been carried out.

4.5 The proposed airspace changes to the LETC do not carry a monetary benefit to the community, users or the sponsor. The whole benefit would be in that safety margins would be increased for all users of the LETC.

4.6 We estimate that there is a less than 1% number of aircraft that do not have 2-way radio equipment installed in their aircraft and so the overall financial effects on the aviation community in this regard is negligible. Neither Land's End nor St Mary's allow non-radio aircraft to use their airports and neither have recorded a request to do so in the last 6 years.

4.7 During Stage 2a, feedback was received from Perranporth Airfield stating that all their aircraft were transponder equipped, we then checked with the aircraft based at St Mary's airport and found that all but one aircraft was transponder equipped. These two airports are the closest to Land's End airport and aircraft from them use the LETC on a very regular basis. Of the total of 10 aircraft based between Perranporth and St Mary's it shows that only 1 of the regular visitors from these airports would be affected by the necessity to carry a transponder. When placed against the 15000 aircraft movements that we had in 2019 the benefits to safety far outweigh the potential costs to such a negligible number of other movements.

4.8 10 Year Traffic Forecast

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Actual Traffic Numbers	**15042**	**9059 (11 mth)**										
Estimated Traffic Numbers			**13500**	**15000**	**15500**	**16000**	**16000**	**16300**	**16600**	**17000**	**17300**	**17500**

4.9 The table above shows the actual figures for 2019 and for 2020 (only 11 months available at time of print). During the summer months after travel restrictions were eased by the government the airline based at Land's End Airport showed a recovery of between 80 – 85% of the previous year's figures. Assuming that recovery will continue at a similar rate over the next 12 – 18 months it is forecast that figures will return to pre-COVID levels in 2022. Bearing in mind the maximum capacity and continued popularity of the Isles of Scilly, it is forecast that traffic levels will continue to rise but at a slower rate than in previous years.

4.10 This ACP originally considered the baseline do-nothing option and nine alternatives which could be used to provide enhanced safety within the LETC. After Stage 2, Step 2b Options Appraisal, many of the options were discounted and following the process of selecting options we are progressing the following. All the options under consideration are;

1. RMZ
2. Combined RMZ/TMZ
3. RMZ + Alter the size of the LETC
4. Combined RMZ/TMZ + Alter the size of the LETC (Preferred)

The preferred option is to implement a Combined RMZ/TMZ and alter the size of the LETC to encompass the IAPs at Land's End and St Mary's airports.

4.11 **Do Nothing**

The "Do Nothing" option assumes that there are no mitigating design principles implemented and all users continue to operate within the LETC with no changes made to enhance safety.

Group	Impact	Level of Analysis	Evidence
Communities	Noise impact on health & quality of lifestyle	Qualitative	There will be no proposed changes to air traffic patterns so there will be no impact for noise. Most of the LETC is over the sea between Land's End and the Isles of Scilly.
Communities	Air quality	Qualitative	No changes to aircraft routings below 7000 ft so no effect on air quality
Wider Society	Greenhouse gas impact	Qualitative	No changes to aircraft routings below 7000 ft so no effect on aviation greenhouse gas emissions.
Wider Society	Capacity / resilience	Qualitative	There would be no changes to workload for ATC. Capacity of the airspace in terms of the number of aircraft would not change.
General Aviation	Access	Qualitative	No change from today
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative	There would be no increase in effective capacity
General Aviation / Commercial airlines	Fuel burn	Qualitative	No change from today

Commercial airlines	Training costs	Qualitative	No change from today
Commercial airlines	Other costs	Qualitative	No change from today
Airport / ANSP	Infrastructure costs	Qualitative	No change from today
Airport / ANSP	Operational costs	Qualitative	No change from today
Airport / ANSP	Deployment costs	Qualitative	No change from today

4.12 **Option 1 - Radio Mandatory Zone (RMZ)**

This option calls for the reclassification of the LETC to an RMZ. Exact size and boundaries of the RMZ would need to be agreed with adjacent ATCUs and operating agencies of the RMZ decided upon.

Group	Impact	Level of Analysis	Evidence
Communities	Noise impact on health & quality of lifestyle	Qualitative	There will be negligible changes to air traffic patterns so there will be no impact for noise. Most of the LETC is over the sea between Land's End and the Isles of Scilly.
Communities	Air quality	Qualitative	Negligible changes to aircraft routings below 7000 ft so no effect on air quality. This change option would not increase the number of aircraft within the LETC so air quality would not be adversely affected.
Wider Society	Greenhouse gas impact	Qualitative	Negligible changes to aircraft routings below 7000 ft so no effect on aviation greenhouse gas emissions. This change option would not increase the number of aircraft within the LETC so aviation greenhouse gas emissions would not increase.
Wider Society	Capacity / resilience	Qualitative	ATC workload would remain the same as there would not be any significant changes that ATC could make to the level of service provided. Capacity in terms of the number of aircraft

			that could utilise it would remain the same as today as the physical dimensions of the LETC would not be changed.
General Aviation	Access	Qualitative & Monetise	Aircraft would need to be in 2-way radio communication with ATC before entering the airspace and maintain that contact whilst operating within it. There may be a very small number of aircraft, estimated to be <1% that do not, or would not wish to, use 2-way radio equipment and therefore would not be permitted to enter the airspace. A one-off cost implication for these users would be in the order of £1000 for suitable radio equipment, this equates to approximately 12 aircraft movements (based on 2019 figures of 1200 GA movements). Prior agreements may be able to be made beforehand regarding the operation of aircraft within the airspace before establishing 2-way radio communication with ATC.
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative	No change from today
General Aviation / Commercial airlines	Fuel burn	Qualitative	No change from today
Commercial airlines	Training costs	Qualitative	No change from today
Commercial airlines	Other costs	Qualitative	No change from today
Airport / ANSP	Infrastructure costs	Qualitative	No change from today
Airport / ANSP	Operational costs	Qualitative	No change from today
Airport / ANSP	Deployment costs	Qualitative	No change from today

4.13 **Option 2 - Implementation of a combined RMZ / TMZ**

This option calls for the reclassification of the LETC to a combined RMZ / TMZ. All aircraft wishing to operate within the LETC would need to be both transponder and radio equipped and be in contact with the appropriate agency before entering.

Group	Impact	Level of Analysis	Evidence
Communities	Noise impact on health & quality of lifestyle	Qualitative	There will be negligible changes to air traffic patterns so there will be no impact for noise. Most of the LETC is over the sea between Land's End and the Isles of Scilly.
Communities	Air quality	Qualitative	Negligible changes to aircraft routings below 7000 ft so no effect on air quality. This change option would not increase the number of aircraft within the LETC so air quality would not be adversely affected.
Wider Society	Greenhouse gas impact	Qualitative	Negligible changes to aircraft routings below 7000 ft so no effect on aviation greenhouse gas emissions. This change option would not increase the number of aircraft within the LETC so aviation greenhouse gas emissions would not increase.
Wider Society	Capacity / resilience	Qualitative	At present when aircraft carry-out IAP's at Land's End they select a pre-allocated SSR code – a similar procedure could be used for aircraft entering the LETC. If this was the case, workload for the ATCU would not increase. Capacity in terms of the number of aircraft that could utilise it would not change as the physical dimensions would remain the same as today.
General Aviation	Access	Qualitative & Monetise	Aircraft would need to be equipped with and operate

			suitable transponder and 2-way radio equipment. There may be a very small number of aircraft, estimated to be <1% that do not, or would not wish to, use 2-way radio equipment and therefore would not be permitted to enter the airspace. A one-off cost implication for these users would be in the order of £1000 for suitable radio equipment, this equates to approximately 12 aircraft movements (based on 2019 figures of 1200 GA movements). A one-off cost implication in the order of £2000 would need to be made for suitable transponder equipment. Only 1 of the locally based aircraft are not transponder equipped. Prior agreements could be entered into to allow limited operation of these aircraft subject to other factors agreed with ATC.
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative	No change from today
General Aviation / Commercial airlines	Fuel burn	Qualitative	No change from today
Commercial airlines	Training costs	Qualitative	No change from today
Commercial airlines	Other costs	Qualitative	No change from today
Airport / ANSP	Infrastructure costs	Qualitative & Monetise	Land's End Airport currently has no operational requirement for approved surveillance equipment and so if it wished to benefit from the information gained from electronic conspicuity then the airport/ANSP would have to setup data line installations, feed costs, safety case and flight calibration, estimated £60K - £120K. It is outside the

			financial reach of the airport/ANSP to install and operate this equipment and so this was discounted at an earlier stage.
Airport / ANSP	Operational costs	Qualitative & Monetise	Land's End Airport currently has no operational requirement for approved surveillance equipment and so if it wished to benefit from the information gained from electronic conspicuity then the ANSP would have to obtain radar feed from an approved source at an estimated cost of £60K annually. It is outside the financial reach of the ANSP to install and operate this equipment and so this was discounted at an earlier stage.
Airport / ANSP	Deployment costs	Qualitative & Monetise	Land's End Airport currently has no operational requirement for approved surveillance equipment and so if it wished to benefit from the information gained from electronic conspicuity then the ANSP would have to train the ATCOs to the required level which would have an estimated cost of £150K. It is outside the financial reach of the ANSP to upgrade the ATC qualifications of its ATCOs and so this was discounted at an earlier stage.

4.14 **Option 3 – RMZ + Alter the size of the LETC to encompass the IAP's at Land's End and St Mary's Airports.**

Changing the dimensions of the LETC would take into account any parts of the IAPs at Land's End and St Mary's airports that are currently outside of the LETC.

Group	Impact	Level of Analysis	Evidence
Communities	Noise impact on health & quality of lifestyle	Qualitative	There will be negligible changes to air traffic patterns so there will be no impact for noise. Most of the LETC is over the sea between Land's End and the Isles of Scilly.
Communities	Air quality	Qualitative	Negligible changes to aircraft routings below 7000 ft so no effect on air quality. This change option would not increase the number of aircraft within the LETC so air quality would not be adversely affected.
Wider Society	Greenhouse gas impact	Qualitative	Negligible changes to aircraft routings below 7000 ft so no effect on aviation greenhouse gas emissions. This change option would not increase the number of aircraft within the LETC so aviation greenhouse gas emissions would not increase.
Wider Society	Capacity / resilience	Qualitative	ATC workload would remain the same as there would not be any significant changes that ATC could make to the level of service provided. Capacity in terms of the number of aircraft that could utilise it would remain the same as today as the physical dimensions of the LETC would change only to include the IAP's at Land's End and St Mary's airports.
General Aviation	Access	Qualitative & Monetise	Aircraft would need to be in 2-way radio communication with ATC before entering the airspace and maintain that

			contact whilst operating within it. There may be a very small number of aircraft, estimated to be <1% that do not, or would not wish to, use 2-way radio equipment and therefore would not be permitted to enter the airspace. Prior agreements may be able to be made beforehand regarding the operation of aircraft within the airspace before establishing 2-way radio communication with ATC.
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative	No change from today
General Aviation / Commercial airlines	Fuel burn	Qualitative	No change from today
Commercial airlines	Training costs	Qualitative	No change from today
Commercial airlines	Other costs	Qualitative	No change from today
Airport / ANSP	Infrastructure costs	Qualitative	No change from today
Airport / ANSP	Operational costs	Qualitative	No change from today
Airport / ANSP	Deployment costs	Qualitative	No change from today

4.15 **Option 4 - Implementation of a combined RMZ / TMZ + Alter the size of the LETC to encompass the IAP's at Land's End and St Mary's Airports.**

This option calls for the reclassification of the LETC to a combined RMZ / TMZ. All aircraft wishing to operate within the LETC would need to be both transponder and radio equipped and be in contact with the appropriate agency before entering. As per the published CAA TMZ policy statement, prior agreements could be entered into to allow limited operation of these aircraft subject to other factors agreed with ATC. (https://publicapps.caa.co.uk/docs/33/20150814PolicyStatementRMZAndTMZ.pdf)

Changing the dimensions of the LETC would take into account any parts of the IAPs at Land's End and St Mary's airports that are currently outside of the LETC. It could also consider making the LETC larger throughout. Stakeholder feedback will be sought during the consultation period of Stage 3 for ideas and opinions on this.

Group	Impact	Level of Analysis	Evidence
Communities	Noise impact on health & quality of lifestyle	Qualitative	There will be negligible changes to air traffic patterns so there will be no impact for noise. Most of the LETC is over the sea between Land's End and the Isles of Scilly.
Communities	Air quality	Qualitative	Negligible changes to aircraft routings below 7000 ft so no effect on air quality. This change option would not increase the number of aircraft within the LETC so air quality would not be adversely affected.
Wider Society	Greenhouse gas impact	Qualitative	Negligible changes to aircraft routings below 7000 ft so no effect on aviation greenhouse gas emissions. This change option would not increase the number of aircraft within the LETC so aviation greenhouse gas emissions would not increase.
Wider Society	Capacity / resilience	Qualitative	At present when aircraft carry-out IAP's at Land's End they select a pre-allocated SSR code – a similar procedure could be used for aircraft entering the LETC. If this was the case, workload for the ATCU would not increase. Capacity in terms of the number of aircraft that could utilise it would remain the same as today as the physical dimensions of the LETC would change only to include the IAP's at Land's End and St Mary's airports.
General Aviation	Access	Qualitative & Monetise	Aircraft would need to be equipped with and operate suitable transponder and 2-way radio equipment. A one-off cost implication for these users would be in the order of £1000 for suitable radio equipment

			and £2000 for suitable transponder equipment. There may be a very small number of aircraft, estimated to be <1% that do not, or would not wish to, use 2-way radio equipment and therefore would not be permitted to enter the airspace. Only 10% of locally based aircraft are not transponder equipped, this equates to 1 user. As per the published CAA policy statement prior agreements could be entered into to allow limited operation of these aircraft subject to other factors agreed with ATC.
General Aviation / Commercial airlines	Economic impact from increased effective capacity	Qualitative	No change from today
General Aviation / Commercial airlines	Fuel burn	Qualitative	No change from today
Commercial airlines	Training costs	Qualitative	No change from today
Commercial airlines	Other costs	Qualitative	No change from today
Airport / ANSP	Infrastructure costs	Qualitative & Monetise	Land's End Airport currently has no operational requirement for approved surveillance equipment and so if it wished to benefit from the information gained from electronic conspicuity then the airport/ANSP would have to setup data line installations, feed costs, safety case and flight calibration, estimated £60K - £120K. It is outside the financial reach of the airport/ANSP to install and operate this equipment and so this was discounted at an earlier stage.
Airport / ANSP	Operational costs	Qualitative & Monetise	Land's End Airport currently has no operational requirement for approved surveillance equipment and so if it wished to benefit from the information gained from electronic

			conspicuity then the ANSP would have to obtain radar feed from an approved source at an estimated cost of £60K annually. It is outside the financial reach of the ANSP to install and operate this equipment and so this was discounted at an earlier stage.
Airport / ANSP	Deployment costs	Qualitative & Monetise	Land's End Airport currently has no operational requirement for approved surveillance equipment and so if it wished to benefit from the information gained from electronic conspicuity then the ANSP would have to train the ATCOs to the required level which would have an estimated cost of £150K. It is outside the financial reach of the ANSP to upgrade the ATC qualifications of its ATCOs and so this was discounted at an earlier stage.

5 Safety Assessment

5.1 Options Appraisal Safety Assessment – Do Nothing

There have been a number of safety related reports regarding operation of aircraft in the LETC. Some have been reported through the MOR scheme, some AIRPROX and some through the internal Land's End Airport or Skybus Safety Management Systems. These reports all related to incidents before the second commercial operator, Sloane Helicopters, started regular scheduled flights to and from Penzance heliport. Since then the traffic volume operating within the LETC has increased to sometimes an extra 40 air traffic movements per day.

In addition to this, RNP + PINS approaches have been or are imminent, at four airports/heliports within 35NM of each other with more aircraft potentially flying IFR. Since this level of traffic is likely to continue and safety concerns are still being raised by pilots and ATCO's 'do nothing' is not a viable option. Safety data has been gathered from a number of sources and not necessarily all from reportable incidents so the quantitative number of actual reports may seem low. There have been a number of incidents where observation has been made of unidentified traffic within the LETC by ATC and pilots (the most recent of which by a helicopter pilot on Thursday 3rd September 2020) that did not warrant a formal report.

5.2 Options Appraisal Safety Assessment – Option 1 Radio Mandatory Zone (RMZ)

Should the LETC be reclassified as an RMZ then all aircraft wishing to operate within would have to establish 2-way radio communication with ATC before entry. This should remove the possibility of unknown traffic from the LETC. The usefulness of this relies on the accuracy of pilot position and level reports. If a pilot cannot establish 2-way communication with ATC, then they would have to remain clear of the RMZ. There are circumstances under which certain activities take place without radio contact at present (e.g. para gliding at Sennen Cove) and with careful planning and formal agreements these activities could continue. Again, by entering into letters of agreement, aircraft could get airborne from sites within the RMZ and establish 2-way radio communication at the earliest opportunity.

The RMZ may not need to be active 24/7 and could be promulgated to coincide with the commercial operations of the airports/heliport within the LETC thus making the LETC as accessible as possible in line with increased safety margins. Currently commercial operations take place Mon–Sat 0800-1830. Any extra commercial operations could be covered by NOTAM.

Points to be considered with this are

- All aircraft must establish 2-way radio communication with ATC to operate within the LETC
- Almost all aircraft are fitted with appropriate 2-way radio communication equipment and for those that aren't handheld radios can be purchased and used effectively
- Certain activities may be permitted without radio contact under a LOA (An informal discussion and further clarification has already taken place with stakeholders who expressed concern over not being granted access due to non-radio operation. Land's End ATC clearly stated the overarching goal of increasing safety for all users and continuing the policy of access for all)
- This is a good option for GA operations as it is a practical middle ground between doing nothing and having controlled airspace, which would pose many restrictions to aircraft wishing to operate within the LETC
- Although a clearance isn't needed to enter an RMZ, CAA policy is if a pilot is told to 'standby' they are to remain clear of the airspace **(14 August 2015: POLICY FOR RADIO MANDATORY ZONES AND TRANSPONDER MANDATORY ZONES, Annex A)**

The establishment of an RMZ would eliminate the unknown traffic element in the LETC and not pose too many restrictions to aircraft in terms of cost and access so 'Radio Mandatory Zone (RMZ) is a viable option.

5.3 Options Appraisal Safety Assessment – Option 2 Combined RMZ / TMZ

Under this combination all aircraft wishing to operate within the LETC would need to operate a transponder in accordance with the local promulgated procedures and establish 2-way radio communication with ATC before entry.

As detailed above, the RMZ would remove the unknown traffic element from the LETC and the TMZ would ensure that an aircraft's onboard ACAS system could provide any relevant alerting information.

The TMZ safety enhancement would benefit the airspace users directly as any suitably equipped aircraft would have information regarding the range, altitude and bearing of other aircraft in order to aid them in early collision avoidance. The information transmitted by aircraft would give an accurate position with no chance of accidentally reporting an inaccurate one. Neighbouring surveillance equipped air traffic control units (RNAS Culdrose & Newquay) would also have more information regarding the traffic within and approaching the LETC in order to enhance the service to aircraft under their jurisdiction. Currently all aircraft carrying out IAPs at Land's End airport carry a discreet transponder code and are visible on surveillance equipment and ACAS systems (there is no requirement for Land's End to verify the code just to confirm with the pilot that the code is selected and used) and so having all aircraft within the LETC doing so (different code to the IAPs) would make all airspace users visible on surveillance radar and ACAS systems. Having both these elements combined would remove the potential of unknown traffic operating within the LETC and add another level of safety enhancement directly to the airspace users themselves.

The benefits of removing unknown traffic from the LETC, added information to other surveillance air traffic control units, meeting the future needs of airspace users and increasing the usefulness of ACAS systems makes 'Combined RMZ/TMZ' a viable option.

5.4 Options Appraisal Safety Assessment – Option 3 Radio Mandatory Zone (RMZ) + Alter the Dimensions of the LETC

5.4.1 The assessment for the RMZ is as 5.2 above.

5.4.2 After initial consideration regarding what might be gained from altering the size of the LETC, it was decided that a major improvement would be to increase the size around the IAPs at Land's End and St Mary's airports. Currently when aircraft are carrying out an IAP their tracks take them outside the LETC. By having the IAP's inside the LETC and having it designated as an RMZ as well this would greatly enhance safety for aircraft carrying out these approaches especially if they were in IMC at the time. Feedback is being sought from stakeholders, via the consultation, for any other ideas or opinions regarding altering the size of the LETC.

5.5 Options Appraisal Safety Assessment – Option 4 Combined RMZ/TMZ + Alter the Dimensions of the LETC

5.5.1 The assessment for the combined RMZ/TMZ is as 5.3 above.

5.5.2 After initial consideration regarding what might be gained from altering the size of the LETC, it was decided that a major improvement would be to increase the size around the IAPs at Land's End and St Mary's airports. Currently when aircraft are carrying out an IAP their tracks take them outside the LETC. By having the IAP's inside the LETC and having it designated as an RMZ/TMZ as well this would greatly enhance safety for aircraft carrying out these approaches especially if they were in IMC at the time. Feedback is being sought from stakeholders, via the consultation, for any other ideas or opinions regarding altering the size of the LETC.

6 Safety Assessment Conclusion

6.1 The proposed option 4 - Combined RMZ/TMZ coupled with increasing the size of the LETC to incorporate the IAPs at Land's End and St Mary's airports, will provide the safest and most effective solution for all current and future users of the LETC. This option has a negligible impact on CO2 emissions, has no further noise impact than already present, nor does it negatively impact air quality or lifestyles of those under the flight paths. The Safety Matrix table below summarises.

	Option 1	Option 2	Option 3	Option 4
	RMZ	RMZ/TMZ	RMZ + Alter Size	RMZ/TMZ + Alter Size
Remove unknown aircraft	✓	✓	✓	✓
IAP's Included at Land's End	✗	✗	✓	✓
IAP's Included at St Mary's	✗	✗	✓	✓
Future users considered	✗	✓	✗	✓
ACAS compatible	✗	✓	✗	✓
Provides accurate position reports	✗	✓	✗	✓
Environmental Impact considered	✓	✓	✓	✓

6.3 During Stage 1 of this ACP we developed and finalised a set of Design Principles (DP) to be used throughout this whole process. See Appendix B for a full list of the finalised Design Principles.

6.4 DP9 states *"The airspace design shall consider operation by a single authority"*

The LETC has three air traffic control units involved in it and one air ground radio service and after discussing this DP with the other units involved, we have realised that this is something that will need to be considered fully at a later date due to the lack of available information at this time. And so, deciding how any future airspace may need to be operated will require careful planning and consideration by all parties.

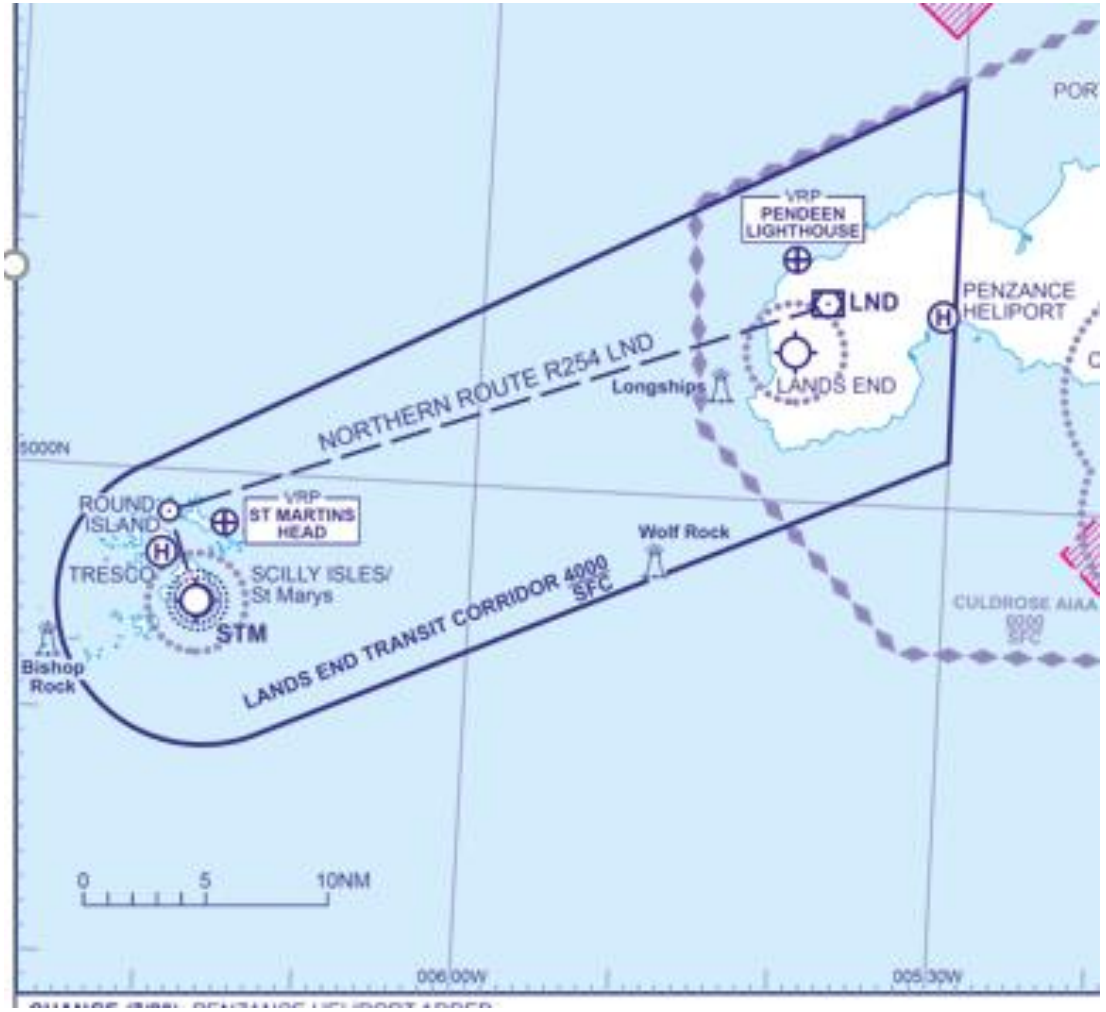
6.5 To aid us in considering this we are seeking stakeholder opinion and so space has been made in the consultation feedback form.

7 Conclusions and Next Steps

Having carefully assessed all the proposed options, we suggest that a Combined RMZ/TMZ coupled with increasing the size of the LETC around the IAPs at Land's End and St Mary's airports is the preferred solution. However, to enable complete engagement with stakeholders we will carry forward the following options to be consulted upon under Stage 3 of this proposal.

1. RMZ
2. Combined RMZ/TMZ
3. RMZ + Alter the size of the LETC
4. Combined RMZ/TMZ + Alter the size of the LETC (Preferred)

APPENDIX A



AIRAC AD 2-EGHC-3-1 Land's End Transit Corridor

Appendix B

Land's End Airport Ltd

Final Design Principles

DP1	The airspace design and its operation must be as safe or safer than today for all airspace users that are affected by the airspace change.
DP2	Subject to the overriding design principle of maintaining a high standard of safety, the highest priority principle of this airspace change is that it accords with the CAA's published Airspace Modernisation Strategy (CAP 1711) and any current or future plans associated with it.
DP3	Ensure that all airspace users, current & future, retain the ability to have safe and efficient access to the airspace.
DP4	Ensure that all possible technical solutions – both existing and emerging – are considered (e.g. RADAR, ADSB, MLAT, TCAS). The lifecycle cost of options shall be affordable to the Airport's and commercial operator's income, the equipment costs for GA and other users.
DP5	Controlled airspace options should ensure there is safe and efficient access for other types of operations, and should explore measures, including classification and flexible use of airspace, where possible and appropriate, to improve access and decrease airspace segregation.
DP6	Options should consider an RMZ and/or TMZ solution.
DP7	Ensure that any changes fully consider any environmental impact – to include noise, air pollution and social issues.
DP8	As feedback was received regarding the size of the airspace (some requesting a small volume and others a larger volume), both the height and breadth of the LETC will be fully considered.
DP9	The airspace design shall consider operation by a single authority.