LAND'S END AIRPORT

CAP 1616 – AIRSPACE CHANGE PROPOSAL

FOR THE

LAND'S END TRANSIT CORRIDOR (LETC)

-

STAGE 2 : DEVELOP & ASSESS

2B: OPTIONS APPRAISAL (PHASE 1 INITIAL)

ID : ACP-2019-75

LAND'S END AIRPORT

ACP SUBMISSION STEP 2B : OPTIONS APPRAISAL (PHASE 1 INITIAL)

SEPTEMBER 2020

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1. Introduction

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

1.2 This document aims to provide adequate evidence to satisfy Stage 2 Develop and Assess Gateway, Step 2B Options Appraisal (Phase 1 Initial), including Safety Assessment.

2. Change Level

2.1 The changes in this ACP mainly impact flights over the sea (the majority of the LETC is SW of Land's End Airport). Hence in accordance with the Levels as defined in CAP1616, it is expected that this proposal is categorised as a Level 2C change.

2.2 It is not anticipated that this change will have an adverse effect on CO2 emissions or noise impacts to stakeholders on the ground, therefore no further environmental impact assessments have been conducted.

3. Options Appraisal

Land's End airport utilises a risk register to keep track of the highest risks to business and safe operations at the airport. When taking into account the top 40 risks, the nature of the airspace in the LETC has featured continuously in the top 5. The airline that serves the Isles of Scilly, based at Land's End, also comprises a risk register and it's top 5 risks also have the LETC airspace design featuring highly.

We have looked at a number of available options for consideration with the aim of improving the airspace environment in which aircraft operate between Penzance, Land's End and the Isles of Scilly. These are detailed below.

3.1 Do Nothing

The "Do Nothing" option assumes that there are no mitigating design principles implemented.

Group	Impact	Level of Impact	Evidence
ATC / Airport	Resilience	Qualitative	No change to the existing traffic loading and support to aviation from present level
Commercial Operators	Access / fuel / safety	Qualitative	No change from present operation
General Aviation	Access / fuel / safety	Qualitative	No change from present operation
Military Operators	Access / safety	Qualitative	No change from present operation
Environment	Pollution / Noise	Qualitative	No extra flights or change in routing so no change from present operation
Local Communities	Noise levels	Qualitative	No extra flights or change in routing so no change from present operation

3.2 Obtain Radar feed from existing Radar unit

This option calls for Radar information to be fed into an Air Traffic Monitor (ATM) unit at Land's End Airport. Agreements and contracts would need to be entered into between all parties and specific tests and assurances made to ensure accuracy, reliability and availability. All ATCO's would need to be further trained in the use of the ATM and a renewal of ATCO currency and competency examination carried out by SARG.

Group	Impact	Level of Impact	Evidence
ATC / Airport	Resilience	Qualitative / Monetary	There would be greater scope for identification of traffic within the LETC, but there would be limitations imposed upon ATC, by the CAA, regarding the use of such information. ATM information would depend fully on the quality of the signals being received through the high-speed broadband feed and its reliability. Any down time with the Radar would mean a loss of signal to the ATM. There would be setup and ongoing maintenance costs for the airport
Commercial Operators	Access / fuel / safety	Qualitative / Monetary	Access would remain the same, however, there would be greater scope for identification of traffic in the LETC. Routing should stay the same so there would be no extra fuel burn. Any extra costs for the Radar feed may have to be recovered in extra charges to commercial aviation.
General Aviation	Access / fuel / safety	Qualitative / Monetary	Access to the LETC would remain the same for GA and routings shouldn't change so there would be no extra fuel burn. ATC would have the potential to provide greater accuracy in regard to traffic information. Any extra costs for the Radar feed may have to be recovered in extra charges to the GA community in the form of landing and fuel fees.
Military Operators	Access / safety	Qualitative	Access to the LETC would remain the same and it isn't anticipated that there would be any change in service to military traffic. They sometimes receive a BASIC service from Culdrose Radar when needed.
Environment	Air quality / Noise	Qualitative	The routing and number of aircraft wouldn't change so there is no anticipated increase in pollution or noise.

3.3 Install Radar

This option calls for the purchase and installation of a Radar system at Land's End airport. A suitable site would need to be found for the installation and necessary planning permissions obtained before any physical equipment could be installed. All ATCO's at Land's End would need to be trained and qualified in the use of Radar and a maintenance contract by an outside Air Traffic Engineering contractor entered into.

Group	Impact	Level of Impact	Evidence
ATC / Airport	Resilience	Qualitative / Monetary	ATC would be able to provide a higher level of service to participating aircraft and aid with sequencing and deconfliction.
Commercial Operators	Access / fuel / safety	Qualitative / Monetary	Access to the LETC would remain the same for commercial aviation and safety would be increased with the advent of more flight information services available. Any extra costs for the operation of the Radar may have to be recovered in extra charges to commercial aviation in the form of landing and fuel fees.
General Aviation	Access / fuel / safety	Qualitative	Access to the LETC would remain the same for GA and routings wouldn't change so there would be no extra fuel burn. ATC would be able to offer a range of flight information services thus improving safety for GA. Any extra costs for the operation of the Radar may have to be recovered in extra charges to the GA community in the form of landing and fuel fees.
Military Operators	Access / safety	Qualitative	Access to the LETC would remain the same and it isn't anticipated that there would be any reduction in service to military traffic, on the contrary they could obtain a Radar based flight information service for the entire LETC.
Environment	Air quality / Noise	Qualitative	Due to the installation of the Radar there would be a huge impact on the local environment in terms of visual aspect and potentially noise. The Radar would have to be sited in an elevated position and under normal operating conditions, the system would pose no hazard to the general public. There would however need to be areas made inaccessible to unauthorised people.

3.4 Class D controlled airspace

This option calls for the reclassification of the LETC from class G to class D airspace. All ATCO's would have to undergo further inhouse training to cover the airspace differences and a renewal of ATCO currency and competency examination carried out by SARG.

Group	Impact	Level of Impact	Evidence
ATC / Airport	Resilience	Qualitative	This would offer ATC a greater control over the LETC as all aircraft would need ATC clearance before entry and have to comply with instructions whilst inside the LETC.
Commercial Operators	Access / fuel / safety	Qualitative / Monetary	Access for commercial operators would be subject to ATC clearance. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins will be raised as all traffic in the LETC should be known and complying with ATC instructions.
General Aviation	Access / fuel / safety	Qualitative / Monetary	Access for GA traffic would be subject to ATC clearance. At peak traffic times it may be that not all requests for entry and routing can be granted. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins will be raised as all traffic in the LETC should be known and complying with ATC instructions.
Military Operators	Access / safety	Qualitative	Access for military traffic would be subject to ATC clearance. Most military aviation in and around the LETC takes place at very low level and so there is no anticipated restrictions, other than the need for clearance.
Environment	Air quality / Noise	Qualitative	Under normal circumstances the routing and number of aircraft wouldn't change so there is no anticipated increase in pollution or noise.

3.5 Class E controlled airspace

This option calls for the reclassification of the LETC from class G to class E airspace. All ATCO's would have to undergo further inhouse training to cover the airspace differences and a renewal of ATCO currency and competency examination carried out by SARG.

Group	Impact	Level of Impact	Evidence
ATC / Airport	Resilience	Qualitative	This would offer only partial control over the traffic as VFR aircraft do not need clearance to enter and thus there would still be an unknown traffic possibility.
Commercial Operators	Access / fuel / safety	Qualitative / Monetary	Access for commercial operators flying IFR would be subject to ATC clearance. Aircraft operating VFR need no clearance to enter. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins will not be raised significantly as there may still be unknown traffic in the LETC.
General Aviation	Access / fuel / safety	Qualitative / Monetary	Access for GA traffic flying IFR would be subject to ATC clearance. Aircraft operating VFR need no clearance to enter. At peak traffic times it may be that not all requests for IFR entry and routing can be granted. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins will not be raised significantly as there may still be unknown traffic in the LETC.
Military Operators	Access / safety	Qualitative	Most military aviation in and around the LETC operate under VFR at very low level and so there is no anticipated restrictions.
Environment	Air quality / Noise	Qualitative	Under normal circumstances the routing and number of aircraft wouldn't change so there is no anticipated increase in pollution or noise.

3.6 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 Impact	Evidence
ATC / Airport	Resilience	Qualitative	This would offer ATC a greater level of information regarding aircraft operating within the LETC as all aircraft would need to have and operate radio equipment. Contact with ATC would have to be made before entry into the LETC, however, a clearance would not be necessary.
Commercial Operators	Access / fuel / safety	Qualitative / Monetary	Access would remain the same for commercial operators as public transport flights must operate subject to minimum equipment requirements (MER), part of which is suitable two-way radio communication equipment. Letters of agreement for the LETC also state that these commercial operators must establish two-way communication with ATC and maintain a listening watch. Aircraft could depart from a site within the RMZ and establish two-way communications as soon as possible after departure, providing it was in accordance with a previously arranged letter of agreement. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins would be raised as there should now be no unknown traffic in the LETC.
General Aviation	Access / safety	Qualitative	Access to the LETC would be restricted to aircraft operating suitable radio equipment but since almost all general aviation aircraft are fitted with a radio, in actuality, this shouldn't prevent anyone from entering the LETC. Neither Land's End nor St Mary's airports accept non-radio aircraft to arrive or depart as part of their PPR. Aircraft could depart from a site within the RMZ and establish

			two-way communications as soon as possible after departure providing it was in accordance with a previously arranged letter of agreement. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins would be raised as there should now be no unknown traffic in the LETC.
Military Operators	Access / safety	Qualitative	All military aircraft are fitted with suitable radio equipment and follow a LOA when flying within the LETC that includes two-way radio communication with ATC.
Environment	Air quality / Noise	Qualitative	Under normal circumstances the routing and number of aircraft wouldn't change so there is no anticipated increase in pollution or noise.

3.7 Transponder Mandatory Zone (TMZ)

This option calls for the reclassification of the LETC to a TMZ. Exact size and boundaries of the TMZ would need to be agreed with adjacent ATCUs and operating agencies of the TMZ decided upon along with any standard SSR codes for aircraft operating within the LETC. All aircraft

Group	Impact	Level of Impact	Evidence
ATC / Airport	Resilience	Qualitative	This wouldn't offer Land's End ATC any real-time benefit as we are unable to utilise information from aircraft transponders. Radar units would receive more information regarding the aircraft operating within the LETC. Unapproved sources of surveillance data may be provided with more information, but ATC can only use such sites for forward planning and not to provide any type of air traffic service. The pilot of an aircraft that wishes to operate in a TMZ without such serviceable transponder equipment may be granted access to the TMZ subject to specific ATC

			approval. Contact with ATC would have to be made before entry into the LETC, however, a clearance would not be necessary. Workload for Land's End ATC would increase due to the need for greater and more frequent coordination with a Radar unit to confirm TMZ compliance.
Commercial Operators	Access / fuel / safety	Qualitative	Access would remain the same for commercial operators as public transport flights must operate subject to minimum equipment requirements (MER), part of which is suitable and operational transponder equipment. All aircraft within the TMZ would now be available to be interrogated by TCAS systems. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins would be raised for TCAS equipped aircraft as there should now be no unknown traffic in the LETC. Safety margins would not be raised for aircraft not fitted with TCAS.
General Aviation	Access / fuel / safety	Qualitative / Monetary	Access would be restricted to aircraft fitted with and operating a transponder in line with specific local procedures. There would be a monetary cost to pilots whose aircraft were not yet fitted with a transponder of around £2000. All aircraft within the TMZ would now be available to be interrogated by TCAS systems. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins would only be raised for TCAS equipped aircraft as there would still be the potential of an unknown traffic element with in LETC.
Military Operators	Access / safety	Qualitative	All military aircraft are fitted with suitable transponder equipment so access should remain the same.

Environment	Air quality / Noise	Qualitative	Under normal circumstances the routing and number of aircraft wouldn't change so there is no anticipated increase in pollution or noise.

3.8 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 Impact	Evidence
ATC / Airport	Resilience	Qualitative	This would offer ATC a greater level of information regarding aircraft operating within the LETC as the RMZ part of this combination would entail all aircraft being in two-way communication with ATC before entry and whilst flying within the LETC. Aircraft could depart from a site within the RMZ and establish two-way communications as soon as possible after departure, providing it was in accordance with a previously arranged letter of agreement. The TMZ part of this combination would provide Radar units with more information regarding the aircraft operating within the LETC. Unapproved sources of surveillance data may be provided with more information, but ATC can only use such sites for forward planning and not to provide any type of air traffic service. The pilot of an aircraft that wishes to operate in a TMZ without such serviceable transponder equipment may be granted access to the TMZ subject to specific ATC approval. Contact with ATC would have to be made before entry into the LETC in order to fulfil the RMZ requirement, however, a clearance would not be necessary. Workload for Land's End ATC could be kept to an acceptable level by entering into a LoA with Radar units

			regarding transponder use, providing two-way radio communication existed.
Commercial Operators	Access / fuel / safety	Qualitative	Access would remain the same for commercial operators as public transport flights must operate subject to minimum equipment requirements (MER), part of which is suitable and operational transponder and radio equipment. All aircraft within the RMZ/TMZ would now be available to be interrogated by TCAS systems. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins would be raised for all aircraft as there should now be no unknown aircraft operating within the LETC.
General Aviation	Access / fuel / safety	Qualitative / Monetary	Access would be restricted to aircraft fitted with and operating a transponder in line with specific local procedures and in two-way radio communication with ATC. There would be a monetary cost to pilots whose aircraft were not yet fitted with a transponder of around £2000. Aircraft could depart from a site within the RMZ and establish two-way communications as soon as possible after departure providing it was in accordance with a previously arranged letter of agreement. An arrangement could also be agreed regarding the unserviceability of transponder equipment. All aircraft within the TMZ would now be available to be interrogated by TCAS systems. There shouldn't be any need to alter routing, but this can't be ruled out so may result in changes in planned fuel burn. Safety margins would be raised for all aircraft as there should now be no unknown aircraft operating within the LETC.

Military Operators	Access / safety	Qualitative	All military aircraft are fitted with suitable transponder equipment so access should remain the same.
Environment	Air quality / Noise	Qualitative	Under normal circumstances the routing and number of aircraft wouldn't change so there is no anticipated increase in pollution or noise.

3.9 Automatic Dependent Surveillance – Broadcast (ADS-B)

ADS-B is a surveillance technology in which an aircraft determines its position via satellite navigation and periodically broadcasts it, enabling it to be tracked. The information can be received by air traffic control ground stations. ADS–B is "automatic" in that it requires no pilot or external input. It is "dependent" in that it depends on data from the aircraft's navigation system. (https://en.wikipedia.org/wiki/Automatic_dependent_surveillance_%E2%80%93_broadcast)

This option calls for the installation of an ADS-B receiver at the airport. At present this technology is on trial in the UK and not available for air traffic control use. It would be limited to providing planning information only.

Group	Impact	Level of Impact	Evidence
ATC / Airport	Resilience	Qualitative	As not all aircraft are ADS-B equipped there would be no change to the existing traffic loading and support to aviation from present level.
Commercial Operators	Access / fuel / safety	Qualitative	No change from present operation
General Aviation	Access / fuel / safety	Qualitative	No change from present operation
Military Operators	Access / safety	Qualitative	No change from present operation
Environment	Pollution / Noise	Qualitative	No extra flights or change in routing so no change from present operation

4. Stakeholder Feedback Received

Land's End Airport has identified potential stakeholders and engaged with them from the beginning of this process and during stage 2A gave all stakeholders an opportunity to respond.

Stakeholders were encouraged to provide comment on a feedback form included/attached to the letter/email sent out in stage 2A. The letter/email was sent out on the 4th September 2020, an email reminder with an updated document link sent on the 7th September 2020 and a final reminder email sent on the 9th September 2020. We asked that all responses were with us no later than 1230 on 11th September 2020.

The feedback response was very good – a total of 17 different organisations responded from a variety of backgrounds – Commercial Operators, GA organisations, Flying School/Clubs, Gliding/Hang-Gliding Clubs, Environmental Groups, local councils and adjacent ATC Units (both civil and military).

The feedback received is summarised in the document "Step 2A – Stakeholder Feedback". Where a question was raised by a stakeholder Land's End Airport has sought to address this in the first instance and when appropriate developed the option accordingly. Any changes or additions to the safety assessment have been highlighted in red.

5. Safety Assessment Updated

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, RNAV (GNSS) + 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 – Obtain Radar Feed

Surveillance information could be obtained from an approved source and displayed in the VCR on a small Radar screen called an Air Traffic Monitor. ATCO's could then use this information in an approved manner to provide extra guidance and information to aircraft flying within the LETC. The ANSP would have to approach one of the local Radar units, RNAS Culdrose or Newquay Cornwall Airport or both, and investigate the possibility of obtaining a real-time Radar feed.

Points to be considered with this are

- Approval from the CAA
- Compliance with all EASA and CAA legislation
- Integrity of the Radar feed
- Latency (Time lag between gathering and displaying information)
- Periods of availability of the Radar feed
- Installation costs (Upgrading broadband, Radar display equipment, etc)
- Radar information costs (contract with the Radar unit)
- Maintenance contract with existing ATE organisation
- Training costs for ATC staff (COVID 19 restrictions have currently made the availability of college-based training unpredictable)
- Radar coverage at lower levels in the LETC may not be consistent/reliable (Commercial and Military flights often fly at 500ft, 1,000ft and 1,500ft in the LETC)

Introducing a real-time Radar feed to Land's End would be an option if costs could be controlled but in this time of economic uncertainty it would be unwise to enter into what would likely be a large initial and moderate ongoing costs without any reliable way to make these costs meet the business model.

Since many of these costs are still unknown and likely to be greater than the airport could sustain 'Obtain a Radar feed' is not a viable option.

5.3 Options Appraisal Safety Assessment – Install Radar

Installing a Radar system at Land's End would allow ATC to offer a higher level of service to aircraft flying in the LETC. A suitable location would need to be found to site the Radar antenna with considerations made for safety of the public on the ground, high ground causing blind spots on the Radar display and overall effective Radar coverage of the LETC.

Points to be considered with this are

- Approval from the CAA
- Compliance with all EASA and CAA legislation
- Suitable location for the Radar antenna
- Planning permissions
- Environmental impact
- Training at the ATC college for ATCO's (Circa £80k) (COVID 19 restrictions have currently made the availability of college-based training unpredictable)
- Purchase and installation costs (Circa £2M)
- Maintenance contract with existing ATE organisation

The environmental impact of constructing and operating a Radar at Land's End would be considerable in terms of visual impact, safety of the public, and noise of operation (Radar antenna rotate and so there is some noise impact although this may be low). The costs involved in purchase, installation, staff training and maintenance of the Radar unit would place undue financial burden on Land's End airport and so 'Install Radar' is not a viable option.

5.4 Options Appraisal Safety Assessment – Class D Airspace

Class D is a type of controlled airspace where all flights wishing to operate within it need to obtain a clearance before entry and whilst inside comply with ATC instructions. This should eliminate all unknown traffic from the LETC and thus increase safety margins for all operators equally. Flights can be conducted under IFR or VFR or SVFR day or night.

Points to be considered with this are

- All flights would need a clearance to enter the LETC
- Land's End ATC (Aerodrome "Tower" Control Service (ADI)) is only permitted to operate one IFR aircraft at a time
- Land's End ATC may not be permitted to operate IFR and SVFR flights at the same time
- Military traffic may be more restricted than they are at present due to having to comply with specific ATC instructions
- A new LOA with RNAS Culdrose would be needed and take into consideration the overlap of the LETC and the Culdrose AIAA

There are many plusses to having the LETC designated class D controlled airspace but also a few rather large hurdles to tackle as well. Land's End ATC is restricted to handling one IFR aircraft at a time and so this would bring in to question the real benefit of the airspace reclassification as multiple frequencies may have to be utilised to accommodate traffic in the same geographical area. This would present safety and timing issues regarding co-ordination between ATC units.

All flights would need an ATC clearance to enter the airspace and so during periods of high workload may result in delays and restrictions to GA and commercial flights alike. All in all, because of the LETC ending up in a far more complex state that it is 'Class D Airspace' in not a viable option.

5.5 Options Appraisal Safety Assessment – Class E Airspace

Class E is a type of controlled airspace where all IFR flights wishing to operate within it need to obtain a clearance before entry and whilst inside comply with ATC instructions. VFR flights do not need this clearance and so there would still be an unknown traffic element. Flights can be conducted under IFR or VFR day or night.

Points to be considered with this are

- IFR flights would need ATC clearance to enter the LETC
- Land's End ATC is only permitted to operate one IFR aircraft at a time
- VFR flights could still enter the LETC without clearance or radio contact

Class E airspace doesn't eliminate the possibility of unknown traffic in the LETC and so 'Class E Airspace' is not a viable option.

5.6 Options Appraisal Safety Assessment – 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. If a pilot cannot establish 2-way communication with ATC then he 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)**
- Legislation that the UK CAA has adopted from the EU regarding RMZ can be located following this link https://www.legislation.gov.uk/eur/2012/923/annex/section/6/division/sera.6005/adopted

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.

5.7 Options Appraisal Safety Assessment – Transponder Mandatory Zone (TMZ)

CAP 1391 is published by the CAA to highlight the benefits and reasons behind aircraft operating with electronic conspicuity (EC). At the most basic level, aircraft equipped with an EC device effectively signal their presence to other airspace users, turning the 'see and avoid' concept into 'see, BE SEEN, and avoid.'

Should the LETC be reclassified as a TMZ then all aircraft wishing to operate within would have to operate a transponder in accordance with promulgated ATC procedures. A pilot wishing to operate within the TMZ without a transponder may be granted permission to do so under certain ATC approval, if not then he would have to remain clear of the TMZ.

A number of different types of aircraft are now fitted with TCAS (Traffic Collision Avoidance System), a system where another aircraft's transponder is interrogated, and information received regarding bearing and altitude and whether this aircraft poses a potential proximity risk. If all aircraft operated a transponder in the LETC, other aircraft fitted with a TCAS system would benefit.

Land's End ATC is unable to utilise information from transponders other than viewing an unapproved source of surveillance information (e.g. FlightRadar24). An ATC unit cannot use an unapproved source for anything

other than forward planning and so could not pass any information viewed on this source to an aircraft on its frequency.

It is possible that aircraft may comply with the requirements of the TMZ but still not be in 2-way radio contact with ATC and thus Land's End ATC may not be aware of certain traffic until notified by another ATC unit. For Land's End ATC to confirm compliance with the TMZ every flight would need to be coordinated with a Radar unit, thus increasing the workload to what may become an unmanageable level. Safety margins may therefore be degraded, and the level of service reduced. (The need for allocation of codes and verification of such was raised by a stakeholder and would need to be addressed at an early stage. Land's End will seek appropriate professional/regulatory advice on this)

The establishment of a TMZ, on its own, would increase work levels at Land's End and may reduce safety and service levels and so 'Transponder Mandatory Zone (TMZ) is not a viable option.

5.8 Options Appraisal Safety Assessment – 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 TCAS system could provide any relevant alerting information. Having both these elements combined should remove the potential of unknown traffic operating within the LETC.

(See notes from 5.6 (RMZ) and 5.7 (TMZ))

The benefits of removing unknown traffic from the LETC and increasing the usefulness of TCAS systems makes 'Combined RMZ/TMZ' a viable option.

5.9 Options Appraisal Safety Assessment – ADS-B

The installation of an ADS-B receiver at the airport would not introduce any large costs and could be carried out relatively simply. TCAS systems do not gather the same amount of information from ADS-B signals and thus would not trigger safety alerts but rather only give more information to potentially enhance situational awareness.

However, because the technology is currently on trial in the UK this wouldn't provide Land's End ATC with a timely solution. Therefore, until these trials are complete and a National policy has been confirmed, further enhancement to safety using 'ADS-B' is not a viable option at present.

(Land's End Airport is open to following the progress of this technology with a view to utilising it in the future if and when it becomes approved for ATC use within our existing capacity)

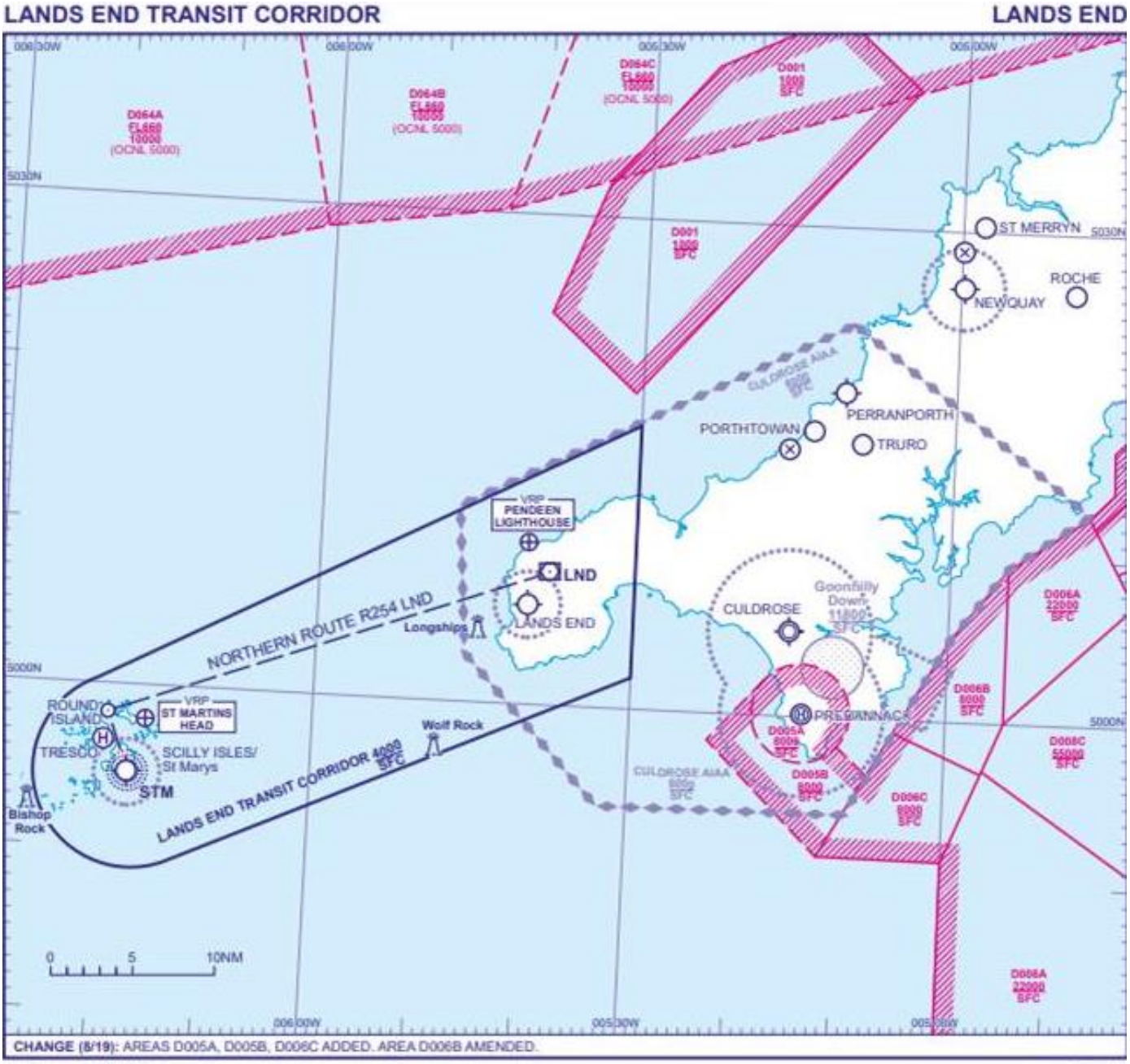
6. Safety Assessment Conclusion Updated

After considering the above, listening to and including stakeholder feedback comments in the further development of the proposal it is concluded that there is no change to the initial conclusion of the establishment of an RMZ being the minimal option with the preferred being the establishment of a Combined RMZ / TMZ. It is the opinion that this will provide safe and efficient mitigation to any present safety concerns and increase safety margins for all airspace users of the LETC.

7. Conclusions and Next Steps

Since none of the other options deliver the same sustainable and beneficial increase in safety the options of 'Radio Mandatory Zone' and 'Combined RMZ / TMZ' will be carried forward to consultation.

APPENDIX A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FL660
10000
(OCNL 5000)
D064C
FL660
10000
(OCNL 5000)
D001
1000
SFC
ST MERRYN
NEWQUAY
ROCHE
PERRANPORTH
PORTHTOWAN
TRURO
VRP
PENDEEN
LIGHTHOUSE
LND
LANDS END
Longships
NORTHERN ROUTE R254 LND
CULDROSE
Goonhilly
Down
11500
SFC
D006A
22000
SFC
D006B
6000
SFC
D005A
6000
SFC
D005B
6000
SFC
D006C
6000
SFC
D006C
55000
SFC
CULDROSE AIAA
6000
SFC
ROUND
ISLAND
VRP
ST MARTINS
HEAD
TRESCO
SCILLY ISLES/
St Marys
STM
Bishop
Rock
Wolf Rock
LANDS END TRANSIT CORRIDOR 4000 SFC
0
5
10NM
CHANGE (8/19): AREAS D005A, D005B, D006C ADDED. AREA D006B AMENDED.
AERO INFO DATE 01 MAY 19
AD 2-EGHC-3-