NATS

Performance
through Innovation

LAMP Phase 1A

Airspace Change Proposal - Module A

London Stansted Airport: Departure Route Proposal

Issue 2.1
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Prepared by:

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Airspace Change Assurance

Issue	Month/ Year	Changes in this issue
Issue 1	November 2014	
Issue 2	February 2015	Updated with cross references to system wide traffic and CO_2 analysis presented in the bridging ACP. Format changes to cover sheet and headings to match the rest of LAMP 1A ACP package. Text changes marked in red text
Issue 2.1	April 2015	Corrected referencing errors. All changes marked in blue

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1 Introduction

This is a NATS proposal, supported by Stansted Airport.

Flights that currently depart Stansted Airport towards Kent (south east) are becoming more inefficient as the airspace they fly through becomes more congested. This proposal seeks to place most of these flights onto the existing eastbound departure routes, so that they may avoid the congestion; this would reducing the risk of delay, reduce fuel consumption and the amount of CO_2 generated.

A CO_2 saving of 6,400-14,900 tonnes per annum was initially estimated using conservative assumptions. Updated fuel and CO2 estimates are provided with the bridging ACP.

There would also be overall noise benefits since the aircraft would be able to climb more quickly and people beneath the current departure route would be overflown less; however, people beneath the eastbound departure route would be overflown more often.

This change would also ensure that the Stansted Airport operation fits into a wider programme of change to the use of airspace structures supporting airports in South East England. It is an enabler for the implementation of Point Merge at London City Airport

2 How to Read this Airspace Change Proposal

This document forms Module A of the LAMP Phase 1 ACP package. The structure of the ACP is shown in Figure 1 below. (This document highlighted in red).

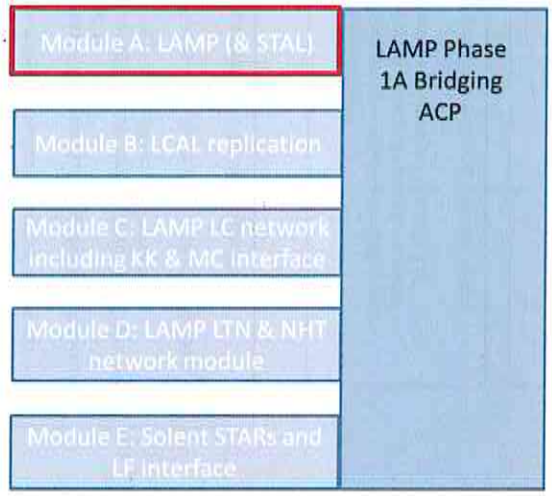

Figure 1: LAMP Phase 1 ACP structure

Much of the evidence of meeting CAP725 requirements has already been documented in other consultation and technical documents.

This ACP document is designed to be a reference document to demonstrate compliance with CAP725 requirements. As such it provides cross references to relevant evidence where it exists elsewhere, as well as presenting some additional detail where required.

Whilst this proposal has been designed so it could stand alone, it forms part of the LAMP set of ACPs which will meet CAP725 requirements for the whole of the LAMP Phase 1A airspace development. Note that in this ACP document, where an 'Appendix' is referenced without a Prefix, it relates to an Appendix of this ACP and is therefore found appended to the end.

The document map below details the reference documents for all modules of the ACP.

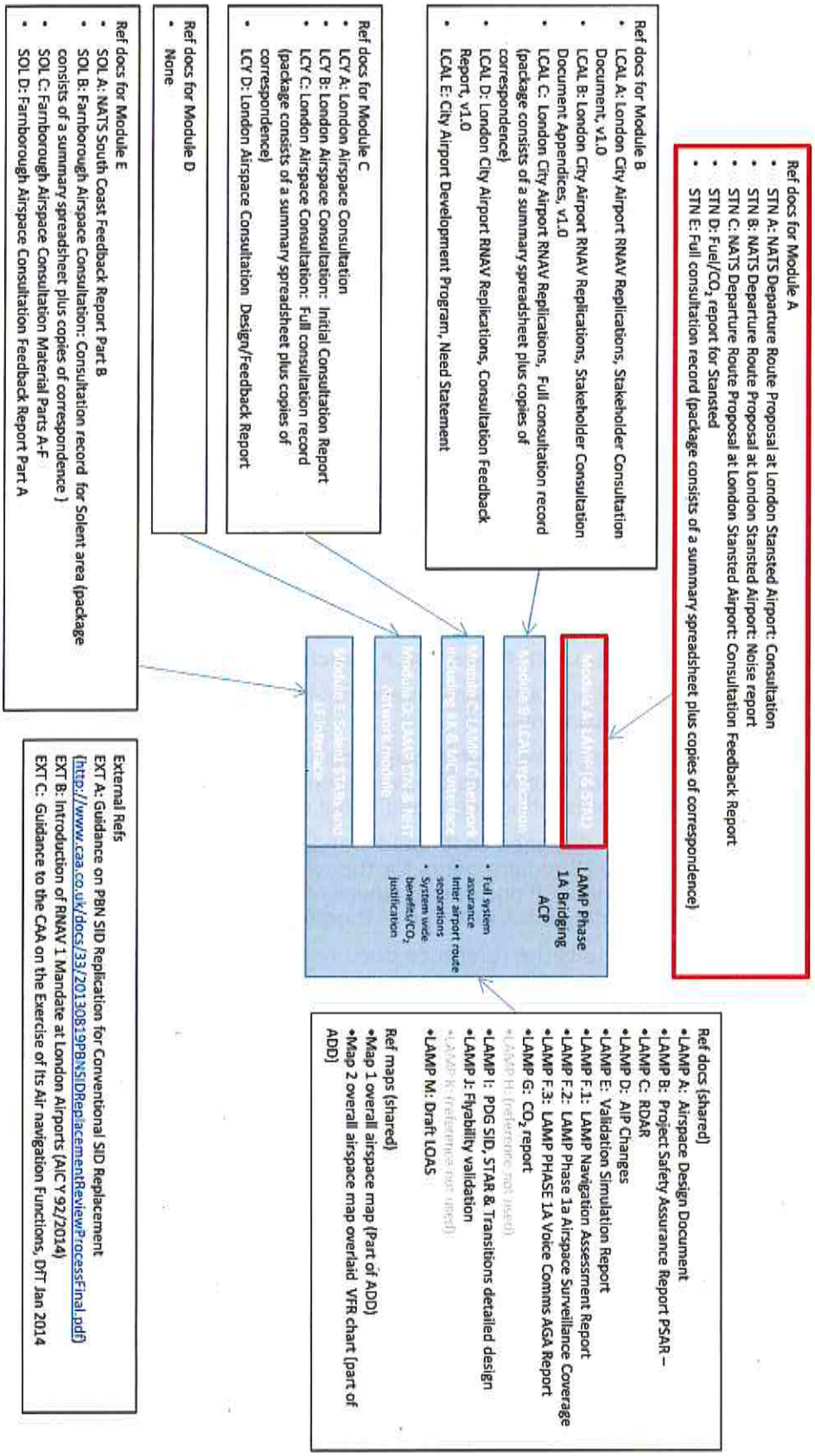

Figure 2: Document Map & References

3 Justification

The consultation document describes the justification for the proposal in detail, see STN A Section 5.

4 Current Airspace Description

4.1 Existing Airspace & Traffic Routings

See STN A Section 5 pages 11-14

4.2 Traffic Figures

See Bridging ACP (the equivalent paragraph number to this para) and STN A Figure 3 page 14.

4.3 Aircraft Types

See Bridging ACP (the equivalent paragraph number to this para) and STN A Appendix C page 34

4.4 Operational Efficiency, Complexity, Delays & Choke Points

The operational efficiency of the DET SID is constrained as a consequence of its interaction with Heathrow arrivals and other traffic flows to the south of the airport.

See STN A Section 5 pages 11 -13 for details.

Stansted departure delays can occur as the consequence of conditional release of STN DET departures; this is conditional on conflicting traffic on the LTN and NHT DET SIDs which fly the same radial to DET and are also held down to cross the LHR arrivals stream into the Lambourne hold.

4.5 Environmental Issues

The environmental efficiency of the DET SID is constrained as a consequence of its interaction with Heathrow arrivals and other traffic flows to the south of the airport.

See STN A Section 5 pages 11 - 13 for details.

5 Proposed Airspace Description

5.1 Objectives/Requirements for Proposed Design

The objective is to improve environmental and operational efficiency for Stansted DET departures. The proposed solution is to switch traffic from the constrained DET SIDs onto the less constrained CLN SIDs, and link the CLN SID to the original routing at KONAN on (U)L607 at a higher FL. See STN A Section 2 pages 2-4 and STN A Section 5 pages 11- 13 for details.

It should be noted that the SIDs that are the subject of this proposal are already in existence and are currently being flown by the airlines without restriction, meaning that the number of flights on each SID is not constant. Regardless of this proposal the number of flights on each route could change as traffic volumes and patterns vary over time.

5.2 Proposed New Airspace/Route Definition & Usage

Draft AIP data relating to the ENR section of the AIP (such as coordinates, true tracks, CAS bases etc) will be supplied in full with the LAMP bridging ACP (LAMP D).

SID Requirements

There would be no change to DET or CLN design.

Minor text amendments are required to the SID plates (see Appendix B).

SID usage would be restricted by the following RAD restrictions;

.....

CLN

Not available for traffic

DEP EGSS/SC

Via KONAN

2300-0600 UTC winter (1hr earlier in summer)

.....

DET

Not available for traffic

DEP EGSS/SC

Via KONAN

0600-2300 UTC winter (1hr earlier in summer)

.....

The existing LYD SID will remain in use as today.

ATS Route Requirements

A new link route is required to join CLN to KONAN for UL607. This link would be (U)M84 as shown below.

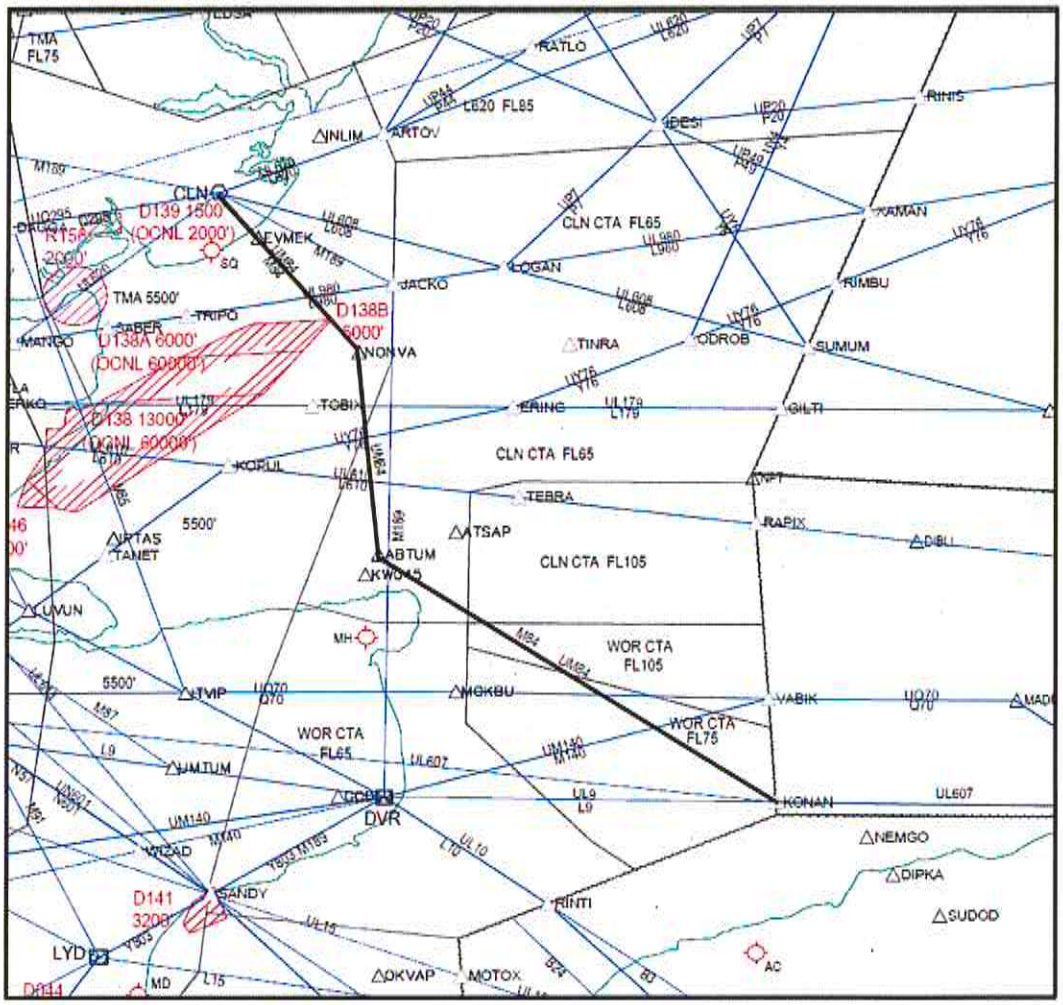

Figure 3 Proposed Link Route

(U)M84 is to be defined eastbound RNAV5 available H24/365

The airway will be defined with width 5nm either side of:

CLN – EVMEK (new) – NONVA (new) – ABTUM (new) – KONAN.

EVMEK would be used by ATC to tactically position aircraft when there are potential conflicts such as London City or Biggin Hill arrivals from the NW, and eastbound LTMA departures.

A concentration of traffic is not expected on the CLN – EVMEK track because it will not always be used, and tracks will generally be turned south earlier – see para 5.4 below on tactical usage.

The alignment of (U)M84 cannot go direct between NONVA and KONAN because of an interaction with Gatwick arrivals. These currently route via ERING and TEBRA to TANET, but will be changed as part of the LAMP Bridging ACP to route ERING and TEBRA to ABTUM. The position of ABTUM, which gives the kink in the (U)M84, provides additional track distance to enable Stansted departures to climb and Gatwick arrivals to descend such that the conflict at ABTUM is resolved, this would not be the case if (U)M84 was a direct route between NONVA and KONAN. In addition S15 also must transfer LTMA departures to MAAS/BRU by 10nm east of DVR. If they route NONVA – KONAN they wouldn't enter S15 until they were already 10nm east of DVR.

CAS requirements

No CAS changes are required by the Stansted SID proposal.

5.3 Procedural Usage

The Stansted southbound traffic using the CLN SID would be procedurally separated from the Heathrow arrivals by the TCE sector group: Stansted departures would climb FL130 level CLN before turning south, whilst Heathrow arrivals descend FL160 level SABER.

Aircraft will be transferred to S15 at prior to ABTUM FL200 level by ABTUM.

S15 will be transferred to MUAC (FL250 or above) or BRU (FL240 and below) at a coordinated level.

5.4 Tactical Usage

Whilst the procedural separation would keep the Stansted departures below the Heathrow arrivals, in practice most Stansted arrivals are expected climb sufficiently to get above the Heathrow arrivals. When this is the case they will be tactically turned off the CLN SID on a southerly heading when they are sufficiently above any conflicting Heathrow traffic.

Variation in climb performance and conflicting Heathrow traffic will result in a spread of flights turning south from the CLN SID. This spread will be from abeam BRAIN (note that BRAIN is just south of the SID rather than on it; its use in this ACP is simply as a reference point) out to CLN. The tactical turn south will generally be at levels between FL150 and 200- see Figure 2 overleaf showing data taken from the Real Time simulation.

Figure 2 demonstrates that only a very small proportion of Stansted departures are expected to be held at beneath FL150 to cross the Heathrow arrivals (ie there is only one aircraft that does this in the real time sample shown overleaf – represented by the red dot in the mouth of the estuary to the east of Southend).

5.5 Forecast Usage

All the traffic numbers in this ACP Module and referenced documents relate to a baseline of 2012 traffic +20% illustrating a possible 2016 scenario, and 2012+40% illustrating a possible 2020 scenario (see STN A para 3.14 and STN C feedback report para 5.15).

See STN A Figure 4 on page 15 for details of forecast route usage.

System wide traffic data is provided in the Bridging ACP.

No changes to the fleet mix are expected as a result of this proposal.

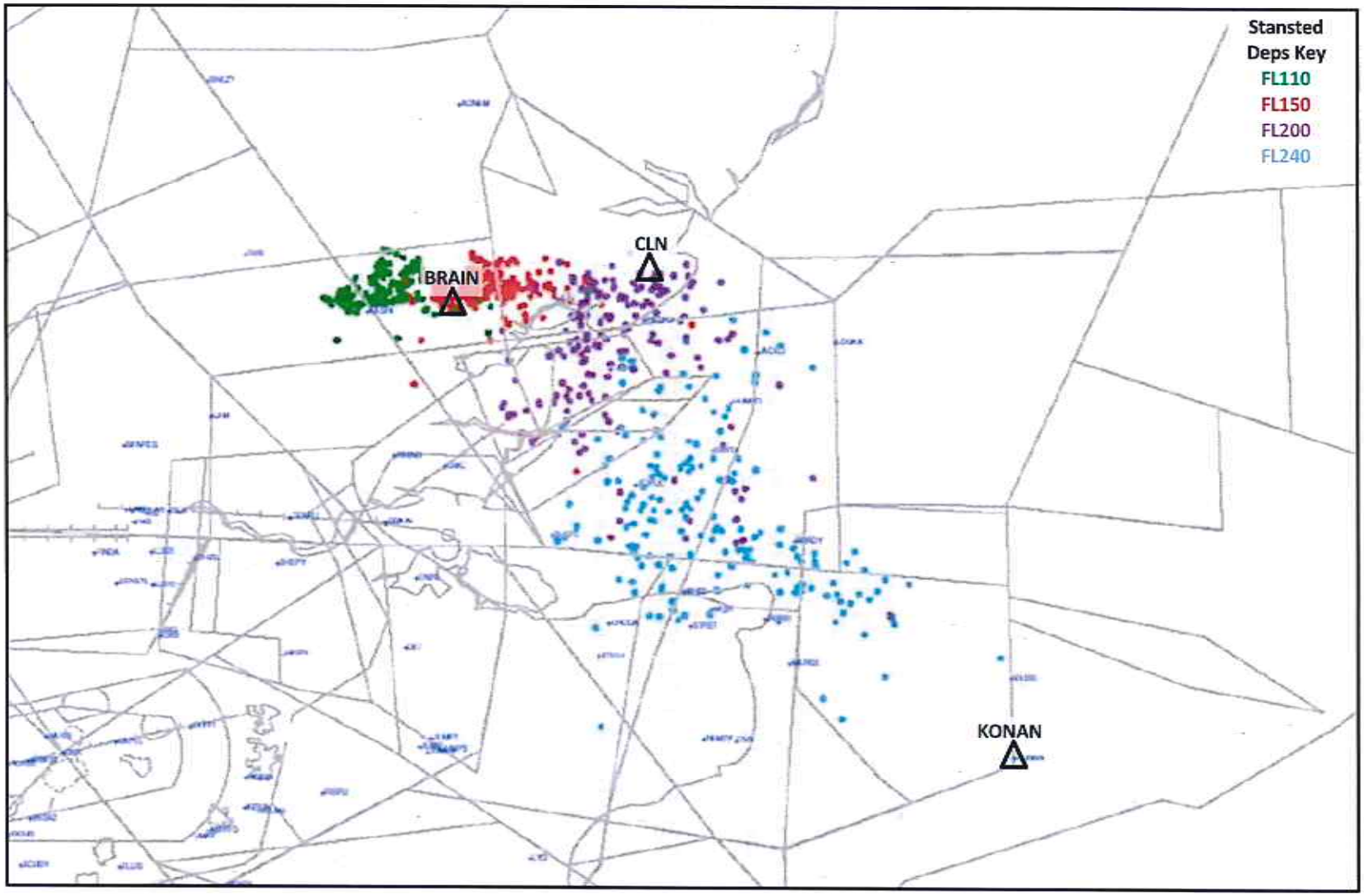

Figure 2: Plot from real-time simulation showing Stansted departures passing FL110, FL150, FL200 and FL240

6 Impacts & Consultation

6.1 Units Affected by the Proposal

This proposal affects Stansted Airport and London Terminal Control, Swanwick. The proposal is sponsored by NATS and supported by Stansted Airport Limited.

6.2 Safety Issues/Analysis

As this proposal utilises existing SIDs which operators are free to file today, no safety issues have been identified with this change in SID allocation.

The proposed SID allocation and link routes have been simulated in the context of the wider LAMP Phase 1A changes, including the point merge for London City. The simulation plot shown in Figure 2 shows that aircraft on this route will be under tactical control.

Full safety analysis and RSAD for (U)M84 in the context of Phase 1A will be provided as part of the bridging ACP (this will include the LAMP 1A simulation report PSAR and RSAD – references LAMP B and LAMP C).

6.3 Military Implications & Consultation

As this change is contained wholly within existing controlled airspace and does not impact the operation of Northolt departures, the UK MoD has raised no objection to this change (see Appendix A).

6.4 General Aviation Airspace Users Impact & Consultation

As this change is contained wholly within existing controlled airspace there will be no effect on general aviation. There was no significant feedback from GA (see STN C).

6.5 Commercial Air Transport Impact & Consultation

The Commercial Air Transport (CAT) community is supportive of this change, citing the benefits listed with the consultation document (see STN C).

6.6 CO_2 Environmental Analysis Impact & Consultation

See STN D for modelled fuel/CO_2 details per flight as per consultation.

~~The analysis of CO2 per flight is provided in STN C.~~

This analysis quotes a saving per flight in the range of 120kg to 205kg based on conservative assumptions.

See STN A for details of the resulting CO2 saving for the fleet based on the consultation traffic figures.

This method provides an estimate of enabled fuel saving as the modelled routes are the flight plan routes. This does not take into account tactical variations in lateral tracks. In today's airspace aircraft are often turned towards DVR from the southbound track before reaching DET (see ref doc A appendix F). In the proposed design aircraft that are climbing well on the CLN track would similarly be expected to be turned south before reaching CLN (see section 5.3). These effects are broadly expected to cancel out.

However, we have taken a conservative approach to the numbers we have declared, reducing the overall average fuel saving presented in the consultation document (reference STN A) to 100-200kg per flight. STN A also translates the fuel saving per flight into an estimate of the fleet wide fuel and CO2 saving for the 2012+20% and 2012+40% scenarios – see Para 5.5).

A number of challenges to our CO2 figures were made in the consultation - see STN C para 5.16 for details.

This proposal would also enable wider savings as it is a dependency for the London City Airport changes planned as part of the wider LAMP phase 1A. The full phase 1A CO2 benefits will be presented in the LAMP Bridging ACP. However, we are presenting the Stansted proposal as a stand alone change here as we believe that the benefits to the Stansted operation alone will provide sufficient justification for making the Stansted changes, regardless of whether the rest of LAMP phase 1A is progressed.

Note also that a system wide assessment of LAMP1A fuel and CO2 implications has been undertaken. This analysis has used updated traffic samples and as a system wide analysis this has used different underlay assumptions regarding traffic volumes – the results and reasons for the differences are presented in the bridging ACP.

6.7 Local Environmental Impacts & Consultation

See STN A Section 6 pages 16 to 28 for impacts and STN C (in particular STN C para 5.8 to 5.23.

A number of environmental questions were raised through the consultation. We have considered and answered them in STN C - see Sections 4 and 5 for details

6.8 Economic Impact

NATS is not aware of any established methodology that is widely accepted as providing a complete and robust economic valuation of the environmental impacts of changes to airspace structure. Furthermore, NATS will not base the case for change on an economic valuation of environmental impact and therefore does not propose to attempt to provide or develop such analysis for this ACP.

7 Analysis of Options

7.1 Do Nothing

The current operation could be maintained however the benefits for the Stansted operations described in this document would not be realised.

It would also prevent the implementation of LAMP changes for London City Airport as part of the wider LAMP phase 1A.

7.2 Implement the Change as Described

The benefits and impacts described within the consultation document would be implemented (see STN A).

7.3 Make Changes to Route Alignments

Making changes to route alignments was out of scope of this particular proposal.

See STN C para 4.3

8 Airspace Description Requirement

CAP 725, Appendix A Paragraph 5, provides a list of requirements for a proposed airspace description. These are listed below:

	CAA CAP725, Appendix A paragraph 5 Requirement. "The proposal should provide a full description of the proposed change including the following:"	**Description for this Proposal**
a	The type of route or structure; e.g. Airway, UAR, Conditional Route, Advisory Route, CTR, SIDs/STARs, Holding Patterns, etc;	See Section 5
b	The hours of operation of the airspace and any seasonal variations;	See Section 5
c	Interaction with domestic and international en-route structures, TMAs or CTAs with an explanation of how connectivity is to be achieved. Connectivity to aerodromes not connected to CAS should be covered;	See Section 5

d	Airspace buffer requirements (if any);	The safety buffers for MOD operation within Shoeburyness are wholly contained within the lateral limits of the Danger Areas. The existing L980 airway is approximately 2.7nm from D138A at its closest point. The current SPEAR 1B STAR for LCY is approximately 1.2nm from D138 at its closest point. The existing Y76 airway is approximately 2.7nm from D138 at its closest point. These airways and STARs currently remain open regardless of Shoeburyness Danger Area activity. The proposed RNAV5 airway M84 is 2.6nm from D138A at its closest point. D138B is only ever active up to 5000ft, beneath the base of Controlled Airspace. The SS DVR SID and proposed airway M84 is procedurally separated from D138B. When Shoeburyness is active at regular levels (up to FL120) it will be common place for SS departures to be routed over the top of the Danger Areas direct to ABTUM (from after BRAIN see para 5.4). When Shoeburyness is notified as high (1-2 times per year), SS departures will be left on their route and radar monitored to ensure route conformance against Shoeburyness Danger Areas.
e	Supporting information on traffic data including statistics and forecasts for the various categories of aircraft movements (Passenger, Freight, Test and Training, Aero Club, Other) and Terminal Passenger numbers;	See Section 4
f	Analysis of the impact of the traffic mix on complexity and workload of operations;	Not applicable (no impact)
g	Evidence of relevant draft Letters of Agreement, including any arising out of consultation and/or Airspace Management requirements;	The Stansted change and introduction of (U)M84 does not affect any LOAs (the wider Phase LAMP phase 1A will affect the MUAC LOA – this will be supplied when the relevant changes are specified in the bridging ACP as part of LAMP A)

h	Evidence that the Airspace Design is compliant with ICAO Standards and Recommended Practices (SARPs) and any other UK Policy or filed differences, and UK policy on the Flexible Use of Airspace (or evidence of mitigation where it is not);	The routings, as described in Section 5, are compliant with the required standards and policies
i	The proposed airspace classification with justification for that classification;	There are no proposed changes to airspace classification
j	Demonstration of commitment to provide airspace users equitable access to the airspace as per the classification and where necessary indicate resources to be applied or a commitment to provide them in-line with forecast traffic growth. 'Management by exclusion' would not be acceptable;	There are no proposed changes to CAS relating to this module of the LAMP Phase 1 A ACP
k	Details of and justification for any delegation of ATS.	There are no proposed changes to delegation of ATS relating to this module of the LAMP Phase 1 A ACP

9 Operational Impact

CAA CAP725, Appendix A Paragraph 7, provides a list of requirements for operational impact. These are listed below:

	CAA CAP725, Appendix A paragraph 7 requirements. "An analysis of the impact of the change on all airspace users, airfields and traffic levels must be provided, and include an outline concept of operations describing how operations within the new airspace will be managed. Specifically, consideration should be given to:"	**Evidence of Compliance/Proposed Mitigation**
a	Impact on IFR General Air Traffic and Operational Air Traffic or on VFR General Aviation (GA) traffic flow in or through the area;	No IFR GA impact No OAT impact See paras 6.3, 6.4 and 6.5 on page 14
b	Impact on VFR operations (including VFR Routes where applicable);	No VFR impact See para 6.4 on page 14
c	Consequential effects on procedures and capacity, i.e. on SIDS, STARS, and/or holding patterns. Details of existing or planned routes and holds;	See Sections 5 and 6
d	Impact on aerodromes and other specific activities within or adjacent to the proposed airspace;	No impact See Sections 5 and 6
e	Any flight planning restrictions and/or route requirements.	RAD restriction See para 5.2

10 Supporting Infrastructure & Resources

CAA CAP725, Appendix A Paragraph 6, provides a list of requirements for supporting infrastructure/resources. These are listed below:

	CAA CAP725, Appendix A Paragraph 6, general Requirements	**Evidence of Compliance/Proposed Mitigation**
a	Evidence to support RNAV and conventional navigation as appropriate with details of planned availability and contingency procedures.	The proposed SIDs and airway/UAR are contained within airspace where the CNS infrastructure is well proven and appropriate contingency procedures already exist. Changes to the wider LTMA as part of the LAMP Bridging ACP (LAMP F) will provide CNS assurance for the wider Phase 1A.
b	Evidence to support primary and secondary surveillance radar (SSR) with details of planned availability and contingency procedures.	As per item **a**
c	Evidence of communications infrastructure including R/T coverage, with availability and contingency procedures.	As per item **a**
d	The effects of failure of equipment, procedures and/or personnel with respect to the overall management of the airspace must be considered.	As per item **a**
e	The Proposal must provide effective responses to the failure modes that will enable the functions associated with airspace to be carried out including details of navigation aid coverage, unit personnel levels, separation standards and the design of the airspace in respect of existing international standards or guidance material.	As per item **a**
f	A clear statement on SSR code assignment requirements is also required.	No changes to the extant methods of SSR code allocation to traffic using these routes is required.
g	Evidence of sufficient numbers of suitably qualified staff required to provide air traffic services following the implementation of a change.	The proposed routes are contained within airspace managed by Swanwick ATC. The procedures do not require any changes to staffing requirements at this unit although individual TC East sectors will be open more often to accommodate Phase 1a changes There would be no impact on staffing requirements at Stansted Airport.

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11 Airspace & Infrastructure Requirements

CAA CAP725, Appendix A Paragraphs 11-14, provides a list of requirements for airspace and infrastructure. These are listed below:

	CAA CAP725, Appendix A paragraph 11: General Requirements	**Evidence of Compliance/Proposed Mitigation**
a	The airspace structure must 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;.	See Section 5 especially para 5.2
b	Where an additional airspace structure is required for radar control purposes, the dimensions shall be such that radar control manoeuvres can be contained within the structure, allowing a safety buffer. This safety buffer shall be in accordance with agreed parameters as set down in DAP Policy Statement 'Safety Buffer Policy for Airspace Design Purposes Segregated Airspace';	See Section 8 item **d**
c	The Air Traffic Management (ATM) system must be adequate to ensure that prescribed separation can be maintained between aircraft within the airspace structure and safe management of interfaces with other airspace structures;	Changes to the wider LTMA as part of the LAMP Bridging ACP will consider all these points.
d	Air Traffic Control (ATC) procedures are to ensure required separation between traffic inside a new airspace structure and traffic within existing adjacent or other new airspace structures;	See LAMP Bridging ACP especially RDAR LAMP C (supplied later and separately)
e	Within the constraints of safety and efficiency, the airspace classification should permit access to as many classes of user as practicable;	There are no proposed changes to airspace classification or access
f	There must be assurance, as far as practicable, against unauthorised incursions. This is usually done through the classification and promulgation.	Details of the airspace changes associated with this proposal will be published two AIRAC cycles in advance.
g	Pilots shall be notified of any failure of navigational facilities and of any suitable alternative facilities available and the method of identifying failure and notification should be specified;	Failure of navigational facilities will be promulgated by NOTAM and ATC will provide navigational assistance using radar when necessary.

h	The notification of the implementation of new airspace structures or withdrawal of redundant airspace structures shall be adequate to allow interested parties sufficient time to comply with user requirements. This is normally done through the AIRAC cycle;	Changes will be published via the normal AIRAC cycles. Two AIRAC cycles notice will be given.
i	There must be sufficient R/T coverage to support the ATM system within the totality of proposed controlled airspace.	Changes to the wider LTMA as part of the LAMP Bridging ACP will consider all these points.
j	If the new structure lies close to another airspace structure or overlaps an associated airspace structure, the need for operating agreements shall be considered;	See LAMP Bridging ACP especially RDAR LAMP C (supplied later and separately) See Section 8 item **d**
k	Should there be any other aviation activity (low flying, gliding, parachuting, microlight site, etc.) in the vicinity of the new airspace structure and no suitable operating agreements or ATC Procedures can be devised, the Change Sponsor shall act to resolve any conflicting interests;	If such a conflict occurred then we would act accordingly

	CAA CAP725, Appendix A paragraph 12: ATS Route Requirements	**Evidence of Compliance/Proposed Mitigation**
a	There must be sufficient accurate navigational guidance based on in-line VOR/DME or NDB or by approved RNAV derived sources, to contain the aircraft within the route to the published RNP value in accordance with ICAO/EuroControl Standards;	The proposed SIDs and airway/UAR are contained within airspace where the CNS infrastructure is well proven and appropriate contingency procedures already exist. Changes to the wider LTMA as part of the LAMP Bridging ACP will provide CNS assurance for the wider Phase 1A (see LAMP F).
b	Where ATS routes adjoin Terminal Airspace there shall be suitable link routes as necessary for the ATM task;	Changes to the wider LTMA as part of the LAMP Bridging ACP will consider all these points.
c	All new routes should be designed to accommodate P-RNAV navigational requirements.	(U)M84 is defined as an RNAV5 airway. There are no changes to conventional SIDs.

	CAA CAP725, Appendix A paragraph 13: Terminal Airspace Requirements	**Evidence of Compliance/Proposed Mitigation**
a	The airspace structure shall be of sufficient dimensions to contain appropriate procedures, holding patterns and their associated protected areas;	See Section 5 especially para 5.2 and 6.2.
b	There shall be effective integration of	See Section 5 especially para 5.2

	departure and arrival routes associated with the airspace structure and linking to designated runways and published IAPs;	and 6.2.
c	Where possible, there shall be suitable linking routes between the proposed terminal airspace and existing en-route airspace structure;	See Section 5
d	The airspace structure shall be designed to ensure that adequate and appropriate terrain clearance can be readily applied within and adjacent to the proposed airspace;	All procedures and routes are compliant with PANS Ops standards
e	Suitable arrangements for the control of all classes of aircraft (including transits) operating within or adjacent to the airspace in question, in all meteorological conditions and under all flight rules, shall be in place or will be put into effect by Change Sponsors upon implementation of the change in question (if these do not already exist);.	See Section 5
f	Change Sponsors shall ensure that sufficient VRPs are established within or adjacent to the subject airspace to facilitate the effective integration of VFR arrivals, departures and transits of the airspace with IFR traffic;	No change to extant VRPs
g	There shall be suitable availability of radar control facilities;	No change to extant availability
h	Change Sponsors shall, upon implementation of any airspace change, devise the means of gathering (if these do not already exist) and of maintaining statistics on the number of aircraft transiting the airspace in question. Similarly, Change Sponsors shall maintain records on the numbers of aircraft refused permission to transit the airspace in question, and the reasons why. Change Sponsors should note that such records would enable ATS Managers to plan staffing requirements necessary to effectively manage the airspace under their control;	Current methods of record-keeping will continue under this proposal.
i	All new procedures should, wherever possible, incorporate Continuous Descent Approach (CDA) profiles after aircraft leave the holding facility associated with that procedure.	Not applicable
	CAA CAP725, Appendix A paragraph 14: Off Route Airspace Requirements	**Evidence of Compliance/Proposed Mitigation**
	There are no proposed changes to off route airspace structures as part of this proposal.	

12 Environmental Requirements

This section details the required elements of an Environmental Assessment for the Phase 2 ACP development, based upon CAP 725 Appendix B.

The requirements in this section are grouped by the degree of compliance expected from airspace change sponsors. In following this guidance:

- **Must** – change sponsors are to meet the requirements in full when this term is used.
- **Should** – change sponsors are to meet these requirements unless there is sufficient reason which must be agreed in writing with the DAP case officer and the circumstances recorded in the formal airspace change documentation.
- **May** – change sponsors decide whether this guidance is appropriate to the circumstances of the airspace change.

	Requirement		Ref.	Page	Evidence
1	In order to ensure that the various areas for environmental assessment by DAP are addressed, Change Sponsors should submit the documentation with the following clearly defined sections: Description of the airspace change (refer to 28 – 33); Traffic forecasts (refer to 34 – 38); An assessment of the effects on noise (refer to Sections 4 and 5); An assessment of the change in fuel burn/CO2 (refer to Section 6); An assessment of the effect on local air quality (refer to Section 7); and An economic valuation of environmental impact, if appropriate (refer to Section 9).	General	Para 2	B-1	See Sections 4, 5 & 6
2	It is considered unlikely that airspace changes will have a direct impact on animals, livestock and biodiversity. However, Change Sponsors should remain alert to the possibility and may be required to include these topics in their environmental assessment.	General	Para 18	B-4	See Section 6.7 which refers to STN C
3	Environmental assessment should set out the base case or current situation so that changes can be clearly identified.	General	Para 19	B-4	See Section 4
4	Environmental assessment should follow the Basic Principles listed in CAP 725.	General	Para 20	B-4	See Section 6
5	A technical document containing a comprehensive and complete description of the airspace change including the environmental impact will be required and must be produced for all airspace changes.	General	Para 25	B-6	See Sections 5 & 6

	Requirement		Ref.	Page	Evidence
6	It may be appropriate for Change Sponsors to produce a more general description of the airspace change and the rationale for its proposal in an easy-to-read style for public consumption. If such an additional separate document is produced, it must contain details of the environmental impact of the proposal.	General	Para 25	B-6	See STN A
7	The environmental assessment must include a high quality paper diagram of the airspace change in its entirety as well as supplementary diagrams illustrating different parts of the change. This diagram must show the extent of the airspace change in relation to known geographical features and centres of population	Airspace Design	Para 28	B-7	See STN A
8	The proposal should consider and assess more than one option, then demonstrate why the selected option meets safety and operational requirements and will generate an overall environmental benefit or, if not, why it is being proposed.	Airspace Design	Para 29	B-7	See Section 7
9	The Change Sponsor must provide DAP with a complete set of coordinates describing the proposed change in electronic format using World Geodetic System 1984 (WGS 84). In addition, the Sponsor must supply these locations in the form of Ordnance Survey (OS) national grid coordinates.	Airspace Design	Para 30	B-7	See Section 5 especially para 5.2
10	This electronic version must provide a full description of the horizontal and vertical extent of the zones and areas contained within the airspace change. It must also include coordinates in both WGS 84 and OS national grid formats that define the centre lines of routes including airways, standard instrument departures (SID), standard arrival routes (STAR), noise preferential routes (NPR) or any other arrangement that has the effect of concentrating traffic over a particular geographical area.	Airspace Design	Para 30	B-7	See Section 5 especially para 5.2
11	Change Sponsors should provide indications of the likely lateral dispersion of traffic about the centre line of each route. This should take the form of a statistical measure of variation such as the standard deviation of lateral distance from the centre line for given distances along track in circumstances where the dispersion is variable.	Airspace Design	Para 31	B-7	See Section 5.4

12	Sponsors may supply the outputs from simulation to demonstrate the lateral dispersion of traffic within the proposed airspace change or bring forward evidence based on actual performance on a similar kind of route. It may be appropriate for Sponsors to explain different aspects of dispersion e.g. dispersion within NPRs when following a departure routeing and when vectoring – where the aircraft will go and their likely frequency	Airspace Design	Para 31	B-7	See Section 5.4
13	Change Sponsors must provide a description of the vertical distribution of traffic in airways, SIDs, STARs, NPRs and other arrangements that have the effect of concentrating traffic over a particular geographical area	Airspace Design	Para 32	B-7	See Section 5.4
14	For departing traffic, sponsors should produce profiles of the most frequent type(s) of aircraft operating within the airspace. They should show vertical profiles for the maximum, typical and minimum climb rates achievable by those aircraft.	Airspace Design	Para 32	B-7	No change to climb profiles
15	A vertical profile for the slowest climbing aircraft likely to use the airspace should also be produced.	Airspace Design	Para 32	B-8	No change to climb profiles
16	All profiles should be shown graphically and the underlying data provided in a spread sheet with all planning assumptions clearly documented.	Airspace Design	Para 32	B-8	No change to climb profiles
17	Change Sponsors should explain how consideration of CDA and LPLD is taken into account within their proposals	Airspace Design	Para 33	B-8	There are no changes to descent profiles
18	In planning changes to airspace arrangements, sponsors may have conducted real and/or fast time simulations of air traffic for a number of options.	Traffic Forecasts	Para 34	B-8	A Real time simulation has been undertaken for LAMP Phase 1A as a whole – the simulation report will be provided with the bridging ACP For Fast Time Simulation see para 6.6
19	Change Sponsors must include traffic forecasts in their environmental assessment.	Traffic Forecasts	Para 35	B-8	See Section 4 and STN C para 5.15
20	Information on air traffic must include the current level of traffic using the present airspace arrangement and a forecast. The forecast will need to indicate the traffic growth on the different routes contained within the airspace change volume.	Traffic Forecasts	Para 35	B-8	See Section 4 and STN C para 5.15
21	The sources used for the forecast must be documented.	Traffic Forecasts	Para 35	B-8	See STN C para 5.15

22	Typically, forecasts should be for five years from the planned implementation date of the airspace change. There may be good reasons for varying this – for example, to use data that has already been made available to the general public at planning inquiries, in airport master plans or other business plans	Traffic Forecasts	Para 36	B-8	STN C para 5.15. Because LAMP Phase 2 is expected to come into being by 2020 it was agreed with ERCD that a 2020 forecast (ie implementation + 4 years) was more appropriate than 2021 (+5 years).
23	It may also be appropriate to provide forecasts further into the future than five years: examples are extensive airspace changes or where traffic is forecast to grow slowly in the five-year period but faster thereafter.	Traffic Forecasts	Para 36	B-8	See above
24	It may be appropriate for Change Sponsors to outline the key factors [affecting traffic forecasts] and their likely impact. In these circumstances, Sponsors should consider generating a range of forecasts based on several scenarios that reflect those uncertainties – this would help prevent iterations in the assessment process.	Traffic Forecasts	Para 37	B-8	A range of forecasts has not been produced. The justification for change is not sensitive to the degree to which traffic grows (all the benefits and impacts increase or decrease proportionately).
25	Traffic forecasts should contain not only numbers but also types of aircraft. Change Sponsors should provide this information by runway (for arrivals/departures) and/or by route with information on vertical distribution by height/altitude/flight level as appropriate.	Traffic Forecasts	Para 38	B-9	See STN A Appendix C. ERCD analysis used their 2012 contours as the baseline for the analysis.
26	Types of aircraft may be given by aircraft type/engine fit using ICAO type designators. If this is not a straightforward exercise, then designation by the UK Aircraft Noise Contour Model (ANCON) types or by seat size categories would be acceptable	Traffic Forecasts	Para 38	B-9	ERCD analysis used their 2012 contours produced for the airport/DFT as the baseline for the analysis.
27	Change Sponsors must produce Leq, 16 hours noise exposure contours for airports where the proposed option entails changes to departure and arrival routes for traffic below 4,000 feet agl based on the published minimum departure and arrival gradients. Under these circumstances, at least three sets of contours must be produced: Current situation – these may already be available as part of the airport's regular environmental reporting or as part of the airport master plan; Situation immediately following the airspace change; and Situation after traffic has increased under the new arrangements (typically five years after implementation although this should be discussed with the DAP Project Leader).	Noise	Para 44	B-11	See STN A Section 6 (para 6.12 onwards) and STN B for contours and population counts

28	The contours should be produced using either the UK Aircraft Noise Contour Model (ANCON) or the US Integrated Noise Model (INM) but ANCON must be used when it is currently in use at the airport for other purposes.	Noise	Para 46	B-12	ERCD were contracted to undertake this work using ANCON
29	Terrain adjustments should be included in the calculation process (i.e. the height of the air routes relative to the ground are accounted for).	Noise	Para 47	B-12	ERCD were contracted to undertake this work using ANCON
30	Contours must be portrayed from 57 dBA Leq, 16 hours at 3 dB intervals.	Noise	Para 48	B-12	See STN A Section 6 (para 6.12 onwards) and STN B
31	Contours should not be produced at levels below 54 dBA Leq, 16 hours because this corresponds to generally low disturbance to most people.	Noise	Para 48	B-12	See STN A Section 6 (para 6.12 onwards) and STN B
32	Change Sponsors may include the 54 dBA Leq, 16 hours contour as a sensitivity analysis but this level has no particular relevance in policy making.	Noise	Para 48	B-12	See STN A Section 6 (para 6.12 onwards) and STN B
33	A table should be produced showing the following data for each 3 dB contour interval: Area (km2); and Population (thousands) – rounded to the nearest hundred.	Noise	Para 49	B-12	See STN A Section 6 (para 6.12 onwards) and STN B
34	It is sometimes useful to include the number of households within each contour, especially if issues of mitigation and compensation are relevant: This table should show cumulative totals for areas/populations/households. For example, the population for 57 dBA will include residents living in all higher contours. The source and date of population data used should be noted adjacent to the table. Population data should be based on the latest available national census as a minimum but more recent updated population data is preferred. The areas calculated should be cumulative and specify total area within each contour including that within the airport perimeter.	Noise	Para 50	B-12	Population dataset is CACI 2013 update of the 2011 Census.

35	Contours for assessment should be provided to DAP in both of the following formats: Electronic files in the form of a comma delimited ASC2 text file containing three fields as an ordered set (i.e. coordinates should be in the order that describes the closed curve) defining the contours in Ordnance Survey National Grid in metres: Field Name Units 1 Level dB 2 Easting six figure easting OS national grid reference (metres) 3 Northing six figure northing OS national grid reference (metres) Paper version overlaid on a good quality 1:50 000 Ordnance Survey map. However, it may be more appropriate to present contours on 1:25 000 or 1:10 000 Ordnance Survey maps.	Noise	Para 51	B-13	This is not provided
36	Contours for a general audience may be provided overlaid on a more convenient map (e.g. an ordinary road map with a more suitable scale for publication in documents). The underlying map and contours should be sufficiently clear for an affected resident to be able to identify the extent of the contours in relation to their home and other geographical features. Hence, the underlying map must show key geographical features, e.g. street, rail lines and rivers.	Noise	Para 53	B-13	See STN A
37	SEL footprints must be used when the proposed airspace includes changes to the distribution of flights at night below 7,000 feet agl and within 25 km of a runway. Night is defined here as the period between 2300 and 0700 local time. If the noisiest and most frequent night operations are different, then footprints should be calculated for both of them. A separate footprint for each of these types should be calculated for each arrival and departure route. If SEL footprints are provided, they should be calculated at both 90 dBA SEL and 80 dBA SEL.	Noise	Para 56	B-13	No SEL analysis has been done see STN A paras 6.15-6.16
38	SEL footprints may be used when the airspace change is relevant to daytime only operations. If SEL footprints are provided, they should be calculated at both 90 dBA SEL and 80 dBA SEL.	Noise	Para 56	B-14	No SEL analysis has been done see STN A paras 6.15-6.16

39	SEL footprints for assessment should be provided to DAP in both of the following formats: Electronic files in the form of a comma delimited ASC2 text file containing three fields as an ordered set (i.e. coordinates should be in the order that describes the closed curve) defining the footprints in Ordnance Survey National Grid in metres: Field Field Name Units 1 Level dB 2 Easting six figure easting OS national grid reference (metres) 3 Northing six figure northing OS national grid reference (metres) Paper version overlaid on a good quality 1:50 000 Ordnance Survey map. However, it may be more appropriate to present footprints on 1:25 000 or 1:10 000 Ordnance Survey maps.	Noise	Para 57	B-14	No SEL analysis has been done See STN A Para 6.15-6.16
40	SEL footprints for a general audience may be provided overlaid on a more convenient map (e.g. an ordinary road map with a more suitable scale for publication in documents). The underlying map and footprints should be sufficiently clear for an affected resident to identify the extent of the footprints in relation to their home or other geographical features. Hence, this underlying map must show key geographical features, e.g. streets, rail lines and rivers. Calculations should include terrain adjustments as described in the section on Leq contours	Noise	Para 58	B-14	No SEL analysis has been done See STN A Para 6.15-6.16
41	Change Sponsors may use the percentage highly annoyed measure in the assessment of options in terminal airspace to supplement Leq. If they choose to use this method, then the guidance on population data for noise exposure contours set out should be followed. Sponsors should use the expression and associated results in calculating the number of those highly annoyed. If they wish to use a variant method, then this would need to be supported by appropriate research references.	Noise	Para 65	B-15	This method has not been used

42	Change Sponsors may use the LDEN metric but, if they choose to do so, they must still produce the standard Leq, 16 hours contours as previously described. If airspace change sponsors wish to use the LDEN metric they must do so in a way that is compliant with the technical aspects of the Directive and any supplementary instructions issued by DEFRA. Sponsors should note the requirement for noise levels to be calculated as received at 4 metres above ground level. In particular, the guidance on how contours are to be portrayed, as described in the section dealing with Leq contours applies. Calculations should include terrain adjustments as described in the section on Leq contours. An exception regarding LDEN contours is the production of a table showing numerical data on area, population and households which should be presented by band (e.g. 55 dBA to 60 dBA) rather than cumulatively as for UK Leq contours (e.g. >55 dBA). Change Sponsors should make it clear where areas/counts are by band or cumulative.	Noise	Para 67 & 69 & 70	B-15 & B-16	This method has not been used
43	Change Sponsors may use the LNight metric within their environmental assessment and consultation. If they do so, SEL footprints must also be produced. Calculations should include terrain adjustments as described in the section on Leq contours.	Noise	Para 73	B-16	This method has not been used
44	Change Sponsors may use difference contours if it is considered that redistribution of noise impact is a potentially important issue.	Noise	Para 78	B-17	This method has not been used
45	Change Sponsors may use PEI as a supplementary assessment metric.	Noise	Para 85	B-19	This method has not been used
46	Change Sponsors may use the AIE metric as a supplementary assessment metric. If the sponsor uses PEI as a supplementary metric then AIE should also be calculated as both metrics are complementary.	Noise	Para 87	B-19	This method has not been used
47	Change Sponsors may vary the information displayed in Operations Diagrams providing that the diagram is a fair and accurate representation of the situation portrayed.	Noise	Para 88	B-20	See STN A Figures 3 and 4
48	Change Sponsors may use maximum sound levels (Lmax) in presenting aircraft noise footprints for public consumption if they think that this would be helpful. This does not replace the obligation to comply with the requirement to produce sound exposure level (SEL) footprints, where applicable.	Noise	Para 95	B-21	This method has not been used

49	Change Sponsors may produce diagrams portraying maximum sound event levels (Lmax) for specific aircraft types at a number of locations at ground level beneath the airspace under consideration. This may be helpful in describing the impact on individuals. It is usual to include a table showing the sound levels of typical phenomenon e.g. a motor vehicle travelling at 30 mph at a distance of 50 metres.	Noise	Para 96	B-21	This method has not been used
50	Change Sponsors must demonstrate how the design and operation of airspace will impact on emissions. The kinds of questions that need to be answered by the sponsor are: Are there options which reduce fuel burn in the vertical dimension, particularly when fuel burn is high e.g. initial climb? Are there options that produce more direct routeing of aircraft, so that fuel burn is minimised? Are there arrangements that ensure that aircraft in cruise operate at their most fuel-efficient altitude, possibly with step-climbs or cruise climbs?	Climate Change	Para 102	B-22	See Sections 6 & 7
51	Change Sponsors should estimate the total annual fuel burn/mass of carbon dioxide in metric tonnes emitted for the current situation, the situation immediately following the airspace change and the situation after traffic has increased under the new arrangements – typically five years after implementation. Sponsors should produce estimates for each airspace option considered.	Climate Change	Para 106	B-23	See para 6.6
52	Change Sponsors should provide the input data for their calculations including any modelling assumptions made. They should state details of the aircraft performance model used including the version numbers of software employed.	Climate Change	Para 107	B-23	See para 6.6
53	Where the need to provide additional airspace capacity, reduce delays or mitigate other environmental impact results in an increase in the total annual fuel burn/ mass of carbon dioxide in metric tonnes between the current situation and the situation following the airspace change, Sponsors should provide justification.	Climate Change	Para 108	B-23	Not applicable

54	Change Sponsors must produce information on local air quality only where there is the possibility of pollutants breaching legal limits following the implementation of an airspace change. The requirement for local air quality modelling will be determined on a case by case basis as discussed with the DAP Project Leader and ERCD. This discussion will include recommendations of the appropriate local air quality model to be used. Concentrations should be portrayed in micrograms per cubic metre (µg.m-3). They should include concentrations from all sources whether related to aviation and the airport or not. Three sets of concentration contours should be produced: Current situation – these may already be available as part of the airport's regular environmental reporting or as part of the airport master plan; Situation immediately following the airspace change; and Situation after traffic has increased under the new arrangements – typically five years after implementation although this should be discussed with the DAP Project Leader.	Local Air Quality	Para 115	B-25	Not Applicable. No changes below 1,000ft
55	Contours for assessment should be provided to DAP in similar formats to those used for noise exposure contours. Where Change Sponsors are required to produce concentration contours they should also produce a table showing the following data for concentrations at 10 µ.m-3 intervals: Area (km2); and Population (thousands) – rounded to the nearest hundred.	Local Air Quality	Para 116	B-25	Not Applicable
56	The source and date of population data used should be noted adjacent to the table. Population data should be based on the latest available national census as a minimum but more recent updated population data is preferred.	Local Air Quality	Para 117	B-25	Not Applicable
57	Change Sponsors may wish to conduct an economic appraisal of the environmental impact of the airspace change, assessing the economic benefits generated by the change. If undertaken, this should be conducted in accordance with the guidance from HM Treasury in the Green Book (HM Treasury, 2003). If Change Sponsors include a calculation of NPV then they must show financial discount rates, cash flows and their timings and any other assumptions employed. The discount rate must include that recommended in the Green Book currently set at 3.5%. Additionally, other discount rates may be used in a sensitivity analysis or because they are representative of realistic commercial considerations	Economic Valuation	Para 124 & 126	B-27	No such appraisal has been undertaken

Appendices

Appendix A: Response from the MoD

Text from first MoD response (ref num 10363) by [redacted]

Dear Sir/Madam

In order to fully assess the impact on MOD operations, before submitting a final response, the MOD would like to seek assurance that consideration has been given to the likely impact on adjacent aerodrome SIDs. In particular, with the increase in Stansted CLN SIDs, is it envisaged that this could result in delays to release Northolt traffic on CLN SIDs? Equally, could Northolt expect improved release times for Northolt DVR and DET SIDs? I would be grateful for clarification of these points.

Yours

[redacted]

Reply from [redacted]

[redacted]

As you know, I have been keeping you and Northolt up to date with LAMP plans and have visited the airfield on a number of occasions, the last of which was last year when I briefed SATCO and OC Ops (see attached email). I can assure you that with the proposed LAMP Phase 1a design, Stansted CLN departures have no impact on Northolt CLN departures. In fact, Northolt CLN departures are always above SS CLN departures anyway, as the Northolt SID is 5000ft at BPK, and the Stansted CLN SID only climbs to 4000ft initially.

There will be no change to Northolt release times during Phase 1a as this confliction is between Luton and Northolt, not Stansted and Northolt - this will remain the case until Phase 2. Please let me know if you have any other queries.

[redacted]

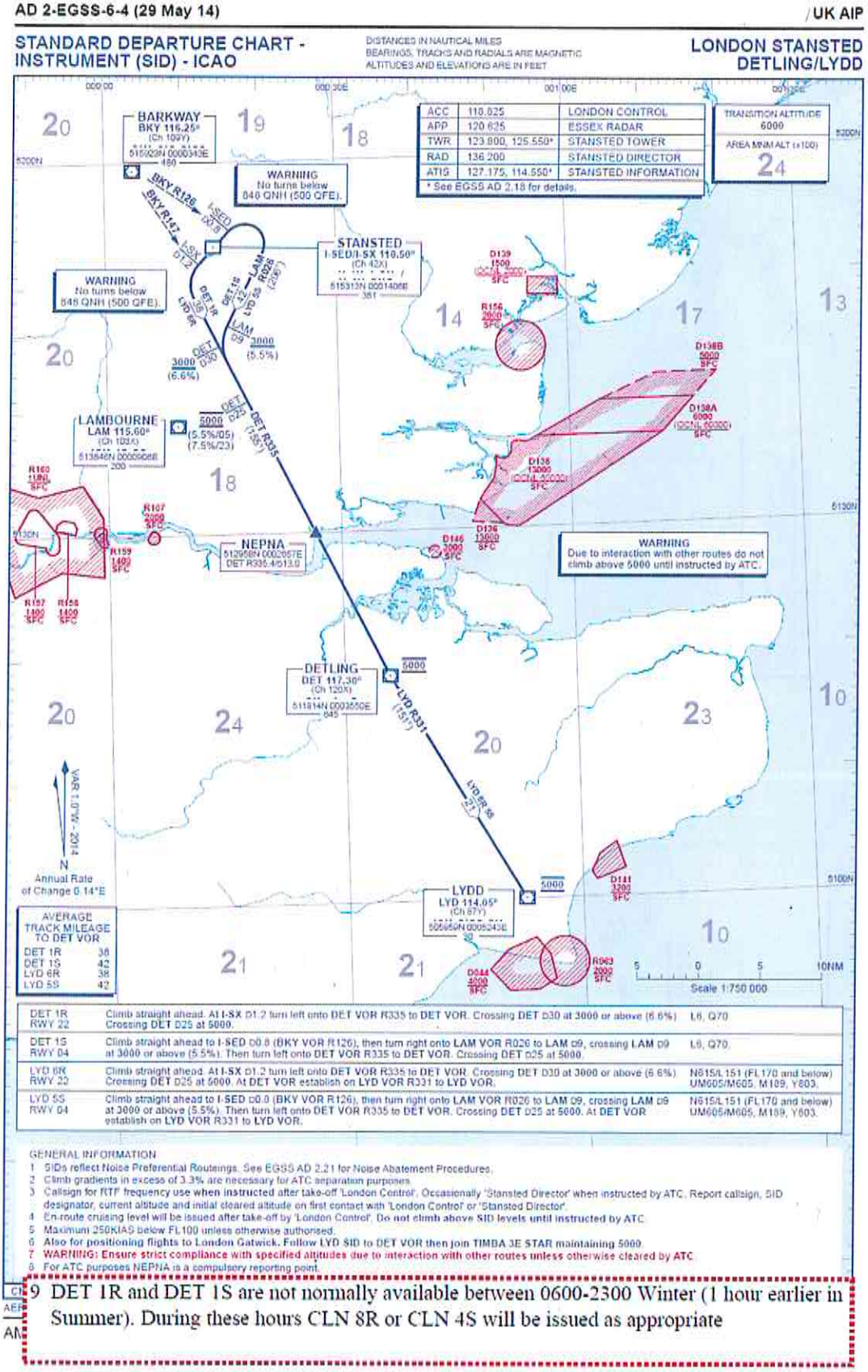
Text from second MoD response (ref num 10539) [redacted]

As the proposed change is wholly contained within existing Controlled Airspace and assurance has been given that, under the proposed LAMP Phase 1a design, the revised Stansted CLN departures would have no impact on RAF Northolt CLN departures, the MOD has no objections to the Stansted proposal.

Yours faithfully

[redacted]

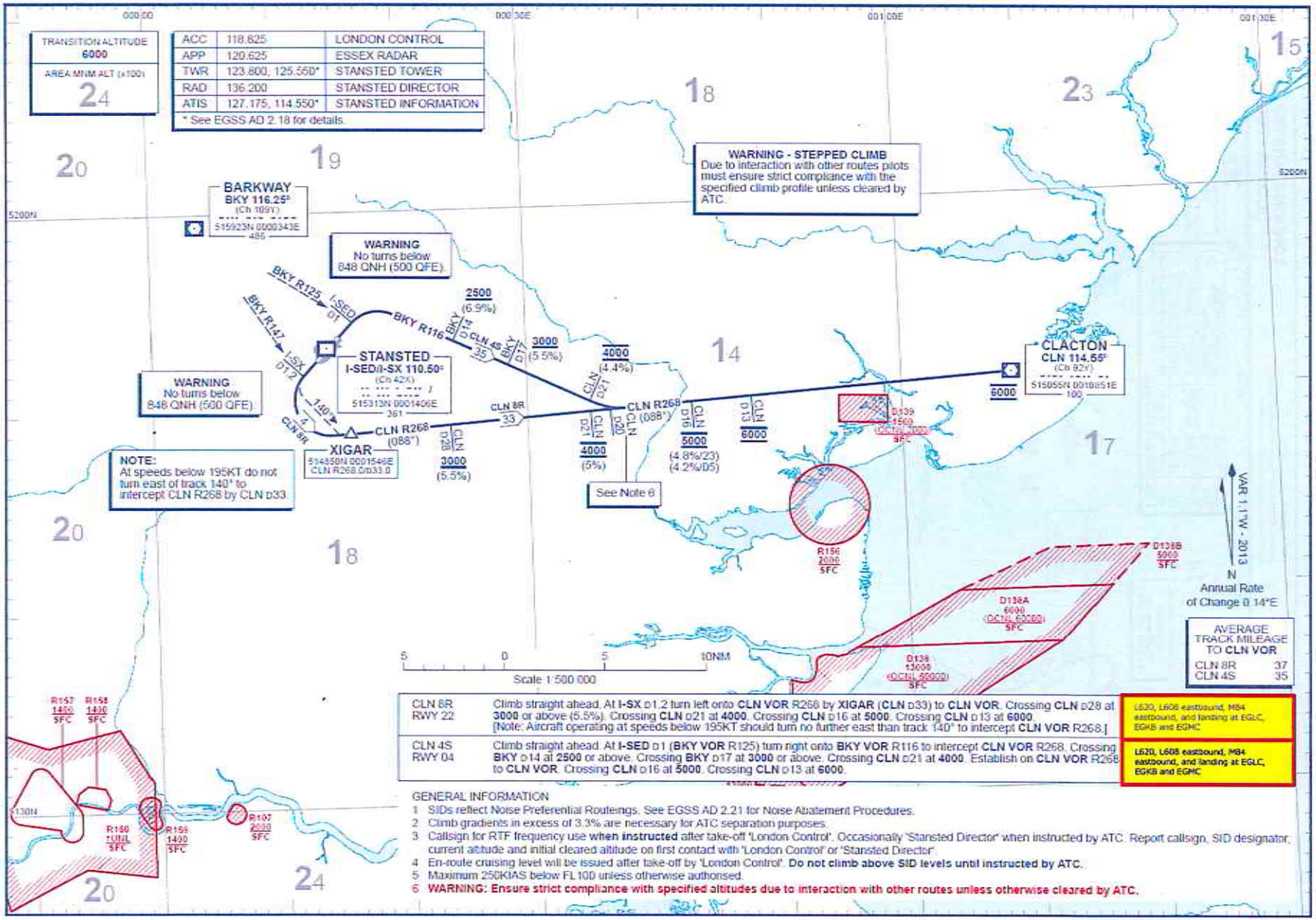
Appendix B: Proposed Amendments to Stansted AIP SIDs



STANDARD DEPARTURE CHART - INSTRUMENT (SID) - ICAO

LONDON STANSTED CLACTON

DISTANCES IN NAUTICAL MILES
BEARINGS, TRACKS AND RADIALS ARE MAGNETIC
ALTITUDES AND ELEVATIONS ARE IN FEET



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