05 July 2018

Karen Denmark
Development Management Team Leader
Uttlesford District Council
Council Offices
London Road
Saffron Walden
CB11 4ER

Dear Karen

Re: UTT/18/0460/FUL: Airfield works comprising two new taxiway links to the existing runway (a Rapid Access Taxiway and a Rapid Exit Taxiway), six additional remote aircraft stands (adjacent Yankee taxiway); and three additional aircraft stands (extension of the Echo Apron) to enable combined airfield operations of 274,000 aircraft movements (of which not more than 16,000 movements would be Cargo Air Transport Movements (CATM)) and a throughput of 43 million terminal passengers, in a 12-month calendar period.

I write in respect of the above application submitted on 22nd February 2018. Since the application submission the required statutory consultation has been undertaken, which has led to a number of consultation responses, made both by the Statutory Consultees and other interested parties. Also during this time, detailed assessment of the application by the Local Planning Authority has taken place.

Stansted Airport Limited (STAL) and its consultant team have considered the products of this process and it is considered that this response may assist in understanding certain aspects of the proposed development and the existing accompanying technical documents, whilst also taking the opportunity to clarify other matters that have been misinterpreted by consultees. Please therefore find attached to this letter our response to the issues that have been raised. The information has been set out in a topic based schedule for ease of navigation. Where a matter requires more extensive explanation, further Annexes are provided and cross-referenced to the schedule.

It is not considered that the information provided is "*additional information which is directly relevant to reaching a reasoned conclusion on the likely significant effects of the development described in the application in order to be an environmental statement*" and therefore this submission is not submitted pursuant to Regulation 25 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

Cargo Limits

On 15th May 2018, I wrote to you concerning an issue that had been raised on several occasions in the responses sent to the Council regarding the application. I considered that it was important to confirm promptly the fact that we are not seeking an increase in the current limit of 20,500 cargo aircraft movements (CATM) in any 12-month period, given that the forecasts show demand growing to only 16,000 CATMs by 2028 (see Chapter 4 of the Environmental Statement). We note that, some of the

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letters of representation received by the Council in respect of the application express particular concerns about the possibility that the application could give rise to an increase in cargo operations above the current CATM limit of 20,500.

Following the Council's response, I wrote again on 18 May 2018 to confirm that we agreed to both a change to the application description and the subsequent inclusion of a condition controlling maximum cargo air transport movements (CATMs), should the application be permitted. Therefore, the updated description of development should now be as follows (change in bold underline):

> *Airfield works comprising two new taxiway links to the existing runway (a Rapid Access Taxiway and a Rapid Exit Taxiway), six additional remote aircraft stands (adjacent Yankee taxiway); and three additional aircraft stands (extension of the Echo Apron) to enable combined airfield operations of 274,000 aircraft movements* ***(of which not more than 16,000 movements would be Cargo Air Transport Movements (CATM))*** *and a throughput of 43 million terminal passengers, in a 12-month calendar period.*

Government Aviation Policy

On 5th June 2018, the Government published its policy in respect of existing runway utilisation (other than Heathrow) in Beyond the Horizon: The future of UK Aviation, Making Best Use of Existing Runways.

In this document, the Government makes clear it is supportive of airports making best use of their runways and that proposals should be 'judged by the relevant local planning authority, taking careful account of all the relevant considerations, particularly economic and environmental impacts and proposed mitigations'.

In the light of several comments made on the application, this policy statement from the Government usefully provides clarity on national aviation policy in relation to existing runway capacity. Moreover, the Government has also made clear in the latest draft of the Aviation National Policy Statement (Section 1) that the NPS for Heathrow R3 does not relate to applications for best use at other airports (including in the south-east).

Should you have any further questions in relation to the above and attached information, please do not hesitate to contact me directly.

Sincerely,

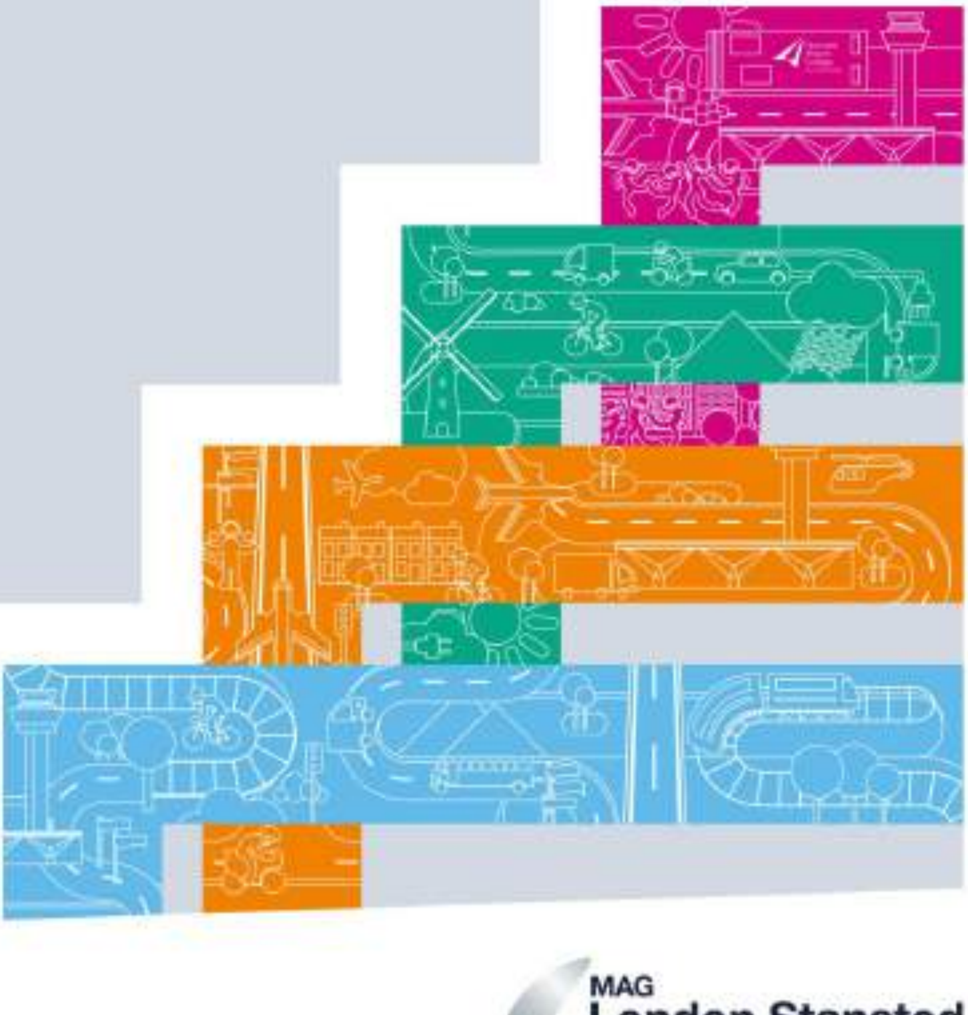
[redacted]

Alistair Andrew, MRTPI
Planning Manger
London Stansted Airport

TRANSFORMING LONDON STANSTED AIRPORT

35+ PLANNING APPLICATION

CONSULTATION RESPONSE AND CLARIFICATIONS



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Consultee Response Schedule

	Matter Raised	STAL Response
Determination Process		
1.1	Clarity is required confirming the proposal does not fall within the scope of development defined as a Nationally Significant Infrastructure Project by virtue of Section 14(1) of the Planning Act 2008.	The application only seeks an 8mppa increase in passenger numbers. It is clear the application is also made on the basis of limited growth of CATMs (up to 16,000), less than what is already permitted (20,500). Nevertheless, to ensure clarity, the application description has been amended and the Applicant is content to accept a limiting condition in line with the submitted forecasts.
1.2	How the increased passenger limit is linked to planned infrastructure works.	Section 4.12 of the Planning Statement makes clear the relationship of the planned works to the further growth of the airport.
1.3	Request for carrying forward a condition to fix existing limits on aircraft noise and aircraft movements	The application makes clear the scale of the development proposed. It is also clear that the operational limits (both aircraft movements, passenger numbers per annum and the maximum noise contour) would be subject to planning conditions.
1.4	No consultation events were held in Elsenham or High Easter which is in contravention of UDC's published guidelines. In addition, 'November/December consultation events did not include the three parishes which fall within the airport: Stansted Mountfitchet, Takeley and Elsenham. It's believed that residents directly affected by the scheme have not been directly informed and that there were poorly advertised consultation events	STAL's approach to consultation has been consistent with UDC guidance. A series of outreach events have been held over a number of weeks and across various locations in Uttlesford, East Hertfordshire and Harlow. During the November outreach, one event was held on the airport site (at the Radisson Blu Hotel) to cater for residents in close proximity to the airport and onsite stakeholders. There has also been media coverage across the area.
1.5	The 2014 Environmental studies should be published (as part of 2008 planning application conditions) prior to proceeding to determine the current 2018 planning application.	This request is made on a mistaken basis. This S106 obligation related to the effects of 'the Development' permitted in 2008, i.e. an increase beyond 25mppa. As 25mppa was not reached until 2016, the 'effect' in 2014 was unrealised / zero / nil.
Planning Policy		
1.6	The application has been portrayed by some as being 'premature', with many government documents and reports due in the coming months, such as: • Aviation Strategy and Final NPS not yet published • Uttlesford District Council (UDC) Local Plan not adopted • Government update on further recommendations on tackling CO_2 emissions • Review on changes to departure routes in 2016 • Government's Select Committee Draft Report Statement due on 24 July 18.	In the main submission the accompanying Planning Statement clearly demonstrated and described the context and reason for the submission of the application and the proposed works. Similarly, an analysis of policy compliance was also provided. The case made remains unchanged. However, since the 35+ application was submitted, some key developments in planning and aviation policy have occurred that are material to the determination of the application. Most significantly, the Government has made clear its policy on making best use of existing runways in its publication of 'Beyond the Horizon: The Future of UK Aviation, Making Best Use of Existing Runways' on 5th June 2018. In this document, the Government affirmed its policy to make best use of existing runways subject to 'all relevant considerations, particularly economic and environmental impact proposed mitigations' (paragraph 1.29). On 25th June 2018 Uttlesford District Council Regulation 19 Pre-submission Local Plan was published for consultation. Whilst this plan's status remains as draft and contains polices with unresolved objections, the weight afforded to it needs to be determined in accordance with the NPPF. Nevertheless, the draft plan does contain policies that relate to increased airport growth which contain links to the prevailing national aviation policy environment. The application and the additional supporting information provided demonstrate compliance with the draft policies. In summary, the 35+ application is neither premature in respect of national aviation policy nor will it prejudice the preparation of the draft local plan. The application cannot be therefore judged as premature.
1.7	Timing of application	Section 2 of the Planning Statement addresses the timing of the application and the horizons over which large scale transport infrastructure should be appropriately planned. Timing comparisons with previous planning applications are not relevant.
1.8	Stansted airport has not been identified by Government for expansion.	This application is not for "airport expansion", but rather for making best use of an existing runway. The Government Policy 'Beyond the Horizon, The Future of UK Aviation: Making Best Use of Existing Runways' published on 5th June 2018 provides clear national policy on the matter and reinforces long-standing support for making best-use of existing runway capacity.
1.9	Interpretation and weight afforded to the Aviation Policy Framework and Airports Commission Reports.	Since the submission of the planning application and many of the consultation responses that have been submitted to the LPA, the Government has published its policy on making best use of existing runways in June 2018. As such, this latest policy makes clear the Government's support in principle for the application as made, subject to detailed examination of relevant considerations. While the Airports Commission's work provides context to emerging national aviation policy, it is not (and never has been) Government policy. Importantly, it has now been largely superseded by more recent policy development. The latest Government policy statement is its response to the Airport's Commission's recommendation (see para 1.5).
1.10	Interpretation and weight afforded to the Airports National Policy Statement.	The ANPS is not a document that is specific to the 35+ application for making best use of Stansted. Whilst this has always been the case, the final ANPS (June 2018) makes clear in section 1, specifically paragraphs 1.38 and 1.39, that the NPS relates to *new* runway capacity in the South East of England, while applications for using existing runways are covered by the complementary 'Beyond the Horizon' policy statement.

1.11	Address the essential test of 'demonstrable need' posed in the draft Airports National Policy Statement.	Section 2 of the Planning Statement sets out the case for additional capacity. The Government's policy on best use does not require a 'need' case to be central to any application, but rather that the economic, environmental impact and proposed mitigations are taken into account. The application as made and the additional supporting information enable a balanced judgement to be reached. The final NPS (paras 2.10 – 2.18) sets out the 'need case' for airport growth. It does not rely simply upon forecasts, but stresses impacts on international and domestic connectivity, prices, competition, delays, resilience and constraining the delivery of wider economic benefits.
1.12	Application fails to address the policy on carbon emissions and does not balance the adverse impacts on climate change with the benefits of air travel.	Chapter 12 of the ES (Carbon Emissions) and Section 6 of the Planning Statement (paragraphs 6.141 to 6.146) addresses carbon emissions in relation to the application and the Planning Benefits associated with the development are set out in Section 8 of the Planning Statement. The Government's Beyond the Horizon paper on next steps towards an aviation strategy sets out the proposed aims and objectives of the new Strategy. This includes "supporting growth while tackling environmental impacts". The Climate Change Act 2008 sets a legally binding target for the UK to reduce its GHG emissions by at least 80% by 2050, compared to 1990 levels. This target includes UK domestic aviation (flights which take off and land in the UK) but does not include emissions from international aviation. The Government has indicated that it will use the Aviation Strategy to re-examine how the aviation sector can best contribute its fair share to emissions reductions at both the UK and global level.
1.13	Failure to comply with Policy ENV11 – Noise Generators of the Uttlesford Adopted Local Plan (and therefore ENV10 & GEN4).	Policy ENV11 clearly states that the first stage of the consideration of potentially noise generating development is to establish whether there is likely to be an adverse effect on noise sensitive development. The relevant sections of the ES that consider air, ground and surface access noise reach no such conclusions and therefore the application is in accordance with the policy. The second stage of the policy, to consider whether the need for the development outweighs the degree of noise generated, is not triggered. On the grounds of no adverse effects, the application accords with ENV10 and GEN4.
1.14	The 'permitted capacity' referred to in Objective 2c of the emerging Uttlesford Local Plan means the 2008 planning permission which is 35mppa. The application proposals are not in accordance with this objective.	In draft Objective 2c, 'permitted capacity' is not defined. Some objectors have considered this to mean the current permitted capacity (i.e. that of the 2008 25+ Permission). However, when read as a whole, Section 2 of the draft plan describes the vision for Uttlesford in 2033. Elsewhere in the plan, sustainable growth of the airport is given qualified support. As such we consider that 'permitted capacity' should be read as being the planning permission in force at Stansted at any point in the plan period. Had Uttlesford District Council intended to constrain Stansted throughput to 35mppa until 2033, a draft policy to this effect could have been proposed; rather, we consider that the wording encapsulates the current permission and any other permissions granted for increased operations at Stansted. It is therefore not appropriate or consistent with the plan read as a whole to conclude that the application is in conflict with the objective as currently drafted.
1.15	Compliance with Objective 3b 'Climate Change and Use of Resources' of the Uttlesford draft Local Plan: specifically, • Ensuring development is located and designed to be resilient to future climate • change and the risk of flooding and "Ensuring new development promotes the use of sustainable travel".	Objectors have commented on the submitted climate change assessment that forms part of the ES, stating that it is not an assessment of impact on climate change. This is incorrect; ES Chapter 13 (Climate Change) presents both an in-combination climate change assessment and a climate change reliance assessment in accordance with the national Planning Practice Guidance and other technical guidance (e.g. EUROCONTROL, IEMA and the Environment Agency) – see paragraphs 13.15 to 13.21 of the ES. The in-combination assessment considers the combined effects of the proposed development and potential climate change impacts on those aspects of the receiving environment and community which could be affected by climate change (see ES Table 13.8) and concludes that there will be no residual effects. Moreover, it is clear from objective 3b of the draft Local Plan, and more importantly paragraph 99 of the NPPF, that it is necessary to show how the proposed development can be resilient to climate change. The application makes clear in the supporting ES, TA and Planning Statement how the airport currently invests in and promotes the use of sustainable transport for its passengers and staff to access the airport, to maintain its high public transport mode share, and will continue to do so.

1.16	Compliance with Draft Policy SP11 of the emerging Uttlesford Local Plan.	As stated above, limited weight should be afforded to policies that are subject of unresolved objections. In respect of SP11, representations made by STAL concerning the detailed wording of this policy have not been resolved in the latest Regulation 19 Draft Plan, and the policy as drafted remains to be tested at an Examination in Public. However, the proposed development accords with all the relevant criteria of the draft policy. A review of the comments received on the application shows that objectors truncate and selectively quote elements of the criteria in the draft policy in an attempt to substantiate a policy conflict. When each criterion is read as a whole and in the context of the whole Plan, no such conflict exists. Examples of this occur for: a) criteria 'd' or '4' (Reg 18 and Reg 19 references respectively) where 'significant increase in air transport movements' is extracted from the policy text. It is suggested that 'significant' can be substantiated from a base of 2017 ATMs, when it is clear that the primary assessment case is a comparison of 'Do Nothing' and the 'Development Case' in 2028. However, the policy criterion as a whole is clearly drafted to consider and judge impacts of increased ATMs 'that would adversely affect the amenities of surrounding occupiers or local environment […]'. The ES demonstrates that no such adverse effects exist and therefore any discussion over 'significant' is irrelevant. b) Criteria 'h' or '8' (Reg 18 and 19 references respectively) where 'minimise the use of the private car' is extracted and claimed to be a policy conflict. The criterion however requires that an application 'incorporates sustainable transportation and surface access measures which minimise the use of the private car […] etc'. The ES and accompanying TA demonstrate such measures are already in place (e.g. the Airport Surface Access Plan and Transport Forum) and will remain so if 35+ is granted.
1.17	Wider relationship between the emerging Uttlesford Local Plan's housing policy and the airport's proposal.	Much has been made by some objectors about the highway impacts when considered alongside the proposed new settlements promoted in the emerging Local Plan for Uttlesford. At a planning application level, it is for each applicant to demonstrate that the development would meet the tests set out in paragraph 32 of the NPPF. The transport modelling undertaken clearly sets out its methodology for factoring in local housing growth. The mitigation proposed and judged necessary to 'limit the significant effects' of the airport's growth (both infrastructure investment and sustainable travel commitments) are related to the application and not to any other third party development, thus according with the requirements of Regulation 122 of the CIL Regulations 2010.
EIA and Alternatives		
1.18	Consideration of the 44.5mppa as a reasonable alternative	At the time of the ES scoping it was made clear that the alteration from 44.5mppa to 43mppa was as a consequence of community consultation clearly indicating a preference for no additional aircraft movements. Please refer to ES Chapter 2 (EIA Methodology), particularly paragraphs 2.13 to 2.19, and ES Chapter 3 (Description of Site, Proposed Development, Policy Context and Alternatives) Having made the decision not to apply for any increase in aircraft movements and to set a limit of 43mppa, which STAL fully expect UDC to impose as a planning cap, any increase to 44.5mppa can no longer be considered as a 'reasonable alternative' as such growth would not be permitted under the planning consent which is being sought.
1.19	The methodology used in the ES is considered misleading as it compares the environmental impact of 43mppa against a baseline of 35mppa. In order to understand the basis of the 'Do Minimum' and 'Development Case' scenarios, the Applicant should demonstrate best practice standards on which the EIA methodology is based.	In accordance with convention and best practice standards complying with the Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Impact Assessment 2004, the EIA has focused on assessing the difference in environmental effects between the Do Minimum scenario and the Development Case. Reference to this can be found in Chapter 2 'EIA Methodology' paragraphs 2.33 and 2.39.
1.20	Planning Horizon: It is considered that an assessment period of just ten years is inadequate and an assessment of the surface access impacts to 2033 should be provided.	The application makes clear the operational limits applied (see the introduction to the Planning Statement) and the assessment period is a consequence of that. An outcome of pre-application public consultation was that no increase in aircraft movements was important to local residents and STAL gave considerable weight to this consideration. The forecasts for the growth of the airport show that the 274,000 aircraft movement limit would be reached in 2028 and therefore it follows that this is the primary assessment year. Air Traffic Forecasts beyond this date would be no higher as the limits would be reached, and therefore impacts of the development no greater. This is explained in the Impact Assessment Assumptions section on ES Chapter 3, in particular paragraph 2.49 which states: "there is no obvious intervening year before 2028, or after, which would derive more pronounced environmental effects than those which would occur in 2028 because this is the year when 43mppa is forecast to be reached". Moreover, as set out in ES Chapter 4 (Aviation Forecasts), STAL's forecasting team, advised by ICF and ACL, has not identified any realistic alternative lower or higher growth forecasts up to 2028.

		Paragraph 2.51 further explains: "Notwithstanding, even if the growth in passenger numbers and aircraft movements were slower to materialise than currently assumed (e.g. due to unforeseen effects on the economy after Brexit) then the consequence of reaching the upper projections for passenger and aircraft movements (up to the combined limit of 274,000 movements) at a later year would not derive any materially different environmental effects than those which would be expected to occur in 2028. Equally, more ambitious growth projections for Stansted, such that the respective 35mppa and 43mppa thresholds would be achieved before 2022/2023 and 2028, are also considered unlikely, as described in Chapter 4". In any event, a sensitivity test to 2033 for highway surface access is provided at paragraph 7.90 of Vol 3 of the ES (Transport Assessment) to ensure alignment with the end of the draft Local Plan period.
1.21	Cumulative Impacts: The ES need to provide an assessment of Cumulative Impacts through to 2033 so that the impacts of the proposed development of Stansted Airport can be considered alongside the impacts associated with implementation of Uttlesford Local Plan and other local plans in the surrounding area	Cumulative impacts within the ES have been appropriately considered against an agreed list of applications and permissions. Paragraph 5(e) of Schedule 4 of the EIA Regulations 2017 requires an environmental statement to consider: "the cumulation of effects with **other existing and/or approved projects**, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources" [emphasis added] Therefore, there is no requirement for an ES to assess the cumulative effects of future development plans or projects unless such developments are subject to planning permission or are otherwise committed to or approved. Notwithstanding, ES Chapter 17 (Cumulative Effects) examines the potential for cumulative effects from 15 committed schemes (see ES Table 17.1), 5 further developments pending determination by UDC (ES Table 17.2) and the various operational improvements that STAL is pursuing as extant or deemed (permitted development) planning permission under the Stansted Transformation Programme (STP). This detailed assessment identified no significant cumulative effects of the 35+ project in combination with these other developments. Cumulative highway impacts are best considered with the use of TEMPro. This approach, agreed with the relevant Highway Authorities, removes any uncertainty that could arise from the draft allocations (housing and employment) that fail to reach adopted plan status. In particular, it is relevant that none of the local plans for surrounding districts have been adopted and all remain at different stages of the plan making process. The environmental impacts of the development are therefore more accurately and reasonably predicted with the methodology used in the ES and TA. A sensitivity test to 2033 for highway surface access is provided at 7.90 of Vol 3 of the ES (Transport Assessment) to ensure alignment with the end of the draft Local Plan period.
Aviation Forecasts		
2.1	The Council should not allow more night flights and increased night cargo movements.	The application does not seek to increase night time movements. Night movements are controlled by the Department for Transport for Stansted. The night flight restrictions at Heathrow, Gatwick and Stansted have been continued until October 2022 which will maintain the status quo in terms of movements while encouraging the use of quieter aircraft at all three airports established in the previous five-year regime. The regime sets night flight movement limits and noise quota limits for both the Winter and Summer at Stansted.
2.2	An updated 'Beyond the Horizon' paper was published by the DfT in April 2018 for consultation. Significantly, the references cited in ES1 Chapter 4 are omitted from the updated paper	As the ES was submitted on 22 February 2018, the Government's paper published in April 2018 could not have been included within the submission. At the time of writing the ES the applicant can only use papers which are published, they are unable to cite future publications which have not yet been released for consultation. In this document, the latest policy position has been addressed, including the Government's updated position on making best use of existing airports, as of June 2018.
2.3	Stansted's forecasts are greater than that of the recent DfT and previously published Airports Commission Forecasts. The level of growth predicted in the application, and the level of 35mppa, is unlikely to be reached as soon as STAL suggests.	Please refer to Chapter 4 Section 4.6.9 of the ES where the differences are highlighted in further detail. Actual growth at Stansted, and other airports, has outstripped both the Airports Commission (AC) and DfT forecasts. For example, the AC (Assessment of Need case, 2015) forecast that by 2017 Gatwick would be handling 38 mppa (actual throughput was 45.5 mppa); and that Luton would be handling 10 mppa (actual throughput was 15.8 mppa). For Stansted, the forecast for 2017 was 22 mppa (actual throughput of 25.9 mppa). Compared with the 2014 baseline, the 6 mppa growth at Stansted between 2015 and 2017 (26 mppa) is double that forecast by the AC. Both DFT and the AC under estimate, by several years, the rate of growth at Stansted: Year in which the current throughput (26mppa) is forecast to be reached at Stansted: - Airports Commission (2013) 2030

		- Airports Commission (2015) 2020 - Airports Commission Low cost case (2015) 2019 - DfT (2017) 2027 - ACTUAL 2017 The DfT has made clear (see Aviation Forecasts document and Explanatory Note) that "the purpose of [its] forecasts is primarily in informing longer term strategic policy rather than in providing detailed forecasts at each individual airport in the short term; the uncertainty reflected by future demand growth scenarios at the national level is compounded at the level of the individual airport". As such, the DfT accept that its forecasts are not intended to be used in a short-term context, in particular over the next ten years. DfT notes that airport-specific forecasts may differ and are likely to reflect local and commercial information that will be relevant to driving growth in the short term. They advise (Aviation Forecasts, para 1.4) that "In some circumstances more recent airport specific data and forecasts might be used, in conjunction with additional relevant information, to inform local planning decisions. This means that where there is an interest in the short-term forecasts, particularly where high levels of competition between airports occur, DfT recommends the use of alternative forecasts or sensitivities (for example, alternative local forecasting) be considered alongside the department's forecast, particularly ones that contain and examine short-term drivers of demand. It is important to recognise the limitations of the Dft's forecasts in relation to the consideration of forecasts of Stansted over the period to 2050.
2.4	STAL / MAG have a poor track record on forecasting	STAL's forecasts have been prepared by credible external specialists and are based on the latest available data for the forecast period at the time of the application, incorporating current traffic levels, route development, Stansted specific airline intelligence and commercial arrangements and an assessment of demand and capacity at other London airports. As such, they are a reasonable basis on which the application can be considered.
2.5	STAL should justify its 2030 opening date for Heathrow R3 rather than 2026.	Government has a target date of opening a new runway at Heathrow by 2030. Heathrow have announced that investment will be phased, and new terminal capacity brought on stream incrementally up to 2040.
2.6	Luton has plans to grow beyond the 18mppa that STAL use as a limit in their forecasts.	Luton's 'announcement' should attract limited material weight in considering this application. Luton is limited to 18mppa on the basis of the limitations of the current planning permission. It expected to reach this figure by 2026/7. On the basis of recent rapid growth, Luton has recently announced its intention to grow the airport beyond this current planning limit. It sees the maximum use of its single runway delivering 36 – 38 mppa in the late 2030s or early 2040s, providing a number of major constraints can be overcome. Although there has been a 'vision' published, there is no published masterplan, planning application or indeed permission, that would substantiate an alternative baseline scenario.
2.7	The Applicant should be required to provide sensitivity analysis for the Stansted forecasts, in the event that Ryanair reduced the scale of its operations at Stansted by (say) 25% as a consequence of Brexit.	We have used economic forecasts that incorporate Oxford Economics' central Brexit case so are already accounting for a slower than otherwise economic growth. A 25% reduction by Ryanair is not considered realistic: The demand for 'low cost' travel is not dependent on the identity of the airline.
2.8	CATMs are predicted to grow to 16,000 in 2028 (para 4.59) and the Applicant, incorrectly, states the 2016 Baseline to be 12,000 CATMs, implying an increase of 33% by 2028. In fact, there were 11,246 CATMs at Stansted in 2016, according to the official CAA statistics and 10,126 CATMs in 2017. The outlook is therefore for an increase in CATMs of 58% compared to today's level.	There is often discrepancy between airport data and CAA data, mainly due to the rationalisation process of CAA statistics. Actual Stansted airport data for 2016 CATMs was recorded at 11,875, which (when rounded for the purposes of presentation in the ES) is 12,000.
2.9	No allowance appears to have been made for long-haul PATMs	Modelling has been undertaken to account for the introduction of long haul PATMs, and it assumes that CATMs continue to be a mixture of older variant aircraft types. The model does phase out the older code Ds over time (many are well over 20 years old today).
2.10	Over optimistic assumptions have been made about the use of 'new generation' aircraft	ICF has projected fleet mix by airline category. These feed assumptions on average aircraft size (seats per ATM) and inform noise and air quality analysis. The methodology for each airline takes the form of a short-term view informed by industry knowledge, known fleet orders, as well as a medium to long term approach using the typical age of the airline's fleet (LCCs typically average 7-10 years), an airline's strategy and high-level transition curves between current and next generation aircraft types. The second approach is required in order to account for future orders and/or leasing strategies that cannot be captured simply by considering today's orderbook. The assumptions made by objectors that a percentage of an airline's overall fleet is required to match the expected percentage of movements by a given aircraft are not comparable statistics. It takes no account of the same single aircraft flying out the airport and returning (i.e. based aircraft) or vice versa ('away based' flying) several times a day and thus delivering multiple plane loads of passengers. The planning statement (section 2) describes the trend to utilise aircraft for long haul routes that were previously only capable of flying short-haul distances. The air quality and noise assessments contain a mix of aircraft that is a reasonably foreseeable representation of the forecast future fleet for Stansted. For example, 'new generation' B737max and A320neo account for 51.6% of movements in the 2028 development case.

		For clarity, a typing correction for paragraph 4.58 of the ES Statement Vol 1 is required. The 80% quoted should be 50%. In full the paragraph should read: *4.58 - The next 10-15 years will also see a significant transition from current generation aircraft to next generation aircraft. From a 2016 baseline of virtually no 'next generation' aircraft, the proportion of these new jets (primarily A320neo and B737Max family aircraft) is forecast to exceed **50%** by 2028. This trend is particularly relevant to the calculation of aircraft noise, which is discussed in ES Chapter 7 (Air Noise).*
2.11	Nowhere in the ES are helicopters mentioned along with the adverse noise impacts	Helicopters form part of the GA allocation. They also appear in the noise assessment too where relevant (there are none forecast in 2028 as GA declines)
2.12	No information on how a reduction in the number of GA movements is to be achieved.	The airport is controlled under international policy (IATA) for the co-ordination of its runway utilisation whereby regularly planned scheduled operations have priority over ad hoc operations such as GA. Ultimately as the airport grows to its capacity (274,000 movements) operation of GA aircraft (ad-hoc movements) will be reduced.
Surface Access- Roads		
3.1	Existing Mode Share Clarification	As a point of clarification concerning Table 10.1: The term "Car" reported from the CAA survey passenger survey relates to car driver trips, where the passenger number for the trip is 0. This refers to all private car trips, parked at the airport, including hire cars. "Car Passenger" refers to all car trips with a passenger occupancy of 1 or more, where cars are drive to the airport, parked or dropped off. The data is taken directly from the detailed survey analysis, publicly available from the CAA.
3.2	Level of background growth uncertainty assumed within the Traffic Assessment and its distribution	TEMPro is a program developed by the Department for Transport (DfT) providing traffic growth projections used in transport models and intended to act as a nationwide standardised distribution of growth in trip ends held with the Nation Trip End Model (NTEM). It also takes into account trends in the quantity and length of car trips per household. The Current TEMPro growth figures are predominantly associated with NETM increases. The TEMPro growth assumptions adopted for all future year traffic predictions provided with the 35+ application are based on the 2016 release of TEMPro and based on the most recent NTEM, which is the most up-to-date dataset of trip ends available for use in transport business cases and are acknowledged by DfT as a robust basis for developing forecasts in the vast majority of cases. TEMPro figures adopted for the analysis consider predicted future local housing and employment at a district level. The factors also include assumptions of future general changes in traffic levels resulting in trends of car usage.
3.3	MAG should continue to proactively work with transport operators to develop and support measures that include improvements to public transport accessibility, in order to facilitate sustainable growth at the airport.	Agreed, STAL in conjunction with the Transport Forum will continue to work with the transport operators and local authorities to facilitate sustainable growth.
3.4	The TA does not account for all key cycle routes that link the Counties.	Cycling at Stansted is only applicable to employees as passengers laden with luggage are more likely to travel by car or public transport modes. Cycling forms 1% of trips by employees at present. Chapter 9 of the TA has set out a number of initiatives that Stansted have set up towards increasing cycling at the Airport. Existing cycle routes were not detailed due to low demand at present. Local Airport initiatives and improvements were alternatively set out as they were considered more relevant to increasing cycle mode share to and from the Airport
3.5	Clarification required on typical Annual Passenger Profile	Refer to TA Addendum (Annex 6)
3.6	Capacity issues between M11 Junction 9 and M11 Junction 13 and models used to understand junction relationship	There has been engagement with Highways England prior to the planning submission to agree the extent of analysis on the trunk road network. This scoping process identified the anticipated traffic levels on the M11 north of junction 8, the impact of the extra 8miliion passengers associated with the application is +2.4%. On this basis it was confirmed by HE that no further analysis was required.
3.7	The health and safety impacts of additional traffic have not been considered within the ES.	Table 6.21 Chapter 6 provides assessment on 'Accident and Safety'. It is shown that there is minimal change in collision risk for links / junctions. Chapter 14 (Public Health and Wellbeing) considers the potential for adverse health effects from both construction traffic (with regards to safety, amenity, severance) and operational access road traffic generation. For the latter, the following operational effects were considered (see ES Table 14.1): • Contribution to air pollutant and noise exposure • Change in amenity value of green / recreational space • Change in road safety • Change in capacity or demand for public transport • Community severance • Impacts on non-motorised users (NMUs) • Change in congestion, access to services This assessment concluded that the residual health and wellbeing effects through all air quality and surface access transport pathways are not significant. (Paragraph 14.77).
3.8	There is a lack of detail on the impact on the B1256. The B1256 route will be severely impacted if A120 cannot sustain traffic.	See Chapter 7 of the TA and Chapter 5 of the corresponding TA Addendum. The B1256 Dunmow Road has been assessed to consider the local road impact.

3.9	Non-compliance with current planning permission to contain all airport related parking on site	All STAL operated car parks are located within the airport's operational area and as such comply with the Uttlesford Adopted Local Plan (2005). Other car parks operating outside the operational boundary are operated by Third Parties and therefore not controlled by STAL.
3.10	There is a 10% decrease in car driver trips – this trend cannot continue indefinitely and must flatten out. This assumption lacks adequate justification. This is also the case for staff car journeys.	The 10% has been derived from the observed trends in previous years (2002-2015 decrease). The introduction of the 2015 SDP Employee Mode Share is predicted to drive this number further. As set out in Paragraph 6.29 in the TA, there has been a 23% reduction in employee car driver mode share between 2002 and 2015, representing, on average, a 1.8% reduction per year over the 13 years. Based on this trend and in line with the aims and objectives of the SDP (to reduce single car occupancy trips), a 10% reduction in car driver trips was considered a realistic target and has been assumed between 2016 and 2028 to illustrate a maintained reduction in car trips from 2019 onwards. All these trips have been allocated to public transport modes. Based on the initiatives to reduce single car trips, for example, the Liftshare scheme (an incentive for employees to car-pool for preferential car parking spaces) the Travelcard scheme (unlimited public transport travel to/from the Airport at a discounted price) and walking and cycling strategies and improvements (employee cycling is at its highest in 13 years), it is considered justified to maintain and sustain the reduction in car trips at its current rate until 2028.
3.11	Employee number differences between Scoping Report and ES	At the time of the Scoping report, precise future employee numbers were not available. In their absence it was suggested that a robust assessment could be provided by assuming a linear increase in employment in relation to passenger numbers. At the time of preparing the TA, more detailed figures were available as reported in in ES Chapter 11 (Socio-economic Effects) and these numbers were hence used for the TA and EA analysis. Other assumptions of staffing attendance and car occupancy and mode of travel have been agreed with ECC and HE, the two relevant highway authorities.
3.12	Generalisation of an average daily staff attendance of 50% at the airport.	As set out in the 2015 Employee Travel Survey and Chapter 4 of the TA, only 66.2% of staff are fulltime. 25% of staff work a three to four-day week. When considering additional factors including annual leave, sick leave, increasing remote/flexible working (a 1% increase per year) and staff layover abroad, a 50% employee daily attendance at the airport is considered justified and robust based on these trends. See Chapter 6 (Paragraph 6.32-6.34) for further detail.
3.13	Staff Mode Share – If a staff occupancy of 1.6 has been assumed then the number of car trips associated with staff have been underestimated by 30%.	A ratio of 1.6 is a reasonable occupancy assumption for overall car based staff travel, which includes taxis that can contain multiple passengers. By way of example, if a lower figure of 1.1. were to be adopted for staff car occupancy, this would only result in 24 additional car trips during the PM peak hour which would be 0.57% increase on the forecast movements in 2028. Such a limited impact would be offset by already robust (overestimated) assumptions about passenger car occupancy. Moreover, the stress test of a further 10% of cars on the road network as set out in the TA Addendum, shows that an additional 419 car trips might be generated, with staff car trips accounting for just 6% of this additional volume. The TA Addendum shows that the mitigation works proposed would result in nil detriment to the SRN, and no material impact on the local road network.
3.14	STAL should subsidise and increase local bus services.	As set out in the TA and Planning Statement, it is already proposed to continue the local bus subsidy via the Transport Forum.
3.15	Cumulative road traffic impacts are a particular important consideration in relation to the planning application. The 2017 Uttlesford Local Plan (2017) is for the period to 2033 and therefore under DfT Circular 02/2013 " overall forecast demand should be compared up to 10 years after date of planning application or the end of the relevant Local Plan" The ES and TA should cover the period to 2033 at a minimum.	Refer to TA Addendum (Annex 6)
3.16	Government Transport Policy in the 'Highways England ('HE') Strategic Road Network Initial Report (2017) makes no mention of improvements to the M11 in the vicinity of Stansted Airport, specifically J8, which would be essential for any further growth of the Airport.	The Highways England ('HE') Strategic Road Network Initial Report (2017) sets out proposals and recommendations. The Policy as a whole relates to the impacts that would be felt as a consequence. The ES deals with this point and demonstrates no impacts. Therefore, the Application is not in conflict.
3.17	M11 and A120 Modelling and Impact Concerns	Further modelling of Junction 8 of the M11 and the A120 link road has been undertaken in collaboration with ECC and HE. It is considered that these two relevant highway authorities will provide the appropriate input to the planning process regarding junction modelling and the appropriateness of suggested mitigation measures acknowledged as being applicable in response to the increase in passenger and employee traffic through this junction. Refer to TA Addendum (Annex 6)
3.18	No evidence of an impact assessment in relation to airport-related HGV movements.	Construction traffic associated with works to deliver infrastructure associated with the planning application has been calculated and fully assessed in the TA. An estimate of construction HGV movements is also provided in ES Chapter 5 (Development Programme and Construction Environmental Management) which proposes that a Construction Traffic Management Plan (CTMP) is adopted for the construction works.
3.19	CAA Passenger Survey and Vehicle Occupancy queries	The CAA survey data provides a highly reliable and large database of travel behaviours. It is the standard means of assessing travel behaviours for UK airports and adopted for all surface access analysis. The detailed issues relating to CAA data are covered in the TA Addendum (Annex 6)

3.20	No evidence is presented in the TA to show predicted staff car movements reducing by 1% with increasing staff numbers on site	The reduction of 1% employee car driver trips from 2016 to 2028 (35mppa) is a consequence of modelling. Between the 2016 and 2028 35mppa scenarios, the growth in employees is gradual, whilst the proportion of car driver trips decreases by 10%. There is also a daily variation in employee arrival and departures. In 2016 compared to the 2028 (35mppa) scenario, the population is smaller, with a greater proportion of car driver trips.
3.21	In the 17:00-18:00 period with an increase to 35mppa overall movements are shown to reduce compared with the existing situation despite an overall 44% increase in passenger numbers, a 14% increase in staff and the 17:00-18:00 period being shown to be the peak period for employee departures. This result is intuitively wrong and no evidence is presented to justify it.	The reduction of 1% employee car driver trips from 2016 to 2028 (35mppa) is a consequence of modelling. Between the 2016 and 2028 35mppa scenarios, the growth in employees is gradual, whilst the proportion of car driver trips decreases by 10%. There is also a daily variation in employee arrival and departures. In 2016 compared to the 2028 (35mppa) scenario, the population is smaller, with a greater proportion of car driver trips.
3.22	<u>Peak Hour Passenger Movements</u> Tables 4.7 and 6.6 should show the same data but do not entirely agree. The figures in Appendix G4 entitled 'vehicles' are higher than other sources of daily vehicle movements. There is no obvious explanation for this. The peak hour vehicle flows in the tables and flow diagrams in Appendix G5 to G8 agree in some cases and disagree in others. The figures in Appendix G5 include some allowance for change of mode as seen in the final tables entitled 'Inc. Mode Share shift and two-way allowance' which contradicts the statement that 'current mode shares will remain constant'. The proportion of passengers using drop-off is shown to reduce from 43% to 32% in the 35mppa situation and 26% in the 43mppa situation. This results in a significant reduction in the increase in vehicle movements in future situations. No explanation is provided to justify this significant alteration of passenger behaviour.	Table 4.7 and Table 6.6 illustrates the same number of total trips per assessment period but discrepancies within the mode of travel. This is because differences when considering two-way allowance. Table 4.7 considers the hourly profile derived from the average flight profiles aggregated into rail, bus/coach and car/taxi trips, divided by the mode split. Table 6.6 works out the proportion of arrivals and departures from the landside trips and divides by the mode share (car drivers, passengers, rail bus and other). It is necessary to understand the variances in data before comparisons can be made. Some of the two-way figures presented in the TA are reflective of two-way passenger movements (by car/taxi) whereas others are by vehicle (taking into account occupancy factors). The 'vehicles' comment in G5 represents an earlier check/crude analysis to work out vehicle numbers. This analysis was not included in any further assessment, as alternative detailed modelling was undertaken to better represent vehicle numbers as shown in Appendix G6. There 2016 daily value shown in G3 is incorrectly reported as 24,777, when the appendix shows the value 24,371 as also reported in G1. The G1/G3 vehicle values differ slightly from those shown in G6 as they are derived from different data sources. The 07:00-08:00 was incorrectly reproduced in the 16:00-17:00 future year scenarios, and the 16:00-17:00 2028 results were shown in the 17:00-18:00 future year assessments. The correct G6 to G8 appendices have therefore been attached in the TA Addendum (Annex 6). The analysis and reported results were for the correct hour and traffic demands. The mode share does not change in the scenarios, but there is a reduction in the number of two-way car trips to the drop-off services. The proportion of trips which are made to the terminal drop-off compared to car park locations shifts in the future scenarios, not the total proportion of trips by car. These targets will be reflected in the planning agreement anticipated with any permission. A key objective of the SPD is to reduce the percentage of 'Kiss and Fly' trips by 30%, and hence the total number of car trips, by providing an effective and attractive premium parking location at a lower cost. The Meet and Greet car park option meets this criteria by offering a service where drivers park adjacent to the front of the terminal building; and unload passengers/bags and depart. The vehicle is transferred to a remote storage area by airport employees for the duration of the passenger's trip, and returned to the terminal pick up area upon the passenger's return. This is a service which has seen significant success in matching the convenience of taxis and kiss and fly and halving the number of vehicle trips from 4 per round air trip to two per round trip.
3.23	Potential impact to local roads in the vicinity of the Airport including Parsonage Road, Church Road and Bury Lodge Lane.	Refer to TA Addendum (Annex 6)
3.24	Chapter 6 of the ES fails to reference DMRB Volume 11, 'Environmental Assessment' that constitutes the most important current guidance and fails to identify a sensitive receptor.	Please refer to Chapter 6 paragraphs 6.32- 6.36 where the applicability of the IEMA guidelines with regard to sensitive receptors is described, together with justification for the screening out of any further analysis in the EIA.
3.25	Local residents using the airport as a transport hub should be inconvenienced as little as possible in seeking to obtain direct access to the terminus. There should be a clear vision as to how the local services will be developed to cater for the significant increase in passenger numbers.	STAL supports this aim. The application as submitted took this into account through, for example, providing a re-worked Rail Commuter Parking Scheme and Express Drop Off Discount Scheme for local residents, that facilitates access to the train station. Continuing local bus network development subsidies are offered as well (see section 7 of Planning Statement).
3.26	The airport should provide a progress report on meeting the aims and targets set out in the Economy and Surface Access section of the 2015 Sustainable Development Plan.	Transport Assessment (Vol 3 of the ES) provides the current (full year) baseline data of surface access performance. The next revision to the Sustainable Development Plan, which includes the Surface Access Strategy will be published in 2020, in line with current national aviation policy.
Surface Access- Rail		
4.1	Potential impacts on the rail network and improvements required to cater for the increased passenger numbers	The rail operations to and from Stansted Airport are linked with other operations on the rail network and the infrastructure and investment being made to the West Anglian Main Line and train services on the rail network.

		The potential impacts of the expansion of operations at the airport on the rail network have been assessed by Network Rail, as the appropriate transport authority. This includes their consideration of sensitivity testing to provide comfort that if the mode share assumptions set out in the TA are exceeded, i.e. that there is a higher take up of rail travel than current recorded, then services will remain satisfactory both for those travelling to Stansted and other users of the Stansted Express trains. They have confirmed they have no objections to the expansion of operations at the airport from 35mppa to 43mppa. Refer to TA Addendum (Annex 6).
4.2	Ely Railway Station connects several lines together (incl. Cambridge, Ipswich, Norwich, Kings Lynn and Peterborough), however during peak times, due to the bottleneck there can be congestion and therefore journey times are increased. As part of the expansion, contributions from the developer to alleviate this issue should be sought as the expansion would result in more services travelling through Ely Railway Station.	The impact on CrossCountry and Abellio Greater Anglia services between Stansted Airport and Cambridge was assessed in the Chapter 8 of the TA. This concluded that future airport passenger demand could be accommodated on existing services. Whilst passenger throughput at Ely Railway Station may increase, there are no proposals to increase the number of services travelling through Ely.
Noise		
5.1	The methodology for assessing additional noise has been considered inadequate, a number of matters were raised on this point: • The Secretary of State for Transport's letter sets out the reasons why the 16-hour day and 8-hour night LAeq average noise metrics are not wholly appropriate to assess all aspects of aircraft noise • The assessment does not include the normal methodology of including absolute noise level thresholds and only bases its assessment on changes compared with the 2016 Baseline year and 2028 Do Minimum for which it says the increases are negligible. • The ground noise assessment metrics are solely based on the equivalent average LAeq noise levels over 16 hours in the day and 8 hours at night • The measurement of background noise levels (LA90) together with maximum noise levels (LAmax) (ES2 Appendix 7.4) at a number of locations around Stansted Airport provides a more effective assessment of likely noise annoyance in the daytime and night time than just the 16-hour day and 8-hour night average noise metrics.	Please refer to Annex 2 for technical notes. The treatment of atmospheric conditions is in accordance with ISO 9613, which is accepted as being an appropriate method of analysing environmental noise, especially over the long term during which conditions can change on a day to day basis. To provide results only for individual occasions (of unknown frequency or timing) for which specific temperature inversion or wind conditions apply would be to misrepresent the typical ground noise conditions. • Average day and night noise levels, expressed as LAeq, are not the only metrics used in the noise assessment. In line with Government guidance several other emerging metrics including N65 daytime and N60 night time are reported. Importantly, SoNA 2014 identifies that the LAeq,16h noise metric is most closely correlated with community response and shall be used when making evidence based decisions. • The assessment does not apply thresholds, but if this has any effect on the assessment, it is to make it more robust, not less. In this case it would have no effect (because all noise levels alongside the roads assessed are above the potential 55 dB(A) threshold identified in paragraph 9.42 of ES Chapter 9). The application of thresholds is redundant in this situation. • Ground noise is different in character to air noise in that it is predominantly audible as a relatively steady state noise, which may fluctuate in level over a typical 24-hour day. It is the relatively continuous comings and goings of aircraft on the ground mixed in with the noise of aircraft at stand that characterises ground noise. It is quite different to the clearly defined series of transient noise events associated with aircraft in flight. Indeed, as ES Appendix A8.1 identifies, airport ground noise has generally been undertaken in accordance with the provisions of BS4142:2014 which deals with industrial or commercial noise sources, reflecting the nature of noise from aircraft on the ground. The standard does not rely on a study of LAmax values being undertaken. • It is unscientific to state that the difference between aircraft noise level (whether measured as LAeq or LAmax) and background noise level (usually measured as LA90) is key to determining the effect on people in the community. SoNA 2014 came to no such conclusion and was clear in its advice that the best correlation of community response is with the absolute value of LAeq,16h. SoNA 2014 derived its results on the basis of responses from individuals exposed to aircraft noise in the vicinity of 9 UK airports, including Stansted.
5.2	Increased number of flights will generate more aircraft noise (night time impacts).	This application does not seek an increase in the 274,000 aircraft movements currently permitted. Airport traffic uses similar routes at night as during the day. Therefore, the effects at night will be localised along the same routes, those being predominantly roads with no dwellings on them. In the case of HGV traffic, the numbers are expected to remain in the same proportion to the overall traffic flows. The only exception is on Round Coppice Road, where the proportion of HGV's is predicted to increase as a result of the cumulative impact of Northside. As there are no dwellings on that road, this will not have any effect. It is reasonable to assume that all HGV routing is direct between facilities on the airport and the strategic road network, avoiding passing any sensitive receptors. It is also worth noting that the spread of passenger aircraft movements over the 24-hour day is not predicted to alter significantly in terms of the proportion that take place at night (the proportion taking place at night is actually predicted to reduce slightly).

		As set out in detail with the Transport Assessment, the total passenger numbers passing through the airport are predicted to increase but the runway becomes more evenly used throughout the day as the airport becomes busier. The current use of the runway is close to capacity first thing in the morning and last thing in the evening. Accordingly, the early morning departures and late-night arrivals grow significantly less than other periods of the day as the runway use becomes more evenly distributed. Passenger and employee movements associated with these early and late flight movements are hence equally predicted to increase by lower proportions than the daily totals. Therefore, taking account of these factors, impacts at night are expected to be no greater than during the day.
5.3	Noise assessment should be based on the Government's latest regulation to be formalised in July 2018.	This application does not seek an increase on the noise levels currently permitted. The study area is more than sufficient to completely encapsulate noise contours down to the LOAEL value, where this is defined, for all operating scenarios. Below the LOAEL, aircraft noise is determined not to have an adverse effect, and there is consequently no need to quantify the noise levels below this value. SoNA 2014 states: *Adverse effects are considered to be those related to health and quality of life. They should be assessed using a risk based approach above LOAEL (Lowest Observed Adverse Effect Level). In order to properly assess the potential adverse effects of airspace change:* • *51 dB LAeq,16h should be regarded as the LOAEL;* • *45 dB Lnight should be regarded as the LOAEL.* The government's Consultation Response on UK Airspace Policy[1] confirmed adoption of these values to establish daytime and night-time LOAEL value for aircraft air noise.
5.4	MAG states new aircraft will be up to 60% quieter but that equates to only approximately 3 decibels, a difference which is not detectable by the human ear.	The perceptibility of the difference in level between any specific aircraft types is not directly relevant to this assessment. The level changes applied to new generation aircraft are stated within the ES Noise Chapter which confirm the source levels utilised in the noise assessment. The appropriate comparator, as assessed, is the overall change in noise level for the reference periods due to the change in aircraft numbers and types for each operational scenario. This change in noise level, including reference to perceptibility where relevant, is included in the ES Chapter and Appendix.
5.5	The ES dismisses the importance of noise complaints.	STAL recognises the importance of noise complaints. However, ES Appendix A7.5 correctly concludes that complaints are a poor indicator of the degree of noise exposure experienced by people. If this were not true, then the incidence of complaints would be higher in areas where people are exposed to higher level of noise, and vice versa. This, in practice, is not the case as the highest incidence of complaints came from people exposed to (relatively) low noise levels. It is not disputed that noise triggers the complaint, but it is not the level per se that is critical. Noise complaints can be triggered by a range of factors, including single events, longer term changes and factors personal to the complainant. It is more likely the perceived intrusion or annoyance associated with observed or heard operations when these have increased noticeably in number over a short period of time. That is the point of the analysis in Appendix A7.5.
5.6	The noise assessment does not take into account emerging government guidance in CAP1498	CAP 1498 is not referred to in the noise assessment as the guidance it contains is aimed at evaluating airspace change proposals (see 1st paragraph of Executive Summary). The 35+ application involves a change in the annual passenger limit and does not require a change in the permitted number of flights, nor is it associated with any changes to flight paths. Consequently, the application does not involve any changes to airspace.
5.7	The Applicant is requested to provide detail of mechanisms to influence the use of quieter aircraft and the impacts of night flights.	Night movements are controlled by the Department for Transport for Stansted. The night flight restrictions at Heathrow, Gatwick and Stansted have been continued until October 2022 which will maintain the status quo in terms of movements while encouraging the use of quieter aircraft at all three airports established in the previous five-year regime. The regime sets night flight movement limits and noise quota limits for both the Winter and Summer at Stansted. In addition, Night Noise Surcharges are proposed which will impose surcharges on operations taking place at any time during the night period (23:00 to 07:00) and ensure that the movements generating the highest noise levels during the most sensitive hours pay the highest price, responding to the 'polluter pays principle'. Noise Penalty Limits are currently imposed to incentivise the best operational practices and noise reduction. It is proposed to tighten the current noise penalty limits for different times of the day. A single limit for the entirety of the 8-hour night period is proposed which is 3dB lower than the existing core night time limit and 5dB lower than the existing day and night shoulder period limits. The daytime noise limit is similarly proposed to be reduced by 5dB. Please refer to Chapter 7 'Air Noise; Section 7.289 onwards.

[1] Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace: Cm 9520, DfT, October 2017.

5.8	Land Compensation should have been included in the EIA. Update required and further consultation.	Land Compensation is governed under Part 1 of the Land Compensation Act 1973 which is not relevant to the EIA process. The airport's Consultative Committee are regularly briefed on the issue.
5.9	At a Stansted Airport Parish Councils Forum (Oct 17), MAG stated there would be a phasing out of the nosier QC/2 aircraft and no consideration would be given to extending the night flight numbers. Either provided false information or MAG position has now changed. Ukraine operators have now opened base for the Antonov An-225 Mriya – Questions how this is an effort to phase out Q/C2 aircraft.	Consistent with the quoted statement, there is now no longer any new scheduling of QC2 aircraft during the night quota period. Operation of such aircraft during the day would be subject to the controls over the daytime noise contour limits that are currently in force at the airport, and as may be amended on the basis of any future grant of planning permission. To reiterate, there is no planned increase in the already approved number of night time or annual aircraft movements.
5.10	Disturbance to the rural surroundings	This paragraph alludes to the fact that the area around Stansted is rural, thereby enjoying low background noise levels and a degree of tranquillity that should afford it special consideration in respect of aircraft operations. Analysis of the background noise data that were measured at a number of locations within the study area (reported in Appendix A7.4) suggests that on aggregate the daytime and night-time background noise levels are slightly higher than the national average reported in the BRE National Noise Incidence Study 2000. This is determined by considering the 50th percentile value of LA90 noise levels measured at all locations both nationally and around Stansted. Please see attached Annex 3A and 3B for further analysis of this point. To reiterate, there is no planned increase in the already approved number of night time or annual aircraft movements.
5.11	The assessment does not attempt to assess cumulative noise effects and ES2 Appendix 7.3 ignores the effects of the London Airspace Management Programme ('LAMP')	It is misleading to suggest that LAMP, or LAMP 2, need to be taken into account in determining cumulative effects. Area wide airspace restrictions are reflected in the operating procedures adopted at Stansted and these have been modelled by the CAA using the accepted methodology. The extent of the noise contours affecting the community around Stansted is determined by aircraft on departure or arrival at the airport and in airspace typically below 4,000ft and definitely below 7,000ft. Aircraft flying to or from other airports in the south east are at much greater altitudes and do not materially contribute to overall aircraft noise levels within the contour areas. Paragraph 9.55 of ES Chapter 9 refers to Chapter 7 with regard to cumulative effects, which are considered in paragraphs 7.308 – 7.312. They set out the reasons that each of the noise sources are dealt with separately and that it is not feasible to derive a 'cumulative noise impact' (nor is it conventional). This is the approach that has been used for the noise assessment at recent airport planning applications; the Heathrow Cranford Agreement application (determined on appeal in February 2017), and the London City Airport application (determined on appeal in July 2016) and this application follows that adopted approach.
5.12	100% single mode contours should be provided for a proper assessment to be carried out.	100% mode contours do indeed reflect the experience of people in the community on any given day, but SoNA 2014 is silent on the relationship between 100% mode noise levels and the response of people so affected. The noise response relationships are all derived from aggregate mode operations that allow for the daily variation in operating direction over a summer season (the busiest time of year). Table 2.2 in ES Chapter 2 ES Methodology responds specifically to the scoping opinion point that 100% Leq single direction runway usage contours should be provided. The approach adopted carefully considers what additional assistance the provision of 100% mode contours would provide to the noise assessment and concludes that it is minimal. This approach is reinforced by the position taken by the inspector in the 2008 inquiry into the 25+ application at Stansted, namely that such contours are of interest but add little to the assessment.
5.13	No figures are provided for "moderate downwind conditions"	The treatment of atmospheric conditions is in accordance with ISO 9612, which is accepted as being an appropriate method of analysing environmental noise, especially over the long term during which conditions can change on a day to day basis. To provide results only for individual occasions (of unknown frequency or timing) for which specific temperature inversion or wind conditions apply would be to misrepresent the typical ground noise conditions.
5.14	The WHO Guidelines for Community Noise provide values for moderate (50dB) and serious (55dB) annoyance over the 16-hour day period as well as maximum noise levels at night. The ES ignores the WHO guideline value for moderate annoyance level of 50dB LAeq and additionally ignores the WHO Night Noise Guidelines where it recommends an Lnight level of 40dB. The assessment also does not any provide any maximum noise levels at night where WHO provides the value of 60dB LAmax	The WHO guideline values used for assessing community disturbance effects are consistent with the approach used for the previous 25+ application and, as noted, other UK airports. The thresholds of 55 dB LAeq,16h and 45 dB LAeq,8h have been selected to represent the threshold of significant community disturbance in the manner that 54 dB LAeq,16h (formerly 57 dB) is determined to mark the onset of significant community disturbance for air noise. It is recognised that annoyance at an individual level can arise at levels below these thresholds and that is why ground noise contours are plotted down to values of 50 dB LAeq,16h daytime and 40 dB LAeq,8h night-time. Government guidance on mitigating aircraft noise, as set out in the Aviation Policy Framework and the more recent consultation documents, indicates that it is not necessary to provide sound insulation merely because noise is at a level deemed to constitute an Adverse Effect. For air nose, the LOAEL is defined to be 51 dB LAeq,16h while current policy is that airport operators shall be required to protect residences and other noise sensitive dwellings at a level of 63 dB LAeq,16h or above. One of the qualification criteria for the SIGS scheme is 55 dB LAeq,16h for ground noise, clearly underlining the fact that this is considered to constitute a sound level requiring mitigation, where appropriate, and not the point at which Adverse Effects are likely to be felt.

5.15	The assessment disguises the high noise levels currently experienced on all the 38 link roads surveyed around the airport.	This does not explain how the judgement was reached that the assessment disguises high noise levels.
5.16	All 38 locations currently exceed the WHO value for serious annoyance of 55dB LAeq.16-hour and many of these locations exceed the 55dBA value by a considerable margin	We have conducted the impact assessment in accordance with relevant guidance (DMRB), in terms of changes in noise level.
5.17	This further increase of ground noise disturbance would be experienced for people living around the airport and the cumulative impacts are not shown to have been assessed in the ES.	Paragraph 9.55 of ES Chapter 9 refers to Chapter 7 with regard to cumulative effects, which are considered in paragraphs 7.308 – 7.312. They set out the reasons that each of the noise sources are dealt with separately and that it is not feasible to derive a 'cumulative noise impact' (nor is it conventional). This is the approach that has been used for the noise assessment at recent airport planning applications; the Heathrow Cranford Agreement application (determined on appeal in February 2017), and the London City Airport application (determined on appeal in July 2016). It is the approach adopted for this application. The trip modelling presented in the Transport Assessment has been agreed with Essex County Council and Highways England as a sound basis for understanding the potential impact of the expansion of operations at the airport. The trip modelling incorporates a series of robust assumptions that generally overestimate likely traffic generation. These robust assumptions include: • Making no reduction in external network (surface access) trips for passengers using the airport for internal flight transfers - currently understood to be around 1-2 million per annum. i.e. all future passengers have been assumed to result in an external trip(s); • Adopting a car occupancy of 1.6 passengers per car while CAA advice on interpretation of its passenger surveys is that a figure of 1.8 may be appropriate; and • Adopting current travel modes for future trip modelling, i.e. making no allowance for a general trend of decreasing car proportion as has been historically the case. Notwithstanding the above, additional sensitivity testing is being provided by SDG to provide comfort that the highway mitigation proposals for the key M11 Junction 8 have sufficient spare capacity to accommodate additional traffic levels. Similarly, ECC is auditing the proposals using their own independent modelling, developed for the ECC J8 improvement scheme.
5.18	In order to minimise unnecessary overflights over existing and planned new communities, including the Harlow and Gilston Garden Town proposals, increasing use of Continuous Descent Approach should be used wherever practicable.	Airspace change is not part of the planning application and remains subject to separate regulatory processes. Although CDA operates on Runway 22 over 90% of the time, CDA is not currently possible on Runway 04 approaches due to airspace restrictions. The Stansted Noise Action Plan sets out a commitment to achieve CDA compliance when possible.
Air Quality		
6.2	A number of guidance reference matters have been raised below: • The 2014 NAEI has been used, 2016 is now available. • Our old H1 guidance for assessing significance has been used; however, this only applies to industrial installation. Elsewhere the DRMB guidance and the ADMS Airports model are referenced which are acceptable.	The latest data available at the time of the preparation of the Air Quality chapter and appendices were used. 2016 NAEI data was only available from 12th June 2018. This is a reference to paragraphs 10.82 to 10.84. Both H1 (now withdrawn) and DMRB guidance are referenced and indeed the DRMB guidance on significance of effects on ecological receptors is based on H1. Both sets of guidance use the same test for effects to be not significant: 1%.
6.3	Rural background data clarification	The estimates for rural background concentration are from Wicken Fen, St Osyth, Rochester Stoke and Harwell. The rural background concentrations closer to London were calculated using these rural backgrounds plus NAEI emissions data. As commented by the Environment Agency, NAEI data for 2014 were used as the latest available. Use of 2014 data rather than 2016 is likely to be a conservative (pessimistic) estimate as NAEI 2014 emissions are likely to be higher overall than NAEI 2015/2016 emissions. Wicken Fen is the only site that is downwind of London in the prevailing wind direction and it is approximately 95km from the centre of London. If data from Wicken Fen were under-estimating, data from Wicken Fen is used when the wind if from wind directions between 307° and 52°, which is a small proportion of the time (as shown in Figure 10.4.1, the windroses).
6.4	Construction should follow the standards and practices in the IAQM's or London Mayor's guidance for construction/demolition and air quality.	Paragraph 10.42 outlines the construction activity which involves only minor changes to airfield infrastructure. The Institute of Air Quality Management (IAQM) construction dust guidance (IAQM (2016) Guidance on the assessment of dust from demolition and construction, version 1.1) will be appropriate and will be used in the development of a Construction Environmental Management Plan (CEMP) and Construction Dust Management Plan (DMP) as described in ES Chapter 5 and 10. These will be used to govern construction activity.
6.5	Concerns regarding the significance of effects at human receptors	The significance of effects at human receptors has been assessed following the IAQM/EPUK guidance as described in paragraphs 10.79 to 10.81 and Table 10.5. Although impacts of up to 1.0ug/m^3 are predicted at a few receptors, at those receptors the background concentration is predicted to be well below air quality objectives and therefore the impact has been assessed as negligible.
6.6	The AQ predictions are based upon assumptions (e.g. cleaner fuel, electric vehicles, abatement equipment) and monitoring data from Hatfield Forest has not been used. Baseline data and predictions may not be accurate and may be underestimated. The 5 year data (2011-16) for NO_2 levels at the two diffusion tubes closest to Hatfield Forest shows an increasing trend. Therefore concern is raised about the reliability of the predicted forecasts. It is noted that the ES indicates that predicted change to lower critical load is less than 1%	Please refer to Annex 2: Information on SSSI impacts for clarifications on this point.

	for Hatfield Forest, however, clearly some critical loads will continue to be exceeded. It is however acknowledged that this cannot be solely attributed to road traffic associated with the airport.	
6.7	Request of a condition to ensure a robust and regular method of air quality monitoring, reporting and assessment against baseline information. It is requested that this includes the monitoring stations at Hatfield Forest with regular reporting to the National Trust and Natural England.	As part of the on-going and current S106 commitments, STAL produces all the data on an annual basis in a publically available report published on the website. This commitment will be continued and will include the new monitoring point in Hatfield Forest.
6.8	Air pollution could have a possible detriment on the adjacent SSSI of Epping Forest.	The Applicant sets out further clarification on the 'Preliminary Ecological Appraisal- Incorporating Information to Inform a Habitats Regulation Assessment (HRA'), originally found in Chapter 16 Appendix 16.1 of the Environmental Statement. This is founded on three pieces of further supporting information associated with Epping Forest Special Area of Conservation (SAC) (Ecological surveys, Nitrogen deposition modelling and traffic modelling) which we hope satisfy the objector. The original conclusions still stand; no significant effect on the SAC is predicted as a result of the 35+ Project. The full technical report can be found in Annex 1.
6.9	No firm evidence or guarantee that in the period to 2028 'new 'cleaner' aircraft types will in the future replace current models	Examples of Stansted based airlines' plans for replacing their existing fleets with 'new generation' aircraft is provided in ES Chapter 4 (Aviation Forecasts), paragraphs 4.33, 4.34 and Figure 4.7 Please also refer to Chapter 10 Section 10.117 where emission factors for the Airbus A320 have been taken from the ICAO databank (issue 23c June 2017) which uses the evidence of data from real engine testing. For the B737 MAX8, emissions were taken from IATA's long-term traffic and emission forecasts for Hong Kong Airport (2014).
6.10	Dismissal of the International Civil Aviation Authority ('ICAO') 3,000 feet assessment for dispersion modelling.	The normal approach to modelling airport and aircraft emissions is not to model emissions over 1,500ft as their impact on ground level concentrations is negligible. The maximum impact of aircraft emissions above 1,500ft is estimated to be less than 0.0005μg/m^3 of NO_2 and it would occur at a distance of over 5km from the airport. Therefore, the impact of these elevated emissions is negligible for ground level concentrations.
6.11	Consideration to be given to associated damage costs from the proposed development.	Damage costs associated with the proposed development have been explored and is considered to be addressed already through the ongoing public transport support funded by the car parking levy in operation at the airport. Greater use of the car parks - with increased passenger throughput - will result in a greater cross subsidy to public transport initiatives. This strategy of increasing public transport use contributes to meeting air quality objectives.
6.12	It is requested that the AQ monitoring station results from inside the airport should be made available.	Monitoring data from monitoring stations inside the airport boundary are given in Table 10.7 of Air Quality Chapter for the years 2012 to 2016. There are no exceedances of the air quality objectives between 2012 and 2016. As part of the on-going and current S106 commitments, STAL produces all the data on an annual basis in a publically available report published on its website. This commitment will be continued.
6.13	Concerns in relation to NO_2 levels at Bishops Stortford AQMA	The Bishops Stortford AQMA is referenced in paragraph 10.96 of ChAQ and concentrations have been calculated at receptors in the AQMA (Table 10.1 and Figure 10.1 of A10.1). Traffic data for roads for roads in Bishops Stortford is provided in Table 10.33 of A10.3.
6.14	Existing exceedance of Burton End monitoring site close to both the airport perimeter and the M11 motorway.	Diffusion tube UT009 is a roadside site which is 3.1m from kerbside (Table 10.7 of ChAQ) and 142m from a location of relevant exposure (Uttlesford District Council, 2015 LAQM Updating and Screening Assessment). The concentration recorded in 2016 (43μg/m^3) is much higher than that recorded in the preceding years (2014-205) and 2016 was the only year in which an exceedance of the objective was measured. In comparison, the Stansted West monitor at the Radar tower, Burton End, which is on the airport, recorded a concentration of 15.7μg/m^3
6.15	Concerns with current monitoring sites showing results very close to the AQ limit.	The predicted NO_2 concentrations for The Four Ashes (receptor R53) and Chapel Hill (R139, R140, R141) are given in Tables 10.32, 10.34 and 10.36 of Appendix 10.5. At all the receptors significant reductions are predicted in 2023 and 2028 compared with the 2016 base case.
6.16	Overly optimistic DfT forecasts regarding the future composition of road traffic, There is an assumption that the recent exposures over doctored diesel engine emissions test results by vehicle manufactures will prevent any future recurrence.	The version of the EFT used was version 8.0 which is based on the COPERT 5 emissions data. This emission data is the data used in Defra/DfT's latest Air Quality Plan: Air quality plan for nitrogen dioxide (NO_2) in UK (2017). Please refer to Annex 4A where this point is discussed further.
6.17	Environmental legislation is currently based on EU law and cannot be modified in the UK until after the 'Brexit' transition period, i.e. until 2021.	The EU air quality limit values were transposed into domestic legislation via the Air Quality Standards Regulations 2010.
6.18	Clarification required to determine whether or not the AQ impacts of the proposed development are acceptable	The predicted impacts of the proposed development on human and ecological receptors are given in A10.5. Impacts at human receptors have been compared to the UK's health-based air quality objectives. The methodology used (paragraphs 10.24 and 10.25 of ChAQ) is that used in the UK for the assessment of airport air quality impacts.
6.19	The ES used meteorological data, air quality monitoring data, background concentration data, airport and road traffic activity data and emission factors for the baseline year 2016. The Council request an assessment be undertaken, using three or more years of meteorological data.	Please refer to Annex 4B where this point is clarified.
6.20	The Council has raised potential issue of odour at the boundary of the airport causing nuisance and possibility of carrying out boundary monitoring.	Please refer to Annex 4C where this point is clarified.

Socio-Economics		
7.1	The socio-economics assessment is considered unbalanced with no economic downsides associated with the proposed development (e.g. net tourism defect, impact on residential property market).	The socio-economic impact assessment of the proposed development (Chapter 11 of the ES) is considered to be balanced, rigorous and accurate. The impact of the Development Case vs. the Do Minimum (without development scenario) on population is in fact very small. Any societal impacts could only come from population growth associated with the development which has been shown to be insignificant. Optimal Economics conclude that the scale of any consequential effects on the net demand for housing in the study area can only be very minor (see ES Chapter 11, paragraph 11.163).
7.2	The socio-economic assessment relies on research published by economic forecasting bodies in 2006 and 2009; and does not take account of the financial crisis or Brexit vote, with the methodology underpinning the studies not included.	This is not correct. Optimal Economic's impact estimates are based on current forecast passenger numbers and relationships between passenger numbers and direct indirect and induced employment, as explained in the methodology section of ES Chapter 11 (Socio-economic Effects). The forecasts prepared by ICF are summarised in ES Chapter 4. As explained at paragraph 4.45 the economic forecasts that underpin the ICF traffic forecast were provided by Oxford Economics in July 2016, following the Brexit Referendum result. The economic forecasts were predicated on Oxford Economics' central case. This is where the UK leaves the EU on unfavourable terms, without negotiating a significant trade deal and the trade relationship between the UK and the EU therefore reverts to WTO rules. Moreover, were Brexit to depress national/ regional growth then the economic impacts of more traffic at Stansted will be relatively more important than presented.
7.3	It is noted that there is a significant difference between the type of jobs on offer at the airport and the type of jobs available to local residents.	Comparison of jobs with local occupational structure does not establish that jobs provided by Stansted are not needed nor are not beneficial from a social and economic point of view in the study area. As set out in paragraph 11.166 of the ES, STAL will continue to develop some key initiatives including the Stansted Airport Employment and Skills Academy with a particular focus on attracting employees from disadvantaged areas including Harlow, Braintree, other parts of Essex and North-East London. By 2028 STAL's aim is to increase employment of local people, at a range of skill levels, in line with airport employment growth of 700 per year.
7.4	In arriving at the above average earnings figures the ES has used an average of part-time and full-time earnings, resulting in figures that are quite meaningless for this type of comparison	The ES used the ONS data for median earnings. Optimal Economics consider the numbers to be a fair comparison and refute the SSE figures.
7.5	Query on significant net economic benefits to the UK in relation to Ryanair staffing.	Employment of non-UK staff by Ryanair is not a substantive point and no evidence is provided. Aircrew of any nationality based out of Stansted will live and spend in the normal staff catchment area.
7.6	The proposed development would have an adverse impact on the UK trade balance of £910 million in 2028 compared to the base case, and of £2,940 million compared to the 2016 Baseline.	While this reflects a simplistic "static" approach to Bottom of the Pyramid (BoP) economic analysis, Optimal Economics assessment of the economic benefits and costs of the 35+ project provides a greater complexity of analysis., Please refer to Section 11.146 onwards; the applicant maintains its position on trade balance.
7.7	Commitments to construction skills / workforce opportunity.	STAL is committed to developing skills and its workforce locally and this can be seen through the development of the on-site Stansted Airport College. STAL and the College will work with ECC as appropriate to develop future opportunities. The physical works directly related to this application are limited however, and other airport development work such as Arrivals Building are larger and offer greater opportunities in respect of construction work.
Carbon Emissions and Climate Change		
8.1	The CO_2 emission projections have only been provided to 2028.	The scope of the GHG assessment extends to 2050. The 2028 forecast year is the first year that the anticipated maximum aircraft movements would be reached. The GHG emissions assessment then incorporates airport operations at this limit in the years leading to 2050 (see ES Chapter 12paragraphs 12.82 to 12.86).
8.2	It seems reasonable to predict that relaxation of the UK aviation industry's 37.5 $MtCO_2$ cap are unlikely to be realised. Indeed, it may be that in the light of the Paris Agreement the cap has to be reduced.	The Applicant agrees that the Paris Agreement demands more significant reductions in emissions. The CCC in its "UK climate action following the Paris Agreement" response stated that the UK already has stretching targets to reduce GHG emissions and that these will achieve positive contributions to global climate action.
8.3	The claims of reduction through aviation in the EU Emissions Trading Scheme ('EU ETS') is not recognised by the consultee	The objector does not recognise the claims made in terms of carbon reduction in the aviation sector as a result of EU ETS. The source of this statement is the European Commission: https://ec.europa.eu/clima/policies/transport/aviation_en
8.4	We assume that the Applicant's assessment of CO_2 emissions takes no account of any effect that CORSIA, if implemented, might have.	We can confirm STAL's emissions are not presented with CORSIA implemented (i.e. 'residual' emissions following CORSIA off-sets)
8.5	MAG has not provided the information we would need in order to re-assess the projected carbon emissions for the base case and the development case, and only a limited amount of the information can be obtained, or confidently estimated from other sources. The provisional view is that the projected carbon emissions (but not the Baseline) have been underestimated by about 15-20%.	DfT estimated 1.6Mt for Stansted in 2030 (35mppa), which demonstrates that MAG's estimation of 2.3Mt in 2030 (35mppa) is a pessimistic estimation. Therefore it is not unreasonable to suggest that MAG's projection for 2050, which is 1.5-2Mt, is likely to be realised towards the lower end of the range, which is in line with DfT's projection of 1.5Mt for Stansted in 2050.
8.6	Both DfT and Airports Commission have assumed that Stansted was capped at 35mppa and this equated to CO_2 emissions of about 1.6Mt in 2030, falling slightly to 1.5Mt by 2050. It is not unreasonable to look upon these figures as budgets because they form part of the	Paragraph 12.21 of the ES states the CCC has only advised government that UK domestic and international aviation emissions should be limited to 37.5 MtCO2e. The CCC has made an allowance to include these emissions within its 5th Carbon Budget but Government has not explicitly included these in its budgets.

	overall UK budget – or planning assumption – for UK aviation carbon emissions to be limited to 37.5Mt CO_2 by 2050	
8.7	MAG states that it has based its emissions projections on the 'CO_2 Roadmaps' produced by 'Sustainable Aviation', an industry-sponsored organisation which has produced three of these Roadmaps over the past ten years and has a record of optimistic projections	Table 12.4 in the ES illustrates how the projected improvements in the aviation sector presented by Sustainable Aviation are in line with the CCC's report on Meeting the UK Aviation Targets. We acknowledge there are uncertainties connected with projecting changes in the efficiency of the aviation sector and we addressed this uncertainty by presenting three scenarios (pessimistic, central and best practice). The DfT also acknowledges that its latest (2017) forecasts are there primarily to inform long term strategies rather than detailed forecasts at each individual airport. Table 8 (p55) of the DfT's UK Aviation Forecasts presents the assumed fuel efficiency improvements to 2050. The Central case of annual improvements ranges from 0.62% (2016/30), 1.31% (2030/40) to 1.45% (2040/50) and hence are more optimistic than our assumptions on fuel efficiency (see Table 12.4 in the ES – range of 0.9 to 1.22% annual efficiency improvement).
8.8	The increase in carbon emissions compared to the base case would amount to approximately 6Mt of CO_2 over the 32-year period to 2050. This is not far short of the emissions that would have been generated over the lifespan of the proposed open-cast mining operation at Highthorn in Northumberland. Significantly the Secretary of State rejected that application, overturning the decision of the Planning Inspector, principally on the grounds of its effect on GHG emissions and the need to combat climate change.	The appropriate comparison in terms of absolute cumulative emissions is between the Do Minimum (DM) and Development Case (DC). Paragraph 12.77 of the ES presents the difference in cumulative emissions between the DM and DC scenarios (2016 – 2028) at 1.1 $MtCO_2$. It is acknowledged that all "GHG emissions from all projects will contribute to climate change; the largest interrelated cumulative environmental effects…as such any GHG emissions or reductions from a project might be considered to be significant…" in paragraph 12.56, in line with IEMA guidance. Each scheme needs to be considered individually and the proposed development at Stansted has been considered and the impact compared to relevant benchmarks. The CCC's UK carbon budgets and the DfT's forecasts exclude radiative forecasts. There is a high level of uncertainty as acknowledged by all.
8.9	Further details are required to show how any additional carbon emissions will be reduced and the offset. Stansted Airport needs to produce a climate action plan of their own, which outlines how carbon emissions will be reduced and offset.	The Incorporated Mitigation section of the Carbon chapter presents the various actions undertaken by Stansted Airport to manage and reduce carbon emissions. Specific to construction carbon emissions, a Construction Environmental Management Plan (CEMP) and Code of Construction Practices (CoCP) plan will be produced to manage the environmental impacts of construction and establish responsibilities for contractors and developers. Stansted Airport has also been measuring and reporting its carbon footprint since 2009 and reporting it in its Corporate and Social Responsibility (CSR) Report. Stansted's 2015/16 CSR Report explicitly describes the airport's carbon management strategy, which identifies carbon emissions within its sphere of influence, such as focusing on reducing airport and surface access carbon emissions, whilst working in partnership to influence flight emissions. In parallel Stansted is pursuing a range of activities including, but not limited to: - Achieving Level 3 (Optimisation) under the ACI ACA Programme - Investing in low energy and low carbon technology such as low / ultra-low energy lighting and fuel efficient vehicles, and where possible sourcing on-site renewable energy sources - Setting itself energy reduction targets and building performance rating targets (BREEAM Excellent)
Public Health and Wellbeing		
9.1	The requirement for a Health Impact Assessment ('HIA') for this planning application stems, not from UDC policy, but from EU Directive 2014/52/EU (April 2014) (amending Directive 2011/92/EU)	While the objector suggests that the Applicant has sought to claim an exemption from the need to assess health impacts based on the limited requirements for health impact assessment (HIA) in local planning policy. This is incorrect, given that an HIA was conducted and submitted with the application.
9.2	A statutory HIA should not be undertaken lightly nor overlap with socio-economic benefit	This is a key principle within HIA is to facilitate more health conscious planning and development, and a fundamental requirement for a balanced, evidence-based health assessment.
9.3	It is considered that the quantification is lacking within the HIA, and many key assertions are put forward with no supporting evidence	For clarity, and as stated in paragraph 14.22 of Chapter 14, health impacts have been assessed quantitatively for changes in noise and air pollution, and qualitatively for other health pathways. This is in accordance with the established health evidence and assessment methodologies that are referenced. Quantified impacts can be readily found in Tables 14.5 and 14.6 of Chapter 14. Not all health outcomes can be fully quantified with the current state of scientific knowledge, but qualitative assessments are nevertheless evidence-based, following the methodology set out in Chapter 14. References to the supporting scientific evidence and guidance on quantitative assessment approaches are detailed thoroughly in the Health Evidence Base at Annex 14.1.3. It must be understood that comments "of a general nature" have quite limited relevance to the assessment of health and wellbeing impacts associated with the development that is proposed.
9.4	The Applicant has not assessed health risks from all of potentially relevant sources of pollution listed in the NPPF. An example is light pollution, where the two new taxiways and nine new aircraft stands will give rise to increased "night glow" from the airport.	Chapter 16 of the ES summarises non-significant environmental effects, which were scoped out of the EIA in accordance with the UDC Scoping Opinion. Paragraph 16.55 states that there will be no discernible change or impact to the visual character or visibility of the airport as a result of the proposed development, as the new infrastructure (which includes the lighting required) would be in keeping with the scale and appearance of existing infrastructure. Paragraph 15.52 states that temporary construction lighting would be directional and not expected to be noticeable beyond the airport boundary. Change in visibility of lighting is therefore not a relevant health pathway in the case of the proposed development. Assessment of cumulative impacts has been undertaken as part of the EIA: Chapter 17 of the ES sets out the relevant cumulative developments that have been assessed and potential for cumulative impacts arising.

		The assessment of health impacts in Chapter 14 is based on the predicted changes in relevant health pathways (e.g. noise, traffic, air pollution), which as described in each topic chapter of the ES, take into account committed developments and also increases in the future road traffic baseline. With regard to cumulative developments on the airport site, paragraph 2.69 of Chapter 2 and Chapter 17 describe how such 'on-airport' cumulative schemes have been considered, noting that these are expected to have been completed prior to construction of the proposed development. The increase in passenger numbers facilitated by such on-airport developments is within the proposed development scenario case that has been assessed in the EIA and HIA. In summary, the assessment of health and wellbeing impacts, drawing from the evidence of changes in environmental and social health pathways reported in the ES, has included relevant cumulative developments. The HIA discusses this at paragraph 14.1.93 (with further detail in the Health Evidence Base at Annex 14.1.3), noting that there is some risk of double-counting the quantified impacts of change in noise and air pollutant exposure, as these are sometimes correlated in the health evidence (due to often being associated with the same exposure sources). Paragraph 14.1.87 of the HIA explains that no significant impact from cumulative ground, road and air noise is predicted; further detail is given in Chapters 7, 8 and 9 of the ES. The maximum impact (adverse or beneficial) via each potential health pathway would not coincide at any one individual receptor. The assessment of health and wellbeing impacts is made at a population level: it is not possible at assess inter-related impacts for any one specific individual or attempt to present a 'net' effect (from the balance of adverse and beneficial impacts), as this would depend upon the individual's personal health. This is discussed for example in paragraphs 14.1.83, 14.1.91 and 14.1.125 in the HIA.
9.5	The HIA makes no mention of the WHO Charter on Transport, Environment and Health.	Relevant health pathways were considered and consulted upon during EIA scoping, and the pathways taken forward for assessment are listed in Table 14.1 of Chapter 14 and all relevant issues have been included in the ES and HIA. Evidence reviews that had been published to inform the forthcoming 2018 WHO noise guidelines were discussed in Annex 14.1.3. All references were correct at the time of writing.
9.6	HIAs need to be conducted independently and seen to be transparent and impartial. HIA reports are otherwise likely to lack credibility	The assessment of health impacts has been undertaken by competent experts (identified in Appendix 1.1 of the ES) following a well-established process, and has involved both statutory and public consultation, including with the Hertfordshire Director of Public Health (as set out in the HIA on pages 14.1-15 to 14.1-16), to inform and refine the scope and focus of the assessment.
9.7	The accumulated data from a number of studies strongly suggests that those living in the vicinity of airports may experience cardiovascular damage and this is also supported by experimental evidence. It is likely that further damage may occur in those who already have compromised cardiac function.	This is discussed extensively in Annex 14.1.3, and has informed the assessment of health and wellbeing impacts as documented fully in the HIA (see e.g. Table 14.1.7 listing exposure-response factors applied and the literature sources).
9.8	The HIA provides no information as to the split between long-haul and short-haul ATMs, or on the comparative passenger seat kilometres. It is therefore not possible to examine and assess (i.e. audit) the results which are asserted by MAG/RPS in the HIA.	The HIA is not intended to be read in isolation to the ES, please refer to Chapter 4 'Aviation Forecasts' for further information.
9.9	The risk to the health of those living in the vicinity of airports and airport access roads, and being affected by poor air quality, arises in particular from emissions of nitrogen dioxide (NO2) and particulate matter (PM10 and PM2.5)	The evidence in this area is acknowledged, discussed extensively in Annex 14.1.3, and has informed the assessment of health and wellbeing impacts as documented fully in the HIA (see e.g. Table 14.1.10 listing exposure-response factors applied and the literature sources).
9.10	Health Impacts of Climate Change and international travel not fully assessed	Climate change risks and resilience measures were assessed in Chapter 13 and Appendix 13.1 in the ES. Potential in-combination impacts, including public health and wellbeing, were assessed in Chapter 13 and Appendix 13.2. The factors mentioned as risks in the UK, such as flooding and heat waves, were considered. With regard to the points about introduction or spread of vector-borne diseases in the UK (due to climate changes allowing greater spread of the vectors, e.g. mosquitoes), the proposed development does not include creation of any new surface water ponds that could, hypothetically, provide a habitat for mosquito disease vectors. As stated by the UK Climate Change Risk Assessment (CCRA) 2017, the risk of introduction of malaria to the UK is low, and projections for 2080 under a range of emission scenarios only indicating a small risk of malaria transmission in the UK. Risks associated with other mosquito-borne diseases such as Dengue and Chikungunya are dependent on risk of invasion of non-native mosquito species to the UK, which remains low in the near term, although may increase with more significant warming in the future (UK CCRA, 2017). The potential for international travel to facilitate spread of disease is by no means a new concern, and healthcare measures are in place nationally to mitigate this risk. Airlines can refuse travel for passengers with an infectious disease and quarantine is available if required for arriving passengers. Public Health England (PHE) monitors risks from diseases such as MERS-CoV, and its February 2018 risk assessment states that the risk of infection to people in the UK is very low. PHE also has various specialist advice and diagnostic units (such as the Imported Fever Service or Rare and Imported Pathogens Laboratory) to assist doctors with managing cases where travellers have returned to the UK with infectious diseases.

		While Incident Management Plans are an operational matter between the airport and PHE or local health authority, and is not a land-use planning matter, to address any concerns by the PHE we will commit to an updating the Management Plan as part of this planning application.
9.11	The Applicant has failed to carry out any proper assessment of the cumulative effects which means including other developments taking place locally at this time, and of the combined adverse effect of the additional noise, emissions, road traffic, light pollution and other impacts upon particular receptors (local residents) that would bear the brunt of the impacts.	The health assessment has followed a balanced, evidence-based approach to consider all relevant pathways that may give rise to either beneficial or adverse impacts. It acknowledges that some people will be affected positively or negatively, and does not attempt to combine this only as a single 'net' effect – recognising that people will be affected in different ways. Significant health and wellbeing benefits arising from employment opportunities (especially for disadvantaged people) are identified in the HIA. Negative impacts via other health pathways including change in noise and air pollutant exposure have been thoroughly assessed and predicted to be negligible or minor, non-significant in EIA terms. It is worth reviewing the HIA conclusions (paragraphs 14.1.179-182), which shows the balanced approach that has been taken.
9.12	In the case of the G1 application, an extensive 'Quality of Life' survey, including a questionnaire provided to local residents, was carried out on behalf of STAL to assess the impact that expansion would have on community wellbeing. The results of that survey showed general opposition to the airport expansion proposal; much of this based on concerns about health and reduced quality of life. These results may or may not be the reason why no similar such survey was carried out on this occasion.	The potential to undertake a separate 'Quality of Life' assessment was discussed in the EIA Scoping Report. The lack of current guidance to define a scope or approach for a stand-alone assessment was noted, and on review of the potential quality of life indicators, we concluded that these were well-covered already by the proposed scope of the health and wellbeing assessment. Appendix 14.1.1 of the ES, "'Quality of Life' Within HIA and EIA", documents this review and the way in which quality of life indicators have been fully included in the impact pathways assessed in the HIA and in Chapter 14 of the ES.
Water Resources and Flood Risk		
10.1	Insufficient evidence has been submitted to demonstrate that the 20% improvement in efficiency can be achieved. There is little reference to specific and measurable targets which would result in a level of accountability. It is unclear how the 20% improvement in efficiency has been determined or how it will be achieved.	STAL have proactively engaged with Affinity Water Limited and are reviewing the existing potable water supply system within the airport to test feasible options for reducing existing pressure on the existing mains. STAL have set out within their Sustainable Development Plan (SDP) the aspiration to reduce water consumption by 20%; this will likely be met through identification and removal of leaks and the use of water efficient technologies within the airport. For example all new buildings, including the new arrivals building, should achieve BREEAM excellent rating. This would be achieved in part with the use of low flush toilets, spray taps etc. The airport is also reviewing opportunities to utilise rainwater harvesting. STAL are also engaging with the Environment Agency and have received a consultation response from the EA with the following proposed condition: *"Prior to the commencement of development and following consultation with the Environment Agency a scheme for the provision and implementation of water, energy and resource efficiency measures, during the construction and operational phases of the development shall be submitted to and agreed, in writing, with the Local Planning Authority. The scheme shall include a clear timetable for the implementation of the measures in relation to the construction and future enhanced operation of the development. The scheme shall be constructed and the measures provided and made available for use in accordance with such timetables as may be agreed and shall be incorporated into the Sustainability Development Plan.* *The scheme shall include the identification of locations for sufficient additional water meters to inform and identify measures in the strategy. The locations shall reflect passenger, commercial and operational patterns of water use across the airport."* STAL accepts the condition in principle and will continue to work with the EA, LPA and Affinity Water to deliver measures to manage water use at the airport.
10.2	It is recommended that the airport is divided into zones with additional water meters installed to the infrastructure network that could be arranged to enable the separation of passenger and non-passenger usage. This will enable a more detailed understanding of water consumption across the site to inform a targeted approach to the introduction of further water saving technologies	Agree: this would be implemented as part of the condition set out above in 10.1.
10.3	It is noted within Development Programmes and Construction Environmental Management (Pg5-9) that water pumps will be required "to facilitate the undertaking of excavation and construction works" Dewatering that occurs during any development process may need to be license under the new licensing legislation.	It is not specifically envisaged that de-watering will be required as the works will be shallow and the ground water table has not been identified as high. Furthermore, the soils are cohesive in nature which limits the flow of ground water. However, any dewatering that does occur within the development process will be as per a Construction Management Plan which would be mindful of the new licensing legislation. Through the CEMP, controls can be implemented at source to limit inputs to the airport surface water drainage system. The existing regime for inspection, operation and management of the receiving balancing ponds would continue and during periods of construction will be increased where beneficial. The existing regime monitors for several water quality parameters, including those most commonly associated with construction impacts of particulates and hydrocarbons.
10.4	It is encourage that future development to deliver measures that act to improve the status of water bodies which are relevant to their site. Of these measures requiring implementation to achieve Good Ecological Status or Potential for the above water bodies, there are two which could be delivered by STAL and are detailed for Great Hallingbury	This is acknowledged as not being necessary by the Consultee. The Great Hallingbury Brook flows north to south to the west of the airport. The proposed development areas drain to the east to the Pincey Brook, which drains to the south in a separate catchment. As a result, the request is not related to the development proposed.

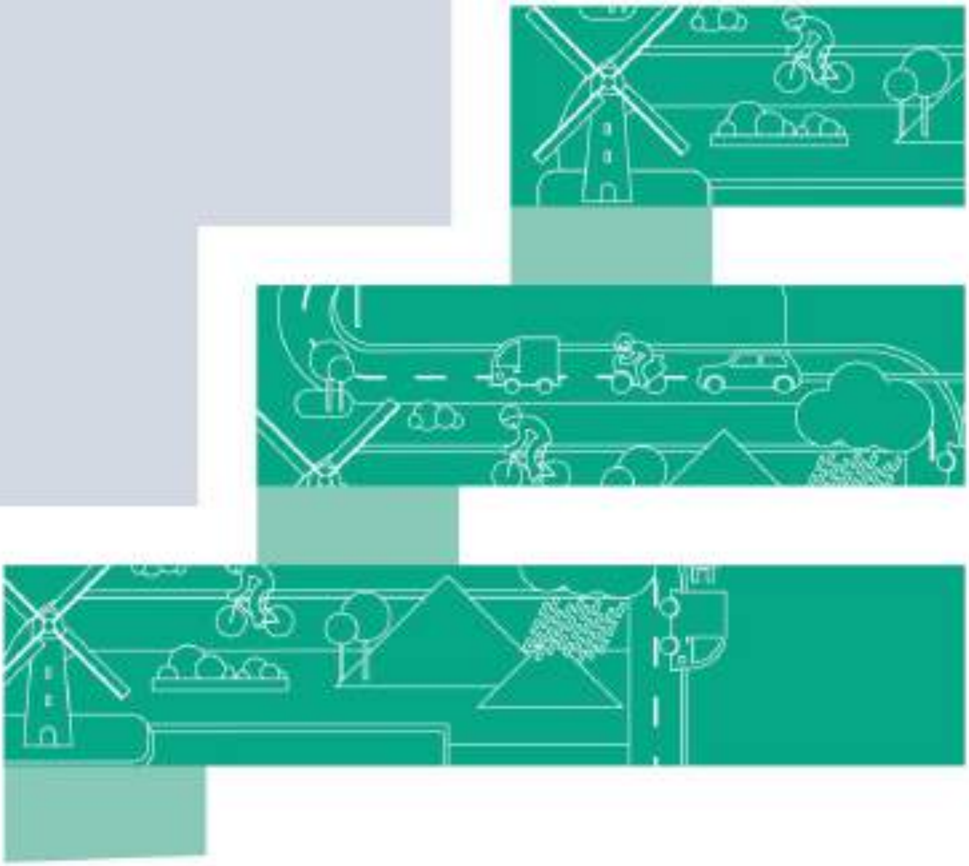
	Brook " Regrade bank side habitats and create riffle pool sequences and Remove excessive over-shading vegetation"	
10.5	It is recommended that the requirements of the National Planning Policy Framework and National Planning Policy Guidance are still followed. All risks to groundwater and surface waters from contamination and appropriate remedial action need to be identified. We expect reports and Risk Assessments to be prepared in line with our approach to groundwater protection document and CLR11 (Model Procedures for the Management of Land Contamination).	The CEMP will set out how groundwater and surface waters will be managed to limit contamination during construction. Post-development the waters will be managed under existing Environmental Permit held by the airport.
10.6	It is requested that specifics of infrastructure (best available techniques) proposed for containing residual glycol at source to lessen the loading on the surface water system are provided including measures to reduce the impacts of de-icers (glycol) at source: as well as use and overspray on taxiways/runways and stands	This is not considered necessary as any measures employed to manage de-icers do not replace the need for 'end of pipe' technology which is already in place at the airport. Contaminated surface water will be pumped to Rye Mead waste water treatment works as per the existing management system.
10.7	The applicant should produce and submit for our approval a De-icer Code of Practice document separate to the Environmental Management System (EMS).	All necessary operational controls and processes covering de-icer application methods, applications areas, storage and spillage clean-up are currently being applied within the wider Airport. These measures will continue to be applied across the airport and as the airfield forms a single catchment, the new development areas will as well.
10.8	It is requested that STAL explore the potential improvements to the attenuation on site.	Additional surface water attenuation for the proposed development has been calculated and the necessary provision can be accommodated at the existing balancing ponds. Additional attenuation as suggested in the consultation responses is not relevant to the development proposed.
10.9	TWUL has not received details of expected increases in volumes of contaminated flows to Rye Meads STW or calculations to confirm that the pump rates will remain the same. This information is required to allow assessments to take place into the capacity of the treatment works to accommodate the increased flows.	WSP has provided details to Thames Water Developer Services who have passed this to their Asset Planners for review. The details set out that the flow rate will not increase. The total contaminated flow is anticipated to increase by circa 1.9 % as there will be a 7.02ha increase over the existing 368ha. It also highlighted that efficiency measures are proposed for potable water which will lead to a knock-on reduction in waste water. Furthermore, details have been provided for the foul discharge to Bishop Stortford waste water treatment works (WWTW) through the two onsite meters. Peak flows from the airport will not increase post development as the increase in passenger numbers will mainly occur outside of the current peak hours (7:00-9:00 and 17:00-20:00).
10.10	The previous Uttlesford WCS was undertaken in 2010/2012 by Uttlesford and does not take account of growth areas within the emerging Local Plan including Easton Park. As such this document is out of date and an updated WCS is currently being produced taking account of proposed growth.	The Flood Risk Assessment references the January 2017 Water Cycle Study Outline update (Arcadis Design and Consultancy) - this includes a potential location for new settlement site at Little Easton (1,400 dwellings up to 2032).
10.11	There is potential that the increase in flows from anticipated growth and expansion of capacity at the airport could result in upgrades to wastewater treatment works which are either not technically feasible or not cost efficient.	This comment is made without any justification and, as such, STAL has met with Thames Water to describe the proposed development and has confirmed details with regards to the proposed increase in passenger numbers to 43mppa and its effect on foul discharge from the airport. In line with the Water Industry Act 1991, STAL has a statutory right to connect new sewers to existing public sewers under section 106 of the aforementioned Act and sewerage undertakers do not have the ability to refuse a connection on the grounds of capacity in the local sewerage network and/or sewage treatment works. However, there are no planned or required new connections and therefore in line with the latest connection charges rules introduced on 1 April 2018 under the Water Industry Act 1991 (as amended 2014) any offsite reinforcement works to sewers or waste water treatment works will now be captured by Thames Water through adjustments to the infrastructures charges, not through any planning agreements or conditions.
10.12	Pollution mitigation would not be necessary during the winter period since all surface water from the runway areas will be discharge from the site as foul water. However outside of this period it should be shown that pollution from all sources are treated in line with mitigation guidelines recommended in the CIRIA SUDS manual C753. While it is understood that the airport already has pollution mitigation measures in place these are currently not in a format that that easily measurable against our assessment criteria. Provide an indicative plan showing possible layout for the proposed storage and treatment	Details of the existing pollution management systems relating to surface water, in place at the airport, are provided in Annex 5. Mitigation measures are needed both winter and summer and several of those detailed in the above note to the LLFA will give benefits all year round. A General Arrangement drawing setting out an option for how the additional volume can be incorporated into the existing attenuation basins are provided in Annex 5.
Ecology		
11.1	Insufficient ecological information on Epping Forest SAC.	STAL sets out further clarification on the 'Preliminary Ecological Appraisal- Incorporating Information to Inform a Habitats Regulations Assessment (HRA'), originally found in Chapter 16 Appendix 16.1 of the Environmental Statement. This is founded on three pieces of further supporting information associated with Epping Forest Special Area of Conservation (SAC) (Ecological surveys, Nitrogen deposition modelling and traffic modelling). This information confirms the conclusions set out in the; no significant effect on the SAC is predicted as a result of the 35+ Project. The full technical report can be found in Annex 1.

11.2	Ecology and biodiversity impacts, both on-airport – where existing grass-lands would need to be ploughed up to make way for the new aircraft stands and taxiways – and off-airport, with particular regard to potential impacts upon Hatfield Forest and East End Wood SSSIs	Please refer to Annex 2, where further clarification on this concern is provided.

TRANSFORMING LONDON STANSTED AIRPORT

35+ PLANNING APPLICATION

ANNEX 1: INFORMATION FOR EPPING FOREST



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Information for Epping Forest

STANSTED AIRPORT

35+ PROJECT

INFORMATION FOR EPPING FOREST

June 2018

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QUALITY MANAGEMENT

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Date:	**June 2018**
Project Number/Document Reference:	**OXF10603_873: Stansted Airport 35 MPPA+: EPPING FOREST**

CONTENTS

1 INTRODUCTION

Background to the Study

1.1 RPS was commissioned by Stansted Airport Ltd (STAL) to undertake a Habitats Regulations Assessment of the proposed expansion of airside infrastructure at Stansted Airport to make the best use of the existing runway as well as an associated increase in passenger numbers, known as the 35+ application.

1.2 The wider Stansted Airport site has been subject to considerable ecological survey work and associated monitoring to inform the 25+ application to make better use of the existing runway (granted at appeal in 2008, planning ref: UTT/0717/06/FUL). While these studies identified several areas within the wider airport that were of ecological significance (such as the airside grassland as skylark habitat and the woodland/hedgerows within the airport site), the physical works associated with the 35+ application in terms of infrastructure development are limited to four locations:

- New Rapid Exit Taxiway (RET) to the south west of the existing runway;
- New Rapid Access Taxiway (RAT) to the north eastern end of the runway;
- Six new stands on the mid airfield (Yankee Remote Stands); and
- Three additional stands at the north eastern end of the airport (Echo Stands).

1.3 Discussions with Natural England have identified one European site that might be affected by the 35+ Project which should be screened for likely significant effects - Epping Forest Special Area of Conservation. The location of this site in relation to Stansted is shown on Figure 1.

1.4 In accordance with advice from Natural England, RPS has carried out a Habitats Regulations Assessment (HRA). This HRA constitutes an update and expansion of the previous screening report presented in Appendix 16.1 of the Environmental Statement (Preliminary Ecological Appraisal). This note incorporates the potential effects arising from aerial emissions from road traffic, based on the traffic modelling undertaken by Steer Davies Gleave (2017), on behalf of STAL, using the Highways Agency (now Highways England) DMRB methodology (HA 2007), to identify roads that could have higher traffic as a result of the 35+ Project.

1.5 A Screening approach is advocated in the DMRB and potentially affected roads are those that meet any of the following criteria:

- *Road alignment will change by 5m or more; or*
- *Daily traffic flows will change by 1,000 AADT or more; or*
- *Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or*
- *Daily average speed will change by 10km/hr or more; or*
- *Peak hour speed will change by 20km/hr or more.*

1.6 In this instance, all roads can be screened out as not significant with the exception of the M25 (J26-J27). Please refer to Section 3.9 where the assessment of this criterion can be found.

1.7 Only properties and Designated Sites within 200m of roads affected by the project need be considered.

1.8 Shape files for these sites were obtained from Natural England's publicly-available download resource (hosted by data.gov.uk). These were plotted along with all roads meeting one of the above criteria; along with a 200m buffer marked on, as required by the DMRB methodology.

2 QUALIFYING INTEREST FEATURES

2.1 Special Areas of Conservation (SACs) are strictly protected sites designated under the European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (known as the Habitats Directive). Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended).

2.2 A sub-set of the Annex I habitat types are defined as being 'priority' because they are considered to be particularly vulnerable and are mainly, or exclusively, found within the European Union (Article 1d). The importance of these 'priority habitat' types is emphasised at several places in the Directive (Articles 4 and 5 and Annex III), not only in terms of the selection of sites, but also in the measures required for site protection (Article 6) and surveillance (Article 11).

2.3 The Epping Forest SAC stretches from Walthamstow to Epping, covering an area of 1,604.95 ha.

2.4 The citation for the site provides the following description of the SAC:

"*Epping Forest is a large ancient wood-pasture with habitats of high nature conservation value including ancient semi-natural woodland, old grassland plains, wet and dry heathland and scattered wetland. The semi-natural woodland is particularly extensive but the Forest plains are also a major feature and contain a variety of unimproved acid grasslands.*

The semi-natural woodlands of Epping Forest include important beech Fagus sylvatica forests on acid soils, which are important for a range of rare epiphytic species, including the moss Zygodon forsteri*. The long history of pollarding, and resultant large number of veteran trees, ensures that the site is also rich in fungi and invertebrates associated with decaying timber. Records of stag beetle* Lucanus cervus *are widespread and frequent.*

Areas of acidic grassland transitional with heathland are generally dominated by a mixture of fine-leaved grasses. In marshier areas, purple moor-grass Molinia caerulea *frequently becomes dominant. Broad-leaved herbs typical of acidic grassland and heathland are frequent, including heather* Calluna vulgaris*. The site also contains an example of wet dwarf-shrub heath with both heather and cross-leaved heath* Erica tetralix*."*

2.5 Qualifying features include a range of both habitats and species. Habitats include:

- Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*). (Beech forests on acid soils);
- European dry heaths; and
- Northern Atlantic wet heaths with *Erica tetralix*. (Wet heathland with cross-leaved heath).

2.6 The site is also designated for qualifying species, which include:

- Stag beetle *Lucanus cervus.*

2.7 The Conservation Objectives for a designated site set out the goals that are considered necessary to maintain or restore the qualifying features of a site to Favourable Conservation Status. Subject to natural change, the Conservation Objectives for the Epping Forest, are to maintain or restore:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and,
- The distribution of qualifying species within the site.

Site Improvement Plan – Epping Forest SAC (14/12/2016)

2.8 The Site Improvement Plan (SIP) provides a high-level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features on the site and outlines the priority measures required to improve the condition of the features.

2.9 The current priority issues for the site are:

- Air pollution (Impact of atmospheric nitrogen deposition);
- Under grazing;
- Public access/disturbance;
- Changes in species distributions;
- Inappropriate water levels;
- Water pollution;
- Invasive species; and
- Disease.

2.10 There are several proposed actions to address the above priority issues.

3 HRA SCREENING

3.1 The screening stage of the HRA assesses the potential effects produced by the proposed development against the interest features of Epping Forest SAC (as set out in Section 2 above) in order to determine whether there could be a likely significant effect (LSE).

3.2 Screening for LSE involves identifying whether the proposed development is a source of potential effects that might affect any of the interest features of the relevant European Sites. If the scheme is a source of such an effect, it is then necessary to determine the length of any pathway of effect (i.e. is it possible for each effect to reach the site?) and, as such, whether there is a potential 'zone of influence' through which the proposed development could affect the interest features of relevant European Sites and what may reduce or prevent the potential effect reaching and/or influencing the relevant European Sites interest features and their conservation objectives.

3.3 The screening for LSEs undertaken identified those interest features from each relevant European Site where there was confidence that they are not likely to be significantly affected, and which therefore need not be considered further, as well as those features where LSEs could occur.

Potential impacts of the proposed Scheme

3.4 In order to ensure a robust assessment, all potential direct, indirect or secondary impacts of the scheme (either alone or in combination with other plans or projects) on the relevant European Sites, in the context of their conservation objectives, have been considered. These are summarised below in Table 3.2.

3.5 Note that decommissioning is not included in the screening as effects since there is no intended date or plan for decommissioning of the airport.

Table 3.2: Scheme activities, pathways and potential effects from the 35+ Project

Scheme Activities	Potential Pathway to an Interest Feature	Potential Effect
Construction		
Land take	Direct habitat loss for construction (SAC species feature)	Loss of habitat for SAC species feature Reduced numbers of SAC species features
	Direct habitat loss for construction (SAC habitat feature)	Reduction of extent of SAC habitat feature
	Habitat fragmentation	Reduced foraging opportunity for SAC species features Reduced breeding opportunity for SAC species features Reduced dispersal opportunity for SAC species features
Aerial emissions	Increase in atmospheric deposition and atmospheric	Damage to SAC habitat features

Scheme Activities	Potential Pathway to an Interest Feature	Potential Effect
	concentrations of pollutants from construction traffic	
Discharge of pollutants to water during construction	Deterioration in water quality	Damage to SAC habitat features Reduced foraging opportunity for SAC species features Reduced breeding opportunity for SAC species features Reduced dispersal opportunity for SAC species features
Noise and vibration generated during construction	Disturbance to species	Reduced foraging opportunity for SAC species features Reduced breeding opportunity for SAC species features Reduced dispersal opportunity for SAC species features
Light spill during construction	Disturbance to species	Reduced foraging opportunity for SAC species features Reduced breeding opportunity for SAC species features Reduced dispersal opportunity for SAC species features
Operation		
Aerial emissions	Increase in atmospheric deposition and atmospheric concentrations of pollutants	Damage to SAC habitat features
Aqueous emissions	Increase in aquatic concentrations of pollutants Increase in water temperature (thermal effects) Alteration to hydrological characteristics of fluvial habitats	Damage to SAC habitat features
	Increase in aquatic concentrations of pollutants Increase in water temperature (thermal effects)	Reduced foraging opportunity for SAC species features Reduced breeding opportunity for SAC species features Reduced dispersal opportunity for SAC species features
Noise generated during operation	Disturbance to species	Reduced foraging opportunity for SAC species features Reduced breeding opportunity for SAC species features Reduced dispersal opportunity for SAC species features

Screening Matrices

3.6 The screening matrices for the scheme ('the 35+ Project') are provided below. The purpose of the matrices is to provide the decision maker with a succinct summary of potential effects.

3.7 Potential effects greyed out in these matrices are those where there was clearly no further study required to conclude that no LSE would occur on a feature, such as direct habitat loss on sites some distance from the scheme. References and explanation for the evidential basis for these conclusions are provided in the accompanying notes.

3.8 Matrix Key:

✓ = Likely significant effect cannot be excluded without further assessment

✕ = Likely significant effect can be excluded

C = construction

O = operation.

Name of European Site	**Epping Forest SAC**													
Distance to Proposal site	23.1 km													
European site features	Land take		Habitat fragmentation		Aerial emission – Surface access		Aerial emissions – Airport operations		Aqueous emissions / discharges		Noise & Vibration		Lighting	
	C	*O*	*C*	*O*	*C*	*O*	*C*	*O*	*C*	*O*	*C*	*O*	*C*	*O*
9120 Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)	✕a	✕a	✕b	✕b	✕c	✕d	✕e	✕e	✕f	✕f	✕g	✕g	✕h	✕h
4010 Northern Atlantic wet heaths with *Erica tetralix*	✕a	✕a	✕b	✕b	✕c	✕d	✕e	✕e	✕f	✕f	✕g	✕g	✕h	✕h
4030 European dry heaths	✕a	✕a	✕b	✕b	✕c	✕d	✕e	✕e	✕f	✕f	✕g	✕g	✕h	✕h
1083 Stag beetle *Lucanus cervus*	✕a	✕a	✕b	✕b	✕c	✕d	✕e	✕e	✕f	✕f	✕g	✕g	✕h	✕h

Evidence supporting conclusions

a.	Nearest element of the 35+ project is 23.1 km from site; no potential for direct habitat loss.
b.	Nearest element of the 35+ project is 23.1 km from site; no potential for fragmentation to affect habitats.
c.	Site 23.1 km from scheme; no potential for aerial emissions during construction work on site to affect habitats within SAC. Any generators etc. would be small scale and therefore, the potential zone of influence would be considerably smaller than this.
d.	Steer Davies Gleave traffic assessment has noted that the 35+ project will result in an increase of 1,493 vehicular movements per day on J26-J27 of the M25 which is within 200 m of Epping Forest SAC. This represents an increase in AADT on this stretch of the M25 of 0.88% and is therefore considered to be insignificant (i.e. <1%) in traffic flow terms. Further justification for this conclusion is provided below. The highest change in AADT as a result of the 35+ project on the local roads passing through Epping Forest was 12 on the northern section of the B1353 Epping Road. (Please see Appendix 2. On the basis of such a low change in AADT, traffic resulting from the 35+ project on these roads can reasonably be considered *de minimis* and therefore no further assessment of emissions from these local roads, either alone or in combination with other plans or projects, is necessary.
e.	Nearest element of the 35+ project is 23.1 km from site; no potential for effects from aerial emissions/discharges.
f.	Nearest element of the 35+ project is 23.1 km from site; no potential for effects from aqueous emissions/discharges.
g.	Nearest element of the 35+ project is 23.1 km from site; no potential for noise / vibration effects on species populations within SAC.
h.	Nearest element of the 35+ project is 23.1 km from site; therefore, no potential for lighting effects on species/habitats within SAC.

3.9 The main trip analysis reported in Chapter 6 of the ES (Surface Access) was prepared on a simple “no-alternative trip scenario”, i.e. on the assumption that all additional traffic associated with the increased passenger movements at Stansted Airport would not otherwise arise. On this basis, in all scenarios/assessment years the only potentially relevant road (with >1000 AADT traffic increase) would be the M25 (J26-27) adjacent to Epping Forest SAC. This is also the only road with increases in traffic above a *de minimis* level within 200 m of the European Designated Site. Local roads within and directly adjoining the SAC were modelled and the largest increase is 12 AADT on the northern section of the B1353 Epping Road is considered *de minimis*. Therefore, even with a very robust assumption of “no alternative trips” which, for the new passengers, all roads but the M25 (J26-J27) can be screened out as not significant.

3.10 The assessment of the change in traffic flows on the M25 as a result of 35+ Project in the “no-alternative trip scenario” is predicted to attract an additional 1,493 vehicular movements per day on the M25 (J26-27) link as a result of passenger- and employee-related travel compared to the current predicted Do-Minimum scenario for the assessment year (2028).

Potential impacts compared to the predicted Do Minimum scenario

3.11 As noted above, the base assumption reported in Chapter 6 does not take in to account the fact that in the absence of expansion of operations at Stansted, given the DfT predicted increase in demand for air travel, the 8 million additional passenger trips that would be attracted to Stansted would otherwise be attracted to other UK airports (such as Bristol, Birmingham and East Midlands). Appendix H of the Transport Assessment (ES Volume 3) examines a more holistic approach and looks at the alternative routing of the additional car based trips to other airports in the without development (Do Minimum) scenario. The assessment contained in Appendix H (re-presented here as Appendix 1) concluded that the likely net effect of the airport expansion i.e. comparing the Development Case (termed the 'Do Something Case' in the TA) with the Do Minimum scenario, is neutral or results in small reduction of trips on the relevant section of the M25 in these alternative scenarios.

3.12 The London market demand will be constrained from 2022/3 when the available capacities of the main London airports (Heathrow, Gatwick and Stansted) become extremely limited; each airport being effectively 'full' at that time. These airports would therefore not be able to accommodate the 8mppa passenger demand predicted by STAL's expert forecasters ICF. However, it is expected that demand for air travel will remain unabated and that alternative airports further afield will attract these trips.

3.13 Results from the redistribution analysis (described in Appendix 1) for Birmingham Airport, East Midlands Airport and Bristol Airport all indicate between 1% and 12% more airport-derived vehicular trips will use the M25 (J26-27) link if the 35+ Project does not go ahead. These additional trips correspond proportionally to the additional passenger demand (8mppa), which would then redistribute to these alternative airports because Stansted would not be able to accommodate them. Of course, in practice, the alternative passenger trips could be anticipated to be shared amongst these and other smaller airports but the effect of traffic flows would be very similar.

3.14 The results of the detailed passenger displacement analysis show that the 35+ Project (Development Case) will actually have the less impact on the total traffic flows for the M25 (J26-27) link closest to Epping Forrest SPA – being +0.93% growth in vehicular traffic, compared to the displacement of passengers to alternative UK Airports - being between 0.94% and 1.04% growth in vehicular traffic, in the without development (Do Minimum) case.

3.15 Furthermore, it should be noted that the uplift in passengers is in comparison to the combined passenger and employee vehicle trips associated with the 35+ Development Case. It is therefore reasonable to assume that some potential employees would also be displaced to these other airports if the 35+ Project did not proceed, although this effect cannot be readily quantified. This would further increase the traffic growth on the M25 (J26-27) link in the without development (Do Minimum) case.

3.16 In summary, when comparing the Development Case and Do Minimum scenario, rather than there being a net increase of 1,493 AADT by 2028 (as reported in the main TA analysis), the more likely outcome would be a net reduction of between -15 and -184 AADT on the M25 (J26-27), depending on where the passengers redirect to as a result of 35+ Project not going ahead. The basis of this hypothesis has been agreed by Highways England.

3.17 In light of the above, 35+ Project is considered unlikely to give rise to a significant effect on Epping Forest SAC due to changes in air quality from traffic generation, and will instead provide a net reduction in traffic on the key section of the M25 closest to the Epping Forest SAC when compared to the traffic flows which would be generated without the development.

Potential impacts of the Development Case (Do-Something scenario)

3.18 Notwithstanding the assessment above, which reveals that by 2028 the 35+ Project will give rise to a lesser traffic increase than under the without development scenario, Natural England has previously indicated it has concerns about the absolute ('worst case') addition of 1,493 vehicular movements per day on the M25 (J26-27) link as a result of passenger and employee-related travel. This is an increase of <1% in the AADT on the M25 and is not considered significant in traffic terms on that basis. Nevertheless, an assessment of the potential for significant effects on the Epping Forest SAC from the traffic associated with this scenario is included in this report for clarity and completeness.

3.19 At the point at which it passes closest to the Epping Forest SAC, the M25 is underground within the Bell Common Tunnel with the eastern portal approximately 120 m east of the SAC boundary and the western portal approximately 15 m from the boundary. However, as the M25 is in a tree-lined cutting at this point, there is also significant vertical distance (circa 10 m) between the carriageway level and the SAC.

3.20 Current guidelines on the assessment of effects of increases in road traffic (HA 2007) require the consideration of designated sites within 200 m of the centre line of carriageways. The basis for this is the widely-observed trend in concentration of NO_x (and associated nutrient nitrogen deposition) to decrease in a logarithmic manner down to background by this distance, although some studies have shown small increases at distances greater than this. However, all studies have shown the greatest decrease in NO_x concentration within 100 m of the road (see Natural England 2016b and references therein).

3.21 For example, transect studies have shown that impacts are greatest within the first 50-100 m from roads. For example, Bignal *et al.* (2008) found that at Bradley Wood more than 60% of oak trees adjacent to the road had severely defoliated and discoloured crowns, but by 150 m from the road, no trees were severely defoliated. At Aston Rowant, the same authors found there was little difference in beech tree health between 50–200 m from a motorway except for leaf discolouration, which affected more than 30% of trees up to 100 m from the road.

3.22 This trend is supported by a study of local air quality monitoring at Epping Forest (Gadsdon & Power, 2009) which found NO_2 and NH_3 derived from traffic emissions on local roads within the SAC made a substantial contribution to the exceedance of critical levels and critical loads at roadside locations and up to 20 m from the edge of the carriageway. Although concentrations were above background for up to 250 m, the decrease in concentration in the initial 20-50 m from the road edge was most substantial. The decrease in NO_x concentration beyond 50m was very shallow. Data presented in that paper (Figure 1 (a)) shows the relationship between the distance from the road edge (x) and NO_x concentration (y) can be expressed by the equation $y = -2.859\ln(x) + 38.176$. Therefore, the measured distance at which the NO_x concentration dropped below the critical level of 30 $\mu g.m^{-3}$ in that study was 17.46 m from the roadside.

3.23 While elevated NO_x concentrations and associated nutrient nitrogen deposition have been noted at distances greater than 200 m (such as that observed in Gadsdon & Power, 2009), the ecological effect of such increases beyond this distance have not been identified with many studies showing no change in the particular indicator of ecological function such as Ellenburg Value or habitat species richness, despite slightly elevated pollutant levels (when compared to background). For example, a 520 m transect into Norway spruce woodland in Germany

(Bernhardt-Römermann *et al*. 2006) away from motorways suggested that impacts on the composition of the field layer extended for up to 80 m upwind of the motorways (Epping Forest is upwind of the M25).

3.24 Also, a similar transect study of blanket bog at Moss Moor (part of the South Pennine Moors SAC) adjacent to the M62 (Bignal *et al*., 2007) used Ellenburg Values to show that species adapted to higher nitrogen availability had greater ground cover up to around 75 m from the motorway (consistent with the measured profile of NO_2), and declined to background levels at around 100 m.

3.25 Modelling of the increase in NO_x concentration and associated nutrient nitrogen deposition from the Development Case has been undertaken, based on the modelled traffic increase described above (Appendix 5).

3.26 The maximum predicted change in NO_x concentration at the edge of the SAC as a result of the additional traffic from the 35+ project is 0.0931 $\mu g.m^{-3}$, well below either 1% of the critical level set for the protection of vegetation (30 $\mu g.m^{-3}$) or the 0.4 $\mu g.m^{-3}$ set within the DMRB. The associated change in nutrient nitrogen deposition is 0.0188 $kgN.ha^{-1}.yr^{-1}$, also well below 1% of the lower critical load for the Annex I woodland (10 $kgN.ha^{-1}.yr^{-1}$, taken from the Site-Relevant Critical Load Tool on the government's Air Pollution Information System (APIS), www.apis.ac.uk). Data presented in Appendix 5 also show that the contribution from the 35+ project decreases rapidly with distance from the M25, supporting the findings of previous work described above.

3.27 Such small increases in both NO_x concentration and nutrient nitrogen deposition rates are both below existing thresholds requiring further assessment (as set out in HA 2007 or Environment Agency 2012a & 2012b) and as such no likely significant effect would be predicted. These thresholds are considered to be *de minimis* (i.e. so small as to be inconsequential) and therefore not significant either alone or in combination with other plans/projects. The rationale behind the use of 1% is described in AQTAG21 (2015); essentially, it is set at a point that is three orders of magnitude below the EQS and is therefore sufficiently precautionary to minimise the risk of screening out potential impacts when the situation would otherwise merit further investigation.

3.28 To further support this conclusion, RPS undertook vegetation surveys of the northern section (in May 2018) of the Epping Forest SAC in the vicinity of the nearest section of the M25 motorway to the designated site, namely Unit 105 (Appendix 3), with a particular focus on the habitat within 200 m of the tunnel portals. The aim of the survey was to determine the habitats present (and specifically the features of interest for which the site is designated) within this unit, particularly within 200 m of the M25, and therefore the potential for significant effects on the SAC as a whole. The locations of the veteran trees (as the main host of potentially vulnerable epiphytes) were mapped and notes made on whether these displayed evidence of stress that could be associated with air pollution. A further aim was to determine the habitats present in relation to dominance by nitrophilous species (e.g. nettles, brambles etc.) that may result from eutrophication from nitrogen deposition.

3.29 The most recent condition assessment of the underlying Site of Special Scientific Interest (SSSI) noted that the unit in this location (Unit 105) was in Favourable condition, however:

"… notwithstanding this assessment, there remains a very significant issue relating to air quality and the related deposition of acidity and of nitrogen. Many veteran trees within the unit display

clear symptoms of stress (e.g. thin canopy and die-back of leading shoots), there is excessive growth of bramble, and there are dense stands of nettles along roadsides and ride edges."

3.30 The only habitat present within 200 m of the M25 in Unit 105 is the woodland Annex I habitat Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) – no dry or wet heath habitats were present.

3.31 No veteran trees occurred within 200 m of the Bell Common Tunnel eastern portal nor within 100 m of the western portal. As described in the recent condition assessment, there was evidence of poor condition of oak trees (in the form of tip die back and significant epicormic growth) at the north of the survey area although there did not appear to be any link with distance from road and it is not possible from the observational evidence alone to attribute the cause of such symptoms.

3.32 Epiphyte number and diversity were low across the entire study area with no clear trend relating to the roads and it is understood that the main area of epiphyte interest within the SAC is the core central zone well to the south of Unit 105 (*per comm.* J. Dagley CoLC). The number of veteran trees in the study area was also small (eight within 200 m of the M25). This is within the context of Epping Forest as a whole which supports over 50,000 veteran trees (CoL 2017) – i.e. <0.016% of the total resource. A full survey of the veteran tree resource within the SAC is currently underway by CoLC. Indications are that the total number of veteran trees is likely to be closer to 55,000 which would reduce this percentage further.

3.33 Areas of dense bramble and nettle occurred in areas dominated by oak outside and along the boundary of the SAC, but were absent from the beech-dominated woodland.

3.34 On the basis of the survey, the area of the SAC within buffer zones around the M25 were calculated (Figure 2 and Table 3.2). The total area of the SAC within 200 m of the M25 is 5.53 ha, 0.34% of the total area of the SAC and 0.85% of the 652.3 ha of Annex I beech woodland that occurs within the Forest (data taken from the Natura 2000 Standard Data Form for Epping Forest – Appendix 4). Therefore, the total area of woodland within 200 m of the M25 is so small as to be *de minimis* within the context of the SAC as a whole.

Table 3.2: Areas of the Epping Forest SAC within 200 m of the M25 portals

Distance from tunnel portal of M25	Area of SAC within buffer	% of total area of SAC	Number of veteran within buffer
20m buffer	0.01ha	0.0006%	0
50m buffer	0.19ha	0.01%	0
100m buffer	0.99ha	0.06%	0
150 m buffer	2.65ha	0.17%	3
200m buffer	5.53ha	0.34%	8
Total area of SAC 1,604.95 ha			

3.35 Therefore, on the basis that:

- the increase in AADT on the M25 associated with the 35+ project is <1% of the total traffic flow;
- associated maximum modelled increases in NO_x concentration and nutrient nitrogen deposition at the edge of the SAC are <<1% of the relevant thresholds and decrease very rapidly with distance;
- the overall condition of Unit 105 is described as being in favourable condition, despite the high background nutrient nitrogen deposition; and
- the total area of the SAC and total area of Annex I habitat within 200 m of the M25 are both <1% of the total resource while the total number of veteran trees within the same area is <<1% of the total number,

3.36 It is concluded that there is no potential for a likely significant effect on the Epping Forest SAC as a result of increased traffic flow on the M25 from the 35+ project.

In combination

3.37 Following current guidelines, the conclusion of no likely significant effect on the basis that the modelled increases in NO_x concentration and nitrogen deposition rates due to traffic increases are less than 1% is made for both alone and in combination assessments. The M25 is a strategically important motorway and one of the busiest in the country. Therefore, the traffic modelling set out in Appendix H of the Traffic Assessment within the ES uses TEMPro to build in strategic growth and can therefore be considered as a proxy for an in-combination assessment.

3.38 TEMPro is a program developed by the Department for Transport (DfT) providing traffic growth projections used in transport models and intended to act as a nationwide standardised distribution of growth in trip ends held with the National Trip End Model (NTEM). It also takes into account trends in the quantity and length of car trips per household. The Current TEMPro growth figures are predominantly associated with NETM increases. The TEMPro growth assumption adopted for all future year traffic predictions provided with the 35+ application is based on the 2016 release of TEMPro and based on the most recent NTEM, which is the most up-to-date dataset of trip ends available for use in transport business cases: both are acknowledged by DfT as a robust basis for developing forecasts in the vast majority of cases. TEMPro figures adopted for the analysis consider predicted future local housing and employment at a district level. The factors also include assumptions of future general changes in traffic levels resulting in trends of car usage.

3.39 At a local level it is often appropriate to adjust TEMPro growth factors to take account of housing and employment allocations in a study area. So for instance, growth of traffic on the local roads within Epping Forrest could vary from TEMPro Assumptions if either local housing allocations in Epping and the immediate surrounding districts were higher or lower than those assumed within the NETM, and/or specific developments were anticipated to lead to traffic using specific roads to access sites. However, at a regional level this becomes more difficult to predict and less appropriate. For a strategic highway link such as the M25, local housing allocations will have only a marginal effect on the changes in total traffic passing along the link. This is because the M25 carries a wide range of longer distance trips and growth of traffic could be reasonably reflect changes in population and the propensity for people to undertake car trips across the whole of South East England, or indeed more generally across the UK.

3.40 The use of TEMPro growth above base traffic as a proxy for all other development likely to result in additional traffic on the M25 is appropriate as a robust assessment for understanding total future potential traffic. The complexity with 35+ Project is that a single year has been assessed for the EA impact based on 2028 being when the full implications of a 43mppa permission would be expected to first occur. The TEMPro growth factors included in the TA and EIA, which adds around 18% to existing traffic levels is the growth of traffic associated with other development between 2016 and 2028.

3.41 Therefore, the data supporting the conclusion above of no likely significant effect already has an in-combination component built in, due to the use of TEMPro within the traffic modelling.

3.42 To further support this conclusion, and given the difficulty in predicting changes in traffic flow on the M25 due to its strategic nature, the potential headroom in AADT before the change in NOx concentration or associated nitrogen deposition exceeded the 1% threshold has been calculated.

3.43 The increase in AADT due to the 35+ Project is predicted to be 1,493 with a corresponding maximum increase in NOx concentration of 0.0931 $\mu g.m^{-3}$ and nutrient N deposition of 0.0188 $kgN.ha^{-1}.yr^{-1}$. The relevant thresholds are 0.3 $\mu g.m^{-3}$ (using the more conservative 1% of the critical level rather than the 0.4 $\mu g.m^{-3}$ set out in the DMRB) and 0.1 $kgN.ha^{-1}.yr^{-1}$ (1% of the relevant critical load of 10 $kgN.ha^{-1}.yr^{-1}$). Therefore, the headroom before the 1% thresholds are breached would be 0.2069 $\mu g.m^{-3}$ and 0.0812 $kgN.ha^{-1}.yr^{-1}$.

3.44 All else being equal, therefore, assuming a linear relationship between change in NOx concentration/nutrient N deposition and AADT, other plans/projects in the area would need to generate an additional 3,318 or 6,448 above the growth predicted by TEMPro before the 1% threshold were reached (i.e. 1,493/0.0931 x 0.2069 and 1,493/0.0188 x 0.0812).

4 CONCLUSIONS

4.1 Following advice from Natural England, a Habitats Regulations Assessment (HRA) of the effects of the proposed 35+ project on the Epping Forest Special Area of Conservation (SAC) was undertaken. An initial screening of Likely Significant Effects did not identify any issues likely to result in such an effect. This included on the M25 between J26/27 where the change in AADT was <1% of existing flows. Traffic increases on all other roads were so small as to be *de minimis*.

4.2 For the purposes of supporting (or otherwise) the conclusion of no likely significant effect, further assessment of the Epping Forest SAC in relation to the M25 has therefore been undertaken. Based on a Do-Minimum scenario that accounts for the diversion of passengers to other airports in the event that the 35+ application is unsuccessful, the Development Case shows a net decrease in traffic on the M25 adjacent to the SAC. Therefore, rather than an additional 1,493, as reported in the body of the TA, a more reasonable assumption for change in AADT due to 35+ Project would be between -15 and -184, depending on where the passengers redirect to as a result of 35+ Project not going ahead.

4.3 Notwithstanding this, additional modelling of changes in air quality show that both NO_x concentration and nutrient nitrogen deposition has been undertaken for the AADT change of 1,493 in the absence of any form of passenger redirection. Maximum values for both are <1% of the relevant thresholds at the edge of the SAC and decrease rapidly with distance into the designated site. Given that the TEMPro model used within the traffic modelling incorporates traffic growth associated with a strategic road such as the M25, these data are relevant for both alone and in-combination scenarios.

4.4 Also, a further survey of the vegetation present in the north of the SAC identified that no heathland habitats occurred within 200 m of the M25. The survey noted that 0.85% of the Annex 1 woodland habitat (5.53 ha of a total of 652.3 ha) and 0.34 % of the total SAC area occurred within this 200m buffer from the M25 and that this unit (Unit 105) is recorded as being in favourable condition. The total number of veteran trees present (as the key hosts for the most sensitive epiphytes) was 8, <0.016% of the total resource within Epping Forest.

4.5 Therefore, on the basis of the above, no significant effect on the SAC as a result of the 35+ Project is predicted, either alone or in combination. As such, there is no requirement to undertake an Appropriate Assessment.

5 REFERENCES

AQTAG21 (2015) 'Likely significant effect' – use of 1% and 4% long-term thresholds and 10% short-term threshold. https://www.midsussex.gov.uk/media/3152/ep69_aqtag21lse.pdf [accessed June 2018]

Bernhardt-Römermann, M., Kirchner, M., Kudernatsch, T., Jakobi, G. & Fischer, A. (2006). *Changed vegetation composition in coniferous forests near to motorways in Southern Germany: The effects of traffic-born pollution*. Environmental Pollution,143(3), 572-581.

Bignal, K.L., Ashmore, M.R. & Power, S.A. (2004). *The ecological effects of diffuse air pollution from road transport. English Nature Research Report* 580. URL: http://publications.naturalengland.org.uk/category/47017

Bignal, K.L., Ashmore, M.R., Headley, A.D., Stewart, K. & Weigert, K. (2007). *Ecological impacts of air pollution from road transport on local vegetation*. Applied Geochemistry, 22(6),1265-1271.

Bignal, K.L., Ashmore, M.R. & Headley, A.D. (2008). *Effects of air pollution from road transport on growth and physiology of six transplanted bryophyte species*. Environmental Pollution, 156:2, 332-340

City of London Corporation (2017) https://www.cityoflondon.gov.uk/things-to-do/green-spaces/epping-forest/wildlife-and-nature/Pages/trees-and-pollarding.aspx [accessed 31/05/18]

Environment Agency (2012a) *Operational Instruction 66_12 Simple assessment of the impact of aerial emissions from new or expanding IPPC regulated Industry for impacts on nature conservation*. EA.

Environment Agency (2012b) *Operational Instruction 67_12 Detailed assessment of the impact of aerial emissions from new and expanding IPPC regulated industry for impacts on nature conservation*. EA.

Gadsdon, S.R. & Power, S.A. (2009) *Quantifying local traffic contributions to NO2 and NH3 concentrations in natural habitats*. Environmental Pollution, 57(10), 2845-2852.

Highways Agency (2007) *Design Manual for Roads and Bridges*, HA 207/07, Vol. 11, Section 3, Part 1 Air Quality

National Trust (2015) *Uttlesford District Council Local Plan Issues and Options Consultation: Representations on behalf of the National Trust*.

Natural England (2016a) *Site Improvement Plan Epping Forest SAC*

Natural England (2016b) *The ecological effects of air pollution from road transport: an updated review*. URL: http://publications.naturalengland.org.uk/publication/6212190873845760

Stansted Airport Ltd (2017) Biodiversity Action Plan. STAL Unpublished Report.

Steer Davies Gleave (2017) *Stansted Airport 35+: Surface Traffic Assessment*.

APPENDIX 1 – REDISTRIBUTION TRAFFIC MODELLING

steer davies gleave

Technical Note

To	Natural England
Cc	Stansted Airport Limited, RPS
From	Steer Davies Gleave
Date	15 December 2017
Project	Stansted 35+ Project

Project No. 23003401

Epping Forest SSSI – Impact of Stansted 35+ Project

Introduction

1. Steer Davies Gleave (SDG) was commissioned by Stansted Airport Limited (STAL) to provide surface access transport consultancy advice in support of the planning application to increase the allowable passenger throughput at Stansted Airport from 35 million passengers per annum (mppa) to 43mppa (hereby referred to as the 'Stansted Airport 35+ Project').

2. An Environmental Statement (ES) scoping report was produced for the proposed planning application and issued to a number of stakeholders in July 2017. Natural England (NE) was amongst the stakeholders approached for comment. NE is the UK government's statutory advisor for the natural environment, who "*help to protect England's nature and landscapes for people to enjoy and for the services they provide*".

3. In response to the ES scoping report, NE set out the following response regarding the Epping Forest SSSI:

   "we advise that your ES submission needs to include a traffic assessment with predictions for traffic levels including key roads near Epping Forest SAC, SSSI. It should be noted that the current baseline levels of road traffic movements are for aircraft passenger levels (and staffing/operational traffic associated with current operations) are below the permitted passenger levels of 35mppa, so predictions need to be provided for road traffic movements that would meet the 35mppa level within indicated growth timetables and to meet 43mppa within the timetables indicated."

4. Epping Forest SSSI comprises 1,728 hectares of land and expands across Epping Forest District, London Borough of Waltham Forest and the London Borough of Redbridge.

5. It was designated as an SSSI in 1953 (Under 1949 Act) and 1980 (Under 1981 Act). It is one of few remaining large-scale examples of ancient wood-pasture in lowland Britain. The environment has retained "*habitats of high nature conservation value including ancient semi-natural woodland, old grassland plains and scattered wetland*". The semi-natural woodland is particularly extensive, forming one of the largest coherent blocks in the country. Another major feature is the forest plains, which contain a variety of unimproved acid grasslands, uncommon elsewhere in Essex and London. Epping Forest SSSI also supports "*a nationally outstanding assemblage of invertebrates, major amphibian interest and an exceptional breeding bird community*".

6. It is considered that the key consideration is the impact associated with an increase in vehicular traffic on the M25, Junction 26-27 link associated with a proportion of the additional 8 million passengers.

7. This note sets out the forecast traffic flows expected on this link of the M25 as a result of the passenger cap increase at Stansted Airport, compared to consented conditions, i.e. the vehicle movements associated with 8 million additional passenger movements and associated increased employee vehicle trips, both taking into account predicted modes of travel and average car occupancies.

8. It sets out a comparison of the additional traffic flows to and from Stansted Airport for the Stansted Airport 35+ Project compared to the volume of traffic that would utilise this link of the M25 should the 8 million passengers use alternative airports once Stansted Airport reaches its current 35mppa cap.

Methodology

Passenger and Employee Forecasts

9. To inform the surface access travel patterns at Stansted Airport for the existing and future baselines, the following data sources have been used to derive up-to-date and robust information:

- Civil Aviation Authority (CAA) 2016 Passenger Survey data;
- ICF Passenger Outputs (2016); and
- Employee Travel Survey (2015).

10. These sources were used to derive existing and future baseline passenger and employee modes of travel and places of residence; to inform the distribution of employees and passengers travelling to/from Stansted Airport, and to further delineate the proportion that would travel via the M25 (J26-27).

Mode Share

11. The mode share from the 2016 CAA passenger survey was used to derive the number of vehicle trips for passengers in 2028.

12. The baseline modal split for employees was forecast from the Employee Travel Survey (2015). The future mode share for employees was derived from the existing modal share and the targets outlined in Stansted Airport's 2015 Sustainable Development Plan to reduce the number of single car occupancy trips for employees at Stansted Airport.

13. The proportion of the mode share which comprises vehicle trips for passengers and employees in 2028, is therefore shown in Table 1.

Table 1: Future Vehicular Mode Share – Passengers and Employees

	Proportion of Vehicle Trips (%)*
Passengers	50%
Employees	55%

*This includes all trips made by car, car passenger and taxis. An average occupancy of 1.6 persons was applied to car passenger and taxi trips to derive the number of vehicles. More information is provided in Technical Note 01 and the Transport Assessment.

14. To forecast the quantum of vehicle trips generated by passengers and employees in the 2028 35mppa and 2028 43mppa future year scenarios, the average daily passenger and employee forecasts were applied to the vehicle mode splits presented in Table 1. These results are shown in Table 2.

Table 2: Average Total Daily Vehicle Trips

Scenario	Daily Passenger Vehicle Trips	Daily Employee Vehicle Trips	Total
2028 (35mppa) 'Do Minimum'	36,454	8,163	**44,617**
2028 (43mppa) 'Do Something'	42,815	10,018	**52,833**

Place of Residence

15. In order to determine the proportion of persons (passengers and employees) using the M25 (J26-27) link, a trip origin/destination was assigned to predicted trips. The surface origin of air passengers was derived

from the CAA 2016 passenger survey. The 2015 Employee Survey informed the distribution of employees. The baseline trip distribution was also used to inform the 2028 scenarios, as the catchment for passengers and employees is not anticipated to alter significantly. Table 3 shows the aggregated distributions for passengers and employees.

Table 3: Place of Residence – Passengers and Employees

	Passengers	Employees
East Midlands	6%	1%
West Midlands	2%	0%
Southwest and Wales	3%	0%
East Anglia	13%	7%
Outer South East NW	3%	2%
Outer South East NE	14%	77%
Outer South East SE	3%	1%
Outer South East SW	2%	1%
Inner London	31%	1%
Outer London NE	7%	6%
Outer London NW	9%	3%
Outer London SE	2%	1%
Outer London SW	2%	0%
Rest of UK	2%	0%
Total	**100%**	**100%**

Routing of Passengers and Employees

16. Future additional traffic flows on the M25 (J26-27) link were forecast using the system application 'Network Analyst' in ArcGIS to assign the trip distribution to the highway network based on lowest journey times.

17. The network used was 'Pitney Bowes 2016 Speed profiles – Night (22:00 – 04:00)', which provides a reliable proxy for free flow conditions and suitable for the 24 hour operation at the airport. This was then edited by SDG to account for the A14 improvements and Huntingdon Bypass which will be complete and operational by 2028.The national speed limit was adopted as the link speed for this new route.

18. The network was used to calculate the quickest timed routes from weighted population centres from each residential district to the Airport. The districts were weighted according to population density, which was calculated by deriving the median coordinates for each district, weighted by population at Lower Super Output Area (LSOA) level (2011). A number of employee/passenger vehicles were assigned to each district, based on the relative size (area) of each district, compared with the overall aggregate zone where:

$$\left(\frac{\text{District Population}}{\text{Total zone population}}\right) \times \text{No. of passengers and employees in the overall zone}$$

19. It was then assumed that all passengers and employees within each district took the fastest route to Stansted Airport. Passenger only trips were calculated for the alternative airports tested, as the number of employees affected is not directly comparable. Employee travel characteristics are usually determined by locality.

Results

Travel to Stansted Airport

20. In order to quantify the increase in traffic posed by the passenger cap application for 43mppa, results were produced for:

- 2028 (35mppa) 'Do Minimum' Scenario; and
- 2028 (43mppa) 'Do Something' Scenario.

21. The distribution of passengers and employees to/from Stansted Airport as derived from the existing passenger and employee surveys, is presented in Figure 1.

Figure 1: Passenger and Employee Routing to Stansted Airport

22. Based on the passenger and employee routings shown in Figure 1, the proportion of vehicle trips via the M25 (J26-27) link was derived. Table 4 illustrates the number of vehicles per scenario which are predicted to travel via the M25 (J26-27) link, according to place of residence.

Table 4: Vehicle movements on M25 (J26-27) – Stansted Airport

Aggregate zone	Travel to Stansted Airport on M25 (J26 27)						
	Projected Employees (2028 35mppa)	Projected Employees (2028 43mppa)	Difference in Employees (2028 35mppa vs 43mppa)	Projected Passengers (2028 35mppa)	Projected Passengers (2028 43mppa)	Difference in Passengers (2028 35mppa vs 43mppa)	Total Difference (Employees + Passengers)
East Midlands	1	1	**0**	57	70	**13**	**13**
West Midlands	0	0	**0**	0	0	**0**	**0**
Southwest and Wales	10	12	**2**	768	944	**176**	**178**
East Anglia	0	0	**0**	0	0	**0**	**0**
Outer South East NW	84	103	**19**	1,316	1,618	**302**	**321**
Outer South East NE	1,016	1,246	**231**	1,392	1,711	**319**	**550**
Outer South East SE	0	0	**0**	0	0	**0**	**0**
Outer South East SW	31	38	**7**	606	745	**139**	**146**
Inner London	0	0	**0**	0	0	**0**	**0**
Outer London NE	0	0	**0**	0	0	**0**	**0**
Outer London NW	54	66	**12**	1,188	1,460	**272**	**284**
Outer London SE	0	0	**0**	0	0	**0**	**0**
Outer London SW	0	0	**0**	0	0	**0**	**0**
Rest of UK	0	0	**0**	0	0	**0**	**0**
Total	**1,195**	**1,466**	**271**	**5,327**	**6,549**	**1,222**	**1,493**

23. As Table 4 shows, a combined total of 1,493 daily trips are predicted for the M25 (J26-27) link in the 2028 (43mppa) 'Do Something' scenario compared to the consented 2028 (35mppa) 'Do Minimum' results to Stansted Airport.

24. The largest proportion of passengers using the M25 (J26-27) are located in the 'Outer South East NE' and 'Outer South East NW' zones., with a similar distribution of employees.

25. Figure 2 and Figure 3 visually present the proportion of trips made by passengers and employees respectively to Stansted Airport, between the two scenarios tested.

Figure 2: Proportion of Passengers using the M25 (J26-27) link – Stansted Airport

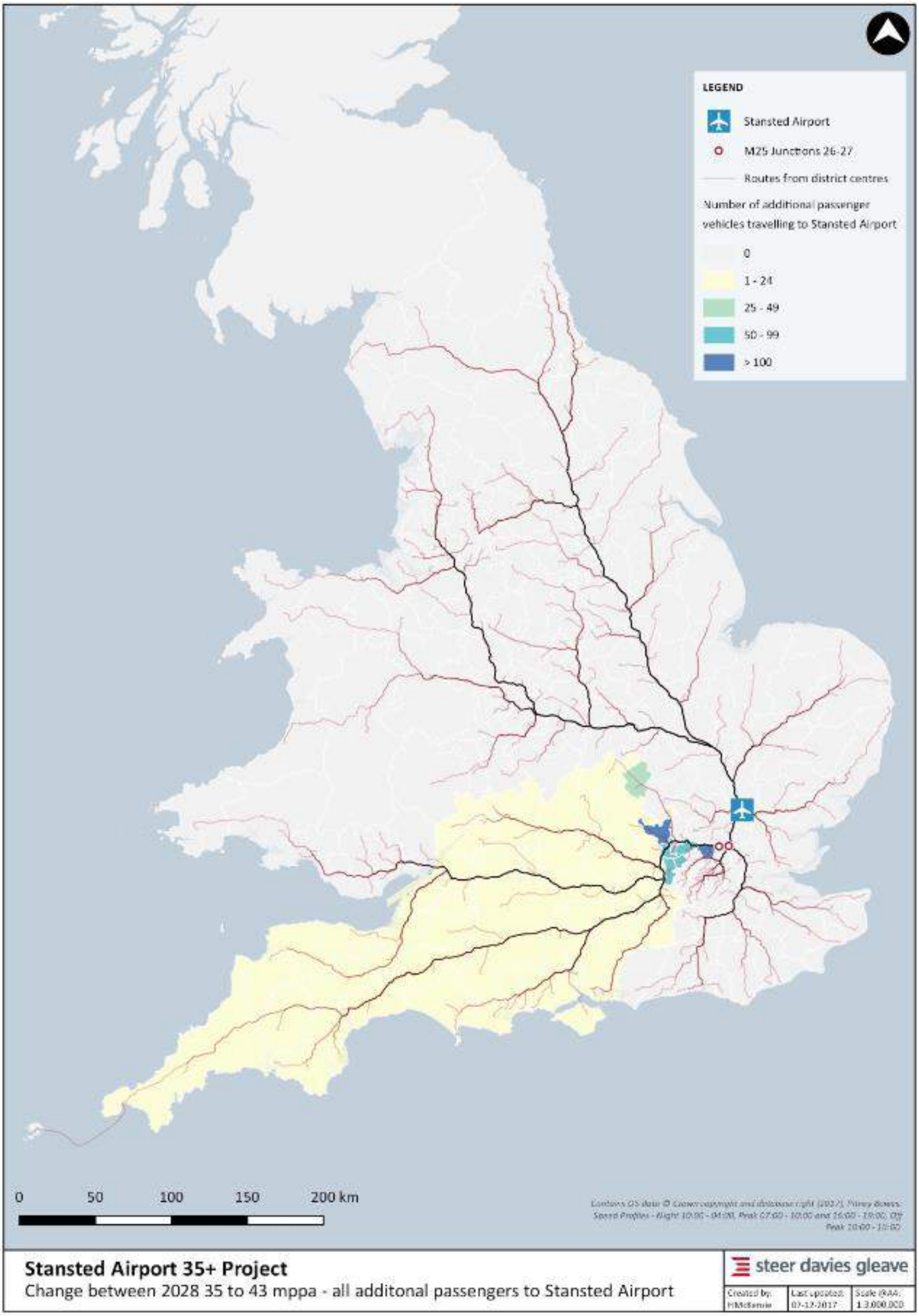
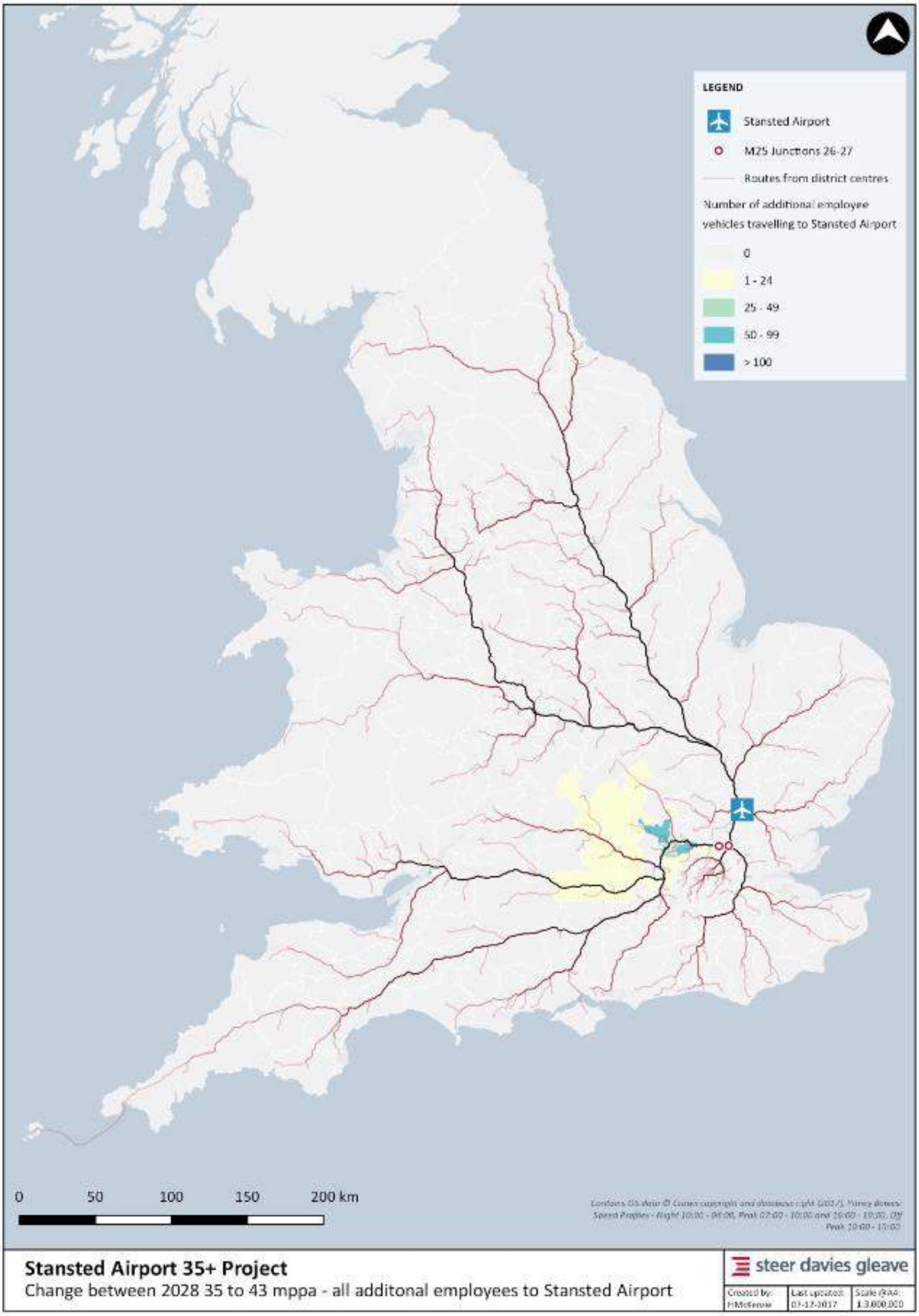


Figure 3: Proportion of Employees using the M25 (J26-27) link– Stansted Airport



Potential Future Travel – Other Airports

26. The Department for Transport predicts a steady increase in air travel demand and their modelling suggests that demand distributes between airports based on ability to handle demand. Hence, whilst the increased cap application will attract vehicular trips on the M25 (J26-27) link for travel to and from Stansted Airport; without the cap application, the same 8mppa passengers will still be expected to travel, but via other UK Airports where there is suitable capacity.

27. The potential for associated vehicle trips to otherwise use the M25 (J26-27) link for travel to other UK Airports has therefore been analysed to consider the impact of the Stansted 35+ Project, compared to alternative of increased passenger travel to other airports.

28. In the current absence of alternative permitted expansion of other south-east England airports, the airports selected for analysis are as follows:

- Birmingham Airport;
- East Midlands Airport; and
- Bristol Airport.

29. All of the options above have been considered as they display 'spare' operating capacity at 2028, sufficient to accommodate, between them, the displaced 8mppa. In order to provide a simple direct comparison, three scenarios have been tested:

- **Option 1** – All Passengers displaced to Birmingham Airport;
- **Option 2** – All Passengers displaced to East Midlands Airport; and
- **Option 3** – All Passengers displaced to Bristol Airport.

30. In practice, any displacement would be expected to be a mix of the three options. No London-based Airports were tested as all are projected to be operating at capacity by 2028[1].

Option 1 – All Passengers displaced to Birmingham Airport

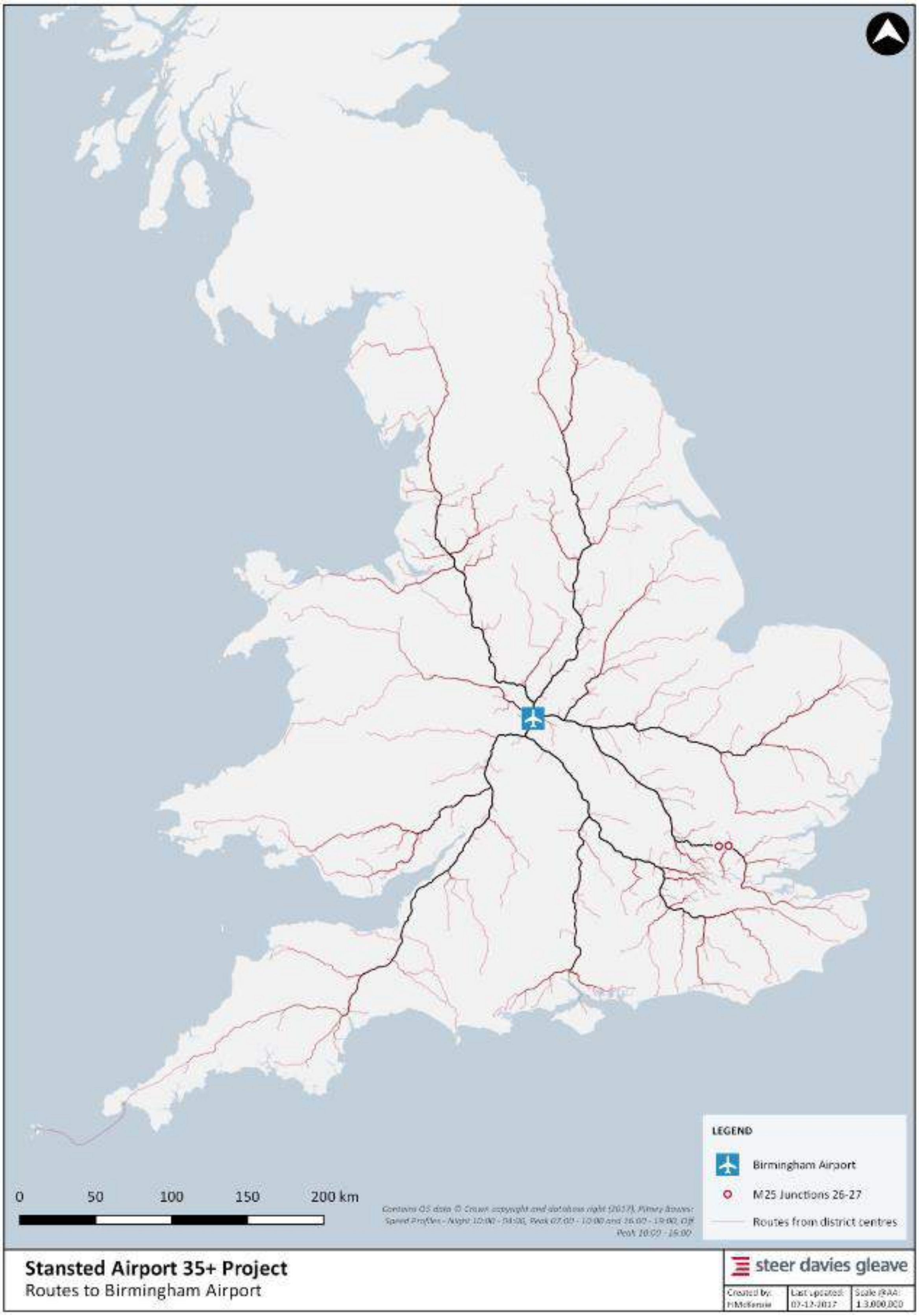
31. Birmingham Airport is the seventh largest airport in the UK, located in the Metropolitan Borough of Solihull, eight miles south east of Birmingham city centre.

32. In 2016, a total of 11.6 million passengers were recorded to travel through Birmingham Airport (CAA passenger survey, 2016). The maximum throughput of passengers is estimated presently at 27mppa (Towards 2030 (Airport Masterplan to 2030), Birmingham Airport 2007). It is noted that a new masterplan is being prepared by the airport to support further growth to 55mpaa by 2050.

33. The routing of passengers to/from Birmingham Airport, based on the origins presented in Table 3 and the same assignment technique as adopted above, is presented in Figure 4.

[1] It is acknowledged that London Heathrow Airport will not have a third runway by 2028, and forecasts show that 2030 is a realistic timescale for opening.

Figure 4: Passenger Routing to Birmingham Airport



34. The assignment of vehicle trips via the M25 (J26-27) link was derived based on the passenger routings shown in Figure 4. Table 5 illustrates the number of vehicles per scenario which are predicted to travel across the M25 (J26-27) link, according to place of residence.

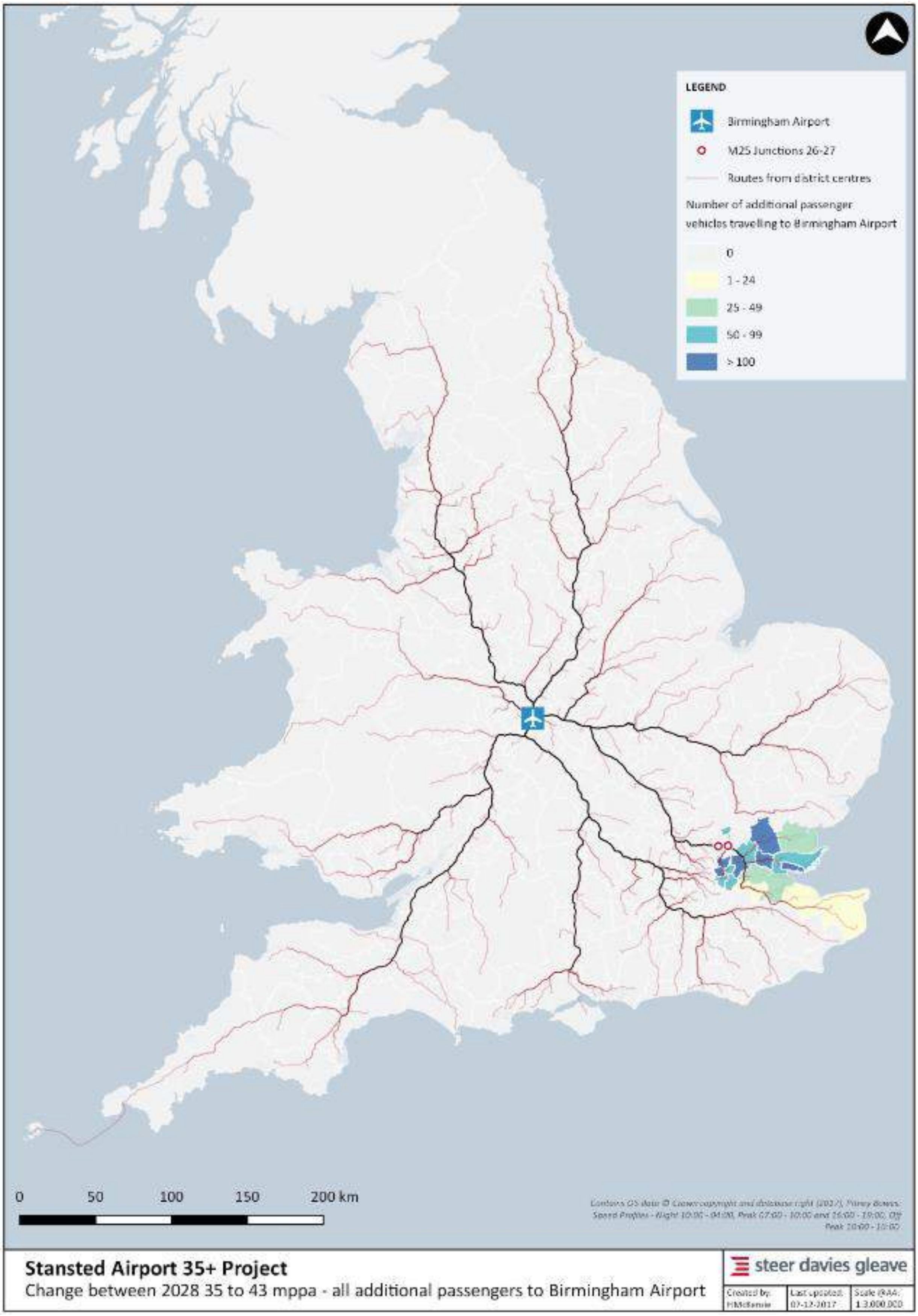
Table 5: Vehicle movements on M25 (J26-27) – Birmingham Airport

Aggregate Zone	Total additional Employee and Passenger trips to Stansted Airport 2028 43 (8mppa)	Displacement of additional Passenger trips to Birmingham Airport 2028 43 (8mppa)	Difference in M25 (J26 27) trips (+/)
Rest of UK	0	0	0
East Midlands	13	0	-13
West Midlands	0	0	0
Southwest and Wales	179	0	-179
East Anglia	0	0	0
Outer South East NW	321	0	-321
Outer South East NE	550	684	+134
Outer South East SE	0	184	+184
Outer South East SW	146	0	-146
Inner London	0	74	+74
Outer London NE	0	516	+516
Outer London NW	285	0	-285
Outer London SE	0	52	+52
Outer London SW	0	0	0
Total	**1,493**	**1,508**	**+15**

35. As Table 5 shows, a total of 1,508 passenger related vehicle trips would use the M25 (J26-27) link to travel to Birmingham Airport in the absence of the 35+ Project at Stansted Airport. This is 15 more vehicle trips than the traffic increase forecast for this link associated with travel to and from Stansted Airport with the 35+ Project including Passengers and employees.

36. Figure 5 visually present the origin/destinations of the displaced passengers respectively to Birmingham Airport.

Figure 5: Proportion of Passengers using the M25 (J26-27) – Birmingham Airport



Option 2 – All Passengers displaced to East Midlands Airport

37. Option 2 sets out the proportion of vehicle trips travelling on the M25 (J26-27) link in the instance that the 8mppa is displaced to East Midlands Airport.

38. East Midlands Airport is located in Leicestershire, within 14 miles of Loughborough, Derby and Nottingham. In 2016, a total of 4.65 million passengers were recorded to travel through East Midlands Airport (CAA passenger survey, 2016). The maximum throughput of passengers is estimated at 10mppa (EMA Sustainable Development Plan, 2015), however, all 8 million trips have been assigned to the airport for this comparison exercise.

39. The routing of passengers to/from East Midlands Airport is presented in Figure 6.

40. Based on the passenger routings shown in Figure 6 and the assignment method previously adopted, the predicted number of passenger related vehicle trips attracted to the M25 (J26-27) link was derived. Table 6 illustrates the number of vehicles per scenario which are predicted to travel on the M25 (J26-27) link, according to place of residence.

Table 6: Vehicle movements on M25 (J26-27) – East Midlands Airport

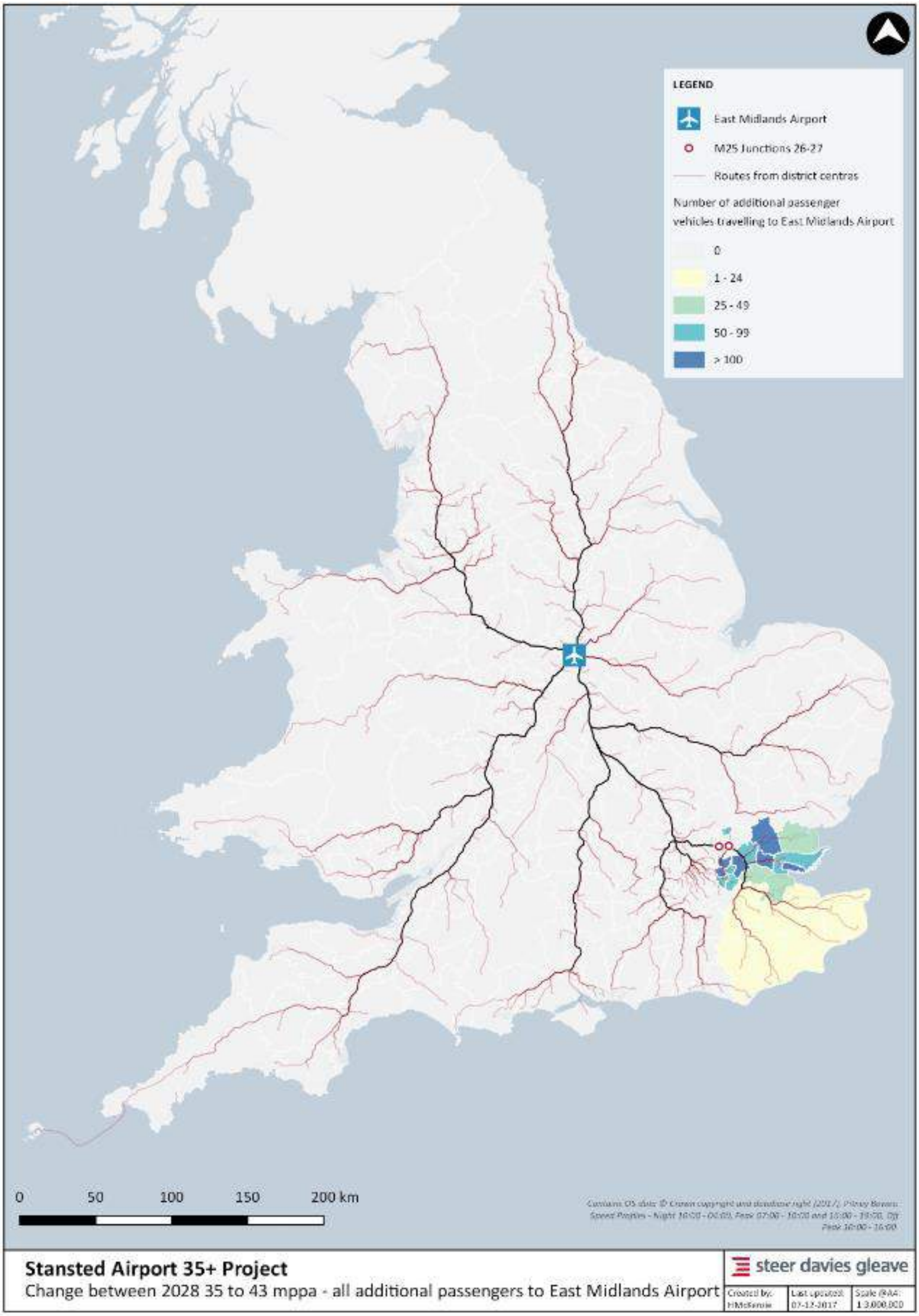
Aggregate Zone	Total additional Employee and Passenger trips to Stansted Airport 2028 43 (8mppa)	Displacement of additional Passenger trips to East Midlands Airport 2028 43 (8mppa)	Difference in M25 (J26 27) trips (+/)
Rest of UK	0	0	0
East Midlands	13	0	-13
West Midlands	0	0	0
Southwest and Wales	179	0	-179
East Anglia	0	0	0
Outer South East NW	321	0	-321
Outer South East NE	550	684	+134
Outer South East SE	0	352	+352
Outer South East SW	146	0	-146
Inner London	0	74	+74
Outer London NE	0	516	+516
Outer London NW	285	0	-285
Outer London SE	0	52	+52
Outer London SW	0	0	0
Total	**1,493**	**1,677**	**+184**

41. As Table 6 shows, a total of 1,677 passenger related vehicle trips would use the M25 (J26-27) link to travel to and from East Midlands Airport in the absence of the 35+ Project at Stansted Airport. This is 184 vehicle trips compared to the traffic forecast for passengers and employees combined, towards Stansted Airport for the 35+ project.

42. Passengers using the M25 (J26-27) are located in the 'Outer South East NE', 'Outer London NE' and 'Outer South East SE' zones. Figure 7 visually presents the origin/destinations of the displaced passengers to East Midlands Airport.

Figure 6: Passenger Routing to East Midlands Airport

Figure 7: Proportion of Passengers using the M25 (J26-27) – East Midlands Airport



Option 3 – All Passengers displaced to Bristol Airport

43. Bristol Airport is the UK's ninth largest airport, located in Lulsgate Bottom in North Somerset. In 2016, a total of 7.6 million passengers were recorded to travel through Bristol Airport (CAA passenger survey, 2016). The maximum throughput of passengers is estimated at 15mppa by 2030 (Bristol Airport 'Preparing for the Future', 2017).

44. The predicted trip assignment of vehicles for passengers to/from Bristol Airport is presented in Figure 8.

45. Based on the passenger routings shown in Figure 8 and the assignment method previously adopted, the predicted number of vehicle trips attracted to the M25 (J26-27) link was derived. Table 7 illustrates the number of vehicles per scenario which are predicted to travel on the M25 (J26-27) link, according to place of residence.

Table 7: Vehicle movements on M25 (J26-27) – Bristol Airport

Aggregate Zone	Total additional Employee and Passenger trips to Stansted Airport 2028 43 (8mppa)	Displacement of additional Passenger trips to Bristol Airport 2028 43 (8mppa)	Difference in M25 (J26 27) trips (+/)
Rest of UK	0	0	0
East Midlands	13	0	-13
West Midlands	0	0	0
Southwest and Wales	179	0	-179
East Anglia	0	305	+305
Outer South East NW	321	0	-321
Outer South East NE	550	1,090	+540
Outer South East SE	0	0	0
Outer South East SW	146	0	-146
Inner London	0	0	0
Outer London NE	0	121	+121
Outer London NW	285	0	-285
Outer London SE	0	0	0
Outer London SW	0	0	0
Total	**1,493**	**1,516**	**+23**

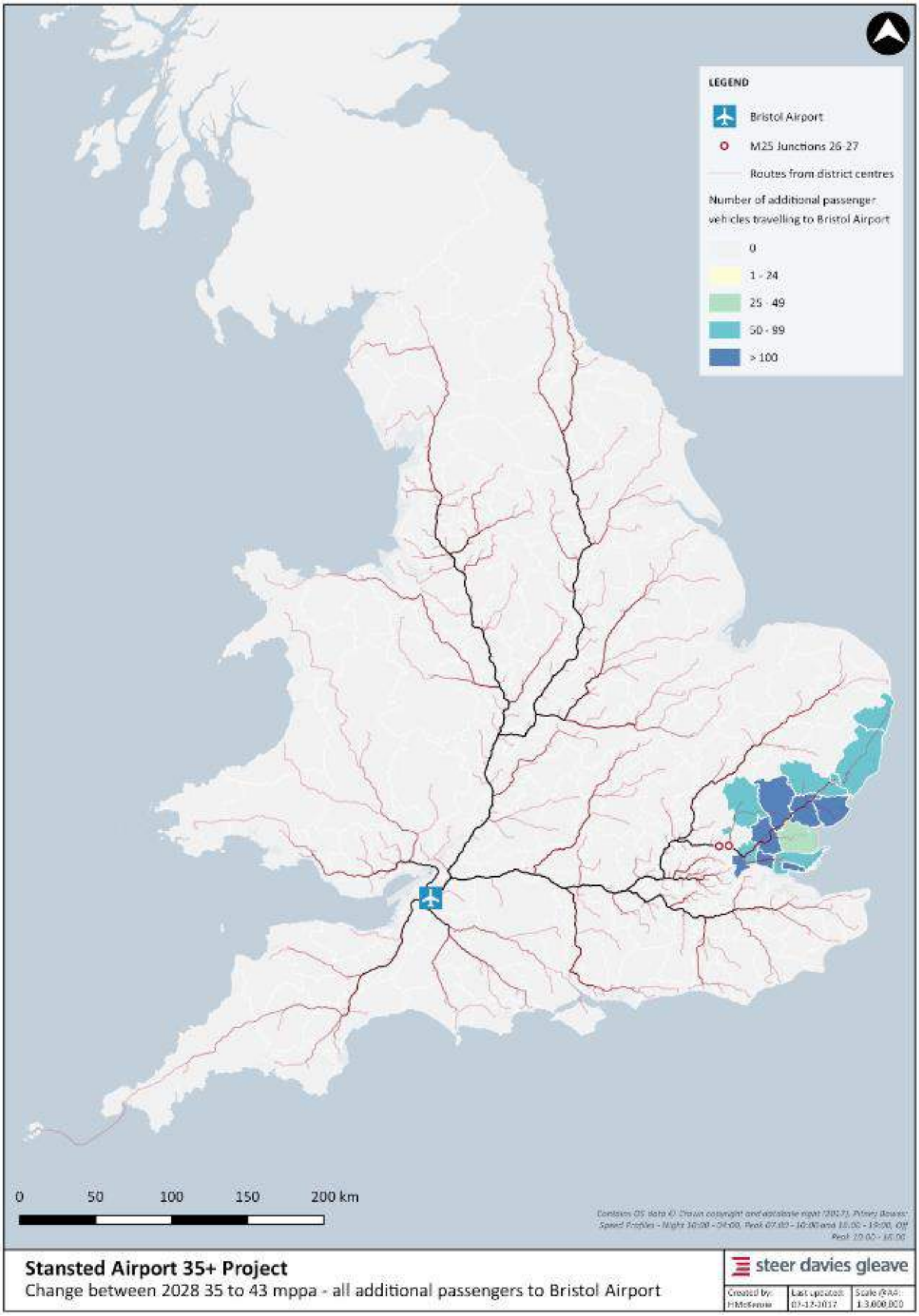
46. As Table 7 shows, a total of 1,516 vehicle passenger related trips would use the M25 (J26-27) link to travel to Bristol Airport in the absence of the 35+ Project at Stansted Airport. This is 23 additional vehicle trips compared to the traffic forecast for passengers and employees combined, towards Stansted Airport for the 35+ Project.

47. Passengers using the M25 (J26-27) are located in 'East Anglia', the 'Outer South East NE' and 'Outer London NE' zones. Figure 9 visually presents the origin/destinations of the displaced passengers to Bristol Airport.

Figure 8: Passenger Routing to Bristol Airport

48.

Figure 9: Proportion of Passengers using the M25 (J26-27) – Bristol Airport



Summary and Conclusions

49. Stansted Airport 35+ Project is predicted to attract an additional 1,493 vehicular movements per day on the M25 (J26-27) link as a result of passenger and employee related travel.

50. In the absence of expansion of operations at Stansted, 8 million additional passenger trips will be diverted from Stansted to other UK airports.

51. The London market demand will be constrained from 2022/3 when the available airport capacities become limited in their operating capacities, and would therefore not be able to accommodate the 8mppa passenger demand. However, in accordance with DfT predictions, it is reasonable to anticipate that demand for air travel will remain and that alternative airports will attract these trips.

52. Results from the redistribution analysis for Birmingham Airport, East Midlands Airport and Bristol Airport all indicate between 1% and 12% more vehicular trips will use the M25 (J26-27) link if the Stansted 35+ Project does not go ahead, associated with a proportion of the passenger travel (8mppa). In practice, the alternative passenger trips could be anticipated to be shared amongst these and other smaller airports. This uplift in passengers is in comparison to the combined passenger and employee vehicle trips associated with the Stansted Airport 35+ application. It is considered that any future displaced employee travel to other airports would further increase the traffic growth on the M25 (J26-27) link.

Background Traffic Comparison

53. In all scenarios tested, there is an increase in vehicular traffic across the M25 (J26-27), however to understand the impact of growth compared to background traffic, 2016 existing traffic flow data was derived from the DfT at this point on the M25 as a baseline. 2016 data was used as this is the latest fully dataset provided. TEMPro was used to growth the background traffic for the assessment year: 2028. The background traffic growth is shown in Table 8, for the 1026 and 2028 scenarios, with and without traffic to Stansted Airport. The 2028 (35mppa) 'Do Minimum' scenario has been included as this has received planning consent.

Table 8: Consented and Forecast Background Traffic Growth

Assessment Scenario	Volume of Traffic on M25 (J26 27)
2016 Baseline Traffic	135,453
2016 Background Traffic (No Airport)	131,033
2028 Background Traffic (No Airport)	154,422
2028 35mppa at Stansted Airport (consented)	160,943

54. To understand the impact of the Stansted 35+ Project compared to the background flows presented in Table 8, the forecast additional 8mmpa trips to Stansted Airport and alternative airports: Birmingham, East Midlands and Bristol, were added and compared to the background flows, and a percentage change was calculated per airport to consider the proportional impact. The results are presented in Table 9.

Table 9: Traffic Growth on M25 (J26-67) With/Without Stansted 35+ Project

Assessment Scenario	Volume of Traffic on M25 (J26 27)	% Growth
2028 43mppa at Stansted Airport	162,436	+0.93%
2028 43mppa (8mppa to Birmingham Airport)	162,451	+0.94%
2028 43mppa (8mppa to East Midlands Airport)	162,620	+1.04%
2028 43mppa (8mppa to Bristol Airport)	162,459	+0.94%

55. The results of the analysis indicate that the 35+ Project at Stansted Airport will have the least impact on the total traffic flows for the M25 (J26-27) link of +0.93% growth in vehicular traffic compared to the displacement of passengers to alternative UK Airports which varies between +0.94 and +1.04% growth, if the consented 35mppa cap at Stansted Airport is retained. This additional growth represents passengers only compared to the combined passenger and employee demand at Stansted Airport. Potential future employee travel could further exacerbate the traffic flows on the M25 (J26-27) for other UK airports.

APPENDIX 2 – LOCAL ROAD TRAFFIC IMPACTS

Traffic Impact in Epping Forrest

1.1 SDG have undertaken detailed catchment analysis to identify likely attraction of using local roads passing through Epping Forrest. As anticipated, figures are very small. There are very low population densities in the Forest and the roads through the forest have only a very local attraction as a route to Stansted. The largest potential impact of the change from 35mpppa to 43mppa would be on the northern section of B1393, High Road as it reaches the north of the forest, crossing the M25. At this point we anticipate an additional 12 daily trips, compared with an AADT in 2028 of around 23,600 vehicles, i.e. 0.05% impact.

Analysis

1.2 Historic database information has been used to understand travel time prioritised, car driving routing to identify the catchment area that could be expected to choose to use the local roads and then the B1393 to travel northwards through the forest. The routing is shown in Figure 1 below:

Figure 1: Identified catchment likely to route through Epping Forest

1.3 GIS analysis has then been used to identify the populations of postcode zones lying within the catchment and compared those with the total populations of the districts in which they sit. Population in areas routing through Epping Forest (at LSOA level, ran from population weighted centroids) – are as set out in the table below:

Table 1: B1393 Catchment

LA Name	Total Population	Population routing through Epping Forest	%

1.4 These proportions have then been applied to our employee and passenger used for the modelling reported in the application TA/EA, as set out in Tables 2 and 3 below:

Table 2: Potential employee travel on B1393

District	Proportion of employees within whole district	Proportion of routing through Epping Forest	Proportion of Total Employees	Daily Trips 2016	Daily Trips 35mppa	Daily Trips 43mppa
						0
LB Waltham Forrest	1.3%	4.66%	0.06%	2	2	3
Epping			0.05%		2	2
Total	-	-	**0.12%**	**4**	**4**	**5**

Table 3: Potential passenger travel on B1393

District	Proportion of passengers using car within whole district	Proportion of routing through Epping Forest	Proportion of total car passengers	Daily Trips 2016	Daily Trips 35mppa	Daily Trips 43mppa
Redbridge	1.6%	0.48%	0.008%	2	3	3
LB Waltham Forrest	2.7%	4.66%	0.126%	31	46	56
Epping	2.3%	3.04%	0.070%	17	25	31
Total	-	-	**0.141%**	**50**	**74**	**90**

1.5 The current B1393 AADT are of the order of 20,000 vehicles. This could be anticipated to increase to around 23,600 by 2028. Of this total, Stansted related traffic is currently 54 trips increasing to 78 trips by 2028 with current permission and to 95 with the expanded operations as set out in Table 4 below:

Table 4: B1393 Predicted AADT

Scenario	Background Traffic	Stansted Traffic	Stansted Traffic Proportion
		54	0.27%
2028- 35mppa	23,600	78	0.33%
2028- 43mppa		90	0.38%
Impact of 35+	**23,600**	**12**	**0.05%**

1.6 The analysis indicates de minimis impacts on the identified minor roads of within Epping Forrest

APPENDIX 3 – EPPING FOREST SURVEY NOTE

Epping Forest Ecology Survey Briefing Note

RPS were commissioned by Stansted Airport Ltd. (STAL) to undertake vegetation surveys of the northern section of the Epping Forest Special Area of Conservation (SAC) in the vicinity of the nearest section of the M25 motorway to the designated site, namely Unit 105 of the site. The most recent condition assessment of the underlying Site of Special Scientific Interest (SSSI) noted that the unit in this location (Unit 105) was in Favourable condition, however:

"… notwithstanding this assessment, there remains a very significant issue relating to air quality and the related deposition of acidity and of nitrogen. Many veteran trees within the unit display clear symptoms of stress (eg thin canopy and die-back of leading shoots), there is excessive growth of bramble, and there are dense stands of nettles along roadsides and ride edges."

The aim of the survey was therefore to determine the habitats present (and specifically the features of interest for which the site is designated) within this unit, particularly within 200m of the M25. The locations of the veteran trees and other potentially vulnerable receptors (such as epiphytes) were mapped and notes made on whether these displayed evidence of such stress. A further aim was to determine the habitats present in relation to dominance by nitrophilous species that may result from eutrophication from nitrogen deposition.

Methodology and sampling strategy

Veteran trees

Four transects were walked aiming to cover as much ground within the northernmost 300m of the SAC adjacent to the M25 (see Survey Plan 1). Where possible, straight transect lines were adhered to; however, due to the nature of the site some areas were blocked by fallen trees and areas dominated by holly *Ilex aquifolia*. In these cases the route was redirected. The location of veteran trees was mapped. While walking all transects, notes were made of any evidence of high nitrogen deposition were assessed by mapping areas of vigorous ruderal growth such as that of common nettle *Urtica dioica* and bramble *Rubus fruiticosus agg.*

Habitat community and species identification

The transects were used to map species composition and habitat community type, as well as the Common Standards Monitoring (CSM) indicators to assess the 'condition' of the woodland component of the SSSI. Therefore, the sampling strategy followed the NVC standard methodology but with less emphasis was on delimiting homogenous stands across the site.

The transect was based on the guidelines outlined in the Common Standards Monitoring Guidance for Woodlands Habitats (JNCC 2004). This method was chosen to account for small changes in species composition across the site and to better understand the potential drivers of such composition. Eleven 4x4m quadrats were paced out along the transect. Ground cover and canopy cover were both noted along with percentage cover of each species.

Results

Habitat type

No acid grassland or heathland habitats were recorded within the survey area.

Data collected within the quadrats are presented in Appendix 1. The habitat types present in this part of Epping Forest show an affinity with a mixture of W10 *Quercus robur-Pteridum aquilinum-Rubus fruiticosus* woodland and W14 *Fagus sylvatica-Rubus Fruiticosus* woodland. The second of these is characteristic of the Annex I woodland habitat *Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae or Ilici-Fagenion*)* that is a primary reason for selection of Epping Forest as an SAC. Mature woodland is across the survey area including directly adjacent to the roads.

Habitat description

The habitat across the majority of the site is largely homogenous being of varying levels of maturity of mainly beech, oak, hornbeam and holly. The ground cover is mostly bare with occasional hornbeam saplings establishing. One clearing was dominated by bracken (Quadrat 8).

The woodland rides and edges are notably different to the rest of the woodland being dominated by oak and ruderal species such as nettle and bramble. There are however other herbaceous woodland species found along these open areas not seen within the woodland such as yellow pimpernel, lords-and-ladies and enchanter's nightshade.

In particular, north of the SAC boundary adjacent to the cricket pitch over the Bell Common Tunnel, the woodland is dominated by oak and to a lesser degree hornbeam with infrequent immature beech, distinctly different from the woodland habitat present within the SAC. The understorey in this area was particularly dominated by bramble and nettle.

Distribution of veteran trees

No veteran trees occurred within 200 m of the Bell Common Tunnel eastern portal nor within 100 m of the western portal (Survey Plan 2).

Condition of tress

In general, the mature/veteran beech trees across the survey were in reasonable condition with some trees displaying extensive damage by leaf-mining invertebrates. Oak was most frequent towards the edges of the SAC and along the rides. As described by Natural England, many of these displayed evidence of stress including abundant epicormic growth and branch die-back. It is not possible from observational evidence to determine the cause of this stress, although nutrient imbalance due to nitrogen enrichment may be a contributory factor.

SAC within 200 m of the M25

Table 1 below describes the area of the SAC within the buffer zones around the two Bell Common Tunnel portals (Survey Plan 2). Only 0.27% of the total SAC area occurs with 200 m of the portals [note a separate calculation of area of SAC within 200m of the M25 as a whole is still to be calculated – as a very small area of the SAC to the west of the portal falls into the category].

Table 1: Areas of the Epping Forest SAC within 200 m of the M25 portals

Distance from tunnel portal of M25	Area of SAC within buffer	% of total area of SAC	Number of veteran within buffer
20m buffer	0.01ha	0.0006%	0
50m buffer	0.19ha	0.01%	0
100m buffer	0.99ha	0.06%	0
150 m buffer	2.65ha	0.17%	3
200m buffer	5.53ha	0.34%	8
Total area of SAC 1,604.95ha			

Photographs of Epping Forest

Photograph 1: Epping Forest beech pollards

Photograph 2: Epping Forest beech pollards with holly understorey

Photograph 3: Evidence of localised nutrient enrichment along path edge due to dogs

Photograph 4: Oak-dominated woodland to north of SAC with bramble/nettle ground flora

Photograph 5: Epicormic growth on oak

Photograph 6 – M25 west-bound

Appendix 1: Quadrats taken along transect and species composition.

Quadrant		Species	Common Name	Percentage Cover
Q1	**Ground**	*N/A*		
	Canopy	*Illex aquifolium*	Holly	100%
		Quercus robur	Common Oak	80%
Q2	**Ground**	*Carpinus betulus*	Hornbeam	10%
		Illex aquifolium	Holly	1%
		Moss (To be ID'd)		10%
	Canopy	*Illex aquifolium*	Holly	100%
		Carpinous betulus	Hornbeam	100%
Q3	**Ground**	*Oxalis acetosella*	Wood Sorel	1%
		Moss (T B I)		40%
		Carpinus betulus	Hornbeam	1%
	Canopy	*Quercus robur*	Common Oak	1%
		Illex aquifolium	Holly	60%
		Carpinous betulus	Hornbeam	40%
Q4	**Ground**	*N/A*		
	Canopy	*Illex aquifolium*	Holly	80%
		Fagus sylvatica	Beech	40%
Q5	**Ground**	*Carpinous betulus*	Hornbeam	10%
		Moss (TBI)		1%
	Canopy	*Illex aquifolium*	Holly	80%
		Quercus Robur	Common Oak	60%
		Fagus sylvatica	Beech	40%
Q6	**Ground**	*Moss (TBI)*		30%
	Canopy	*Fagus sylvatica*	Beech	100%
Q7	**Ground**	*N/A*		

	Canopy	*Carpinous betulus*	Hawnbeam	40%
		Acer pseudoplantanus	Sycamore	50%
		Sorbus aucuparia	Rowan	40%
		Fagus sylvatica	Beech	20%
Q8	**Ground**	*Pteridium aquilinum*	Bracken	40%
	Canopy	*Carpinus betulus*	Hornbeam	10%
Q9	**Ground**	*Alleria petiolate*	Garlic Mustard	40%
		Rubus fruiticosus	Bramble	60%
		Geum urbanum	Wood avens	10%
	Canopy	*Quercus cerris*	Turkey Oak	40%
		Sorbus aucuparia	Rowan	40%
Q10	**Ground**	*Rubus fruiticosus*	Bramble	90%
	Canopy	*Quercus robur*	Common Oak	20%
		Betula pubescence	Downy Birch	30%
Q11	**Ground**	*Cardamine flexuosa*	Wavey Bitter-Cress	10%
		Circaea lutetiana	Enchanters Nightshade	10%
		Geum urbanum	Wood avens	10%
		Urtica diocia	Stinging Nettle	30%
		Rubus fruiticosus	Bramble	20%
		Silene dioca	Red Campion	10%
		Chamerion angustifolium	Great Willowherb	10%
		Gallium aparine	Cleavers	10%
	Canopy	*Quercus robur*	Common Oak	30%

Other species noted around the site not included within the quadrats include: red-veined dock *Rumex sanguinus,* rhododendron *Rhododendron ponticum,* herb-robert *Geranium robertianum,* lord's-and-ladies *Arum maculatum,* hawthorn *Cretagous monogyna,* cherry laurel *Prunus laurocerasus* and yellow pimpernel *Lysimachia nemorum*.

APPENDIX 4 – EPPING FOREST SAC STANDARD DATA FORM

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0012720**

SITENAME **Epping Forest**

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1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0012720

1.3 Site name

Epping Forest

1.4 First Compilation date	1.5 Update date
1996-01	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

Date site proposed as SCI:	1996-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude
0.0225

Latitude
51.64416667

2.2 Area [ha]:

1630.74

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKI2	Outer London
UKH3	Essex

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
4010			3.26		G	C	C	B	C
4030			11.42		G	C	C	B	C
9120			652.3		M	A	B	A	A

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
I	1083	Lucanus cervus			p				P	DD	C	A	C	B
A	1166	Triturus cristatus			p				P	DD	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, **I** = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N09	20.0
N16	70.0
N07	0.2
N08	3.8
N06	6.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: acidic,neutral,sand,clay 2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and importance

Northern Atlantic wet heaths with Erica tetralix for which the area is considered to support a significant presence. European dry heaths for which the area is considered to support a significant presence. Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion) for which this is considered to be one of the best areas in the United Kingdom. Lucanus cervus for which this is one of only four known outstanding localities in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
	Threats and	Pollution	inside/outside

Positive Impacts			
Rank	Activities, management	Pollution (optional)	inside/outside

Rank	pressures [code]	(optional) [code]	[i|o|b]
H	M02		B
H	H04		B
H	G01		I
H	J02		B
H	A04		I

	[code]	[code]	[i|o|b]
H	B02		I
H	A04		I
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippophaë rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

5.1 Designation type codes

APPENDIX 5 – AIR QUALITY MODELLING

Technical Note

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Project title	Stansted Airport 35+ Planning Application (UTT/18/0460/FUL)	Job number	253360-00
cc	STAL / RPS	File reference	AQ/TN/005
Prepared by	Arup	Date	15 June 2018
Subject	Impact of 35+ Planning Application on Epping Forest Special Area of Conservation (SAC)		

Natural England has raised the impact of the 35+ Planning Application on ecological receptors in Epping Forest Special Area of Conservation (SAC) as a potential concern. We have undertaken an investigation into the potential impact on nutrient nitrogen deposition in the SAC in 2028, using forecast traffic data from Steer Davies Gleave (SDG).

The data used as input to the modelling is given in Appendix A1. The results are presented in section 1 and conclusions are in section 2.

1 Nutrient Nitrogen Deposition Results

Table 1 presents the predicted concentrations and nutrient nitrogen deposition at receptors in Epping Forest SAC due to the road traffic on the M25 between junction 26 and 27 in 2028, and the road traffic plus background, without the 35+ Planning Application. The background concentrations are assumed to include the impact of all relevant emission sources and the six road links nearest to the ecological receptors in Epping Forest have been modelled explicitly to capture the maximum impact of the predicted change in traffic. Results are presented with the following ADMS-Roads model options: complex terrain, variable surface roughness, noise barriers and tunnel portals. Meteorological data from Stansted Airport for 2016 has been used. Section A1.11 discusses sensitivity of the results to the model options and section A1.12 discusses the sensitivity to meteorological data.

Table 2 presents the predicted increase in NOx concentrations and nutrient nitrogen deposition in 2028 at the receptors due to the 35+ Planning Application. The change is given in terms of deposition rate (kgN/ha/yr) and the change in deposition rate as a function of the minimum critical load. The maximum predicted change in deposition rate is 0.17% of the minimum critical load of 10kgN/ha/yr.

Figure 1 and Figure 2 present the predicted deposition rate as contour plots: due to traffic on the M25 without the 35+ Planning Application (Figure 1) and the predicted change due to the 35+ Planning Application (Figure 2). It can be observed that the deposition rate decreases rapidly with distance from the road.

Table 1: 2028 without 35+ Planning Application: NOx concentration (μg/m^3) and nutrient nitrogen deposition (kgN/ha/yr), road contribution and total (road plus background)

ID	Easting	Northing	NOx concentration (μg/m^3)		Nutrient nitrogen deposition rate (kgN/ha/yr)	
			Road contribution	Road + background	Road contribution	Road + background
a	544591	201032	10.3	36.9	1.45	28.33
b	544570	201016	10.7	37.4	1.51	28.39
c	544548	200999	8.0	34.7	1.13	28.01
d	544525	200981	5.8	32.5	0.83	27.71
e	544499	200962	4.2	30.8	0.60	27.48
f	544471	200941	3.0	29.6	0.43	27.31
g	544611	201017	5.2	31.8	0.74	27.62
h	544635	201000	3.0	29.7	0.43	27.31
i	544662	200993	2.0	28.7	0.29	27.17
j	544696	200984	1.4	28.1	0.20	27.08
k	544762	200988	0.9	27.6	0.14	27.02
l	544801	200990	0.8	27.5	0.12	27.00
m	544837	200989	0.8	27.5	0.12	27.00
n	544878	200987	0.8	27.5	0.12	27.00
o	544918	200978	1.0	27.7	0.15	27.03
p	544944	200967	1.3	28.0	0.19	27.07
q	544938	200942	1.3	28.0	0.20	27.08
r	544933	200917	1.3	28.0	0.19	27.07

Table 2: 2028 35+ Planning Application: change in NOx concentration (μg/m^3) nutrient nitrogen deposition (kgN/ha/yr)

ID	Change in NOx concentration due to 35+ (μg/m^3)	Change in deposition rate due to 35+ (kgN/ha/yr)	Total deposition rate with 35+ (kgN/ha/yr)	Change as a percentage of the lower critical load (%)
a	0.11	0.02	28.35	0.17
b	0.12	0.02	28.41	0.17
c	0.09	0.01	28.03	0.12
d	0.06	0.01	27.72	0.09
e	0.05	0.01	27.48	0.06
f	0.03	<0.01	27.31	0.03
g	0.06	0.01	27.63	0.09
h	0.03	0.01	27.32	0.06
i	0.02	<0.01	27.18	0.03
j	0.02	<0.01	27.09	0.03
k	0.01	<0.01	27.02	<0.01
l	0.01	<0.01	27.00	0.03
m	0.01	<0.01	27.00	0.03
n	0.01	<0.01	27.00	<0.01
o	0.01	<0.01	27.03	0.03
p	0.01	<0.01	27.08	0.03
q	0.01	<0.01	27.08	<0.01
r	0.01	<0.01	27.07	<0.01

2 Conclusions

The impact of the 35+ Planning Application on traffic on the M25 between junctions 26 and 27 is predicted to be zero in 2023 and 1,493 AADT (2-way) in 2028. The impact of this change in traffic on receptors in Epping Forest SAC has been calculated. The maximum increase in nutrient nitrogen deposition is predicted to be 0.02kgN/ha/yr, which corresponds to 0.17% of the minimum critical load. Levels of deposition drop off rapidly away from the road.

Changes of less than 1% of a critical level or critical load can be assumed to be insignificant, an approach used consistently by Highways England, Natural England, the Environment Agency and the Institute of Air Quality Management[1]. The effect of the 35+ Planning Application on nutrient nitrogen deposition in this area is therefore **not significant**.

[1]Highways England Interim Advice Note 174/13, Updated advice for evaluating significant local air quality effects for users of DMRB 11, Section 3, Part 1. Annex A, A.2.

Figure 1: Nutrient nitrogen deposition (kgN/ha/yr) without the 35+ Planning Application change in traffic (road + background) within 200m of the portal centreline

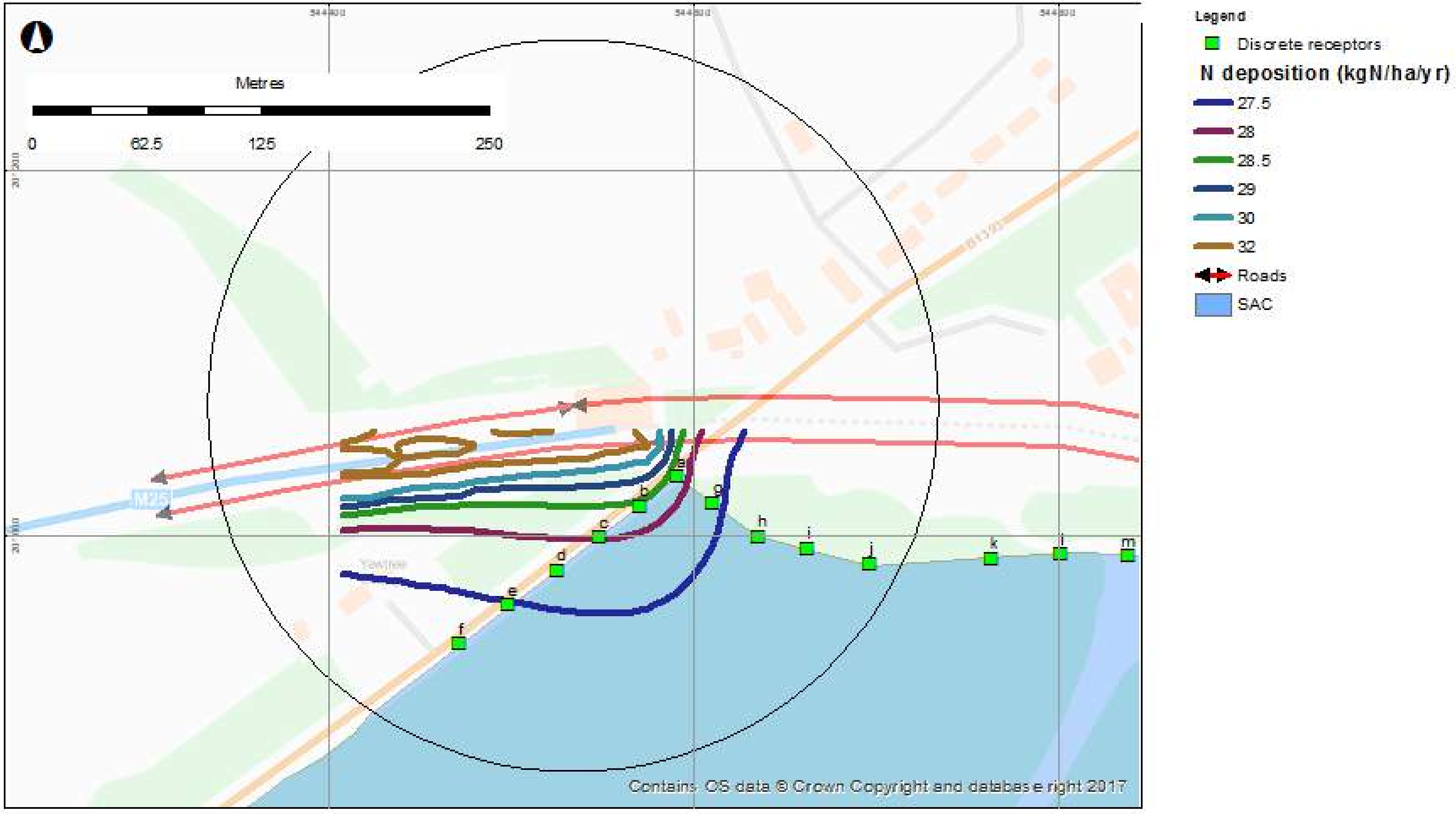
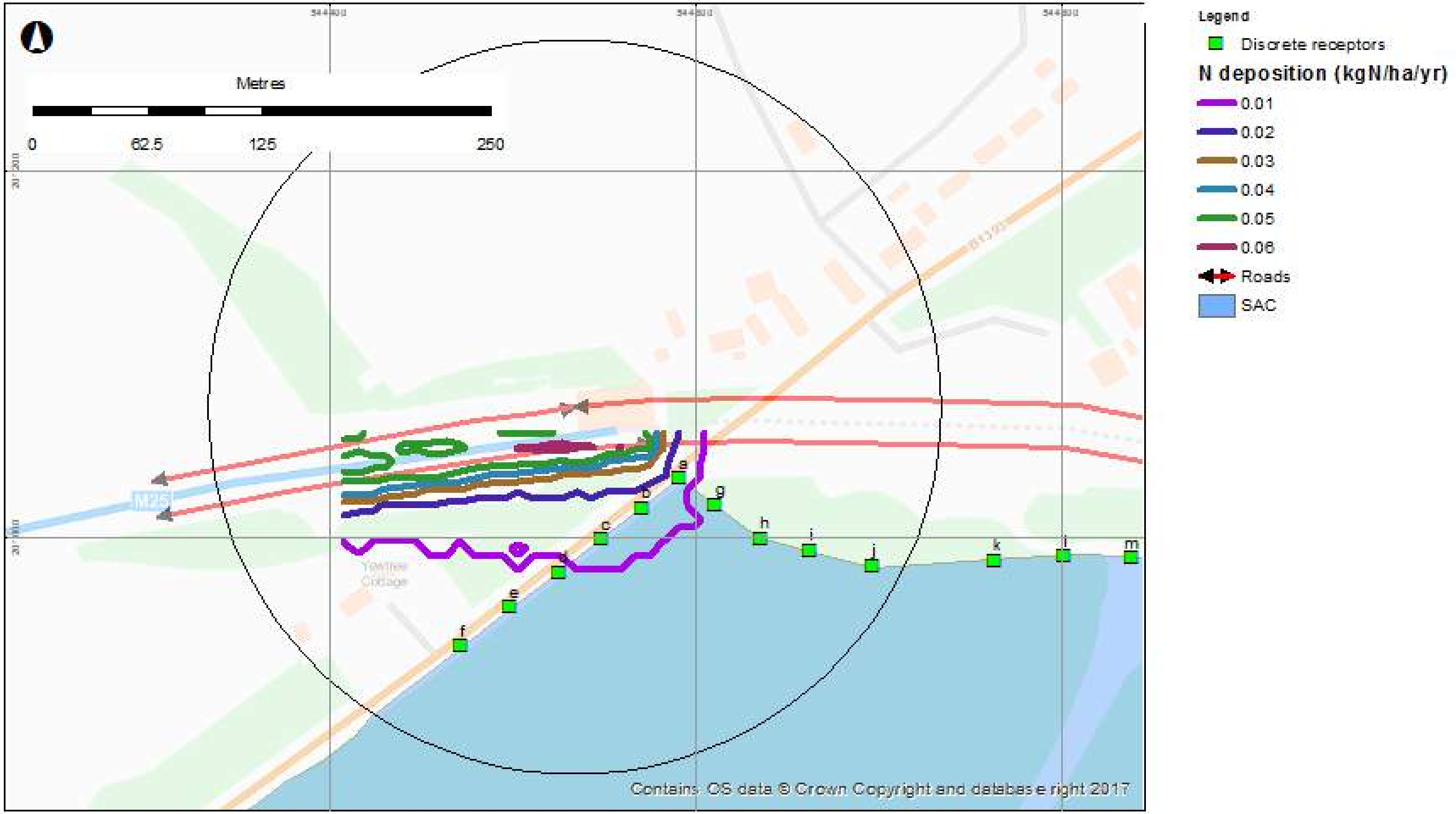


Figure 2: Nutrient nitrogen deposition (kgN/ha/yr), change due to the 35+ Planning Application change in traffic within 200m of the portal centreline



A1 Model Input Data

A1.1 Traffic Data

2016 data on the links near the SAC between junctions 26 and 27 of the M25 were obtained from the Department for Transport's (DfT's) webtris website[2]. The annual average daily traffic (AADT) data for each link is given in Table 3 and the links are shown in Figure 3. A width of 15m was assumed for each road link and a speed of 96kph (60mph). Emissions were calculated using the latest Emission Factor Toolkit (EFT) from Defra, version 8.0.1[3].

SDG supplied forecasts of the projected growth in baseline traffic between 2016 and 2028 (Tempro), and the impact of the currently consented capacity (35mppa) and the 35+ Planning application (43mppa). The ratio between the 2028 AADT without 35+ and the 2016 total without 35+ is 1.20. The AADT flows in Table 3 were therefore multiplied by 1.20 to give the link-specific AADT flows in 2028 (Table 4).

The predicted change in traffic due to the 35+ Planning application is 1,493, which exceeds one of the criteria set by Highways England in the Design Manual for Roads and Bridges (DMRB)[4] for defining *"whether there are likely to be significant impacts associated with particular broadly defined routes or corridors"*. The criterion is that there is a change of 1,000 AADT in daily traffic flow.

Table 3: 2016 AADT data for modelled road links, from DfT webtris website

Site	Name	AADT
10363	5570_EB	68,405
10362	5570_WB	68,355
10527	5573_EB	71,138
10527	5573_WB	71,138
10444	5576_EB	68,444
10538	5576_WB	67,807
Note: At DfT Count ID 28049 the HGVs are 14.3% of total vehicles. This percentage of HGVs was assumed to be the same for all road links.		

Table 4: 2-way AADT between M25 junctions 26 and 27, supplied by SDG

ID	Scenario	AADT		
		2016	2023	2028
A	Baseline	137,155	137,155	137,155
B	Tempro	0	15,066	26,830
C	Change due to 35 mppa	4,845	6,522	6,522
D	Total without 35+	142,000	158,743	170,507
E	Change due to 35+	0	0	1,493*
Note: *The percentage of HDVs was assumed to be 2%				

[2] Webtris http://webtris.highwaysengland.co.uk/ [Accessed June 2018]
[3] https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html [Accessed June 2018]
[4] HA207/07 Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 1, May 2007, paragraph 3.12

A1.2 Dispersion Model

The dispersion model ADMS-Roads version 4.0.1.0 was used. It allows the ADMS-Roads options of road traffic, tunnel portals and noise barriers to be modelled with hills (complex terrain).

No model verification was carried out due to the high level nature of this assessment and the lack of suitable monitoring data. However, the verification described in the ES for receptors near to motorways concluded that no adjustment factor was required. Therefore, there is a high degree of confidence that the modelling results provide an accurate prediction of pollutant concentrations close to the modelled links.

A1.3 Receptors

Figure 3 shows the discrete receptors at which nutrient nitrogen deposition was calculated (receptors a to r) and the extent of the gridded output (green rectangle) used to plot contours. Results were also calculated at receptors at a 2m resolution along a 200m transect starting at the western tunnel exit. Figure 4 shows the location of the receptors with respect to the ends of each road link.

Figure 3: Road links (blue), discrete receptors (green) and Epping Forest SAC (grey)

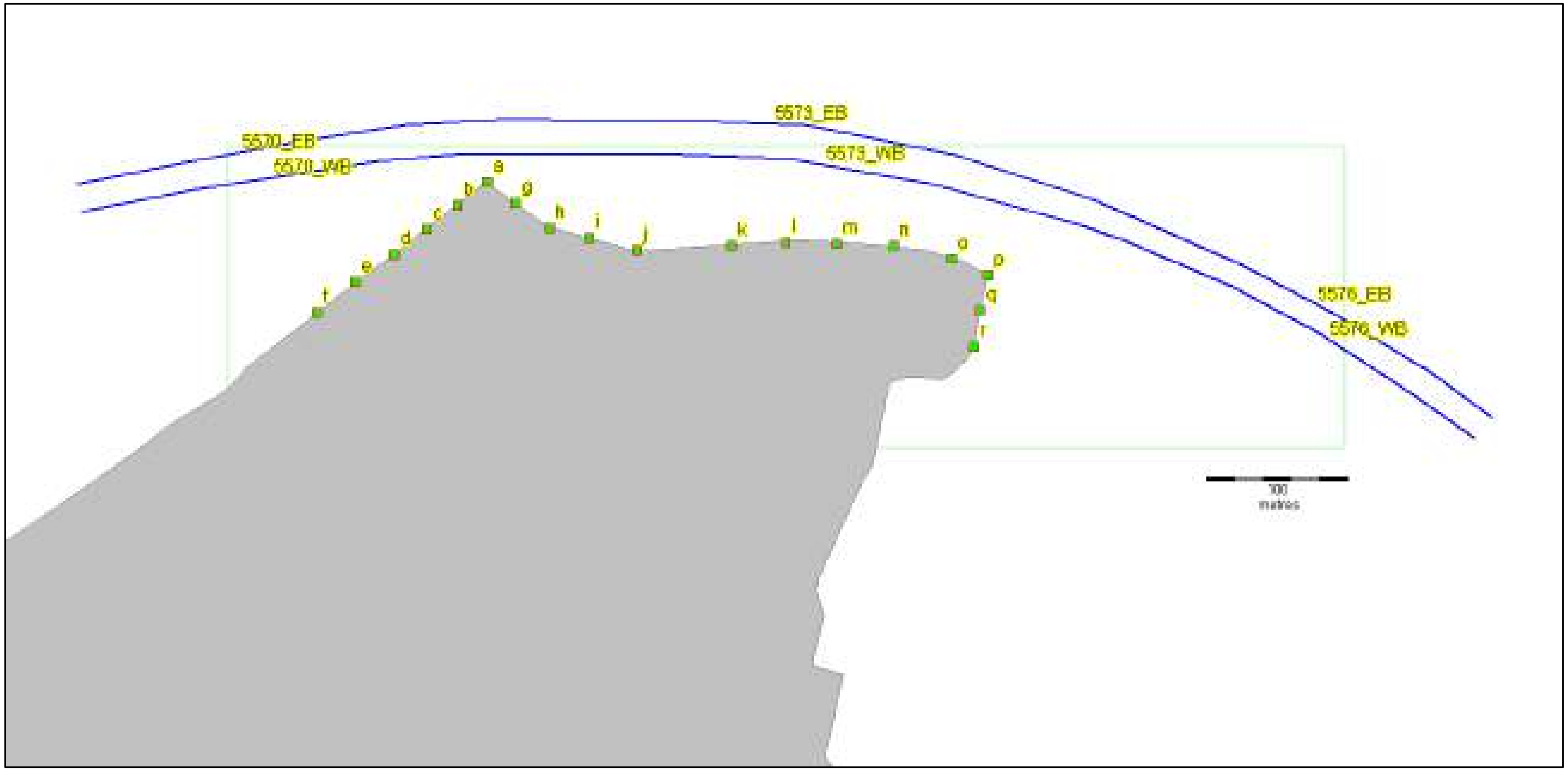
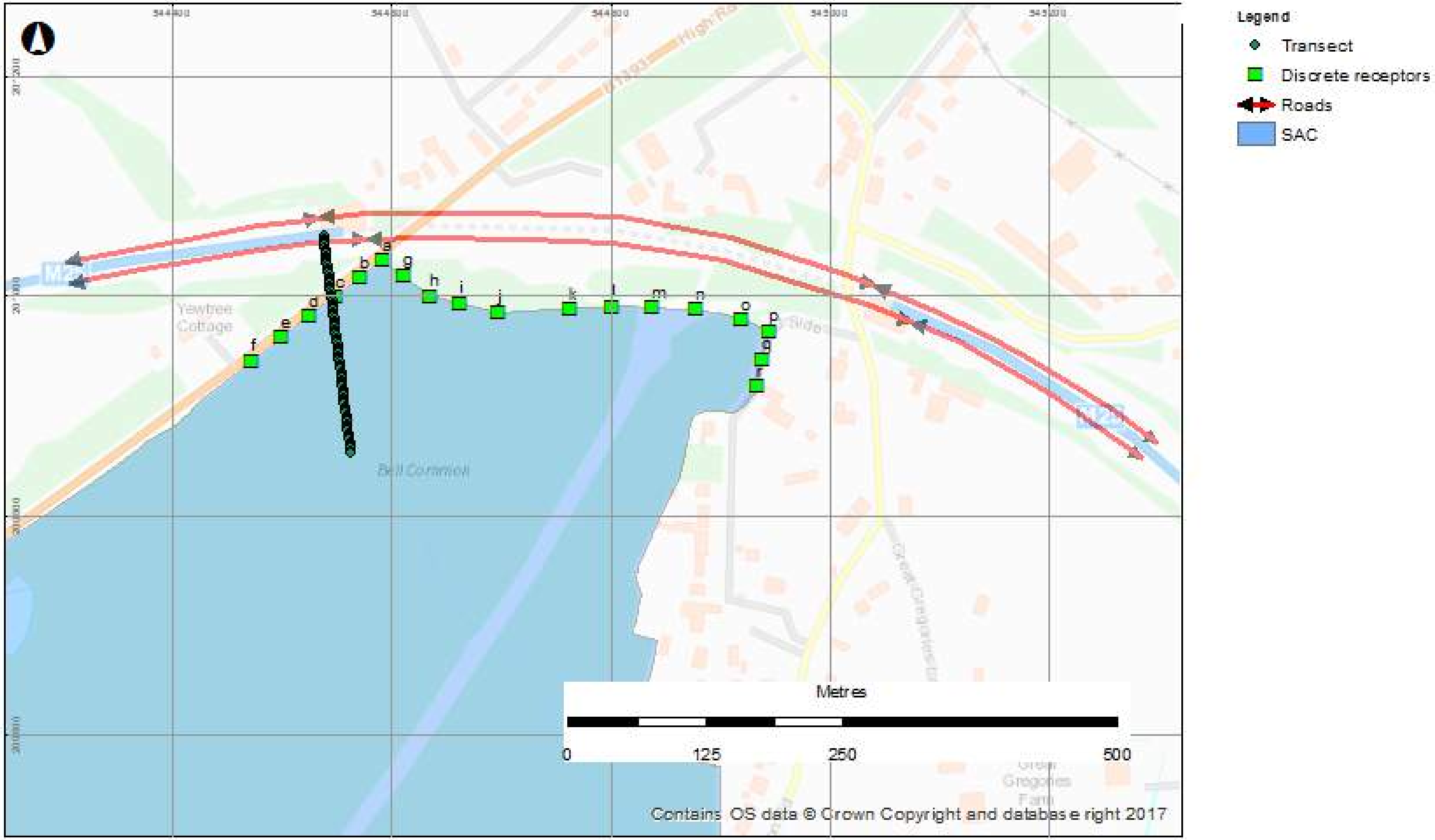


Figure 4: Road links, discrete receptors and transect

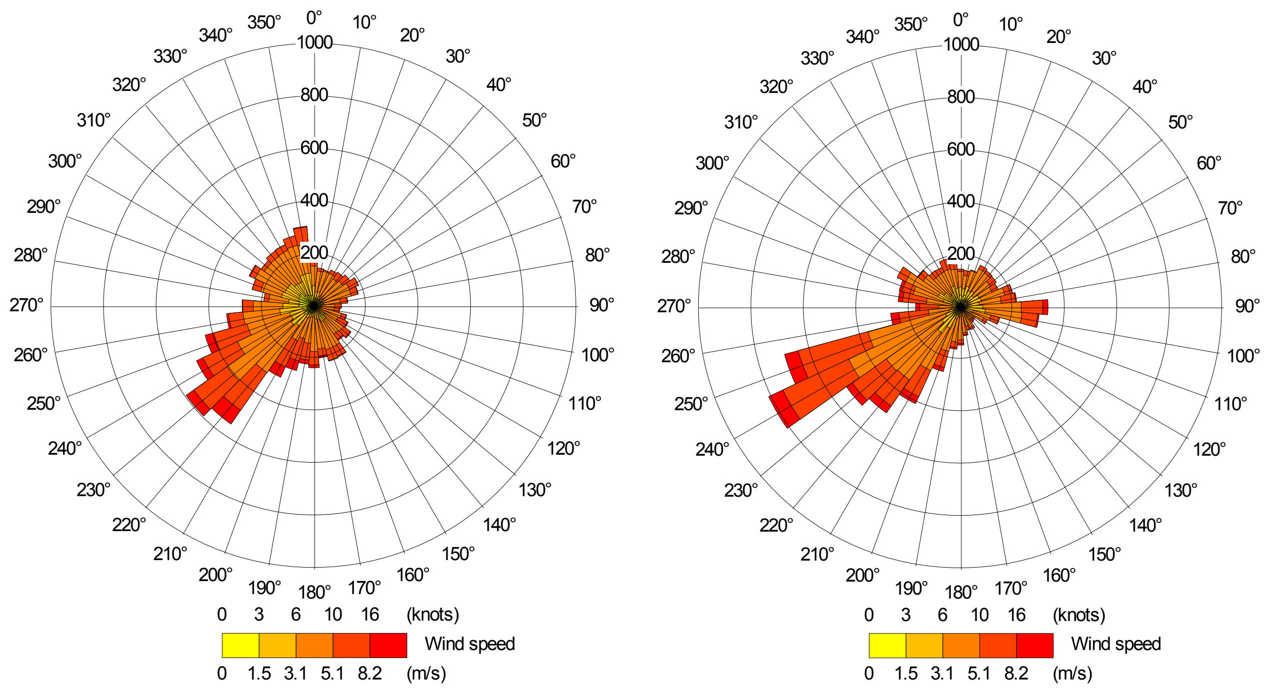


A1.4 Meteorological Data

Figure 5 presents the windrose of the meteorological data used, from Stansted Airport, 2016. The prevailing wind directions are south-westerly. Data from London City Airport, also shown in Figure 5, has been used to test the sensitivity of the results to the choice of meteorological data station.

A surface roughness of 0.2m was used at the meteorological site and 1.0m at the dispersion site. A minimum Monin-Obukhov length of 10m was used at the meteorological site and 30m at the dispersion site.

Figure 5: Stansted Airport 2016 windrose (left); London City Airport 2016 windrose (right)



A1.5 Terrain and Variable Surface Roughness

Terrain data was obtained from the Environment Agency 2m resolution LIDAR data[5]. In order to achieve a large enough domain of terrain data to enable contour plots over a sufficient extent, and yet retain the high resolution features and meet the limit on file size (66,000 points of data), a terrain file was created with 7m resolution. Figure 7 shows the terrain data used.

To represent the greater surface roughness in the forest compared with the fields to the north of the forest, a variable surface roughness file was created covering the same domain as the terrain data. A value of 1.0m was used to represent surface roughness in the forest and 0.3m to represent the fields to the north of the forest[6].

[5] https://data.gov.uk/dataset/002d24f0-0056-4176-b55e-171ba7f0e0d5/lidar-composite-dtm-2m Supplied by RPS, June 2018

[6] ADMS-Roads version 4.0 User Guide, Table 3.9

The details of the flow and dispersion through the forest has not been modelled as it is beyond the capability of the ADMS-Roads model, and indeed may not be well handled even by a computational fluid dynamics (CFD) model, a more complex and computationally intensive numerical model. However, as the maximum impact will be at the trees closest to the modelled road links, the details of flow further from the road links will not affect the conclusions.

A1.6 Noise Barrier

The solid fence at the top of the cutting was modelled as a noise barrier along either side of the road links emerging from the eastern and western portals: road link 5570 (5570_EB, 5570_WB) and 5576 (5576_EB, 5576_WB) for all of their lengths.

In the flat terrain scenario a noise barrier 12m in height above the road surface and 15m from the centreline of each road link was modelled using the ADMS-Roads additional input file, Noise barriers option. In the model runs with terrain the height of the noise barrier was specified as 2m, corresponding to the height at the top of the fence above the local terrain.

A1.7 Tunnel Portal

The tunnel portals were modelled using the following parameters:

- Bore depth: 6m
- Portal Base Elevation: 10m
- Outflow width: 15m
- Outflow Wall: yes

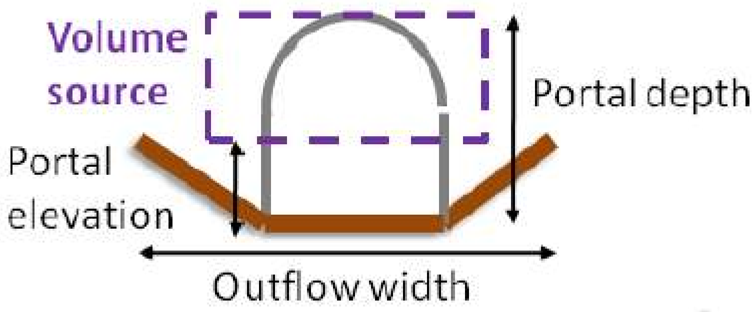


Figure 6: Taken from the ADMS-Roads User Guide

The portals were modelled using the ADMS-Roads additional input file, Road tunnels option.

A1.8 Critical Load, Background Deposition Rate and Background Concentration

The nutrient nitrogen critical load for three of the interest features of the SAC[7] (Atlantic acidophilous beech forests with Ilex, Northern Atlantic wet heaths with Erica tetralix, and European dry heaths) is **10-20kgN/ha/yr**. The fourth interest feature, stag beetle, is not sensitive to nitrogen.

The background concentration of NOx at the assessed receptors[7] is 22.66µg/m^3 at receptors a and b, and 25.05µg/m^3 at the remaining receptors. These background concentrations are below the critical level and air quality objective for ecological receptors of 30µg/m^3. However, the critical level does not apply to locations more than 20km from towns with more than 250,000 inhabitants, or more than

[7] Air Pollution Information System (APIS) http://www.apis.ac.uk/srcl/select-a-feature?site=UK0012720&SiteType=SAC&submit=Next accessed June 2018

5km from other built-up areas, industrial installations or motorways[8]. This air quality objective does not therefore apply at the assessed receptors.

The background nutrient nitrogen deposition rate at the receptors[7] assessed is **26.88kg/ha/yr**, which is above both the minimum and maximum critical loads for the site.

A1.9 Calculation of NO_2 Concentration

The dispersion model predicts NOx concentrations which comprise nitric oxide (NO) and nitrogen dioxide (NO_2). The deposition rate of NO is negligible and therefore the amount of NO_2 at each receptor was calculated.

The Local Air Quality Management Technical Guidance (LAQM.TG16)[9] details an approach for calculating the roadside conversion of NOx to NO_2. This approach takes into account the NOx generated by the road traffic, ambient NOx and/or NO_2, the concentration of ozone and the different proportions of primary NO_2 emissions in different years. This approach is available as a spreadsheet calculator, and the most up-to-date version, version 6.1[10], has been used.

The background NO_2 concentration for 2016 has been obtained from Defra's $1km^2$ resolution background maps[11]. The values are $18.88\mu g/m^3$ at receptors a and b, and $17.23\mu g/m^3$ at the remaining receptors. The highest value of $18.88\mu g/m^3$ was used in the NOx to NO_2 converter for all receptors as a conservative assumption.

A1.10 Calculation of Nutrient Nitrogen Deposition

The predicted NO_2 concentrations were multiplied by a deposition velocity of 0.003m/s, the value recommended by the Environment Agency for deposition of NO_2 to forest[12], to give the deposition rate of NO_2 in $\mu g/m^2/s$. The deposition rate values in $\mu g/m^2/s$ were then multiplied by 96 to convert to units of kgN/ha/yr, which are the units of the nutrient nitrogen deposition critical load.

A1.11 Sensitivity of Results to Complex Model Options

The options used in the modelling (terrain, noise barrier, road tunnel) are advanced model options and validation of the options alone or in combination is limited. A sensitivity analysis was undertaken to assess the importance of these advanced options in determining the magnitude of the final result. Table 5 shows the predicted deposition flux at the specified receptors. The results show the expected, physically reasonable, trends:

- Use of the tunnel option reduced concentrations at receptors close to the road links in the tunnel (5573_EB and 5573_WB), receptors a and g-r, and increases it at receptors close to the tunnel portal, receptors b to f; and

---

[8] 2010 No.100, Environmental Protection, The Air Quality Standards Regulations 2010, 11 June 2010
[9] Defra (2016) Local Air Quality Management Technical Guidance.TG16
[10] Defra NOx to NO2 calculator (version 6.1), https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc [Accessed: June 2018].
[11] https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html [Accessed June 2018]
[12] AQTAG 06 "Technical Guidance on Detailed Modelling Approach for an Appropriate Assessment for Emissions to Air, 20/04/10

- Use of the noise barrier options reduces concentrations at receptors close to the noise barrier (in this case that is all the receptors).

In addition:

- Use of terrain with the complex options of noise barrier and tunnel portal generally increased the maximum concentration;
- Use of variable surface roughness as well as terrain reduced the maximum concentration slightly and increased the minimum concentrations slightly.

The difference between the minimum value at receptor a and the maximum value is 55%. The concentration and deposition results presented in the sections 1 and 2 are therefore those for case:

- Complex terrain + variable surface roughness + tunnel + noise barrier (Stansted meteorological data).

A1.12 Sensitivity of Results to Meteorological Data Station

To test the sensitivity of model results to the choice of meteorological data station, a comparison has been made between NOx concentrations calculated using data from Stansted Airport and from London City Airport (City) for 2016. The results are shown in Table 5.

Use of data meteorological data from London City Airport reduced the maximum concentration and increased the minimum concentrations. Stansted Airport meteorological data has therefore been used to generate the results presented in sections 1 and 2 as it is judged to be the more representative of the modelled area. London City Airport is on the Thames estuary where more easterly winds are recorded (Figure 5) than would be expected at the study area.

Figure 7: Terrain data used

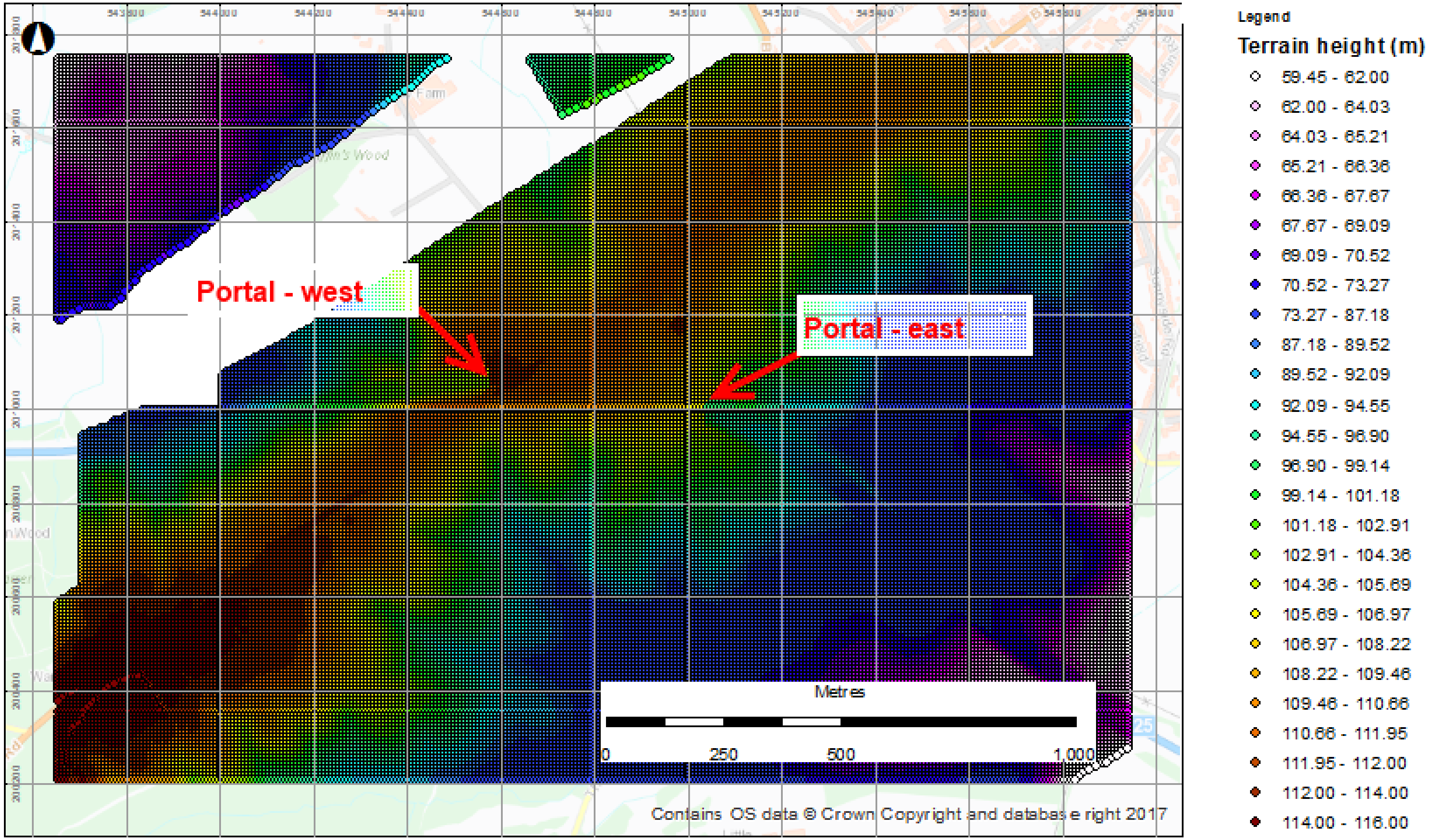
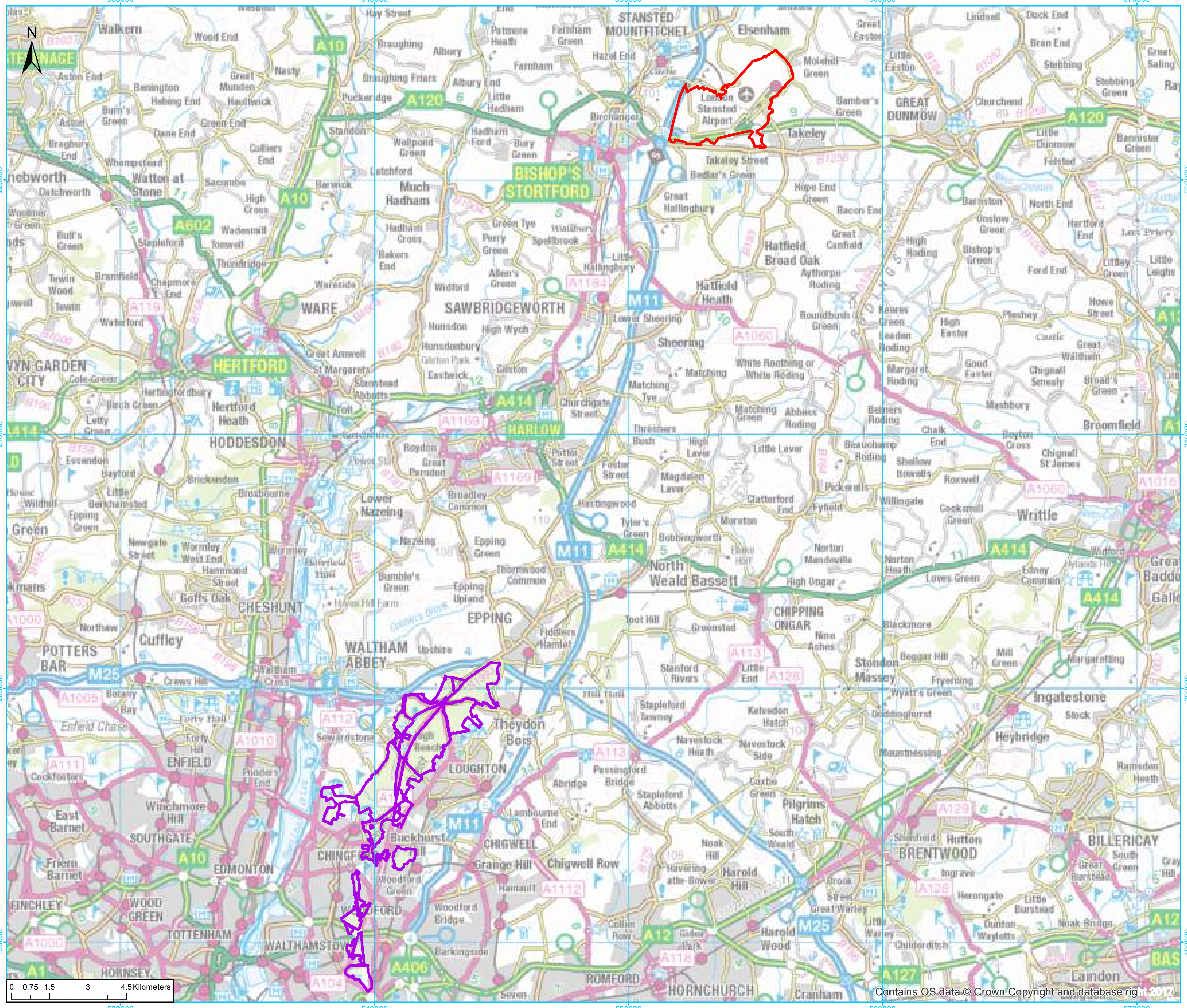


Table 5: Nutrient nitrogen deposition at specified receptors (kg/ha/yr) using different advanced model options

ID	Easting	Northing	Flat terrain				Complex terrain					
			None	Tunnel	Noise barrier	Tunnel + Noise barrier	None	Tunnel	Noise barrier	Tunnel + Noise barrier	Variable roughness + Tunnel + Noise barrier	Variable roughness + Tunnel + Noise barrier**
a	544591	201032	11.8	10.1	9.3	7.6	11.3	10.3	10.6	10.7	10.3	8.2
b	544570	201016	7.4	5.9	9.5	7.9	6.7	5.8	10.8	10.9	10.7	8.0
c	544548	200999	5.4	4.4	7.5	6.6	5.4	4.5	8.6	8.5	8.0	6.3
d	544525	200981	4.1	3.5	5.8	5.2	4.3	3.5	6.3	6.1	5.8	4.8
e	544499	200962	3.3	2.8	4.4	3.9	3.3	2.8	4.4	4.3	4.2	3.6
f	544471	200941	2.6	2.3	3.3	3.0	2.3	2.1	2.9	2.9	3.0	2.7
g	544611	201017	7.6	7.1	5.2	4.7	7.3	7.0	5.2	5.2	5.2	4.2
h	544635	201000	5.3	5.1	3.2	3.0	4.9	4.8	3.0	3.0	3.0	2.6
i	544662	200993	4.8	4.7	2.3	2.2	4.4	4.4	2.0	2.1	2.0	1.9
j	544696	200984	4.3	4.2	1.7	1.6	4.0	4.0	1.4	1.4	1.4	1.4
k	544762	200988	4.6	4.6	1.2	1.1	4.6	4.5	0.9	0.9	0.9	1.1
l	544801	200990	4.9	4.9	1.0	1.0	5.0	5.0	0.8	0.8	0.8	1.0
m	544837	200989	5.2	5.2	1.0	0.9	5.2	5.2	0.8	0.8	0.8	1.1
n	544878	200987	5.7	5.7	1.0	1.0	5.4	5.4	0.8	0.8	0.8	1.3
o	544918	200978	5.7	5.7	1.2	1.1	5.2	5.2	1.0	1.0	1.0	1.6
p	544944	200967	5.3	5.2	1.4	1.4	4.7	4.7	1.2	1.2	1.3	2.0
q	544938	200942	3.7	3.7	1.3	1.3	3.3	3.3	1.2	1.2	1.3	1.9
r	544933	200917	2.8	2.8	1.2	1.2	2.6	2.6	1.2	1.2	1.3	1.7

FIGURE 1

Epping Forest SAC Location Plan



Document: C:_GIS temp\OXF10603_Stansted Expansion\OXF10603_EppingForest_Location.mxd

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Legend

- Airport boundary
- Epping Forest SAC

Rev	Description	Date	Initial	Checked

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Client RPS London

Project Stansted expansion

Title Location of Stansted airport and Eppring Forest SAC

Status	Drawn By	PM/Checked By
Draft	KM	MB
Job Ref	Scale @ A3	Date
OXF10603	1:149,145	MAY 18
Drawing Number		Rev
Figure 1.1		A

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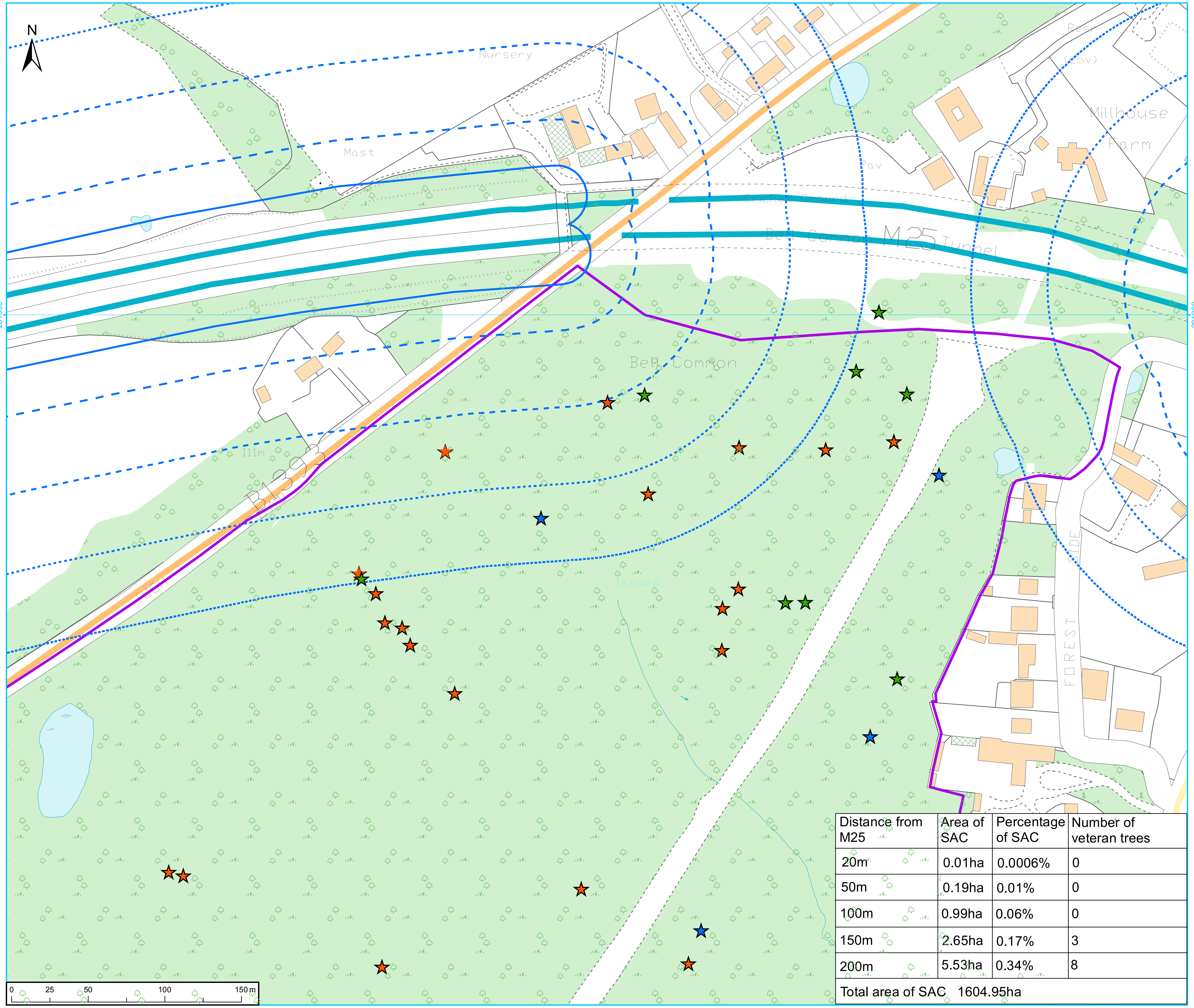
FIGURE 2

Unit 105 Plan – Veteran Trees



Distance from M25	Area of SAC	Percentage of SAC	Number of veteran trees
20m	0.01ha	0.0006%	0
50m	0.19ha	0.01%	0
100m	0.99ha	0.06%	0
150m	2.65ha	0.17%	3
200m	5.53ha	0.34%	8
Total area of SAC 1604.95ha			

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Legend

- Veteran beech
- Veteran hornbeam
- Veteran oak
- 20m from M25
- 50m from M25
- 100m from M25
- 150m from M25
- 200m from M25
- Epping Forest SAC

Rev	Description	Date	Initial	Checked

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Project Stansted expansion

Title Plan 2

Status	Drawn By	PM/Checked By
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Job Ref	Scale @ A3	Date
OXF10603	1:2,500	MAY 18
Drawing Number		Rev
-		H

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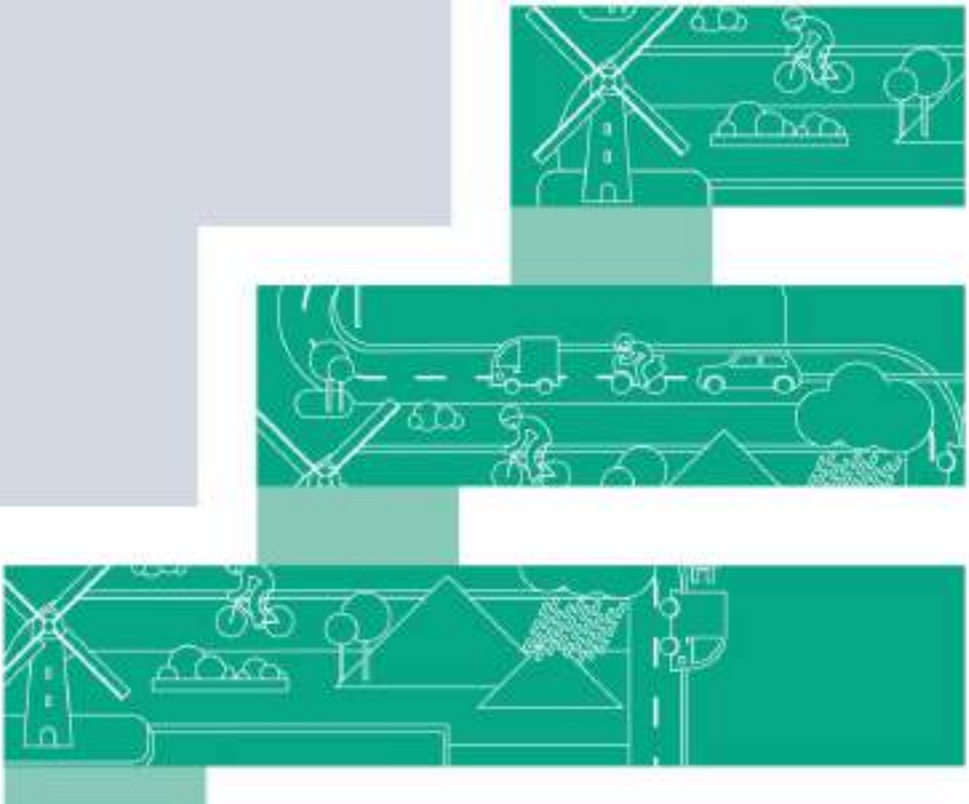
Document: C:_GIS temp\OXF10603_Stansted Expansion\OXF10603_EppingForest_Plan2_wholeM25.mxd

TRANSFORMING LONDON STANSTED AIRPORT

35+ PLANNING APPLICATION

ANNEX 2: INFORMATION ON SSSI IMPACTS



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Technical Note

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Project title:	Stansted Airport 35+ Planning Application (UTT/18/0460/FUL)	**Job number**	253360-00
Cc:	Stansted Airport Limited (STAL), part of Manchester Airport Group (MAG)	**File reference**	AQ/TN/006
Prepared by:	Arup	**Date**	22 June 2018
Subject:	Response to Natural England Letter of 10 May 2018		

Natural England's letter of 10th May 2018 to Karen Denmark at Uttlesford District Council raised several queries on the air quality assessment which forms part of the 35+ Planning Application. This note responds to those queries which were similar five points (i to v) for each ecological site considered by Natural England and to issues raised in a meeting held on 20 June 2018 at STAL.

1 Response to queries raised in the 10 May 2018 letter

i. Natural England notes that 2016 baseline nutrient nitrogen deposition exceeds minimum critical loads. This is reported in paragraphs 10.106 to 10.110 of Chapter 10 of the Environmental Statement (ES).

ii. The air quality modelling considered all the relevant emission sources that would impact air concentration at the receptors. The local sources were modelled explicitly, that is as roads, as stacks, as aircraft exhausts, and other sources, which were included in the background concentration and deposition rate.

   Tables 10.9 and 10.10 of Chapter 10 show the emissions from each modelled source group and they include the split of traffic on each road link into airport-related and non-airport related. The detailed traffic split by road link can be found in Tables 10.3.3 to 10.3.5 in Appendix 10.3.

   Tables 10.5.2, 10.5.4 and 10.5.6 show the predicted changes in concentration due to the proposed 35+ Planning Application development in 2023 for NO_2, PM_{10} and $PM_{2.5}$ respectively. Tables 10.5.3, 10.5.5 and 10.5.7 show the predicted changes in 2028. The changes shown are all airport-related.

iii. Queries regarding TEMPRO have been addressed within the "Information to Inform HRA" found in Annex 1 of the Rebuttal Letter to Uttlesford District Council.

iv. In accordance with the DMRB guidance a 2% per annum reduction in background nitrogen deposition was assumed between 2016 and 2023, and 2016 and 2028. The test for significance of air quality effects on ecological receptors is whether the change due to the proposed development being less than 1% of the critical load. The test has been carried out on the predicted impacts and is shown in Table 10.5.9. The maximum change is 0.5% and therefore the effect is not significant.

   If the impact is less than 1% of the critical load, the background deposition rate is not considered.

Therefore, the percentages shown in Table 10.5.9 and the conclusion that effects are not significant, would be unaffected by the use of a more pessimistic forecast of reduction in background deposition.

v. Queries regarding TEMPRO have been addressed within the "Information to Inform HRA" found in Annex 1 of the Rebuttal Letter to Uttlesford District Council.

2 Response to queries raised in the 20 June 2018 meeting

Natural England queried whether the verification was robust without using any monitoring data from Hatfield Forest and queried why monitoring sites close to the Forest had been excluded from the verification.

Figure 1 identifies the monitors near to Hatfield Forest where monitoring data for NO_2 in 2016 is present. As described in Table 10.4.2 of Appendix 10.4, none of these monitors were included in the verification as they were not close to the explicitly modelled sources and therefore did not make good verification sites. UT034 (b) was located at a junction of four roads and traffic data had only been supplied for two of the roads.

Table 1 shows the monitored concentrations and predicted concentrations at those monitors. The data demonstrates two things:

- Concentrations of NO_2 in and around the Forest are low, all are well below the air quality objective of 40µg/m^3, and decrease with distance from the main roads; and
- Despite the monitor note being used in the verification, the monitored concentrations are well predicted by the model with the modelled values within 25% of the monitored values. Defra's TG16 Guidance[1] suggests no model adjustment is needed if the values are within 25%.

Table 1: Comparison of 2016 monitored and modelled annual mean NO_2 concentrations

Monitor	**NO_2 annual mean concentration (µg/m^3)**		**Difference (%)***
	Monitored	**Modelled**	
UT002	26.7	24.7	-7%
UT024	17	15.1	-11%
UT025	17.8	16.2	-9%
UT026	13.5	13.7	1%
UT038	25.8	21.6	-16%
Notes: *Difference = (Modelled-Monitored)/Monitored			

[1] Defra (2016) Local Air Quality Management Technical Guidance.TG16

Technical Note

Figure 1: Monitors near Hatfield Forest

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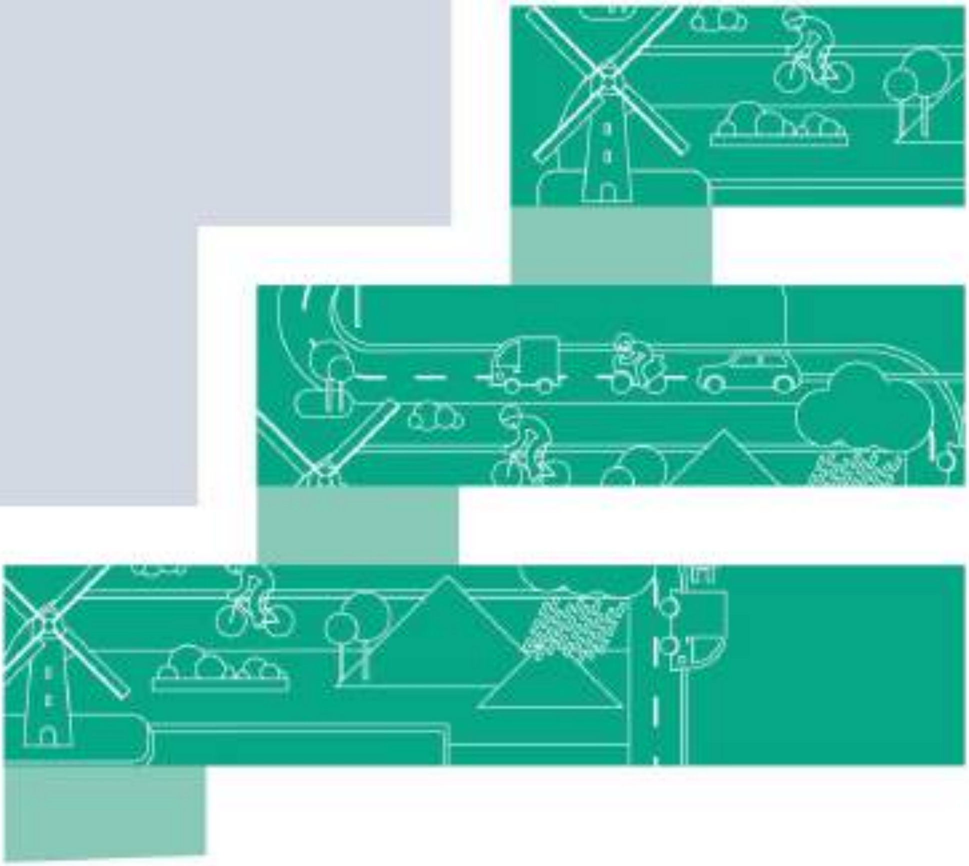
35+ PLANNING APPLICATION

ANNEX 3A: NOISE TECHNICAL NOTE



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Background Noise Levels around Stansted

Subject:	**Background Noise Levels around Stansted**		
Project:	**Stansted Airport: 35 mppa + Development**		
Date:	**22 June 2018**	**Prepared:**	**VC**
Revision:	**0**	**Approved:**	**JB**

A1 Assessment of Aircraft Noise

A1.1 Air noise contours have been presented in the ES using metrics and at levels as set out in relevant CAA documents CAP 1616a, CAP 5120 (draft) and CAP 725.

A1.2 The assessment values fully reflect emerging Government policy on aircraft air noise.

A1.3 That policy was in turn informed by the results of *SoNA 2014: aircraft* which reports clear correlation between people's response to aircraft noise based on the level to which they are exposed. The survey did not report any effect on that relationship resulting from prevailing background noise levels.

A1.4 *SoNA 2014: aircraft* derived its results on the basis of responses from individuals exposed to aircraft noise in the vicinity of 9 UK airports, including Stansted.

A2 Measured Background Noise Levels

A2.1 Daytime

A2.1.1 *Appendix 7.4 Background Noise Measurements* sets out the results of a large number of noise measurements carried out at various locations around Stansted Airport over a period of around 18 months leading up to the submission of the ES. The lowest background noise levels over the daytime period of 07h00 to 23h00, expressed as L_{A90} values, measured at these locations are summarised in the table below:

Background Noise Levels around Stansted

Position	Location	Measured
1	Bishops Stortford	48
2	Great Hallingbury	48
3	Little Hallingbury	46
4	Hatfield Forest	41
5	Takeley	45
6	Elsenham	45
7	Tye Green	45
8	Stansted Mountfitchet	43
9	Broxted	39
10	Plegdon Green	36
11	Brick End	42
12	Thaxted North	39
13	Thaxted South	53
14	Hatfield Heath	49
15	Great Easton	39
16	Bran End/Stebbing	41
A	Gaunts End	47
B	BE Monks Farm	47
	BE Ash Tree Oub	46
	BE Warmans Farm	48
	BE Bury Lodge	52
C	Molehill Green	50
D	Thaxted	44
	50th Percentile of range of lowest values	**46**

T1 Daytime background noise levels around Stansted Airport, 2016 - 2018

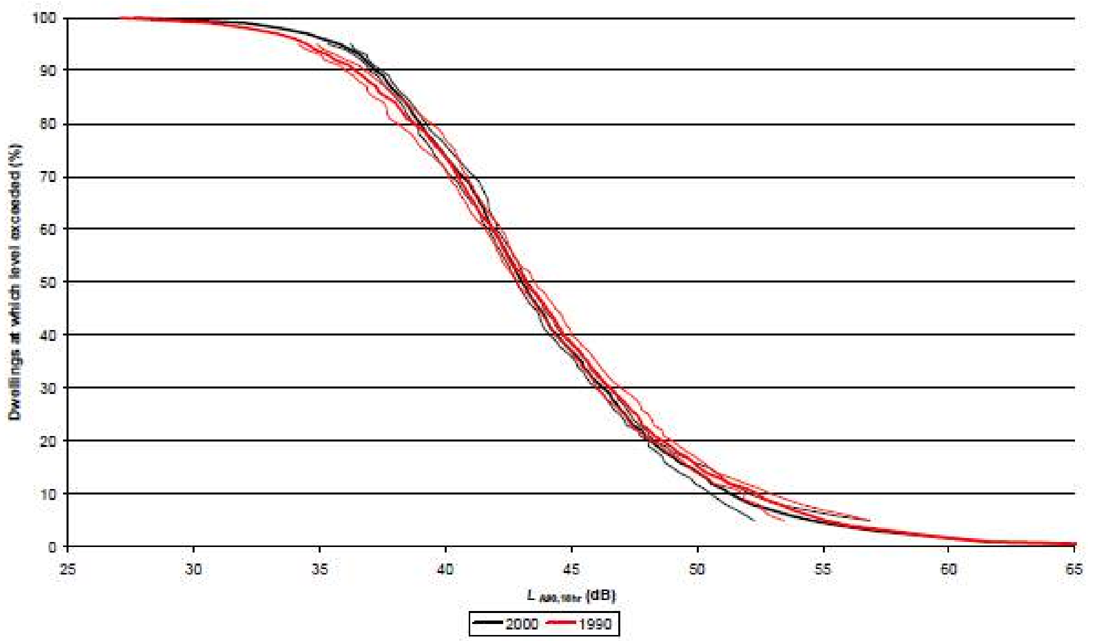
A2.1.2 These values can be put in the context of typical daytime background noise levels throughout the United Kingdom by reference to the most recent survey of national noise levels contained in the BRE National Noise Incidence Study[1].

A2.1.3 Figure 13 from that report provides statistical information on the range and incidence of background noise levels throughout the country the form of a cumulative distribution of daytime (07h00 to 23h00) L_{A90} noise levels:

[1] BRE National Noise Incidence Study 2000 (England and Wales): prepared for defra, February 2002, Client report number 203938r

Background Noise Levels around Stansted

7.13 Figure 13 – Cumulative distribution for 16hr L_{A90} (0700 – 2300)



A2.1.4 This indicates that the 50th percentile of daytime (07h00 to 23h00) background noise levels when assessed across England and Wales as a whole is 43 dB L_{A90}.

A2.1.5 This would suggest that across the measurement positions chosen for noise survey around Stansted airport, the daytime background noise levels are not unusually low compared to the country as a whole in 2000 and indeed are 3 dB higher than the median value on aggregate.

A2.2 Night-time

A2.2.1 Background noise levels over the night-time period of 23h00 to 07h00, expressed as L_{A90} values, at the measurement locations are summarised in the table below:

Position	Location	Measured
1	Bishops Stortford	34
2	Great Hallingbury	43
3	Little Hallingbury	40
4	Hatfield Forest	38
5	Takeley	46
6	Elsenham	44
7	Tye Green	46
8	Stansted Mountfitchet	46
9	Broxted	29
10	Plegdon Green	34
11	Brick End	31
12	Thaxted North	31
13	Thaxted South	40
14	Hatfield Heath	44
15	Great Easton	28
16	Bran End/Stebbing	25
A	Gaunts End	39
B	BE Monks Farm	43
	BE Ash Tree Oub	42
	BE Warmans Farm	45
	BE Bury Lodge	48
C	Molehill Green	44
D	Thaxted	32
	50^{th} Percentile of range of lowest values	**41**

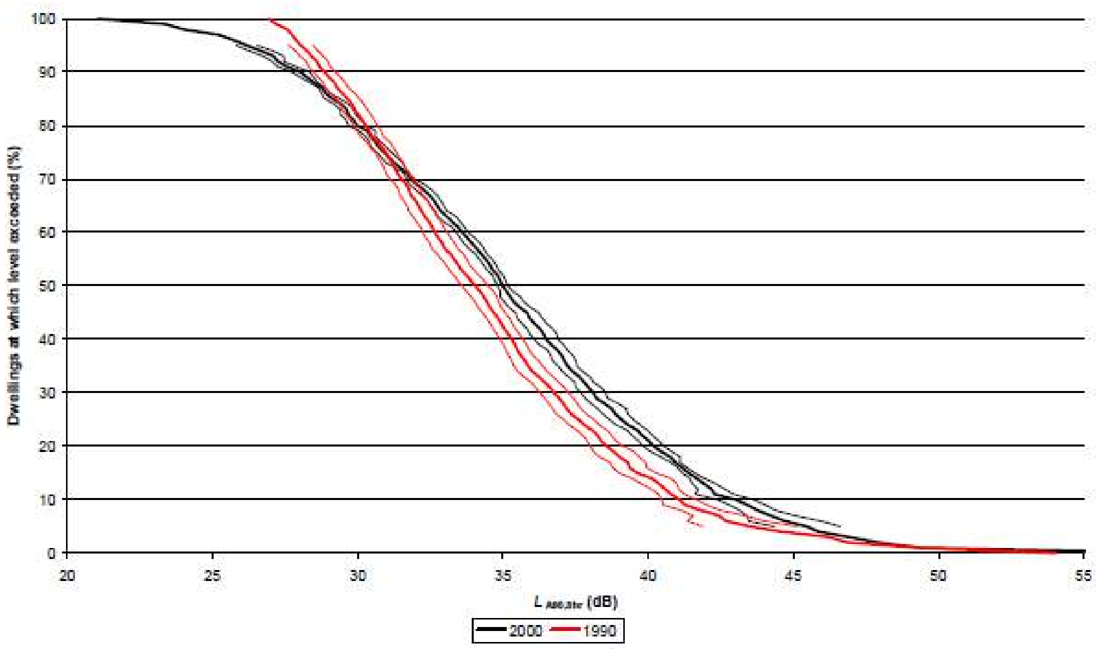
T2 Night-time background noise levels around Stansted Airport, 2016 - 2018

A2.2.2 Again, these values can be put in the context of typical night-time background noise levels throughout the UK by reference to the same study.

A2.2.3 Figure 16 from that report provides statistical information on the range and incidence of background noise levels throughout the country the form of a cumulative distribution of night-time (23h00 to 07h00) LA_{90} noise levels:

Background Noise Levels around Stansted

7.16 Figure 16 – Cumulative distribution for 8hr L_{A90} (2300 – 0700)



A2.2.4 This indicates that the 50th percentile of night-time (23h00 to 07h00) background noise levels when assessed across England and Wales as a whole is 35 dB L_{A90}.

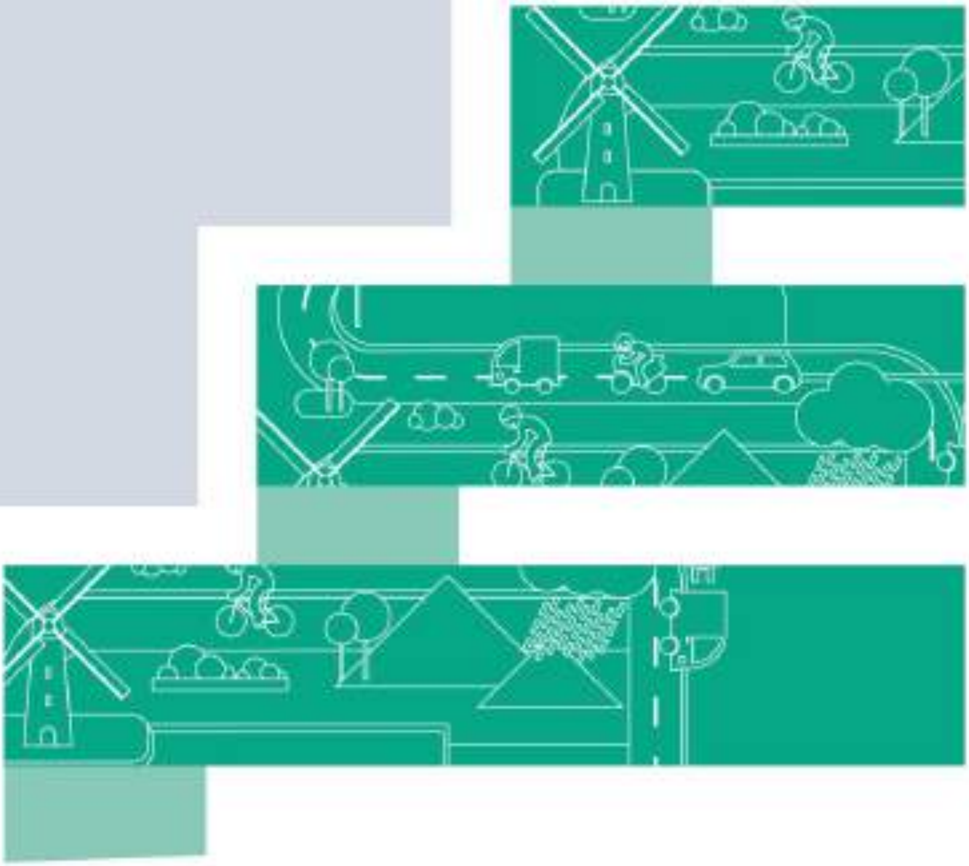
A2.2.5 This would suggest that across the measurement positions chosen for noise survey around Stansted airport, the night-time background noise levels are not unusually lower compared to the country as a whole in 2000 and indeed are 6 dB higher than the median value on aggregate.

End of Section

TRANSFORMING LONDON STANSTED AIRPORT

35+ PLANNING APPLICATION

ANNEX 3B: NOISE TECHNICAL NOTE



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Memorandum

Project:	**Stansted Airport: 35 mppa + Development**
Subject:	**ES Noise Chapter: additional clarification for UDC**
Prepared:	**Vernon Cole**
Date:	**22 June 2018**
Reference:	**16/0366/M19** **Revision:** **-** **Approved:** **BH/JB**

This memo sets out some additional clarification pertaining to the noise study, responding to queries raised and observations made by Uttlesford District Council and Bickerdike Allen Partners at meetings held on 2nd and 15th May 2018 and 18th June 2018.

1 Noise Sensitive Receptor Schedules

1.1 Detailed grid data have been received from ERCD enabling us to determine the value of any noise metric at any location within the noise study area. These are subject to the refinement of the grid, which varies from 10m to 100m depending on the metric, and lower bounds for each metric.

1.2 A careful review of these data have led to the conclusion that a refinement to the non-residential noise sensitive receptor study is in order, and the attached Schedules A7.3/SCH1 and A7.3/SCH9 contain some revisions as follows (highlighted in blue in the schedule):

1. More precise geographic locations for:

- Howe Green School;
- Thaxted Primary School;
- Hatfield Heath Primary School.

2. Revised N65 (daytime) values for the 25+case at all locations.

1.3 These changes do not materially affect the noise assessment nor its outcomes. They have been made in the interests of precision and clarification, and while the results of the analysis indicate small changes in noise levels at each of these locations, they are small and do not alter any conclusions reached as to impacts.

1.4 It should also be noted that Schedules A7.3/SCH3 to A7.3/SCH8 have benefitted from a minor correction in that the departure (D) and arrival (A) title blocks in each table are transposed. Although differences in numbers between the two are very small, the tables now read correctly.

1.5 Again these are changes made by way of clarification and we can confirm that the noise modelling has been undertaken with the correct assignment of departure and arrivals numbers. There are no consequences for the noise impact conclusions of the changes.

2 L_{Amax} Values at Noise Sensitive Receptors

2.1 See Schedules A7.3/SCH11 dealing with departures, A7.3/SCH12 dealing with arrivals and SCH13 dealing with number of daily operations. They are the outcomes at each receptor location for a worst case day on which either all departures or all arrivals result in overflights that have the potential to affect the receptor in question.

Departures

2.2 The lower L_{Amax} values attributable to the new generation aircraft on departure can be seen, with computed differences consistent with the 3dB lower noise levels on departure used in the modelling for the 737-Max compared to the 737-800. The departure L_{Amax} value is calculated by correcting the SEL value derived using the ANCON model by -10dB.

2.3 Considering the frequency of departures, these increase from approximately 12/hour during the daytime in 2016 to 21/hour in 2028 with the development in place. With no development the frequency increases to 18/hour, which equates to the frequency of departure by single aisle, narrow body aircraft type assumed in the 25+ submission. The key difference is that the forecasts are for the majority of flyovers to be by new generation, quieter aircraft which is why $L_{Aeq,T}$ noise levels are expected to be lower than forecast for the 25+ case.

2.4 The relationship between number of departures and number of direct flyovers at any receptor depends on its location relative to the individual departures SIDs, with only those located on in areas where all three SIDs overlap experiencing a direct flyover for every departure.

2.5 At the majority of schools, the L_{Amax} is expected to be below the threshold for which an internal level of 60 dB L_{Amax} is exceeded with open windows (allowing for a 12dB reduction from the external free field level through an open window) due to the noise benefits associated with new generation, quieter aircraft. The only schools expected to experience flyover noise levels in excess of 72 dB L_{Amax} (highlighted in **bold** in Schedules A7.3/SCH11 and SCH12) are:

- Howe Green School: 737-800 only, all three SIDs on Rwy 22;
- Spellbrook Primary School: 737-800, BUZ only on Rwy 22.

2.6 An important point to note is that L_{Amax} departure noise levels are not expected to increase as a result of the development. This is due to the fact that operational changes associated with the proposed increase in passenger throughput do not include operations by aircraft that are noisier than those currently operating. The expected outcome is that currently operating aircraft (e.g. Boeing 737-800) will be replaced by new, quieter aircraft (Boeing

737-MAX). No flyovers by the 737-MAX are expected to generate L_{Amax} noise levels in excess of 72 dB on departure.

Arrivals

2.7 Figure 16/0366/SELA1 shows SEL arrivals footprints at values of 80 dB(A) and 90 dB(A) for the both the Boeing 737-800 and 737-MAX on both runways 04 and 22. These have been generated using INM 7.0d. The lower L_{Amax} values attributable to the new generation aircraft on arrival can be seen, with computed differences consistent with the >2dB lower noise levels on arrival. The INM output includes L_{Amax} values and these are therefore taken directly from the model rather than correcting the SEL value.

2.8 Considering the frequency of arrivals, these vary from one assessment scenario to the next in the same way as departures, reflecting the fact that total operations are equally split between departures and arrivals.

2.9 The relationship between number of departures and number of direct flyovers at any receptor is simpler for arrivals, as 100% of them are straight in on each runway. Only those receptors located on or close to the extended centre line of the runway can be considered to be directly overflown by arrivals.

2.10 At the majority of schools, the L_{Amax} is expected to be below the threshold for which an internal level of 60 dB L_{Amax} is exceeded with open windows (12dB overall noise level difference) due to the noise benefits associated with new generation, quieter aircraft. The only schools expected to experience flyover noise levels in excess of 72 dB L_{Amax} from arrivals (highlighted in **bold**) are:

- Spellbrook Primary School: 737-800 and 737-MAX, Rwy 04;
- The Leventhorpe School: 737-800 only, Rwy 04;
- Mandeville Primary School: 737-800 only, Rwy 04.

2.11 It is notable that there are no arrivals on runway 22, approaching from the NE, which give rise to L_{Amax} noise levels above 72 dB at any school. It is also notable that since the noise benefit of the 737-MAX is less on arrival than on departure, Spellbrook may still be subject to levels in excess of 72 dB L_{Amax} when this aircraft type flies over on arrival.

Scale of Effects

2.12 It is important to note that maximum noise levels at schools due to aircraft flyovers will not increase if this application is permitted. As indicated in Schedule A7.3/SCH13 the number of flyovers occurring in any hour is forecast to increase by around 50%, or just over, compared to those experienced in 2016. This increase will occur whether or not the application is permitted. What is notable is that for both the Do Minimum and Development Case Scenarios the frequency of flyovers by noisier, current generation narrow body single aisle aircraft will reduce in favour of quieter, new generation variants.

2.13 So far as maximum noise levels on departure are concerned, the implications for the affected schools are:

- It is only flyovers by existing aircraft types (e.g. Boeing 737-800) that give rise to maximum noise levels above the 72 dB threshold;
- Flyovers by new generation aircraft (e.g. Boeing 737-MAX) will not lead to the threshold being exceeded;
- At the small number of schools affected by departure noise levels above 72 dB L_{Amax}, the excess is small being 3 dB at Howe Green and only 1 dB at Spellbrook.

2.14 With regard to maximum noise levels on arrival, the following can be noted:

- For the majority of affected schools, it is only flyovers by existing aircraft types (e.g. Boeing 737-800) that give rise to maximum noise levels above the 72 dB threshold;
- The exception occurs in the case of Spellbrook where arrivals by the Boeing 737-MAX may just exceed the 72 dB threshold by 1 dB;
- Again, at the small number of schools affected by arrival noise levels above 72 dB L_{Amax}, the excess is small being 4 dB at Spellbrook, 2 dB at Leventhorpe and 1 dB at Mandeville.

2.15 In context, therefore, granting the application will not materially alter the situation at any school that is currently affected by noise from aircraft flyovers. STAL has not received complaints about noise from any school and neither have there been objections on noise grounds to the current application from any school.

2.16 Recognising, however, that a small number of schools are potentially located within the SIGS qualification boundaries[1], STAL propose to address this issue as follows:

- The noise modelling undertaken for the ES identifies noise effects at each school in terms of a number of metrics. These are compared to the qualification criteria as a screening tool to determine which schools are potentially affected by aircraft noise;
- In order to properly quantify those noise effects, it is proposed that each school meeting the screening criteria is offered the opportunity to participate in a noise monitoring exercise. Using the mobile monitors that form part of the airport's ANOMS[2], daytime noise levels during the busy summer period can be determined so as to precisely identify whether the SIGS qualifying metrics are actually exceeded and, if so, to what degree;

[1] Relevant criteria are: 57 dB $L_{Aeq,16h}$ or N65 200. To encapsulate possible effects of individual aircraft flyovers affecting classrooms with open windows consideration is also given to 72 dB $L_{A1,30min}$.

[2] STAL operates a Noise Monitoring and Track Keeping system, ANOMS. The system employs are 8 fixed noise monitors, 4 located at each of the runways, and 2 mobile monitors that can be located within the community as required.

- Likely changes to the measured levels resulting from operational changes associated with increasing the passenger throughput to 43 mppa will be assessed;
- This process is intended to define with reasonable clarity which schools are or will be affected by aircraft noise at levels that have the potential to affect the learning environment;
- STAL will use the results of the exercise to engage with the relevant bodies to discuss possible measures to compensate or offset the residual effects of aircraft noise where these have the potential to affect the learning environment.

2.17 Each case will be dealt with on its own merits as the circumstances and actual consequences arising from aircraft noise at the identified noise levels will differ from school to school.

2.18 What would not be appropriate is to simply attempt to modify or enhance the glazing provision in a school, or part of it, when such measures would not mitigate any noise effects being experienced.

3 SIGS

Qualification Boundaries

3.1.1 Attached Figure 16/0366/SE1 shows on plan the extent of the contours that define the SIGS qualification boundaries for airborne aircraft noise.

3.1.2 Attached Figure 7.3/F1A is a variation on the figure attached to Technical Appendix 7.3 showing the location of all non-residential noise sensitive receptors considered in the noise study. In this case, only those receptors lying within the SIGS qualification boundaries are identified. Examination of Schedule A7.3/SCH9 indicates that none of these lie within the higher 66 or 69 dB $L_{Aeq,16h}$ contours.

3.1.3 As a point of note, it is understood that receptor number 28, the Ebenezer Chapel in Molehill Green, is no longer in use as a place of worship as the building has been sold and its intended use is currently unknown.

Air Noise: 55 dB L_{night}

3.1.4 It was queried how the 55 dB L_{night} contour for the 2028 Development Case operations compares to the extent of the SIGS thresholds. This is pertinent because this value is the WHO interim target for night noise under their current Night Noise Guidelines.

3.1.5 Attached Figure 16/0366/SN1 plots the relevant contour against the extent of the current SIGS air noise qualification boundaries. It can be seen that the contour is entirely enclosed within the SIGS qualification thresholds, meaning that any person exposed to this level of night-time noise from airborne aircraft will be eligible for SIGS under the terms of the scheme.

Ground Noise: 45 dB $L_{Aeq,8h}$

3.1.6 It was suggested by BAP that since the 2028 DC $L_{Aeq,8h}$ ground noise contours covered a greater extent than those indicated for the 25+ consented case, consideration could be given to extending the SIGS qualification criteria to include residences falling within this band.

3.1.7 The acceptability or otherwise of the proposal to extend the SIGS to cover the 45 dB $L_{Aeq,8h}$ night-time ground noise contour should be considered in the light of this application not seeking an increase in the number of permitted aircraft movements. Although it is correct that predictions of night-time ground noise indicate that levels may be marginally higher in 2028 than was foreseen at the time of the 25+ application, this is not actually a consequence of permitting the development.

3.1.8 The ground noise contours contained in *Appendix 8.1 Ground Noise* include contour Figure 8.1/GN6 which compares the 2028 ground noise night-time contours with and without the development in place. They are virtually indistinguishable throughout the surrounding community except where benefits will arise from decommissioning of the Northside apron should permission be granted. In those areas ground noise levels are expected to reduce.

3.1.9 Night-time aircraft movements at Stansted are subject to Government control via the Night Noise Regulations. As a consequence, the airport will reach its cap on movements before 2028 whether or not permission is granted to increase the passenger throughout beyond 35 mppa. This is the underlying reason why the noise study has concluded that night-time noise level differences arising purely as a consequence of the development going ahead are negligible, both in respect of ground noise and air noise.

Number of Qualifying Properties [3]

3.1.10 Table T1 compares the number of properties eligible for SIGS under the terms of the existing scheme to the approximate number of properties expected to be eligible under the terms of the new scheme as currently proposed for the 35+ application.

[3] In this section, the number of properties within the proposed SIGS are taken from the ERCD noise modelling and rounded to the nearest 50. The numbers indicated may therefore differ from those published by Stansted Airport which are based on address points.

Scheme	Residences	Schools	Healthcare Facilities	Places of Worship	Community Facilities
Existing	1,088	-	-	-	-
Proposed:					
High	50	-	-	-	-
Medium	400				
Low	1,600 [a]	5	2	8 [b]	3

T1 Approximate number of properties eligible for SIGS

[a] Estimated for the 'peak noise year' based on dwelling counts within the 2024 DC 57dB $L_{Aeq,16h}$ and 2023 DC N65 200 contours.

[b] Reducing to 7 if the Ebenezer Chapel in Molehill green is excluded, the building having been sold.

3.1.11 It should be noted that the terms of the scheme are defined for dwellings, with both the proposed financial offer and number of properties falling eligible being significantly increased over the existing scheme.

3.1.12 For non-residential receptors falling within the boundaries of the scheme, each facility would be assessed on a case by case basis to determine what form of mitigatory or compensatory measures are best suited the particular circumstances.

SIGS Attenuation

3.1.13 To achieve the BS8223:2014 recommended internal daytime noise level of 35 dB $L_{Aeq,16h}$ in habitable rooms, the following sound insulation considerations will apply:

- **57 dB** £5,000: 25dB attenuation required. Well sealed single glazing or good quality double glazing. Most houses may already have this so grant may end up being used almost exclusively for ventilation.
- **60 and 63 dB** £8,000: 31dB attenuation required. Well sealed, good quality double glazing or secondary glazing for standard single glazed houses. Some of the additional grant can be used for ventilation.
- **66 and 69 dB** £10,000: 34dB attenuation required. High performance double glazing or purpose designed secondary glazing for standard single glazed houses. Again, some of the additional grant can be used for ventilation.
- There are no dwellings or other noise sensitive receptors exposed to noise levels above 69 dB $L_{Aeq,16h}$.

3.1.14 The proposed SIGS scheme reflects the increasingly negative effects of noise as levels increase by providing higher levels of grant at higher noise exposure. How the grant is best used to protect occupant amenity will depend on individual circumstances. Each property will need to be assessed on its own merits within the proposed guidelines rather than trying to adopt a blanket approach.

4 People Significantly Affected

4.1 UDC has queried whether, following the publication of the Parliamentary report on the Airports National Policy Statement, consideration has been given in the ES to the likely gross number of people who will be newly exposed to significant levels of noise annoyance arising from the scheme, taking account (if it hasn't already) those affected down to 51 dB $L_{Aeq,16h}$.

4.2 The NPS has been updated, following a vote in Parliament, and is published as a June 2018 revision. Updates to the document do not alter the methodology to be employed in assessing noise impacts.

4.3 It should be noted that Tables T30, T36, T42, T48, T54 and T61 in ES Technical Appendix 7.3 identify the cumulative population affected by air noise above thresholds given in 3dB steps starting at 51 dB $L_{Aeq,16h}$ for all the assessed operating scenarios. The information requested has therefore been supplied.

4.4 For convenience, the numbers contained in these tables are summarised in Schedule A7.3/SCH14.

5 Noise Envelope Condition

5.1 UDC has queried whether it is feasible to apply a condition that limits the noise envelope in a manner that that progressively tightens it over the years, i.e. meeting government policy of fairly sharing out the benefits from new technology.

5.2 In principle there is no reason why such a condition could not be applied, and it is worth considering the precedent set at Luton Airport, where the following condition has been applied to the 18mppa consent granted in 2014:

Condition 10

The area enclosed by the 57dB(A) Leq,16h (0700-2300) contour shall not exceed 19.4 sq km for daytime noise, and the area enclosed by the 48dB(A) Leq,8hr (2300-0700) contour shall not exceed 37.2 sq km for the night-time noise, when calculated by the Federal Aviation Authority Integrated Noise Model version 7.0d (or as may be updated or amended).

Within five years of the commencement of development a strategy shall be submitted to the Local Planning Authority for their approval which defines the methods to be used by LLOAL or any successor or airport operator to reduce the area of the noise contours by 2028 for daytime noise to 15.2 km2 for the area exposed to 57dB(A) Leq,16h (0700-2300) and above and for night-time noise to 31.6 km2 for the area exposed to 48 dB(A) Leq,8hr (2300-0700).

End of Section

Schedule A7.3/SCH1: Non-residential Sensitive Receptors

	Receptor	Postcode	Easting	Northing
	SCHOOLS			
1	Howe Green School	CM22 7UF	550500	218750
2	Spellbrook Primary School	CM23 4BA	548610	217260
3	Little Hallingbury C of E Primary school	CM22 7RE	550130	217530
4	North and West Essex Adult Community College	CM20 1NW	544050	210640
5	Thaxted Primary School	CM6 2LH	561420	230820
6	The Leventhorpe School	CM21 9BY	548160	215810
7	Great Sampford Primary School	CB10 2RL	564330	235460
8	Thorn Grove Primary School	CM23 5LD	549670	220690
9	Mandeville Primary School	CM21 0BL	547860	215430
10	The Bishops Stortford High School	CM23 3LU	548950	219770
11	Birchwood High School	CM23 5BD	550400	212840
12	High Wych C of E Primary School	CM21 0JB	546210	214120
13	Summercroft Primary School	CM23 5BJ	550150	221590
14	Hatfield Heath Primary School	CM22 7EA	548860	219760
15	Thorley Hill Primary School	CM23 3NH	549530	220520
16	Herts and Essex High School	CM23 5NJ	548380	215300
17	Reedings Junior School	CM21 9DD	549500	221530
18	Hockerill Anglo European College	CM23 5HX	548300	219780
19	Richard Whittington Primary School	CM23 3NP	549760	221840
20	All Saints C of E Primary School	CM23 5BE	548860	219760
	HEALTHCARE			
21	Falcon House Little Hallingbury	CM22 7PP	549850	217940
22	Humfrey Lodge, Thaxted	CM6 2PX	561000	231420
23	Herts and Essex Hospital	CM23 5JH	549790	220870
24	Lyne Driscoll High Wych	CM21 0HN	546450	214460
25	Saint Elizabeth's Centre Much Hadham	SG10 6EW	543870	216880
	PLACES OF WORSHIP			
26	St Giles Church Great Hallingbury	CM22 7TZ	550980	219660
27	St Mary the Virgin Church Broxted	CM6 2BU	557730	227410
28	Ebenezer Chapel Molehill Green (T.B.C)	CM22 6PH	556340	224960
29	St Mary the Virgin Church Chickney	CM6 2BY	557310	228080
30	Thaxted Baptist Church	CM6 2ND	561100	230850
31	St Mary the Virgin Church Little Hallingbury	CM22 7RE	550200	217530
32	Thaxted Church (St. John the Baptist) Thaxted	CM6 2QY	560920	231060
33	Thaxted URC Church	CM6 2PY	560720	230930
	COMMUNITY FACILITIES			
34	Thaxted Anglican Church Hall	CM6 2PY	560720	230930
35	Little Hallingbury Village Hall	CM22 7RD	550170	217360
36	Thaxted Baptist Church Hall	CM6 2ND	561100	230850
37	The Barn Theatre Little Easton Major	CM6 2JN	560300	223570

Schedule A7.3/SCH2: List of proposed cumulative developments

No.	UDC Ref. No.	Address	Description	Status
1	UTT/13/0177/OP	Land west of Hall Road, Elsenham	Erection of up to 130 dwellings with associated open space, play areas, land for educational use and other ancillary works.	Approved
2	UTT/0142/12/OP	Land north of Stansted Road, Elsenham	Residential development comprising 155 No. dwellings, 55 No. extra care units, land for the provision of a multi-use community building, and associated on and off site infrastructure provision, following demolition and clearance of Essex Auto spray and associated residential property	Approved
3	UTT/13/1393/OP	Land South Of Dunmow Road Brewers End Takeley Bishops Stortford Hertfordshire	Proposed residential planning application for erection of up to 100 dwellings, to include provision of 6.3 hectares of public open space	Approved
4	UTT/15/1036/FUL	Land adjacent to Enterprise House, Stansted Airport	Eight storey, 12,842sqm (GEA) quality hotel consisting of a net accommodation area of 8,159sqm, with ancillary restaurant and gym, vehicle parking and access	Under Construction/ Opening Soon
5	UTT/16/3566/FUL	Gorefield Road, Stansted	A dedicated terminal facility for arriving passengers (34,384sqm); an associated forecourt; and altered access and service roads.	Approved
6	UTT/16/3669/OP	Land South East Of Great Hallingbury	Outline application with all matters reserved for 35 dwellings	Awaiting decision

No.	UDC Ref. No.	Address	Description	Status
7	UTT/17/1080/SCO	Land West Of Canfield Road Great Canfield Essex	Proposed development of 210 dwellings, public open space, landscaping, sustainable drainage systems and access point from Green Lane	EIA Scoping. Application not submitted
8	UTT/13/1618/OP	Land At Walpole Farm Cambridge Road Stansted Essex	Redevelopment of land to provide approximately 160 dwelling houses, up to 600 square metres of commercial (B1) floor space, approximately 0.45ha reserved for educational uses, seven full size allotments, paddock and community woodland area with associated open space, landscaping, access, parking and drainage	Approved
9	UTT/1335/12/FUL	Land At Brewers End Dunmow Road Takeley CM22 6QH	Erection of 41 no. dwellings (including affordable housing) with new vehicular and pedestrian access, associated infrastructure and landscaping	Conditions discharged
10	UTT/14/2991/OP	Land at Elsenham Nurseries, Elsenham	Demolition of existing buildings and erection of 40 residential dwellings including open space and landscaping	Discharging Conditions
11	UTT/13/1790/OP	Land South of Stansted Road, Elsenham	Outline application for a development of up to 165 homes, open space and allotments. All matters reserved except for access.	Application not submitted
12	UTT/17/3573/OP	Land To The North West Of Henham Road Elsenham	Outline application with all matters reserved except for access for: up to 350 dwellings, 1 no. primary school including early years and childcare setting for up to 56 places, open spaces and landscaping	
13	UTT/17/3197/FUL	Land South Of School Lane Henham	Residential development for 36 dwellings and associated roads and parking, together with public open space	

No.	UDC Ref. No.	Address	Description	Status
14	UTT/17/3323/FUL	De Salis Hotel Green Street Elsenham CM22 6DR	Expansion of DeSalis Hotel by raising the existing pitched roof to allow conversion of the roof space to accommodate 31 additional bedrooms, construction of a new two storey building within central courtyard to accommodate new conference room, laundry and extension to existing restaurant, with an additional 16 bedrooms to the first floor area	
15	UTT/17/3572/SO	Land West Of Canfield Road Great Canfield Road Great Canfield Essex	Request for formal scoping opinion for the Environmental Statement to accompany an outline planning application for up to 135 dwellings	
16	UTT/17/1852/FUL	Land adjacent to Coppice Close, Dunmow Road, Takeley, Hertfordshire	Residential development of 20 dwellings with associated vehicular access points off Dunmow Road, open space, car parking and associated infrastructure	
17	UTT/1473/11/FUL	Tri Sail Water Circle Elsenham Meadows Elsenham CM22 6DS	Demolition of existing office and car park. Construction of three interlinked buildings (7 storeys, 6 storeys, 5 storeys) containing 6,978 sqm of offices and 1,394 sqm floorspace of ancillary mixed retail, Café/restaurant and health/spa facilities	

No.	UDC Ref. No.	Address	Description	Status
18	UTT/16/3565/OP	Land to the west of Bonningtons Farm Station Road Hatfield Broad Oak	Outline application with all matters reserved, except for access for - "Community led Mixed Use Development of up to 275 residential units, site for Primary School, Multi Use Games Area, Kick About Area, Flexible Neighbourhood Building (A1, A2,A3, A5, B1, D1 & D2 Uses), Car Park, Trim Trail and Dog Walking Circuit"	
19	UTT/16/0709/SO	Tri Sail Development, Green Street, Elsenham Hertfordshire	Request for a scoping opinion in respect of proposed Commercial Development.	
20	UTT/13/1959/OP	Elms Farm, Church Road, Stansted Essex CM24 8PX	Outline application for the demolition of existing livery buildings and construction of a residential development with access from Church Road and comprising circa 53 new residential units.	

Schedule A7.3/SCH3: Operations, 2016 Baseline

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	234.424	234.424	451.588	49.728	32.543	**82.272**	**533.859**
B727	Boeing 727 (Chapter 2&3)	0.011	0.022	**0.033**	0.011	0.000	**0.011**	**0.044**
B733	Boeing 737-300/400/500	2.424	2.663	**5.087**	3.174	2.891	**6.065**	**11.152**
B736	Boeing 737-600/700	0.337	0.457	**0.794**	0.185	0.087	**0.272**	**1.065**
B738	Boeing 737-800/900	149.554	165.424	**314.978**	31.902	16.163	**48.065**	**363.043**
B744G	Boeing 747-400: CF6-80F engines	0.837	0.859	**1.696**	0.022	0.000	**0.022**	**1.717**
B744P	Boeing 747-400: PW4000 engines	0.500	0.565	**1.065**	0.098	0.044	**0.141**	**1.207**
B744R	Boeing 747-400: RB211 engines	0.576	0.576	**1.152**	0.000	0.000	**0.000**	**1.152**
B747SP	Boeing 747SP	0.044	0.044	**0.087**	0.000	0.000	**0.000**	**0.087**
B748	Boeing 747-800	0.391	0.446	**0.837**	0.076	0.022	**0.098**	**0.935**
B753	Boeing 757-300	0.000	0.011	**0.011**	0.011	0.000	**0.011**	**0.022**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.587	0.674	**1.261**	0.391	0.315	**0.707**	**1.967**
B757P	Boeing 757-200: PW2037/2040 engines	0.065	0.391	**0.457**	0.467	0.130	**0.598**	**1.054**
B762	Boeing 767-200	0.294	0.185	**0.478**	0.348	0.446	**0.793**	**1.272**
B763G	Boeing 767-300: CF6-80 engines	1.087	1.598	**2.685**	0.946	0.435	**1.380**	**4.065**
B763P	Boeing 767-300: PW4000 engines	0.044	0.044	**0.087**	0.011	0.022	**0.033**	**0.120**
B764	Boeing 767-400	0.044	0.044	**0.087**	0.000	0.000	**0.000**	**0.087**
B772G	Boeing 777-200: GE90 engines	0.076	0.087	**0.163**	0.011	0.000	**0.011**	**0.174**
B773G	Boeing 777-200LR/300ER: GE90 engines	1.174	1.500	**2.674**	0.761	0.435	**1.196**	**3.870**
B788	Boeing 787-8	0.315	0.337	**0.652**	0.022	0.000	**0.022**	**0.674**
BA46	BAe 146/Avro RJ series	0.033	0.022	**0.054**	0.000	0.000	**0.000**	**0.054**
CRJ	Bombardier CRJ100/200 series	0.141	0.163	**0.304**	0.033	0.011	**0.044**	**0.348**
EA30	Airbus A300	0.696	0.696	**1.391**	0.728	0.717	**1.446**	**2.837**
EA31	Airbus A310	0.022	0.022	**0.043**	0.000	0.000	**0.000**	**0.043**
EA318	Airbus A318	0.054	0.065	**0.120**	0.000	0.000	**0.000**	**0.120**
EA319C	Airbus A319: CFM56 engines	23.391	23.478	**46.870**	3.554	3.446	**7.000**	**53.870**
EA319V	Airbus A319: IAE V2500 engines	2.728	2.739	**5.467**	0.065	0.044	**0.109**	**5.576**
EA320C	Airbus A320: CFM56 engines	4.641	4.696	**9.337**	0.739	0.696	**1.435**	**10.772**
EA320V	Airbus A320: IAE V2500 engines	1.152	1.065	**2.217**	0.087	0.152	**0.239**	**2.457**
EA321C	Airbus A321: CFM56 engines	3.207	3.761	**6.967**	2.087	1.544	**3.630**	**10.598**
EA321V	Airbus A321: IAE V2500 engines	0.054	0.054	**0.109**	0.000	0.000	**0.000**	**0.109**
EA33	Airbus A330	1.283	1.750	**3.033**	0.533	0.065	**0.598**	**3.630**
EA34	Airbus A340-200/300	0.239	0.207	**0.446**	0.011	0.044	**0.054**	**0.500**
EA346	Airbus A340-500/600	0.033	0.033	**0.065**	0.000	0.000	**0.000**	**0.065**
ERJ	Embraer ERJ 135/145	0.837	0.946	**1.783**	0.228	0.087	**0.315**	**2.098**
ERJ170	Embraer E-170/175	0.120	0.141	**0.261**	0.011	0.000	**0.011**	**0.272**
ERJ190	Embraer E-190/195	1.152	1.152	**2.304**	0.217	0.250	**0.467**	**2.772**
EXE3	Chapter 3 executive jets	9.815	10.457	**20.272**	1.989	1.348	**3.337**	**23.609**
FK10	Fokker 70/100	0.033	0.044	**0.076**	0.022	0.011	**0.033**	**0.109**
L4P	Large four-engine propeller	0.033	0.033	**0.065**	0.000	0.000	**0.000**	**0.065**
LTT	Large twin-turboprop	7.044	4.989	**12.033**	0.870	2.935	**3.804**	**15.837**
MD11	McDonnell Douglas MD-11	1.315	1.283	**2.598**	0.033	0.054	**0.087**	**2.685**
MD80	McDonnell Douglas MD-80 series	0.011	0.011	**0.022**	0.000	0.000	**0.000**	**0.022**
SP	Single piston	0.109	0.065	**0.174**	0.000	0.022	**0.022**	**0.196**
STP	Small twin-piston	0.022	0.022	**0.043**	0.000	0.022	**0.022**	**0.065**
STT	Small twin-turboprop	0.641	0.609	**1.250**	0.087	0.109	**0.196**	**1.446**

Schedule A7.3/SCH4: Operations, 2023 Do Minimum, 35 mppa

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	308.641	319.825	628.466	54.666	43.482	98.148	726.614
B733	Boeing 737-300/400/500	0.376	0.385	**0.760**	**0.039**	0.029	**0.068**	**0.828**
B736	Boeing 737-600/700	4.140	3.967	**8.107**	**4.313**	4.485	**8.798**	**16.906**
B7378MAX	Boeing 737-800 MAX	41.785	43.277	**85.063**	**6.103**	4.611	**10.714**	**95.777**
B738	Boeing 737-800/900	191.539	196.354	**387.893**	**19.701**	14.885	**34.586**	**422.479**
B744G	Boeing 747-400: CF6-80F engines	0.645	1.087	**1.731**	**1.268**	0.826	**2.093**	**3.825**
B744P	Boeing 747-400: PW4000 engines	0.243	0.409	**0.652**	**0.477**	0.311	**0.788**	**1.440**
B744R	Boeing 747-400: RB211 engines	0.432	0.728	**1.159**	**0.849**	0.553	**1.402**	**2.561**
B757C	Boeing 757-200: RB211-535C engines	0.087	0.089	**0.176**	**0.059**	0.057	**0.116**	**0.292**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.668	0.681	**1.349**	**0.453**	0.440	**0.893**	**2.242**
B757P	Boeing 757-200: PW2037/2040 engines	0.461	0.469	**0.930**	**0.312**	0.304	**0.616**	**1.546**
B763G	Boeing 767-300: CF6-80 engines	1.327	1.266	**2.592**	**1.457**	1.518	**2.975**	**5.567**
B763P	Boeing 767-300: PW4000 engines	0.059	0.056	**0.115**	**0.065**	0.067	**0.132**	**0.247**
B772G	Boeing 777-200: GE90 engines	1.043	1.856	**2.899**	**2.232**	1.420	**3.652**	**6.551**
B773G	Boeing 777-200LR/300ER: GE90 engines	1.266	1.719	**2.985**	**0.453**	0.000	**0.453**	**3.438**
B788	Boeing 787-8	0.412	0.609	**1.021**	**0.197**	0.000	**0.197**	**1.218**
B789	Boeing 787-9	0.000	0.000	**0.000**	**0.000**	0.000	**0.000**	**0.000**
EA30	Airbus A300	0.799	1.485	**2.284**	**1.827**	1.142	**2.969**	**5.254**
EA319C	Airbus A319: CFM56 engines	8.431	8.642	**17.073**	**0.867**	0.655	**1.522**	**18.595**
EA319V	Airbus A319: IAE V2500 engines	0.960	0.984	**1.945**	**0.099**	0.075	**0.173**	**2.118**
EA319NEO	Airbus 319 NEO	0.527	0.546	**1.074**	**0.077**	0.058	**0.135**	**1.209**
EA320C	Airbus A320: CFM56 engines	11.355	11.640	**22.995**	**1.168**	0.882	**2.050**	**25.046**
EA320V	Airbus A320: IAE V2500 engines	2.087	2.140	**4.227**	**0.215**	0.162	**0.377**	**4.603**
EA320NEO	Airbus 320 NEO	11.397	11.804	**23.200**	**1.665**	1.258	**2.922**	**26.122**
EA320NEOLR	Airbus 320 NEO Long Range	1.282	1.314	**2.596**	**0.132**	0.100	**0.231**	**2.828**
EA321C	Airbus A321: CFM56 engines	4.534	4.648	**9.182**	**0.466**	0.352	**0.819**	**10.001**
EA321V	Airbus A321: IAE V2500 engines	0.037	0.038	**0.075**	**0.004**	0.003	**0.007**	**0.082**
EA321NEO	Airbus 321 NEO	0.383	0.396	**0.779**	**0.056**	0.042	**0.098**	**0.877**
EA33	Airbus A330	2.519	3.554	**6.073**	**1.589**	0.555	**2.144**	**8.217**
EA34	Airbus A340-200/300	0.089	0.078	**0.167**	**0.042**	0.052	**0.094**	**0.261**
EA359	Airbus A350-900	0.000	0.000	**0.000**	**0.000**	0.000	**0.000**	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.000	0.530	**0.530**	**0.530**	0.000	**0.530**	**1.060**
EA38R	Airbus A380: Trent 900 engines	0.000	0.530	**0.530**	**0.530**	0.000	**0.530**	**1.060**
ERJ	Embraer ERJ 135/145	1.857	1.678	**3.536**	**0.715**	0.893	**1.608**	**5.144**
EXE3	Chapter 3 executive jets	8.151	7.192	**15.342**	**3.836**	4.794	**8.630**	**23.972**
LTT	Large twin-turboprop	7.824	7.873	**15.697**	**1.096**	1.046	**2.142**	**17.839**
MD11	McDonnell Douglas MD-11	0.845	0.845	**1.690**	**1.267**	1.267	**2.535**	**4.224**
STT	Small twin-turboprop	1.084	0.956	**2.040**	**0.510**	0.638	**1.148**	**3.188**

Schedule A7.3/SCH5: Operations, 2023 Development Case, 36.4 mppa

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	317.147	331.717	648.863	58.479	43.910	102.389	751.252
B733	Boeing 737-300/400/500	0.397	0.410	**0.807**	0.042	0.029	**0.071**	**0.878**
B736	Boeing 737-600/700	3.273	3.101	**6.375**	5.215	5.387	**10.602**	**16.976**
B7378MAX	Boeing 737-800 MAX	43.350	45.349	**88.698**	6.531	4.532	**11.063**	**99.762**
B738	Boeing 737-800/900	198.785	205.211	**403.995**	20.993	14.566	**35.559**	**439.554**
B744G	Boeing 747-400: CF6-80F engines	0.656	1.245	**1.901**	1.258	0.669	**1.928**	**3.829**
B744P	Boeing 747-400: PW4000 engines	0.247	0.469	**0.716**	0.474	0.252	**0.726**	**1.441**
B744R	Boeing 747-400: RB211 engines	0.439	0.834	**1.273**	0.843	0.448	**1.291**	**2.564**
B757C	Boeing 757-200: RB211-535C engines	0.078	0.085	**0.163**	0.073	0.065	**0.138**	**0.301**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.597	0.655	**1.251**	0.557	0.499	**1.056**	**2.307**
B757P	Boeing 757-200: PW2037/2040 engines	0.411	0.451	**0.863**	0.384	0.344	**0.728**	**1.591**
B763G	Boeing 767-300: CF6-80 engines	1.028	0.966	**1.994**	1.763	1.824	**3.587**	**5.581**
B763P	Boeing 767-300: PW4000 engines	0.046	0.043	**0.089**	0.078	0.081	**0.159**	**0.248**
B772G	Boeing 777-200: GE90 engines	1.063	2.140	**3.203**	2.214	1.137	**3.351**	**6.555**
B773G	Boeing 777-200LR/300ER: GE90 engines	0.948	1.651	**2.599**	0.703	0.000	**0.703**	**3.302**
B788	Boeing 787-8	0.366	0.712	**1.077**	0.346	0.000	**0.346**	**1.423**
B789	Boeing 787-9	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA30	Airbus A300	0.816	1.722	**2.537**	1.812	0.906	**2.718**	**5.255**
EA319C	Airbus A319: CFM56 engines	8.520	8.795	**17.314**	0.900	0.624	**1.524**	**18.838**
EA319V	Airbus A319: IAE V2500 engines	0.970	1.002	**1.972**	0.103	0.071	**0.174**	**2.146**
EA319NEO	Airbus 319 NEO	0.535	0.559	**1.094**	0.081	0.056	**0.136**	**1.230**
EA320C	Airbus A320: CFM56 engines	11.421	11.790	**23.212**	1.206	0.837	**2.043**	**25.255**
EA320V	Airbus A320: IAE V2500 engines	2.099	2.167	**4.266**	0.222	0.154	**0.376**	**4.642**
EA320NEO	Airbus 320 NEO	11.399	11.924	**23.323**	1.717	1.192	**2.909**	**26.232**
EA320NEOLR	Airbus 320 NEO Long Range	1.456	1.503	**2.959**	0.154	0.107	**0.261**	**3.219**
EA321C	Airbus A321: CFM56 engines	4.761	4.914	**9.675**	0.503	0.349	**0.852**	**10.526**
EA321V	Airbus A321: IAE V2500 engines	0.039	0.040	**0.079**	0.004	0.003	**0.007**	**0.086**
EA321NEO	Airbus 321 NEO	0.401	0.420	**0.821**	0.060	0.042	**0.102**	**0.923**
EA33	Airbus A330	2.255	3.984	**6.238**	2.180	0.451	**2.632**	**8.870**
EA34	Airbus A340-200/300	0.089	0.079	**0.168**	0.042	0.053	**0.095**	**0.263**
EA359	Airbus A350-900	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.479	0.479	**0.958**	0.000	0.000	**0.000**	**0.958**
EA38R	Airbus A380: Trent 900 engines	0.479	0.479	**0.958**	0.000	0.000	**0.000**	**0.958**
ERJ	Embraer ERJ 135/145	1.890	1.710	**3.600**	0.721	0.901	**1.622**	**5.222**
EXE3	Chapter 3 executive jets	8.220	7.253	**15.472**	3.868	4.835	**8.703**	**24.175**
LTT	Large twin-turboprop	8.017	8.083	**16.100**	1.336	1.269	**2.604**	**18.704**
MD11	McDonnell Douglas MD-11	0.528	0.528	**1.056**	1.584	1.584	**3.169**	**4.225**
STT	Small twin-turboprop	1.093	0.964	**2.057**	0.514	0.643	**1.157**	**3.215**

Schedule A7.3/SCH6: Operations, 2024 Development Case, 38.1 mppa

Average Summers Day

		Day		
		A	D	Total
	Aircraft Type	332.202	346.588	678.789
B733	Boeing 737-300/400/500	0.394	0.405	**0.799**
B736	Boeing 737-600/700	3.441	3.265	**6.706**
B7378MAX	Boeing 737-800 MAX	56.517	58.914	**115.432**
B738	Boeing 737-800/900	197.423	203.178	**400.601**
B744G	Boeing 747-400: CF6-80F engines	0.692	1.318	**2.010**
B744P	Boeing 747-400: PW4000 engines	0.261	0.496	**0.757**
B744R	Boeing 747-400: RB211 engines	0.464	0.883	**1.346**
B757C	Boeing 757-200: RB211-535C engines	0.070	0.072	**0.142**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.539	0.552	**1.091**
B757P	Boeing 757-200: PW2037/2040 engines	0.372	0.380	**0.752**
B763G	Boeing 767-300: CF6-80 engines	1.003	0.941	**1.944**
B763P	Boeing 767-300: PW4000 engines	0.045	0.042	**0.086**
B772G	Boeing 777-200: GE90 engines	1.126	2.271	**3.396**
B773G	Boeing 777-200LR/300ER: GE90 engines	0.552	0.949	**1.501**
B788	Boeing 787-8	0.561	1.075	**1.636**
B789	Boeing 787-9	0.000	0.000	**0.000**
EA30	Airbus A300	0.866	1.829	**2.695**
EA319C	Airbus A319: CFM56 engines	5.383	5.540	**10.923**
EA319V	Airbus A319: IAE V2500 engines	0.613	0.631	**1.244**
EA319NEO	Airbus 319 NEO	0.641	0.668	**1.308**
EA320C	Airbus A320: CFM56 engines	12.519	12.883	**25.402**
EA320V	Airbus A320: IAE V2500 engines	2.301	2.368	**4.669**
EA320NEO	Airbus 320 NEO	14.455	15.068	**29.522**
EA320NEOLR	Airbus 320 NEO Long Range	1.668	1.717	**3.385**
EA321C	Airbus A321: CFM56 engines	4.936	5.080	**10.016**
EA321V	Airbus A321: IAE V2500 engines	0.041	0.042	**0.082**
EA321NEO	Airbus 321 NEO	0.532	0.554	**1.086**
EA33	Airbus A330	2.579	4.504	**7.083**
EA34	Airbus A340-200/300	0.091	0.080	**0.172**
EA359	Airbus A350-900	0.000	0.000	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.814	0.814	**1.628**
EA38R	Airbus A380: Trent 900 engines	0.814	0.814	**1.628**
ERJ	Embraer ERJ 135/145	1.944	1.760	**3.704**
EXE3	Chapter 3 executive jets	8.377	7.392	**15.769**
LTT	Large twin-turboprop	8.565	8.630	**17.195**
MD11	McDonnell Douglas MD-11	0.492	0.492	**0.985**
STT	Small twin-turboprop	1.114	0.983	**2.097**

Schedule A7.3/SCH7: Operations, 2028 Do Minimum, 35 mppa

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	**311.334**	**323.873**	**635.207**	**56.996**	**44.457**	**101.454**	**736.660**
B733	Boeing 737-300/400/500	0.207	0.211	**0.418**	0.017	0.013	**0.030**	**0.448**
B736	Boeing 737-600/700	4.270	4.094	**8.364**	5.842	6.018	**11.860**	**20.224**
B7378MAX	Boeing 737-800 MAX	137.292	141.472	**278.764**	17.098	12.919	**30.017**	**308.781**
B738	Boeing 737-800/900	97.696	99.676	**197.372**	8.101	6.121	**14.221**	**211.593**
B744G	Boeing 747-400: CF6-80F engines	0.815	1.426	**2.241**	1.457	0.847	**2.304**	**4.545**
B744P	Boeing 747-400: PW4000 engines	0.307	0.537	**0.844**	0.549	0.319	**0.867**	**1.711**
B744R	Boeing 747-400: RB211 engines	0.546	0.955	**1.501**	0.976	0.567	**1.543**	**3.044**
B757C	Boeing 757-200: RB211-535C engines	0.060	0.054	**0.114**	0.047	0.052	**0.099**	**0.213**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.458	0.415	**0.874**	0.359	0.402	**0.761**	**1.635**
B757P	Boeing 757-200: PW2037/2040 engines	0.316	0.286	**0.602**	0.248	0.277	**0.525**	**1.127**
B763G	Boeing 767-300: CF6-80 engines	1.022	0.961	**1.983**	1.249	1.310	**2.560**	**4.542**
B763P	Boeing 767-300: PW4000 engines	0.045	0.043	**0.088**	0.055	0.058	**0.114**	**0.202**
B772G	Boeing 777-200: GE90 engines	1.351	2.468	**3.819**	2.574	1.457	**4.031**	**7.850**
B773G	Boeing 777-200LR/300ER: GE90 engines	0.733	0.956	**1.688**	0.223	0.000	**0.223**	**1.911**
B788	Boeing 787-8	0.705	0.998	**1.703**	0.293	0.000	**0.293**	**1.996**
B789	Boeing 787-9	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA30	Airbus A300	1.056	1.995	**3.050**	2.112	1.173	**3.285**	**6.335**
EA319C	Airbus A319: CFM56 engines	4.320	4.408	**8.728**	0.358	0.271	**0.629**	**9.357**
EA319V	Airbus A319: IAE V2500 engines	0.492	0.502	**0.994**	0.041	0.031	**0.072**	**1.066**
EA319NEO	Airbus 319 NEO	1.893	1.951	**3.843**	0.236	0.178	**0.414**	**4.257**
EA320C	Airbus A320: CFM56 engines	3.070	3.132	**6.203**	0.255	0.192	**0.447**	**6.649**
EA320V	Airbus A320: IAE V2500 engines	0.564	0.576	**1.140**	0.047	0.035	**0.082**	**1.222**
EA320NEO	Airbus 320 NEO	25.018	25.780	**50.798**	3.116	2.354	**5.470**	**56.268**
EA320NEOLR	Airbus 320 NEO Long Range	1.316	1.342	**2.658**	0.109	0.082	**0.192**	**2.849**
EA321C	Airbus A321: CFM56 engines	3.541	3.613	**7.154**	0.294	0.222	**0.515**	**7.669**
EA321V	Airbus A321: IAE V2500 engines	0.029	0.030	**0.059**	0.002	0.002	**0.004**	**0.063**
EA321NEO	Airbus 321 NEO	1.404	1.447	**2.851**	0.175	0.132	**0.307**	**3.158**
EA33	Airbus A330	3.034	4.192	**7.226**	1.726	0.569	**2.295**	**9.520**
EA34	Airbus A340-200/300	0.089	0.079	**0.168**	0.042	0.052	**0.094**	**0.262**
EA359	Airbus A350-900	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.000	0.911	**0.911**	0.911	0.000	**0.911**	**1.822**
EA38R	Airbus A380: Trent 900 engines	0.000	0.911	**0.911**	0.911	0.000	**0.911**	**1.822**
ERJ	Embraer ERJ 135/145	1.868	1.689	**3.557**	0.717	0.897	**1.614**	**5.172**
EXE3	Chapter 3 executive jets	8.182	7.219	**15.401**	3.850	4.813	**8.663**	**24.064**
LTT	Large twin-turboprop	8.020	8.062	**16.082**	1.446	1.405	**2.851**	**18.933**
MD11	McDonnell Douglas MD-11	0.525	0.525	**1.049**	1.049	1.049	**2.099**	**3.148**
STT	Small twin-turboprop	1.088	0.960	**2.048**	0.512	0.640	**1.152**	**3.200**

Schedule A7.3/SCH8: Operations, 2028 Development Case, 43 mppa

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	345.250	366.546	**711.795**	63.948	42.651	**106.599**	**818.395**
B733	Boeing 737-300/400/500	0.256	0.264	**0.520**	0.028	0.019	**0.047**	**0.566**
B736	Boeing 737-600/700	2.764	2.772	**5.536**	5.083	5.075	**10.157**	**15.693**
B7378MAX	Boeing 737-800 MAX	159.730	167.217	**326.947**	24.459	16.972	**41.431**	**368.378**
B738	Boeing 737-800/900	113.852	117.612	**231.464**	12.282	8.522	**20.804**	**252.269**
B744G	Boeing 747-400: CF6-80F engines	0.685	1.446	**2.130**	1.370	0.609	**1.978**	**4.109**
B744P	Boeing 747-400: PW4000 engines	0.258	0.544	**0.802**	0.516	0.229	**0.745**	**1.547**
B744R	Boeing 747-400: RB211 engines	0.459	0.968	**1.427**	0.917	0.408	**1.325**	**2.751**
B757C	Boeing 757-200: RB211-535C engines	0.012	0.012	**0.024**	0.024	0.024	**0.048**	**0.072**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.093	0.093	**0.185**	0.185	0.185	**0.370**	**0.555**
B757P	Boeing 757-200: PW2037/2040 engines	0.064	0.064	**0.128**	0.128	0.128	**0.255**	**0.383**
B763G	Boeing 767-300: CF6-80 engines	0.495	0.495	**0.990**	0.990	0.990	**1.980**	**2.971**
B763P	Boeing 767-300: PW4000 engines	0.022	0.022	**0.044**	0.044	0.044	**0.088**	**0.132**
B772G	Boeing 777-200: GE90 engines	1.236	2.610	**3.846**	2.473	1.099	**3.572**	**7.418**
B773G	Boeing 777-200LR/300ER: GE90 engines	0.599	1.109	**1.708**	0.510	0.000	**0.510**	**2.219**
B788	Boeing 787-8	0.761	1.585	**2.346**	0.824	0.000	**0.824**	**3.170**
B789	Boeing 787-9	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA30	Airbus A300	1.030	2.175	**3.205**	2.061	0.916	**2.976**	**6.182**
EA319C	Airbus A319: CFM56 engines	4.701	4.856	**9.557**	0.507	0.352	**0.859**	**10.416**
EA319V	Airbus A319: IAE V2500 engines	0.535	0.553	**1.089**	0.058	0.040	**0.098**	**1.186**
EA319NEO	Airbus 319 NEO	2.055	2.151	**4.206**	0.315	0.218	**0.533**	**4.739**
EA320C	Airbus A320: CFM56 engines	3.422	3.535	**6.957**	0.369	0.256	**0.625**	**7.583**
EA320V	Airbus A320: IAE V2500 engines	0.629	0.650	**1.279**	0.068	0.047	**0.115**	**1.394**
EA320NEO	Airbus 320 NEO	28.082	29.398	**57.480**	4.300	2.984	**7.284**	**64.764**
EA320NEOLR	Airbus 320 NEO Long Range	1.945	2.009	**3.954**	0.210	0.146	**0.355**	**4.309**
EA321C	Airbus A321: CFM56 engines	4.271	4.412	**8.683**	0.461	0.320	**0.780**	**9.463**
EA321V	Airbus A321: IAE V2500 engines	0.035	0.036	**0.071**	0.004	0.003	**0.006**	**0.078**
EA321NEO	Airbus 321 NEO	1.690	1.769	**3.459**	0.259	0.180	**0.438**	**3.897**
EA33	Airbus A330	2.839	5.375	**8.214**	2.939	0.403	**3.342**	**11.555**
EA34	Airbus A340-200/300	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA359	Airbus A350-900	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.954	0.954	**1.907**	0.000	0.000	**0.000**	**1.907**
EA38R	Airbus A380: Trent 900 engines	0.954	0.954	**1.907**	0.000	0.000	**0.000**	**1.907**
ERJ	Embraer ERJ 135/145	0.435	0.435	**0.869**	0.000	0.000	**0.000**	**0.869**
EXE3	Chapter 3 executive jets	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
LTT	Large twin-turboprop	9.873	9.955	**19.828**	1.533	1.451	**2.983**	**22.811**
MD11	McDonnell Douglas MD-11	0.517	0.517	**1.034**	1.034	1.034	**2.068**	**3.102**
STT	Small twin-turboprop	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**

Cole Jarman

Schedule A7.3/SCH9: Daytime Noise Metrics at Sensitive Receptors that are not Dwellings

	Receptor	25+		2016		2023 DM		2023 DC		2028 DM		2028 DC	
		$L_{Aeq,16h}$	N65	$L_{Aeq,16h}$	N65	$L_{Aeq,16h}$	N65	$L_{Aeq,16h}$	N65	$L_{Aeq,16h}$	N65	$L_{Aeq,16h}$	N65
	SCHOOLS												
1	Howe Green School	62.5	345	60.6	230	61.5	317	61.7	328	60.7	320	61.3	360
2	Spellbrook Primary School	58.9	208	56.9	138	58.0	184	58.1	190	57.2	181	57.8	203
3	Little Hallingbury C of E Primary school	57.9	212	55.9	172	56.5	214	56.7	222	55.7	179	56.3	205
4	North and West Essex Adult Community College	<50	<10	50.0	10	<50	11	<50	11	<50	<10	<50	10
5	Thaxted Primary School	55.0	58	53.5	147	54.7	176	54.8	181	54	99	54.5	112
6	The Leventhorpe School	54.6	114	52.6	126	53.7	150	53.8	155	53	120	53.5	137
7	Great Sampford Primary School	53.1	51	52.1	126	53.2	138	53.3	142	52.5	78	53.1	88
8	Thorn Grove Primary School	52.7	27	51.0	<10	52.1	<10	52.2	<10	51.2	<10	51.7	<10
9	Mandeville Primary School	53.5	105	51.7	61	52.8	84	52.9	86	52	83	52.6	95
10	The Bishops Stortford High School	51.5	19	50.3	<10	51.4	<10	51.5	<10	50.6	<10	51.1	<10
11	Birchwood High School	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
12	High Wych C of E Primary School	52.4	77	51.9	59	53.1	83	53.2	85	52.4	83	52.9	93
13	Summercroft Primary School	51.8	17	50.3	<10	51.4	<10	51.5	<10	50.5	<10	51.0	<10
14	Hatfield Heath Primary School	53.9	106	52.7	78	51.3	65	51.4	68	<50	44	51.0	51
15	Thorley Hill Primary School	51	17	50.0	<10	51	<10	51.1	<10	50.1	<10	50.7	<10
16	Herts and Essex High School	52.5	25	50.9	<10	51.9	<10	52.1	<10	51.1	<10	51.6	<10
17	Reedings Junior School	50.8	12	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
18	Hockerill Anglo European College	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
19	Richard Whittington Primary School	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
20	All Saints C of E Primary School	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10

Schedule A7.3/SCH9 (cont.):

	Receptor	25+ LAeq,16h	25+ N65	2016 LAeq,16h	2016 N65	2023 DM LAeq,16h	2023 DM N65	2023 DC LAeq,16h	2023 DC N65	2028 DM LAeq,16h	2028 DM N65	2028 DC LAeq,16h	2028 DC N65
	HEALTHCARE												
21	Falcon House Little Hallingbury	60.1	270	58.0	218	58.9	275	59	284	58.1	246	58.6	278
22	Humfrey Lodge, Thaxted	58	253	56.2	158	57.3	225	57.4	232	56.6	227	57.2	252
23	Herts and Essex Hospital	52.7	26	51.1	<10	52.1	<10	52.2	<10	51.2	<10	51.8	<10
24	Lyne Driscoll High Wych	53.1	80	52.2	59	53.4	83	53.5	86	52.7	84	53.2	94
25	Saint Elizabeth's Centre Much Hadham	<50	14	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
	PLACES OF WORSHIP												
26	St Giles Church Great Hallingbury	65.9	356	63.4	230	64.4	317	64.6	328	63.7	320	64.2	361
27	St Mary the Virgin Church Broxted	65.5	337	62.7	222	63.7	311	63.8	321	63	314	63.5	350
28	Ebenezer Chapel Molehill Green	59.7	116	58.1	66	59.1	254	59.2	262	58.2	180	58.8	204
29	St Mary the Virgin Church Chickney	56	76	55.6	73	56.7	235	56.8	242	55.9	148	56.5	168
30	Thaxted Baptist Church	57.5	246	55.7	158	56.9	224	57	230	56.2	226	56.7	252
31	St Mary the Virgin Church Little Hallingbury	57.9	211	56.0	170	56.5	217	56.7	225	55.7	194	56.2	223
32	Thaxted Church (St. John the Baptist) Thaxted	58.5	257	56.5	158	57.7	225	57.8	232	57	227	57.5	252
33	Thaxted URC Church	58.6	257	56.6	158	57.8	225	57.9	232	57.1	227	57.6	252
	COMMUNITY FACILITIES												
34	Thaxted Anglican Church Hall	58.6	257	56.6	158	57.8	225	57.9	232	57.1	227	57.5	252
35	Little Hallingbury Village Hall	57.3	191	55.3	161	55.8	186	55.9	192	54.9	137	55.4	157
36	Thaxted Baptist Church Hall	57.5	246	55.7	158	56.9	224	57	230	56.2	226	55.9	252
37	The Barn Theatre Little Easton Major	<50	17	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10

Schedule A7.3/SCH10: Night-time Noise Metrics at Sensitive Receptors that are not Dwellings[4]

	Receptor	25+		2016		2023 DM		2023 DC		2028 DM		2028 DC	
		$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60
	HEALTHCARE												
21	Falcon House Little Hallingbury	54.5	43	53.5	37	54.7	46	54.8	48	54.4	47	54.5	47
22	Humfrey Lodge, Thaxted	52.6	32	52.9	36	54	40	54.3	43	53.9	42	54.3	42
23	Herts and Essex Hospital	46.6	24	45.8	21	47.7	25	47.8	25	47.3	20	47.1	20
24	Lyne Driscoll High Wych	48.6	14	48.8	15	49.8	17	50.1	18	49.7	18	50.1	18
25	Saint Elizabeth's Centre Much Hadham	<45	10	<45	10	<45	<10	<45	<10	<45	<10	<45	<10

[4] This list limited to non-dwelling receptors that are routinely occupied during the night and therefore potentially sensitive to nigh-time noise levels

Schedule A7.3/SCH11: L_{Amax} Departure flyover noise levels at Sensitive Receptors that are not Dwellings for 100% worst case operating mode

	NOISE SENSITIVE RECEPTOR NAME	POSTCODE	EASTING	NORTHING	BUZ 45%	CLN 54% 737-800	DET 1%	BUZ 45%	CLN 54% 737-MAX	DET 1%	RWY
	SCHOOLS										
1	Howe Green School	CM22 7UF	550497	218754	**75**	**74**	**75**	72	71	72	22
2	Spellbrook Primary School	CM23 4BA	548610	217260	**73**	<60	62	70	<60	<60	22
3	Little Hallingbury C of E Primary school	CM22 7RE	550130	217530	71	69	72	68	66	69	22
4	North and West Essex Adult Community College	CM20 1NW	544050	210640	<60	<60	<60	<60	<60	<60	22
5	Thaxted Primary School	CM6 2LH	561415	230820	<60	<60	<60	<60	<60	<60	04
6	The Leventhorpe School	CM21 9BY	548160	215810	67	<60	<60	64	<60	<60	22
7	Great Sampford Primary School	CB10 2RL	564330	235460	<60	<60	<60	<60	<60	<60	04
8	Thorn Grove Primary School	CM23 5LD	549670	220690	67	65	65	64	62	62	22
9	Mandeville Primary School	CM21 0BL	547860	215430	65	<60	<60	62	<60	<60	22
10	The Bishops Stortford High School	CM23 3LU	548950	219770	67	62	63	64	<60	<60	22
11	Birchwood High School	CM23 5BD	550400	212840	<60	<60	61	<60	<60	<60	22
12	High Wych C of E Primary School	CM21 0JB	546210	214120	<60	<60	<60	<60	<60	<60	22
13	Summercroft Primary School	CM23 5BJ	550150	221590	66	65	65	63	62	62	22
14	Hatfield Heath Primary School	CM22 7EA	552200	215095	67	61	62	64	<60	<60	22
15	Thorley Hill Primary School	CM23 3NH	548860	219760	67	64	65	64	61	62	22
16	Herts and Essex High School	CM23 5NJ	549530	220520	63	<60	<60	60	<60	<60	22
17	Reedings Junior School	CM21 9DD	548380	215300	63	61	62	<60	<60	<60	22
18	Hockerill Anglo European College	CM23 5HX	549500	221530	65	<60	<60	62	<60	<60	22
19	Richard Whittington Primary School	CM23 3NP	548300	219780	63	62	62	<60	<60	<60	22
20	All Saints C of E Primary School	CM23 5BE	549760	221840	67	61	62	64	<60	<60	22

Schedule A7.3/SCH11 (cont.):

	NOISE SENSITIVE RECEPTOR NAME	POSTCODE	EASTING	NORTHING	BUZ 45%	CLN 54% 737-800	DET 1%	BUZ 45%	CLN 54% 737-MAX	DET 1%	RWY
	HEALTHCARE										
21	Falcon House Little Hallingbury	CM22 7PP	549850	217940	74	68	70	71	65	67	22
22	Humfrey Lodge, Thaxted	CM6 2PX	561000	231420	<60	<60	<60	<60	<60	<60	04
23	Herts and Essex Hospital	CM23 5JH	549790	220870	67	65	65	64	62	62	22
24	Lyne Driscoll High Wych	CM21 0HN	546450	214460	<60	<60	<60	<60	<60	<60	22
25	Saint Elizabeth's Centre Much Hadham	SG10 6EW	543870	216880	62	<60	<60	<60	<60	<60	22
	PLACES OF WORSHIP										
26	St Giles Church Great Hallingbury	CM22 7TZ	550980	219660	77	77	77	74	74	74	22
27	St Mary the Virgin Church Broxted	CM6 2BU	557730	227410	76	73	68	73	70	65	04
28	Ebenezer Chapel Molehill Green	CM22 6PH	556340	224960	76	76	77	73	73	74	04
29	St Mary the Virgin Church Chickney	CM6 2BY	557310	228080	74	67	63	71	64	60	04
30	Thaxted Baptist Church	CM6 2ND	561100	230850	<60	<60	<60	<60	<60	<60	04
31	St Mary the Virgin Church Little Hallingbury	CM22 7RE	550200	217530	70	70	72	67	67	69	22
32	Thaxted Church (St. John the Baptist) Thaxted	CM6 2QY	560920	231060	<60	<60	<60	<60	<60	<60	04
33	Thaxted URC Church	CM6 2PY	560720	230930	<60	<60	<60	<60	<60	<60	04
	COMMUNITY FACLITIES										
34	Thaxted Anglican Church Hall	CM6 2PY	560720	230930	<60	<60	<60	<60	<60	<60	04
35	Little Hallingbury Village Hall	CM22 7RD	550170	217360	70	69	72	67	66	69	22
36	Thaxted Baptist Church Hall	CM6 2ND	561100	230850	<60	<60	<60	<60	<60	<60	04
37	The Barn Theatre Little Easton Major	CM6 2JN	560300	223570	<60	61	72	<60	<60	69	04

Schedule A7.3/SCH12: L_{Amax} Arrival flyover noise levels at Sensitive Receptors that are not Dwellings for 100% worst case operating mode

	NOISE SENSITIVE RECEPTOR NAME	POSTCODE	EASTING	NORTHING	04	22	04	22	RWY
					737-800		737-MAX		
	SCHOOLS								
1	Howe Green School	CM22 7UF	550497	218754	69	38	67	35	04
2	Spellbrook Primary School	CM23 4BA	548610	217260	**76**	31	**73**	28	04
3	Little Hallingbury C of E Primary school	CM22 7RE	550130	217530	66	34	64	31	04
4	North and West Essex Adult Community College	CM20 1NW	544050	210640	59	20	57	17	04
5	Thaxted Primary School	CM6 2LH	561415	230820	27	62	24	60	22
6	The Leventhorpe School	CM21 9BY	548160	215810	**74**	29	**72**	26	04
7	Great Sampford Primary School	CB10 2RL	564330	235460	21	66	18	64	22
8	Thorn Grove Primary School	CM23 5LD	549670	220690	50	39	48	36	04
9	Mandeville Primary School	CM21 0BL	547860	215430	**73**	28	71	25	04
10	The Bishops Stortford High School	CM23 3LU	548950	219770	52	36	49	33	04
11	Birchwood High School	CM23 5BD	550400	212840	46	43	44	40	04
12	High Wych C of E Primary School	CM21 0JB	546210	214120	71	25	69	22	04
13	Summercroft Primary School	CM23 5BJ	550150	221590	46	41	44	38	04
14	Hatfield Heath Primary School	CM22 7EA	552200	215095	39	31	37	28	04
15	Thorley Hill Primary School	CM23 3NH	548860	219760	51	35	48	32	04
16	Herts and Essex High School	CM23 5NJ	549530	220520	46	39	44	36	04
17	Reedings Junior School	CM21 9DD	548380	215300	66	29	64	26	04
18	Hockerill Anglo European College	CM23 5HX	549500	221530	44	39	42	36	04
19	Richard Whittington Primary School	CM23 3NP	548300	219780	48	34	46	31	04
20	All Saints C of E Primary School	CM23 5BE	549760	221840	43	41	41	38	04

Schedule A7.3/SCH12 (cont.):

	NOISE SENSITIVE RECEPTOR NAME	POSTCODE	EASTING	NORTHING	04	22	04	22	RWY
					737-800		737-MAX		
	HEALTHCARE								
21	Falcon House Little Hallingbury	CM22 7PP	549850	217940	27	71	24	69	04
22	Humfrey Lodge, Thaxted	CM6 2PX	561000	231420	50	39	47	36	22
23	Herts and Essex Hospital	CM23 5JH	549790	220870	72	26	70	23	04
24	Lyne Driscoll High Wych	CM21 0HN	546450	214460	39	25	37	22	04
25	Saint Elizabeth's Centre Much Hadham	SG10 6EW	543870	216880	27	71	24	69	04
	PLACES OF WORSHIP								
26	St Giles Church Great Hallingbury	CM22 7TZ	550980	219660	87	40	85	37	04
27	St Mary the Virgin Church Broxted	CM6 2BU	557730	227410	36	75	33	73	22
28	Ebenezer Chapel Molehill Green	CM22 6PH	556340	224960	45	56	42	53	22
29	St Mary the Virgin Church Chickney	CM6 2BY	557310	228080	36	74	33	72	22
30	Thaxted Baptist Church	CM6 2ND	561100	230850	27	65	24	63	22
31	St Mary the Virgin Church Little Hallingbury	CM22 7RE	550200	217530	68	34	66	31	04
32	Thaxted Church (St. John the Baptist) Thaxted	CM6 2QY	560920	231060	27	69	24	67	22
33	Thaxted URC Church	CM6 2PY	560720	230930	27	71	24	68	22
	COMMUNITY FACLITIES								
34	Thaxted Anglican Church Hall	CM6 2PY	560720	230930	27	71	24	69	22
35	Little Hallingbury Village Hall	CM22 7RD	550170	217360	64	34	62	31	04
36	Thaxted Baptist Church Hall	CM6 2ND	561100	230850	27	65	24	63	22
37	The Barn Theatre Little Easton Major	CM6 2JN	560300	223570	34	35	31	32	22

Schedule A7.3/SCH13: Number of L_{Amax} departure/arrival events for worst case 100% operating mode[5]

Scenario	TOTAL			PER HOUR		
	All variants	737-300/800 A319/A320/A321	MAX NEO	All variants	737-300/800 A319/A320/A321	MAX NEO
25+	285	285	0	18	18	0
2016	196	196	0	12	12	0
2023 Do Min	282	226	57	18	14	4
2023 Dev Case	293	234	59	18	14	4
2024 Dev Case	306	231	76	19	14	5
2028 Do Min	285	113	172	18	7	11
2028 Dev Case	331	134	197	21	8	13
	16h	09h-16h				
2016 Busy Day	230	87				
per hour	14	12				
2028 Busy Day	341	149				
per hour	21	21				

[5] Not all events are expected to give rise to the same L_{Amax} noise level, as this will vary depending on the SID routing being operated.

Schedule A7.3/SCH14: Number of people affected by aircraft noise at different levels of exposure

Total number of people affected [1]

$L_{Aeq,16h}$ (dB)	2023 Do Min	2023 Dev Case	2024 Dev Case	2028 Do Min	2028 Dev Case	25+	2016
>51	16,944	17,644	18,096	11,884	15,336	15,480	12,600
>54	6,734	6,934	7,334	5,634	6,234	7,434	5,700
>57	3,434	3,584	3,784	1,834	2,884	3,634	1,750
>60	984	1034	1,084	734	884	1,334	600
>63	384	384	384	284	334	484	200
>66	84	98	76	50	57	234	50
>69	0	0	0	0	0	0	0
>72	0	0	0	0	0	0	0

[1] This is the cumulative total of people affected by noise above the indicated level

Differences between studied scenarios [2]

$L_{Aeq,16h}$ (dB)	2023 DC vs DM	2023 DC vs 2016	2024 DC vs 2023 DM	2024 DC vs 2016	2028 DC vs DM	2028 DC vs 2016	25+ vs 2028 DC	25+ vs 2024 DC	25+ vs 2016
51 - 54	700	5,044	1,152	5,496	3,452	2,736	144	-2,616	2,880
54 - 57	200	1,234	600	1,634	600	534	1,200	100	1,734
57 - 60	150	1,834	350	2,034	1,050	1,134	750	-150	1,884
60 - 63	50	434	100	484	150	284	450	250	734
63 - 66	0	184	0	184	50	134	150	100	284
66 - 69	14	48	-8	26	7	7	177	158	184
69 - 72	0	0	0	0	0	0	0	0	0
>72	0	0	0	0	0	0	0	0	0

[2] These are the differences in number of people affected within each 3 dB noise band

Schedule A7.3/SCH1: Non-residential Sensitive Receptors

	Receptor	Postcode	Easting	Northing
	SCHOOLS			
1	Howe Green School	CM22 7UF	550500	218750
2	Spellbrook Primary School	CM23 4BA	548610	217260
3	Little Hallingbury C of E Primary school	CM22 7RE	550130	217530
4	North and West Essex Adult Community College	CM20 1NW	544050	210640
5	Thaxted Primary School	CM6 2LH	561420	230820
6	The Leventhorpe School	CM21 9BY	548160	215810
7	Great Sampford Primary School	CB10 2RL	564330	235460
8	Thorn Grove Primary School	CM23 5LD	549670	220690
9	Mandeville Primary School	CM21 0BL	547860	215430
10	The Bishops Stortford High School	CM23 3LU	548950	219770
11	Birchwood High School	CM23 5BD	550400	212840
12	High Wych C of E Primary School	CM21 0JB	546210	214120
13	Summercroft Primary School	CM23 5BJ	550150	221590
14	Hatfield Heath Primary School	CM22 7EA	548860	219760
15	Thorley Hill Primary School	CM23 3NH	549530	220520
16	Herts and Essex High School	CM23 5NJ	548380	215300
17	Reedings Junior School	CM21 9DD	549500	221530
18	Hockerill Anglo European College	CM23 5HX	548300	219780
19	Richard Whittington Primary School	CM23 3NP	549760	221840
20	All Saints C of E Primary School	CM23 5BE	548860	219760
	HEALTHCARE			
21	Falcon House Little Hallingbury	CM22 7PP	549850	217940
22	Humfrey Lodge, Thaxted	CM6 2PX	561000	231420
23	Herts and Essex Hospital	CM23 5JH	549790	220870
24	Lyne Driscoll High Wych	CM21 0HN	546450	214460
25	Saint Elizabeth's Centre Much Hadham	SG10 6EW	543870	216880
	PLACES OF WORSHIP			
26	St Giles Church Great Hallingbury	CM22 7TZ	550980	219660
27	St Mary the Virgin Church Broxted	CM6 2BU	557730	227410
28	Ebenezer Chapel Molehill Green (T.B.C)	CM22 6PH	556340	224960
29	St Mary the Virgin Church Chickney	CM6 2BY	557310	228080
30	Thaxted Baptist Church	CM6 2ND	561100	230850
31	St Mary the Virgin Church Little Hallingbury	CM22 7RE	550200	217530
32	Thaxted Church (St. John the Baptist) Thaxted	CM6 2QY	560920	231060
33	Thaxted URC Church	CM6 2PY	560720	230930
	COMMUNITY FACILITIES			
34	Thaxted Anglican Church Hall	CM6 2PY	560720	230930
35	Little Hallingbury Village Hall	CM22 7RD	550170	217360
36	Thaxted Baptist Church Hall	CM6 2ND	561100	230850
37	The Barn Theatre Little Easton Major	CM6 2JN	560300	223570

Schedule A7.3/SCH2: List of proposed cumulative developments

No.	UDC Ref. No.	Address	Description	Status
1	UTT/13/0177/OP	Land west of Hall Road, Elsenham	Erection of up to 130 dwellings with associated open space, play areas, land for educational use and other ancillary works.	Approved
2	UTT/0142/12/OP	Land north of Stansted Road, Elsenham	Residential development comprising 155 No. dwellings, 55 No. extra care units, land for the provision of a multi-use community building, and associated on and off site infrastructure provision, following demolition and clearance of Essex Auto spray and associated residential property	Approved
3	UTT/13/1393/OP	Land South Of Dunmow Road Brewers End Takeley Bishops Stortford Hertfordshire	Proposed residential planning application for erection of up to 100 dwellings, to include provision of 6.3 hectares of public open space	Approved
4	UTT/15/1036/FUL	Land adjacent to Enterprise House, Stansted Airport	Eight storey, 12,842sqm (GEA) quality hotel consisting of a net accommodation area of 8,159sqm, with ancillary restaurant and gym, vehicle parking and access	Under Construction/ Opening Soon
5	UTT/16/3566/FUL	Gorefield Road, Stansted	A dedicated terminal facility for arriving passengers (34,384sqm); an associated forecourt; and altered access and service roads.	Approved
6	UTT/16/3669/OP	Land South East Of Great Hallingbury	Outline application with all matters reserved for 35 dwellings	Awaiting decision

No.	UDC Ref. No.	Address	Description	Status
7	UTT/17/1080/SCO	Land West Of Canfield Road Great Canfield Essex	Proposed development of 210 dwellings, public open space, landscaping, sustainable drainage systems and access point from Green Lane	EIA Scoping. Application not submitted
8	UTT/13/1618/OP	Land At Walpole Farm Cambridge Road Stansted Essex	Redevelopment of land to provide approximately 160 dwelling houses, up to 600 square metres of commercial (B1) floor space, approximately 0.45ha reserved for educational uses, seven full size allotments, paddock and community woodland area with associated open space, landscaping, access, parking and drainage	Approved
9	UTT/1335/12/FUL	Land At Brewers End Dunmow Road Takeley CM22 6QH	Erection of 41 no. dwellings (including affordable housing) with new vehicular and pedestrian access, associated infrastructure and landscaping	Conditions discharged
10	UTT/14/2991/OP	Land at Elsenham Nurseries, Elsenham	Demolition of existing buildings and erection of 40 residential dwellings including open space and landscaping	Discharging Conditions
11	UTT/13/1790/OP	Land South of Stansted Road, Elsenham	Outline application for a development of up to 165 homes, open space and allotments. All matters reserved except for access.	Application not submitted
12	UTT/17/3573/OP	Land To The North West Of Henham Road Elsenham	Outline application with all matters reserved except for access for: up to 350 dwellings, 1 no. primary school including early years and childcare setting for up to 56 places, open spaces and landscaping	
13	UTT/17/3197/FUL	Land South Of School Lane Henham	Residential development for 36 dwellings and associated roads and parking, together with public open	

No.	UDC Ref. No.	Address	Description	Status
			space	
14	UTT/17/3323/FUL	De Salis Hotel Green Street Elsenham CM22 6DR	Expansion of DeSalis Hotel by raising the existing pitched roof to allow conversion of the roof space to accommodate 31 additional bedrooms, construction of a new two storey building within central courtyard to accommodate new conference room, laundry and extension to existing restaurant, with an additional 16 bedrooms to the first floor area	
15	UTT/17/3572/SO	Land West Of Canfield Road Great Canfield Road Great Canfield Essex	Request for formal scoping opinion for the Environmental Statement to accompany an outline planning application for up to 135 dwellings	
16	UTT/17/1852/FUL	Land adjacent to Coppice Close, Dunmow Road, Takeley, Hertfordshire	Residential development of 20 dwellings with associated vehicular access points off Dunmow Road, open space, car parking and associated infrastructure	
17	UTT/1473/11/FUL	Tri Sail Water Circle Elsenham Meadows Elsenham CM22 6DS	Demolition of existing office and car park. Construction of three interlinked buildings (7 storeys, 6 storeys, 5 storeys) containing 6,978 sqm of offices and 1,394 sqm floorspace of ancillary mixed retail, Café/restaurant and health/spa facilities	

No.	UDC Ref. No.	Address	Description	Status
18	UTT/16/3565/OP	Land to the west of Bonningtons Farm Station Road Hatfield Broad Oak	Outline application with all matters reserved, except for access for - "Community led Mixed Use Development of up to 275 residential units, site for Primary School, Multi Use Games Area, Kick About Area, Flexible Neighbourhood Building (A1, A2,A3, A5, B1, D1 & D2 Uses), Car Park, Trim Trail and Dog Walking Circuit"	
19	UTT/16/0709/SO	Tri Sail Development, Green Street, Elsenham Hertfordshire	Request for a scoping opinion in respect of proposed Commercial Development.	
20	UTT/13/1959/OP	Elms Farm, Church Road, Stansted Essex CM24 8PX	Outline application for the demolition of existing livery buildings and construction of a residential development with access from Church Road and comprising circa 53 new residential units.	

Schedule A7.3/SCH3: Operations, 2016 Baseline

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	234.424	234.424	451.588	49.728	32.543	**82.272**	**533.859**
B727	Boeing 727 (Chapter 2&3)	0.011	0.022	**0.033**	0.011	0.000	**0.011**	**0.044**
B733	Boeing 737-300/400/500	2.424	2.663	**5.087**	3.174	2.891	**6.065**	**11.152**
B736	Boeing 737-600/700	0.337	0.457	**0.794**	0.185	0.087	**0.272**	**1.065**
B738	Boeing 737-800/900	149.554	165.424	**314.978**	31.902	16.163	**48.065**	**363.043**
B744G	Boeing 747-400: CF6-80F engines	0.837	0.859	**1.696**	0.022	0.000	**0.022**	**1.717**
B744P	Boeing 747-400: PW4000 engines	0.500	0.565	**1.065**	0.098	0.044	**0.141**	**1.207**
B744R	Boeing 747-400: RB211 engines	0.576	0.576	**1.152**	0.000	0.000	**0.000**	**1.152**
B747SP	Boeing 747SP	0.044	0.044	**0.087**	0.000	0.000	**0.000**	**0.087**
B748	Boeing 747-800	0.391	0.446	**0.837**	0.076	0.022	**0.098**	**0.935**
B753	Boeing 757-300	0.000	0.011	**0.011**	0.011	0.000	**0.011**	**0.022**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.587	0.674	**1.261**	0.391	0.315	**0.707**	**1.967**
B757P	Boeing 757-200: PW2037/2040 engines	0.065	0.391	**0.457**	0.467	0.130	**0.598**	**1.054**
B762	Boeing 767-200	0.294	0.185	**0.478**	0.348	0.446	**0.793**	**1.272**
B763G	Boeing 767-300: CF6-80 engines	1.087	1.598	**2.685**	0.946	0.435	**1.380**	**4.065**
B763P	Boeing 767-300: PW4000 engines	0.044	0.044	**0.087**	0.011	0.022	**0.033**	**0.120**
B764	Boeing 767-400	0.044	0.044	**0.087**	0.000	0.000	**0.000**	**0.087**
B772G	Boeing 777-200: GE90 engines	0.076	0.087	**0.163**	0.011	0.000	**0.011**	**0.174**
B773G	Boeing 777-200LR/300ER: GE90 engines	1.174	1.500	**2.674**	0.761	0.435	**1.196**	**3.870**
B788	Boeing 787-8	0.315	0.337	**0.652**	0.022	0.000	**0.022**	**0.674**
BA46	BAe 146/Avro RJ series	0.033	0.022	**0.054**	0.000	0.000	**0.000**	**0.054**
CRJ	Bombardier CRJ100/200 series	0.141	0.163	**0.304**	0.033	0.011	**0.044**	**0.348**
EA30	Airbus A300	0.696	0.696	**1.391**	0.728	0.717	**1.446**	**2.837**
EA31	Airbus A310	0.022	0.022	**0.043**	0.000	0.000	**0.000**	**0.043**
EA318	Airbus A318	0.054	0.065	**0.120**	0.000	0.000	**0.000**	**0.120**
EA319C	Airbus A319: CFM56 engines	23.391	23.478	**46.870**	3.554	3.446	**7.000**	**53.870**
EA319V	Airbus A319: IAE V2500 engines	2.728	2.739	**5.467**	0.065	0.044	**0.109**	**5.576**
EA320C	Airbus A320: CFM56 engines	4.641	4.696	**9.337**	0.739	0.696	**1.435**	**10.772**
EA320V	Airbus A320: IAE V2500 engines	1.152	1.065	**2.217**	0.087	0.152	**0.239**	**2.457**
EA321C	Airbus A321: CFM56 engines	3.207	3.761	**6.967**	2.087	1.544	**3.630**	**10.598**
EA321V	Airbus A321: IAE V2500 engines	0.054	0.054	**0.109**	0.000	0.000	**0.000**	**0.109**
EA33	Airbus A330	1.283	1.750	**3.033**	0.533	0.065	**0.598**	**3.630**
EA34	Airbus A340-200/300	0.239	0.207	**0.446**	0.011	0.044	**0.054**	**0.500**
EA346	Airbus A340-500/600	0.033	0.033	**0.065**	0.000	0.000	**0.000**	**0.065**
ERJ	Embraer ERJ 135/145	0.837	0.946	**1.783**	0.228	0.087	**0.315**	**2.098**
ERJ170	Embraer E-170/175	0.120	0.141	**0.261**	0.011	0.000	**0.011**	**0.272**
ERJ190	Embraer E-190/195	1.152	1.152	**2.304**	0.217	0.250	**0.467**	**2.772**
EXE3	Chapter 3 executive jets	9.815	10.457	**20.272**	1.989	1.348	**3.337**	**23.609**
FK10	Fokker 70/100	0.033	0.044	**0.076**	0.022	0.011	**0.033**	**0.109**
L4P	Large four-engine propeller	0.033	0.033	**0.065**	0.000	0.000	**0.000**	**0.065**
LTT	Large twin-turboprop	7.044	4.989	**12.033**	0.870	2.935	**3.804**	**15.837**
MD11	McDonnell Douglas MD-11	1.315	1.283	**2.598**	0.033	0.054	**0.087**	**2.685**
MD80	McDonnell Douglas MD-80 series	0.011	0.011	**0.022**	0.000	0.000	**0.000**	**0.022**
SP	Single piston	0.109	0.065	**0.174**	0.000	0.022	**0.022**	**0.196**
STP	Small twin-piston	0.022	0.022	**0.043**	0.000	0.022	**0.022**	**0.065**
STT	Small twin-turboprop	0.641	0.609	**1.250**	0.087	0.109	**0.196**	**1.446**

Schedule A7.3/SCH4: Operations, 2023 Do Minimum, 35 mppa

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	**308.641**	**319.825**	**628.466**	**54.666**	**43.482**	**98.148**	**726.614**
B733	Boeing 737-300/400/500	0.376	0.385	**0.760**	**0.039**	0.029	**0.068**	**0.828**
B736	Boeing 737-600/700	4.140	3.967	**8.107**	**4.313**	4.485	**8.798**	**16.906**
B7378MAX	Boeing 737-800 MAX	41.785	43.277	**85.063**	**6.103**	4.611	**10.714**	**95.777**
B738	Boeing 737-800/900	191.539	196.354	**387.893**	**19.701**	14.885	**34.586**	**422.479**
B744G	Boeing 747-400: CF6-80F engines	0.645	1.087	**1.731**	**1.268**	0.826	**2.093**	**3.825**
B744P	Boeing 747-400: PW4000 engines	0.243	0.409	**0.652**	**0.477**	0.311	**0.788**	**1.440**
B744R	Boeing 747-400: RB211 engines	0.432	0.728	**1.159**	**0.849**	0.553	**1.402**	**2.561**
B757C	Boeing 757-200: RB211-535C engines	0.087	0.089	**0.176**	**0.059**	0.057	**0.116**	**0.292**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.668	0.681	**1.349**	**0.453**	0.440	**0.893**	**2.242**
B757P	Boeing 757-200: PW2037/2040 engines	0.461	0.469	**0.930**	**0.312**	0.304	**0.616**	**1.546**
B763G	Boeing 767-300: CF6-80 engines	1.327	1.266	**2.592**	**1.457**	1.518	**2.975**	**5.567**
B763P	Boeing 767-300: PW4000 engines	0.059	0.056	**0.115**	**0.065**	0.067	**0.132**	**0.247**
B772G	Boeing 777-200: GE90 engines	1.043	1.856	**2.899**	**2.232**	1.420	**3.652**	**6.551**
B773G	Boeing 777-200LR/300ER: GE90 engines	1.266	1.719	**2.985**	**0.453**	0.000	**0.453**	**3.438**
B788	Boeing 787-8	0.412	0.609	**1.021**	**0.197**	0.000	**0.197**	**1.218**
B789	Boeing 787-9	0.000	0.000	**0.000**	**0.000**	0.000	**0.000**	**0.000**
EA30	Airbus A300	0.799	1.485	**2.284**	**1.827**	1.142	**2.969**	**5.254**
EA319C	Airbus A319: CFM56 engines	8.431	8.642	**17.073**	**0.867**	0.655	**1.522**	**18.595**
EA319V	Airbus A319: IAE V2500 engines	0.960	0.984	**1.945**	**0.099**	0.075	**0.173**	**2.118**
EA319NEO	Airbus 319 NEO	0.527	0.546	**1.074**	**0.077**	0.058	**0.135**	**1.209**
EA320C	Airbus A320: CFM56 engines	11.355	11.640	**22.995**	**1.168**	0.882	**2.050**	**25.046**
EA320V	Airbus A320: IAE V2500 engines	2.087	2.140	**4.227**	**0.215**	0.162	**0.377**	**4.603**
EA320NEO	Airbus 320 NEO	11.397	11.804	**23.200**	**1.665**	1.258	**2.922**	**26.122**
EA320NEOLR	Airbus 320 NEO Long Range	1.282	1.314	**2.596**	**0.132**	0.100	**0.231**	**2.828**
EA321C	Airbus A321: CFM56 engines	4.534	4.648	**9.182**	**0.466**	0.352	**0.819**	**10.001**
EA321V	Airbus A321: IAE V2500 engines	0.037	0.038	**0.075**	**0.004**	0.003	**0.007**	**0.082**
EA321NEO	Airbus 321 NEO	0.383	0.396	**0.779**	**0.056**	0.042	**0.098**	**0.877**
EA33	Airbus A330	2.519	3.554	**6.073**	**1.589**	0.555	**2.144**	**8.217**
EA34	Airbus A340-200/300	0.089	0.078	**0.167**	**0.042**	0.052	**0.094**	**0.261**
EA359	Airbus A350-900	0.000	0.000	**0.000**	**0.000**	0.000	**0.000**	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.000	0.530	**0.530**	**0.530**	0.000	**0.530**	**1.060**
EA38R	Airbus A380: Trent 900 engines	0.000	0.530	**0.530**	**0.530**	0.000	**0.530**	**1.060**
ERJ	Embraer ERJ 135/145	1.857	1.678	**3.536**	**0.715**	0.893	**1.608**	**5.144**
EXE3	Chapter 3 executive jets	8.151	7.192	**15.342**	**3.836**	4.794	**8.630**	**23.972**
LTT	Large twin-turboprop	7.824	7.873	**15.697**	**1.096**	1.046	**2.142**	**17.839**
MD11	McDonnell Douglas MD-11	0.845	0.845	**1.690**	**1.267**	1.267	**2.535**	**4.224**
STT	Small twin-turboprop	1.084	0.956	**2.040**	**0.510**	0.638	**1.148**	**3.188**

Schedule A7.3/SCH5: Operations, 2023 Development Case, 36.4 mppa

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	**317.147**	**331.717**	**648.863**	**58.479**	**43.910**	**102.389**	**751.252**
B733	Boeing 737-300/400/500	0.397	0.410	**0.807**	0.042	0.029	**0.071**	**0.878**
B736	Boeing 737-600/700	3.273	3.101	**6.375**	5.215	5.387	**10.602**	**16.976**
B7378MAX	Boeing 737-800 MAX	43.350	45.349	**88.698**	6.531	4.532	**11.063**	**99.762**
B738	Boeing 737-800/900	198.785	205.211	**403.995**	20.993	14.566	**35.559**	**439.554**
B744G	Boeing 747-400: CF6-80F engines	0.656	1.245	**1.901**	1.258	0.669	**1.928**	**3.829**
B744P	Boeing 747-400: PW4000 engines	0.247	0.469	**0.716**	0.474	0.252	**0.726**	**1.441**
B744R	Boeing 747-400: RB211 engines	0.439	0.834	**1.273**	0.843	0.448	**1.291**	**2.564**
B757C	Boeing 757-200: RB211-535C engines	0.078	0.085	**0.163**	0.073	0.065	**0.138**	**0.301**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.597	0.655	**1.251**	0.557	0.499	**1.056**	**2.307**
B757P	Boeing 757-200: PW2037/2040 engines	0.411	0.451	**0.863**	0.384	0.344	**0.728**	**1.591**
B763G	Boeing 767-300: CF6-80 engines	1.028	0.966	**1.994**	1.763	1.824	**3.587**	**5.581**
B763P	Boeing 767-300: PW4000 engines	0.046	0.043	**0.089**	0.078	0.081	**0.159**	**0.248**
B772G	Boeing 777-200: GE90 engines	1.063	2.140	**3.203**	2.214	1.137	**3.351**	**6.555**
B773G	Boeing 777-200LR/300ER: GE90 engines	0.948	1.651	**2.599**	0.703	0.000	**0.703**	**3.302**
B788	Boeing 787-8	0.366	0.712	**1.077**	0.346	0.000	**0.346**	**1.423**
B789	Boeing 787-9	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA30	Airbus A300	0.816	1.722	**2.537**	1.812	0.906	**2.718**	**5.255**
EA319C	Airbus A319: CFM56 engines	8.520	8.795	**17.314**	0.900	0.624	**1.524**	**18.838**
EA319V	Airbus A319: IAE V2500 engines	0.970	1.002	**1.972**	0.103	0.071	**0.174**	**2.146**
EA319NEO	Airbus 319 NEO	0.535	0.559	**1.094**	0.081	0.056	**0.136**	**1.230**
EA320C	Airbus A320: CFM56 engines	11.421	11.790	**23.212**	1.206	0.837	**2.043**	**25.255**
EA320V	Airbus A320: IAE V2500 engines	2.099	2.167	**4.266**	0.222	0.154	**0.376**	**4.642**
EA320NEO	Airbus 320 NEO	11.399	11.924	**23.323**	1.717	1.192	**2.909**	**26.232**
EA320NEOLR	Airbus 320 NEO Long Range	1.456	1.503	**2.959**	0.154	0.107	**0.261**	**3.219**
EA321C	Airbus A321: CFM56 engines	4.761	4.914	**9.675**	0.503	0.349	**0.852**	**10.526**
EA321V	Airbus A321: IAE V2500 engines	0.039	0.040	**0.079**	0.004	0.003	**0.007**	**0.086**
EA321NEO	Airbus 321 NEO	0.401	0.420	**0.821**	0.060	0.042	**0.102**	**0.923**
EA33	Airbus A330	2.255	3.984	**6.238**	2.180	0.451	**2.632**	**8.870**
EA34	Airbus A340-200/300	0.089	0.079	**0.168**	0.042	0.053	**0.095**	**0.263**
EA359	Airbus A350-900	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.479	0.479	**0.958**	0.000	0.000	**0.000**	**0.958**
EA38R	Airbus A380: Trent 900 engines	0.479	0.479	**0.958**	0.000	0.000	**0.000**	**0.958**
ERJ	Embraer ERJ 135/145	1.890	1.710	**3.600**	0.721	0.901	**1.622**	**5.222**
EXE3	Chapter 3 executive jets	8.220	7.253	**15.472**	3.868	4.835	**8.703**	**24.175**
LTT	Large twin-turboprop	8.017	8.083	**16.100**	1.336	1.269	**2.604**	**18.704**
MD11	McDonnell Douglas MD-11	0.528	0.528	**1.056**	1.584	1.584	**3.169**	**4.225**
STT	Small twin-turboprop	1.093	0.964	**2.057**	0.514	0.643	**1.157**	**3.215**

Schedule A7.3/SCH6: Operations, 2024 Development Case, 38.1 mppa

Average Summers Day

		Day		
		A	D	Total
	Aircraft Type	332.202	346.588	678.789
B733	Boeing 737-300/400/500	0.394	0.405	**0.799**
B736	Boeing 737-600/700	3.441	3.265	**6.706**
B7378MAX	Boeing 737-800 MAX	56.517	58.914	**115.432**
B738	Boeing 737-800/900	197.423	203.178	**400.601**
B744G	Boeing 747-400: CF6-80F engines	0.692	1.318	**2.010**
B744P	Boeing 747-400: PW4000 engines	0.261	0.496	**0.757**
B744R	Boeing 747-400: RB211 engines	0.464	0.883	**1.346**
B757C	Boeing 757-200: RB211-535C engines	0.070	0.072	**0.142**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.539	0.552	**1.091**
B757P	Boeing 757-200: PW2037/2040 engines	0.372	0.380	**0.752**
B763G	Boeing 767-300: CF6-80 engines	1.003	0.941	**1.944**
B763P	Boeing 767-300: PW4000 engines	0.045	0.042	**0.086**
B772G	Boeing 777-200: GE90 engines	1.126	2.271	**3.396**
B773G	Boeing 777-200LR/300ER: GE90 engines	0.552	0.949	**1.501**
B788	Boeing 787-8	0.561	1.075	**1.636**
B789	Boeing 787-9	0.000	0.000	**0.000**
EA30	Airbus A300	0.866	1.829	**2.695**
EA319C	Airbus A319: CFM56 engines	5.383	5.540	**10.923**
EA319V	Airbus A319: IAE V2500 engines	0.613	0.631	**1.244**
EA319NEO	Airbus 319 NEO	0.641	0.668	**1.308**
EA320C	Airbus A320: CFM56 engines	12.519	12.883	**25.402**
EA320V	Airbus A320: IAE V2500 engines	2.301	2.368	**4.669**
EA320NEO	Airbus 320 NEO	14.455	15.068	**29.522**
EA320NEOLR	Airbus 320 NEO Long Range	1.668	1.717	**3.385**
EA321C	Airbus A321: CFM56 engines	4.936	5.080	**10.016**
EA321V	Airbus A321: IAE V2500 engines	0.041	0.042	**0.082**
EA321NEO	Airbus 321 NEO	0.532	0.554	**1.086**
EA33	Airbus A330	2.579	4.504	**7.083**
EA34	Airbus A340-200/300	0.091	0.080	**0.172**
EA359	Airbus A350-900	0.000	0.000	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.814	0.814	**1.628**
EA38R	Airbus A380: Trent 900 engines	0.814	0.814	**1.628**
ERJ	Embraer ERJ 135/145	1.944	1.760	**3.704**
EXE3	Chapter 3 executive jets	8.377	7.392	**15.769**
LTT	Large twin-turboprop	8.565	8.630	**17.195**
MD11	McDonnell Douglas MD-11	0.492	0.492	**0.985**
STT	Small twin-turboprop	1.114	0.983	**2.097**

Schedule A7.3/SCH7: Operations, 2028 Do Minimum, 35 mppa

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	**311.334**	**323.873**	**635.207**	**56.996**	**44.457**	**101.454**	**736.660**
B733	Boeing 737-300/400/500	0.207	0.211	**0.418**	0.017	0.013	**0.030**	**0.448**
B736	Boeing 737-600/700	4.270	4.094	**8.364**	5.842	6.018	**11.860**	**20.224**
B7378MAX	Boeing 737-800 MAX	137.292	141.472	**278.764**	17.098	12.919	**30.017**	**308.781**
B738	Boeing 737-800/900	97.696	99.676	**197.372**	8.101	6.121	**14.221**	**211.593**
B744G	Boeing 747-400: CF6-80F engines	0.815	1.426	**2.241**	1.457	0.847	**2.304**	**4.545**
B744P	Boeing 747-400: PW4000 engines	0.307	0.537	**0.844**	0.549	0.319	**0.867**	**1.711**
B744R	Boeing 747-400: RB211 engines	0.546	0.955	**1.501**	0.976	0.567	**1.543**	**3.044**
B757C	Boeing 757-200: RB211-535C engines	0.060	0.054	**0.114**	0.047	0.052	**0.099**	**0.213**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.458	0.415	**0.874**	0.359	0.402	**0.761**	**1.635**
B757P	Boeing 757-200: PW2037/2040 engines	0.316	0.286	**0.602**	0.248	0.277	**0.525**	**1.127**
B763G	Boeing 767-300: CF6-80 engines	1.022	0.961	**1.983**	1.249	1.310	**2.560**	**4.542**
B763P	Boeing 767-300: PW4000 engines	0.045	0.043	**0.088**	0.055	0.058	**0.114**	**0.202**
B772G	Boeing 777-200: GE90 engines	1.351	2.468	**3.819**	2.574	1.457	**4.031**	**7.850**
B773G	Boeing 777-200LR/300ER: GE90 engines	0.733	0.956	**1.688**	0.223	0.000	**0.223**	**1.911**
B788	Boeing 787-8	0.705	0.998	**1.703**	0.293	0.000	**0.293**	**1.996**
B789	Boeing 787-9	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA30	Airbus A300	1.056	1.995	**3.050**	2.112	1.173	**3.285**	**6.335**
EA319C	Airbus A319: CFM56 engines	4.320	4.408	**8.728**	0.358	0.271	**0.629**	**9.357**
EA319V	Airbus A319: IAE V2500 engines	0.492	0.502	**0.994**	0.041	0.031	**0.072**	**1.066**
EA319NEO	Airbus 319 NEO	1.893	1.951	**3.843**	0.236	0.178	**0.414**	**4.257**
EA320C	Airbus A320: CFM56 engines	3.070	3.132	**6.203**	0.255	0.192	**0.447**	**6.649**
EA320V	Airbus A320: IAE V2500 engines	0.564	0.576	**1.140**	0.047	0.035	**0.082**	**1.222**
EA320NEO	Airbus 320 NEO	25.018	25.780	**50.798**	3.116	2.354	**5.470**	**56.268**
EA320NEOLR	Airbus 320 NEO Long Range	1.316	1.342	**2.658**	0.109	0.082	**0.192**	**2.849**
EA321C	Airbus A321: CFM56 engines	3.541	3.613	**7.154**	0.294	0.222	**0.515**	**7.669**
EA321V	Airbus A321: IAE V2500 engines	0.029	0.030	**0.059**	0.002	0.002	**0.004**	**0.063**
EA321NEO	Airbus 321 NEO	1.404	1.447	**2.851**	0.175	0.132	**0.307**	**3.158**
EA33	Airbus A330	3.034	4.192	**7.226**	1.726	0.569	**2.295**	**9.520**
EA34	Airbus A340-200/300	0.089	0.079	**0.168**	0.042	0.052	**0.094**	**0.262**
EA359	Airbus A350-900	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.000	0.911	**0.911**	0.911	0.000	**0.911**	**1.822**
EA38R	Airbus A380: Trent 900 engines	0.000	0.911	**0.911**	0.911	0.000	**0.911**	**1.822**
ERJ	Embraer ERJ 135/145	1.868	1.689	**3.557**	0.717	0.897	**1.614**	**5.172**
EXE3	Chapter 3 executive jets	8.182	7.219	**15.401**	3.850	4.813	**8.663**	**24.064**
LTT	Large twin-turboprop	8.020	8.062	**16.082**	1.446	1.405	**2.851**	**18.933**
MD11	McDonnell Douglas MD-11	0.525	0.525	**1.049**	1.049	1.049	**2.099**	**3.148**
STT	Small twin-turboprop	1.088	0.960	**2.048**	0.512	0.640	**1.152**	**3.200**

Schedule A7.3/SCH8: Operations, 2028 Development Case, 43 mppa

Average Summers Day

		Day			Night			
		A	D	Total	A	D	Total	Total
	Aircraft Type	345.250	366.546	**711.795**	63.948	42.651	**106.599**	**818.395**
B733	Boeing 737-300/400/500	0.256	0.264	**0.520**	0.028	0.019	**0.047**	**0.566**
B736	Boeing 737-600/700	2.764	2.772	**5.536**	5.083	5.075	**10.157**	**15.693**
B7378MAX	Boeing 737-800 MAX	159.730	167.217	**326.947**	24.459	16.972	**41.431**	**368.378**
B738	Boeing 737-800/900	113.852	117.612	**231.464**	12.282	8.522	**20.804**	**252.269**
B744G	Boeing 747-400: CF6-80F engines	0.685	1.446	**2.130**	1.370	0.609	**1.978**	**4.109**
B744P	Boeing 747-400: PW4000 engines	0.258	0.544	**0.802**	0.516	0.229	**0.745**	**1.547**
B744R	Boeing 747-400: RB211 engines	0.459	0.968	**1.427**	0.917	0.408	**1.325**	**2.751**
B757C	Boeing 757-200: RB211-535C engines	0.012	0.012	**0.024**	0.024	0.024	**0.048**	**0.072**
B757E	Boeing 757-200: RB211-535E4/E4B engines	0.093	0.093	**0.185**	0.185	0.185	**0.370**	**0.555**
B757P	Boeing 757-200: PW2037/2040 engines	0.064	0.064	**0.128**	0.128	0.128	**0.255**	**0.383**
B763G	Boeing 767-300: CF6-80 engines	0.495	0.495	**0.990**	0.990	0.990	**1.980**	**2.971**
B763P	Boeing 767-300: PW4000 engines	0.022	0.022	**0.044**	0.044	0.044	**0.088**	**0.132**
B772G	Boeing 777-200: GE90 engines	1.236	2.610	**3.846**	2.473	1.099	**3.572**	**7.418**
B773G	Boeing 777-200LR/300ER: GE90 engines	0.599	1.109	**1.708**	0.510	0.000	**0.510**	**2.219**
B788	Boeing 787-8	0.761	1.585	**2.346**	0.824	0.000	**0.824**	**3.170**
B789	Boeing 787-9	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA30	Airbus A300	1.030	2.175	**3.205**	2.061	0.916	**2.976**	**6.182**
EA319C	Airbus A319: CFM56 engines	4.701	4.856	**9.557**	0.507	0.352	**0.859**	**10.416**
EA319V	Airbus A319: IAE V2500 engines	0.535	0.553	**1.089**	0.058	0.040	**0.098**	**1.186**
EA319NEO	Airbus 319 NEO	2.055	2.151	**4.206**	0.315	0.218	**0.533**	**4.739**
EA320C	Airbus A320: CFM56 engines	3.422	3.535	**6.957**	0.369	0.256	**0.625**	**7.583**
EA320V	Airbus A320: IAE V2500 engines	0.629	0.650	**1.279**	0.068	0.047	**0.115**	**1.394**
EA320NEO	Airbus 320 NEO	28.082	29.398	**57.480**	4.300	2.984	**7.284**	**64.764**
EA320NEOLR	Airbus 320 NEO Long Range	1.945	2.009	**3.954**	0.210	0.146	**0.355**	**4.309**
EA321C	Airbus A321: CFM56 engines	4.271	4.412	**8.683**	0.461	0.320	**0.780**	**9.463**
EA321V	Airbus A321: IAE V2500 engines	0.035	0.036	**0.071**	0.004	0.003	**0.006**	**0.078**
EA321NEO	Airbus 321 NEO	1.690	1.769	**3.459**	0.259	0.180	**0.438**	**3.897**
EA33	Airbus A330	2.839	5.375	**8.214**	2.939	0.403	**3.342**	**11.555**
EA34	Airbus A340-200/300	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA359	Airbus A350-900	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
EA38GP	Airbus A380: GP7000 engines	0.954	0.954	**1.907**	0.000	0.000	**0.000**	**1.907**
EA38R	Airbus A380: Trent 900 engines	0.954	0.954	**1.907**	0.000	0.000	**0.000**	**1.907**
ERJ	Embraer ERJ 135/145	0.435	0.435	**0.869**	0.000	0.000	**0.000**	**0.869**
EXE3	Chapter 3 executive jets	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**
LTT	Large twin-turboprop	9.873	9.955	**19.828**	1.533	1.451	**2.983**	**22.811**
MD11	McDonnell Douglas MD-11	0.517	0.517	**1.034**	1.034	1.034	**2.068**	**3.102**
STT	Small twin-turboprop	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.000**

Cole Jarman

Schedule A7.3/SCH9: Daytime Noise Metrics at Sensitive Receptors that are not Dwellings

	Receptor	25+ $L_{Aeq,16h}$	25+ N65	2016 $L_{Aeq,16h}$	2016 N65	2023 DM $L_{Aeq,16h}$	2023 DM N65	2023 DC $L_{Aeq,16h}$	2023 DC N65	2028 DM $L_{Aeq,16h}$	2028 DM N65	2028 DC $L_{Aeq,16h}$	2028 DC N65
	SCHOOLS												
1	Howe Green School	62.5	345	60.6	230	61.5	317	61.7	328	60.7	320	61.3	360
2	Spellbrook Primary School	58.9	208	56.9	138	58.0	184	58.1	190	57.2	181	57.8	203
3	Little Hallingbury C of E Primary school	57.9	212	55.9	172	56.5	214	56.7	222	55.7	179	56.3	205
4	North and West Essex Adult Community College	<50	<10	50.0	10	<50	11	<50	11	<50	<10	<50	10
5	Thaxted Primary School	55.0	58	53.5	147	54.7	176	54.8	181	54	99	54.5	112
6	The Leventhorpe School	54.6	114	52.6	126	53.7	150	53.8	155	53	120	53.5	137
7	Great Sampford Primary School	53.1	51	52.1	126	53.2	138	53.3	142	52.5	78	53.1	88
8	Thorn Grove Primary School	52.7	27	51.0	<10	52.1	<10	52.2	<10	51.2	<10	51.7	<10
9	Mandeville Primary School	53.5	105	51.7	61	52.8	84	52.9	86	52	83	52.6	95
10	The Bishops Stortford High School	51.5	19	50.3	<10	51.4	<10	51.5	<10	50.6	<10	51.1	<10
11	Birchwood High School	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
12	High Wych C of E Primary School	52.4	77	51.9	59	53.1	83	53.2	85	52.4	83	52.9	93
13	Summercroft Primary School	51.8	17	50.3	<10	51.4	<10	51.5	<10	50.5	<10	51.0	<10
14	Hatfield Heath Primary School	53.9	106	52.7	78	51.3	65	51.4	68	<50	44	51.0	51
15	Thorley Hill Primary School	51	17	50.0	<10	51	<10	51.1	<10	50.1	<10	50.7	<10
16	Herts and Essex High School	52.5	25	50.9	<10	51.9	<10	52.1	<10	51.1	<10	51.6	<10
17	Reedings Junior School	50.8	12	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
18	Hockerill Anglo European College	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
19	Richard Whittington Primary School	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
20	All Saints C of E Primary School	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10

Schedule A7.3/SCH9 (cont.):

	Receptor	25+ $L_{Aeq,16h}$	25+ N65	2016 $L_{Aeq,16h}$	2016 N65	2023 DM $L_{Aeq,16h}$	2023 DM N65	2023 DC $L_{Aeq,16h}$	2023 DC N65	2028 DM $L_{Aeq,16h}$	2028 DM N65	2028 DC $L_{Aeq,16h}$	2028 DC N65
	HEALTHCARE												
21	Falcon House Little Hallingbury	60.1	270	58.0	218	58.9	275	59	284	58.1	246	58.6	278
22	Humfrey Lodge, Thaxted	58	253	56.2	158	57.3	225	57.4	232	56.6	227	57.2	252
23	Herts and Essex Hospital	52.7	26	51.1	<10	52.1	<10	52.2	<10	51.2	<10	51.8	<10
24	Lyne Driscoll High Wych	53.1	80	52.2	59	53.4	83	53.5	86	52.7	84	53.2	94
25	Saint Elizabeth's Centre Much Hadham	<50	14	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10
	PLACES OF WORSHIP												
26	St Giles Church Great Hallingbury	65.9	356	63.4	230	64.4	317	64.6	328	63.7	320	64.2	361
27	St Mary the Virgin Church Broxted	65.5	337	62.7	222	63.7	311	63.8	321	63	314	63.5	350
28	Ebenezer Chapel Molehill Green	59.7	116	58.1	66	59.1	254	59.2	262	58.2	180	58.8	204
29	St Mary the Virgin Church Chickney	56	76	55.6	73	56.7	235	56.8	242	55.9	148	56.5	168
30	Thaxted Baptist Church	57.5	246	55.7	158	56.9	224	57	230	56.2	226	56.7	252
31	St Mary the Virgin Church Little Hallingbury	57.9	211	56.0	170	56.5	217	56.7	225	55.7	194	56.2	223
32	Thaxted Church (St. John the Baptist) Thaxted	58.5	257	56.5	158	57.7	225	57.8	232	57	227	57.5	252
33	Thaxted URC Church	58.6	257	56.6	158	57.8	225	57.9	232	57.1	227	57.6	252
	COMMUNITY FACILITIES												
34	Thaxted Anglican Church Hall	58.6	257	56.6	158	57.8	225	57.9	232	57.1	227	57.5	252
35	Little Hallingbury Village Hall	57.3	191	55.3	161	55.8	186	55.9	192	54.9	137	55.4	157
36	Thaxted Baptist Church Hall	57.5	246	55.7	158	56.9	224	57	230	56.2	226	55.9	252
37	The Barn Theatre Little Easton Major	<50	17	<50	<10	<50	<10	<50	<10	<50	<10	<50	<10

Schedule A7.3/SCH10: Night-time Noise Metrics at Sensitive Receptors that are not Dwellings[1]

		25+		2016		2023 DM		2023 DC		2028 DM		2028 DC	
	Receptor	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60	$L_{Aeq,8h}$	N60
	HEALTHCARE												
21	Falcon House Little Hallingbury	54.5	43	53.5	37	54.7	46	54.8	48	54.4	47	54.5	47
22	Humfrey Lodge, Thaxted	52.6	32	52.9	36	54	40	54.3	43	53.9	42	54.3	42
23	Herts and Essex Hospital	46.6	24	45.8	21	47.7	25	47.8	25	47.3	20	47.1	20
24	Lyne Driscoll High Wych	48.6	14	48.8	15	49.8	17	50.1	18	49.7	18	50.1	18
25	Saint Elizabeth's Centre Much Hadham	<45	10	<45	10	<45	<10	<45	<10	<45	<10	<45	<10

[1] This list limited to non-dwelling receptors that are routinely occupied during the night and therefore potentially sensitive to nigh-time noise levels

Schedule A7.3/SCH11: L_{Amax} Departure flyover noise levels at Sensitive Receptors that are not Dwellings for 100% worst case operating mode

	NOISE SENSITIVE RECEPTOR NAME	POSTCODE	EASTING	NORTHING	BUZ 45%	CLN 54%	DET 1%	BUZ 45%	CLN 54%	DET 1%	RWY
						737-800			737-MAX		
	SCHOOLS										
1	Howe Green School	CM22 7UF	550497	218754	**75**	**74**	**75**	72	71	72	22
2	Spellbrook Primary School	CM23 4BA	548610	217260	**73**	<60	62	70	<60	<60	22
3	Little Hallingbury C of E Primary school	CM22 7RE	550130	217530	71	69	72	68	66	69	22
4	North and West Essex Adult Community College	CM20 1NW	544050	210640	<60	<60	<60	<60	<60	<60	22
5	Thaxted Primary School	CM6 2LH	561415	230820	<60	<60	<60	<60	<60	<60	04
6	The Leventhorpe School	CM21 9BY	548160	215810	67	<60	<60	64	<60	<60	22
7	Great Sampford Primary School	CB10 2RL	564330	235460	<60	<60	<60	<60	<60	<60	04
8	Thorn Grove Primary School	CM23 5LD	549670	220690	67	65	65	64	62	62	22
9	Mandeville Primary School	CM21 0BL	547860	215430	65	<60	<60	62	<60	<60	22
10	The Bishops Stortford High School	CM23 3LU	548950	219770	67	62	63	64	<60	<60	22
11	Birchwood High School	CM23 5BD	550400	212840	<60	<60	61	<60	<60	<60	22
12	High Wych C of E Primary School	CM21 0JB	546210	214120	<60	<60	<60	<60	<60	<60	22
13	Summercroft Primary School	CM23 5BJ	550150	221590	66	65	65	63	62	62	22
14	Hatfield Heath Primary School	CM22 7EA	552200	215095	67	61	62	64	<60	<60	22
15	Thorley Hill Primary School	CM23 3NH	548860	219760	67	64	65	64	61	62	22
16	Herts and Essex High School	CM23 5NJ	549530	220520	63	<60	<60	60	<60	<60	22
17	Reedings Junior School	CM21 9DD	548380	215300	63	61	62	<60	<60	<60	22
18	Hockerill Anglo European College	CM23 5HX	549500	221530	65	<60	<60	62	<60	<60	22
19	Richard Whittington Primary School	CM23 3NP	548300	219780	63	62	62	<60	<60	<60	22
20	All Saints C of E Primary School	CM23 5BE	549760	221840	67	61	62	64	<60	<60	22

Schedule A7.3/SCH11 (cont.):

	NOISE SENSITIVE RECEPTOR NAME	POSTCODE	EASTING	NORTHING	BUZ 45% (737-800)	CLN 54% (737-800)	DET 1% (737-800)	BUZ 45% (737-MAX)	CLN 54% (737-MAX)	DET 1% (737-MAX)	RWY
	HEALTHCARE										
21	Falcon House Little Hallingbury	CM22 7PP	549850	217940	74	68	70	71	65	67	22
22	Humfrey Lodge, Thaxted	CM6 2PX	561000	231420	<60	<60	<60	<60	<60	<60	04
23	Herts and Essex Hospital	CM23 5JH	549790	220870	67	65	65	64	62	62	22
24	Lyne Driscoll High Wych	CM21 0HN	546450	214460	<60	<60	<60	<60	<60	<60	22
25	Saint Elizabeth's Centre Much Hadham	SG10 6EW	543870	216880	62	<60	<60	<60	<60	<60	22
	PLACES OF WORSHIP										
26	St Giles Church Great Hallingbury	CM22 7TZ	550980	219660	77	77	77	74	74	74	22
27	St Mary the Virgin Church Broxted	CM6 2BU	557730	227410	76	73	68	73	70	65	04
28	Ebenezer Chapel Molehill Green	CM22 6PH	556340	224960	76	76	77	73	73	74	04
29	St Mary the Virgin Church Chickney	CM6 2BY	557310	228080	74	67	63	71	64	60	04
30	Thaxted Baptist Church	CM6 2ND	561100	230850	<60	<60	<60	<60	<60	<60	04
31	St Mary the Virgin Church Little Hallingbury	CM22 7RE	550200	217530	70	70	72	67	67	69	22
32	Thaxted Church (St. John the Baptist) Thaxted	CM6 2QY	560920	231060	<60	<60	<60	<60	<60	<60	04
33	Thaxted URC Church	CM6 2PY	560720	230930	<60	<60	<60	<60	<60	<60	04
	COMMUNITY FACLITIES										
34	Thaxted Anglican Church Hall	CM6 2PY	560720	230930	<60	<60	<60	<60	<60	<60	04
35	Little Hallingbury Village Hall	CM22 7RD	550170	217360	70	69	72	67	66	69	22
36	Thaxted Baptist Church Hall	CM6 2ND	561100	230850	<60	<60	<60	<60	<60	<60	04
37	The Barn Theatre Little Easton Major	CM6 2JN	560300	223570	<60	61	72	<60	<60	69	04

Schedule A7.3/SCH12: L_{Amax} Arrival flyover noise levels at Sensitive Receptors that are not Dwellings for 100% worst case operating mode

	NOISE SENSITIVE RECEPTOR NAME	POSTCODE	EASTING	NORTHING	04	22	04	22	RWY
					737-800		737-MAX		
	SCHOOLS								
1	Howe Green School	CM22 7UF	550497	218754	69	38	67	35	04
2	Spellbrook Primary School	CM23 4BA	548610	217260	**76**	31	**73**	28	04
3	Little Hallingbury C of E Primary school	CM22 7RE	550130	217530	66	34	64	31	04
4	North and West Essex Adult Community College	CM20 1NW	544050	210640	59	20	57	17	04
5	Thaxted Primary School	CM6 2LH	561415	230820	27	62	24	60	22
6	The Leventhorpe School	CM21 9BY	548160	215810	**74**	29	**72**	26	04
7	Great Sampford Primary School	CB10 2RL	564330	235460	21	66	18	64	22
8	Thorn Grove Primary School	CM23 5LD	549670	220690	50	39	48	36	04
9	Mandeville Primary School	CM21 0BL	547860	215430	**73**	28	71	25	04
10	The Bishops Stortford High School	CM23 3LU	548950	219770	52	36	49	33	04
11	Birchwood High School	CM23 5BD	550400	212840	46	43	44	40	04
12	High Wych C of E Primary School	CM21 0JB	546210	214120	71	25	69	22	04
13	Summercroft Primary School	CM23 5BJ	550150	221590	46	41	44	38	04
14	Hatfield Heath Primary School	CM22 7EA	552200	215095	39	31	37	28	04
15	Thorley Hill Primary School	CM23 3NH	548860	219760	51	35	48	32	04
16	Herts and Essex High School	CM23 5NJ	549530	220520	46	39	44	36	04
17	Reedings Junior School	CM21 9DD	548380	215300	66	29	64	26	04
18	Hockerill Anglo European College	CM23 5HX	549500	221530	44	39	42	36	04
19	Richard Whittington Primary School	CM23 3NP	548300	219780	48	34	46	31	04
20	All Saints C of E Primary School	CM23 5BE	549760	221840	43	41	41	38	04

Schedule A7.3/SCH12 (cont.):

	NOISE SENSITIVE RECEPTOR NAME	POSTCODE	EASTING	NORTHING	04	22	04	22	RWY
					737-800		737-MAX		
	HEALTHCARE								
21	Falcon House Little Hallingbury	CM22 7PP	549850	217940	27	71	24	69	04
22	Humfrey Lodge, Thaxted	CM6 2PX	561000	231420	50	39	47	36	22
23	Herts and Essex Hospital	CM23 5JH	549790	220870	72	26	70	23	04
24	Lyne Driscoll High Wych	CM21 0HN	546450	214460	39	25	37	22	04
25	Saint Elizabeth's Centre Much Hadham	SG10 6EW	543870	216880	27	71	24	69	04
	PLACES OF WORSHIP								
26	St Giles Church Great Hallingbury	CM22 7TZ	550980	219660	87	40	85	37	04
27	St Mary the Virgin Church Broxted	CM6 2BU	557730	227410	36	75	33	73	22
28	Ebenezer Chapel Molehill Green	CM22 6PH	556340	224960	45	56	42	53	22
29	St Mary the Virgin Church Chickney	CM6 2BY	557310	228080	36	74	33	72	22
30	Thaxted Baptist Church	CM6 2ND	561100	230850	27	65	24	63	22
31	St Mary the Virgin Church Little Hallingbury	CM22 7RE	550200	217530	68	34	66	31	04
32	Thaxted Church (St. John the Baptist) Thaxted	CM6 2QY	560920	231060	27	69	24	67	22
33	Thaxted URC Church	CM6 2PY	560720	230930	27	71	24	68	22
	COMMUNITY FACLITIES								
34	Thaxted Anglican Church Hall	CM6 2PY	560720	230930	27	71	24	69	22
35	Little Hallingbury Village Hall	CM22 7RD	550170	217360	64	34	62	31	04
36	Thaxted Baptist Church Hall	CM6 2ND	561100	230850	27	65	24	63	22
37	The Barn Theatre Little Easton Major	CM6 2JN	560300	223570	34	35	31	32	22

Schedule A7.3/SCH13: Number of L_{Amax} departure/arrival events for worst case 100% operating mode[1]

Scenario		All variants	737-300/800 A319/A320/A321	MAX NEO		All variants	737-300/800 A319/A320/A321	MAX NEO
25+	TOTAL	285	285	0	PER HOUR	18	18	0
2016		196	196	0		12	12	0
2023 Do Min		282	226	57		18	14	4
2023 Dev Case		293	234	59		18	14	4
2024 Dev Case		306	231	76		19	14	5
2028 Do Min		285	113	172		18	7	11
2028 Dev Case		331	134	197		21	8	13
		16h	09h-16h					
2016 Busy Day		230	87					
per hour		14	12					
2028 Busy Day		341	149					
per hour		21	21					

[1] Not all events are expected to give rise to the same L_{Amax} noise level, as this will vary depending on the SID routing being operated.

Schedule A7.3/SCH14: Number of people affected by aircraft noise at different levels of exposure

Total number of people affected [1]

$L_{Aeq,16h}$ (dB)	2023 Do Min	2023 Dev Case	2024 Dev Case	2028 Do Min	2028 Dev Case	25+	2016
>51	16,944	17,644	18,096	11,884	15,336	15,480	12,600
>54	6,734	6,934	7,334	5,634	6,234	7,434	5,700
>57	3,434	3,584	3,784	1,834	2,884	3,634	1,750
>60	984	1034	1,084	734	884	1,334	600
>63	384	384	384	284	334	484	200
>66	84	98	76	50	57	234	50
>69	0	0	0	0	0	0	0
>72	0	0	0	0	0	0	0

[1] This is the cumulative total of people affected by noise above the indicated level

Differences between studied scenarios [2]

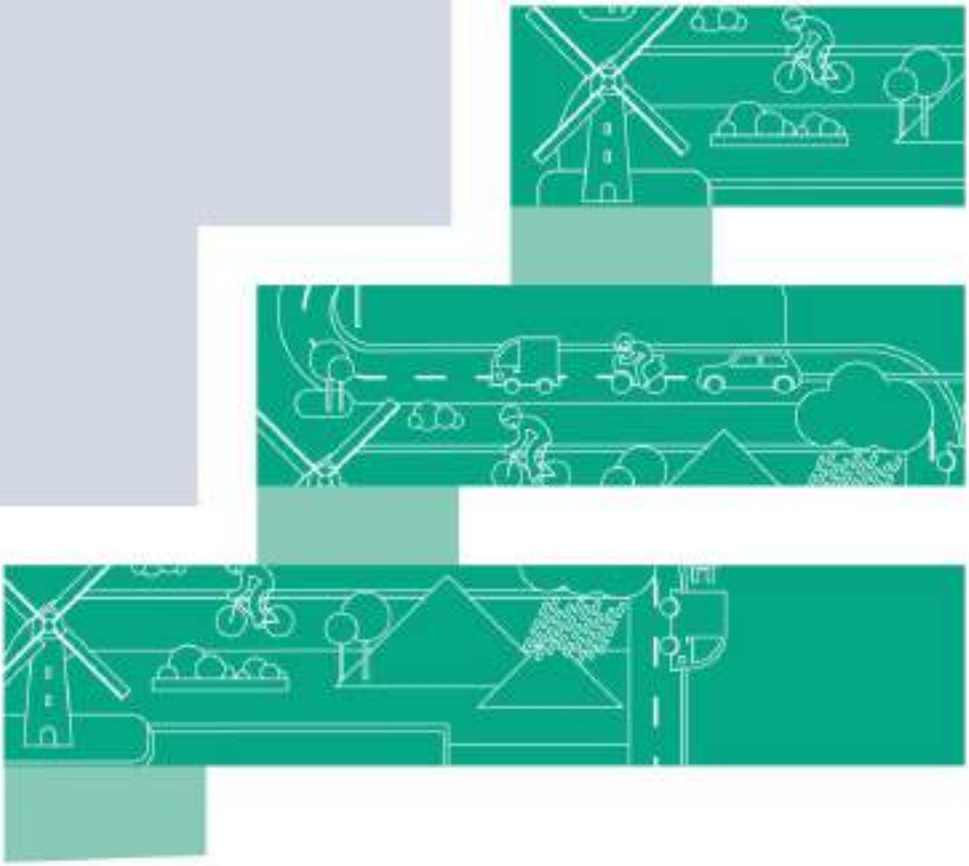
$L_{Aeq,16h}$ (dB)	2023 DC vs DM	2023 DC vs 2016	2024 DC vs 2023 DM	2024 DC vs 2016	2028 DC vs DM	2028 DC vs 2016	25+ vs 2028 DC	25+ vs 2024 DC	25+ vs 2016
51 - 54	700	5,044	1,152	5,496	3,452	2,736	144	-2,616	2,880
54 - 57	200	1,234	600	1,634	600	534	1,200	100	1,734
57 - 60	150	1,834	350	2,034	1,050	1,134	750	-150	1,884
60 - 63	50	434	100	484	150	284	450	250	734
63 - 66	0	184	0	184	50	134	150	100	284
66 - 69	14	48	-8	26	7	7	177	158	184
69 - 72	0	0	0	0	0	0	0	0	0
>72	0	0	0	0	0	0	0	0	0

[2] These are the differences in number of people affected within each 3 dB noise band

TRANSFORMING LONDON STANSTED AIRPORT

35+ PLANNING APPLICATION

ANNEX 4A: AIR QUALITY TECHNICAL NOTE



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Technical Note

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Project title	Stansted Airport 35+ Planning Application (UTT/18/0460/FUL)	Job number	253360-00
cc	Alistair Andrew Keeley Briggs	File reference	AQ/TN/001
Prepared by	Marilena Karyampa Christine McHugh	Date	1 June 2018
Subject	Further information for the air quality assessment		

A meeting with Uttlesford District Council (UDC) and their consultants (WYG) was held on 28th March 2018 to discuss the outcomes of the air quality assessment included in the Environmental Statement (ES) accompanying the Stansted Airport 35+ Planning Application (UTT/18/0460/FUL). This note provides further information in relation to the council's request of:

> **Road traffic emissions**
>
> The ES has used Defra projections for future year road traffic emission factors and background pollutant concentrations. The Council requested an assessment be undertaken, in which road traffic emissions for the future assessment years of 2023 and 2028 are kept to the level of the 2016 baseline year.

This note is for information only and is not an official submission to the planning application.

Methodology

Road traffic emissions for the future assessment years of 2023 and 2028 (Do Minimum (DM) and Development Case (DC) scenarios) have been estimated using the baseline 2016 emission factors. Background concentrations have also been kept constant at the 2016 levels. This is very likely to be an over-estimate of emissions, especially in the later assessment year of 2028. Recent evidence from real world driving tests on Euro VI heavy goods vehicles (HGVs) has shown that their emissions are close to the limit values, probably due to the implementation of an element of on-board diagnosis or real world driving testing introduced by EC Regulation No. 595/2009 for Euro VI. Similar tests will be introduced for light vehicles, including cars, in 2019 and 2020. Therefore, it is anticipated that by 2023 and certainly by 2028, road traffic emissions will have reduced to close to the limit values as newer vehicles enter into the fleet.

The ADMS-Airport dispersion software was used to predict concentrations of nitrogen dioxide (NO_2) at the sensitive receptor locations presented in the ES. Concentrations of oxides of nitrogen (NOx) have also been predicted for sensitive ecological sites in the study area and an assessment nitrogen deposition has been undertaken for the Hatfield Forest National Nature Reserve (NNR) and Site of Special Scientific Interest (SSSI) and the Elsenham Woods SSSI. The contribution of other sources (airport and car parks) at these receptors have been kept as previously calculated in the assessment presented in ES.

Emissions of particulate matter (PM_{10} and $PM_{2.5}$) are not subject to the same uncertainty as NOx emissions, and hot exhaust PM is a small component of the total PM. Therefore, revised concentrations for PM are not presented in this note.

Results

Emissions

Table 1 presents the predicted emissions from road traffic vehicles in 2023 and 2028 using the baseline 2016 emission factors. A comparison against the predicted emissions from the ES is also presented. It should be noted that these values include both airport and non-airport related road traffic emissions, and therefore these emissions are not solely attributed to the airport.

It can be observed that NOx emissions are two to three times higher for the future assessment years when emissions are kept constant to the 2016 baseline. Similarly, PM_{10} and $PM_{2.5}$ emissions in the future assessment years are approximately 1.5 times higher than in the ES.

Table 1 Summary of road traffic emissions [tonnes per year – t/yr]

Assessment	Base 2016	DM 2023	DC 2023	DM 2028	DC 2028
NOx emissions (t/yr)					
ES assessment	594	368	371	256	268
Assessment with 2016 emissions		700	705	740	774
PM_{10} emissions (t/yr)					
ES assessment	30.9	28.5	28.7	29.3	30.6
Assessment with 2016 emissions		36.4	36.7	38.5	40.2
$PM_{2.5}$ emissions (t/yr)					
ES assessment	20.9	17.2	17.3	17.4	18.2
Assessment with 2016 emissions		24.7	24.9	26.1	27.3

Human receptors

In 2023, negligible impacts were predicted in the ES at all assessed receptors. Annual mean NO_2 concentrations were predicted to exceed the air quality standard of 40µg/m^3 at one receptor (R137) on London Road in Bishop’s Stortford, out of the 244 receptors assessed. The largest increase in annual mean NO_2 concentrations was predicted to be 0.5µg/m^3 at receptors R181 (Anvil Cross, Great Hallingbury) and R179 (Hall Green, Little Hallingbury), but concentrations at both these receptors were well below the air quality standard.

In this assessment, negligible impacts are still predicted at all assessed receptors in 2023. Annual mean NO_2 concentrations are predicted to exceed the air quality standard at five receptors as detailed in Table 2. However, the change in concentrations at these receptors as a result of the proposed development is very small (no greater than 0.1µg/m^3). The largest increase in annual mean NO_2

concentrations is predicted to be 0.6µg/m^3 at receptor R38 at Mill End in Takeley; however, the predicted concentration at this receptor is 28.5µg/m^3 which is well below the air quality standard.

Table 2 Receptors with predicted NO_2 exceedances in 2023

Receptor	Location	DM	DC	Change
R127	41 London Road, Bishop's Stortford CM23 5NA	41.0	41.1	0.1
R128	49 London Road, Bishop's Stortford CM23 5NA	41.7	41.7	<0.1
R129	Itvet Corner 2-4, London Road, Bishop's Stortford CM23 5ND	41.2	41.2	<0.1
R137	24 Hockerill Court, London Road, Bishop's Stortford CM23 5SB	61.5	61.5	<0.1
R145	12 Lower Street, Stansted CM24 8LP	42.4	42.4	<0.1

In 2028, negligible impacts were predicted in the ES at all assessed receptors and no exceedances of the annual mean NO_2 concentrations were predicted. The highest annual mean NO_2 concentrations were predicted to be 37.1µg/m^3 at receptor R137 on London Road in Bishop's Stortford. The largest increase in annual mean NO_2 concentrations was predicted to be 1.0µg/m^3 at receptor R38 at Mill End in Takeley; the predicted concentration at this receptor was 19.7µg/m^3 in the development case.

In this assessment, negligible impacts are predicted at most of the assessed receptors, however, a moderate adverse is impact is predicted at one receptor (R181 at Anvil Cross in Little Hallingbury) and slight adverse impacts at four receptors. These are receptors R67 at Motts Green, R81 at Goose Lane, R179 at Hall Green in Little Hallingbury, and R155 at Burton End in Stansted. Annual mean NO_2 concentrations are predicted to exceed the air quality standard at six receptors as detailed in Table 3. The change in concentrations at these receptors as a result of the proposed development is very small (no greater than 0.1µg/m^3). The largest increase in annual mean NO_2 concentrations is predicted to be 1.8µg/m^3 at receptor R38 at Mill End in Takeley, however, the predicted concentration at this receptor is 29.8µg/m^3 which is well below the air quality standard.

Table 3 Receptors with predicted NO_2 exceedances in 2028

Receptor	Location	DM	DC	Change
R127	41 London Road, Bishop's Stortford CM23 5NA	41.8	41.8	<0.1
R128	49 London Road, Bishop's Stortford CM23 5NA	42.5	42.6	0.1
R129	Itvet Corner 2-4, London Road, Bishop's Stortford CM23 5ND	42.0	42.1	0.1
R137	24 Hockerill Court, London Road, Bishop's Stortford CM23 5SB	62.1	62.2	0.1
R145	12 Lower Street, Stansted CM24 8LP	43.8	43.8	<0.1
R147	2 The Mews, High Lane, Stansted CM24 8NB	40.3	40.4	0.1

Ecological receptors

No significant effects were predicted in the ES at ecological receptors due to nitrogen deposition. NOx concentrations were predicted to be below the air quality standard of 30μg/m^3. In this assessment, exceedances of the air quality standard are predicted at the western boundary of Elsenham Woods SSSI. No exceedances are predicted at any of the other ecological receptors. Minor increases in nitrogen deposition are predicted at the Hatfield Forest SSSI and NNR and the Elsenham Woods SSSI. However, the changes are less than 1% of the relevant lower critical loads for the sites and therefore no significant effects are anticipated.

In the Hatfield Forest SSSI and NNR, in the ES the highest annual mean NOx concentrations were predicted at the north-western boundary of the site and they were 18.8μg/m^3 in 2023 and 18.2μg/m^3 in 2028. The largest change in annual mean NOx concentrations due to the proposed development was also predicted at the north-western boundary of the site at 0.1μg/m^3 in 2023 and 0.4μg/m^3 in 2028. The proposed development was predicted to add 0.01kg N/ha/yr as a maximum to the site in 2023 and 0.04kg N/ha/yr in 2028, both of which are less than 1% of the site's lower critical load.

In this assessment, the highest annual mean NOx concentrations in the Hatfield Forest SSSI and NNR are predicted to be 26.7μg/m^3 in 2023 and 27.9μg/m^3 in 2028 at the north-western boundary of the site. The largest change in annual mean NOx concentrations due to the proposed development is predicted to be 0.7μg/m^3 in 2028 at the north-western boundary of the site. The predicted change in NOx concentrations in 2023 is 0.1μg/m^3. The proposed development is predicted to add 0.01kg N/ha/yr in 2023 and 0.07kg N/ha/yr in 2028 as a maximum at the site, which are both less than 1% of the site's lower critical load. Therefore, no significant effects are anticipated at this site from the proposed development.

In the ES at the Elsenham Woods SSSI, the highest annual mean NOx concentrations were predicted at the western boundary of the site and they were 27.9μg/m^3 in 2023 and 28.4μg/m^3 in 2028. The largest change in annual mean NOx concentrations due to the proposed development was predicted at the south-western boundary of the site at 0.1μg/m^3 in 2023 and 0.4μg/m^3 in 2028. The proposed development was predicted to add 0.02kg N/ha/yr as a maximum at the site in 2023 and 0.08kg N/ha/yr in 2028, both of which are less than 1% of the site's lower critical load.

In this assessment, the highest annual mean NOx concentrations in the Elsenham Woods SSSI are predicted to be 34.0μg/m^3 in 2023 and 34.2μg/m^3 in 2028 at the western boundary of the site, which exceed the air quality standard of 30μg/m^3. The largest change in annual mean NOx concentrations due to the proposed development is predicted to be 0.5μg/m^3 in 2028 at the south-western boundary of the site. The predicted change in NOx concentrations in 2023 is 0.1μg/m^3. The proposed development is predicted to add 0.02kg N/ha/yr in 2023 and 0.08kg N/ha/yr in 2028 as a maximum at the site, which are both less than 1% of the site's lower critical load. Therefore, no significant effects are anticipated at this site from the proposed development.

Conclusions

It should be noted that the use of 2016 road traffic emission factors for the future assessment years provides a pessimistic and unrealistic assessment of air quality impacts from the proposed development, especially in relation to the 2028 assessment year. Overall, the absolute predicted concentrations are higher in this assessment when compared to the ES. This is expected, since the baseline 2016 road emission factors and background concentrations are higher than those in the future assessment years.

Exceedances of the NO_2 air quality standard are predicted at a few more receptor locations compared to the ES: at five receptors out of the 244 assessed in 2023 rather than one; and six receptors in 2028 rather than zero. The change in concentrations due to the proposed development at all of these locations is very small, no greater 0.1µg/m^3.

Exceedances of the NOx air quality standard are also predicted at the western boundary of Elsenham Woods SSSI. No exceedances are predicted at any of the other ecological receptors, including the Hatfield Forest SSSI and NNR. The predicted changes in nitrogen deposition at the Hatfield Forest SSSI and NNR and the Elsenham Woods SSSI are less than 1% of the relevant lower critical loads for these sites and therefore no significant effects are anticipated.

DOCUMENT CHECKING

	Prepared by	Checked by	Approved by
Name	Marilena Karyampa	Christine McHugh	Christine McHugh
Signature			

TRANSFORMING LONDON STANSTED AIRPORT

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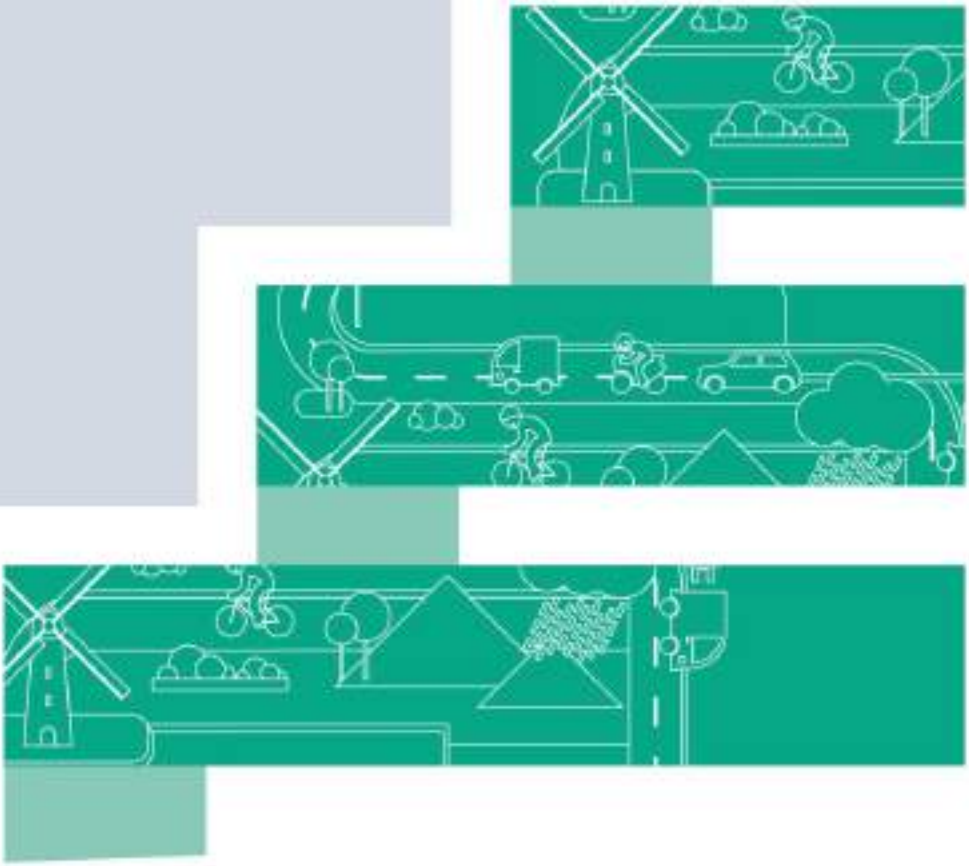
ANNEX 4B: AIR QUALITY TECHNICAL NOTE



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Technical Note

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Project title	Stansted Airport 35+ Planning Application (UTT/18/0460/FUL)	Job number	253360-00
cc	Alistair Andrew Keeley Briggs	File reference	AQ/TN/002
Prepared by	Marilena Karyampa Christine McHugh	Date	12 June 2018
Subject	Further information for the air quality assessment		

A meeting with Uttlesford District Council (UDC) and their consultants (WYG) was held on 28th March 2018 to discuss the outcomes of the air quality assessment included in the Environmental Statement (ES) accompanying the Stansted Airport 35+ Planning Application (UTT/18/0460/FUL). This note provides further information in relation to the council's request of:

Multiple years for model verification

The ES used ***meteorological data***, ***air quality monitoring data, background concentration data, airport*** and ***road traffic activity data*** and ***emission factors*** for the baseline year 2016. The Council requested an assessment be undertaken, using three or more years of meteorological data.

This note is for information only and is not an official submission to the planning application.

Methodology

It should be noted that an assessment of multiple years for model verification is not standard practice for air quality assessments of airport developments. Moreover, there are six items shown above in ***bold italics*** that are used in a verification exercise; by ignoring just one or a few of these items, such as the meteorological data, is to ignore important causes of inter-annual differences in emissions and concentrations. Therefore, this assessment does not form a detailed model verification exercise, rather an indication of what the model performance would be using multiple years of meteorological data.

This note provides a comparison of the air quality model verification for three years: 2014, 2015 and 2016 (which is the baseline year used in the ES assessment). The ADMS-Airport dispersion software was used to predict concentrations of oxides of nitrogen (NOx) at the monitoring sites within the study area, as presented in the ES.

The following data has been used in this assessment:

- Meteorological data for the airport for 2014, 2015 and 2016; and
- Air quality monitoring data for the study area for the same years.

The following assumptions have been made:

- No changes to airport operations, flights or passenger numbers have been included in this assessment. The 2016 assessment of the airport's contribution to local air quality has been used for the two earlier assessment years of 2014 and 2015.

  In 2016, there were 24.3 million passengers per annum (mppa) and 166,152 air transport movements (ATMs). In 2015, there were 22.6mppa and 157,248 ATMs and in 2014, there were 20.0mppa and 143,463 ATMs[1].

- No changes to traffic flows on the highway network have been included in this assessment. The 2016 traffic information has been used for the two earlier assessment years of 2014 and 2015.
- Road traffic emissions for 2014 have been calculated using the previous version of Defra's Emissions Factor Toolkit (EFT), version 7.0. This is because the latest EFT has a starting year of 2015 and therefore does not include emission factors for earlier years.
- Road traffic emissions for 2015 have been calculated using the same EFT version as the one in the ES assessment, i.e. version 8.0.
- Background pollutant concentrations have been kept constant between the years. This is because the ES assessment used emissions from the National Atmospheric Emissions Inventory (NAEI) to derive, through modelling, the background concentrations. The NAEI data in the ES were the latest available at the time of assessment and were for 2014. They were combined for the ES with 2016 meteorological data to calculate the background concentrations. These background concentrations were considered to be sufficiently relevant for 2014 and 2015 not to undertake remodelling.

The assessment therefore includes calculation of road traffic emissions for 2014 and 2015, prediction of NO_2 concentrations for these years, use of the relevant meteorological data and comparison of modelled against monitored concentrations for these years. A comparison of unadjusted concentrations between the three years (2014, 2015 and 2016) is provided in this note.

Results

Meteorological data

Appendix 10.4 of the ES presents a comparison between the 2014, 2015 and 2016 meteorological data for Stansted Airport.

Model verification

Table 1 presents the comparison of the modelled and monitored NO_2 concentrations for the three assessment years (2014, 2015 and 2016). The ratio of modelled over monitored concentrations is also presented, with green being used to show values within 10%, orange being values greater than ±10% and within 25% and red being over ±25%. The Defra TG16 guidance[2] advises that should the

[1] http://www.stanstedairport.com/about-us/london-stansted-airport-and-mag/our-performance/
[2] Defra (2016) Local Air Quality Management Technical Guidance, TG16

modelled NO_2 results be largely within ±25% of the monitored values, then no adjustment is necessary.

In the 2016 baseline assessment presented in the ES, modelled concentrations at sites mainly influenced by the airport and roadside locations were within ±25% of the measured values and no adjustment was undertaken. However, modelled NO_2 concentrations at roadside sites within the town centres of Bishop's Stortford and Stansted Mountfitchet were significantly over ±25% of the measured values. Therefore, an adjustment factor of 4.0 was applied to the road traffic emissions for the main roads within the town centres.

Figure 1 presents a comparison of the model performance prior to any adjustment for 2014, 2015 and 2016. It can be observed that sites mainly influenced by the airport are still within ±25% of measured values in both 2014 and 2015, but with 2014 providing a better correlation than 2015. Roadside sites outside the town centres are still largely within ±25% of measured values in 2014 and 2015, but there are a couple of sites that are over the ±25% threshold. For roadside locations within Bishop's Stortford, the modelled concentrations are still significantly over ±25% of the measured values. However, for the roadside location within Stansted Mountfitchet, the modelled concentrations are within 25% of the measured values for both 2014 and 2015.

If the adjustment factor of 4.0 is used for road traffic emissions within the town centres (as in the main ES), Figure 2 presents the model performance after the adjustment. It can be observed that the correlation is not as good in 2014 and 2015 as it is for 2016.

Table 1 Comparison of modelled and monitored NO2 concentrations (µg/m^3) for 2014, 2015 and 2016

ID	Description	2014			2015			2016		
		Modelled NO_2	Monitored NO_2	Ratio[1]	Modelled NO_2	Monitored NO_2	Ratio	Modelled NO_2	Monitored NO_2	Ratio
Airport										
M15	Stansted 3 CM[2]	21.8	22.0	-1%	21.9	26.0	-16%	22.5	21.0	7%
M16	Stansted 4 CM	17.2	17.0	1%	17.1	19.0	-10%	17.4	19.0	-8%
M17	Stansted 3	21.1	22.5	-6%	21.2	25.5	-17%	21.7	21.2	2%
M18	Stansted North	19.7	20.3	-3%	19.6	22.5	-13%	19.8	18.8	5%
M19	Stansted East	23.2	28.7	-19%	22.2	33.8	-34%	22.8	27.9	-18%
M21	Stansted West	16.9	18.3	-7%	16.9	19.0	-11%	17.4	15.7	11%
Bishop's Stortford										
M8	EH17 Dunmow Road	21.2	68.0	-69%	21.1	65.7	-68%	21.6	64.9	-67%
M10	EH19 London Road	21.7	76.0	-71%	20.6	70.3	-71%	21.5	69.6	-69%
M14	EH68 Hadham Road	18.2	38.0	-52%	18.4	33.5	-45%	18.9	33.1	-43%
Stansted Mountfitchet										
M4	UT033 Chapel Hill	22.4	26.9	-17%	21.3	27.6	-23%	21.8	36.2	-40%
Other roadside locations										
M3	UT009 Burton End	40.7	33.6	21%	41.0	35.5	15%	43.0	43.0	0%
M20	Stansted South	21.5	25.5	-15%	21.3	29.9	-29%	22.4	25.4	-12%
M22	UT002 Thatched Cottage	23.4	20.7	13%	23.2	21.4	9%	24.6	26.7	-8%
M24	UT008 Hallingbury	36.2	26.2	38%	32.9	25.2	31%	35.4	29.9	18%
M1	UTT2 Takeley	15.9	17.8	-11%	16.0	15.9	1%	NA[3]	NA	NA
M28	UT035	20.9	21.2	-1%	NA	NA	NA	NA	NA	NA

[1] Ratio calculated as [(modelled – monitored)] / monitored] x 100%

[2] CM: continuous monitor

[3] NA: site not included in the model verification due to there being no monitoring data available for the comparison

Figure 1 Model performance before adjustment

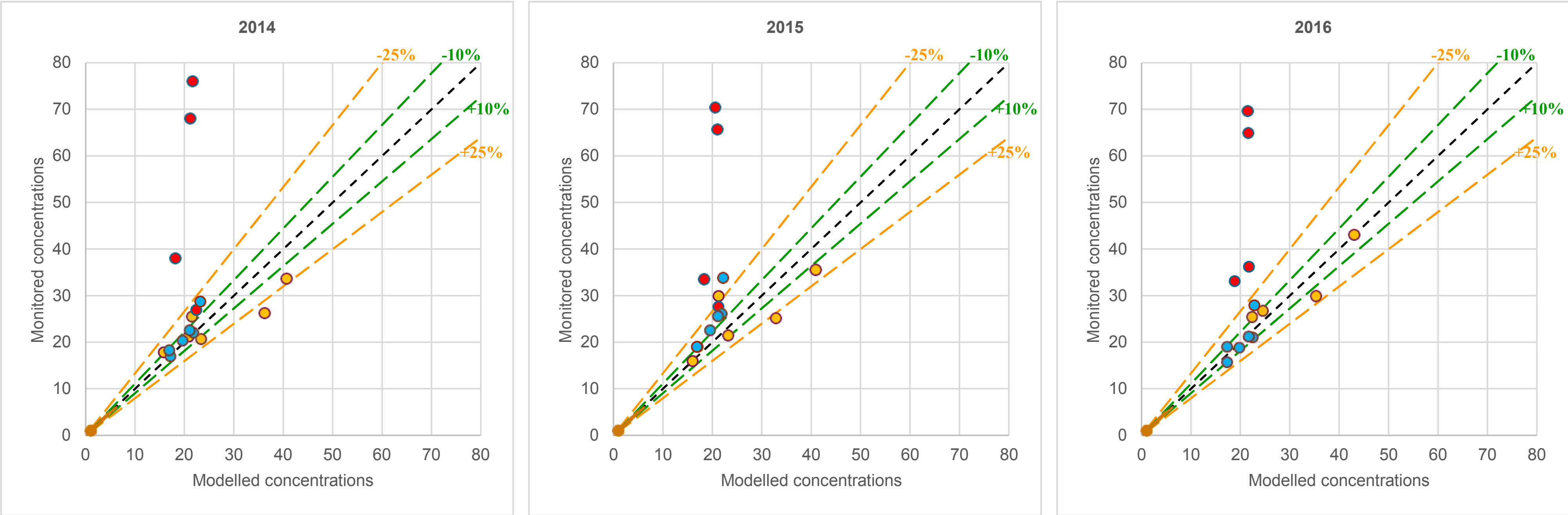
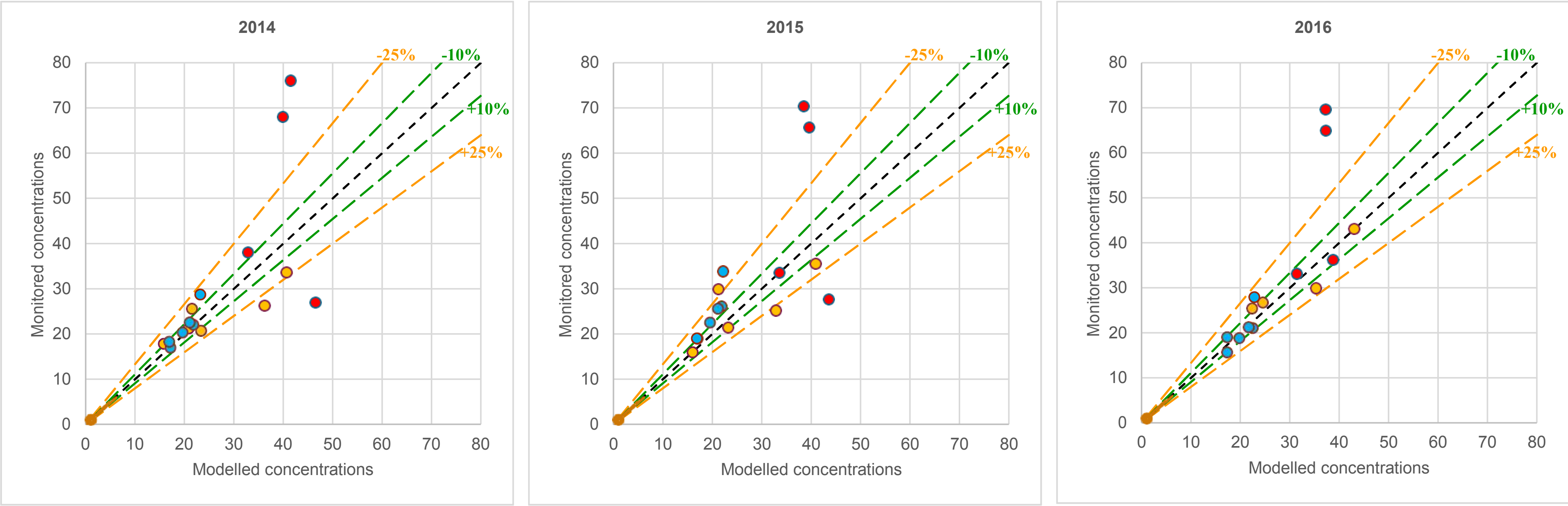


Figure 2 Model performance after adjustment, using an adjustment factor of 4.0 for the town centres of Bishop's Stortford and Stansted Mountfitchet



Conclusions

It should be noted that an assessment of multiple years for model verification is not standard practice for air quality assessments of airport developments. Overall, the assessment for 2014 and 2015 has shown that the comparison of modelled NO_2 concentrations with measured values was similar to the ES 2016 baseline. There was a good correlation for airport and roadside locations, while roadside sites within the town centres were significantly over the ±25% threshold, similar to the 2016 baseline presented in the ES.

The adjustment factor of 4.0 applied to the road traffic emissions in the town centres is appropriate for use in the 2016 baseline assessment in the ES. For the earlier years of 2014 and 2015, more detailed assessment would need to be undertaken to derive appropriate adjustment factors for the model by taking into account road traffic flows, background concentrations, airport activity, airport emission factors and the impact of the appropriate year's meteorological data on the resulting emissions for these years.

It is concluded that the model verification undertaken in the ES for the year 2016 was appropriate for the air quality assessment and if a full verification had been undertaken for a different year the resulting adjustment factors would have been similar.

Technical Note

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Project title	Stansted Airport 35+ Planning Application (UTT/18/0460/FUL)	Job number	253360-00
cc	Alistair Andrew Keeley Briggs David Thomson (RPS)	File reference	AQ/TN/006
Prepared by	Christine McHugh Marilena Karyampa	Date	5 July 2018
Subject	Clarifications and further information for the air quality assessment		

A meeting with Uttlesford District Council (UDC) and their consultants (WYG), and East Herts District Council (EHDC) was held on 28th June 2018 to discuss the outcomes of the air quality assessment included in the Environmental Statement (ES) accompanying the Stansted Airport 35+ Planning Application (UTT/18/0460/FUL). This note provides further information in relation to the EHDC request concerning:

> **Verification of model results in Bishops Stortford**
>
> EHDC raised the point that after applying an adjustment factor of 4 to road traffic emissions in Bishop's Stortford, monitored and modelled NO_2 concentrations agree within ±25%, except at the two monitoring sites closest to the Hockerill Road/London Road junction, i.e. sites M8 (EH17, EH35, EH36) and M10 (EH19, EH39, EH40). At these two sites, annual mean NO_2 concentrations are underestimated in the model by 43% and 46% respectively.
>
> It was requested that the verification be revisited to eliminate the underestimation, by comparing the background concentrations used to Defra's mapped background concentrations and increasing the background concentration if necessary, and/or increasing the adjustment factor.

This note is for information only and is not an official submission to the planning application.

Introduction

Model verification refers to the comparison of modelled pollutant concentrations with measured concentrations at the same points to assess the performance of the model and determine an adjustment factor, if one is required. The Defra TG16 guidance[1] advises that if the modelled NO_2 concentrations are within ±25% of the measured values and there is no systematic over or under-prediction of concentrations, then no adjustment to the modelled results is necessary. If this is not the case, then the modelled values are adjusted based on the observed relationship between modelled and measured NOx concentrations to provide better agreement.

[1] Defra (2016) Local Air Quality Management Technical Guidance, TG16

Modelled results may not compare as well at some locations for various reasons, including:

- Errors/uncertainties in model input data (e.g. traffic flows and speed data estimates);
- Model setup (including street canyons where applicable, road widths, location of monitoring sites);
- Neglect of local effects (e.g. queues, bus stops, street canyons and hills);
- Model limitations (treatment of surface roughness and meteorological data);
- Uncertainty in monitoring data, notably diffusion tubes (e.g. bias adjustment factors and annualisation of short-term data); and
- Uncertainty in emissions and emission factors.

Details of the model verification undertaken for the air quality assessment of the proposed development are presented in Chapter 10 and Appendix 10.4 of the ES.

Verification in the ES Chapter

As described above, the verification process involves a comparison of modelled versus monitored pollutant concentrations to determine the performance of the air quality model. The model verification for the air quality assessment of the proposed development identified that modelled concentrations were within ±25% of measured values at sites influenced mainly by the airport and roadside locations. However, an adjustment was undertaken (adjustment factor of 4) for the main roads within the towns of Bishop's Stortford and Stansted Mountfitchet to account for uncertainties in the traffic data flows and the measured air quality concentrations at these locations.

Using this adjustment factor, the maximum impact of the 35+ Planning Application at any sensitive receptor in the town of Bishop's Stortford is predicted to be 0.1µg/m^3 in both 2023 and 2028, which is negligible and not significant. The largest annual mean NO_2 concentrations in Bishop's Stortford are predicted at receptor R137 on London Road (45.1µg/m^3 in 2023 and 37.1µg/m^3 in 2028).

Comparison of background concentrations

The background concentrations used in the modelling were calculated using rural background monitoring data and National Atmospheric Emissions Inventory emissions, as described in paragraphs 10.98 to 10.102 of the ES. Background concentrations in 2023 and 2028 were assumed to decrease in line with the decrease in Defra's forecast background concentrations.

Table 1 compares the background NOx concentrations used in the model with the Defra background concentrations. The background NOx concentrations used in the baseline modelling were 1.7 – 1.8µg/m^3 lower than the Defra concentrations. All the monitoring sites in Bishop's Stortford are roadside sites. The lowest concentration measured at a roadside site in 2016 was 19.6µg/m^3, measured at EH66, 221 Rye Street. The modelled background concentrations therefore are compatible with the monitored concentrations.

As the total concentration is the sum of the background and road contribution (and other smaller contributions), use of a lower background concentration is conservative in that it attributes more to the road sources and therefore magnifies the impact of road sources including the airport-related traffic.

Table 1: Comparison of 2016 ES and Defra background NOx concentrations at verification sites in Bishop's Stortford

ID	Site	Modelled background NOx (μg/m[3])	Defra background NOx (μg/m[3])
M8	EH17, EH35, EH36	16.7	18.4
M10	EH19, EH39, EH40	16.6	18.4
M14	EH68, EH69	15.4	17.1

Use of a higher adjustment factor

The two monitoring sites closest to the Hockerill Junction are sites M8 (EH17, EH35, EH36) and M10 (EH19, EH39, EH40). A comparison between the modelled NO_2 concentrations and the monitored values shows that the model under-estimates the concentrations at this location, even with the adjustment factor of 4.0 as presented in the ES. It should be noted however that no air quality impacts are anticipated within Bishop's Stortford as a result of the proposed development and the model verification presented in the ES remains valid.

For the purposes of this note, further investigation has been undertaken for these two monitoring sites at Hockerill Junction and a higher adjustment factor of 8.5 has been derived for this location for the road traffic NOx emissions. With the application of this higher adjustment factor, the modelled NO_2 concentrations are brought within ±25% of the measured values, which is the acceptable range for verification in Defra's TG16 guidance. Table 2 shows the results of verification using an increased adjustment factor for the sites closest to the Hockerill Road/London Road junction.

Table 2: Verification of Bishop's Stortford sites

ID	Site	Total NOx concentration (μg/m[3])	Modelled NO_2 concentration (μg/m[3])	Monitored NO_2 concentration (μg/m[3])	Ratio[1]
Before adjustment					
M8	EH17, EH35, EH36	29.1	21.6	64.9	**-67%**
M10	EH19, EH39, EH40	28.8	21.5	69.6	**-69%**
M14	EH68, EH69	24.8	18.9	33.1	**-43%**
After adjustment[2]					
M8	EH17, EH35, EH36	95.4	54.3	64.9	**-16%**
M10	EH19, EH39, EH40	95.4	54.3	69.6	**-22%**
M14	EH68, EH69	45.5	31.5	33.1	**-5%**

Notes:
[1] Ratio calculated as [(modelled – monitored)] / monitored] x 100%.
Red indicates values outside the range ±25%; orange denotes values between ±25% and ±10%; green indicates values within ±10%
[2] M8 and M10 – adjustment factor of 8.5; M14 – adjustment factor of 4

Predicted concentrations at receptors in Bishop's Stortford

The increased adjustment factor of 8.5 has been applied to predicted concentrations at the relevant receptors in Bishop's Stortford. Tables 3 and 4 show the predicted concentrations with (DC, Development Case) and without (DM, Do Minimum) the 35+ Planning Application.

The results show the maximum predicted concentration at a residential receptor in 2023 would be 66.3µg/m^3 at receptor R137 on London Road; the same concentrations are predicted at this receptor both with and without the proposed development. The maximum increase in NO_2 concentrations (DC minus DM) would be 0.4µg/m^3 at receptor R120 on Manor Road (changing from 37.4µg/m^3 to 37.8µg/m^3). **Negligible** impacts are predicted at all receptors within Bishop's Stortford in 2023 due to the proposed development, and therefore no significant effects are anticipated for air quality.

In 2028 the maximum predicted concentration at a residential receptor would be 55.5µg/m^3 at receptor R137 on London Road; the same concentrations are predicted at this receptor both with and without the proposed development. The maximum increase in NO_2 concentrations would be 0.5µg/m^3 at receptor R120 on Manor Road (changing from 32.0µg/m^3 to 32.5µg/m^3). **Negligible** impacts are predicted at all receptors within Bishop's Stortford in 2023 due to the proposed development, and therefore no significant effects are anticipated for air quality.

Overall, negligible impacts are predicted at the sensitive receptors within Bishop's Stortford even with the increased factor of 8.5 for road traffic emissions. Therefore, the results of the ES remain unchanged and no significant effects are anticipated for air quality in either 2023 or 2028 due to the proposed development.

Table 3: Predicted NO_2 concentrations ($\mu g/m^3$) and impacts in 2023

ID	Description	2023 DM	2023 DC	Change	Impact	Significance
Education (Schools, Colleges, Nurseries)						
ED2	Hockerill Anglo-European College, Dunmow Road, Bishop's Stortford CM23 5HX	18.9	19.0	0.1	Negligible	Not significant
ED4	St Michael's Primary School, Apton Road, Bishop's Stortford CM23 3SN	12.2	12.2	0.0	Negligible	Not significant
ED5	St Joseph's Catholic Primary School, Great Hadham Road, Bishop's Stortford CM23 2NL	11.5	11.5	0.0	Negligible	Not significant
ED6	The Junior School, Maze Green Road, Bishop's Stortford CM23 2PH	11.5	11.5	0.0	Negligible	Not significant
ED10	Summercroft Primary School, Plaw Hatch Close, Bishop's Stortford CM23 5BJ	13.2	13.3	0.1	Negligible	Not significant
ED12	Bishop's Stortford College, Maze Green Road, Bishop's Stortford CM23 2PG	11.7	11.7	0.0	Negligible	Not significant
ED13	Northgate Primary School, Cricketfield Lane, Bishop's Stortford CM23 2RL	11.3	11.3	0.0	Negligible	Not significant
ED14	Thorn Grove Primary School, Thorn Grove, Bishop's Stortford CM23 5LD	16.1	16.1	0.0	Negligible	Not significant
ED15	Doodle Do day nursery, Portland Road, Bishop's Stortford CM23 3SL	13.1	13.2	0.1	Negligible	Not significant
ED18	All Saints CoE Primary School and Nursery, Parsonage Lane, Bishop's Stortford CM23 5BE	12.6	12.6	0.0	Negligible	Not significant
ED19	Birchwood High School, Parsonage Lane, Bishop's Stortford CM23 5BD	13.1	13.1	0.0	Negligible	Not significant
ED20	Windhill Primary & Nursery School, Windhill, Bishop's Stortford CM23 2NE	11.6	11.6	0.0	Negligible	Not significant
ED21	Herts and Essex High School, Warwick Road, Bishop's Stortford CM23 5NJ	18.8	18.9	0.1	Negligible	Not significant
ED48	Continuum School, The Grange, Woodgates End, Dunmow CM6 2BN	11.8	11.8	0.0	Negligible	Not significant
ED49	St Michael's Primary School, Apton Road, Bishop's Stortford CM23 3SN	11.5	11.5	0.0	Negligible	Not significant
Healthcare (Hospitals, Care homes)						
H2	Elmhurst, Windhill, Bishop's Stortford CM23 2NF	11.9	11.9	0.0	Negligible	Not significant
H3	Conewood Manor nursing and care home, 60 Dunmow Road, Bishop's Stortford CM23 5HL	31.4	31.7	0.3	Negligible	Not significant

ID	Description	2023 DM	2023 DC	Change	Impact	Significance
H4	Herts and Essex Community Hospital, Cavell Drive, Bishop's Stortford CM23 5JH	15.9	16.0	0.1	Negligible	Not significant
Residential Properties						
R87	Castle Cottage, The Causeway, Bishop's Stortford CM23 2EL	24.5	24.6	0.1	Negligible	Not significant
R91	Hadham Court, Hadham Road, Bishop's Stortford CM23 2QQ	15.7	15.7	0.0	Negligible	Not significant
R92	61 Hadham Road, Bishop's Stortford CM23 2QY	15.2	15.2	0.0	Negligible	Not significant
R93	Watsons Yard, Hadham Road, Bishop's Stortford CM23 2WH	19.3	19.3	0.0	Negligible	Not significant
R94	Causeway House, 1 Dane Street, Bishop's Stortford CM23 3BT	28.0	28.0	0.0	Negligible	Not significant
R119	143 Dunmow Road, Bishop's Stortford CM23 5HQ	21.0	21.0	0.0	Negligible	Not significant
R120	1 Manor Road, Bishop's Stortford CM23 5HU	37.4	37.8	0.4	Negligible	Not significant
R121	158 Dunmow Road, Bishop's Stortford CM23 5HW	25.3	25.6	0.3	Negligible	Not significant
R122	2A Crescent Road, Bishop's Stortford CM23 5JU	39.3	39.3	0.0	Negligible	Not significant
R123	22 Crescent Road, Bishop's Stortford CM23 5JU	40.6	40.6	0.0	Negligible	Not significant
R124	1B Hallingbury Road, Bishop's Stortford CM23 5JY	19.6	19.7	0.1	Negligible	Not significant
R125	12 Hallingbury Road, Bishop's Stortford CM23 5LA	18.6	18.6	0.0	Negligible	Not significant
R126	46 Hallingbury Road, Bishop's Stortford CM23 5LA	16.7	16.7	0.0	Negligible	Not significant
R127	41 London Road, Bishop's Stortford CM23 5NA	42.8	42.8	0.0	Negligible	Not significant
R128	49 London Road, Bishop's Stortford CM23 5NA	43.4	43.4	0.0	Negligible	Not significant
R129	Itvet Corner 2-4, London Road, Bishop's Stortford CM23 5ND	43.3	43.3	0.0	Negligible	Not significant
R134	2 Manor Links, Bishop's Stortford CM23 5RA	19.2	19.2	0.0	Negligible	Not significant
R135	1 Manor Links, Bishop's Stortford CM23 5RA	20.2	20.2	0.0	Negligible	Not significant
R136	12 Norris Close, Bishop's Stortford CM23 5RE	18.7	18.8	0.1	Negligible	Not significant
R137	24 Hockerill Court, London Road, Bishop's Stortford CM23 5SB	66.3	66.3	0.0	Negligible	Not significant
R138	25 Wranglings, Beldams Lane, Bishop's Stortford CM23 5TB	17.4	17.5	0.1	Negligible	Not significant
R173	Thomas Heskin Court, Station Road, Bishop's Stortford CM23 3EE	38.0	38.0	0.0	Negligible	Not significant

Table 4: Predicted NO_2 concentrations (μg/m^3) and impacts in 2023

ID	Description	2028 DM	2028 DC	Change	Impact	Significance
Education (Schools, Colleges, Nurseries)						
ED2	Hockerill Anglo-European College, Dunmow Road, Bishop's Stortford CM23 5HX	17.7	17.8	0.1	Negligible	Not significant
ED4	St Michael's Primary School, Apton Road, Bishop's Stortford CM23 3SN	12.7	12.7	0.0	Negligible	Not significant
ED5	St Joseph's Catholic Primary School, Great Hadham Road, Bishop's Stortford CM23 2NL	12.1	12.1	0.0	Negligible	Not significant
ED6	The Junior School, Maze Green Road, Bishop's Stortford CM23 2PH	12.1	12.1	0.0	Negligible	Not significant
ED10	Summercroft Primary School, Plaw Hatch Close, Bishop's Stortford CM23 5BJ	13.4	13.5	0.1	Negligible	Not significant
ED12	Bishop's Stortford College, Maze Green Road, Bishop's Stortford CM23 2PG	12.2	12.2	0.0	Negligible	Not significant
ED13	Northgate Primary School, Cricketfield Lane, Bishop's Stortford CM23 2RL	11.8	11.9	0.1	Negligible	Not significant
ED14	Thorn Grove Primary School, Thorn Grove, Bishop's Stortford CM23 5LD	16.1	16.2	0.1	Negligible	Not significant
ED15	Doodle Do day nursery, Portland Road, Bishop's Stortford CM23 3SL	13.5	13.5	0.0	Negligible	Not significant
ED18	All Saints CoE Primary School and Nursery, Parsonage Lane, Bishop's Stortford CM23 5BE	12.9	13.0	0.1	Negligible	Not significant
ED19	Birchwood High School, Parsonage Lane, Bishop's Stortford CM23 5BD	13.2	13.3	0.1	Negligible	Not significant
ED20	Windhill Primary & Nursery School, Windhill, Bishop's Stortford CM23 2NE	12.2	12.2	0.0	Negligible	Not significant
ED21	Herts and Essex High School, Warwick Road, Bishop's Stortford CM23 5NJ	17.9	18.0	0.1	Negligible	Not significant
ED48	Continuum School, The Grange, Woodgates End, Dunmow CM6 2BN	12.4	12.4	0.0	Negligible	Not significant
ED49	St Michael's Primary School, Apton Road, Bishop's Stortford CM23 3SN	12.1	12.2	0.1	Negligible	Not significant
Healthcare (Hospitals, Care homes)						
H2	Elmhurst, Windhill, Bishop's Stortford CM23 2NF	12.5	12.5	0.0	Negligible	Not significant
H3	Conewood Manor nursing and care home, 60 Dunmow Road, Bishop's Stortford CM23 5HL	27.3	27.6	0.3	Negligible	Not significant
H4	Herts and Essex Community Hospital, Cavell Drive, Bishop's Stortford CM23 5JH	15.9	16.0	0.1	Negligible	Not significant

ID	Description	2028 DM	2028 DC	Change	Impact	Significance
Residential Properties						
R87	Castle Cottage, The Causeway, Bishop's Stortford CM23 2EL	21.7	21.7	0.0	Negligible	Not significant
R91	Hadham Court, Hadham Road, Bishop's Stortford CM23 2QQ	14.6	14.6	0.0	Negligible	Not significant
R92	61 Hadham Road, Bishop's Stortford CM23 2QY	14.6	14.6	0.0	Negligible	Not significant
R93	Watsons Yard, Hadham Road, Bishop's Stortford CM23 2WH	17.8	17.8	0.0	Negligible	Not significant
R94	Causeway House, 1 Dane Street, Bishop's Stortford CM23 3BT	24.3	24.4	0.1	Negligible	Not significant
R119	143 Dunmow Road, Bishop's Stortford CM23 5HQ	18.9	19.0	0.1	Negligible	Not significant
R120	1 Manor Road, Bishop's Stortford CM23 5HU	32.0	32.5	0.5	Negligible	Not significant
R121	158 Dunmow Road, Bishop's Stortford CM23 5HW	22.4	22.7	0.3	Negligible	Not significant
R122	2A Crescent Road, Bishop's Stortford CM23 5JU	34.1	34.2	0.1	Negligible	Not significant
R123	22 Crescent Road, Bishop's Stortford CM23 5JU	35.3	35.3	0.0	Negligible	Not significant
R124	1B Hallingbury Road, Bishop's Stortford CM23 5JY	19.3	19.3	0.0	Negligible	Not significant
R125	12 Hallingbury Road, Bishop's Stortford CM23 5LA	18.5	18.5	0.0	Negligible	Not significant
R126	46 Hallingbury Road, Bishop's Stortford CM23 5LA	16.8	16.9	0.1	Negligible	Not significant
R127	41 London Road, Bishop's Stortford CM23 5NA	36.7	36.8	0.1	Negligible	Not significant
R128	49 London Road, Bishop's Stortford CM23 5NA	36.9	36.9	0.0	Negligible	Not significant
R129	Itvet Corner 2-4, London Road, Bishop's Stortford CM23 5ND	36.6	36.6	0.0	Negligible	Not significant
R134	2 Manor Links, Bishop's Stortford CM23 5RA	17.3	17.4	0.1	Negligible	Not significant
R135	1 Manor Links, Bishop's Stortford CM23 5RA	18.2	18.3	0.1	Negligible	Not significant
R136	12 Norris Close, Bishop's Stortford CM23 5RE	17.2	17.2	0.0	Negligible	Not significant
R137	24 Hockerill Court, London Road, Bishop's Stortford CM23 5SB	55.5	55.5	0.0	Negligible	Not significant
R138	25 Wranglings, Beldams Lane, Bishop's Stortford CM23 5TB	17.5	17.5	0.0	Negligible	Not significant
R173	Thomas Heskin Court, Station Road, Bishop's Stortford CM23 3EE	32.6	32.6	0.0	Negligible	Not significant

Conclusions

A review of model verification in Bishops Stortford showed that:

- **Background concentrations:** while the values used in the verification were 1.7 – 1.8μg/m^3 lower than the Defra mapped concentrations, they were compatible with the lowest concentration measured at a roadside site in 2016. As the total concentration is the sum of the background and road contribution (and other smaller contributions), use of a lower background concentration is conservative in that it attributes more to the road sources and therefore magnifies the impact of road sources including the airport-related traffic;
- **Adjustment factor:** use of a higher adjustment factor of 8.5 for receptors closest to the Hockerill Road/London Road junction brought the predicted NO_2 concentrations at sites M8 and M10 within ±25% of the monitored concentrations and therefore no further adjustment is needed; and
- **Predicted concentrations at receptors:** the increased adjustment factor of 8.5 was applied to predicted concentrations at the relevant receptors in Bishops Stortford. The conclusion was unchanged from that in the ES, in that the impact of the 35+ Planning Application at residential receptors in Bishop's Stortford is negligible and therefore the effect is not significant.

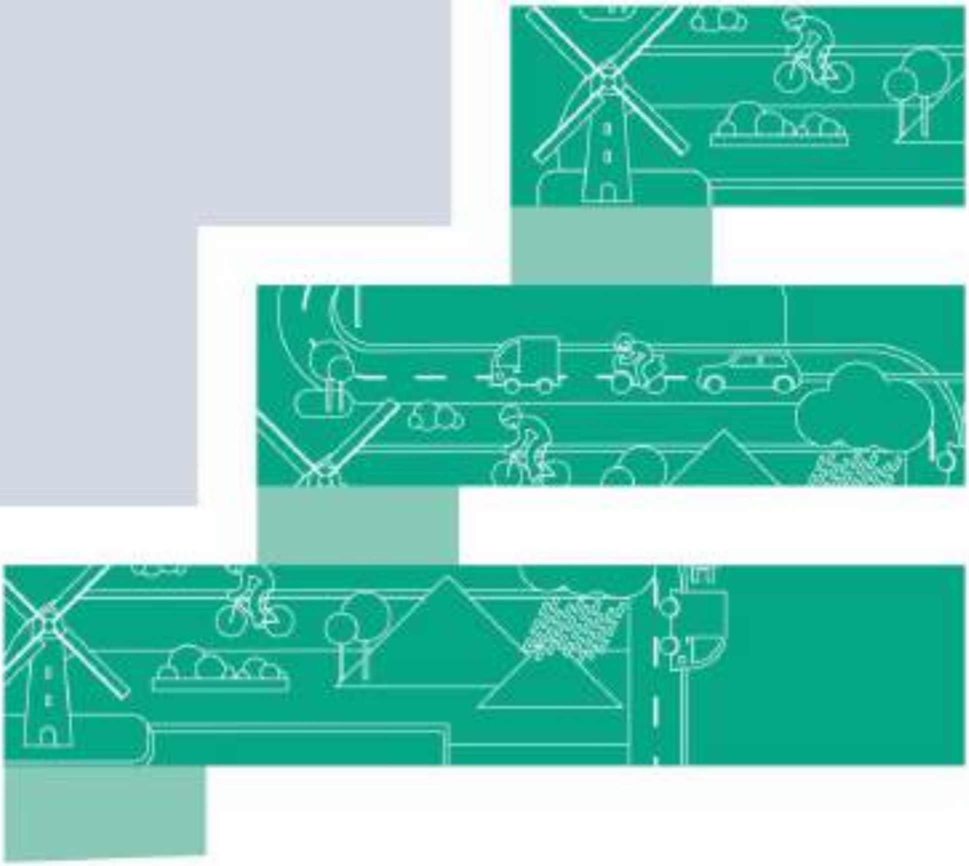
DOCUMENT CHECKING

	Prepared by	Checked by	Approved by
Name	Christine McHugh	Marilena Karyampa	Christine McHugh
Signature			

TRANSFORMING LONDON STANSTED AIRPORT

35+ PLANNING APPLICATION

ANNEX 4C: AIR QUALITY TECHNICAL NOTE



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Technical Note

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Project title	Stansted Airport 35+ Planning Application (UTT/18/0460/FUL)	Job number	253360-00
cc	Alistair Andrew Keeley Briggs	File reference	AQ/TN/004
Prepared by	Christine McHugh Marilena Karyampa	Date	2 July 2018
Subject	Clarifications and further information for the air quality assessment		

A meeting with Uttlesford District Council (UDC) and their consultants (WYG) was held on 28th March 2018 to discuss the outcomes of the air quality assessment included in the Environmental Statement (ES) accompanying the Stansted Airport 35+ Planning Application (UTT/18/0460/FUL). This note provides further information and clarifications in relation to the council's request of:

> **Odour**
>
> The Council raised the issue of odour at the boundary of the airport and discussed the possibility of carrying out boundary monitoring.

Odour Nuisance and Measurement

Whether or not an odour is a nuisance is a question that is quite subjective, depending on the sensitivity to odour of an individual and the individual's perception of the offensiveness or not of the odour. In addition, it is *changes* in odour concentration that give rise to complaints, as people can become used to a persistent level of odour, but changes in odour may occur over a short timescale and due to the turbulence in the atmosphere will not be uniform across an area. This makes odour difficult to measure in real time.

Complaints of odour near airports are sometimes received in connection with oily droplets and/or fuel dumping[1,2] and as fuel dumping does not occur, that casts doubt on some of the complaints. Other complaints, however, may correlate with the airport activity (e.g. long hold times, engine testing) and the wind direction at the time of the complaint.

Odour would arise from airport sources due to the release of vapour when tanks are being filled or, more commonly, due to unburnt hydrocarbons. The three hydrocarbons associated with aircraft engine emissions are benzene, naphthalene and toluene.

---

[1] BAA Stansted (2006) Generation 1 Environmental Statement, Volume 3, Air Quality, April 2006, section 8.2
[2] Amec Foster Wheeler (2016) Cambridge Airport Engine Ground Run-up Enclosure, Environmental Statement, report to Marshall Group Properties Limited, December 2016

Odour is usually a mixture of substances, which makes the measurement of odour difficult in two particular ways:

- it is not a matter of measuring concentrations of one substance, but of determining the odour due to the mixture of pollutants; and
- the mixture of substances contributing to background odour (e.g. agricultural odours) is likely to be different to those from the airport, and the background odour cannot be simply subtracted from the total odour to give the airport-related odour.

Odour measurement

TAG Farnborough Airport commissioned odour monitoring downwind of aircraft engine exhausts[3] using the method of sampling by evacuated barrels (pump, barrel, sampling tubes and bags). The sampling analysis identified the issue of distinguishing airport-related odour from background odour.

TAG Farnborough Airport also committed to an odour monitoring scheme[4] which would first analyse each complaint on the basis of wind direction and airport activity at the time of the complaint, and would include sampling and odour analysis at the request of residents. This sampling involves bringing equipment (as above) and suitably qualified personnel to site, so there will be a time delay of days if not weeks between the complaint and the measurement. The sampling would also be subject to the limitations discussed above: the variation of odour across an area and the short time scale of odour nuisance.

Recent Experience at Stansted Airport

The Operations Team at Stansted Airport has supplied data on odour complaints received in recent years. In the last five years a total of 27 complaints concerning odour were received. The breakdown by financial year is shown in Table 1. At Manchester Airport, which has the same owner and operator as Stansted Airport (Manchester Airport Group), the number of odour complaints is also very low, with one or two per year and, in some years, no complaints.

Table 1: Stansted Airport, number of odour complaints in recent years

Financial year	Number of odour complaints
2013/14	4
2014/15	14
2015/16	1
2016/17	4
2017/18	4

A statement on odour management at Stansted Airport is included at Appendix A.

[3] Arup (2009) Farnborough Airport, Odour Assessment, report to Rushmoor Borough Council, reference 209721, August 2009
[4] TAG Farnborough Airport (2010) Odour Monitoring Scheme, April 2010

Experience at Major UK Airports 1999-2005

The Environmental Statement[1] for STAL's 2006 Generation 1 proposed development looked into the potential for odour nuisance near to the Airport.

STAL had undertaken an odour survey between August and November 2005. During the survey the Airport actively requested reports of any incidents of odour nuisance from residents, which resulted in 99 reports, mostly from residents in Birchanger Green and Stansted Mountfitchet. Apart from that survey there was little information on odour complaints with just a "small number" received by the Airport and Uttlesford District Council each year. The ES therefore looked into complaints at other UK airports. The number of complaints for years between 1999 and 2005 is summarised in Table 2. It can be seen that the number of complaints is low, especially considering the level of airport activity and the number of residential properties close to the airports.

Manchester Airport

Manchester Airport received the most complaints during this period with a peak in 2001. In 2001 Manchester Airport started using the second runway and it can be seen that by 2004 the level of complaints had returned to the same level as before the use of the second runway commenced. It is also noted[1] that most complaints were received from an individual property close to a holding area for one of the runways.

Gatwick Airport

The Environmental Health Office for Reigate & Banstead reported that complaints are few, around 10-12 complaints a year[5], which corresponds to the data in Table 2.

Gatwick Airport planned to complete a full airport odour study by end of 2009, but the number of complaints in 2009 was found to be negligible and therefore the study was deemed to be not necessary[6].

Table 2 Number of odour complaints at major UK airports

Year	Number of odour complaints			
	Heathrow	Gatwick	Manchester	Birmingham
1999	No data	No data	22	No data
2000	14	6	23	4
2001	20	9	191	3
2002	10	9	78	3
2003	5	2	61	2
2004	10	3	26	2
2005	8	6	No data	No data

[5] Draft minutes, The Noise & Track Monitoring Advisory Group (NaTMAG) 23rd February 2017
[6] Gatwick Airport Limited (2010) Sustainability Performance Review 2009, Date of issue: 21/09/2010

Experience at other UK airports

TAG Farnborough Airport

In 2007 and 2008 a total of 32 and 20 odour complaints respectively were received. In addition, Hart District Council received six complaints in 2008, but only three between 1994 and 2007. The complaints were attributed to long hold times at the airport. TAG Farnborough Airport implemented an odour management plan and committed to odour monitoring if requested by residents[4]. Since that time odour complaints have reduced to approximately one per quarter year as reported in the TAG Information Reports[7].

Cambridge Airport

The nature of the business at Cambridge Airport is that there is a high proportion of aircraft maintenance and engine testing. Cambridge City Council received two odour complaints between 2013 and 2015 and no complaints were recorded by Marshall Group Properties Limited[2]. The complaints were related to engine testing, and the engine ground running (EGR) facility at that time was close to a public road. The 2016 Environmental Statement concerned relocation of the EGR facility.

Conclusions

A review of odour complaints at UK airports has shown that:

- Odour is subjective and sensitivity varies from individual to individual;
- Odour is difficult to measure as: it is often due to a mixture of substances; can be confounded by background odour that cannot simply be subtracted from the total; it can be due to short time scale events; it can vary across an area; and the sampling requires equipment and personnel;
- The number of odour complaints in recent years at Stansted Airport and Manchester Airport, which have the same owner and operator, are extremely low, with typically no more than four complaints per year, and a maximum of 14 per year;
- The number of odour complaints at major UK airports between 1999 and 2005 was very low: fewer than 10-12 per annum typically at Heathrow, Gatwick, Stansted and Birmingham Airports;
- Smaller airports such as Cambridge Airport which carries out proportionately more engine testing than larger airports due to the nature of their business have nonetheless received a very low number of odour complaints; and
- Farnborough Airport received 32 and 20 complaints in 2007 and 2008 respectively after which an odour management plan was implemented. Since that time odour complaints have reduced to approximately one per quarter year.

Odour is not a significant issue at UK airports. The number of complaints received is very low.

[7] Farnborough Aerodrome Consultative Committee (FACC), TAG Information Report – February 2018

Appendix A: Stansted Airport's Odour Management Statement

STAL has monitored, reported on and managed air quality for over a decade and has well established processes and procedures in place. The air quality monitoring around the airport shows that it is well within the regulatory EU air quality limits. The trend for air quality around London Stansted has been one of continual improvement.

If residents believe that they experiencing aviation fuel odour problems, then reports of such issues can be made online via the website and STAL work with Uttlesford District Council's Environmental Health Team to investigate any complaints. Investigation into any such complaints would include, but is not limited to: wind direction, engine testing schedules, and airfield operations on the appropriate day.

The website provides a button to mailto: stanstednoiseline@stanstedairport.com

Technical Note

253360-00 2 July 2018

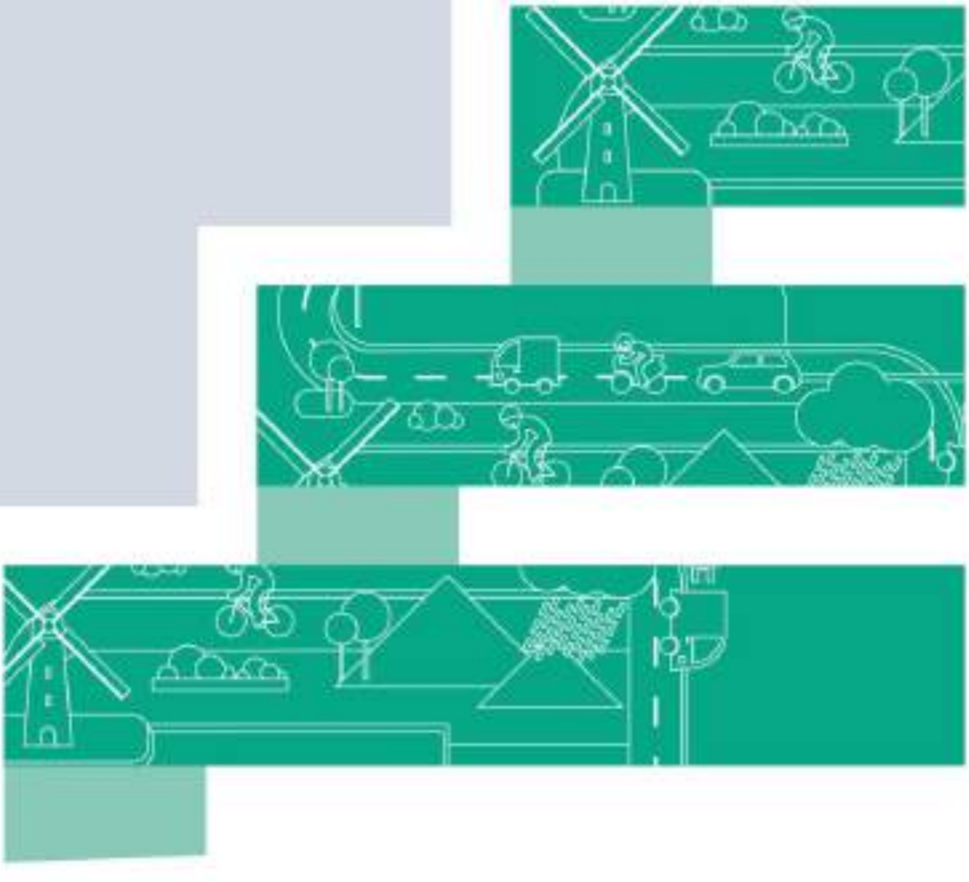
DOCUMENT CHECKING

	Prepared by	Checked by	Approved by
Name	Christine McHugh	Marilena Karyampa	Christine McHugh
Signature			

TRANSFORMING LONDON STANSTED AIRPORT

35+ PLANNING APPLICATION

ANNEX 5: WATER TECHNICAL NOTE



Find out more at
ourstansted.com

MAG London Stansted Airport

WSP RESPONSE TO ECC LLFA CONSULTATION RESPONSE – Stansted Airport 35+

DATE	07 June 2018	CONFIDENTIALITY	Public
SUBJECT	FLOOD RISK AND DRAINAGE STRATEGY		

PROJECT	Author	Checked	Approved
70036781	J. Berryman	J. Berryman	J. Berryman

1. INTRODUCTION

ECC LLFA have reviewed the Flood Risk Assessment and the associated documents which accompanied the planning application and have issued a joint response responding to all areas of the application. As it may take some time for the response to work its way out to the consultation Tim Simpson (TS) has provided a summary of the response in his email dated 20th March 2018. TS comments are set out below:

- Fully address pollution risk. – Pollution mitigation would not be necessary during the winter period since all surface water from the runway areas will be discharge from the site as foul water. However outside of this period it should be shown that pollution from all sources are treated in line with mitigation guidelines recommended in the CIRIA SUDS manual C753. While it is understood that the airport already has pollution mitigation measures in place these are currently not in a format that that easily measurable against our assessment criteria.
- Provide an indicative plan showing possible layout for the proposed storage and treatment

2. RESPONSE

This response seeks to clarify the above points and where required sets out further information for the County Council to review in order for them to be in a position to withdraw their objection to the proposal.

1. ***Fully address pollution risk. – Pollution mitigation would not be necessary during the winter period since all surface water from the runway areas will be discharge from the site as foul water. However outside of this period it should be shown that pollution from all sources are treated in line with mitigation guidelines recommended in the CIRIA SUDS manual C753. While it is understood that the airport already has pollution mitigation measures in place these are currently not in a format that that easily measurable against our assessment criteria.***

The four proposed areas which make up the development and will see an increase in impermeable area will connect to the existing 'Runway / Taxiway' surface water catchment.

As outlined in the FRA, during the winter period the surface water is contaminated with de-icer and is subsequently pumped to Rye Mead WWTW – see FRA for details.

The below sets out the existing surface water treatment stages and monitoring present at the airport.

Existing hard surfaces in these areas are drained by slot drains which run along the low edge of the taxiway surfaces. Grass areas in these areas are drained by French drains. Drainage from both of the above surfaces contains catch pits. Furthermore, Area 1 (Ret) and part of Area 2 (Yankee) (see proposed Masterplan in **Appendix A**) will drain to the existing ditch system to the south east of the runway. At the end of this ditch, the water is then culverted back to Pond C. The existing surface water drainage network is set out in Appendix C of the FRA. A review has been undertaken to determine if additional green SuDS could be retrofitted in the vicinity of the four development areas, however a number of constraints limit installation:

- No open water features can be installed adjacent to the airfield due to risk of bird strike.
- Grassed areas adjacent to the runway/taxi way areas much be kept clear and be of a similar topography to the runway/taxi to allow for the event of an aircraft leaving the taxiway onto the grassed areas.
- A number of strategic airport utilities are run under the grassed areas adjacent to the runway/taxi way.

All runway / taxi way drainage is fed through an oil separator near Pond C, details of which are set out in **Appendix B**.

The airport have aerators installed on the clean pond which are highly effective at overcoming oxygen deficits in the summer due to lower O2 solubility. The As Built drawing south facilities in the clean side of Pond C are set out in **Appendix C.**

Floating FUCHS Spiral Aerator

STAL have no history of exceeding hydrocarbon limits for Pond C over the last 10 years. **Appendix D** sets out the inspection, operation and management regime for the balancing pond system at the airport, this includes the water quality compliance sampling collection and field analysis regime for all ponds at the airport.

2. ***Provide an indicative plan showing possible layout for the proposed storage and treatment***

   Please refer to Appendix B for General Arrangement Drawing which sets out one of the options for providing the required 256m³ of attenuation.

   Outputs from the modelling for the baseline and proposed scenarios are set out in Appendix I of the FRA. Figure 7-2 within the FRA shows the full discharge curves for the baseline and proposed scenario. This volume difference between the two lines equates to 256m³. This volume as a minimum will need to be attenuated and discharged at a rate no greater than the 1:1 greenfield runoff rate as per the requirements set out by Essex County Council Lead Local Flood Authority, this equates to 14.1 l/s.

   The required attenuation may be provided in one of the following forms (and is subject to review as part of an ongoing Airport Wide Water Review and subsequent detailed design):

   1. Merge the two eastern basins into a single basin
   2. Increase the size of one or both of the eastern basins
   3. Construct a new attenuation basin next to the existing basins.

   Option 2 is set out within this General Arrangement drawing in **Appendix E**.

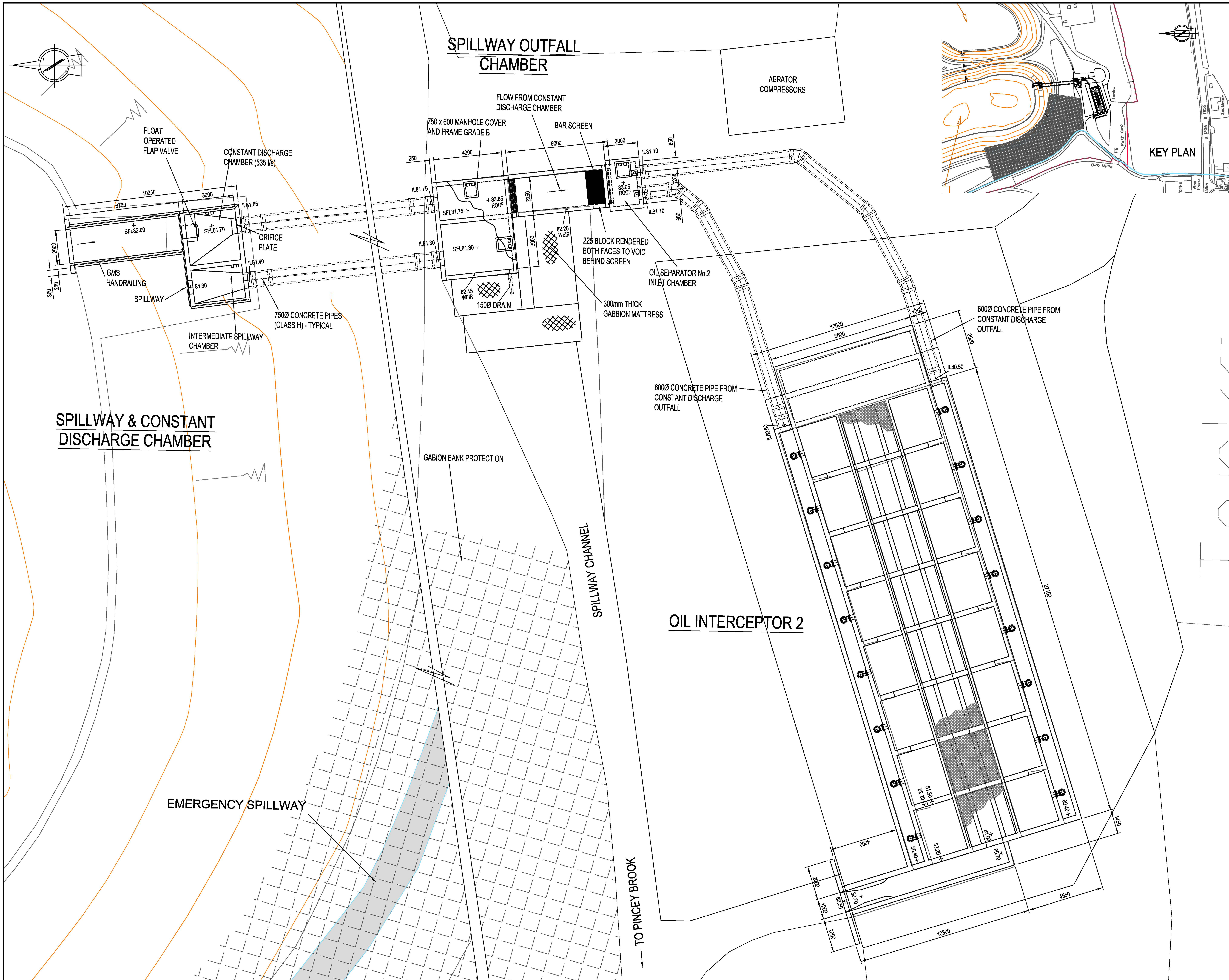
Appendix A –Development Masterplan

PASCALL
+WATSON

Airfield Infrastructure 02

PASCALL
+WATSON

Appendix B – Pond C Oil Separator



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM (mAOD) UNLESS OTHERWISE STATED.
3. TO BE READ IN CONJUNCTION WITH DRAWING Nos: STAL-BV-19615-C-50033, 50034 & 50035

Scale 1:100

Rev	Revised By	Date	Checked By	Date
P0	DA	02.06.09	SMM / DW	02.06.09

ISSUE FOR COMMENT

BAA

Gatwick Airport Limited
London Gatwick Airport
West Sussex
RH6 0NP

BLACK & VEATCH

Grosvenor House
69 London Road
Redhill
RH1 1LQ

Airport: STANSTED

Project Name: G2

Title: POND C - CLEAN OUTLET (DRAWING 5 of 5)

Discipline: CIVILS | Project Phase:

Drawing Originator: BLACK & VEATCH | Originator's Job No.: 107973

Checked By	Checked Date	Drawn By	Drawn Date
FS	02.06.09	NHE	31/03/09

Approved By	Approval Date	Scale
NM	02.06.09	1:100 & 1:2000

Building Grid Reference

Owner	Originator	Project Ref.	Discipline	Drawing No.	Revision
STAL	BV	19615	C	50036	P0

Appendix C – Pond C – Clean Side – Aeration Facilities As Build Drawing