

CITY AIRPORT DEVELOPMENT PROGRAMME (CADP)

CADP: HEALTH IMPACT ASSESSMENT

**London City Airport**
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London City Airport

City Airport Development Programme

Health and Equalities Impact Assessment

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Date of issue:	16 July 2013			
Revision:	5			
Project number	JAS6839			
Document file path:	O:\Jobs_6001-7000\6839s\Deliverable\JAS6839_HIA_rev5_200130717 (3).docx			

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Revision History				
Rev	Date	Status	Reason for revision	Additional comments
0	11/01/13	Draft	-	
1	25/04/13	Draft	Updated project description	
2	05/07/13	Draft	Revised applications and Draft ES Technical Inputs	
3	12/07/13	Draft	Received revised air quality and noise assessment	
4	16/07/13	Draft	Legal Review	
5	17/07/13	Final Draft	Final Review	

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Executive Summary

Background

1. London City Airport ('the Airport') operates within the terms of a July 2009 Planning Permission (ref. 07/01510/VAR) which enables it to operate up to 120,000 aircraft movements, subject to the operation of a noise factoring system and other controls. The Airport is not seeking to increase the number of aircraft movements or to change its hours of operation, beyond that which is already approved. Furthermore, all existing environmental and operational controls, strategies and systems approved through the conditions attached to the 2009 Planning Permission and the associated Section 106 planning agreement will continue to apply.
2. The proposed development, known as the City Airport Development Programme (CADP), comprises a full planning application to construct new passenger facilities, 7 new aircraft stands and associated infrastructure (CADP1) together with a separate outline planning application for a hotel (CADP2). New passenger facilities and infrastructure are required to enable the Airport to respond to forecast growth in passenger numbers (particularly in peak periods) and accommodate new generation aircraft which are physically larger than the current fleet.
3. In keeping with best practice, a voluntary Health Impact Assessment (HIA) has been commissioned. The primary aim of the HIA has been to build upon and complement the outputs of the ES to further integrate health and wellbeing within the proposed CADP, to identify and assess potential health outcomes and to put forward recommendations to optimise health gains whilst minimising potential negative impacts and inequality.

Assessment

4. The construction and operation of the proposed CADP has a number of features that might be considered to have implications for the health of neighbouring communities. This HIA has examined the extent of these in a manner that considers local circumstance and the best available scientific evidence.

Construction Effects

5. Construction of the proposed CADP presents a number of potential health pathways. However, taking into account the level of emissions to air generated on-site, their intermittent nature/duration and minimal opportunity for community exposure, the risk to community health is not of a level to quantify any measurable adverse health outcome. Potential disruption would be further managed through bespoke mitigation detailed in the CADP Environmental Statement, alongside on-going Airport engagement and community support initiatives. A summary of these measures is provided in the Health Action Plan (HAP) presented at Chapter 7 of this document.
6. Prior to mitigation, a key risk associated with the construction phase would be increased traffic movements and the associated risk of collision. Such risk, however, is of low likelihood and will be primarily managed through a Construction Logistics Plan (CLP) adopted by the main

contractor. As set out in the CADP Transport Assessment (TA), this CLP will include details of the transportation strategy for construction materials to and from the Airport, including the use of the river where possible, in order to minimise the impacts on the local road network.

7. Construction emissions are predicted to be minimal and will remain within National air quality standards set to protect health. When further accounting for local high burdens of poor health and relative sensitivity, these emissions are not of an order to quantify any adverse health outcome. As with all major construction projects, dust impacts can be anticipated. However, following the implementation of a Dust Management Plan (DMP) approved by the Local Authority, potential impacts would be limited to minor annoyance and do not present a risk to local community health.
8. Following mitigation, construction noise is not predicted to be of a magnitude sufficient to quantify any adverse health outcome, with impacts limited to potential annoyance and short term intermittent sleep disturbance at the community level during landside infrastructure works. On-going engagement with local communities will therefore be key to both managing any residual impacts, and enabling local residents to better manage any intermittent disturbance.
9. Construction of the proposed CADP would generate significant direct, indirect and induced income and employment at the local and regional level, with subsequent socio-economic health benefits at the local and regional level.

Operational Effects

10. Once operational, potential changes in air quality are predicted to be negligible, remain within environmental standards set to protect health and not of a level to quantify any change in local health outcome.
11. The proposed CADP will not seek to alter the current operational flying hours of the Airport as permitted in the 2009 Planning Permission, with no aircraft taking off or landing after 22.00 hours or before 6.30. On this basis, the proposed CADP will not impact upon sleep disturbance.
12. Prior to mitigation, air noise from the increase in movements (up to 111,000 flights per annum by 2023) and changes in the fleet mix presents a potentially significant impact on community annoyance, largely for existing populations within the 57 dB contour (associated with the onset of significant community annoyance) and new populations from permitted residential developments within this contour.
13. The threshold of Sound Insulation Scheme (SIS) at the Airport is currently the lowest for any UK airport (57 dB) and provides greater mitigation compared with the Government's recommended threshold of 63 dB $L_{Aeq,16h}$ which was set with the intention of largely precluding the onset of significant annoyance. On this basis, following mitigation, the risk of potential annoyance will be significantly reduced.
14. There are no hospitals located within the 57 dB $L_{Aeq,16h}$ noise contours (either now or proposed). The Richard House hospice currently lies within the boundary of the existing Sound Insulation Scheme, and is already well insulated against external noise. Potential changes in noise

exposure at local schools and other academic institutions (e.g. the University of East London) are marginal, and not of a level to quantify any impact upon academic performance.

15. Changes in Airport infrastructure and operations will alter the characteristics of daytime ground noise and consequent exposure to surrounding communities. The overall ground noise impact of the proposed CADP has been assessed as 'negligible' to 'minor adverse', with both 'moderate beneficial' (e.g. -4.2 dB at Newland Street) and 'moderate adverse' impacts (e.g.+3.9 dB at Brixham Street) experienced at particular locations. Potential health impacts related to ground noise are therefore limited to localised daytime annoyance, which are to be managed through current operational procedures and are not of a level to quantify any measurable adverse health outcome.
16. Surface transport noise from the proposed CADP will be largely negligible for the majority of receptors modelled. However, properties on Woodman Street closest to the new eastern access road are predicted to be exposed to a major relative increase in noise due to the new traffic source. However, by 2023, absolute noise levels at properties on the eastern end of Woodman Street are predicted to remain comparable to the other modelled receptors (predicted at 60.5 L_A 10,18h), and fall within the Airport's existing Sound Insulation Scheme, thereby largely mitigating the localised daytime noise impact.
17. All junctions indicate sufficient capacity to accommodate the proposed CADP, while the implementation of a second vehicle access to the Airport from Woolwich Manor Way roundabout to the east will provide additional capacity on the highway network and enables the potential traffic impact of the proposed CADP to be spread and more effectively managed between two access points. As such, the proposed CADP will result in a reassignment of traffic on the local highway network, resulting in a reduction in traffic on certain links, most notably Royal Albert Way east (with a -14.6% reduction) and Royal Albert Way west (with a -13.1% reduction), and an increase on others such as Woolwich Manor Way south (+42.4%).
18. The proposed CADP is not predicted to impact upon local road capacity, materially impact upon road safety or adversely impact upon community severance.
19. The proposed CADP presents a significant increase in the number of direct, indirect and induced income and employment opportunities with a high proportion of employment opportunities likely to be taken up locally, with significant socio-economic health benefits at a regional and local level.
20. The Hotel outline application (CADP2) constitutes a 3 star hotel with the potential for 260 rooms, generating up to 130 additional direct jobs and £5.8 million of GVA upon opening. This would constitute an additional socio-economic health benefit.

Conclusions

21. On the basis that all regulatory environmental standards set to protect health are predicted to be achieved; that the assessment from relative changes in air quality, noise and transport upon existing burdens of health are not sufficient to quantify any significant adverse health outcome; and, when considering the Airport's commitment for on-going community engagement to

investigate and address concerns, the proposed CAPD does not constitute a significant risk to local community health.

22. Furthermore, when accounting for the underlying factors defining local burdens of poor health in and surrounding the area (largely socio-economic and lifestyle related), and the direct, indirect and induced socio-economic benefits from the proposed CADP, alongside an impressive catalogue of committed community support initiatives introduced by the Airport (summarised within the HAP) to optimise local health benefit uptake, the proposed CADP constitutes a net health benefit.

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1 Introduction

Background

- 1.1 The proposed development project, known as the City Airport Development Programme (CADP), comprises a full planning application to the London Borough of Newham (LBH) to construct new passenger facilities, 7 new aircraft stands and associated infrastructure (CADP1) together with a separate outline planning application for a hotel (CADP2).
- 1.2 The CADP1 application is required to enable the London City Airport ('the Airport') to respond to forecast growth in passenger numbers (particularly at peak periods) and to accommodate new generation aircraft which are physically larger than the current fleet. The planning application is described as:

"Planning Application CADP1: Works to demolish existing buildings and structures and provide additional infrastructure and passenger facilities at London City Airport without changes to the number of permitted flights or opening hours previously permitted pursuant to planning permission 07/01510/VAR. Detailed planning permission is being sought for

- (a) Demolition of existing buildings and structures;
- (b) Works to provide 4 no. upgraded aircraft stands and 7 new aircraft parking stands;
- (c) The extension and modification of the existing airfield to include the creation of a taxiline running parallel to the eastern part of the runway and connecting with the existing holding point;
- (d) The creation of a vehicle access point over King George V Dock for emergency vehicle access;
- (e) Laying out of replacement landside Forecourt area to include vehicle circulation, pick up and drop off areas and hard and soft landscaping;
- (f) The Eastern Extension to the existing Terminal building (including alteration works to the existing Terminal) to provide reconfigured and additional passenger facilities and circulation areas, landside and airside offices, immigration areas, security areas, landside and airside retail and catering areas, baggage handling facilities, storage and ancillary accommodation;
- (g) The construction of a 3 storey passenger pier to the east of the existing Terminal to serve the proposed passenger parking stands;
- (h) Erection of a Noise Barrier at the eastern end of the proposed Pier
- (i) Erection of a temporary Noise Barrier along part the southern boundary of the Application Site to the north of Woodman Street;
- (j) Western Extension and alterations to the existing Terminal to provide reconfigured additional passenger facilities and circulation areas, security areas, landside and airside offices, landside retail and catering areas and ancillary storage and accommodation;
- (k) Western Energy Centre, storage, ancillary accommodation and landscaping to the west of the existing Terminal;
- (l) Temporary Facilitation Works including the erection of a Noise Barrier to the south of 3 aircraft stands, a Coaching Facility and the extension to the outbound baggage area;
- (m) Works to upgrade Hartmann Road;

- (n) Landside passenger and staff parking, car hire parking and associated facilities, taxi feeder park and ancillary and related work;
- (o) Eastern Energy Centre;
- (p) Dock Source Heat Exchange System and Fish Refugia within King George V Dock; and
- (q) Ancillary and related work.

- 1.3 Outline Planning Permission is being sought for the hotel (Application CADP2) to provide a degree of flexibility for the building which is likely to be brought forward separately by a hotel operator. This application is described as:

Planning Application CADP2: Erection of a Hotel with up to 260 bedrooms, ancillary flexible A1-A4 floorspace at ground floor, meeting/conference facilities together with associated amenity space, landscaping, plant and ancillary works.

- 1.4 A full description of the CADP1 and CADP2 applications is provided in the Planning Statement and CADP Design and Access Statement (DAS) which accompany these applications.
- 1.5 The Airport currently operates within the terms of a July 2009 Planning Permission (ref. 07/01510/VAR) which enables it to operate up to 120,000 aircraft movements, subject to the operation of a noise factoring system and other controls. The Airport is not seeking to increase the number of aircraft movements or to change its hours of operation, beyond that which is already approved. Furthermore, all existing environmental and operational controls, strategies and systems approved through the conditions attached to the 2009 Planning Permission and the associated Section 106 planning agreement will continue to apply.
- 1.6 In keeping with best practice, a voluntary Health Impact Assessment (HIA), including elements of Equalities Impact Assessment (EqIA), has been commissioned to inform and support the planning process and application for the proposed CADP.
- 1.7 The remainder of this Chapter provides an introduction to the HIA, detailing its aims and objectives, the approach and methodology applied, and its relationship to the Environmental Statement (ES) which is submitted separately with the CADP1 and CADP2 planning applications.

Health Impact Assessment

- 1.8 HIA is a multidisciplinary process designed to identify and assess the potential health outcomes (both adverse and beneficial) of a proposed project, plan or programme and to deliver evidence-based recommendations that maximise health gains and reduce or remove potential negative impacts or inequalities (Ref.1).
- 1.9 Although not a statutory requirement of the UK planning process, there is a sector-specific requirement through the Aviation Policy Framework (Ref.2) and an expectation from the London Borough of Newham (Ref.3), to investigate and address potential impacts from airport developments upon local communities, their health and wellbeing.

Approach

- 1.10 The basis and principles of this HIA, which has been prepared in accordance with current guidance (Ref.1), are set on a broad socio-economic model of health that encompasses conventional health impacts such as communicable disease, accidents and risk along with wider determinants of health vital to achieving good health and wellbeing. These wider determinants of health include income, employment, housing, education, the quality of the urban environment, crime and the perception of crime. In this instance, the HIA also includes elements of Equalities Impact Assessment (EqIA), to ascertain if aspects of the proposed CADP have a disproportionate impact upon specific sensitive community groups.
- 1.11 A key aspect of the HIA approach has been to work alongside, draw from and build upon the technical assessments contained within the CADP Environmental Statement (ES). The HIA has had regard to the following:
1. the EIA Scoping Report (October 2012) and LBN's formal Scoping Opinion dated 4th December 2012, together with subsequent correspondence;
 2. the public consultation process and Statement of Community Involvement (June 2013);
 3. the noise and vibration assessment completed by Bickerdike Allen Partners (BAP) and presented in Chapter 8 of the ES;
 4. the air quality assessment and detailed air dispersion modelling completed by Air Quality Consultants (AQC) and presented in Chapter 9 of the ES;

1 Kemm J and West Midlands Public Health Observatory. (2007). Critical Guide to HIA. Available at www.apho.org.uk/resource/item.aspx?RID=44422 last accessed 15/07/13.

2 Aviation Policy Framework. (2013). Presented to Parliament by the Secretary of State for Transport by Command of Her Majesty. March 2013. Cm 8584. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/153776/aviation-policy-framework.pdf last accessed July 2013

3 London Borough of Newham. (2012). Newham's Local Plan - the Core Strategy. Adopted Version January 2012. Paragraph 6.19. Page 91. Available at <http://www.newham.gov.uk/Documents/Environment%20and%20planning/Core%20Strategy%2004-13%20Final%20LR.pdf> last accessed 15/07/13.

5. the Transport Assessment (TA) by Vectos presented in Chapter 11 of the ES; and,
 6. the socio-economic assessment completed by York Aviation and presented in Chapter 7 of the ES.
- 1.12 Integration with the planning and EIA process has enabled the consideration of potential health pathways (particularly noise) to iteratively inform the development of the proposed CADP and this HIA. The HIA has tracked and accounted for refinements to the CADP proposals, ensuring that it is informed by the final predicted changes in environmental and socio-economic conditions directly attributable to the proposed CADP.

Aim and objectives

- 1.13 The primary aim of the HIA has been to build upon and complement the outputs of the ES to further integrate health and wellbeing within the proposed CADP, to identify and assess potential health outcomes and to put forward recommendations to optimise health gains whilst minimising potential negative impacts and inequality.
- 1.14 This aim has been achieved through the following:
1. HIA scoping to establish, justify and agree an appropriate scope and focus of assessment with key stakeholders;
 2. community profiling to establish local circumstance and relative sensitivity, forming the founding platform to the assessment process;
 3. iterative HIA support to address local circumstance and community health concerns through the refinement of the proposed CADP;
 4. quantifying and appraising the magnitude, distribution and likelihood of potential health outcomes (both adverse and beneficial) directly attributable to the proposed CADP; and
 5. development of a Health Action Plan (HAP) to further address local circumstance, support the uptake of potential health benefits and inform on-going community engagement and feedback.

Methodology

- 1.15 Although guidance and a generic HIA process exists, the methods employed in HIA are often tailored to meet the particular assessment requirements of a project. In this instance, the HIA has been run parallel with the Environmental Impact Assessment (EIA), drawing from technical outputs and integrating key stages of community and stakeholder engagement. Core stages of the HIA include:
1. HIA Scoping;
 2. Project Profile;
 3. Community Profile;
 4. Stakeholder Engagement;

5. Assessment; and
 6. Conclusion, Recommendations and Health Action Plan.
- 1.16 Each of these stages is described below.

Scoping Exercise

- 1.17 Scoping is the process by which the focus of the HIA is set, defining the key health pathways to be assessed (i.e. aspects with the potential to influence health, both adversely and beneficially); and, just as importantly, rationalise aspects to be outside of the scope. This is necessary to ensure the HIA is fit for purpose, meets stakeholder expectations and identifies potential opportunities to support local and strategic health objectives, but does not cover matters that the HIA cannot influence.
- 1.18 The scope of the HIA was initially defined through a review of the available project information and health literature, and then refined through the formal EIA Scoping Opinion from LBN (referred to above) and the response of statutory consultees. It was further developed by a formal HIA scoping exercise (November to December 2012) and through feedback from key health stakeholders. A copy of the HIA Scoping Document is presented at Appendix A.
- 1.19 During the development and refinement of the proposed CADP a number of changes to the planning strategy have ensued, including the separation of elements of the proposed CADP into two different planning applications as described above. These changes do not alter the scope and focus of the HIA.

Project Profile

- 1.20 The project profile draws from the planning application, the ES and available literature to outline the core activities and associated health pathways to be investigated in greater detail within the assessment stage. A health pathway can be described as the way in which an activity influences a known determinant of health. As an example of how the health pathway concept is applied, construction activities are known to influence environmental determinants of health including air quality, noise and traffic. A health pathway is identified when such influences have the opportunity to impact on communities with the potential to cause a response or health effect.
- 1.21 Identification of potential health pathways helps to define the scope of the study, from which it is possible to develop a suitable evidence base and a more informed community profile. The distribution, magnitude and significance of the health pathways are then investigated within the assessment stage.

Community Profile

- 1.22 Evidence suggests that different communities have varying susceptibilities to health impacts and benefits as a result of social and demographic structure, behaviour and relative economic

circumstance (Ref.4). A community profile therefore not only forms the basis to exposure response modelling, but also provides a means to consider how potential health pathways identified in the project profile might act disproportionately upon certain communities and sensitive groups. In this instance, the community profile makes use of available demographic and health care data, complementing the socio-economic profile given in the ES.

Stakeholder Engagement

- 1.23 An important component of gathering an appropriate evidence base and tailoring the HIA to local circumstance is seeking the views of stakeholders and key representatives of communities likely to be affected by the proposed CADP. In this instance, an integrated engagement strategy was applied to engage and catalogue community and stakeholder concerns, providing informed feedback at exhibitions and a mechanism to both refine the proposed CADP to address such concerns through design, and influence the scope and focus of the final assessment.
- 1.24 In this instance, engagement has been delivered through an integrated engagement strategy, applied to inform:
1. the refinement of the proposed CADP;
 2. the project profile, to guide and further refine the scope and focus of the HIA;
 3. the community profile, aiding the identification and discussion of local health priorities, perceptions and concerns;
 4. the assessment protocols and evidence base applied; and
 5. the development and refinement of the Health Action Plan.
- 1.25 Section 4 of the HIA provides a brief summary of engagement stages and outputs pertinent to the HIA. However, for a more detailed account of the integrated consultation strategy, the methods applied, the stakeholders and communities engaged and the consultation outputs, the reader should refer to the full Statement of Community Involvement (SCI) (June 2013) report submitted with the planning applications.

Assessment

- 1.26 The assessment stage maps the project profile and technical outputs of the ES against the community profile to assess and appraise the magnitude, likelihood and distribution of potential health outcomes (both adverse and beneficial) that would be directly attributable to the proposed CADP.
- 1.27 To keep the HIA a concise and publicly-accessible document, the assessment draws upon the technical assessment outputs of the ES but does not seek to repeat or replicate them. Key inputs are, however, cross referenced with the ES to aid transparency.

4 Kemm J and West Midlands Public Health Observatory. (2007). Critical Guide to HIA. Available at www.apho.org.uk/resource/item.aspx?RID=44422 last accessed 15/07/13.

Health Action Plan (HAP)

- 1.28 The HAP expands upon the normal recommendations section within HIA guidance (Ref.5), establishing recommended protocols and monitoring regimes to be implemented to further reduce and remove potential negative health impacts while maximising opportunities to increase health benefits. In this instance, the HAP draws from and builds upon the mitigation outlined in the ES and existing Airport community support initiatives which are tailored to local circumstance and needs.

5 Kemm J and West Midlands Public Health Observatory. (2007). Critical Guide to HIA. Available at www.apho.org.uk/resource/item.aspx?RID=44422 last accessed 15/07/13.

2 Project Profile

Introduction

- 2.1 This section draws from the description of the proposed CADP detailed in the ES, and sets the scope of potential health pathways to be investigated. For the sake of brevity, the HIA does not seek to repeat the full description of the proposed CADP, but outlines the key aspects and the associated health pathways. For further details of the proposed CADP, the reader should refer to the Planning Statement, Design and Access Statement (DAS) and/or Chapter 2 of the ES: Site Context and Scheme Description.

CADP1

- 2.2 London City Airport is located between the Royal Albert Dock and King George V Dock within the London Borough of Newham, east London. Figure 2.1 illustrates the current layout of the airport.
- 2.3 The application site for CADP 1 extends to 60.1 hectares and includes the existing airport boundary and areas outside (principally to the south) required for the implementation of the proposed CADP. CADP1 overlaps with the application site for the proposed Hotel (CADP2) to ensure integration between the two proposals.
- 2.4 As detailed in the planning application description (above) and illustrated by Figure 2.2 and Figure 2.3, the Airport seeks full Planning Permission from LBN for new and upgraded aircraft stands, an extension to the taxiway running adjacent to the runway, a new extended Terminal, reconfigured Forecourt area and related infrastructure works. The CADP1 application proposals will allow the Airport to meet increasing regulatory standards, accommodate a new generation of larger, more fuel efficient aircraft, and improve the facilities and experience of passengers using the Airport. It will also enhance the operational efficiency and passenger capacity of the Airport in accordance with current and future customer, airline and regulatory requirements.
- 2.5 The proposed CADP does not seek to increase the permissible number of aircraft movements or noise factored movements (both currently 120,000 per annum), nor will there be any change in operational hours or other conditions by which the Airport currently operates.

CADP2

- 2.6 CADP2 is for outline Planning Permission for the erection of a hotel opposite the Western Extension on Hartman Road, with up to 260 bedrooms, ancillary flexible A1-A4 floor space (retail /restaurant/bar) at ground floor, meeting/conference facilities together with associated amenity space, landscaping, plant and ancillary works.

Figure 2.1 Current Aerial View of London City Airport (looking east)



Figure 2.2 Planning Application Redline Boundary and Existing Airport Layout

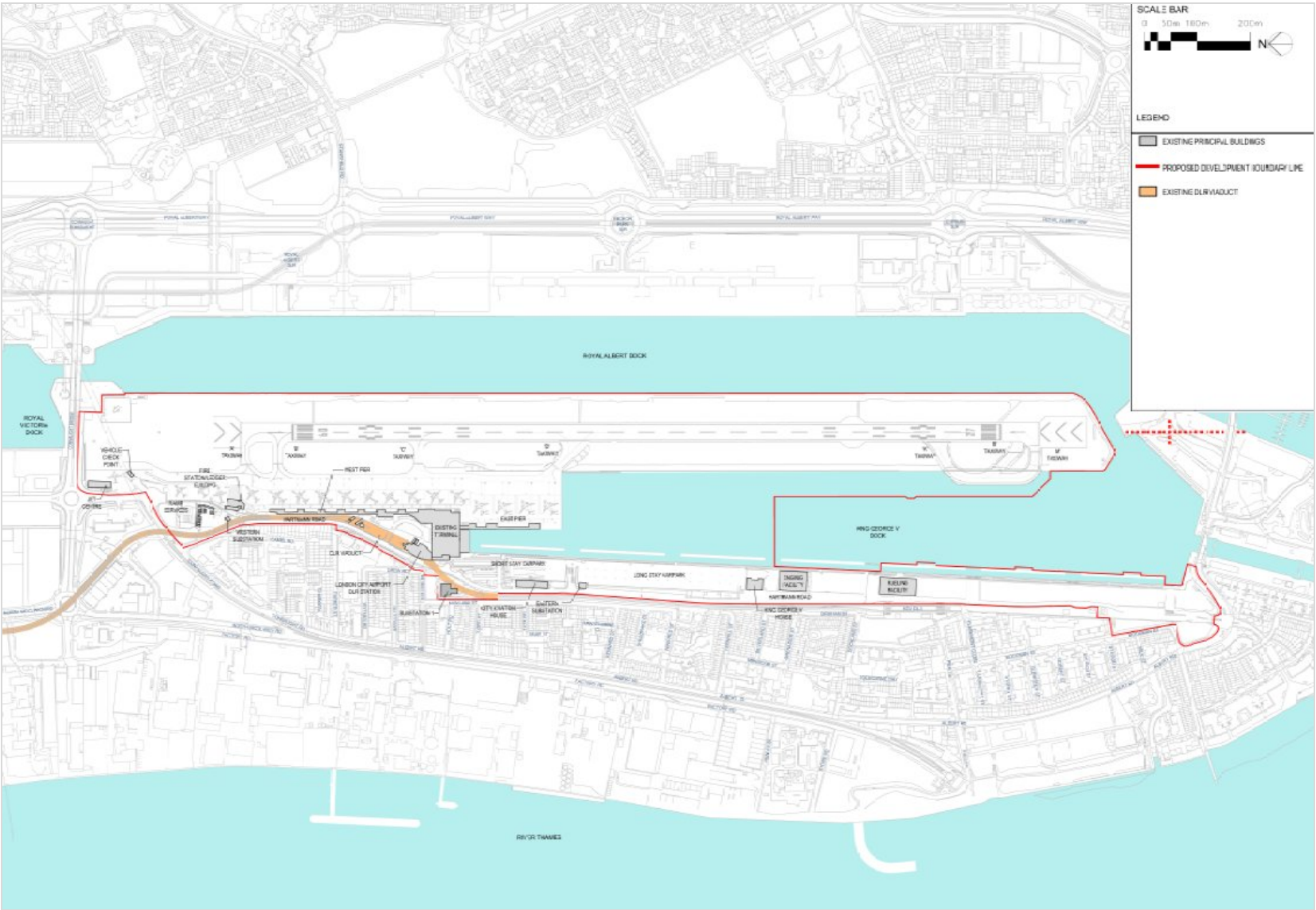
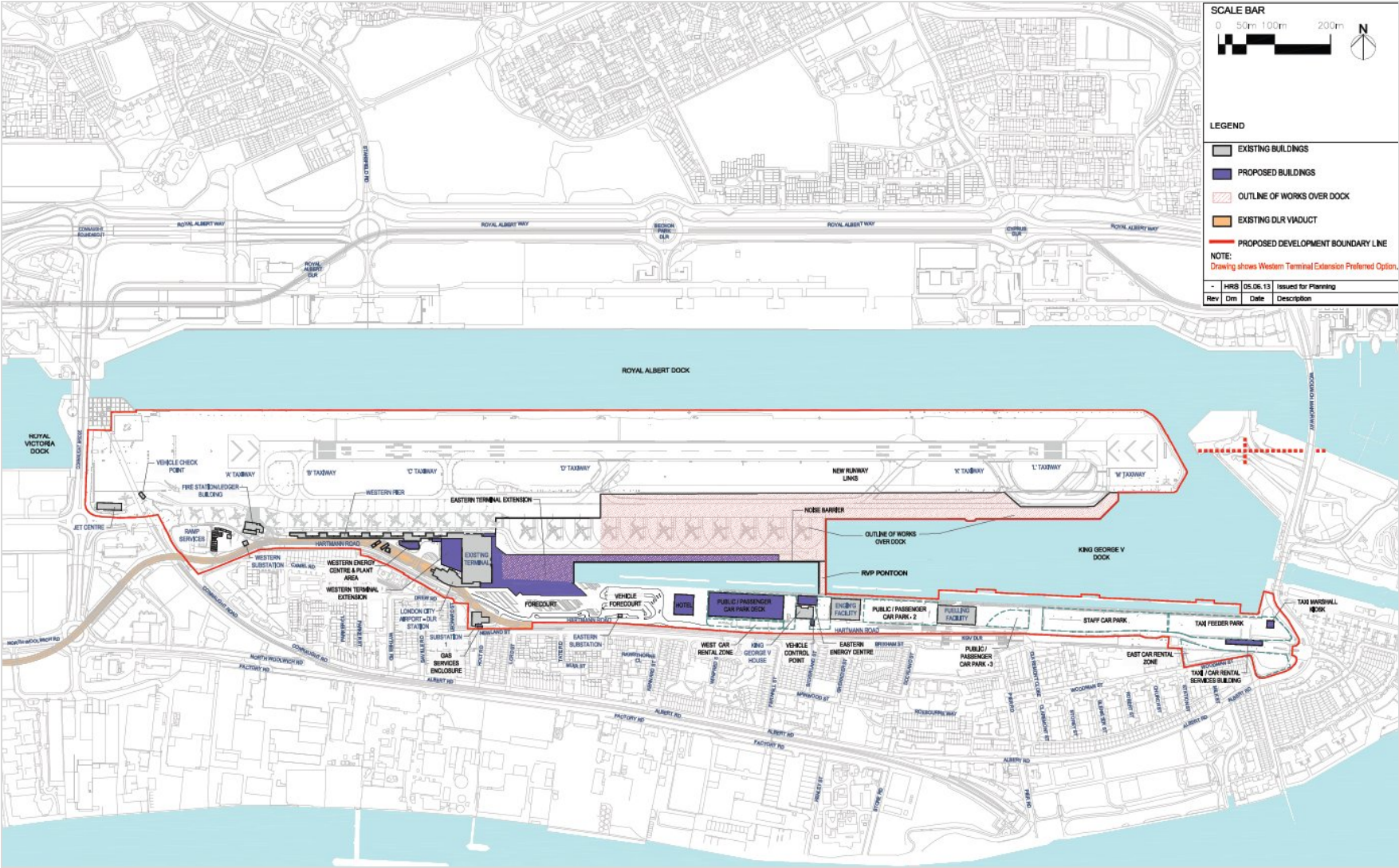


Figure 2.3 Planning Application Redline Boundary with the Proposed CADP



Health Pathways

- 2.7 A health pathway can be described as the way in which an activity influences a known determinant of health. As an example of how the health pathway concept is applied, construction activities are known to influence environmental determinants of health including air, noise and traffic. A health pathway is identified when such influences have the opportunity to impact on communities with the potential to cause a response or health outcome.
- 2.8 The identification of potential health pathways helps to define and rationalise the scope of the assessment, from which it is possible to develop an appropriate evidence base and an informed community profile. The distribution, magnitude and significance of potential health pathways are then investigated.

Construction

Approach

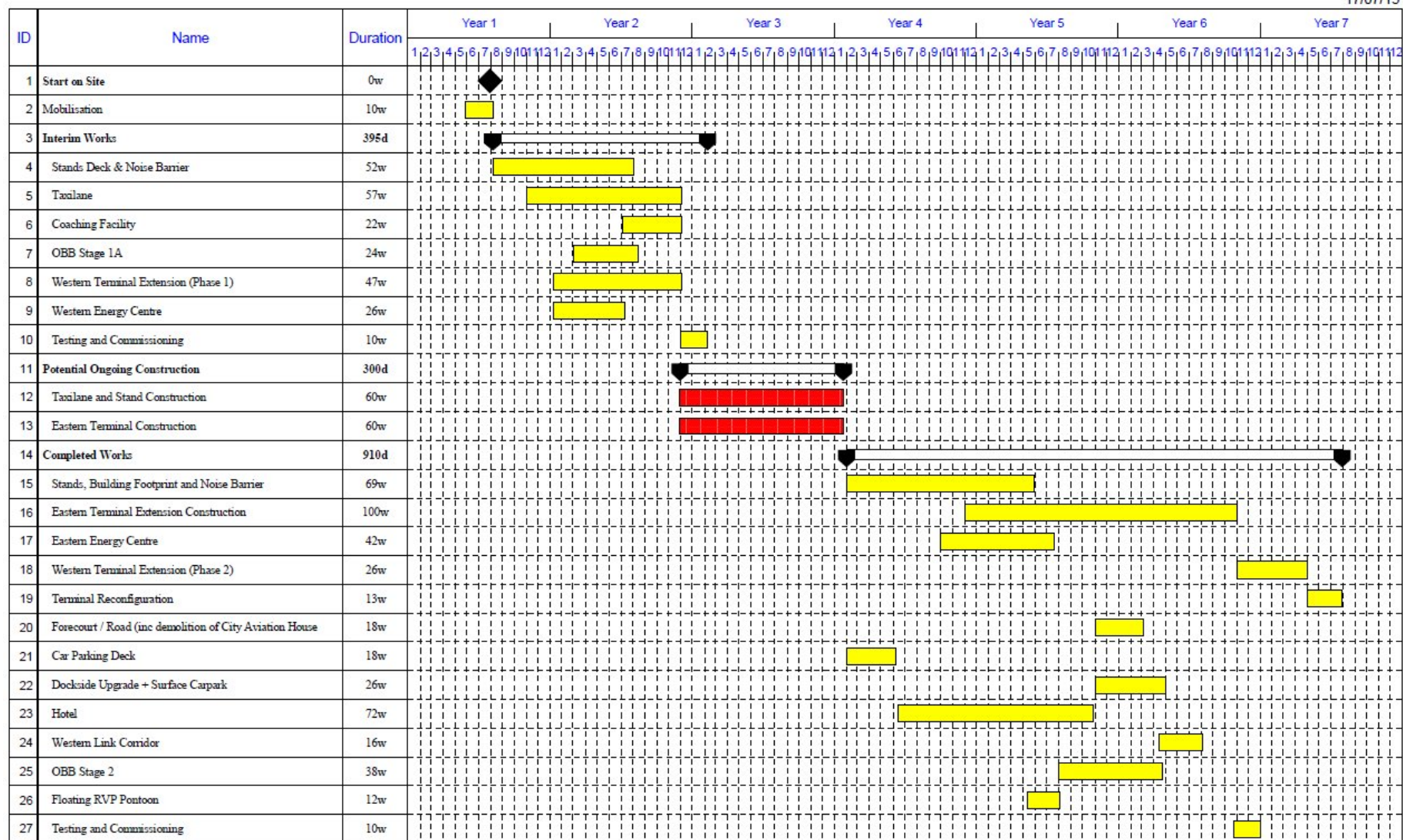
- 2.9 The construction programme and techniques to be applied build upon the previous eastern dock expansion experience, implementing tried and tested methods that minimise/manage environmental impacts and potential disruption/annoyance to local communities, and cause minimal disruption to local businesses reliant on the operation of the Airport.
- 2.10 Equally, wherever practical, the workforce will be sourced from the local area to maximise the uptake of socio-economic benefits and further minimise transport requirements. Construction materials and equipment will be delivered both by road and river to minimise congestion and disruption during peak transport hours to communities and travellers alike.

Programme

- 2.11 As shown in Figure 2.4, the proposed CADP represents a seven year phased/progressive construction programme. Initial stages (Year 1–2) include the partial construction of the eastern taxilane and three new Code C compliant stands on a new deck over King George V Dock. The temporary “Facilitating Works” for this infrastructure comprise an extended outbound baggage (OBB) handling facility, a new Coaching Facility to serve the three stands, and a noise barrier.
- 2.12 The new stands, taxilane and Facilitating Works are expected to be complete by late 2016 in order to meet the short term/ critical requirements of the Airport and airlines. During this time, the first phases of the Western Terminal Extension (WTE) and the Western Energy Centre will also be developed. The remainder of the proposed CADP will be built out progressively over the following four years (Years 3-6) to match demand. The full CADP works are anticipated to be complete and fully operational by Year 7.
- 2.13 It is important to note however, that the progressive construction programme is dependent upon the realisation of forecasted demand triggering specific construction phases, and it is unlikely that the construction process will be continuous during the entire six year period.

Figure 2.4 LCY CADP Likely Construction Sequence

17/07/13



- 2.14 The assessment sections of the ES and HIA adopt a conservative approach by applying the 'peak year' of construction (Year 4), on the basis that this is likely to represent the 'worst case' period for potential impacts on sensitive receptors within and around the Airport, including local residents, passengers and members of the public. Further information on the 'worst case' year and other details on the construction programme are described in Chapter 6 of the ES.

Construction Working Hours

- 2.15 As detailed in Chapter 6 of the ES, the construction working hours of the proposed CADP will be limited by the operational hours and activities of the Airport, and certain construction works will be performed at night and during the 24 hour weekend period when the Airport is closed. This is particularly relevant to activities close to the runway and those which require working at height within the transitional areas.
- 2.16 Specific night-time (22:00 to 06:30) and weekend (12:30 Saturday to 12:30 Sunday) activities proposed are:
1. 90% of board piling (night-time and weekend);
 2. crane placement of large precast elements close to the runway;
 3. crane placement of reinforcing steel for the in-situ concrete slab;
 4. all pavement works within the existing runway strip and dock edge (night-time and weekend);
 5. all breaking out of the KGV Dock walls (weekend only, not night-time);
 6. drainage infrastructure constructed within the runway strip;
 7. construction of other services within the runway strip;
 8. construction of the new building requiring craneage affecting airfield operations, and;
 9. essential safety and maintenance activities (night-time and weekend).
- 2.17 Other elements of the construction beyond the transitional surface and operational areas of the Airport (e.g. the surface car parking, Hotel and Eastern Energy Centre) are likely to take place during normal day-time hours (8.00 to 19:00). Any planned abnormal activities outside of these core hours will be agreed with LBN.
- 2.18 The construction employment estimates during the key phases of the CADP works are as follows:
- between Years 1 to the beginning of Year 3 the peak personnel employed per calendar month is estimated at 395 construction workers; and
 - between Years 4 and the end of Year 6, the peak personnel employed per calendar month is estimated at 499 construction workers.
- 2.19 In addition, construction of the proposed Hotel has been identified separately and the peak personnel employed per calendar month for the construction of this building is estimated at 275 workers.

Construction Health Pathways

- 2.20 Potential health pathways associated with the construction of the proposed CADP are therefore primarily environmental, including localised changes in air quality, noise and surface transport during the construction period, with wider socio-economic pathways associated with direct, indirect and induced income and employment opportunities. Wider health pathways are associated with general community disruption (noise, dust and transport) in close proximity to construction areas.

Operation

- 2.21 Once operational, the provision of new passenger facilities and infrastructure will enable the Airport to meet increasing regulatory standards, respond to forecast growth in passenger numbers (particularly at peak periods) and accommodate new generation aircraft which are physically larger than the current fleet, and offer improvements in fuel efficiency, noise emissions and other operational benefits.
- 2.22 Potential health pathways associated with the operation of the proposed CADP include changes in passenger throughput and associated surface movements along new access points and parking/taxi drop off facilities (i.e. changes in air quality, noise and risk from road traffic accident and injury). The CADP will also lead to changes in air noise, ground noise and emissions, largely due to the realignment and provision of new infrastructure and the uplift of aircraft movements facilitated by this new infrastructure. Wider socio-economic health pathways are associated with Airport enhanced capability and service, securing and expanding business, tourism and facilitating social and recreational activities.

Equalities Impact Assessment

- 2.23 Construction and operational health pathways have the potential to have a disproportionate impact upon existing burden of poor health and relative socio-economic deprivation, with some particular sensitivity to changes in noise within specific age groups. Such community groups and relative sensitivity to specific health pathways are accounted for within the following assessment and further addressed within the Health Action Plan.
- 2.24 The construction and operation of the proposed CADP does not present any disproportionate impact upon sex, race, ethnicity, religion, sexual orientation or sexual preference. On this basis, no further EqIA is required.

Tailoring the HIA to the Project Profile

- 2.25 Table 2.1 provides a summary of the potential health pathways associated with the proposed CADP and represents the scope of health topics to be addressed as part of the HIA.

Table 2.1: Health Pathways

Feature	Health Pathway	Health Determinant	Potential Implication	Distribution
Construction Phase	Changes to local air quality	Environment	Adverse	Local
	Changes in noise exposure	Environment	Adverse	Local
	Changes in local transport nature and flow rates	Transport	Adverse	Local
	Increased direct, indirect and induced employment opportunities	Socio-economic	Beneficial	Local
Operational Phase	Direct, indirect and induced income employment opportunities	Socio-economic	Beneficial	Local/Regional
	Changes in noise exposure	Environment	Adverse	Local
	Changes in local road transport nature and flow rates	Transport	Adverse	Local
	Changes to local air quality (emissions to air)	Environment	Adverse	Local/Regional

2.26 On the above basis, it was determined that the following matters should be taken forward to the full assessment stage:

1. quantitative exposure response modelling for changes in PM₁₀, PM_{2.5} and NO₂ exposure during construction and operation (applying the UK Department of Health's Committee on the Medical Effects of Air Pollutants (COMEAP) methodology) to quantify potential changes in life expectancy and local cardiovascular and respiratory hospital admissions);
2. risk assessment from changes in construction and operational road traffic movements and subsequent risk of collisions directly attributed to the CADP;
3. qualitative appraisal as to community disruption and potential health outcome from changes in construction and operational noise (drawing from the detailed noise assessment of the ES); and
4. qualitative appraisal as to the socio-economical health benefits from direct, indirect and induced income and employment opportunities (drawing from the socio-economic assessment within Chapter 7 of the ES).

3 Community Profile

Introduction

- 3.1 Evidence suggests that different communities have varying susceptibilities to both health impacts and benefits as a result of social and demographic structure, behaviour and relative economic circumstance. The community profile provides an insight into how potential health pathways identified within the project profile may act disproportionately upon certain communities and sensitive receptors.

Site Location and Setting

- 3.2 The Airport is located between the Royal Albert Dock and King George V Dock within the London Borough of Newham, east London. The site is situated in the Royal Docks ward bordered by Canning Town South, Custom House and Beckton wards to the north, and the Thames to the south.

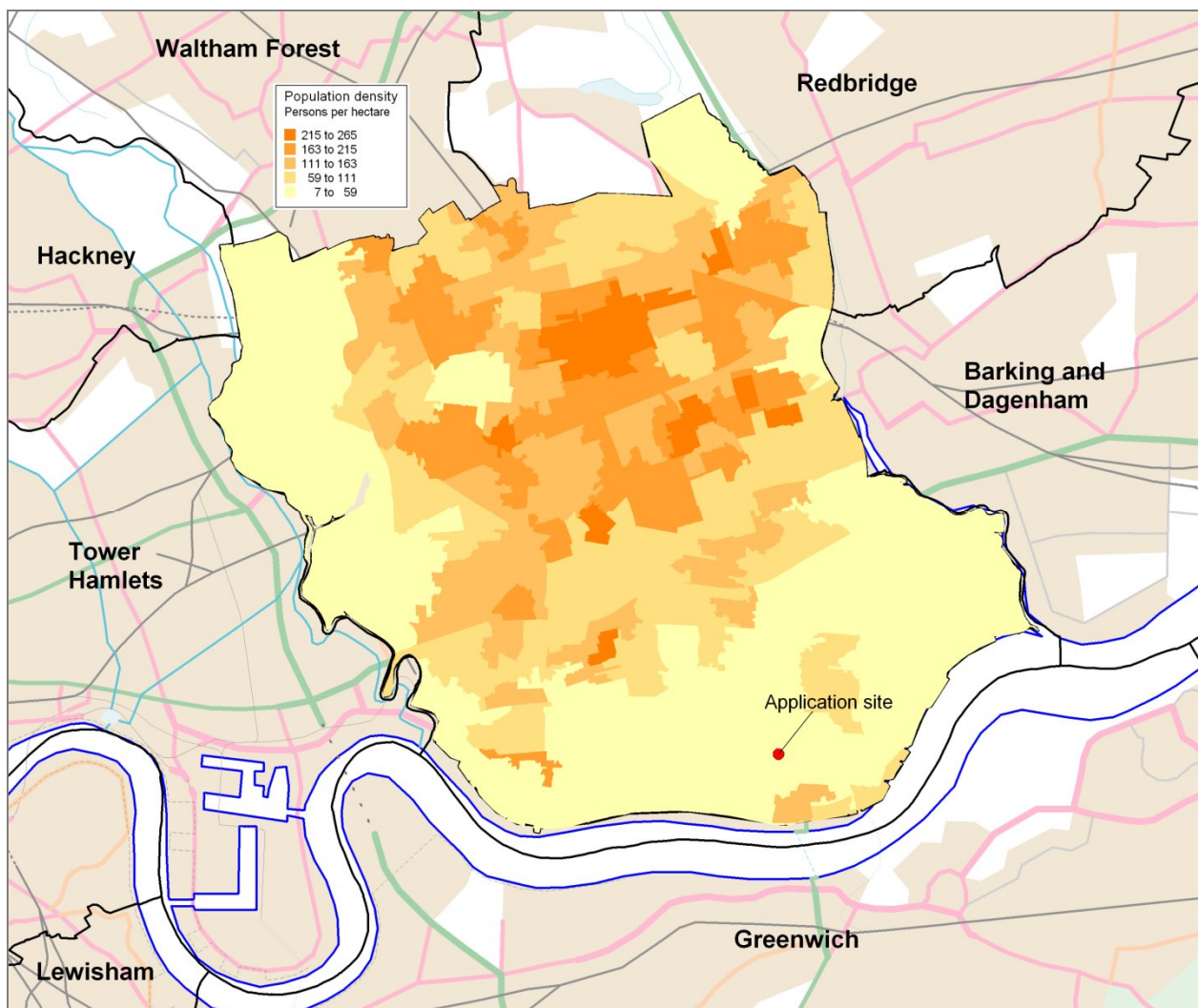
Local Demography

- 3.3 The 2011 census has shown the population of England to have increased since 2001 by nearly 3.6 million people to 53,012,456. Similarly over the last decade the population of Newham has also shown an increase in total population from 243,905 people in 2001 to 307,984 in 2011 (an increase of approximately 23.5%) (Ref. 6, Ref.7).
- 3.4 As shown in Figure 3.1, overall London exhibits a population density of 45.62 people per hectare (pph), increasing to 67.34 in Newham.
- 3.5 However, such population density is not uniform throughout Newham, where as shown in Figure 3.1, higher population densities can be seen to the north of Newham around the Forest Gate, Upton Park and Green Street area, with significantly lower population densities in proximity to the Airport.

6 Office for National Statistics. (2011). 2011 Census: Residence Type, Local Authorities in England and Wales (QS101EW). Available at <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcn%3A77-286348> last accessed 01/07/13.

7 Office for National Statistics. (2011). 2011 Census: Population and Household Estimates for England and Wales, March 2011. Available at <http://www.ons.gov.uk/ons/rel/census/2011-census/population-and-household-estimates-for-england-and-wales/stb-e-w.html#tab-correction> last accessed 01/07/13.

Figure 3.1 Newham Population Density



Population Structure

- 3.6 The population of Newham has a young age demographic with a high proportion of adults and notably more males who are aged 30-44 years but also children aged 0-9 years, indicating a high percentage of young families (Ref.8). As shown in Figures 3.2 and 3.3, when applying the 2011 Census data, this difference in demographic can be seen at both the national level, and when compared against the age profile for the rest of inner city London.

8 Office for National Statistics. (2011). 2011 Census: Age Structure (KS102EW). Available at <http://www.neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=7&b=6275177&c=newham&d=13&e=13&g=6334753&i=1001x1003x1004&o=362&m=0&r=1&s=1372786677020&enc=1&dsFamilyId=2474> last accessed 01/07/12.

Figure 3.2 Newham and London Age Profile

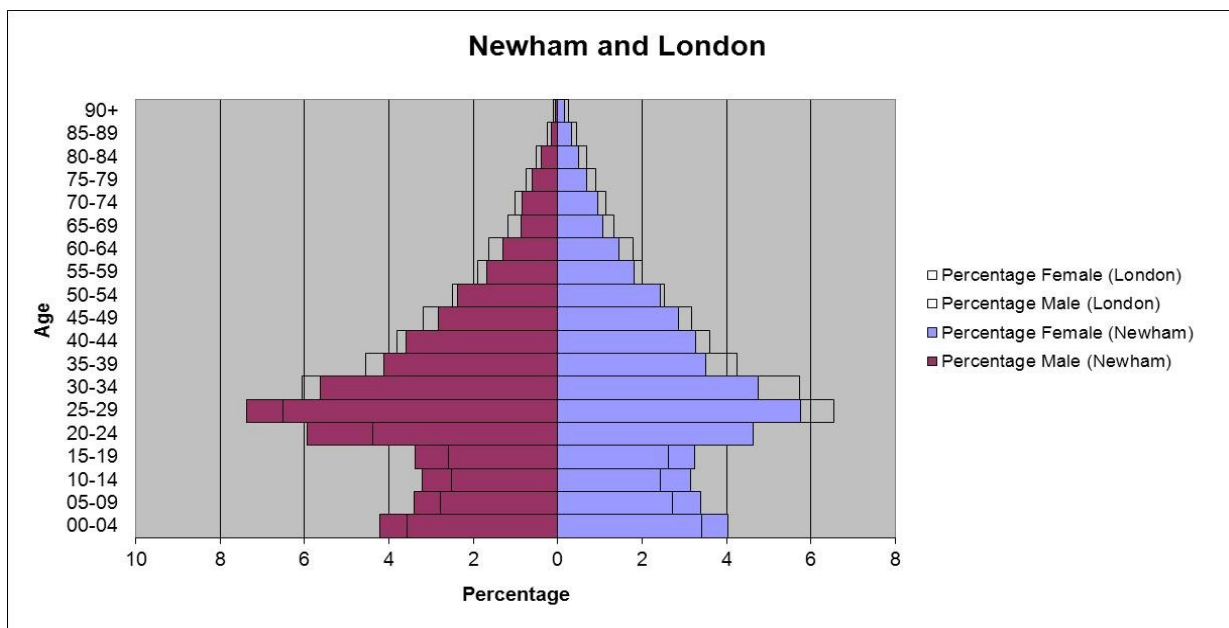
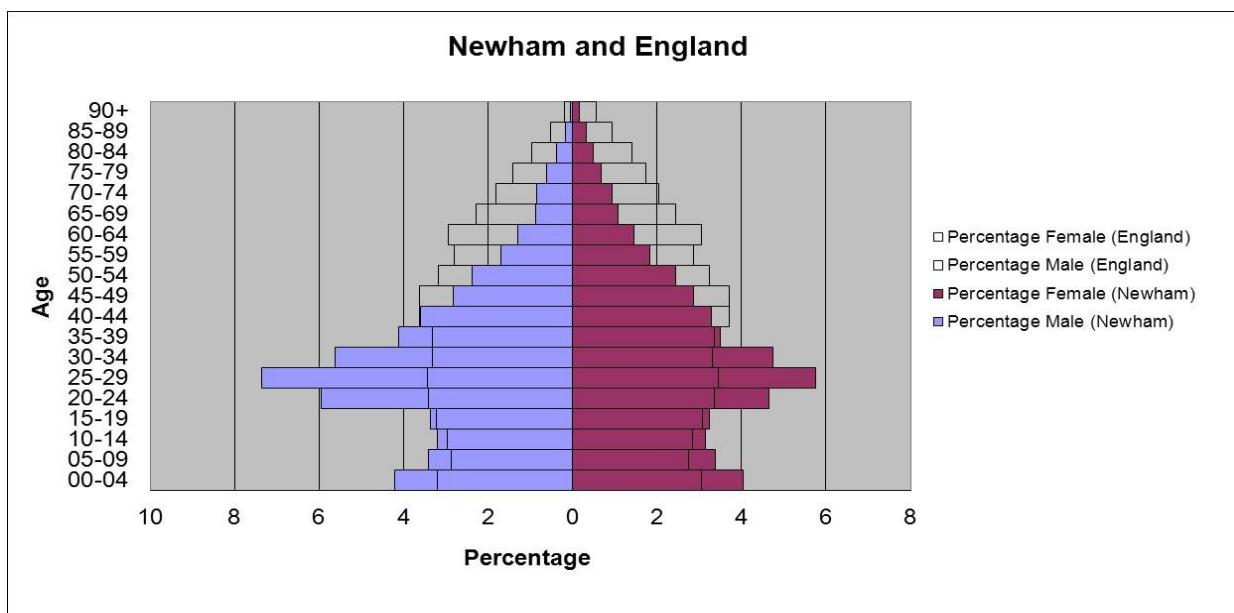


Figure 3.3 Newham and England Age Profile



- 3.7 Data from the Newham Joint Strategic Needs Assessment (JSNA) indicates that there is variation in the age profile at the ward level, the proportion of people aged over 65 ranges from 4.5% (Beckton) to 11.1% (Plaistow South) compared against the national average for England of 16.5%. Table 3.1 utilises data from the JSNA, based on 2011 population projections to show the ward level age comparison (Ref.9).

Table 3.1 Population Age Profile by Ward

Area Name	Percentage Under 18	Percentage 18-64	Percentage 65 Plus
England	21.1	62.4	16.5
London	23.0	66.0	11.0
Newham	26.8	66.1	7.1
Beckton	22.7	73.2	4.1
Boleyn	28.3	63.3	8.4
Canning Town North	29.5	63.6	7.0
Canning Town South	28.1	63.4	8.5
Custom House	27.6	64.0	8.4
East Ham Central	28.5	64.6	6.9
East Ham North	30.5	63.7	5.8
East Ham South	33.5	58.4	8.1
Forest Gate North	25.1	68.0	7.0
Forest Gate South	23.3	71.4	5.3
Green Street East	28.9	64.3	6.8
Green Street West	26.8	65.6	7.7
Little Ilford	31.0	62.5	6.5
Manor Park	26.4	64.6	9.0
Plaistow North	27.3	64.9	7.87
Plaistow South	20.2	68.9	10.9
Royal Docks	22.1	72.8	5.1
Stratford and New Town	21.8	72.2	6.0
Wall End	30.4	63.3	6.3
West Ham	27.8	64.7	7.6

9 NHS North East London and the City. (2012). Newham Joint Strategic Needs Assessment 2011/12: September 2012 Update. Available at www.newhamccg.nhs.uk/Docs/2%204%20JSNA%20Sept%2012%20Update.pdf last accessed 01/07/13.

Religion

- 3.8 The London Borough of Newham exhibits a high religious diversity compared against the national average, with a higher percentage of people stating their religion as Muslim (24% compared with 3.1% in England), Hindu (6.93% compared with 1.11% in England), and Sikh (2.83% compared with 0.67% in England).
- 3.9 Such a distribution is not however uniform within Newham, where, as shown in Table 3.2, the percentage of religions in the Royal Docks ward (location of Airport) is less diverse and closer resembles that to the London trend (Ref.10).

Table 3.2 Percentage of Religions Stated in the 2011 Census

Religion	Royal Docks	Newham	London	England
Christian	53.89	39.98	48.42	59.38
Buddhist	1.03	0.79	1.00	0.45
Hindu	5.03	8.75	5.03	1.52
Jewish	0.19	0.11	1.82	0.49
Muslim	13.25	31.97	12.39	5.02
Sikh	0.77	2.08	1.54	0.79
Other Religion	0.36	0.35	0.59	0.43
No Religion	18.44	9.54	20.73	24.74
Religion Not Stated	7.05	6.42	8.47	7.18

Ethnicity

- 3.10 As shown in Table 3.3, the 2011 Census reflects the considerable ethnic diversity of Newham (Ref. 11).

Table 3.3 Ethnic Group in Newham 2011

Ethnic Group	Population	Percentage of Newham Population
White; English/Welsh/Scottish/Northern Irish/British	51516	16.7
White; Irish	2172	0.7
White; Gypsy or Irish Traveller	462	0.2
White; Other White	35066	11.4
Mixed/Multiple Ethnic Groups; White and Black Caribbean	3957	1.3
Mixed/Multiple Ethnic Groups; White and Black African	3319	1.1
Mixed/Multiple Ethnic Groups; White and Asian	2677	0.9
Mixed/Multiple Ethnic Groups; Other Mixed	3992	1.3
Asian/Asian British; Indian	42484	13.8

- 10 Office for National Statistics. (2011). 2011 Census: Religion 2011 (QS208EW). Available at www.neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=7&b=6505416&c=Royal+Docks&d=14&e=61&g=6335034&i=1001x1003x1032x1004&m=0&r=1&s=1372714495121&enc=1&dsFamilyId=2579 last accessed 01/07/13.
- 11 Office for National Statistics. (2011). 2011 Census: Ethnic Group 2011 (QS208EW). Available at www.neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=7&b=6275177&c=newham&d=13&e=13&g=6334753&i=1001x1003x1004&o=362&m=0&r=1&s=1372716877856&enc=1&dsFamilyId=2477 last accessed 01/07/13.

Ethnic Group	Population	Percentage of Newham Population
Asian/Asian British; Pakistani	30307	9.8
Asian/Asian British; Bangladeshi	37262	12.1
Asian/Asian British; Chinese	3930	1.3
Asian/Asian British; Other Asian	19912	6.5
Black/African/Caribbean/Black British; African	37811	12.3
Black/African/Caribbean/Black British; Caribbean	15050	4.9
Black/African/Caribbean/Black British; Other Black	7395	2.4
Other Ethnic Group; Arab	3523	1.1
Other Ethnic Group; Any Other Ethnic Group	7149	2.3

- 3.11 However, the population of Newham, in terms of ethnicity, varies substantially by age group. Of people aged less than 20 years of age, 20.7% of the population are black African and 16.5% are Bangladeshi. Of people aged 20-64 years, 15% of the population are black African and 8.7% are Bangladeshi. In contrast, 16% of the under 20s age range population are white, rising to 33% of the 20-64 age range population and 55% of 65 years and over population (Ref.12).
- 3.12 Equally, ethnicity varies considerably within Newham, where available data indicates that the Royal Docks demonstrates a lower ethnic diversity than the Newham trend (Ref.13).

Gay, Lesbian, Bisexual and Transgendered Residents

- 3.13 There are no clear figures indicating the number or distribution of gay, lesbian, bisexual and transgendered residents within Newham. National estimates indicate that between 5 to 7% of the population is gay, lesbian bisexual or transgender and that the proportion may be higher in London than elsewhere in the UK. If applied to the Newham population, this would suggest at least between 15,400 and 21,560 people identifying themselves as gay, lesbian, bisexual or transgender in the borough (Ref.9).
- 3.14 In regards to the construction and operation of the proposed CADP, the potential health pathways under investigation do not present a disproportionate impact or risk to this community group.

Education

- 3.15 Table 3.4 presents data from the 2011 Census: Qualification (Ref.14) providing an overview of the highest level of qualifications held within the London Borough of Newham, London and England and Wales.

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- 12 NHS North East London and the City. (2012). Newham Joint Strategic Needs Assessment 2011/12: September 2012 Update. Available at www.newhamccg.nhs.uk/Docs/2%204%20JSNA%20Sept%2012%20Update.pdf last accessed 01/07/13.
- 13 Office for National Statistics. (2011). 2011 Census: Ethnic Group 2011 (QS201EW). Available at www.neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=7&b=6505416&c=Royal+Docks&d=14&e=13&g=6335034&i=1001x1003x1004&o=362&m=0&r=1&s=1372781971607&enc=1&dsFamilyId=2575 last accessed 01/07/13.

Table 3.4 Qualifications in Percentage

Highest Level of Qualification	Newham	London	England and Wales
No Qualifications	20.6	17.6	22.7
Highest Level of Qualification: Level 1	11.4	10.7	13.3
Highest Level of Qualification: Level 2	11.2	11.8	15.3
Apprenticeship	1	1.6	3.6
Highest Level of Qualification: Level 3	9.9	10.5	12.3
Highest Level of Qualification: Level 4 s and Above	30.1	37.7	27.2
Highest Level of Qualification: Other Qualifications	15.7	10	5.7
Note: No qualifications: No formal qualifications Level 1: 1-4 GCSEs or equivalent qualifications. Level 2: 5 GCSEs or equivalent qualifications. Apprenticeships. Level 3: 2 or more A-levels or equivalent qualifications. Level 4 or above: Bachelor degree or equivalent, and higher qualifications. Other qualifications including foreign qualifications.			

- 3.16 As shown in Table 3.4 (Ref.15), compared with England and Wales a higher percentage of people in Newham have either Level 4 and above qualifications or no qualifications with far fewer people in the Apprenticeship & Level 2 bands, highlighting the potential for inequality across the borough. Compared with London, the population of Newham has fewer qualifications across all bands and a higher percentage of people with no qualifications.
- 3.17 The percentage of key stage 4 students who achieve 5 GCSEs at grades A* to C (including Maths & English) is similar between Newham (58.5%) and England (58.4%). This is based on 2012 data (Ref.16).
- 3.18 Such a profile indicates a potential barrier to employment and income uptake, and a factor influencing relative deprivation and associated burdens of poor health.

- 14 Office for National Statistics. (2011). 2011 Census: Qualification (KS501EW). Available at www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Qualifications last accessed 02/07/13.
- 15 Office for National Statistics. (2011). Nomis Official Labour Market Statistics. Available at <http://www.nomisweb.co.uk/reports/lmp/la/1946157255/report.aspx?town=newham> last accessed 02/07/13
- 16 Public Health England (2012). Newham Public Health Profile 2012. Available at http://www.apho.org.uk/resource/view.aspx?RID=50215&SEARCH=N* last accessed 02/07/13.

Employment

- 3.19 The Borough of Newham has a high level of unemployment (11.9%, the highest in London) compared against the average for both London (9.0%) and England (7.9%). This is coupled with a high level of economic inactivity and a higher percentage of job seeker allowance claimants (6% in Newham compared with 4% in London and 4% in Great Britain) (Ref.17). This is more pronounced among the 18 - 24 year age group (Ref.18). Education and employment have been identified through the Newham JSNA as a key priority in the development of local health plans (Ref. 9).
- 3.20 As shown in Table 3.5, compared with London fewer people in Newham are employed in senior and professional occupations but many more work in low skilled elementary jobs, this data tallies with the level of qualifications held in the area as shown in Table 3.5 (Ref. 19).

Table 3.5 Occupation Expressed as a Percentage

Occupation	Newham	London	England
Managers, Directors and Senior Officials	7.2	11.6	10.9
Professional Occupations	14.8	22.5	17.5
Associate Professional and Technical Occupations	9.9	16.3	12.8
Administrative and Secretarial Occupations	10.2	11.7	11.5
Skilled Trades Occupations	10.4	8.3	11.4
Caring, Leisure and Other Service Occupations	9.2	7.9	9.3
Sales and Customer Service Occupations	12.8	7.5	8.4
Process, Plant and Machine Operatives	6.8	4.7	7.2
Elementary Occupations	18.6	9.6	11.1

- 3.21 Newham residents are therefore considered sensitive to socio-economic health pathways in terms of potential impacts but also opportunities.

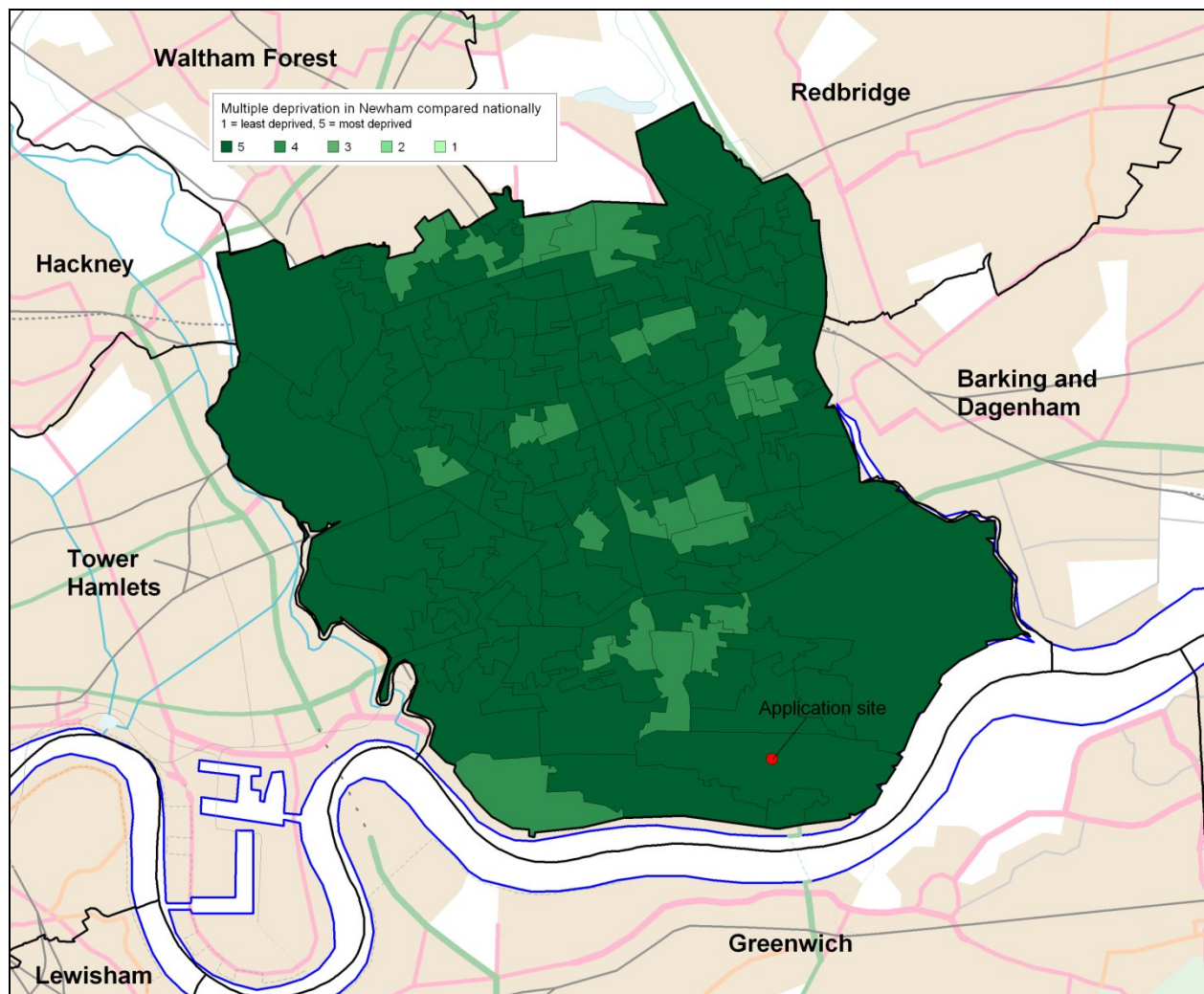
Deprivation

- 3.22 The Index of Multiple Deprivation (IMD) measures relative levels of deprivation in small areas of England against seven weighted domains. The domains and associated weightings include income (22.5%), employment (22.5%), health (13.5%), education (13.5%), barriers to housing (9.3%), crime (9.3%) and living environment (9.3%).

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- 17 Office for National Statistics. (2011). 2011 Census: Economic Deprivation. Available at <http://www.neighbourhood.statistics.gov.uk/dissemination/LeadKeyFigures.do?a=7&b=6275177&c=newham&d=13&e=4&q=6334753&i=1001x1003x1004&m=0&r=1&s=1372760409018&enc=1> last accessed 02/07/13.
- 18 Office for National Statistics. (2011). Newham Local Labour Profile. Available at <http://www.nomisweb.co.uk/reports/lmp/la/1946157255/report.aspx#tabempunemp> last accessed 02/07/13.
- 19 Office for National Statistics. (2011). 2011 Census: Occupation (KS608EW). Available at <http://www.neighbourhood.statistics.gov.uk/dissemination/LeadTableView.do?a=7&b=6275177&c=newham&d=13&e=9&q=6334753&i=1001x1003x1004&m=0&r=1&s=1372762821912&enc=1&dsFamilyId=2541> last assessed 02/07/13.

3.23 As indicated in the JSNA, socioeconomic deprivation is one of the most important factors accounting for poorer health outcomes. Based on the IMD, Newham is the 3rd most deprived local authority area in the country (Ref. 9). Figure 3.4 shows IMD scores within Newham compared to the rest of England, split equally into five ranks (quintiles) where 1 = least deprived and 5 = most deprived. As is clear from the figure, all of Newham falls into the two most-deprived quintiles, and the great majority is among the most-deprived 20% of LSOAs in England.

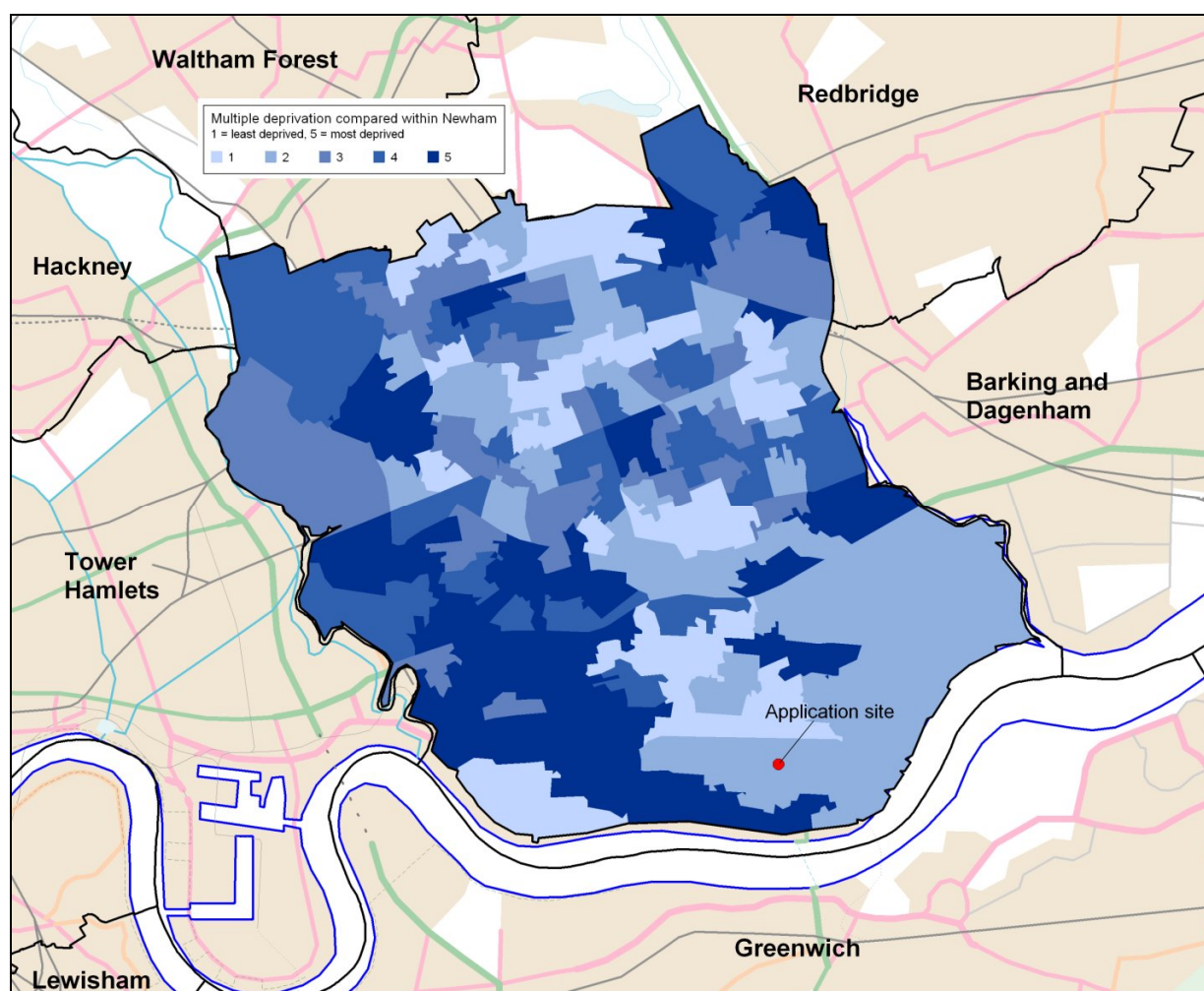
Figure 3.4 Index of Multiple Deprivation Compared Nationally



3.24 Figure 3.5 shows IMD scores compared within Newham itself, with scores shown by quintiles where 1 = least deprived and 5 = most deprived. Within Newham, relative levels of deprivation do not have a clear spatial trend, although notably a number of the most-deprived areas lie immediately to the south and west of the application site.

3.25 Communities in proximity to the Airport therefore demonstrate a high level of relative deprivation, and are considered sensitive to socio-economic health pathways (i.e. activities with the potential to influence, education, income and employment).

Figure 3.5 Index of Multiple Deprivation Compared Within Newham



Health

- 3.26 The 2012 Newham Public Health Profile indicates that the health of people in Newham is mixed compared with the England average, and significant associations between areas of socio-economic deprivation and burdens of poor health higher than the national trend (Ref.20).

Life Expectancy

- 3.27 The average life expectancy in Newham is 76.2 years for males and 81.1 years for females compared with the average for England of 78.6 years for males and 82.6 years for females (Ref.20). There is also variation within Newham where life expectancy is 5 years lower for men and 5.5 years lower for women in the most deprived areas of Newham than in the least deprived areas.

20 Public Health England (2012). Newham Public Health Profile 2012. Available at http://www.apho.org.uk/resource/view.aspx?RID=50215&SEARCH=N* last accessed 02/07/13.

- 3.28 The number of early deaths due to heart disease and stroke is significantly higher in Newham compared with the average for England (115.4 compared with 67.3 per 100,000 people aged less than 75 years)(Ref.21).
- 3.29 In keeping with the national trend there has been a steady decrease in all age all-cause mortality, early death rates from heart disease and stroke and early deaths rates from cancer during 2000 – 2009. However, such rates remain consistently higher in Newham compared with England (Ref. 16).

Hospital Admissions

- 3.30 Hospital admission data for a range of causes is available across London for the period April 2006 to March 2007. During this time the Newham PCT had 1,468 admissions per 100,000 people for respiratory disease, 1,668 admissions per 100,000 people for circulatory disease and 968 admissions per 100,000 people for coronary heart disease (Ref.22).
- 3.31 The numbers for coronary heart disease have shown a decrease since 2002/03 where there were 1,131 hospital admissions per 100,000 people. Data for the same year is not available for respiratory disease or circulatory disease (Ref.22). However 2005/06 data shows a higher number of admissions for circulatory disease (2,380 per 100,000 people) and respiratory disease (1,571 per 100,000 people) compared with 2006/07.

Lifestyle

Alcohol

- 3.32 Newham has a significantly higher number of adults admitted to hospital for alcohol related harm than the average for England (2,760 compared with 1,895 per 100,000 people). However, in those aged under 18 the number of hospital admissions due to alcohol is significantly lower compared with the average for England (Ref.21). Almost half of all admissions are within the 35-54 age groups with three times as many men as women being admitted (Ref.23).
- 3.33 The Newham Alcohol Harm and Disorder Reduction Plan 2010-2013 identifies alcohol misuse as a significant problem for Newham, and as a cause of serious violent crime and anti-social behaviour. During 2009 – 2010 there were a total of 1,911 alcohol related crimes of which 49%

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- 21 Public Health England (2012). Newham Public Health Profile 2012. Available at www.apho.org.uk/resource/view.aspx?RID=50215&SEARCH=N* last accessed 02/07/13.
- 22 London Health Observatory. (2007). Hospital Admission Rates for Selected Primary Diagnoses and Causes, by PCT, April 2002 – March 2007. Available at http://www.lho.org.uk/LHO_Topics/Data/HESAnalyses.aspx last accessed 02/07/13.
- 23 NHS North East London and the City. (2012). Newham Joint Strategic Needs Assessment 2011/12: September 2012 Update. Available at www.newhamccg.nhs.uk/Docs/2%204%20JSNA%20Sept%2012%20Update.pdf last accessed 01/07/13.

were categorised as violence against the person or sexual offences. Such crimes are distributed across the borough with hotspot areas focused around town centres (Ref.24).

Smoking

- 3.34 Smoking is the largest cause of preventable death, accounting for more than 81,400 premature deaths in England in 2009 (Ref.25). In Newham the number of adults who smoke is comparable with the England average at 20.9% and 20.7% respectively. However, Newham exhibits a higher number of smoking related deaths (at 249 per 100,000) than the national trend (211 per 100,000) (Ref.26). As recommended in the JSNA continued investment in the Newham Stop Smoking service is required alongside work that is targeted toward priority groups (Ref.27).

Drugs

- 3.35 Drug misuse can lead to a range of health problems and the risk of contracting blood-borne viruses. In 2009/10 there were an estimated 2,049 Opiate/Crack Users (OCUs) in Newham. Substance misuse related deaths in Newham are higher than those in England (Ref.26).

Exercise and Obesity

- 3.36 Obesity is a preventable cause of morbidity and early mortality. Levels of obesity within Newham are slightly higher but not significantly different to the national average at 25.3% and 24.2% respectively. However far fewer adults are physically active with only 9% in Newham compared with 11.2% across England. This is balanced by a higher proportion of healthy eating adults within Newham compared with England at 31.6% and 28.7% respectively (Ref.26).
- 3.37 The National Child Measurement Programme has indicated that in Newham 12.9% of reception class pupils are obese against 11.0% across London (Ref.28) and 9.5% across England. For the Year 6 children, the gap between the geographic areas remains similar but overall levels of obesity have nearly doubled to 24.7% in Newham, 22.5% in London and 19.2% in England (Ref. 26, Ref.27, Ref.28).

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- 24 Newham London. (2010). Newham Alcohol Harm and Disorder Reduction Plan 2010-2013. Available at <http://mgov.newham.gov.uk/documents/s35160/Newham%20Alcohol%20Harm%20and%20Disorder%20Reduction%20Plan.pdf> last accessed 02/07/13.
- 25 Department of Health. (2011). Healthy Lives, Healthy People: A Tobacco Control Plan for England. Available at www.gov.uk/government/uploads/system/uploads/attachment_data/file/135349/dh_124960.pdf last accessed 02/07/13.
- 26 Public Health England (2012). Newham Public Health Profile 2012. Available at www.apho.org.uk/resource/view.aspx?RID=50215&SEARCH=N* last accessed 02/07/13.
- 27 NHS North East London and the City. (2012). Newham Joint Strategic Needs Assessment 2011/12: September 2012 Update. Available at www.newhamccg.nhs.uk/Docs/2%204%20JSNA%20Sept%2012%20Update.pdf last accessed 01/07/13.
- 28 The Health and Social Care Information Centre (2012). National Child Measurement Programme: England, 2011/12 School Year. Available <https://catalogue.ic.nhs.uk/publications/public-health/obesity/nati-chil-meas-prog-eng-2011-2012/nati-chil-meas-prog-eng-2011-2012-rep.pdf> last accessed 02/07/13.

Crime

- 3.38 As reported through the JSNA violent crime impacts on health both directly and through its impact on the wider community in terms of perceived risk, and changes in behaviour and social/recreational activities and networks (particularly within the elderly community).
- 3.39 Rates of violent crime are high in Newham compared to the London average and 48% of residents in the borough perceive anti-social behaviour to be a problem (the highest of all London boroughs) (Ref.29).
- 3.40 In the period 2012 -2013, there were a total of 770,220 crimes across the Metropolitan police force with 31,686 crimes in the Newham. The majority of these related to either theft handling (41.3%) or violence against the person (20.3%) (Ref.30).

Conclusion

- 3.41 Newham exhibits a densely populated and highly diverse community (in terms of ethnicity and religion) and a younger demographic than national and regional averages.
- 3.42 Key challenges for the borough include a relatively low education attainment and skills base, high levels of socio-economic deprivation and pockets of deprivation amongst the highest in England. Unemployment is a key priority for the borough as set out through the JSNA; unemployment remains above the national average with a subsequent higher number of JSA claimants.
- 3.43 Although improving, health within the borough remains below the national trend and burdens of poor health are closely associated with pockets of socio-economic deprivation. Lifestyle choices including smoking and healthy eating are comparable with the national average. However, Newham has a higher number of alcohol related hospital admissions, smoking related mortality obesity (particularly in children) and incidents of violent crime.
- 3.44 In contrast, the Royal Docks (where the airport is located), exhibits a significantly lower population density and ethnic diversity, yet exhibits high levels of socio-economic deprivation.
- 3.45 Although socio-economic circumstance and health is generally improving in Newham, there remain pockets of socio-economic deprivation and burdens of poor health that make specific communities sensitive to changes in environmental and socio-economic conditions. Areas exhibiting high burdens of poor health are more at risk from factors that may exacerbate existing conditions. As such, the assessment section of this HIA considers the highest burdens of poor health to ensure a conservative approach.

29 NHS North East London and the City. (2012). Newham Joint Strategic Needs Assessment 2011/12: September 2012 Update. Available at

30 www.newhamccg.nhs.uk/Docs/2%204%20JSNA%20Sept%2012%20Update.pdf last accessed 01/07/13.
Metropolitan Police (2013). Crime Figures: Financial Year 2012 to 2013. Available <http://maps.met.police.uk/tables.htm>, last accessed 02/07/13.

- 3.46 Local communities are equally sensitive to improvements in socio-economic status (through increased education, employment, and income) and lifestyle activities (such as improved social networks, social capital, improved diet and physical activity), which will aid in addressing an underlying factor for patterns of existing poor health. The assessment section and subsequent HAP investigates potential health benefits and necessary initiatives to improve the uptake of such benefit locally, associated with the proposed CADP.
- 3.47 In terms of equality and sensitive community groups, the potential health pathways associated with the construction and operation of the proposed CADP will not have a disproportionate impact upon any single community group (ethnicity, religion, sexual orientation etc), although sensitive receptors are considered to include individuals exhibiting high levels of socio-economic deprivation, existing burdens of poor health and certain age groups (sensitive to transport impacts and changes in noise and air quality). The assessment section and subsequent HAP consider such sensitivity.

4 Stakeholder Engagement

Overview

- 4.1 An important component of gathering an appropriate evidence base and tailoring the HIA to local circumstance is seeking the views of stakeholders and representatives of communities likely to be affected by the proposed CADP. This section provides an overview of the stakeholder engagement strategy and summarises the key outputs gained to further refine the focus of the HIA and the recommendations within the HAP.
- 4.2 For a full account of the integrated engagement strategy and its outputs, please refer to the Statement of Community Involvement accompanying the CADP planning submission.

Scoping

- 4.3 The HIA scoping document in Appendix A was issued to the Directors of Public Health for the London Boroughs of Newham, Tower Hamlets and Greenwich via email on the 23rd November 2012. Key comments and suggestions received are summarised in Table 4.1.

Table 0.1 Scoping Responses

Topic	Summary of Stakeholder Comments
Policy	This is also in line with policy SP2 – Healthy Neighbourhoods within the adopted Core Strategy, which requires a HIA to be submitted with all major planning applications.
Integration with the EIA	Further information in terms of how the proposed HIA will interact with the overall EIA and how health issues will be weighted and assessed within the overall EIA matrix
Health Benefits	Demonstrate how health will be protected and how development has, in addition to any proposed mitigation measures, avoided and reduced any impacts on the health of the local population.
Project Profile	Try to actively look at the CADP and how it can minimise its impacts on health, but also how it can proactively promote healthier lifestyles within the local community. As part of the HIA it would also be beneficial to see how the health of passengers has been considered as part of the CADP, particularly considering the construction of a new extended Terminal and reconfiguration of the Forecourt.
Community Profile	Fully support the creation of a Community Profile and this should be made an integral part of the HIA's development process.
Engagement	Engagement will need to be continuous throughout all stages of the CADP, from planning to completion and after completion, and in such a frequency that really addresses the concerns of the local population. Propose that consideration is given to the creation of a healthy local community group that is be able to give feedback on any impacts which might only develop and be noticed after the completion of the CADP.
Access	Disruption to transport may impact differentially and to what extent has improved access including for disabled people been factored into the CADP.
Assessment	<ul style="list-style-type: none">▪ Resource minimisation – e.g. sustainable use of water resources, use of renewable energy, reduction of energy demand by design (both during construction and operation phases)▪ Promoting independence – wheelchair access etc., (presumably this is compulsory in a development of this kind)▪ Use of building materials – use of non-toxic building materials, use of

Topic	Summary of Stakeholder Comments
	<p>renewably sourced building materials</p> <ul style="list-style-type: none"> ▪ Promotion of active travel – does the CADP support sustainable forms of transport (cycle storage, pedestrian safety, connectivity with other infrastructure) ▪ Crime reduction/safety – what measures are taken to increase safety (secure by design) both within the CADP and in vicinity ▪ How will health impacts be monitored post-development?

- 4.4 The HIA Scoping exercise with key health stakeholders confirmed that the scope and focus of the HIA was appropriate, that the health pathways to be investigated were correct, and suggested additional aspects and community support initiatives that the Airport could consider through the refinement of the proposed CADP and within the HAP to support wider health improvement programmes within Newham.

5 Assessment

Introduction

- 5.1 The following assessment section investigates each of the health pathways previously identified and verified through scoping with key health stakeholders.
- 5.2 The HIA does not seek to repeat the detailed methodology, baseline monitoring studies, modelling or the full impact assessment outputs of the various technical assessments within the ES. Instead, it takes the ES outputs and applies these to assess the potential outcome on health.
- 5.3 A key comment from health stakeholders during the HIA scoping exercise was the general need to improve transparency and integration with the ES. The following assessment section therefore provides cross references to ES Chapters used to inform the HIA. Table 0.1 below sets the structure of the ES and describes its relationship with the HIA, where applicable.

Table 0.1: ES Chapter Heading and Technical Disciplines

ES Chapter	Title	Description and Integration with the HIA
1	Introduction	Presents the proposed CADP and the structure of the ES. Refers the reader to the existence of the standalone HIA submitted alongside the CADP Planning Applications CADP1 and CADP2
2	Site Context and Scheme Description	Introduces LCY Airport, presents the requirement for the proposed CADP and details the core elements forming the founding platform for both the ES and HIA. Provides an overview of the existing Airport layout and its setting and provides a fuller description of the proposed CADP (CADP1 and CADP2 applications).
3	EIA Methodology	Outlines the EIA process including the methodologies used during the pre-planning, consultation, scoping and subsequent EIA. The criteria for assessing the significance of effects (both adverse and beneficial) and the process to identify additional measures to avoid, reduce, offset or enhance identified effects are described. The specific scope and methodology of the technical assessments is provided in detail in the relevant chapters. Presents the regulatory assessment approach and methodologies applied defying the ES and subsequent technical input into the HIA
4	Consideration of Alternatives	Describes the main alternatives that have been considered by the Airport and its Project Team and explains, where relevant, the reasons why certain decisions were made to discount these alternatives on environmental, commercial, operational or other grounds. Presents the alternative options to inform the scenarios assessed in both the ES and HIA
5	Planning Context and Existing Controls	Summarises the national, regional and local planning context for the proposed CADP, focusing on aviation policy and other statutory controls. It also describes relevant operational, safety and environmental controls currently in place at the Airport and which will be carried forward under the CADP.
6	Development Programme, Demolition and Construction	Details the proposed CADP construction programme and sequence of construction activities defining assessment parameters within the ES and consequent HIA. Provides a more detailed account of the engineering works associated with the proposed CADP and presents the likely sequence of the construction works. This chapter also provides a summary of the overarching environmental mitigation measures that will be applied during all phases of the construction works, with reference to the Construction Environmental Management Plan (CEMP) which will be implemented by the appointed contractors.

ES Chapter	Title	Description and Integration with the HIA
7	Socio-Economics, Recreation and Community	Considers the potential implications of the proposed CADP on the local and wider economy and population. The chapter assesses the potential effects of the proposed increase in aircraft movements and associated growth in passenger numbers on income and employment in LBN and elsewhere, together with its effect on the local community and recreational uses. Summarises the national, regional and local policy requirements, details the methodology and presents the assessment findings informing the HIA
8	Noise and Vibration	Presents the potential impacts of the proposed CADP on the local and wider noise environment. It considers different sources of noise to which separate standards and assessment methodologies apply, including: air noise (from aircraft in flight), ground noise (from aircraft on the runway, taxiway and stands; and from fixed building plant and other sources), road traffic noise, and construction noise and vibration. Summarises the national, regional and local policy requirements, details the construction and operational assessment methodology and presents the assessment findings informing the HIA
9	Air Quality	Considers the potential impacts of the proposed CADP upon local air quality, including nitrogen dioxide, particulates and odours. The assessment focuses on two pollutants with respect to potential human health effects, namely nitrogen dioxide (NO ₂) and fine particles (PM ₁₀ and PM _{2.5}), as these pollutants are of greatest concern within LBN. Consideration is also given to the potential for odour nuisance. Each principal source of these pollutants is considered, focussing on emissions associated with aircraft, road traffic on the local network and other sources of emissions introduced by the CADP. Summarises the national, regional and local policy requirements, details the construction and operational assessment methodology and presents the assessment findings informing the HIA
10	Townscape and Visual Impact	Assesses the likely significant effects of the development of the proposed CADP on townscape character and views experienced by the public and other receptors. The likely impacts are assessed during both the construction and operation of the proposed CADP. It identifies and describes the type and potential sensitivity of visual receptors likely to be most affected; evaluates the sensitivity of the prevailing townscape and local character areas; and, identifies both visual and townscape effects brought about by the proposed CADP. Summarises the national, regional and local policy requirements, details the assessment methodology and presents the assessment findings
11	Traffic and Transport	Considers the potential effects of the proposed CADP on surface access in terms of local road network and public transport services. A separate Transport Assessment (TA) and Travel Plan have also been prepared and are appended to the ES. The TA and ES chapter jointly summarise the national, regional and local policy requirements, details the construction and operational assessment methodology and presents the assessment findings informing the HIA
12	Water Resources and Flood Risk	Considers the potential impact of the proposed CADP on the hydrological regimes of the Application Site and its surroundings, in particular the likely significant effects on flood risk and the water quality of KGV Dock. It provides an account of monitoring that has been undertaken within KGV Dock, including within the open and covered water. Summarises the national, regional and local policy requirements, details the assessment methodology and presents the assessment findings
13	Ecology and Biodiversity	This chapter reports on the potential impact of the proposed CADP on ecology and implications to the biodiversity value of the surrounding area, including habitats, protected species or otherwise notable species of wildlife. Summarises the national, regional and local policy requirements, details the assessment methodology and presents the assessment findings
14	Cultural Heritage	Provides an assessment of the potential effects of the proposed CADP on heritage assets within the Application Site and within a one kilometre Search Area. This includes the potential impact on both buried archaeology and built heritage assets. A full Desk Based Assessment (DBA) has been conducted in order to provide the historical and archaeological context of the Application Site, to define the heritage receptors that might be affected by the proposed

ES Chapter	Title	Description and Integration with the HIA
		CADP. Summarises the national, regional and local policy requirements, details the assessment methodology and presents the assessment findings
15	Waste	Reports on the assessment of the likely significant environmental effects of waste generation associated with the proposed CADP. This includes the effects of waste produced as a result of demolition and construction activities and the potential additional waste to be generated during operation of the new development due to the predicted increase in passenger numbers. Summarises the national, regional and local policy requirements, details the assessment methodology and presents the assessment findings
16	Ground Conditions and Contamination	Reports on the assessment of the effects of the proposed CADP relating to ground conditions and contamination. A baseline assessment has been completed which draws upon and summarises the results of a Phase 1 Environmental Risk Assessment and an intrusive ground investigation carried out at the Airport in March 2013. The assessment also draws upon numerous previous site investigations relating to the Application Site, the reports of which are reproduced in the appendices to this chapter.
17	Climate Change	Presents a carbon footprint calculation for the Airport's baseline (present-day/2012 operations) and future year (2023) with and without the proposed CADP. It draws on information presented in other reports including the 2012 Airport Carbon Accreditation report and the Energy and Low Carbon Strategy that accompanies the CADP planning submission. The chapter evaluates the predicted changes in greenhouse gas (GHG) emissions that will arise due to the Airport's future operations, including from energy consumed in the Airport's buildings and emissions from aircraft in the landing and take-off (LTO) cycle, which will be influenced by the proposed CADP.
18	Cumulative Effects	Considers the environmental effects from other permitted and likely developments in proximity to the Airport which individually might be insignificant but, in combination with the proposed CADP, could amount to significant cumulative ('in-combination') effects. Details existing and consented facilities with the potential for a cumulative impact, and provides an appropriate assessment of effect informing the HIA
19	Summary of Mitigation and Residual Effects	Presents a summary of all mitigation proposed and the significance of residual effects, also informing the HIA

Emissions to Air

- 5.4 A health pathway associated with the construction and operation of the proposed CADP is the generation of emissions to air and consequent community exposure.
- 5.5 Research into the potential health effects of air pollutants is extensive and provides statistically significant associations between many classical air pollutants and effects on a wide range of cardiovascular and respiratory health outcomes.
- 5.6 The following assessment concentrates on potential risk from changes in exposure to particulate matter (PM₁₀ and PM_{2.5}) and nitrogen dioxide (NO₂) during the construction and operational phases of the proposed CADP, being primary pollutants and the primary focus for research by the Committee on the Medical Effects of Air Pollutants (COMEAP) (Ref 31, 32, 33).

31 The Committee on the Medical Effects of Air Pollutants (2006). Cardiovascular Disease and Air Pollution. Department of Health. Available at www.comeap.org.uk/images/stories/Documents/Reports/cvd%20report%202006.pdf last accessed 15/07/13.

Construction

- 5.7 As detailed in Chapter 9 of the ES (Air Quality) prior to mitigation, construction emissions (PM₁₀, PM_{2.5} and NO₂) from demolition, plant, earth works and associated transport movements during the 'worst case' year will be intermittent and temporary. There is limited opportunity for community exposure, the resulting concentrations remain within air quality standards set to protect health, and are assessed to be of a 'moderate adverse' impact prior to mitigation.
- 5.8 The most significant air quality impact during the course of construction is from potential dust impacts. This includes specific phases of work within 20m of some sensitive receptors (i.e. properties that lie to the south of Newland Street and Brixham Street, and the community and educational facilities at the Storey Centre, Woodman Community Centre and Fight for Peace). Although dust does not represent a significant health hazard, it can result in temporary annoyance, potentially aggravate existing respiratory ailments, and cause general concern.
- 5.9 As detailed in Chapter 9 of the ES, a comprehensive Dust Management Plan compliant with GLA Best Practice Guidance (Ref.34), and to be approved by the Local Authority, will be implemented. This will include as a minimum:

Communications

- implement a stakeholder communications plan that includes engagement before and during work on the site; and
- display the name and contact details of person(s) accountable for air quality and dust issues.

Site Management

- record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken; and
- record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the actions to resolve the situation in the log book.

Monitoring

- undertake daily on-site and off-site inspection;
- when activities with a high potential to produce dust are being carried out, and during prolonged dry or windy conditions, increase the frequency of inspections;

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- 32 The Committee on the Medical Effects of Air Pollutants. (2007). Draft Long-Term Exposure to Air Pollution: Effect on Mortality. Available at http://comeap.org.uk/images/stories/Documents/Reports/draft_mortality_report.pdf last accessed 15/07/13.
- 33 The Health Protection Agency for the Committee on the Medical Effects of Air Pollutants (2009). Long-Term Exposure to Air Pollution: Effect on Mortality. Available at <http://comeap.org.uk/images/stories/Documents/Reports/mortality%20report%202009.pdf> last accessed 15/07/13.
- 34 GLA (2006) The control of dust and emissions from construction and demolition. Best Practice Guidance.

- carry out regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary; and
- agree real time PM₁₀ continuous monitoring locations with the Local Authority in line with IAQM guidance on monitoring, set at levels that preclude any adverse health outcome.

Preparing and maintaining the site

- plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Use intelligent screening where possible – e.g. Locating Sites offices between potentially dusty activities and the receptor;
- erect solid screens or barriers around the site boundary;
- avoid site runoff of water or mud;
- keep site fencing, barriers and scaffolding clean; and
- remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site.

Operating vehicle/machinery and sustainable travel

- ensure all on-road vehicles comply with the requirements of the London Low Emission Zone;
- ensure all vehicles switch off engines when stationary;
- avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable; and
- impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas.

Operations

- only use cutting, grinding or sawing equipment fitted in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non potable water where possible;
- use enclosed chutes, conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste management

- only use registered waste carriers to take waste off-site; and
- avoid bonfires and burning of waste materials.

Measures specific to demolition

- soft strip inside buildings before demolition operations (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);
- ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground;
- avoid explosive blasting, using appropriate manual or mechanical alternatives ; and
- bag and remove any biological debris or damp down such material before demolition.

Measures specific to earthworks

- re-vegetate earthworks and exposed area/soil stockpiles to stabilise surfaces as soon as practicable. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil as soon as practicable.

Measures specific to construction

- avoid scabbing if possible (a dust generating activity caused during clearing and preparing concrete surfaces);
- ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place; and
- ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.

Measures specific to track-out

- use water-assisted dust sweeper(s) on the access and local roads to remove as soon as practicable and material tracked out of the site. This may require the sweeper being continuously in use.
- avoid dry sweeping of large areas;
- ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- record all inspections of haul routes and any subsequent action in a site log book;
- install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
- inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as practicable; and

- implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site). Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site and layout permits.
- 5.10 Following mitigation, potential dust impacts are considered 'slight adverse', but are not of an order of magnitude to quantify any adverse health outcome to passengers, local communities or visitors.

Operation

- 5.11 As detailed within Chapter 9 of the ES, a series of conservative PM₁₀, PM_{2.5} and NO₂ dispersion models has been carried out for the Base Year (2012) and three future assessment years (2019, 2021 and 2023) for the With and Without CADP scenarios. The models account for a number of Airport emission sources, including:
1. aircraft main engines operating within the Landing and Take-off (LTO) cycle, Auxiliary Power Units (APU) and engine testing;
 2. airside support vehicles and plant (e.g. Mobile Ground Power Units);
 3. airport boiler plant;
 4. fire training ground;
 5. staff and passenger vehicle movements within the car park; and
 6. road traffic on airport landside roads and on the local road network.
- 5.12 The following section draws from and builds upon such outputs to further explore and, where possible, quantify any potential risk to local community health applying the available health evidence base.

Particulate Matter (PM₁₀ and PM_{2.5})

- 5.13 As demonstrated in Chapter 9 of the ES, the Airport is not a significant source of PM₁₀ or PM_{2.5} (particulate matter with a mean aerodynamic diameter of 10 and 2.5 microns or less). Modelled changes in annual mean concentrations at all receptors remain significantly within air quality standards set at concentrations that preclude any measurable adverse health outcome to sensitive community receptors.
- 5.14 As shown in Table 5.2, the proposed CADP is not anticipated to significantly influence changes in local PM₁₀ concentration exposure at any of the receptors modelled. The most noteworthy change exhibited between the scenarios during any year is at R5; a residential receptor with a potential annual increase of 0.5 µg.m³ by 2019, and 0.4 µg.m³ by 2021 and 2023.
- 5.15 Minor reductions in annual mean PM₁₀ are also anticipated at R1 and R2 (Camel Road/Hartmann Road and Camel Road/Parker Street) between -0.1 and -0.2 µg.m³.

Table 0.2: Difference in Annual Mean PM₁₀ between With and Without Scheme Scenarios

Receptor Number	Location	Difference in PM ₁₀ Annual Mean (µg.m ³)		
		2019	2021	2023
Existing Locations				
R1	Camel Road/Hartmann Road	0	-0.1	-0.2
R2	Camel Road/Parker Street	0	-0.2	-0.1
R3	Parker Street (Portway Primary School)	0.1	0	0
R4	Newland Street (opposite entrance to LCY car park)	0.3	0.2	0.2
R5	Newland Street/Kennard Street	0.5	0.4	0.4
R6	Brixham Street/Dockland Street	0.3	0.2	0.2
R7	Plattens Court/Billingway Dock Head	0.2	0.1	0.1
R8	Albert Road/Woolwich Manor Way	0.1	0	0
R9	Robert Street adj Albert Road (north side)	0.1	0.1	0.1
R10	Collier Close adj Gallions Way Roundabout (eastern side)	0.1	0	0
R11	Yeoman Close adj Royal Albert Way	0	0	0
R12	Straight Road/Campton Close	0	0	0
R13	Mill Rd adj North Woolwich Road (west)	0	0.1	0
R14	Connaught Road/Leonard Street	0.1	0	0
R15	Victoria Dock Road (between Chantler and Freemasons Roads)	0	0	0
R16	Gallions Primary School adj Royal Docks Road	0	0	0
R17	Drew Road/Leonard Street	0.2	0.1	0.2
R18	Woolwich Manor Way (UEL)	0.1	0.1	0.1
R19	West Silvertown 1 (1.5 m elevation)	0	0	0.1
R19	West Silvertown 1 (20 m elevation)	0.1	0	0
R20	West Silvertown 2 (1.5m elevation)	0	0	0
R20	West Silvertown 2 (20 m elevation)	0	0	0
R21	Flats on Drew Road (20 m elevation)	0	0	0.1
R22	Flats on Docklands Street (40 m elevation)	0	0	0.1
Proposed/committed Developments				
R23	Silvertown Quays (30 m from Connaught Bridge)	0	0	-0.1
R24	Silvertown Quays 1 (1.5 m elevation)	0	-0.1	0
R24	Silvertown Quays 1 (20 m elevation)	0	0	0
R25	Silvertown Quays 2 (1.5 m elevation)	0	0	0
R25	Silvertown Quays 2 (20 m elevation)	0	0	0
R26	Royal Albert Basin 1 (1.5 m elevation)	0.1	0.1	0.1
R26	Royal Albert Basin 1 (20 m elevation)	0	0	0
R27	Royal Albert Basin 2 (1.5 m elevation)	0	0	0
R27	Royal Albert Basin 2 (20 m elevation)	0.1	0.1	0.1
R28	Royal Albert Basin 1 (1.5 m elevation)	0	0	0
R28	Royal Albert Basin 1 (20 m elevation)	0	0	0
R29	Royal Albert Basin (1.5 m elevation)	0.1	0.1	0

Receptor Number	Location	Difference in PM ₁₀ Annual Mean (µg.m ³)		
		2019	2021	2023
R29	Royal Albert Basin (20 m elevation)	0	0	0
R30	Royal Albert Basin (1.5 m elevation)	0	0	0
R30	Royal Albert Basin (20 m elevation)	0	0	0
R31	North Side of Royal Albert Dock (10 m from Royal Albert Way)	0	0	0
R32	North Side of Royal Albert Dock (1.5 m elevation)	0.1	0	0.1
R32	North Side of Royal Albert Dock (20 m elevation)	0.1	0	0
R33	North Side of Royal Albert Dock (1.5m elevation)	0.1	0.1	0.1
R33	North Side of Royal Albert Dock (20 m elevation)	0.1	0.1	0
R34	King George V Dock (1.5 m elevation)	0	0	0
R34	King George V Dock (20 m elevation)	0	0	0
For the complete Air Quality Dispersion model outputs, please refer to Chapter 9 of the ES				

- 5.16 Such changes in concentration exposure are negligible, and not of an order to quantify any change in local health outcome. To clarify, the exposure response coefficients developed by the UK Department of Health's Committee on the Medical Effects of Air Pollutants establish that there is a 0.75% increased risk in the background rate of all-cause mortality per 10 µg.m³ increase in PM₁₀ (Ref. 35, Ref.36).
- 5.17 The maximum change in concentration exposure at any receptor of 0.5 µg.m³ is orders of magnitude lower than is required to quantify any meaningful change in health outcome, as is relative community exposure.
- 5.18 To put this into context, applying the highest mortality rate in London (Newham males at 749 per 100,000) (Ref.37) more than the 30 times the entire population of the Royal Docks (10,679 people) (Ref 38), or the entire population of Newham (307,984 people) would need to reside in a property at R5, before any aggregate adverse health outcome could be quantified.

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- 35 The Committee on the Medical Effects of Air Pollutants. (2007). Draft Long-Term Exposure to Air Pollution: Effect on Mortality. Available at http://comeap.org.uk/images/stories/Documents/Reports/draft_mortality_report.pdf last accessed 15/07/13.
- 36 The Health Protection Agency for the Committee on the Medical Effects of Air Pollutants (2009). Long-Term Exposure to Air Pollution: Effect on Mortality. Available at <http://comeap.org.uk/images/stories/Documents/Reports/mortality%20report%202009.pdf> last accessed 15/07/13.
- 37 NHS North East London and the City. (2012). Newham Joint Strategic Needs Assessment 2011/12: September 2012 Update. Available <http://www.newhamccg.nhs.uk/Docs/2%204%20JSNA%20Sept%2012%20Update.pdf> last accessed 11/07/13.
- 38 Office for National Statistics. (2011). 2011 Census: Usual Resident Population, March 2011. Available at www.ons.gov.uk last accessed 24/04/13.

- 5.19 The COMEAP has also established that there is a 0.8% increased risk in respiratory and cardiovascular hospital admissions (Ischemic Heart Disease) per 10 $\mu\text{g.m}^3$ increase in PM_{10} (Ref.39). The maximum annual-mean PM_{10} increase of 0.5 $\mu\text{g.m}^3$ and relative exposure is again orders of magnitude lower than is required to quantify any adverse health outcome to local communities, passengers or visitors.
- 5.20 Evidence suggests that increased exposure to $\text{PM}_{2.5}$ is potentially more hazardous to human health than larger particles (Ref.40). However, as detailed in Chapter 9 of the ES, and summarised below, the airport is not a significant source of $\text{PM}_{2.5}$, and all modelled receptors will remain significantly below air quality standards set to preclude any measurable adverse health outcome.
- 5.21 As shown in Table 5.3, the most significant change exhibited between the scenarios during any year is again at R5; (Newland Street/Kennard Street) with a potential annual increase of 0.5 $\mu\text{g.m}^3$ by 2019, reducing to 0.4 $\mu\text{g.m}^3$ by 2021 and 0.3 $\mu\text{g.m}^3$ by 2023.
- 5.22 Minor reductions in annual mean $\text{PM}_{2.5}$ of 0.1 to 0.2 $\mu\text{g.m}^3$ are also anticipated at R1 and R2 (Camel Road/Hartmann Road and Camel Road/Parker Street).

Table 0.3: Difference in Annual Mean $\text{PM}_{2.5}$ between With and Without Scheme Scenarios

Receptor Number	Location	Difference in PM _{2.5} Annual Mean (µg.m ³)		
		2019	2021	2023
Existing Locations				
R1	Camel Road/Hartmann Road	0.1	-0.2	-0.1
R2	Camel Road/Parker Street	-0.1	-0.2	-0.1
R3	Parker Street (Portway Primary School)	0.1	0	0
R4	Newland Street (opposite entrance to LCY car park)	0.2	0.2	0.1
R5	Newland Street/Kennard Street	0.5	0.4	0.3
R6	Brixham Street/Dockland Street	0.3	0.2	0.2
R7	Plattens Court/Billingway Dock Head	0.1	0	0.1
R8	Albert Road/Woolwich Manor Way	0.1	0	0
R9	Robert Street adj Albert Road (north side)	0.1	0.1	0
R10	Collier Close adj Gallions Way Roundabout (eastern side)	0	0	0.1
R11	Yeoman Close adj Royal Albert Way	0.1	0	0
R12	Straight Road/Campton Close	0.1	0.1	0
R13	Mill Rd adj North Woolwich Road (west)	0	0	0

39 The Committee on the Medical Effects of Air Pollutants (2006). Cardiovascular Disease and Air Pollution. Department of Health. Available at <http://comeap.org.uk/images/stories/Documents/Reports/cvd%20report%202006.pdf> last accessed 15/07/13.

40 The Health Protection Agency for the Committee on the Medical Effects of Air Pollutants. (2009). Long-Term Exposure to Air Pollution: Effect on Mortality. Available at http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317137020526 last accessed 15/07/13.

Receptor Number	Location	Difference in PM _{2.5} Annual Mean (µg.m ³)		
		2019	2021	2023
R14	Connaught Road/Leonard Street	0.1	0.1	0
R15	Victoria Dock Road (between Chantler and Freemasons Roads)	0	0	0.1
R16	Gallions Primary School adj Royal Docks Road	0	0	0.1
R17	Drew Road/Leonard Street	0.1	0.1	0.1
R18	Woolwich Manor Way (UEL)	0.1	0.1	0.1
R19	West Silvertown 1 (1.5 m elevation)	0	0	0
R19	West Silvertown 1 (20 m elevation)	0.1	0	0
R20	West Silvertown 2 (1.5m elevation)	0	0	0
R20	West Silvertown 2 (20 m elevation)	0	0	0
R21	Flats on Drew Road (20 m elevation)	0	0	0.1
R22	Flats on Docklands Street (40 m elevation)	0.1	0.1	0.1
Proposed/committed Developments				
R23	Silvertown Quays (30 m from Connaught Bridge)	0.1	0	-0.1
R24	Silvertown Quays 1 (1.5 m elevation)	0	-0.1	0
R24	Silvertown Quays 1 (20 m elevation)	0.1	0	-0.1
R25	Silvertown Quays 2 (1.5 m elevation)	0	0	0
R25	Silvertown Quays 2 (20 m elevation)	0	0	0
R26	Royal Albert Basin 1 (1.5 m elevation)	0	0.1	0
R26	Royal Albert Basin 1 (20 m elevation)	0	0	0
R27	Royal Albert Basin 2 (1.5 m elevation)	0	0	0
R27	Royal Albert Basin 2 (20 m elevation)	0.1	0	0.1
R28	Royal Albert Basin 1 (1.5 m elevation)	0.1	0.1	0.1
R28	Royal Albert Basin 1 (20 m elevation)	0	0	0
R29	Royal Albert Basin (1.5 m elevation)	0	0	0.1
R29	Royal Albert Basin (20 m elevation)	0	0.1	0.1
R30	Royal Albert Basin (1.5 m elevation)	0	0	0
R30	Royal Albert Basin (20 m elevation)	0	0	0
R31	North Side of Royal Albert Dock (10 m from Royal Albert Way)	0.1	0	0
R32	North Side of Royal Albert Dock (1.5 m elevation)	0.1	0	0.1
R32	North Side of Royal Albert Dock (20 m elevation)	0.1	0	0
R33	North Side of Royal Albert Dock (1.5m elevation)	0.1	0.1	0.1
R33	North Side of Royal Albert Dock (20 m elevation)	0.1	0.1	0.1
R34	King George V Dock (1.5 m elevation)	0	0	0
R34	King George V Dock (20 m elevation)	0.1	0	0
For the complete Air Quality Dispersion model outputs, please refer to Chapter 9 of the ES				

- 5.23 Similar to PM₁₀, such changes in concentration exposure (both increase and decreases) are negligible, and not of an order to quantify any change in local health outcome. To clarify, the exposure response coefficients developed by the UK Department of Health's Committee on the Medical Effects of Air Pollutants establish that there is a 6% increased risk in the background rate of all-cause mortality per 10 µg.m³ increase in PM₁₀ (Ref.41).
- 5.24 The change in concentration exposure associated with the proposed CADP is therefore orders of magnitude lower than is required to quantify any meaningful change in health outcome, as is relative community exposure.
- 5.25 To put this into context, applying the highest mortality rate in London (Newham males at 749 per 100,000) (Ref.42) more than the 29 times the entire population of the Royal Docks (10,679 people) (Ref.43), or the entire population of Newham (307,984 people) would need to reside in a property at R5, before any aggregate adverse health outcome could be quantified.
- 5.26 Given that both the With and Without CADP scenarios will remain within PM₁₀ and PM_{2.5} air quality standards set to protect health, and that relative changes in local concentration exposure are not of a level to quantify any change in health outcome (either adverse or beneficial), it is concluded that the proposed CADP does not constitute any measurable risk to local community, passenger or visitor health from changes in PM₁₀ and PM_{2.5} exposure.

Nitrogen Dioxide

- 5.27 As detailed in Chapter 9 of the ES, changes in NO₂ annual mean concentrations are primarily associated with changes in road surface movements to and from the Airport, yet remain within air quality standards set to protect health at all receptors for both the With and Without CADP scenarios.
- 5.28 As shown in Table 5.4, when applying official emission reduction factors associated with improvements in vehicle emissions, the proposed CADP is not anticipated to significantly influence changes in local annual mean NO₂ concentrations at any of the receptors modelled.
- 5.29 The most noteworthy changes exhibited between the scenarios during any year are at R4, R5, R6 and R7 (Newland Street/Kennard Street, Brixham Street/Dockland Street and Platterns Court/Billingway Dock Head) due to a combination of airport activities and the creation of an additional vehicle access point to the airport and parking area. Such increases are, however, negligible with changes in NO₂ annual mean at R5 ranging from 2.3 µg.m³ by 2019 (or 3 µg.m³

41 The Health Protection Agency for the Committee on the Medical Effects of Air Pollutants. (2009). Long-Term Exposure to Air Pollution: Effect on Mortality. Available at http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317137020526 last accessed 15/07/13.

42 NHS North East London and the City. (2012). Newham Joint Strategic Needs Assessment 2011/12: September 2012 Update. Available <http://www.newhamccg.nhs.uk/Docs/2%204%20JSNA%20Sept%2012%20Update.pdf> last accessed 11/07/13.

43 Office for National Statistics. (2011). 2011 Census: Usual Resident Population, March 2011. Available www.ons.gov.uk, last accessed 24/04/13.

when not applying official emission reduction factors), reducing to $1.6 \mu\text{g.m}^3$ by 2019 and marginally increasing to $1.7 \mu\text{g.m}^3$ by 2023.

- 5.30 Minor reductions in annual mean NO_2 are also anticipated at R1 and R2 (Camel Road/Hartmann Road and Camel Road/Parker Street) between -0.1 and $-0.7 \mu\text{g.m}^3$, due to the offset of vehicles along new access points.

Table 0.4: Difference in Annual Mean NO₂ between With and Without Scheme Scenarios

Receptor Number	Location	Difference in NO ₂ Annual Mean (µg.m ³)			
		2019		2021	2023
		With Official Emissions Reduction	Without Official Emissions Reduction		
Existing Locations					
R1	Camel Road/Hartmann Road	0.3	0.5	-0.6	-0.1
R2	Camel Road/Parker Street	0	0.2	-0.7	-0.3
R3	Parker Street (Portway Primary School)	0.3	0.3	0	0.3
R4	Newland Street (opposite entrance to LCY car park)	1	1.2	0.5	0.8
R5	Newland Street/Kennard Street	2.3	3	1.6	1.7
R6	Brixham Street/Dockland Street	1.9	2.5	1	1.1
R7	Plattens Court/Billingway Dock Head	1.2	1.7	0.6	0.6
R8	Albert Road/Woolwich Manor Way	0.6	0.7	0.2	0.3
R9	Robert Street adj Albert Road (north side)	0.4	0.6	0.2	0.3
R10	Collier Close adj Gallions Way Roundabout (eastern side)	0.3	0.3	0.2	0.3
R11	Yeoman Close adj Royal Albert Way	0.2	0.3	0.2	0.3
R12	Straight Road/Campton Close	0.1	0.2	0.1	0.2
R13	Mill Rd adj North Woolwich Road (west)	0.1	0.2	0.2	0.2
R14	Connaught Road/Leonard Street	0.3	0.5	0.1	0.3
R15	Victoria Dock Road (between Chantler and Freemasons Roads)	0	0	0	0.1
R16	Gallions Primary School adj Royal Docks Road	0.1	0.2	0.1	0.2
R17	Drew Road/Leonard Street	0.7	0.8	0.1	0.4
R18	Woolwich Manor Way (UEL)	0.4	0.4	0.5	0.7
R19	West Silvertown 1 (1.5 m elevation)	0	0	0.1	0.1
R19	West Silvertown 1 (20 m elevation)	0	0.1	0.1	0.1
R20	West Silvertown 2 (1.5m elevation)	0	0	0.1	0.1
R20	West Silvertown 2 (20 m elevation)	0.1	0.1	0.1	0.1

Receptor Number	Location	Difference in NO ₂ Annual Mean (µg.m ³)			
		2019		2021	2023
		With Official Emissions Reduction	Without Official Emissions Reduction		
R21	Flats on Drew Road (20 m elevation)	0.2	0.2	0.1	0.4
R22	Flats on Docklands Street (40 m elevation)	0.3	0.4	0.2	0.4
Proposed/committed Developments					
R23	Silvertown Quays (30 m from Connaught Bridge)	0	0.1	-0.1	0.1
R24	Silvertown Quays 1 (1.5 m elevation)	0	0.1	-0.1	0
R24	Silvertown Quays 1 (20 m elevation)	0.1	0.1	0.1	0.2
R25	Silvertown Quays 2 (1.5 m elevation)	0	0.1	0	0.1
R25	Silvertown Quays 2 (20 m elevation)	0.1	0.1	0.1	0.1
R26	Royal Albert Basin 1 (1.5 m elevation)	0.3	0.3	0.4	0.5
R26	Royal Albert Basin 1 (20 m elevation)	0.2	0.3	0.2	0.4
R27	Royal Albert Basin 2 (1.5 m elevation)	0.2	0.3	0.3	0.4
R27	Royal Albert Basin 2 (20 m elevation)	0.2	0.3	0.2	0.3
R28	Royal Albert Basin 1 (1.5 m elevation)	0.3	0.4	0.4	0.5
R28	Royal Albert Basin 1 (20 m elevation)	0.2	0.3	0.3	0.4
R29	Royal Albert Basin (1.5 m elevation)	0.4	0.4	0.4	0.5
R29	Royal Albert Basin (20 m elevation)	0.3	0.3	0.3	0.5
R30	Royal Albert Basin (1.5 m elevation)	0.1	0.2	0.2	0.2
R30	Royal Albert Basin (20 m elevation)	0.2	0.1	0.1	0.2
R31	North Side of Royal Albert Dock (10 m from Royal Albert Way)	0.2	0.3	0.1	0.2
R32	North Side of Royal Albert Dock (1.5 m elevation)	0.2	0.1	0.2	0.3
R32	North Side of Royal Albert Dock (20 m elevation)	0.2	0.2	0.2	0.2
R33	North Side of Royal Albert Dock (1.5m elevation)	0.5	0.5	0.5	0.7
R33	North Side of Royal Albert Dock (20 m elevation)	0.4	0.4	0.4	0.6

Receptor Number	Location	Difference in NO ₂ Annual Mean (µg.m ³)			
		2019		2021	2023
		With Official Emissions Reduction	Without Official Emissions Reduction		
R34	King George V Dock (1.5 m elevation)	0.1	0.1	0.1	0.1
R34	King George V Dock (20 m elevation)	0.1	0.1	0.1	0.1
For the complete Air Quality Dispersion model outputs, please refer to Chapter 9 of the ES					

- 5.31 The COMEAP does not consider that the evidence on NO₂ is sufficiently robust for quantification, but provides a risk coefficient of 0.5% per 10 µg.m³ increase for an effect on respiratory hospital admissions for sensitivity analysis purposes only (i.e. a precautionary approach through an additional conservative assessment) (Ref 44, Ref.45).
- 5.32 Applying the worst case contribution of 2.3 µg.m³, the proposed CADP might represent a potential annual increase in background respiratory hospital admission rates for those communities exposed of 0.115% (2.3/10 x 0.5%).
- 5.33 To put this into context, approximately, applying the 2006 – 2007 total respiratory disease hospital admission rate for Newham (1,468 admissions per 100,000 people) more than five times the entire population of the Royal Docks (10,679 people) (Ref 46), would need to be subject to a 2.3 µg.m³ annual increase before a single additional hospital respiratory admission could be quantified.
- 5.34 Given that potential concentrations are significantly lower at all other existing receptors, will remain within air quality standards set to protect health, and are not of a level to quantify any adverse health outcome, it is concluded that the proposed CADP does not constitute any measurable risk to local community, passenger or visitor health from changes in NO₂ exposure.

Noise

- 5.35 Noise has the potential to affect health in a variety of ways; some of which can be auditory and occur as a direct impact of the noise. Direct auditory effects usually result in damage to the ear,

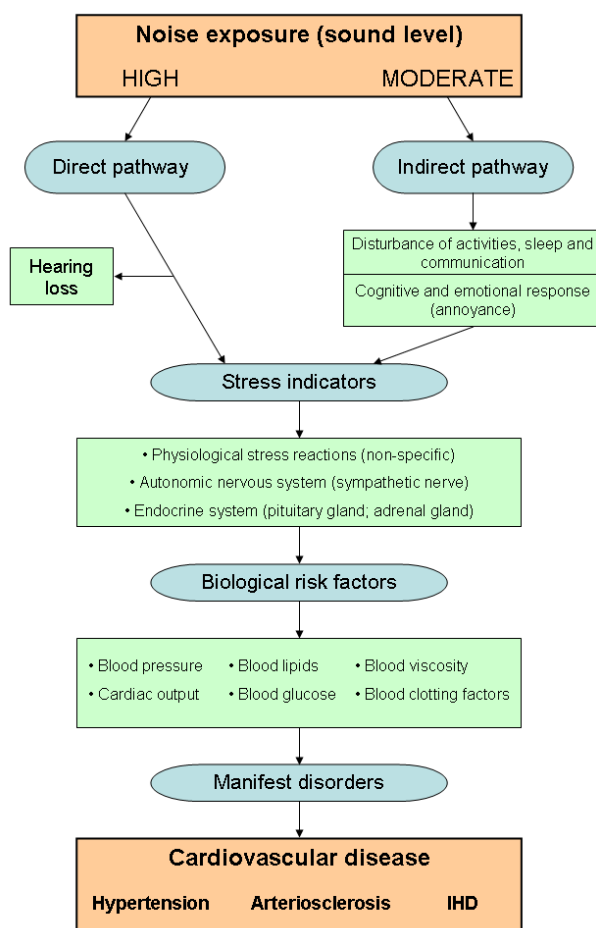
44 The Health Protection Agency for the Committee on the Medical Effects of Air Pollutants. (2007). Long-Term Exposure to Air Pollution: Effect on Mortality. Available www.advisorybodies.doh.gov.uk/comeap/statementsreports/longtermeffectsmort2007.htm last accessed 15/07/13.

45 The Health Protection Agency for the Committee on the Medical Effects of Air Pollutants. (2009). Long-Term Exposure to Air Pollution: Effect on Mortality. Available at www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317137020526, last accessed 15/07/13.

46 Office for National Statistics. (2011). 2011 Census. Usual resident population, March 2011 Available www.ons.gov.uk Last Accessed 24/04/13

in particular damage to the inner ear from intense and prolonged exposure, which is not relevant for the proposed CADP. Such risks are usually associated with occupational health or prolonged exposure to loud music and managed through good working practice and the provision of appropriate personal protective equipment. Figure 5.1 illustrates the various ways in which noise can affect health.

Figure 0.1: The Noise Health Pathway



Source: Good Practice Guide on Noise Exposure and potential health effects (Ref 47)

5.36 There are a wide range of non-auditory health effects that may be associated with exposure to environmental noise, although the pathways and strength of association for these are not fully understood. Examples of non-auditory health effects include:

- annoyance;
- mental health;
- cardiovascular and physiological;
- performance (tasks and academic); and

47 European Environment Agency. (2010). Good Practice Guide on Noise Exposure and Potential Health Effects. Available at http://www.dflid.de/Downloads/EEA_1010xx_Noise&Health.pdf last accessed 15/07/13.

- night time effects (sleep disturbance).

5.37 A summary of the available evidence base for each of the non-auditory health effects is provided in Appendix B.

Construction Noise

5.38 As detailed in Chapter 8 of the ES (Noise and Vibration), the construction of the proposed CADP will occur intermittently over a significant period of time, giving rise to noise and vibration with the potential to cause disruption to local communities around the Airport, and during the night when some of the works will take place (due to constraints during the operation of the airport).

5.39 The construction of the proposed CADP will build upon the programme and techniques applied during the recent infrastructure works at the Airport (such as the construction of the Eastern Apron), which managed environmental and noise impacts (including night time periods) effectively, with minimal community complaints.

5.40 As detailed in Chapter 8 of the ES, noise levels have been modelled at the façade of eleven receptors, and predictions made for three key scenarios, including:

- Year 1: construction of apron extension and noise barrier for three aircraft stands with an associated taxiway link and commencement of terminal works;
- Year 4: the peak construction, during which the Eastern Terminal Extension will be under construction, together with four additional new aircraft stands, the Hotel and Eastern Energy Centre; and
- Year 6: Completion of construction of the Eastern Passenger Pier and Eastern Terminal Extension.

5.41 During Year 1, no significant adverse impacts are predicted for daytime working hours, where noise sources are a considerable distance from the nearby communities and will remain below 65 dB $L_{Aeq, 10/5h}$ at all receptors.

5.42 Minor night/evening/weekend adverse noise impacts (between 55 dB $L_{Aeq, T}$) are predicted for the closest residential properties to the new stands, including 40 Newland Street, 86 Winifred Street Flats, 32 Brixham Street and the residential area close to Storey Street School.

5.43 During Year 4 (the peak construction year), no significant adverse impacts are predicted for daytime working hours from the Airport works, with minor impacts limited to landside infrastructure works close to residential properties, including 40 Newland Street, 86 Winifred Street Flats and 32 Brixham Street (a respective 69, 67 and 66 dB $L_{Aeq, 10/5h}$).

5.44 Night time/weekend piling and deck works however, are predicted to have a minor impact (between 55 dB $L_{Aeq, T}$ and 65 dB $L_{Aeq, T}$) at:

- 19 Camel road;
- 86 Winifred Street Flats;

- Storey Street School;
 - UEL halls of residence; and
 - 43 Felixtowe Court.
- 5.45 Necessary landside infrastructure works will also present a moderate impact during night time and weekends when works are carried out close to the nearby community at:
- 40 Newland Street;
 - 86 Winifred Street Flats; and
 - 32 Brixham Street.
- 5.46 During Year 6 the deck work would have been completed and the construction will be limited to daytime building and landside infrastructure works. No significant adverse impacts are predicted for daytime working hours from the Airport works, with minor impacts limited to landside infrastructure works close to residential properties, including 40 Newland Street, 86 Winifred Street Flats and 32 Brixham Street.
- 5.47 Evening and weekend works are predicted to have a minor impact at:
- 19 Camel road;
 - Drew Road Primary School;
 - 40 Newland Street;
 - 86 Winifred Street Flats;
 - 32 Brixham Street
 - Storey Street School;
 - UEL halls of residence.
- 5.48 Remaining landside infrastructure works will also present a moderate impact during evening and weekends at:
- 40 Newland Street;
 - 86 Winifred Street Flats; and
 - 32 Brixham Street.
- 5.49 Prior to mitigation, potential health impacts from construction noise are limited to annoyance and potential intermittent sleep disturbance from landside construction activities in proximity to communities.
- 5.50 In addition to existing mitigation provided through the Airports sector-leading Sound Insulation Scheme (providing insulation for eligible properties including schools and residential properties within the 57 dB $L_{Aeq,16h}$ contour associated with the onset of significant community disturbance), proposed mitigation to address such impacts include:

1. Community relations: Keeping local people informed of progress, particularly noisy construction activities, treating complaints fairly and expediently;
 2. Site Personnel Training: informing site personnel as to local communities and sensitive receptors, and directing the proper use and maintenance of tools and equipment and the positioning of machinery to reduce noise emission to the neighbourhood;
 3. Site Location: Setting noise emission limits with due regard to the proximity of noise sensitive premises and receptors;
 4. Duration of Site Operations: Local residents may be willing to accept higher levels of noise if they know that such levels will only last for a short time: notification of particularly noisy site operations will be provided, and be carried out according to a stated schedule; and
 5. Type of Plant: Consideration should be given to using quiet techniques taking account of practical site constraints and best practicable means.
- 5.51 As detailed in the Chapter 8 of the ES, following mitigation, construction noise is not of an order of magnitude sufficient to quantify any significant adverse health outcome, with impacts limited to potential annoyance at specific properties. On-going engagement with local communities will therefore be key to managing any residual impacts, and enabling local residents to address temporary and intermittent disruption.

Air Noise

- 5.52 The proposed CADP does not seek to increase the permissible number of aircraft movements or noise factored movements (both currently 120,000 per annum), nor will there be any change in operational hours over those currently in place (i.e. no change in night flights) or change in high approach glide slope.
- 5.53 Changes in operational noise therefore come about through the change in aircraft that the new infrastructure will accommodate (as these aircraft will give rise to changes in noise and vibration effects); and changes in airport configuration.
- 5.54 Potential noise health pathways are therefore limited to the quantification of annoyance and potential impacts on academic performance.

Annoyance

- 5.55 As defined in the Civil Aviation Authority (CAA) Guidance (Ref 48), the calculation of the total number of people likely to be 'highly annoyed' is achieved by multiplying the number of people within each 3 dB contour band by the appropriate percentage provided in Table 0.5.

⁴⁸ Civil Aviation Authority. (2007). CAP 725 CAA Guidance on the Application of the Airspace Change Process. Available at <http://www.caa.co.uk/docs/33/CAP725.PDF>, last accessed 15/07/13.

Table 0.5: CAA Percentage of Highly Annoyed People (Daytime Aircraft Noise)

Noise Contour Band	Mid Points of dB LA _{eq} 3 dB Intervals	Percentage Highly Annoyed
54-57	55.5	6.6
57 - 60	58.5	11.1
60 – 63	61.5	18.0
63 - 66	64.5	28.0
66 - 69	67.5	40.7
69 – 72	70.5	54.9
72 - 75	73.5	68.2

5.56 As detailed in Chapter 8 of the ES, changes in operational noise levels have been modelled between the With and Without CADP scenarios for 2019, 2021 and 2023. The noise contours were then applied to establish the number of existing and permitted residential dwellings that would be subject to changes in noise, and a population factor applied to indicate the total number of residents within such dwellings.

5.57 As shown in Table 5.6 below, prior to mitigation and not accounting for the Airports Sound Insulation Scheme the greatest change in high annoyance between the with and without CADP scenarios is for populations within the 57dB contour, with a moderate increase in the 63 dB contour up to 2023 for the existing population.

Table 0.6: Difference in Population Highly Annoyed between Scenarios

dB LA _{eq} , 16h	2019	2021	2023
54 – 57	500	600	500
57 – 60	500	500	500
60 – 63	100	200	300
63 – 66	0	100	100
66 – 69	200	200	200
69 – 72	0	0	0
72 – 75	0	0	0

5.58 It should be noted that the CAP 725 guidance is based on the percentage of a community who are highly annoyed by air noise. By its definition there will be a higher percentage of the community who are not annoyed by air noise and therefore the significance of these results should be treated with caution. To clarify, the noise modelling indicates that when comparing the 'with' and 'without' CADP scenarios, there is either no change or only a slight increase in noise level resulting from the proposed CADP, of the order of 1 dB.

- 5.59 It is important to consider that Airport policy is to provide eligible residential units which fall within the 57 dB $L_{Aeq,16h}$ contour (associated with the onset of significant community disturbance) with sound insulation treatment, if adequate levels of sound insulation are not already in place. This threshold of sound insulation is currently the lowest for any UK airport and significantly lower than the Government's recommended threshold of 63 dB $L_{Aeq,16h}$.
- 5.60 Equally, the Airport operates a scheme where any new residential developments within the 57 dB or 66 dB $L_{Aeq,16h}$ noise contours, which received Planning Permission as of 9th July 2009, but have not yet been built out, will benefit from a noise insulation payment scheme. This funds any additional works anticipated as a result of the Airport's 2009 planning approval, over and above any pre-agreed planning conditions with regard to external sound insulation. This condition will be carried over to any Planning Permission for the proposed CADP.
- 5.61 In addition, the Airport will continue to maintain and to enhance, wherever possible, operational measures that helps to adequately control air noise effects. Such measures include:
1. maintaining restrictions on flights outside the daytime period;
 2. the restriction that all aircraft operating at the Airport must lie within one of the categories or noise limits set out in the Aircraft Categorisation System as agreed with the London Borough of Newham. All such aircraft will meet the ICAO Chapter 4 limits;
 3. the continued operation of a Noise Monitoring and Flight Track Keeping System;
 4. maintaining a public noise complaint handling service;
 5. maintaining an Airport Consultative Committee;
 6. encouraging aircraft operators to adopt quiet operating procedures and to observe published noise abatement procedures;
 7. maintaining Preferred Noise Routes;
 8. maintaining an Approach Glide Slope of 5.5 degrees for all aircraft;
 9. maintaining an enhanced two tier Sound Insulation Scheme with an eligibility criterion trigger level of 57 dB $L_{Aeq,16h}$, the lowest daytime limit adopted in the UK. (This is in contrast to the eligibility criterion trigger level of 63 dB $L_{Aeq,16h}$ recommended by the Central Government for major airports); and
 10. maintaining a Purchase Offer for properties that lie within the high annoyance contour (69 dB) in line with Government recommendations.
- 5.62 In addition, the Airport will improve the scheme by offering those people most affected by noise, that is, those within the 66 dB $L_{Aeq,16h}$ contour, improved secondary glazing or a 100% monetary contribution towards high acoustic performance thermal double glazing, together with acoustic ventilation. This will ensure that all of those most affected by noise are afforded the maximum noise protection opportunity.

- 5.63 There are no hospitals located within the 57 dB $L_{Aeq,16h}$ noise contours (either now or proposed); and the Richard House hospice, which currently lies within the boundary of the existing Sound Insulation Scheme, is predicted to experience a 1 dB increase in noise by 2023; this property is already well insulated against external noise.
- 5.64 On the above basis, following mitigation, the risk of potential annoyance will be significantly reduced.

Sleep Disturbance

- 5.65 The proposed CADP will not seek to alter the current operational flying hours as permitted in the Planning Agreement, where agreed night time (23.00 to 6.00 hours) operations are limited to a small number of movements during the 06.30 to 07.00 hours slot. On this basis, the proposed CADP will not impact upon night time sleep disturbance.

Academic Performance

- 5.66 As detailed in Chapter 8 of the ES, and summarised in Table 0.7 below, noise exposure levels resulting from aircraft will be modest and in keeping with the prevailing ambient noise level, where relative changes at modelled receptors are at most marginal.

Table 0.7: Difference in Air Noise levels at Schools and Colleges ($L_{Aeq,16h}$)

School	2019	2021	2023
Britannia Village Primary School	1	1	1
Calverton Primary School	1	1	1
Chestnut Nursery School/Tollgate Primary School	1	1	1
Culloden Primary School	1	1	1
Discovery Primary School and Childrens Centre	0	0	0
Drew Primary School	1	1	1
Edith Kerrison Nursery School and Childrens Centre/Rosetta Primary School	1	1	1
Faraday School, Trinity Buoy Wharf	1	0	0
Gallions Primary School	1	1	1
Hallsville Primary School	1	1	1
Hawksmoor Primary School	0	0	0
Jubilee Primary School	0	0	0
Langdon Park School	1	1	1
Leapfrog Day Nursery	1	1	1
Linton Mead Primary School	1	0	1
Manorfield Primary School	1	1	1

School	2019	2021	2023
My Nursery	0	1	1
O'Farrels Stage School	1	0	0
Richard House Children's Hospice	1	1	1
St Joachim's R.C. Primary School	1	0	1
St Luke's CEVA Primary and Nursery School	1	1	1
St Margaret Clitherow RC Primary School	0	1	1
Thamesmead School of Dance	1	1	1
The Royal Docks Community School	0	1	1
Windrush Primary School	0	0	0
Winsor Primary School	1	1	1
Woolmore Primary School	1	1	1
University of East London	1	1	1
Woolwich Polytechnic for Boys	1	0	1
Storey Road School	1	1	1
Woodman Community Centre	1	1	1

- 5.67 The RANCH study researched the effects of road traffic and aircraft noise on the cognitive performance and health of children. During this study, aircraft noise exposure was associated with a linear exposure-effect association with reading comprehension, episodic memory and working memory. It was estimated that a 5 dB (A) increase in noise was associated with a 2-month impairment in reading age of UK children aged 9-10.
- 5.68 It should be noted that the RANCH study typically measured changes in cognitive performance in 5 dB (A) increments. In this instance, the potential change in noise exposure at all of the modelled schools is below what is generally considered perceptible. Therefore, the predicted increases in noise are not of a level to quantify any impact on academic performance.
- 5.69 For those schools and colleges experiencing relatively high levels of noise currently, such as Drew Primary School and the University of East London, these have already been built or insulated to cope with higher noise levels from the Airport.
- 5.70 On the above basis, the proposed CADP does not present a significant impact upon local academic performance. The Airport will continue to engage with local academic institutes to iteratively inform and enhance operational activities and best practice in the way it operates.

Ground Noise

- 5.71 Changes in Airport infrastructure and operations will alter the characteristics of daytime ground noise and consequent exposure to surrounding communities. As detailed in Chapter 8 of the ES,

ground noise has been calculated during the busy summer daytime period for a range of With and Without development scenarios.

- 5.72 The overall ground noise impact of the proposed CADP has been assessed as 'negligible' to 'minor adverse', with both 'moderate beneficial' (e.g. -4.2 dB at Newland Street) and 'moderate adverse' impacts (e.g.+3.9 dB at Brixham Street) experienced at particular locations. Potential health impacts related to ground noise are therefore limited to localised daytime annoyance, which are to be managed through current operational procedures and are not of a level to quantify any measurable adverse health outcome.

Transport Noise

- 5.73 The proposed CADP does not seek to increase the permissible number of aircraft movements although the modernisation of the fleet is expected to bring larger aircraft and, as a result, the potential for more passenger throughput and a consequent increase in surface access transport.
- 5.74 As detailed in Chapter 8 of the ES, and summarised in Table 0.8, the proposed CADP will have a negligible effect on the majority of receptors modelled. However, properties on Woodman Street closest to the new eastern access road are predicted to be exposed to a major relative increase in noise due to the new traffic source.

Table 0.8: 2023 Difference in Transport Noise ($L_{A\ 10,18h}$)

Receptor	Difference in dB	Long Term Impact
Connaught Bridge	+0.3	Negligible
Connaught Bridge PH (A)	+0.2	Negligible
Hartman Road	-0.9	Negligible
2 Camel Road (B)	-0.9	Negligible
Connaught Road	-0.8	Negligible
Connaught Road (C)	-0.8	Negligible
Royal Albert Way East	-0.7	Negligible
Royal Albert Way East (D1)	-0.7	Negligible
Royal Albert Way East (D2)	-0.7	Negligible
Royal Albert Way West	-0.6	Negligible
Royal Albert Way West (E)	-0.6	Negligible
Woolwich Manor Way	1.6	Negligible
Woolwich Manor Way (F1)	1.6	Negligible
Woolwich Manor Way (F2)	1.6	Negligible
29 Woodman St (G)	≥ 10	Major

- 5.75 Properties on Woodman Street, which is the closest residential area to the new access road, will be exposed to a new traffic source. The absolute levels of road traffic noise however are low, typically around 60 dB_{LA10;18h} and not significant.
- 5.76 Following consideration of existing mitigation, potential health impacts associated with transport noise are constrained to daytime periods are largely negligible, with absolute changes in transport noise limited to potential changes in annoyance. These effects are not of a level to quantify any measurable adverse health outcome.

Transport

- 5.77 Potential health pathways associated with changes in road traffic movements include increased risk of road traffic accidents and injuries, community severance and exposure to vehicle exhaust and noise emissions. The latter two points of air pollution and noise are addressed in the previous sections of this HIA.

Risk of Road Accident and Injury

- 5.78 The major and most obvious hazard associated with road traffic is the potential increased risk of human injury as a result of collisions.
- 5.79 As detailed in Chapter 11 of the ES (Traffic and Transport), and summarised in Table 0.9, an analysis of the local road network indicates that over a five year period, a total of 44 accidents occurred within the study area, of which four were classified as 'serious' and the remaining forty classified as 'slight'. There were no fatalities during this period.

Table 0.9: Summary of Road Accidents (2007-2012)

Location	Number of Accidents	Severity		
		Slight	Serious	Fatal
Albert Road	21	19	2	0
Hartmann Road	12	11	1	0
Connaught Road	8	7	1	0
Factory Road	3	3	0	0
Total	44	40	4	0

- 5.80 Despite the Airport's presence, the number and severity of accidents is not considered atypical for this part of London, and is partly due to the Airport being served by a range of public, private and green transport options with a modal preference for the Docklands Light Railway (DLR) (Table 0.10).

Table 0.10: Passenger and Staff Modal Split

Transport Mode	Passengers March 2012	Staff September 2011
Docklands Light Railway	49%	22%
Black Cab	27%	0%
Minicab	6%	3%
Car	12%	53%
Bus	0%	10%
Transfer (arrive on one flight and leave on another)	5%	N/A
Walk	Na	7%
Cycle	Na	2%
Motorbike	Na	2%
Other	1%	1%

5.81 As detailed in Chapter 11 of the ES, and summarised below, the predicted change in passenger throughput from the proposed CADP, together with the new Hotel users and staff, is anticipated to follow a similar modal split, with a preference for and sufficient capacity on the DLR to accommodate these increases.

Table 0.11: Change in 2021 Passenger and Staff Modal Split between With and Without CADP and the Hotel

Mode	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Car (Parked)	35	29	64	37	33	70
Car (Drop-off)	24	16	40	31	5	36
Rented Car	3	2	3	3	1	4
Black Taxi	32	23	55	44	5	48
Private Hire Minicab	37	29	66	53	9	62
DLR	181	139	320	250	49	299
Bus	10	8	18	10	9	20
Transfer (Passengers)	6	4	10	8	1	9
Walk	5	0	5	0	5	5
Cycle	2	0	2	0	2	2
Motorcycle	1	0	1	0	1	1
Other	18	34	52	41	18	60
TOTAL	353	283	637	477	138	616

5.82 The proposed CADP will result in a reassignment of traffic on the local highway network, resulting in a redistribution and reduction in traffic on certain links (most notably Royal Albert Way east with a -14.6% reduction and Royal Albert Way west with a -13.1% reduction), and an increase on others (Woolwich Manor Way south +42.4%).

- 5.83 All junctions indicate sufficient capacity to accommodate the proposed CADP, while the implementation of a second vehicle access to the Airport provides additional capacity on the highway network and enables the potential traffic impact of the proposed CADP to be spread and more effectively managed between two access points.
- 5.84 In addition, the proposed CADP will seek to increase the modal split of walking, cycling and use of the east London river crossings for staff and passengers alike, through the provision of a new pedestrian access created along the dockside from the east, connecting to Woolwich Manor Way. Such provision not only improves permeability of the Airport for pedestrians and reduces the walk distance from areas to the east, but also improves safety, by further segregating pedestrian and cycle paths from roads. Additional cycle parking spaces will also be provided.
- 5.85 Construction traffic is not anticipated to present a significant risk and this will be carefully managed through the adoption of a Construction Logistics Plan (CLP) which will include details of the transportation strategy for construction materials to/from the Airport, including the use of the river where possible, in order to minimise the impacts on the local road network.
- 5.86 On the above basis, the proposed CADP is not predicted to impact upon local road capacity, or materially impact upon road safety

Community Severance

- 5.87 The proposed CADP will not adversely impact upon community severance. Instead, it will improve permeability through the provision of an additional Airport access, through the provision of new pedestrian and cycle ways, and through initiatives to improve patronage on local buses and the DLR. Such measures will be detailed in the update to the Airport Travel Plan.

Socio-economic

- 5.88 Employment and income are potentially the most significant determinants of long-term health, influencing a range of factors including the quality of housing, education, diet, lifestyle, coping skills, access to services and social networks. Consequently, poor economic circumstances can influence health throughout life, where communities subject to socio-economic deprivation are more likely to suffer from morbidity, injury, mental anxiety, depression and tend to suffer from higher rates of premature death than those less deprived (Ref. 49, 50, 51).

49 Beland F, Birch S and Stoddart G. (2002). Unemployment and Health: Contextual Level Influences on the Production of Health in Populations. *Social Science & Medicine* 2002 55(11):2033-52.

50 Stafford M, Martikainen P, Lahelma E and Marmot M. (2004). Neighbourhoods and Self-rated Health: a Comparison of Public Sector Employees in London and Helsinki. *Journal Epidemiol Community Health* 2004 58(9):772-8.

- 5.89 Research (Ref.52) indicates that socio-economic circumstance and relative deprivation are key markers of poor health, associated with increased all-cause mortality in the US and five European countries. This association was seen independently of individual country-specific socio-economic characteristics, with no evidence from any of the countries in the study that substantially modified the association.
- 5.90 For men, living in the quartile of neighbourhoods with the highest unemployment compared to the lowest unemployment is associated with an increased risk of mortality (14%–46%), after adjustment for age, education and occupation. A similar but statistically weaker association between unemployment and mortality was found for women.
- 5.91 Projects that have the potential to support regeneration, reduce unemployment and improve socio-economic circumstance, will contribute to improving the health and wellbeing of socio-economically deprived communities.
- 5.92 It is important to note, however, that increasing employment and income opportunities alone will not maximise health benefits. Increased support, training and community involvement is required in order to link and develop skills to employment and reduce the risk of inequality.

Construction

- 5.93 As detailed in the Chapter 7 of the ES (Socio-economics, Recreation and Community), it is estimated that 344 Full Time Equivalent (FTE) direct onsite construction jobs will be supported over the life of the project, with a further 103 indirect and induced FTE jobs, making a total of 448 FTE jobs.
- 5.94 This equates to around £234m of direct gross value added (GVA) and £70m of indirect and induced GVA, making a total of £304m during the construction of the proposed CADP.

Operation

- 5.95 As detailed in the Chapter 7 of the ES, the economic analysis suggests that if planning consent for the proposed CADP is granted, the Airport would support approximately 570 FTE additional direct jobs over what can be achieved by 2021 within the Airport's current infrastructure, increasing to 700 FTE direct jobs by 2023. Associated indirect and induced FTE jobs equate to an additional 170 by 2021 up to 210 by 2023.
- 5.96 The proposed CADP therefore represents a potential additional £30.6 million in GVA by 2021 compared to the Without development scenario, increasing to £39.3 million by 2023. Associated

51 Van Lenthe FJ, et al. (2005). Neighbourhood Unemployment and All Cause Mortality: a Comparison of Six Countries. *Journal Epidemiol Community Health* 2005 59(3):231-7. Available at <http://jech.bmj.com/content/59/3/231.full.pdf+html> last accessed 15/07/13.

indirect and induced GVA equate to an additional £9.2 million by 2021 up to £11.8 million by 2023.

- 5.97 Although it is not possible to model the distribution of future employment uptake, it is fair to assume that the employment catchment area for the Airport will not significantly deviate from the current situation. The distribution of on-site Airport employment is largely derived locally, with 36% of the workforce from the Boroughs of Newham, Greenwich, and Tower Hamlets.
- 5.98 On the above basis, the proposed CADP presents a significant increase in the number of direct, indirect and induced income and employment opportunities with a high proportion of the new jobs likely to be taken up locally. This will have significant socio-economic health benefits at a regional and local level.
- 5.99 The Health Action Plan (HAP) explores additional initiatives to help address existing barriers to such benefits being taken up as part of the Airport's on-going community engagement programme.

The Hotel

- 5.100 In addition to the CADP1, the Hotel outline application (CADP2) constitutes a 3 star hotel with the potential for 260 rooms, generating up to 130 additional direct jobs and £5.8 million of GVA once opened. This would constitute an additional/cumulative socio-economic health benefit.

Total Employment Outcome

- 5.101 Overall, taking all types of employment into account, the CADP proposals would generate an increase in local employment of approximately 1,500 compared to 2012, when the full impact of the hotel is taken into account. This is made up of 1,250 jobs as a result of the increase in operational activity at the Airport and around 200 jobs in total related to the hotel and other elements of CADP2.

6 Conclusion

Summary

- 6.1 The construction and operation of the proposed CADP has a number of features that might be considered to have implications for the health of neighbouring communities. This HIA has examined the extent of these in a manner that considers local circumstance and the best available scientific evidence.
- 6.2 The following section provides a summary as to the significance and potential distribution of health impacts during the construction and operational phases of the proposed CADP.

Construction Effects

- 6.3 Taking into account the likely level of emissions generated on-site during construction, their intermittent nature/duration and minimal opportunity for community exposure, the risk to community health is not of a level to quantify any measurable adverse health outcome. Such effects would be further managed (avoided or reduced) through bespoke mitigation detailed in the ES, alongside on-going engagement and community support initiatives implemented by the Airport. A summary of these measures are provided in the HAP below.
- 6.4 Prior to mitigation, a key risk at the construction phase would be increased traffic movements and the associated risk of collision. However, such risks (of low likelihood) will be primarily managed by the implementation of a Construction Logistics Plan (CLP) which will include details of the transportation strategy for construction materials to/from the Airport, including the use of the river where possible, in order to minimise the impacts on the local road network.
- 6.5 Construction emissions to air are predicted to be minimal, will remain within air quality standards set to protect health and, when accounting for high burdens of poor health and relative sensitivity, are not of an order to quantify any adverse health outcome. As with all major construction projects, dust impacts can be anticipated. However, following the implementation of the comprehensive Dust Management Plan, potential impacts would be limited to minor temporary annoyance and do not present a risk to local community health.
- 6.6 Following mitigation, predicted construction noise would not be of an order of magnitude sufficient to quantify any significant adverse health outcome, with impacts limited to potential annoyance. On-going engagement with local communities will therefore be key to both managing any residual impacts, and enabling local residents to better manage any intermittent disruption.
- 6.7 Construction of the proposed CADP would generate significant direct, indirect and induced income and employment at the local and regional level, with subsequent socio-economic health benefits.

Operational Effects

- 6.8 Once operational, potential changes in air quality are predicted to be negligible and not of a level to quantify any change in local health outcome.
- 6.9 Prior to mitigation, air noise from the increase in movements (up to 111,000 flights per annum by 2023) and changes in the fleet mix presents a potentially significant impact on community annoyance, largely for existing populations within the 57dB contour (associated with the onset of significant community annoyance) and new populations from permitted residential developments within this contour. The proposed CADP will not seek to alter the current operational flying hours as permitted in the Planning Agreement (with no night time flying). On this basis, the proposed CADP will not impact upon sleep disturbance.
- 6.10 The threshold of sound insulation at the Airport is currently the lowest for any UK airport (57 dB) and significantly lower than the Government's recommended threshold of 63 dB $L_{Aeq,16h}$ that largely preclude the onset of significant annoyance.
- 6.11 Potential impacts on schools are predicted to be minimal, with no hospitals located within the 57 dB $L_{Aeq,16h}$ noise contours (either now or proposed). The Richard House hospice currently lies within the boundary of the existing Sound Insulation Scheme, and is therefore already well insulated against external noise. Potential changes in noise exposure at academic institutes are marginal, and not of a level to quantify any impact upon academic performance.
- 6.12 Changes in Airport infrastructure and operations will alter the characteristics of daytime ground noise and consequent exposure to surrounding communities. The overall ground noise impact of the proposed CADP has been assessed as 'negligible' to 'minor adverse', with both moderate beneficial (-4.2 dB at Newland Street) and moderate adverse impacts (+3.9 dB at Brixham Street) in 2023. Potential health impacts are limited to localised daytime annoyance and would be managed through current operational procedures. Such noise effects are not of a level to quantify any measurable adverse health outcome.
- 6.13 Surface transport noise from the proposed CADP will be largely negligible for the majority of receptors modelled. However, properties on Woodman Street closest to the new eastern access road are predicted to be exposed to a major relative increase in noise due to the new traffic source. The absolute levels of road traffic noise however are low, typically around 60 dB $L_{A10,18h}$ and not significant.
- 6.14 The proposed CADP will result in a reassignment of traffic on the local highway network, resulting in a redistribution and reduction in traffic on certain links (most notably Royal Albert Way east with a -14.6% reduction and Royal Albert Way west with a -13.1% reduction), and an increase on others (Woolwich Manor Way south +42.4%).
- 6.15 All junctions indicate sufficient capacity to accommodate the additional road traffic associated with the proposed CADP, while the implementation of a second vehicle access to the Airport provides additional capacity on the highway network and enables the potential traffic impact of

the proposed CADP to be spread and more effectively managed between two access points. The proposed CADP is not predicted to impact upon local road capacity, materially impact upon road safety or adversely impact upon community severance.

- 6.16 The proposed CADP presents a significant increase in the number of direct, indirect and induced income and employment opportunities with a high proportion of employment opportunities likely to be taken up locally, with significant socio-economic health benefits at a regional and local level. In addition, the proposed Hotel is expected to generate up to 130 direct jobs and £5.8 million of GVA upon opening. This would constitute an additional/cumulative socio-economic health benefit.

Conclusions

- 6.17 On the basis that all regulatory environmental standards set to protect health are predicted to be achieved; that the assessment from relative changes in air quality, noise and transport upon existing burdens of health are not sufficient to quantify any significant adverse health outcome; and, when considering commitment for on-going community engagement, the proposed CAPD does not constitute a significant risk to local community health.
- 6.18 Furthermore, when accounting for the underlying factors defining local burdens of poor health in and surrounding the area (largely socio-economic and lifestyle related), and the direct, indirect and induced socio-economic benefits from the proposed CADP, alongside an impressive catalogue of committed community support initiatives introduced by the Airport (summarised within the HAP) to optimise local health benefit uptake, the proposed CADP constitutes a net health benefit.

7 Health Action Plan

Introduction

- 7.1 The Health Action Plan (HAP) builds on the information provided through the assessment sections of this report and provides a series of recommendations to address local circumstance, concerns and needs. The HAP is not solely intended for the Airport, but rather should also be used by the London Borough of Newham and Health Stakeholders to coordinate and complement community support initiatives with the Airport.

Environmental Impact Assessment Mitigation

- 7.2 The ES assesses a range of potential environmental impact pathways, with input from air quality, noise, transport and socio-economic disciplines. Given the multidisciplinary nature of HIA, there is significant overlap with several of the technical disciplines that have informed the ES, and with the mitigation measures that they propose. Therefore, for the sake of brevity, the HAP does not seek to repeat this mitigation in full but signposts and summarise this as a useful basis to complementary HAP mitigation.

Air Quality

- 7.3 As detailed in the ES, and reiterated through the HIA, construction and operational PM₁₀, PM_{2.5} and NO₂ emissions will remain within standards set to protect health and relative changes are not of an order of magnitude to quantify any change in local community health. Although not of a level to quantify any adverse health outcome, dust constitutes a slight adverse impact with the potential to cause annoyance. A series of mitigation measures drawing from best practice guidance is incorporated into the CADP Construction Environmental Management Plan (CEMP), as described in Chapter 6 of the ES. The CEMP will be supported through a committed engagement strategy building from the Airport's on-going engagement with stakeholders and local communities before and during work on site. Engagement will be applied to both inform local communities as to planned and potentially disruptive works, but also to record community concerns and complaints. This will help inform, refine and enhance the construction process and the proposed mitigation, where appropriate.

Noise

Construction Noise Management

- 7.4 The Airport proposes to build upon both best practice guidance and the successful mitigation applied during the construction of the existing Eastern Apron (part of the Operational Improvement Programme in 2007-2008) which managed noise impacts (including night time periods) effectively, with minimal community complaints. Proposed measures include:

1. Community Relations – keeping local people informed of progress and treating complaints fairly and expeditiously;
2. Site Personnel Training – informing site personnel about the need to minimise noise and advising on the proper use and maintenance of tools and equipment and the positioning of machinery to reduce noise emission to the neighbourhood;
3. Site Location – setting noise emission limits with due regard to the proximity of noise sensitive premises;
4. Duration of Site Operations – local residents may be willing to accept higher levels of noise if they know that such levels will only last for a short time: noisy site operations should be carried out according to a stated schedule; and,
5. Type of Plant – consideration should be given to using quiet techniques taking account of practical site constraints and best practicable means.

Ground Noise Management

The Airport already operates a comprehensive ground noise management programme and has sought to enhance such management through the design of the proposed CADP, including:

1. The substantial height of the Eastern Passenger Pier/ east Terminal Extension will act as a noise barrier reducing ground noise levels experienced by the nearest dwellings to the south of the Airport;
 2. Encouraging the minimum use of reverse thrust on landing, consistent with safety constraints;
 3. Except in emergencies, engine testing will be (as now) restricted to areas designated for that purpose;
 4. Maintaining a noise limit for policing the level of high powered ground runs for engine testing and maintenance purposes;
 5. Limiting engine test and maintenance activities to those associated with engine rectification, rather than routine testing;
 6. Limiting the use of Auxiliary Power Units (APUs) on aircraft to no more than 10 minutes prior to departure and 10 minutes after landing; and,
 7. Providing fixed electrical ground power (FEGP) to apron stands to minimise the use of mobile units or APUs.
- 7.5 The Airport operates a system to discourage excessively noisy departures using a system of penalties and incentives agreed between the Airport and LBN. Full details of these mitigation

measures are presented in the Annual Performance Report produced annually by the Airport in July (Ref.52).

- 7.6 The Airport is also currently introducing additional measures under the NOMMS (Noise Monitoring and Mitigation Strategy) which improves upon and replaces the current noise management scheme and noise monitoring system to provide a more robust system of noise monitoring and mitigation. This is to include the measurement and monitoring of ground based sources of noise as well as airborne noise.

Air Noise Management, Mitigation and Monitoring

- 7.7 As detailed below, the Airport operates a comprehensive and leading UK airport air noise management programme.

Monitoring

- 7.8 The Airport has operated a four point noise monitoring system since 1991. This was upgraded in 2000 by the addition of a flight track keeping system. The noise and flight track monitoring system is used to measure the noise as an aircraft departs from the Airport, the results of which assist in the operation of the noise categorisation process.
- 7.9 As part of the NOMMS, a new and more robust noise and flight track system is currently being acquired by the Airport with installation planned to commence in 2013. This will involve the renewal of the existing four point noise monitoring system and its expansion by the addition of three more monitors to ascertain the airborne and ground noise levels emitted by the aircraft with more accuracy. One monitor will be located near East India Dock, the other on the south side of the Thames in Thamesmead. The third will monitor ground noise from aircraft operations on the apron and runway and will be located close to Building 1000 on the north side of Royal Albert Dock.

Sound Insulation Scheme (SIS)

- 7.10 Following the planning consent for additional aircraft movements at the Airport in 2009 (ref 07/01510/VAR), the Airport has enhanced its Sound Insulation Scheme (SIS) by introducing a two tier system. The previous scheme (prior to 2009) offering sound insulation treatment to eligible residential properties within the 57 dB $L_{Aeq,16h}$ noise contour continues but is now supplemented by a second tier where eligible residential properties within the 66 dB $L_{Aeq,16h}$ noise contour are offered an enhanced sound insulation package offering secondary glazing or a contribution towards high performance thermal double glazing, as well as sound insulating ventilators.

52 London City Airport. (2011) Section 106 Annual Performance Report, available at www.londoncityairport.com, last accessed 15/07/13.

- 7.11 It is important to consider that this threshold of sound insulation is currently the lowest for any UK airport and provides 'enhanced' mitigation compared with the Government's recommended threshold of 63 dB $L_{Aeq,16h}$.
- 7.12 Additionally, for those residential properties that were treated under the scheme at least 10 years ago, a free inspection is offered and rectification works undertaken where appropriate to ensure that the standard of sound insulation does not decline over time.
- 7.13 For Public Buildings in community use, those falling within the 57 dB and 66 dB $L_{Aeq,16h}$ noise contours are treated on an individual basis following an assessment to determine the function and occupancy of the building.

Purchase Offer

- 7.14 Any eligible properties that fall within the 69 dB $L_{Aeq,16h}$ noise contour will receive an offer from the Airport to purchase the property at the open market value within 6 months of the owner/occupier making an application for the Airport to do so. To date, no properties fall within this noise contour.

Noise Insulation Payment Scheme

- 7.15 The Airport operates a scheme where any new residential developments within the 57 dB or 66 dB $L_{Aeq,16h}$ noise contours which received Planning Permission but had not been built as of 9th July 2009 will benefit from a noise insulation payment scheme that funds during construction any additional works anticipated as a result of the Airport's 2009 planning approval, over and above any pre-agreed planning conditions with regard to external sound insulation.
- 7.16 On the above basis, the Airport already applies a comprehensive noise management, monitoring and mitigation programme that surpasses Government recommendations and includes on-going community and stakeholder engagement.

Transport and Access

- 7.17 As encouraged by health stakeholders during the HIA scoping exercise, the proposed CADP includes the provision of new and enhanced cycle and pedestrian ways to increase the modal split of walking, cycling and use of the east London river crossings for staff and passengers alike. Additional secure cycle parking and appropriate staff facilities are also included to further enhance the uptake of active transport. Such provision not only improves permeability of the Airport and for existing communities for pedestrians by reducing the walk distance from areas to the east, but also improves safety, by further segregating pedestrian and cycle paths from roads.
- 7.18 The use of these and other sustainable transport modes, including buses and the DLR, will be further promoted through the Airport Travel Plan.

Community Engagement

- 7.19 The Airport has regular communication and contact with local people through a wide variety of channels, including:

1. The London City Airport Consultative Committee (LCACC) provides a forum to monitor and discuss all aspects of the operation and development of the Airport, and especially its impact on, and opportunities for, people living and working in the surrounding area. The LCACC is made up of a balance of representatives from local authorities, public bodies, local residents and Airport users. Meetings are held quarterly and the committee's agendas and minutes are published on the committee website;
2. The 'Runway News' community newsletter provides information on Airport Operations, Development and Community Programmes. It is distributed to 33,000 local homes quarterly and is available online; and
3. London City Airport's Air Transport Forum (ATF), was created in 1999 in response to Government guidelines set out in the 1998 White Paper - 'A New Deal for Transport – Better for Everyone'. It is designed to improve and sustain access to the Airport. The Airport Surface Access Strategy, developed and implemented in conjunction with the ATF, details short and long term plans to increase the use of public transport by staff and passengers.

7.20 On the above basis, the Airport already operates a comprehensive engagement programme with local communities and stakeholders alike, and has already been applied to engage and discuss the proposed CADP (e.g. Runway News Spring 2013, edition 24). Subject to consent, the Airport will utilise such communication channels/forums to continue to raise awareness as to the programme for the proposed CADP, the timing and duration of construction activities, emerging employment opportunities, and complaint contact details and procedures to address community concerns. On-going engagement will thereby aid local communities in managing any residual disruption, while providing a means to further refine construction activities and mitigation, and support the uptake of potential socio-economic opportunities brought forward by the proposed CADP.

Education, Training and Career Development

- 7.21 The proposed CADP has the potential to help directly address some of the economic issues in the area through the creation of jobs and opportunities for local business. It is also in the interest of the Airport to maximise local recruitment and build its supply chain locally. It is recognised, however, that there are barriers to local employment (most notably educational attainment) that need to be addressed to optimise the uptake of benefits locally, and to assist in addressing an underlying causes for health deprivation and inequality.
- 7.22 With these issues in mind, the Airport will continue to support education attainment and employment through the London City Airport's Education Excellence Programme. The programme helps young people and adults develop the skills and attributes required for future employment, either at the Airport or elsewhere. The projects delivered within the programme focus on basic skills, raising aspirations and attitude for employment, and are divided into the following categories:

1. Primary (5-11 years) and Secondary (11-16 years), intended to increase children's aspirations from an early age, and raise awareness as to potential career options; including:
 - educational geography programme for year two students at local selected schools (13 from the London Borough of Newham, 1 from the London Borough of Tower Hamlets and 1 from the London Borough of Greenwich);
 - attending careers and aspiration days;
 - working with the Hackney Education and Business Partnership to deliver Hackney Inspire Sessions, telling primary school children about future careers that they could aim for; and
 - the "Plane Business" education programme has been developed by the Airport in partnership with Newham Education Business Partnership (EBP) as a case study to give local students an insight into airport business, markets and passengers. The aim of this resource is to introduce year nine students to the concepts of business and trade, using London City Airport as a vehicle. It could also be used as a starter activity for GCSE Business Studies students.
 2. Further Education (16-18 years), intended to further raise awareness as to local employment opportunities, career paths and the development of skills and experience to realise them, including:
 - Airport insight travel and tourism. As part of the Education Excellence programme, the Airport, in conjunction with the Travel and Tourism Diploma Organisation, has produced eight short films covering various topics across the business to offer an insight into its operation, strategy and ethos.
 - Work Experience. The Airport runs a weekly work experience placement aimed mainly at college students who are studying a travel and tourism related course within the local area. This involves spending a day in various departments of the airport, such as customer service and airfield operations, to gain a feel for the careers available to them once they have left college.
 3. Higher and Adult Education. The annual London City Airport University Scheme provides financial assistance, management mentoring and paid work placements to local students selected to join the scheme. Since the programme started in 2004, the Airport has awarded 16 students from Newham, Tower Hamlets and Greenwich grants of more than £150,000 in total. In addition to a £2,000 annual grant and a personal Airport Management Mentor, students also benefit from paid work experience in departments around the Airport to gain a better understanding of the business and its operations.
- 7.23 In addition, the Airport continues to support academic institutions in general. For example, in 2012 the Airport donated £8,000 towards the development of a new sensory room in Drew

Primary School and voluntary construction work by the Airport's building contractor (AA Lovegrove) by providing trained volunteers to decorate this facility.

- 7.24 On the above basis, the Airport is already well networked with local academic institutions and operates an impressive education support programme ranging from primary to higher education, linked to the Airport employment support initiatives.
- 7.25 The Airport will continue to work with local schools, colleges, the universities and training providers to raise awareness of opportunities amongst school children and students and support academic excellence through careers talks, work placements, awards and sponsorship.
- 7.26 Although entirely voluntary, should the Airport seek to further enhance its education support, it would be recommended to target initiatives that focus upon young adults in long term unemployment (and potentially unable to re-train or access higher education) and adult education programmes - be it Airport related or broader support. This may include the Airport considering the development of a bespoke apprenticeship programme. The apprenticeship programme could involve working with a local college, university or other training provider to devise a bespoke on-the-job apprenticeship, resulting in a recognised qualification.
- 7.27 Such additional support would effectively cover all education elements, constitute a comprehensive local education support programme and aid in addressing a core underlying factor defining local burdens of poor health, deprivation and inequality.

Employment Support

- 7.28 The Airport already supports local education and employment through a series of interlinked initiatives. The 'Take off into work' employment programme with East London Business Alliance comprises a two week employability training course and then a two week work placement at the Airport within departments such as customer service, retail and car hire. The programme takes place five times per year, with up to 15 candidates and is open for applications from all Newham residents over 16 who are not in employment or education.
- 7.29 Since 2009, the programme has resulted in assisting 300 people from Newham into employment, and is one of the most successful employment programmes in the Borough.
- 7.30 It is recommended to expand the scope of the programme to support the construction of the proposed CADP, offering training and experience in construction and environmental management.
- 7.31 The Airport will also continue to advertise training, education and employment opportunities through its newsletter and to work with local employment agencies and training institutes to maximise the uptake of employments locally.

Community Participation and Support

- 7.32 The Airport already provides a range of local community support initiatives, including education and mentoring programmes, charity and fundraising events and health and wellbeing programmes.

Health and Wellbeing

- 7.33 The existing Airport Health and Wellbeing programme is intended to support staff and neighbouring communities to engage in healthy activities, including:
1. Supporting local programmes that encourage healthy living, team work, commitment, competitiveness and other attributes conducive to sustainable employment;
 2. Encouraging active and healthy lifestyle opportunities for local people through support for health, wellbeing and/or sporting organisations working with the community around London City Airport, or its staff;
 3. A Community Food Enterprise (CFE) is a social enterprise food business which is rooted in the London Borough of Newham and was founded in 2002 by members of the local community. CFE is a sustainable community food enterprise that provides training and employment opportunities for members of the community while supplying fresh fruit and vegetables to local people at a realistic price to encourage them to eat the right food. The Airport engages the CFE as a local supplier to deliver fresh fruit to all Airport staff every week, encouraging its staff base to eat healthily, while providing custom to a local supplier;
 4. London Youth Games: The Airport sponsored both its local teams in Newham and Tower Hamlets for the 2012 London Youth Games. The games involve young people from London's 33 boroughs competing in various sporting activities with the grand finals held in Crystal Palace during the summer; and,
 5. South London Special League, based in Greenwich, holds sporting events for disabled young people from London to improve their fitness, raise their self-esteem and heighten their aspirations. The Airport sponsored its annual summer football tournament and also provided staff volunteers to help out on the day.
- 7.34 It is recommended the Airport further engage with the newly formed Health and Wellbeing Board (Ref. 53) to link health awareness programmes (with greater coordinated coverage and effect), and to explore opportunities for complementary community support initiatives, and the encouragement of other private organisations to participate.

Charity and Community Events

- 7.35 The Airport both supports and actively encourages staff to participate in local charity and community events, between November 2012 and February 2013, the Airport:
1. donated 10 boxes of Christmas crackers to local charity organisations;
 2. volunteered over 150 hours of staff time to various events in the local area;

53 For more information and contacts, please refer to www.newham.gov.uk/Pages/Services/Health-and-wellbeing-board.aspx

3. match funded £250 to Prostate Cancer UK after staff at the Airport Fire Station grew moustaches for 'Movember';
 4. donated 80 tins of biscuits to Neighbours in Poplar;
 5. donated 8 luxury hampers to local schools and organisations for raffles; and,
 6. fundraised over £9,000 for Richard House Children's Hospice (which the Airport has supported for over 15 years).
- 7.36 The East London Business Alliance held its annual toy appeal in November and December of 2012 intended to provide children from East London presents at Christmas (who may not receive any otherwise). Airport staff donated 41 toys.
- 7.37 The Airport provided three years sponsorship for Paralympic swimming star, Amy Marren, who was born in the London Borough of Newham. The sponsorship helped to pay for her physiotherapy and training. This initiative forms part of the Airport's Health and Wellbeing programme aimed at promoting healthy living in the local area amongst the young and old alike.
- 7.38 Nine staff members from London City Airport recently volunteered at Britannia Village Hall in West Silvertown, Newham, working to improve the community centre's garden and its enjoyment of local people. The Airport has a strong relationship with Britannia Village Hall and often supports its many programmes and activities, as well as volunteering an Airport manager to the Trust which manages the centre.
- 7.39 The Airport sponsored young people with disabilities from all over London for an annual summer football tournament held by South London Special League at Greenwich's London Marathon Playing Fields. Over 200 young people from various London schools competed in several leagues such as primary, girls, under 14's and under 16's with the runners up and winners receiving a trophy as well as an award for fair play. The event was staged using a £1,500 donation from the Airport as well as having Airport volunteers on the day. The Airport has supported this event for three years as part of its Community Health and Wellbeing programme aimed at promoting healthy living in the local area around the Airport.
- 7.40 The Airport's grand fundraising total for 2012 was over £28,000. This amount went to its local neighbour and partner Richard House Children's Hospice which cares for children with life limiting conditions. During their 15 year partnership, the Airport has raised over £700,000 on behalf of Richard House. The amount was raised by staff and passengers through various initiatives such as money boxes and bucket shakes in the Airport terminal, cake and book sales for staff, and a fundraising sky dive in October 2012.
- 7.41 On the above basis, the Airport already actively seeks to strengthen its relationship with, and support of, local communities through an impressive array of sponsorship, financial support, coordination and facilitation of charitable events, and further volunteers time to work within local communities.

- 7.42 The core recommendation is to improve awareness of such initiatives to primarily encourage similar support from other organisations, but to also coordinate complementary support initiatives to even greater effect.

Health Action Plan Conclusion

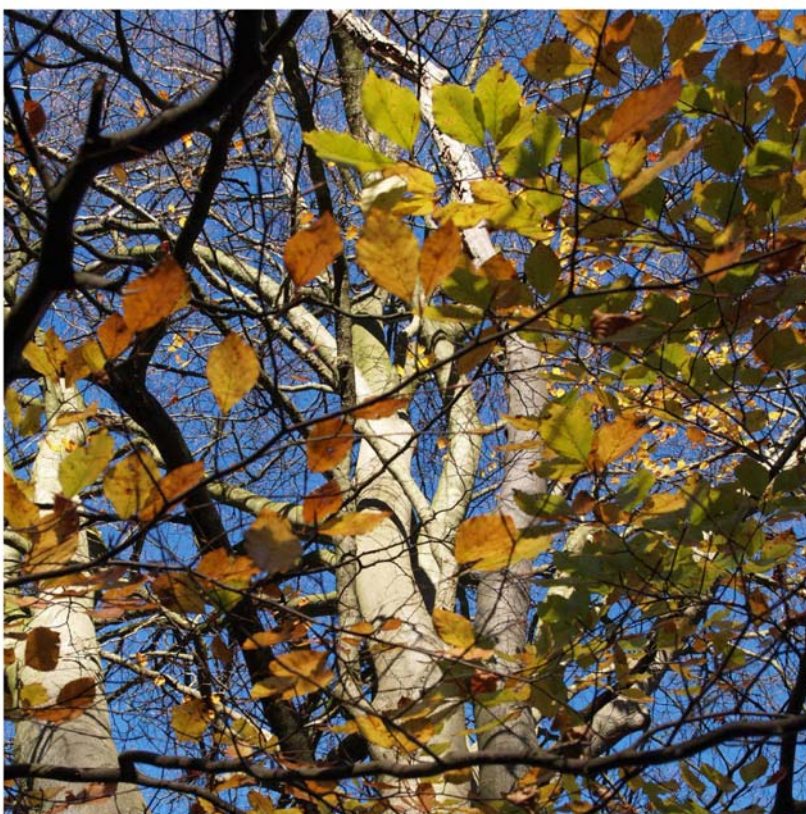
- 7.43 The Airport already provides noise mitigation that surpasses Government recommendations and operates an impressive array of community support initiatives and on-going engagement that target the underlying factors defining local burdens of poor health and inequality.
- 7.44 Health recommendations to supplement existing mitigation and engagement are minor, largely endorsing and refining initiatives to address gaps and local health circumstance. The core recommendation is for the Airport to continue to raise awareness of such initiatives and encourage similar Corporate Social Responsibility (CSR) best practice from other organisations in London. Additionally, it is recommended the Airport CSR Team engage with the newly formed Health and Wellbeing Board to further explore and coordinate health and wellbeing programmes, but to also discuss future community support initiatives, and ways of maximising their influence through coordinated effort.

Appendices

Appendix A: HIA Scoping Statement




Eastern Stand Development (ESD)

Health Impact Assessment Scoping Statement



Eastern Stand Development (ESD)

Health Impact Assessment Scoping Statement

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Date of issue:	21 November 2012			
Revision:	4			
Project number	JAS6839			
Document file path:	\\BRIG-LW-02\Projects\Jobs_6001-7000\6839s\Scoping document\HIA scoping statement211112.docx			

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Quality Management

Revision History				
Rev	Date	Status	Reason for revision	Additional comments
0	10/10/12	First Draft	-	-
1	16/10/12	Draft	Implement Team Comments and Technical Director Review	-
2	15/10/12	Draft	Implement Team Comments and Technical Director Review	-
3	20/11/12	Draft	Implement Team Comments	-
4	21/11/12	Final	Implement Team Comments	-

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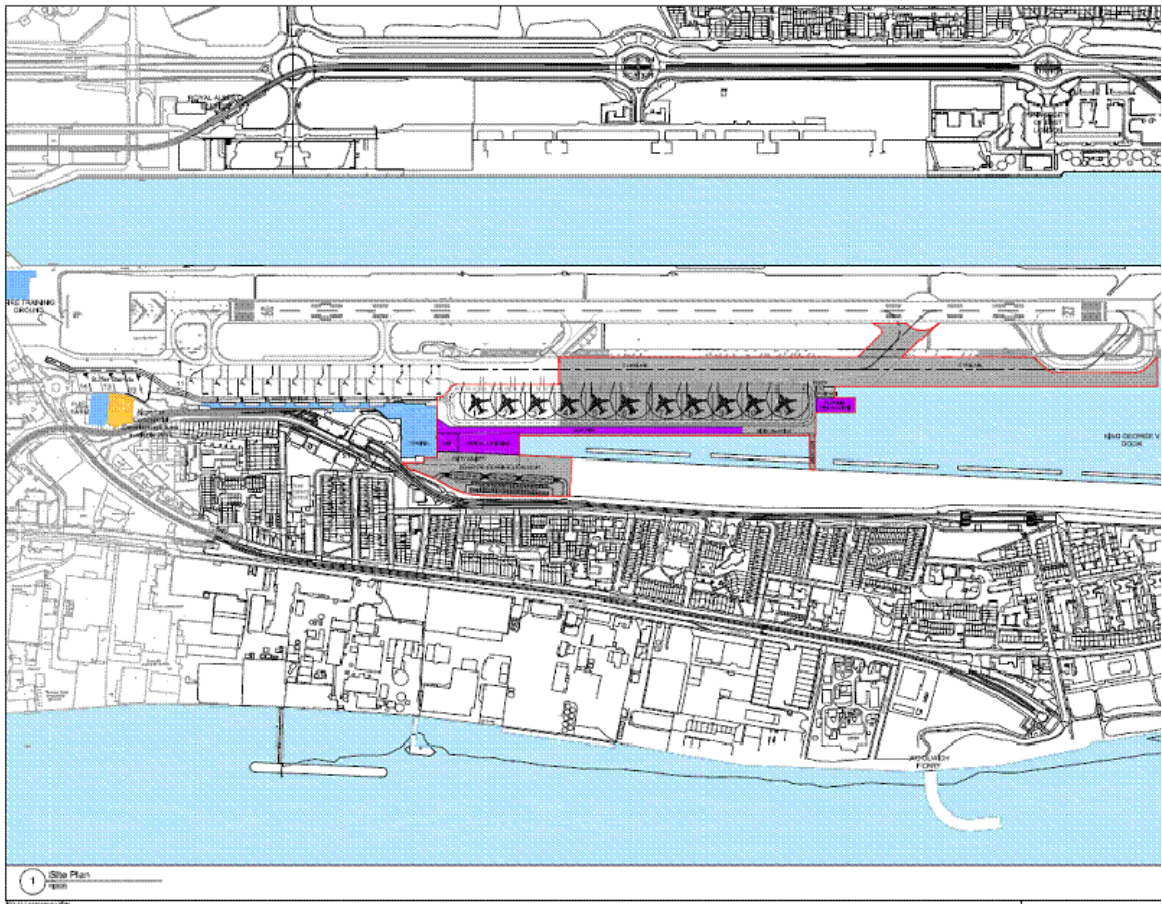
1 Introduction

Background

- 1.1 London City Airport Limited (LCY) intends to seek full planning permission from the London Borough of Newham (LBN) for new and upgraded aircraft stands, an extension to the taxi-lane running adjacent to the runway, a new arrivals building, reconfigured forecourt area and related infrastructure works. The application proposals will allow the Airport to accommodate a new generation of aircraft as well as improving the facilities for passengers. The project, known as the Eastern Stand Development (ESD), forms part of planned on-going improvements at the Airport that will enhance operational efficiency, passenger service and capacity in accordance with current and future customer, airline and regulatory requirements. Such improvements are broadly consistent with the long term plans which were described in London City Airport's 2006 Master Plan. The planning application for the ESD is anticipated to be submitted to LBN towards the end of the first quarter of 2013.
- 1.2 London City Airport is located between the Royal Albert Dock and King George V Dock (KGV) within the London Borough of Newham, east London. Figure 1.1 below illustrates the current layout of the Airport whilst Figure 1.2 shows the indicative redline boundary for the ESD planning application.
- 1.3 The ability of the Airport to enhance its infrastructure and facilities is constrained by its dockside location and proximity of other constraints including the Docklands Light Railway (DLR). Accordingly, consistent with the 2006 Masterplan, it is proposed to extend eastwards by decking over parts of the KGV Dock.

Figure 1.1 - Aerial View of London City Airport (looking east)



Figure 1.2 – Indicative Planning Application Redline Boundary

- 1.4 This ESD project will in part help to ensure that the Airport's existing infrastructure is brought up to regulatory requirements and standards in order to accommodate the most modern aircraft currently operating, in development or early production.
- 1.5 No increase in the permitted number of aircraft movements is being sought at this time and the Airport will continue to operate up to a maximum limit of 120,000 (noise factored) movements per annum within the constraints of the factoring system approved by LBN. Furthermore, all existing environmental and operational controls, strategies and systems approved through the conditions attached to the 2009 Planning Permission (ref. 07/01510/VAR) and the associated Planning Agreement of the July 2009 will continue to apply (with any appropriate amendments, where necessary).

Health Impact Assessment: Scoping Exercise

- 1.6 In keeping with best practice, a voluntary Health Impact Assessment (HIA) has been commissioned to further support more health conscious planning, to aid in further investigating and addressing community concerns and to support the further development and refinement of the on-going Airport Community Relations Strategy.
- 1.7 The purpose of this draft HIA scoping statement is to supplement the formal scoping exercise with statutory consultees, providing key health stakeholders the opportunity to comment upon

and support the refinement of the scope and focus of the HIA. Given that HIA is a non-regulatory requirement, with no governing body and varying methods, such initial input is essential to ensure the subsequent HIA is both suitable for submission as a supplementary document supporting the planning application, but also meets local expectations and requirements.

1.8 In this context, the HIA scoping statement has been sent to the Strategic and Local Planning Authorities (Greater London Authority and London borough of Newham) and the following key health stakeholders:

- Dr Rachel Flowers Newham Joint Director of Public Health
- Dr Ian Basnett Tower Hamlets Director of Public Health
- Dr Hilary Guite Greenwich Director of Public Health

1.9 The remainder of this document sets out the aim and objectives of the study, the proposed approach and methodology.

2 Health Impact Assessment

HIA Aim, Objectives and Necessary Outputs

- 2.1 The primary aim of the HIA is to build on and complement the outputs of the Environmental Statement to demonstrate how community health and well-being are addressed within the ESD, to assess the distribution and significance of potential health pathways (both adverse and beneficial), and where possible, put forward recommendations to maximise health gains whilst minimising potential negative impacts.
- 2.2 This aim will be delivered through the following objectives:
- seeking input on the HIA scope, focus and methods to be applied with the London Borough of Newham and key health stakeholders;
 - community profiling to establish local circumstance and relative sensitivity;
 - quantifying and appraising the magnitude, distribution and likelihood of potential health outcomes (both adverse and beneficial) directly attributable to the ESD;
 - development of a dedicated Health Action Plan (HAP); and
 - the development of a HIA suitable for submission with the planning application.

Approach

- 2.3 The basis of the HIA will be in accordance with UK guidance, set on a broad socio economic model of health that encompasses conventional health impacts such as communicable disease, accidents and risk along with wider determinants vital to achieving good health and well-being.
- 2.4 A key aspect of RPS's approach will be to build upon the process and technical information provided within the Environmental Statement (ES). Such an approach will ensure the consistency and accuracy of the HIA to the ES and ensure a solid basis to the assessment. The final HIA will be submitted alongside the planning application.

Methodology

- 2.5 Although guidance and a generic HIA process exists, the methods employed in HIA are often tailored to meet the particular assessment requirements of a project.
- 2.6 As set out below, the HIA will comprise six key stages including: 1) a HIA scoping exercise, 2) a project profile, 3) a community profile; 4) stakeholder engagement; 5); assessment and 6) a Health Action Plan.

HIA Scoping Exercise

- 2.7 This draft HIA scoping document is intended to supplement the formal Environmental Impact Assessment (EIA) scoping process, by providing key health stakeholders the opportunity to

comment upon the proposed approach, methods and necessary outputs from the onset of the HIA.

Project Profile

- 2.8 The purpose of the project profile is to identify features associated with the proposed development that potentially influence key determinants of health. The profile will be compiled through a review of both project specific and broad information including:
- the project description developed as part of the planning application;
 - the Environmental Statement (ES) and associated technical appendices (in particular, air quality, noise, traffic, socio-economic sections); and
 - consultation with the client and ES project team, including the London City Airport Consultative Committee (LCACC).
- 2.9 By developing the project profile it is possible to list potential causal pathways, to aid in refining the development of an appropriate evidence base, to support the development of a meaningful community profile and to focus the core health issues to be assessed and addressed.
- 2.10 The current health pathways to be assessed are listed in the assessment section below.

Community Profile

- 2.11 Evidence suggests that different communities have varying susceptibilities to health impacts and benefits as a result of social and demographic structure, behaviour and relative economic circumstance.
- 2.12 A community profile therefore not only forms the basis to exposure response modelling but also allows an insight as to how potential health pathways identified by the project profile might act disproportionately upon certain communities and sensitive receptors/groups.
- 2.13 In this case, the community profile will draw from and build upon the socio-economic section of the ES with the use of available small area demographic, socio-economic and health statistics taken from National Statistics supported by health and hospital admissions data available from the PCT and London Health Observatory.

Stakeholder Engagement

- 2.14 Seeking the views of key stakeholders and key representatives of local communities will form an important component of gathering an appropriate evidence base and tailoring the HIA to local circumstance. By highlighting and responding to community concerns the HIA can be applied to address perceived as well as actual risks and develop more effective recommendations to reduce adverse impacts and maximise health benefits.
- 2.15 The HIA will implement a tiered approach, building upon the documented community consultation inputs from the EIA and airport complaint data, with further engagement with key stakeholders responsible for maintaining local community health.

2.16 Tiers of engagement include:

- Review of Airport Consultative Committee outputs: The Airport Community Team holds a catalogue of community consultation outputs and airport complaint data. A review of such information will provide an in-depth insight into local community concerns and opportunities to consider within the HIA;
- EIA/HIA Scoping Exercise: This stage provides high level input from statutory consultees and key stakeholders responsible for protecting the health and well-being of local communities; and
- integrated EIA/HIA Consultation: The HIA team will draw from and complement the on-going EIA consultation process. The HIA team will review consultation feedback to further inform the scope and focus of the HIA, supplemented by iterative consultation with key health stakeholders at the London Borough of Newham and PCT.

2.17 Such a tiered approach provides a means to investigate and address a wide range of community concerns within the HIA, to focus key issues with key community and health stakeholders, and further inform the development of a bespoke Health Action Plan tailored to local requirements and circumstance.

Assessment

2.18 The assessment stage will draw upon appropriate technical topic areas within the ES to ensure the HIA is based upon realistic changes in environmental conditions as a consequence of the proposed ESD.

2.19 The assessment will seek to address each of the core health pathways identified during the project profile and through consultation, and where possible, apply internationally recognised quantitative assessment methods to establish the distribution, significance and likelihood of worst-case potential health outcomes. However, as a minimum the assessment is anticipated to include:

Construction:

- qualitative appraisal as to the potential health impact from changes in local air quality during construction;
- qualitative appraisal as to community disruption and potential health outcome from changes in noise and vibration (drawing from the noise and vibration assessment of the ES);
- quantitative risk assessment from changes in road traffic movements and subsequent risk of collisions directly attributed to the proposed ESD (drawing upon the traffic assessment within the ES); and
- qualitative appraisal as to the socio-economic health benefits from direct, indirect and induced income and employment opportunities (drawing from the socio-economic section of the ES).

Operation:

- quantitative exposure response modelling for changes in concentration exposure to ground-borne emissions to air (predominantly focusing on NO₂ exposure although PM₁₀, and PM_{2.5} will also be assessed to address perceived risks);
- qualitative appraisal as to community disruption and potential health outcome from changes in ground-borne noise from new stands and runway links (drawing from the noise and vibration assessment of the ES);
- quantitative exposure response assessment concerning risk of annoyance and sleep disturbance, among other factors, from changes in air-borne noise directly attributed to the proposed ESD;
- qualitative appraisal as to community disruption and potential health outcome from changes in road traffic noise directly attributed to the proposed ESD; and
- qualitative appraisal as to the socio-economic health benefits of direct, indirect and induced income and employment opportunities that arise from improving the long term viability of London City Airport by facilitating the modernisation of the aircraft fleet mix.

2.20 Public Safety Zones (PSZ) will not be assessed through the HIA.

Health Action Plan

2.21 A Health Action Plan (HAP) expands upon the normal recommendations section within HIA guidance, establishing recommended protocols and monitoring regimes to be implemented during construction and operation to further reduce and remove potential negative health impacts while maximising opportunities to increase health benefits. In this instance, the HIA team will work with the London City Airport Community Liaison team to develop and refine local community support initiatives to further support London health, wellbeing and equality objectives.

2.22 Please feel free to contact Dr Andrew Buroni if you have any queries on the HIA scope and focus, and please send any comments, suggestions or confirmation of the HIA scope to Dr Andrew Buroni.

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Appendix B: Noise Health Evidence Base

Noise Health Evidence Base Summary

Annoyance

Annoyance is the most investigated non auditory health effect from noise. (Ref.54, 55, 56, 57,58, 59, 60, 61).

Annoyance is defined as the feeling of resentment, displeasure, discomfort, dissatisfaction or offence, which occurs when noise interferes with thoughts, feelings or activities. The approach to assessing annoyance is based upon the dose response relationship proposed by Schultz in 1978, and has been updated to include new studies with varying criteria by both Fidell (1991) and Finegold (1994) (Ref.62, Ref.63).

Although there is some evidence to suggest that attitudes to noise have changed (Ref.64), such studies are contested (Ref.65), and in regards to assessing annoyance from aviation noise the approach outlined in the Civil Aviation Authority (CAA) Guidance (Ref.66) remains prominent.

-
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- 66 CAA. (2007) The Revised Airspace Change Process: Draft Cap 725. CAA Guidance on the Application of the Airspace Change Process

Cardiovascular Health Effects

Noise has been associated with a wide range of effects on the cardiovascular systems including systolic and diastolic blood pressure differences, increases in the prevalence and incidence of hypertension, myocardial infarction and angina as well as the number of hospital admissions associated with the cardiovascular diseases (Ref.67, 68, 69, 70, 71, 72, 73, 74).

The current scientific evidence base demonstrates that there are varying associations between changes in both aircraft and road noise exposure with high blood pressure, with a risk of Myocardial Infarction (MI) (heart attack) observed from exposure to road noise. The potential causal mechanism is not however, well understood, with biologically plausible autonomic and endocrine pathways forming the basis to a potential link with cardiovascular disease (Ref.75, 76).

The recent CAA report on Aircraft Noise best encapsulates the current scientific evidence base on the cardiovascular health from aviation noise in their 2013 review:

'In terms of cardiovascular impact there are mixed conclusions from the various reviews and papers on the evidence for effects. Some reviewers consider that there is sufficient evidence, others that the evidence does not convincingly demonstrate an association. Based on existing evidence, it is possible that exposure to aircraft noise may be a risk factor for cardiovascular disease and all would agree that further research is needed to examine the impact of noise on cardiovascular health'. (Ref.77)

Performance

The RANCH study researched the effects of road traffic and aircraft noise on the cognitive performance and health of children. During this study, aircraft noise exposure was associated in a

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 - 68 Tobias et al (2001) Use of poisson regression and Box-Jenkins models to evaluate short-term effects of environmental noise levels on daily emergency admissions in Madrid, Spain., European Journal of Epidemiology; 17 765-77
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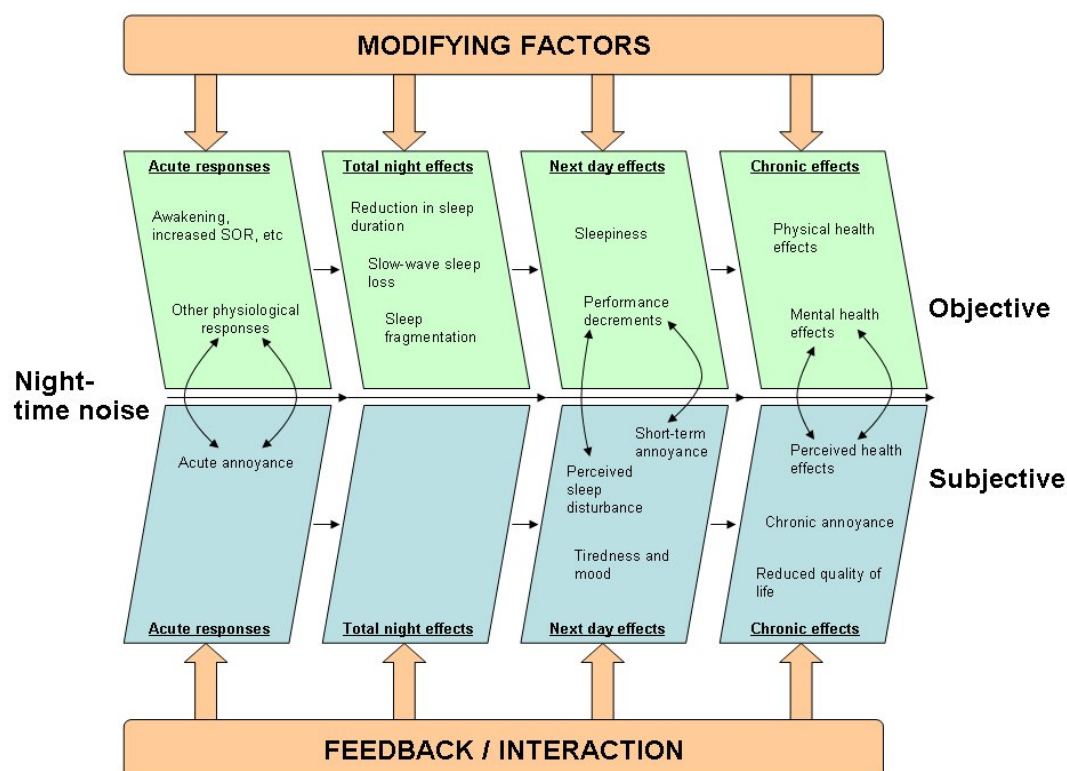
linear exposure-effect association with reading comprehension, episodic memory and working memory (Ref.78) It was estimated that a 5dB (A) increase in noise was associated with a 2-month impairment in reading age of UK children aged 9-10.

Night Time Effects

The WHO guidelines conclude that sleep disturbance is a major effect of environmental noise and that exposure may cause primary effects during sleep and secondary effects after the exposure. Certain groups are more likely to be affected by sleep disturbance according to the WHO, such as the elderly, newborn, shift workers and persons with physical or mental disorders.

A model (shown in App:B.1) for the different causes and effects of sleep disturbance has been proposed, which indicates that sleep disturbance is an intermediate effect on health, by aggravating existing disease or initiating new disease (Ref.79, 80, 81, 82).

Figure App:B.1 The Potential Impacts of Night Time Noise on Health



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- 79 Hume et al (2003) Effects of Aircraft noise on sleep: EEG- Based measurements.
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- 81 Fidell et al (1995) Field Study of Noise induced sleep disturbance; Journal of Acoustical Society of America 98 (2) 1025
- 82 Ollerhead et al (1992) Report of a field study of aircraft noise and sleep disturbance London department of safety, environment and engineering cited in 'Effects of aviation noise awakenings from sleep' June 1997.