



Inner Thames Estuary Feasibility Study

Response to Airports Commission Call for Evidence

**The Mayor of London's Submission:
Supporting technical documents**

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To identify the types of historic environment assets that could be affected by the development of a new Hub airport. It also considers the wider indirect effects on the historic environment from the proposed Hub for London airport and associated supporting infrastructure.

Key messages:

- Produced in 2013 to support the Mayor of London's submissions to the Airports Commission: Outline proposals for long term aviation capacity.

Hub for London

Cultural Heritage Technical Note

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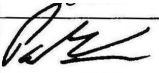




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1. Introduction

- 1.1. This heritage appraisal has been produced in order to identify the types of historic environment assets that could be affected by the development of a new Hub airport at one of three proposed sites within the south-east of England. It also considers the wider indirect effects on the historic environment from the proposed Hub for London airport and associated supporting infrastructure.
- 1.2. Previous short-listing has reduced the number of potential sites reviewed from twenty to the three sites considered in this report.
- 1.3. Site locations are as follows:
 - Inner Estuary: Isle of Grain
 - Outer Estuary
 - Stansted
- 1.4. An indicative site area is considered here to provide a consistent platform from which to collect, review and assess heritage asset data.

2. Methodology

- 2.1. This report assesses the historic environment in terms of built heritage, archaeology and marine heritage within the boundaries of each site and wider study area. Specifically, data searches have focussed on the following designated heritage assets:
- World Heritage Sites
 - Scheduled Monuments
 - Listed Buildings
 - Registered Parks and Gardens
 - Protected Wreck Sites
- 2.2. Each proposal site is roughly rectangular, and would cover an area approximately 9km by 4km. For assessment purposes, a worst case has been assumed that construction would wholly remove any existing above and below ground heritage assets within the site boundary.
- 2.3. Heritage assets within a wider 5km buffer zone of the airport footprint and within a 1km buffer zone of the major surface access infrastructure have also been included in order to assess potential impacts on the setting of heritage assets in the immediate area. It should be noted, however, that an airport development of this magnitude is likely to have a far more extended impact on the historic environment than this initial 5km study area. Where large-scale visual impacts would affect significant groups of historic assets (i.e. historic settlements) outside of the 5km buffer, these have also been considered here. Noise impacts on heritage buildings have not been considered in this Technical Note.
- 2.4. Data sources for built heritage and standing archaeological monuments has been obtained from the National Heritage List for England: <http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/>
- 2.5. In addition selected focussed research of secondary source material was undertaken. This included the 'Buildings of England' series of books, published by Penguin and Yale University Press, the Regional Research Frameworks for Archaeology in England and other published works. A full bibliography is included as an appendix to this report.

3. Proposals

- 3.1. Each of the estuarine proposed sites is rectangular in shape and would consist of eight cross shaped terminal buildings with associated runways, all arranged around a central control tower. A key part of such a hub would be its transport connections with London and the rest of the UK. The transport links of such a development would have major impacts in their own right but these have only been considered in this report in the broadest possible terms, this is because to a large extent, their proposed locations are indicative.
- 3.2. Three possible development sites have been assessed in this report, along with indicative surface access routes

Inner Estuary – Isle of Grain

- 3.3. The Inner Estuary site lies on the north eastern part of the County of Kent on the Isle of Grain and the Hoo peninsula, the isle is now largely a peninsula that extends into the English Channel, it forms the southern side of the Thames Estuary, and the northern side of the Medway estuary.
- 3.4. The proposed hub itself would cover much of the eastern half of the peninsula, and extend offshore out onto the estuarine mudflats.
- 3.5. The airport would be serviced by a high speed rail link to London, which would cross the Thames south of Stanford-le-Hope. A conventional rail link and improved road link would also be constructed. New road links would run along the A2 corridor to a point south east of Gravesend, these would continue through the centre of the Isle of Grain to the north of, and parallel with, the A289, connecting into a lower Thames Crossing.

Outer Estuary

- 3.6. The Outer Estuary site would be located on the sea bed but surrounded by a large bund in the Thames Estuary. This would lie off the coast, partially facing the towns of Whitstable and Herne Bay.
- 3.7. The site would be accessed by standard and high speed rail links, and a motorway connection. These would run in a corridor from Strood along the Isle of Grain, departing the shore at All-Hallows-On-Sea. A second transport link would run along the existing A999 corridor from the M2, leaving the shore between Whitstable and Herne Bay.

Stansted

- 3.8. The Stansted site is located in Essex immediately north east of the existing Stansted Airport. The site would cover an area of farm land and woodland. There are a number of villages, hamlets, farms and numerous individual dwellings within the boundary. It is the most densely populated of the proposed sites.
- 3.9. The airport would be accessed by new high speed and strengthening of the existing road network that services Stansted airport.

4. Historical Background

Inner Estuary and Outer Estuary

- 4.1. In order to assess the potential presence and survival of as-yet unrecorded archaeological remains within the Hub for London sites an understanding of the historic development of the North Kent area has been compiled from available secondary information.
- 4.2. A very useful summation of the development of this area was compiled by Chris Blandford Associates as part of the Thames Gateway development project (Chris Blandford Associates, 2004). The project summarised the development of the area thus:
- The use of the marshes and river throughout history as a key resource for agriculture, fishing and industry;
 - The emergence, seemingly in the late prehistoric period, of a transhumance lifestyle with seasonal movements of people and animals from the lowlands and marshlands to the Downs in Kent and inland in Essex;
 - The development in the late prehistoric of large-scale landscape organisation and field systems which along with the patterns of transhumance have had a strong influence on the grain of the landscape in areas of the Thames Gateway;
 - The prehistoric / Roman development of the major road corridors and route ways;
 - The reclamation of the marshes from the Medieval to the 17th century, possibly with some earlier activity in the Roman period;
 - The development of a distinctive pattern of dispersed settlement across Kent and Essex;
 - The modern growth of London and its suburbs from the 18th century, which has consumed much of the rural landscape of the area;
 - The development of the communication networks (both road and rail) out from London that helped expand the industries, market gardens, orchards, commercial enterprises and settlements that served London and the emerging towns;
 - The development in the 18th, 19th and 20th century of the resort towns to serve London and the south east.
- 4.3. The characterisation project and projects both large and small-scale in the area mean, that compared to similar parts of the UK, we understand much of how the area has developed over many millennia and can use this, to some extent to predict its archaeological potential. A summary of the main developments since the Palaeolithic follows.

The Palaeolithic Period (500,000-10,000BC)

- 4.4. The Palaeolithic period covers about 500,000 years of human history. Kent has produced more artefacts from the Palaeolithic period than many other parts of Britain, and these have mainly been found near rivers or in river valleys. Many of the richest areas of these finds are in north Kent such as between Dartford and Chatham (e.g. Swanscombe, Wymer 1982). Hazell's work (2007) has demonstrated that the area has considerable palaeoenvironmental potential.
- 4.5. Two shouldered and truncated points, found at Oare near Faversham and adjacent to the Isle of Sheppey, are an important addition to the evidence of this phase, relating to the earliest phases of human habitation in the British Isles. In addition to these finds of long blade industries relating to human habitation shortly before 10,000 BP have been found at Riverdale, near Canterbury (Barton 1988), and Springhead (Burchill 1938, Jacobi 1982 – all quoted in Weban-Smith, p71). Though both of these sites are some distance from the North Kent study area. Though these

'few find of stone tools are clear signs of human activity', there is a paucity of evidence relating to other types of material culture (ibid, p72).

- 4.6. It is likely that sea level changes have lead to the concealment of early archaeological evidence; 'much of the evidence for the human re-colonisation of Britain may now be lost under the north sea and English Channel' (ibid, p72).

The Mesolithic Period 10,000-4000BC

- 4.7. There are plentiful finds from the later phases of the Mesolithic (8000 BP) 'finds from fieldwalking and excavation are comparatively common and widespread.' The largest concentration of Mesolithic finds is at Addington (roughly 15 miles south of the Isle of Grain).

The Neolithic Period 4000-2200 BC

- 4.8. The Neolithic period saw the advent of agricultural production in Britain, as crops and domesticated animals were introduced. The Neolithic period is generally characterised by the more varied production of material culture items; 'as progress from hunting and gathering to food production, from mobility to sedentism, from a world in which material possessions were an encumbrance to one in which productive crafts could flourish.' (Weban-Smith, p73).
- 4.9. In general human activity in the Neolithic period began to have a major impact on the natural environment. In Kent at this time the woodlands were cleared, 'though clearances were seldom permanent' and populations were rising, though the overall density remained low and settlements were mobile rather than fixed (ibid, p73).
- 4.10. The archaeological monuments of the Neolithic period are characterised principally by ceremonial monuments such as cursuses, henges and standing stones. The most significant groups of these in Kent are two groups of barrows, one of which is centred on the Medway valley in North Kent, the other is focused on the Stour valley. Other possible groups of barrows have been identified in Thanet and east Kent (ibid, p75).
- 4.11. 'The Medway megaliths are now in a very ruinous state of preservation, but were once some of the largest and most impressive early Neolithic funerary monuments anywhere in the country.' The monument at Coldrum (to the west of the Medway river and closest to the isle of Grain/Sheppey) is the best preserved, 'it originally comprised a chamber built of sarsen slabs at the east end of a long mound with the entrance to the chamber flanked by a curving stone facade. It was built on top of a massive lynchet, which was already well developed. The monument was severely damaged in the Middle Ages... the chamber may have originally have been bigger. To the west of the chamber is a sarsen curb, also partly destroyed. This may represent an earlier mortuary chamber, predating the mound [making] Coldrum a multi period site.' (ibid, p77) Excavations at the sites have revealed a range of pottery and organic remains from the early to the late Neolithic, suggesting lengthy periods of usage. (ibid, p78)
- 4.12. There is a great deal of evidence for late Neolithic land settlement all over Kent, with finds of flint assemblages and pottery being common, though finds of grooved ware pottery are rare. Actual settlement sites are not common, and none have been identified in North Kent, though a potential late Neolithic/early Bronze Age enclosure has been identified on Thanet.

The Bronze Age 2500 – 700 BC

- 4.13. In the second millennium BC bronze was introduced to Kent from the continent; tools and weapons from this period have been found in several sites in North Kent; at Bexley, Faversham and Aylesford (Jessup 1978).
- 4.14. Bronze Age funerary barrows are prolific throughout the county with as many as 800 being known. They are particularly common in east Kent, especially Thanet (Weban-Smith, p88)
- 4.15. In the middle and later Bronze Age the landscape of Kent took on something of its modern appearance. The coastal marshes formed as the river estuaries silted up and woodland clearances accelerated. Population densities increased and the agricultural economy became increasingly diversified and complex. These changes are all reflected in changes in the patterns

of land use; the land was increasingly divided into fields and permanent settlements were built (ibid, p100)

- 4.16. There is evidence that the North Kent coast especially was organised into rectilinear fields and more irregular enclosures by lengths of ditches. Bronze Age Deverel-Rimbury pottery finds have been found in several sites on the Hoo Peninsula and Shrubsole's hill on the Isle of Sheppey (Coles et al 2003, quotes in Weban-Smith p102). 'The concentration of enclosures in north eastern Kent coincides with a string of Middle Bronze Age hoards found there (Perkins, 1988, quotes in Weban-Smith, p103), a bronze age assemblage was found at Harty on the Isle of Sheppey (ibid, p105).
- 4.17. In general there are major concentrations of Bronze Age metal work finds in North and North Eastern Kent, especially the Medway valley. Deposits of bronze and worked gold were found at Aylesford, St Mildred's Bay, Monkton Court Farm and others (Perkins and Hawkes, 1984, Perkins et al 1994, quoted in Weban-Smith p114). This may relate to the ritual deposition of metalwork objects in water.

The Iron Age

- 4.18. The Iron Age is generally characterised by its plentiful and diverse settlement evidence, ranging from individual farmsteads occupied by single households to hillforts providing the focus for larger communities. The period saw a range of social developments, including the development of coinage, industry, and larger and more complex settlement types. Societal organisation became increasingly complex and hierarchical, with the emergence of dynastic power with territorial interests.
- 4.19. Kent at this time was influenced by social changes in continental Europe more quickly than the rest of the country; suggesting exchanges between social elites on both sides of the channel/north sea. There is a marked difference between the eastern coastal and river valleys areas of the county, and the western Weald region; evidenced by different types of contemporary pottery and coinage found in both areas. This suggests a political divide between the western and eastern halves of the county.
- 4.20. The Iron Age is characterised by the proliferation of hilltop fortified sites. The function of these 'forts' is still unclear; and they are likely to have been used for a variety of purposes. It is possible that these forts functioned as storage of grain, meeting places for trade and other social activities. These forts are found distributed all over Kent; curvilinear earthworks on the Isle of Grain may represent one such fort (Phillip 2002b, quoted in Weban-Smith, p120)
- 4.21. The northern coastal zone of Kent represents the densest area of Iron Age settlement in the region. Many of sites of Iron Age land use overly Bronze Age activity. The sites of land use are 'characterised by ditches [which possibly relate to] formal fields or paddocks [or] enclosed settlement sites, or perhaps both.' (Weban-Smith, p120)
- 4.22. Examples of these enclosure complexes are known at Hillside, Gravesend (Phillip and Cheney 1997), Charing Sand Pit (Keller, 1990), Glebelands Harrietsham (Jarman 2002) and Highstead (ibid, p120).

Roman AD43 - 410

- 4.23. The increasing Romanisation of southern England during the late Iron Age culminated in the arrival of military forces in AD 43. The notion that the Roman invasion saw the occupation of a hostile indigenous people by a foreign power is likely to be largely false. Following the invasion the administration of the area was largely left to pro-Roman indigenous aristocrats 'who ran local government on basically Roman lines... much of what we label 'Roman' was built by indigenous inhabitants who... chose to emulate the forms and styles of life and building... that had spread across the empire.' (Millet, p137).
- 4.24. This notwithstanding, a programme of massive infrastructure building, including a complex road network and new or greatly expanded planned towns, was built as a means of controlling the local population (ibid, p137). Kent was central to this process; the area was the first in Britain to have regular pre-invasion Roman contact, and the county served as a gateway to the rest of the nation. The Romans quickly established major ports at Richborough and Dover, and major forts

and settlements at Canterbury and Rochester and Reculver; the extensive Roman road network linked communities along the north coast, and a fort was possibly established at or near Faversham.

- 4.25. The Isle of Grain was not a focus of Roman development; the Roman road network did not extend into the area. Though a possible villa has been identified on the Hoo Peninsula, (ibid, p150). Roman development may well have existed however, as Rochester served a secondary settlement focus, after Canterbury (ibid, p148).

Early Medieval/Anglo Saxon

- 4.26. In the years after the end of Roman influence 'The Church became a dominant force in Kentish society and was ever more visible in the archaeology of its urban and rural landscape.' (Welch, p189). Population centres that had been central during the years of Roman rule tended to remain important; both Rochester and Canterbury became the centres of important Saxon Bishoprics. The network of roads and track ways established by the Romans tended to be retained. There is evidence that patterns of land use and ownership were also retained; it is possible that estates established under the Romans became the basis for manorial and ecclesiastical land holdings in the post-Roman period (ibid, p194).
- 4.27. East Kent retained its 'favoured nation status', something that had persisted since the Iron Age (ibid, p192), this is evidenced by the large number of ecclesiastical foundations in the eastern half of the county. There was a major royal monastery on Thanet, at nearby Reculver and a smaller monastic foundation on Sheppey (ibid, p197).
- 4.28. The nunnery founded by St Sexburga on the Isle of Sheppey is one such example; the nunnery was founded in 664 by the wife of a Kentish Saxon king. It is thought that the nunnery was sacked by the Danes and was re-founded after the conquest. Considerable Saxon work remains in the abbey church, now the parish church of St Sexburga and St Mary, but the bulk of the work dates to the later Medieval period.

Medieval

- 4.29. The medieval period is characterised by a more complex agricultural economy and the increasing power of landed magnates and ecclesiastical foundations. Kent is characterised by dispersed settlement pattern of small hamlets and isolated farms though There was a considerable increase in the development of new urban centres and the expansion of those founded in the Anglo-Saxon/Roman periods, such as Rochester. Other urban centres grew to take advantage of trade links between London and the continent (Weekes, p13)
- 4.30. In Kent settlement in the medieval period was focused on the north and eastern coastal zones; a late medieval farm with two buildings was excavated by the Canterbury Archaeological Trust at Bogshole Lane, Herne Bay, in 2000 (ibid, p10).
- 4.31. The Isle of Sheppey was a focus of development during the later medieval period; being the site of the Abbey of St Sexburga and St Mary (refounded in 1123) and Shurland House, built in the 13th century by Sir Robert de Shurland (the Scheduled and listed standing remains relate to a later Tudor/Jacobean house built on the same site).

Stansted

- 4.32. In order to assess the potential presence and survival of as-yet unrecorded archaeological remains within the Hub for London sites an understanding of the historic development of the West Essex area has been created from available secondary information.

Palaeolithic (500,000 BC – 10,000 BC)

- 4.33. There is much evidence for the early activity of humans in Essex; 'deposits associated with an early course of the Thames at Clacton have yielded the tip of a wooden spear over 400,000 years old; this spear, recovered in 1911 remains the oldest wooden artefact ever found in Britain.' (Brown, p7).

Mesolithic (10,000-4000 BC)

- 4.34. There have been many finds of flint assemblages; though these are confined to the east and south of the county (ibid, p7). 'The high ground at Great Baddow in the Chelmer Valley seem to have been particular favoured areas of occupations and large collections of Mesolithic flint tools were recovered... in the 20th century' (ibid, p7). Major collections of Mesolithic worked flints have been found at Thurrock, Boreham and Nevendon (Medlycott, p6)

Neolithic (4000-2200 BC)

- 4.35. The human population in Essex increased during the Neolithic period, as 'evidence for settlement in Essex during the Neolithic period... is widespread,' though it is likely that the overall density of the population remained low. Neolithic settlements are largely concentrated in the Upper Crouch and Blackwater estuaries in east Essex. (Brown, p8)
- 4.36. There is evidence for the creation of ritual monumental structures, especially in central Essex. There is a concentration of major monuments to the immediate NW of Chelmsford, a good example being the Springfield Cursus (Brown, p8).

Bronze Age (2500-700 BC)

- 4.37. The emergence of a fully agricultural economy in Essex during this period is marked by evidence for more widespread and settled communities. The west of the county was increasingly settled at this stage; 'the most complex example of a middle bronze age settlement... was excavated at Stansted Airport. Several post built round houses set within small rectangular enclosures defined by fences and ditches, lay close to a stream valley which contained remains of a round barrow' (ibid, p9).
- 4.38. Essex is particularly rich in late Bronze Age 'substantial, circular, ditched enclosures', though none are identified in the west of the county. In the north east at Ardleigh, there is a 'highly distinctive' collection of burial mounds, 'creating [an] extensive burial landscape of great complexity.' Though this is some distance from the area of study adjacent to Stansted (ibid, p9).

Iron Age

- 4.39. Colchester was the seat of power of an Iron Age king, and a mint was established there.
- 4.40. Pre conquest Roman goods have been found at Stansted, suggestive of Iron Age elites with high levels of contact with the outside world (Kemble, p13).

Roman Essex

- 4.41. The area of Essex was subdued by a Roman garrison based at a 49 acre fort at Colchester. Colchester became a major centre of Roman life in the region, which was sacked during the Boudeician rebellion. At this time a large Roman fort was established at Great Chesterford, where the road westwards crosses the River Cam (ibid, p15).
- 4.42. Great Dunmow (immediately adjacent to the proposed air port site) was established as a Roman town, adjacent to Stane Street, the Roman road from London to Colchester. Excavations from a shrine at Great Dunmow have revealed votive offering including jewellery, coins and a bone comb dating to the 4th century (ibid, p15).

Early Medieval/Saxon

- 4.43. The west of Essex was seemingly not a focus for Saxon settlement and agricultural activity; 'the majority of Saxon settlements were concentrated along the north bank of the Thames and at Maldon, which was a major Saxon settlement' (ibid, p18).

Later Medieval

- 4.44. In common with the rest of the country the early medieval period was characterised by the increasing power of the church and the increasing landholdings of religious foundations, Essex 'abounded in monastic foundations', with a house of Augustinian Canons at Little Dunmow and

an Alien House in Takely, both in the west of the county (ibid, p19). Within the development area lie the ruins of Tilty, a small Cistercians foundation.

- 4.45. Thaxted, immediately to the northern boundary of Site 8, was a substantial and wealthy community in the Medieval period, and a regional centre for the wool trade (ibid, p19).

5. Site Constraints

- 5.1. This section includes an analysis of heritage assets at each site.

Inner Estuary: Isle of Grain

Table 1: Inner Estuary: Isle of Grain - Table of Assets

Asset Type	Airport Footprint	5km buffer	Surface Access
World Heritage Site	0	0	0
Scheduled Monuments	2	2	55
Listed buildings total	21	124	249
Listed Buildings – Grade I	3	1	N/A
Listed Buildings – Grade II*	2	9	N/A
Listed Buildings – Grade II	16	114	N/A
Registered Parks and Gardens	0	0	14
Protected Wreck Sites	0	2	0

Heritage within the Site Boundary

- 5.2. There are 21 listed buildings within the site boundary. Three of these listed buildings are listed at Grade I and two are listed at Grade II*.
- 5.3. The most significant designated assets within the site boundary are:
- Church of St Peter and St Paul (Grade I 1204545)
 - Church of St James (Grade I 1085755)
 - Church of All Saints (Grade I 1085758)
 - Church of St Mary (Grade II* 1085756)
- 5.4. Each of these churches contains substantial, and very rare, surviving work from the eleventh and twelfth centuries; as well as high quality additions and alterations dating to the later medieval periods, and the nineteenth century.
- 5.5. The Isle of Grain was a strategic location at the mouth of the Medway from at least the 16th century onwards. From this date onwards fortifications were improved in the area, notably with the massive modern new work at nearby Sheerness. In the nineteenth and early twentieth century coastal defence fortifications were enlarged and modernised; a complex network of these fall within the site boundary and are designated heritage assets. These include:
- Slough Fort (Scheduled Monument and elements individually listed at Grade II* and Grade II)
 - Isle of Grain Coastal Artillery Defences (Scheduled Monument with elements individually listed at Grade II)
- 5.6. The majority of these defences were built in the mid nineteenth century as a response to perceived invasion threat from France, and were located on the Isle of Grain to protect the mouth of the Medway and the Naval Dockyards at Sheerness from marine attack. The monuments were both extended and refitted in the early twentieth century, and again during the Second World War, with each phase of works being well preserved.

Heritage within 5km of the site boundary and 1km Transport Corridor

- 5.7. There are 124 listed buildings within the 5km boundary of the site. A key group of these listed buildings is located on and around the former naval dockyards at Sheerness; which is located across the River Medway estuary from the Isle of Grain site. The Dockyards at Sheerness and the fortifications on the Isle of Grain have group value as the fortifications were constructed to protect the docks from seaborne attack.
- 5.8. The Royal Navy dockyards at Sheerness were established in the late 17th century, and are mentioned by Samuel Pepys in his diaries. The docks were rebuilt in the early nineteenth century, by Sir John Rennie, the chief engineer to the Royal Navy, and constitute a 'unique planned early 19th century dockyard' (National Heritage List for England). Of particular note is the ensemble of listed buildings in the south eastern corner of the docks. This area served as the officers accommodation and includes two terraces of three storey classical houses; Regency Close (Grade II* 1258879) and Naval Terrace (Grade II* 1258879) which have been described as 'a piece of Woburn Square transported' and the garrison chapel, now disused. However, the most significant building in the Sheerness docks is a markedly more utilitarian structure than those described above; the former Boat Shed number 78. The regular repeating bays of this shed, with wide areas of glazing, were identified as a prefiguration of the Modern Movement in Sir Nikolaus Pevsner's 'Pioneers of Modern Design.' The shed is listed at Grade I (1273160).
- 5.9. There are 249 listed buildings within the 1km corridor of the transport route of the proposed development and 14 parks and gardens.

Archaeology

- 5.10. There is a high possibility for there being substantial prehistoric archaeology within the site boundary. Palaeolithic and palaeoenvironmental remains have been found in the area (see Hazell 2007). Later prehistoric remains include concentrations what may be Iron Age settlement on the Isle of Grain (Chris Bladford Associates 2004). The Medway valley and the northern Kent coast were both focuses for settlement in the Mesolithic and Neolithic periods.
- 5.11. Later archaeological remains associated with salt production are known on the Isle. The potential presence of archaeological deposits associated with tidal activity such as fishing, fouling etc is high, particularly in the more marshy area of the Isle. As with all waterlogged sites there is a potential for well preserved deposits.
- 5.12. The presence of several parish churches dating to the eleventh century suggests that substantial medieval communities were present on the Isle of Grain. It is therefore likely that buried archaeology relating to the later medieval period is present. There are 55 Scheduled Monuments within 1km of the transport route.

Protected Wrecks

- 5.13. Two adjacent wreck sites located approximately 1km to the north east of the proposed airport site (known respectively as the 'London' and 'King') have been subject to staged archaeological assessment as part of ongoing mitigation for the London Gateway project. In 2007, a diving assessment of both sites was commissioned by the Port of London Authority (PLA). PLA's archaeological contractor concluded that the 'King' site may be part of the London as the sites lie only 400m apart and have produced artefactual evidence of similar date. In addition, the identification of the 'King' does not correspond to any recorded loss.
- 5.14. 'The London' was a second rate 'Large Ship' built in Chatham in 1654 during the Interregnum. She formed part of an English Squadron sent to collect Charles II from the Netherlands and restore him to his throne in an effort to end the anarchy which followed the death of Cromwell in 1658. 'The London' blew-up on passage from Chatham in March 1665.

Outer Estuary

Table 2: Outer Estuary - Table of Assets

Asset Type	Airport Footprint	5km buffer	Surface Access
World Heritage Site	0	0	0
Scheduled Monuments	0	0	58
Listed buildings total	0	0	367
Listed Buildings – Grade I	0	0	N/A
Listed Buildings – Grade II*	0	0	N/A
Listed Buildings – Grade II	0	0	N/A
Registered Parks and Gardens	0	0	14
Protected Wreck Sites	0	1	0

Built Heritage Within the Site Boundary

- 5.15. There are no designated heritage assets within the site boundary.
- 5.16. **Heritage within 5km of the site boundary and 1km Transport Corridor** There are no designated built heritage sites within the 5km buffer around the site. However, the site is located just offshore from the historic resort towns of Whitstable and Herne Bay.
- 5.17. It is likely that the road and rail connections with London will pass through concentrations of built heritage assets. There are 367 listed buildings within the 1km transport corridor and 14 designated parks and gardens.

Archaeology

- 5.18. There is the potential for buried archaeology relating to early human colonisation of the southern counties of England to be present at the Outer Estuary. This may have been disturbed by the construction of the offshore wind farm.
- 5.19. The Outer Estuary site is located offshore from the roman port and fort of Reculver; one of the major southern ports in Roman Britain. There is also a potential for unknown wreck or other maritime archaeological sites to be present. There are 58 Scheduled Monuments within the 1km transport corridor.

Protected Wrecks

- 5.20. A protected wreck is located in the South Edinburgh Channel, approximately 6.5km north east of the proposed site.
- 5.21. It has been suggested that the wreck may be that of a large unidentified Swedish sailing vessel that is noted in Lloyds List as being wrecked on the Long Sand in October 1787. During this period, large armed Swedish merchant vessels exported goods from their homeland to London for onward export to the Indies, and this vessel may have been one of these.
- 5.22. This hypothesis is partly supported by the recovery of a cowrie shell of East Indies origin from the site. However, research into the Swedish plate money indicates that this was not released until the early 19th century suggesting a later date for the site.
- 5.23. The site was discovered in 1972 by the Port of London Authority during routine survey work in the South Edinburgh Channel. Over five years, the Channel had migrated westward and by 1974 the wreck was exposed to a height of six metres.
- 5.24. Investigations supervised by the National Maritime Museum lifted carefully recorded sample items from the wreck. The exposed hull comprised a mid-section and at least one deck on the east side. Collapsed spars, structure, stanchions, knees and three iron cannon (one of which was protruding through a port) were observed. A cargo of iron anchors was also noted. Finds recovered included full wine bottles and over 50 examples of Swedish copper plate money, stamped '2 Dealer 1792'.
- 5.25. Investigation by specialist marine archaeologists may be required to evaluate the likelihood of marine archaeology being present at the Outer Estuary site.

Stansted

Table 3: Stansted - Table of Assets

Asset Type	Airport Footprint	5km buffer	Surface Access
World Heritage Site	0	0	0
Scheduled Monuments	0	0	58
Listed buildings total	291	2147	214
Listed Buildings – Grade I	6	N/A	N/A
Listed Buildings – Grade II*	12	N/A	N/A
Listed Buildings – Grade II	273	N/A	N/A
Registered Parks and Gardens	1	0	13
Protected Wreck Sites	0	0	0

Built Heritage Within the Site Boundary

- 5.26. There are 291 listed buildings within the site boundary.
- 5.27. Great Easton is one of the largest communities within the site boundary. The village is located to the north east of Stansted airport, in the centre of the site boundary. The village is centred on the parish church of St John and St Giles (Grade II* 1112198 *NB spelt St Jiles in the list description*) a parish church of Norman origin, with an Early English chancel, all heavily restored in the late nineteenth century (Ibid, p406). The village centre contains a number of important listed buildings including Essex House, a mid 16th century long wall jetty house (Grade II), and Bridgefoot (Grade II*) a 'remarkably unspoilt 14th century hall house' with (ibid, p406). South of the Village centre is New Farm, the country house built for WF Crittal (the Essex based window manufacturer) in 'Cubist Style' and with additions by Owen Jones (Grade II 111220). There are numerous other Grade II listed houses in the village and environs.
- 5.28. In addition, adjacent to Great Easton Hall (Grade II Listed) is Great Easton Castle (Scheduled Monument number 1017468), the well preserved remains of a Norman motte and bailey castle with extensive earthworks and crop mark remains.
- 5.29. To the immediate south of Great Easton is Little Easton, a nucleated settlement centred on the Church of St Mary the Virgin. The village's principal listed buildings lie close to the church (Grade I 1097465) is built of flint with roman brick and stone dressings, rare fragments of wall painting dating to the 1190s survive inside. Adjacent to the Church lies Easton Manor (Grade II 1334057), a 'theatrical composition' constructed from a small 17th century manor house, two 19th century cottages and historicist early 20th century work (ibid, p550).
- 5.30. To the west of the village lies Easton Lodge Park, a Registered Park and Garden (101484). The gardens were laid out by Harold Peto for the Countess of Warwick, as a setting for Easton Lodge. The gardens are an elaborate composition with highly differentiated areas; including a silver birch grove, Japanese gardens and a sunken Italian garden.
- 5.31. A short distance to the north west of Great Easton, the small nucleated village of Tilty contains 12 listed buildings. The most significant of these being the Church of St Mary the Virgin (Grade I 1169090), built of flint rubble with limestone and clunch dressings. Also of note in the village is Tilty Mill (Grade II* 1112221), an unusually complete 18th century watermill, with some 19th century additions.
- 5.32. Immediately north of Tilty is Duton Hill, a small linear settlement containing around ten listed buildings. Of particular note is Elizabeth Cottage (Grade II* 1194926) a timber framed small open hall house of c1500.
- 5.33. The village of Lindsell is located in the north eastern corner of the site boundary. It is a small nucleated settlement with an attractive grouping of listed buildings centred on the church of St Mary the Virgin (Grade II* 1112140) and Lindsell Hall (Grade II 1112141), which is approached through a gate in the church yard wall. The two make a harmonious grouping in the centre of the village.

- 5.34. To the west of the site, and just within the site boundary, lies the village of Broxton. A hamlet to the north east of Broxton, called Church End, includes a group of Grade II* buildings: Church of St Mary the Virgin (Grade II* 1112251) an early 13th century church, with extensive later additions, Church Hall (Grade II* 1322561) a late 16th century hall house, and a barn to the east of Church Hall (Grade II* 1112225) with crown post roof dating to the 15th century.
- 5.35. In addition Broxton is the location for one of the few private house commissions completed by the Modernist architect Erno Goldfinger. The house is not included on the National Heritage List for England, suggesting that it is unlisted, but it is a heritage asset of some value nonetheless.
- 5.36. Both Bamber Green and Molehill Green lie to the south west of the site boundary, adjacent to Stansted Airport. Molehill Green contains a number of Grade II listed buildings, and the Scheduled Monument site of Waltham Hall (1002161). Bamber Green lies to the south, closer to the A120, and is a linear settlement with a number of listed buildings. In between the two settlements there is a nucleated group of Grade II listed buildings, centred around Waltham Hall (Grade II 1112233) a 17th century timber framed house, and a second smaller group of listed buildings surrounding the Grange Moated site (Scheduled Monument 101467).
- 5.37. **Heritage within 5km of the site boundary and 1km Transport Corridor** There are 2147 listed buildings within the 5km buffer surrounding the Stansted site. The largest concentrations of these are in the towns of Great Dunmow, Thaxted, Great Bardfield and Stansted Mountfitchet. These towns boast high concentrations of medieval and post medieval listed buildings. There are an additional 214 listed buildings and 13 designated parks and gardens within the 1km transport corridor.

Hatfield Forest

- 5.38. Hatfield Forest, a designated Site of Scientific Interest and National Nature Reserve, lies just to the south of the existing airport. It is largely owned by the National Trust and is made up of 1,049 acres (4.245 km²) of mixed woodland, fen and pasture. Hatfield was a medieval royal hunting forest and arguably is the most intact to survive in England. As well as the forest itself the site is significant for the archaeology relating to the forest and its use. Such a long-running low level of exploitation of large areas also means there is a high potential for archaeological remains which pre-date the medieval forest. In addition to its designated status the forest contains two Scheduled Monuments and several listed buildings.

Archaeology

- 5.39. Extensive settlement from the Bronze Age and Iron Age have been found at excavations at Stansted Airport, it is therefore likely that finds from these periods could be found at Site 8. There was a large Roman settlement adjacent to the Stansted site at Little Dunmow and the Roman road from London to Colchester passed near the site; this increases the likelihood of Roman finds.
- 5.40. There are six Scheduled Monuments pertaining to medieval manorial and ecclesiastical land holdings at the Stansted site. The area of Essex was widely settled in the Medieval period; with an extensive and prosperous community at Thaxted, and ecclesiastical foundations at Takeley and Little Dunmow. Finds relating to Medieval land use will therefore be likely. There are 54 Scheduled Monuments within the 1km transport corridor.

6. Potential Physical Impacts

- 6.1. As has been demonstrated above the scale of the proposed development is large and would entail considerable re-modelling of the landscape for each of the options. By necessity transport routes will be extensive and will necessitate large-scale impacts in their own right. The direct impacts detailed below are based on the data presented elsewhere in this report and on an estimation of the archaeological potential of each site.

Inner Estuary

- 6.2. Most of the Isle of Grain would effectively be covered by the proposed development, this would entail the removal of 21 listed buildings. In addition two Scheduled Monuments (both standing fortifications with elements individually listed at Grade II*) would be directly impacted on.
- 6.3. Archaeological deposits, which would entail removal, are difficult to define at this stage, there is, however a demonstrable high potential for Prehistoric, medieval and later remains, associated with settlement and exploitation of the land, the marshes and the sea.
- 6.4. A large area of the site lies under docks and works which have impacted on the value of the heritage resource. The history of industrial activity in this area is long-running and it is probable that this has caused extensive disturbance of areas of buried archaeological deposits.
- 6.5. The protected wreck of The London could experience some effects due to the proximity of construction and changes to the marine flow in the Thames Estuary arising from the new airport.
- 6.6. Within a 1km corridor of the proposed transport links there is potential for direct impacts on a large number of heritage assets.

Outer Estuary

- 6.7. Site 11 is located on an artificial site in the Thames Estuary. The initial assessment of direct impacts of this site indicates little in the way of known heritage assets. There is, however, a potential for buried archaeology at this site which may relate to maritime archaeology (wrecks etc) or to now submerged prehistoric landforms.
- 6.8. Within a 1km corridor of the proposed transport links there is potential for direct impacts on a large number of heritage assets.

Stansted

- 6.9. There are a number of villages, hamlets, farms and numerous individual dwellings within the boundary. It is one of the most densely populated of the proposed sites. There are 291 Listed buildings within the boundary and a great many undesignated heritage assets. The majority of these listed buildings are clustered in the following villages: Great Easton; Little Easton; Tilty; Duton Hill; Lindsell; Church End – Broxted; Bamber's Green; and Molehill Green.
- 6.10. Work at Stansted has demonstrated that there is the potential for considerable buried archaeological deposits in the area, which may date from the Prehistoric to recent times.
- 6.11. Within a 1km corridor of the proposed transport links there is potential for direct impacts on a large number of heritage assets.

7. Potential Setting Impacts

Inner Estuary

- 7.1. Beyond the 5km study area, the impacts of the development could include setting effects on the historic town and fortifications of Sheerness to the south. Although the setting of the fortified town and docks has been, to some extent, harmed by industrial activity to the west of the town, much remains of the fortified 17th and 18th century town and docks, including numerous fine buildings.
- 7.2. Major visual and setting issues could also be apparent from Canvey Island and Southend on Sea, both of which have extensive areas of historic townscape, particularly relating to their 19th and 20th century seaside holiday roles. The outline transport network approaches from the west and could change impact on the setting of numerous heritage assets, particularly in Strood and Gravesend. Wider impacts from noise may include the tentative World Heritage Site encompassing Chatham Dockyard and its Defences.

Outer Estuary

- 7.3. The Site is located in the Thames Estuary. This would lie roughly 2km off the coast and would be partially facing the towns of Whitstable and Herne Bay. Both towns contain numerous historic buildings (both designated and undesignated) and their main focus is their relationship to the sea. Whitstable is famous for its narrow streets and buildings associated with fishing (primarily of shellfish), it has been a tourist destination since the 18th century and its relationship to the sea is key to its significance. Herne Bay is a town with terraces of elegant 18th and 19th century houses facing the promenade and the sea, as with Whitstable its key relationship is with the sea. The large bund of the airport and air traffic would be clearly visible from both towns and this could change the setting of a great number of heritage assets.
- 7.4. As well as the larger towns, numerous smaller settlements could be affected including Reculver, the site of a Roman Saxon Shore Fort but now dominated by the ruinous twin towers of the minster. Views of Reculver were a favourite of JMW Turner both in sketches and in paintings..
- 7.5. The protected wreck in the South Edinburgh Channel may experience some effects during construction and possible changes to the marine flow in the Thames Estuary arising from the new airport.

Stansted

- 7.6. This large terrestrial site contains by far the greatest number of (known or suspected) heritage assets. Setting impacts could be significant and include a densely populated part of Essex and Hertfordshire. There could be numerous changes to the setting of numerous assets including much of Great Dunmow, Thaxted and numerous smaller villages. Although to an extent the setting of some local assets has been impacted by the existing airport, the scale of the proposed development could make this impact far greater.
- 7.7. Although beyond the 5km buffer the historic town of Saffron Walden, a major mercantile centre during the medieval period, could also have the quality of its wider setting affected by the airport development. It is also likely that the setting of Audley End (Grade I 1196114), a property in the stewardship of English Heritage and widely regarded as one of Britain's finest 17th and 18th century country houses, may be affected by the development. Audley End is situated just outside the 5km buffer around the site boundary.
- 7.8. Transport links would partly utilise the route of the existing M11 but may still have considerable heritage impacts, but a new route to the west could impact upon Hatfield Forest, the significance of which is well attested and is in the care of the National Trust.

8. Summary of Impacts

- 8.1. This broad appraisal has shown that the scale of impact on the historic environment from each of the proposed sites could be significant, with terrestrial sites being the most pronounced, in terms of direct impacts on cultural heritage assets and indirect impact over a wide area.
- 8.2. A summary of impacts on each of proposed site has been set out in table 1 below, which defines the likely extent of physical and setting impacts.

Table 1: Outline Heritage Impacts

Site	Nature of physical Impacts	Nature of Setting Impacts
Inner Estuary	Several significant physical impacts, removal of designated and undesignated heritage assets. The transport links may have major direct impacts.	Major Setting impacts, particularly visual and setting impacts on historic coastal towns
Outer Estuary	No major physical impacts known at this time (in advance of specialist survey). The transport links may have major direct impacts.	Major Setting impacts, particularly visual and setting impacts on the historic coastal towns of Herne Bay and Whitstable
Stansted	Very large- removal of numerous undesignated and designated assets and suspected archaeological deposits. The transport links may have major direct impacts.	Major Setting impacts on neighbouring historic settlements. Potentially lesser visual (setting) impact than other locations.

- 8.3. The Site with the largest negative impact on heritage assets is Stansted. The Site with the smallest negative impact on heritage assets is the Outer Estuary Site, although detailed assessment has not taken place at this stage.

9. Conclusions

- 9.1. The Inner Estuary site may have large-scale impacts, the proposed locations of the proposed sites, on or off the coastline, making the setting issues far more pronounced. The change and potential to harm the significance of the setting of a number of historic towns, could be considerable. The Outer Estuary site has been assessed at this stage as having little perceived physical impact. The setting issues of this site, however, are very considerable, as the site is located off the coast of the historic communities of Whitstable and Herne Bay; which draw much of their significance from their coastal location. The Stansted site has by far the largest likely physical and setting impacts.
- 9.2. This short study has attempted to identify the major heritage concerns at the three proposed locations. The proposals at all three locations could have considerable heritage implications and would require a programme of detailed study and assessment in advance of further planning or design. There are cultural heritage disadvantages to all the sites and what may be acceptable in cultural heritage terms. The coastal sites present a broadly similar range of challenges with a lessened direct impact but longer-term and permanent indirect impacts. The terrestrial site could entail major and immediate direct impacts but arguably have lesser indirect impacts over the long-term. More detailed study and assessment would be required at each site in advance of any detailed planning.
- 9.3. This assessment offers a very broad view of the heritage in what would be a particularly large and complex project. The sites could all have considerable heritage implications and the implications of these will only be really understood after more detailed assessment and investigation.
- 9.4. Opportunities for mitigation could be considered as part of the detailed design process. provisionally identified opportunities could include:
- Archaeological excavation/ historic building recording of assets directly impacted by the proposed development or preservation in situ
 - Careful design of new transport links to minimise visual intrusion, direct impacts and noise intrusion
 - Bridges to offshore site should be designed so as to create as little possible change in setting to heritage assets.
 - Consideration should be given to retaining some buildings or sites with the proposed development.
 - Selected buildings of high heritage value or special interest may be moved to new locations.

Appendix 1 – References and Bibliography

Information on individual assets was obtained from the National Heritage List for England

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Appendix 2 – Figures

Legend

Proposed Surface Access Routes

1km Buffer

Site Boundary

Scheduled Monuments

Parks & Gardens

Listed Building

Grade

I

II

II*

