MANSTON AIRPORT: A NATIONAL AND REGIONAL AVIATION ASSET

VOLUME III
The forecast

MARCH 2017

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Authorship and acknowledgements:
This report has been produced by Dr Sally Dixon, an independent aviation and business research consultant. The author wishes to thank all those who contributed to the research. However, the views expressed herein are those of the author only and are based upon independent research by her.

Executive Summary

This report sets out the forecasts for Manston Airport, for freight and passengers for the first 20 years of operation (currently projected to be 2020 to 2040), and detailing the infrastructure required to deliver the forecast. The report provides the necessary data to underpin the proposal to retain Manston as an airport and re-develop the site as a nationally significant infrastructure project.

Manston Airport is located in the South East of the UK where aviation industry demand is highest and most constrained. The airport has a long runway; an ideal airspace location; benefits from easy surface access to London and the rest of the UK; and can provide rapid handling and turnaround times for air freight. The airport would provide almost immediate relief to the pressing situation that is causing considerable loss of potential trade to the South East each year the UK remains without additional runway capacity.

Table 1 Summary 20 year freight and passenger forecast

	Freight moves	Pax moves	**Total moves**	**Inbound tonnage**	**Outbound tonnage**	**Total tonnage**	**Passenger numbers**
Y1	0	0	0	0	0	0	0
Y2	5,252	0	5,252	39,865	56,687	96,553	0
Y3	5,804	4,932	10,736	47,335	61,218	108,553	662,768
Y4	9,700	5,024	14,724	76,326	90,765	167,092	679,868
Y5	9,936	5,064	15,000	81,455	92,286	173,741	686,672
Y6	10,144	6,702	16,846	85,832	95,604	181,436	965,295
Y7	10,872	6,754	17,626	92,357	100,551	192,908	975,591
Y8	11,184	6,754	17,938	96,979	103,694	200,673	975,591
Y9	11,392	6,754	18,146	98,585	104,660	203,245	975,591
Y10	11,600	6,754	18,354	102,609	109,742	212,351	975,591
Y11	12,064	6,966	19,030	107,592	114,785	222,377	1,011,587
Y12	12,547	7,186	19,733	114,034	120,473	234,508	1,049,022
Y13	13,048	7,416	20,464	118,691	125,999	244,690	1,087,954
Y14	13,570	7,654	21,224	125,949	131,039	256,989	1,128,444
Y15	14,113	7,902	22,015	133,064	137,515	270,579	1,170,553
Y16	14,678	8,160	22,837	140,889	143,015	283,904	1,214,347
Y17	15,265	8,428	23,693	146,524	150,070	296,594	1,259,892
Y18	15,875	8,707	24,582	156,271	156,073	312,344	1,307,259
Y19	16,510	8,997	25,507	162,522	162,316	324,838	1,356,521
Y20	17,171	9,298	26,469	171,949	168,809	340,758	1,407,753

Table 1 shows a summary of the freight and passenger forecasts for the first twenty years of operation, from 2020 to 2040, following the reopening of Manston Airport. It should be noted that these forecasts are considerably more conservative than those derived by a macro level, 'top down' method. These forecast have been compiled using a 'bottom up' approach and refer to specific types of traffic. Nonetheless, the forecast shows the airport exceeding the Nationally Significant Infrastructure Project (NSIP)

criteria for 10,000 freight movements by Year 6. Exports are forecast to slightly exceed imports, particularly in the early years of operation.

Manston is also strategically well located to play a vital role in the supply chain that will be stimulated by initiatives such as the Lower Thames Crossing and the Thames Estuary 2050 Growth Commission. What is clear from the details in this report and the others that make up the series of reports is that Manston is capable, in terms of its geographic and airspace position, of making a substantial contribution to the future economic and social well-being of the Nation. The research conducted to derive the forecasts shown in this report show that the opening of Heathrow's third runway will not hamper Manston's viability, whenever the additional capacity at Heathrow becomes operational.

Whilst the RiverOak focus is on the air freight market, the airport is also forecast to handle a considerable number of passengers. Driven by the lack of capacity at south east airports, passenger numbers at Manston Airport are forecast to commence at around 660,000 per year, rising to 1.4 million by Year 20 of operation. Manston can provide a base for a number of low cost carrier aircraft, host seasonal charter flights, and work with Dover Harbour Board to receive passengers destined for cruise ships. The Paramount theme park and Ebbsfleet Garden City development are also expected to increase demand for both in- and outbound flights.

Infrastructure requirements are scheduled to match forecast demand and construction will take place in four phases. These will be prior to operations commencing (in Year 2 for freight, 2021, and Year 3, 2022, for passengers), in Year 4, Year 10, and Year 15. Operations will commence with eight stands for freighters (where it previously operated with one) and three for passenger aircraft. The number of freighter stands will rise to 14 in Year 4, 16 in Year 10 and 19 in Year 15. Passenger aircraft stands will increase from three to four in Year 15. Warehousing and fuel storage will be provided to meet the demand forecasts.

This report concludes that Manston Airport is of strategic importance to the UK, having the ability to attract in excess of 10,000 cargo movements by Year 6 of operation. In light of the business case described in this report, there can be little doubt that, in an increasingly competitive economic climate, the UK simply cannot afford to lose one of its long-serving airports. Indeed, this report shows that Manston Airport is a very valuable local, regional and national asset, capable of providing infrastructure badly needed by the UK and playing a role in helping Britain's connectedness and trade with the rest of the world. In short, Manston comprises critical national infrastructure, important for the economic well-being of the UK.

Definitions and abbreviations

ACI	Airports Council International
Air freight	The carriage of goods by aircraft
ATM	Air Transport Movement and/or Air Traffic Movement
Backload	The transportation of cargo on a return trip to the originating airport
Belly-freight	Cargo stowed under the main deck of a passenger aircraft
CAA	Civil Aviation Authority
Cargo	The term cargo and freight are used interchangeably in this report and refer to goods carried by road, sea or air
Consolidator	A person or company who combines small volumes of commodities from different originators so they can be shipped together and who usually owns the aircraft used for transport
DCO	Development Consent Order
Dedicated carrier	An aircraft that transports only freight (not passengers)
DfT	Department for Transport
EU	European Union
Eurostat	A Directorate-General of the European Commission that provides statistical information to EU institutions and promotes the harmonisation of statistical methods across member states
FBO	Fixed Base Operation
Freight	The term freight and cargo are used interchangeably in this report and refer to goods carried by road, sea or air
Freight forwarder	A person or company that organises the shipment of commodities from an originator (manufacturer, producer, etc.) to a destination (customer, etc.) but generally does not own the aircraft used in the transport
LCC	Low cost carrier
Long haul	No generally agreed definition as 'long' or 'short' is subjective. In Europe, a flight taking more than four hours to complete and/or originating/destined outside Europe is considered long haul
MRO	Maintenance, repair and overhaul facility
NSIP	Nationally Significant Infrastructure Project
Pax	Passengers
Short haul	As per long haul above. Short haul in Europe generally indicates a flight within Europe so taking around four hours or less to complete
TfL	Transport for London
UK	United Kingdom
USA	United States of America

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1 Introduction

1.0.1 This report presents the air traffic forecasts that have been made for Manston Airport. These forecasts include freight and passenger movements for the first 20 years of operation of the airport, from 2020 to 2040. The report also outlines the infrastructure requirements the airport would require in order to deliver the forecast demand.

1.1 Background

1.1.1 Pent up demand for freight carrier slots in the South East makes forecasts based on extrapolation of past activity potentially inaccurate. Rather than merely extrapolating past activity, studies that have focused on the 'lost' or suppressed demand include York Aviation's work (2015, p. 19). This report, prepared for the Freight Transport Association and Transport for London, considers the potential long-term effects on the UK economy of changes in the UK air freight industry resulting from different potential development scenarios for runway capacity in London. York Aviation's significant report calculates that by 2050 with no additional airport capacity, 2.1 million tonnes of freight, equating to 80,000 freighter movements, will have to be trucked to northern Europe to find airport slots.

1.1.2 Transport for London, who manages the Capital's transport network on behalf of the Mayor of London, also prepared forecasts for capacity requirements. Their forecast is rather more conservative, perhaps due to the two-year difference in its compilation, which coincided with a period of stagnation in air freight, which began growing again mid-2013. The TfL forecast shows that by 2050, 54,000 potential freighter movements will not be met by the current capacity in the South East (TfL, 2013), resulting in continued and increasing loss of air freight to northern European airports.

1.1.3 Examples of unconstrained freight-focused airports in Europe show the difference between a true market, where capacity is available to attract freighter flights, and a constrained market such as that in London. However, forecasts are usually calculated for a region or country before allocating a proportion to individual airports, missing any currently unmet demand. The work detailed in this report takes a different approach by using a qualitative method, identified from the literature review as a more reliable means of forecasting. The approach identifies potential users of Manston Airport and builds a forecast from this intelligence.

1.2 Aim and objectives

1.2.1 The RiverOak vision is to establish Manston Airport as a successful freight-focused airport with supplementary passenger operations. The aim of this report is to provide the forecast figures that underpin the proposal and supports business planning and development at Manston Airport.

1.2.2 There are a number of objectives set out for this work and in particular the results will:

- Provide the information required to support the Development Consent Order (DCO) application
- Inform stakeholders during consultation
- Provide information for Government and industry organisations

1.3 Report structure

1.3.1 The report commences by providing the background to the forecasting method chosen to assess the air freight and passenger demand for Manston Airport. Having established the background, the forecasts are presented, shown by freight movements and tonnage, and by passenger movements and numbers. Next, details of the infrastructure required to deliver the forecast are shown. The report concludes with a summary of the case for Manston Airport.

2 Forecasting methods

2.0.1 This section describes the way in which both air freight and passenger forecasting methods were derived and details the models used in the short, medium, and long term.

2.1 Air freight forecasting method

2.1.1 Whilst methodologies for passenger air travel forecasting are well developed, freight markets are much more problematic. As Ishutkina, MIT International Center for Air Transportation (ICAT), says:

> "*freight markets are generally more liberalized when compared to the passenger markets. Therefore, national carrier data do not accurately depict the cargo flows taking place to and from a particular country due to the dominance of only a few major international cargo carriers such as DHL, FedEx and UPS. In addition, aggregate freight data may misrepresent the traffic flows for a particular country because they do not capture the asymmetry, which is often present in cargo flows between economies. In other words, the national cargo carrier data are not representative of the freight flows to and from a particular country*." ((Ishutkina, 2009, p. 55)

2.1.2 A detailed review of air freight forecasting literature is presented in the report, 'Manston Airport: A National and Regional Aviation Asset, Volume II: A qualitative study of potential demand'. This review showed that a qualitative approach was the most appropriate method through which to gather data on the potential demand for an individual airport. The data collected is also shown in Volume II of this series of reports.

2.1.3 However, in order to provide a detailed picture of the potential air freight and passenger demand for Manston Airport, it was necessary to convert this information into a quantitative forecast. This type of forecasting can, of course, be handled in a number of ways and there is unlikely ever to be consensus on either the approach or the data used. There were two main options for forecasting freight at Manston Airport. The first was to use forecasts from one or more sources (such as Eurostat, the DfT, etc.) and 'divert' a proportion of national and international (Northern Europe including France, Belgium, Holland) traffic to Manston. The issue with this approach is the difficulty in identifying a realistic formula by which to divert air freight to Manston.

2.1.4 The second option was to take a qualitative approach focused on collecting market data. This allows base data to be derived from a method that takes account of how commodities are currently transported and how they are likely to be transported in the near future. This approach is particularly applicable in the Manston case since the airport is not currently operational. Indeed, in the short-term, any useful forecast needs to be built from the likely behaviour of potential airport users.

2.1.5 This method is confirmed by the ACI-North America, who represents local, regional and state governing bodies that own and operate commercial airports in the United States and Canada, and recommends deriving customised inputs from a detailed market assessment. This assessment should be informed by carriers, their business partners and other supporting entities in the air freight community (ACI-NA, 2013, p. 3). The Airports Commission also recommends using the Delphi Method[1], pointing out that

[1] A forecasting method based on gathering opinions from a panel of experts

relying on, "*a single, central-point forecast would be a risky approach*" (Airports Commission, 2013, p. 8).

Primary data collection

2.1.6 As such, a qualitative approach forms the basis for the short and medium-term (years one to ten, 2020 to 2029) air freight forecast at Manston Airport. The collection and analysis of this data is described in Volume II of this series of reports and consisted of face-to-face interviews with representatives from key stakeholder groups including:

- Kent transport infrastructure
- Government and public sector
- Industry associations
- Freight forwarders and consolidators
- Local businesses who import/export
- Cargo airlines

2.1.7 The freight forecast for Manston Airport is split by:

- Air Traffic Movements
- Aircraft type (wide and narrow-bodied)
- Number of tonnes or passengers
- Imports and exports by tonnage

Secondary data

2.1.8 Secondary data was used to provide an overview of the industry, which allowed the primary data to be put into a global and national context. Secondary data was also used to provide information on macro-level growth in the industry, which allowed a percentage increase, year-on-year in the long-term (from Years 11 to 20) to project growth from the short- and medium-term market data forecasts.

2.1.9 IATA's November 2016 data[2] shows global freight volumes up 6.8% compared to the previous year and annual growth in industry-wide passenger traffic accelerated to 7.6%. In terms of capacity, IATA data shows that to November 2016, freight capacity grew by 4.4% from the previous year. This was the fourth consecutive month in which year-on-year freight capacity has grown more slowly than demand.

2.1.10 Boeing's traffic and market outlook describes an air cargo market recovery that began in 2014. Their market outlook 2016-2035 (Boeing, 2016a) forecasts air cargo traffic, measured in revenue tonne-kilometers, at 4.2% although there are differences between the forecasts for regional pairs. For example, Asia-Europe is forecast to show growth of 4.6% (Boeing, 2016b, p. 16). Airbus forecast growth at 4% globally (Airbus, 2016). The Boeing and Airbus forecasts are based on the opinions of experts who summarise the world's major air trade markets and identify key trends. These organisations present comprehensive forecasts between and within each of the air freight markets as well as for the world freighter airplane fleet.

2.1.11 Of interest to the forecast for Manston Airport is an observation made by Boeing, who refer to the continued requirement for dedicated air freight operations:

[2] http://www.iata.org/whatwedo/Documents/economics/Airlines-Financial-Monitor-Dec-16.pdf

"*dedicated freight services offer shippers a combination of reliability, predictability, and control over timing and routing that is often superior to that of passenger operators. As a result, freighters are expected to continue carrying more than half of global air cargo traffic to satisfy the demanding requirements of that market.*" (Boeing, 2014)

2.1.12 The CAA produces airport statistics by month and by year although 2016 annual figures were not available at the time of compiling this report. Their 2015 statistics show that around 313,000 tonnes of freight was carried on dedicated freighters at the London airports during the year, an increase of 3% over the previous year. Freight carried on passenger aircraft fell over the same period by around 1% in the London area, perhaps indicating the impact of LCCs, who do not carry belly-freight, on the air freight market.

2.1.13 Freight airlines do not publish timetables, with only some scheduled freighter operations being shown in OAG (an air travel intelligence company based in the UK) information. This makes gathering base data difficult and forces a number of assumptions to be made by those who forecast air freight using a 'top down' quantitative approach. It is perhaps for this reason that the DfT's aviation model[3] only forecasts freight aircraft for the purpose of assessing runway capacity constraints (para 3.47). Underlying the freighter forecast is a simple projection of UK national air freight tonnage and this has not been updated since 2011 (para 2.61). There is no current forecasting for bellyhold or dedicated freighter tonnage.

2.2 Short- and medium-term freight forecasting model

2.2.1 For this project, short-term is defined as years one to five and medium-term as years six to ten of operation. For Manston, these years are 2020 to 2024 for short-term and 2025 to 2029 for medium-term. 2030 to 2039 are defined as long-term for the purposes of this forecast.

2.2.2 The qualitative data collected for this research and discussed in Volume II of this series of reports, highlights the 'push' and 'pull' factors that are likely to drive demand for Manston Airport. 'Push' factors are those that may lead customers away from other airports or prompt a change to current models. These factors include the bumping of belly-freight at Heathrow, issues with the Channel crossings, increasing problems with security, and potential changes to the current dominance of belly freight in the UK. 'Pull' factors work to attract customers to the airport. These may include the speed of turnaround achieved by Manston, cutting edge security clearing, and the geographic location of the airport and its airspace.

2.2.3 Whilst one of the key drivers for demand at Manston is a lack of capacity at other airports in the South East, there are a number of push and pull attraction factors to take into account. Indeed, the current UK air freight model is for shippers to preference belly-hold cargo, which can take up to a week to arrive and dispatch from some of the Country's airports. The qualitative research detailed in Volume II of this research describes the frustrations associated with this model and the impact at all levels of the supply chain. It seems likely, therefore, that the model will change, much as the model for passenger flights changed some decades ago with low cost carriers now dominating many airports, operating point-to-point at competitive prices.

[3] https://www.gov.uk/government/publications/uk-aviation-forecasts-2013

2.2.4 In addition, the qualitative findings indicated several issues that present opportunities for Manston Airport. These include:

- The sufficiency of slots at South East airports
- Bumping of freight from passenger aircraft
- Security issues particularly with outsized cargo
- Speed of turnaround and bottlenecks for air freight a particular concern due to, "*longer processing time because of security*" (ACI-NA, 2013, p. 5)
- Review of current regulatory controls on the charges and services Heathrow offers to airlines, due to expire at the end of 2018

2.2.5 Interviews undertaken as part of the qualitative research also indicated a number of potential markets for Manston Airport. These include:

- Perishables including fruit, vegetables, flowers, fish, and shellfish
- Outsized freight
- Formula One and luxury cars
- Live animals
- Time sensitive items such as aircraft parts and the oil and gas industry
- Humanitarian and military flights

2.2.6 As such, and also based on market knowledge and confidential discussions with airlines, airports, and organisations involved in the freight forward and integrator markets, a short and medium-term forecast was produced. The freight movements shown in the forecast relate, where possible, to particular carriers identified through the qualitative research. The identity of these carriers is necessarily confidential for commercial reasons. The forecast includes ten aircraft of various types that will be recycled at Manston Airport. These aircraft will arrive without cargo.

2.2.7 Outputs for the freight forecast show the number of movements and the tonnage by year for imports and exports. Tonnage figures have been calculated from the maximum payload for each aircraft type and multiplying by 65% to give an indication of tonnage for the main route (either import or export). 65% is an average figure that intends to cover both full loads and out-of-gauge (cargo that exceeds the internal dimensions of a container by length, width or height) rush parts (such as critical parts for oil rigs, aircraft, etc.).

2.2.8 Backloads (tonnes carried on the return flight) have been calculated by applying a small percentage, sometimes zero in the early years, increasing over time dependent on the potential in that market in the longer-term. An indication of origin/destination pairs is also provided. The freighter fleet mix is shown using the ICAO aircraft design code, which are:

- Code C –(ATR-72, B727, B737, A310, A320, etc.)
- Code D – Heavy transport (B757, B767, etc.)
- Code E - (B747, L-1011, MD-11, DC-10, A330, etc.)
- Code F- (B747-8, A380-800F - when available)

2.2.9 Additionally, the costs of switching airports have been taken into account when considering the likelihood of integrators and freight forwarders moving to Manston. These include (CAA, 2013, p. 26):

- The cost of physical relocation
- Cancellation of long-term contracts
- Loss of economies of scale, although if an entire operation is switched, economies of scale would be gained at the new airport
- Market effects such as marketing new routes and a potential loss of custom in the early years following the switch
- Network effects lost by switching to a smaller airport
- Capacity constraints at other airports, particularly in slot allocations
- Sunk costs such as an airline's investment in the airport from which they are switching

2.3 Long-term freight forecasting model

2.3.1 For this project, long-term is defined as in excess of ten years of operation (from 2030). Whilst the third runway at Heathrow may become operational during this timeframe, capacity constraints are predicted to continue in the South East during the forecasting period. These constraints will make operating from the hub airports increasingly difficult and potentially more expensive. Recent research by SEO Amsterdam Economics and Cranfield University shows that every 10% increase in airport congestion leads to an aggregate 1.4% to 2.2% increase in airfares[4]. Additionally and as Ishutkina says:

> "*secondary airports have several other advantages over the major airports. These include lower-cost facilities and less congestion which allows rapid turnaround times and hence more efficient aircraft operations*" (Ishutkina, 2009, p. 91).

2.3.2 In the long-term, forecasts generally have less reliance on qualitative methods. Any trends flagged during the interviews with specialists have been taken into account by adjusting the forecasts in the short and medium-term. Therefore, from Years 11 to 20 an annual percentage growth has been applied to the figures derived for Year 10. 2016 figures show a notable increase in air cargo demand by almost all carriers, which the latest IATA data shows to be 6.8% in global air freight tonne kilometres (FTKs) for the year to November 2016. After a period of stagnation that followed the global economic slowdown, which Boeing describe as a "*temporary situation*", they say:

> "*As global GDP and world-trade growth accelerate, air cargo traffic, as measured in revenue tonne-kilometers, is projected to grow an average 4.2 percent per year over the next 20 years. World air-cargo volume, in spite of exogenous shocks arising from economic and political events and natural disasters, grew an average of 5.2 percent per year over the last three decades.*" (Boeing, 2016b, p. 16)

2.3.3 However, to be conservative, and in line with the Airbus forecast, a 4% uplift on the Year 10 figures has been applied to extrapolate the long-term forecast for Manston Airport.

2.3.4 The potential for an airline to upgrade the aircraft in their fleet has also been taken into account and is shown as a migration from one aircraft type to the forecast upgrade in the forecast model.

[4] http://www.airport-world.com/news/general-news/6028-the-cost-of-congestion-at-europe-s-busiest-airports-sky-high-air-fares.html

2.4 Passenger forecasting method

2.4.1 As with the air freight forecast, the short to medium-term passenger model is built from market information, which allows specific airline movements and associated aircraft to be used in the forecast. Instead of attempting to either extrapolate from past movements or to allocate overspill from capacity-constrained airports in the South East, intelligence was sought from airlines and experts on the potential markets Manston could attract. Interviews were carried out to establish these potential markets for the airport, which include:

- Resumption of scheduled service twice daily to a hub airport
- A LCC base for two aircraft at Manston rising to three
- The charter market resuming, stimulated by regional developments such as the Paramount theme park and Ebbsfleet Garden City development, which are expected to increase demand for both in- and outbound flights
- Flights from the US that tie up with cruise ships leaving from Dover

2.4.2 Further information can be found in the document "Manston Airport: A National and Regional Aviation Asset, Volume II: A qualitative study of potential demand. Following this qualitative step, a quantitative assessment of the likely movements per annum was estimated through discussion with the airlines involved or by examination of previous schedules and potential demand.

2.5 Passenger forecasting model

2.5.1 The passenger forecast for Manston has been calculated from specific airline movements except for the charter market, which is derived from an estimate of the number of movements Manston is likely to handle. As described above, market intelligence has been used to calculate the short to medium-term forecasts.

2.5.2 The latest IATA figures show that to November 2016, the annual growth in passenger volumes was 7.8%[5]. Boeing forecast passenger traffic grow to 2035 at 4.8%[6] annually. However, to be conservative, an increase of 4% has been applied to the Year 10 forecast to derive the forecasts in Years 11 to 20.

2.5.3 The calculation used to forecast the number of passengers per movement takes the capacity of each aircraft type and applies an average load factor of 65% for the scheduled KLM flight (gauged from previous Manston figures) and 90% for all other services, an industry norm. These load factors are applied on inbound and outbound movements.

[5] http://www.iata.org/whatwedo/Documents/economics/Airlines-Financial-Monitor-Dec-16.pdf

[6] http://www.boeing.com/commercial/market/long-term-market/traffic-and-market-outlook/

3 Manston Airport freight forecast

3.0.1 The previous sections have described the work carried out to determine a forecast for Manston Airport. RiverOak plan to focus on freight, where demand is demonstrable and considerable. There is clear demand for perishable goods, particularly fruit, vegetables, flowers, fish and shellfish. The perishable market has been a staple for Manston in the past, and the airport, with reduced flying time compared with other airports, has a reputation for the speed at which cargo can be offloaded onto trucks. Timely delivery of fresh produce is vital to supermarkets, which require the maximum shelf life to reduce wastage and increase profit margins.

3.0.2 Manston Airport is also well placed to be active in niche markets such as the movement of luxury street vehicles from the Middle East and Formula One cars globally. Manston is also capable of handling live animals such as breeding stock and racehorses. The airport will be able to security screen outsized cargo including oil and gas equipment, which cannot currently be scanned at other airports. These niche markets can provide considerable business for the airport.

3.0.3 Manston has a history of handling military and humanitarian operations and these are expected to return to Manston when the airport is operational. A forecast that matches past operations has therefore been included. There is strong interest in aircraft recycling at Manston and, although this provides only a limited number of movements per year (around ten), would provide the airport operator with many opportunities to derive revenue, create jobs and increase skills in the region.

3.0.4 The forecasts shown in this section commence in the second year of operation for freight and the third for passengers. This delay in commencing operations is to allow time for extensive development to take place at the airport, as detailed in Section 5.

3.1 Freight forecast by movements

3.1.1 The freight movements shown in the forecast relate to particular carriers where possible although this level of detail is not possible in all cases. These findings have been used to calculate the short and medium-term forecasts. From Y11, an incremental growth rate of 4% per annum has been applied (see Section 2.3 for full details). Table 2 shows the number of freighter movement by year from the first to 20th year of operation by ICAO aircraft design code. These codes are[7]:

Code C: Medium range aircraft such as the ATR-72, B727, B737, A310, A320
Code D: Heavy transport such as the B757, B767
Code E: B747, L-1011, MD-11, DC-10, A330, etc.
Code F: B747-8, A380-800F (when available), etc.

3.1.2 It should be noted that one movement is either one landing or one take off. A 'flight' often refers to two movements – one take off and one landing or vice versa. The forecast includes 10 aircraft of various types that will be recycled at Manston Airport. These aircraft will arrive without cargo.

[7] Dr. A. Trani, Virginia Tech, "Aircraft Classifications" (undated). Available from http://128.173.204.63/courses/cee5614/cee5614_pub/acft_classifications.pdf

Table 2 Freighter movements by year by ICAO design code

Freight movements	Code C	Code D	Code E	Code F	Various (recycling)	Total
Y1	0	0	0	0	0	0
Y2	1,872	2,174	1,144	52	10	5,252
Y3	2,184	2,252	1,280	78	10	5,804
Y4	3,640	4,514	1,432	104	10	9,700
Y5	3,744	4,514	1,564	104	10	9,936
Y6	3,848	4,592	1,564	130	10	10,144
Y7	4,472	4,670	1,564	156	10	10,872
Y8	4,680	4,748	1,564	182	10	11,184
Y9	4,888	4,748	1,564	182	10	11,392
Y10	4,992	4,826	1,564	208	10	11,600
Y11	5,192	5,019	1,627	216	10	12,064
Y12	5,399	5,220	1,692	225	11	12,547
Y13	5,615	5,429	1,759	234	11	13,048
Y14	5,840	5,646	1,830	243	12	13,570
Y15	6,074	5,872	1,903	253	12	14,113
Y16	6,316	6,106	1,979	263	13	14,678
Y17	6,569	6,351	2,058	274	13	15,265
Y18	6,832	6,605	2,140	285	14	15,875
Y19	7,105	6,869	2,226	296	14	16,510
Y20	7,389	7,144	2,315	308	15	17,171

3.1.3 The Transport for London work (TfL, 2013) talks of diverting 14,000 movements to airports outside the London airspace such as Manston. This forecast shows the Nationally Significant Infrastructure Project (NSIP) threshold for 10,000 freight movements per annum being achieved in Year 6 and the 14,000 movements discussed by TfL by Y15.

3.2 Freight forecast by tonnage

3.2.1 Further information on how these markets were identified can be found in Volume II of this series of reports. Markets include:

- Global import and export for parcels and packages
- Africa particularly for the import of flowers, fruit and vegetables
- China for the import of consumer goods and export of luxury items (included under niche freight operations but, due to a lack of concrete evidence the forecast is extremely conservative)
- Middle East particularly for export markets including fish and shellfish
- Pakistan including the import of clothing and the export of consumer goods
- Russia for gas and oil equipment and the export of luxury items
- South America for the import of perishable fresh produce
- US for a range of import and exports

3.2.2 The freight forecast by number of tonnes and ICAO design code for exports from Manston Airport is shown in Table 3. The method used to calculate tonnage from

movements is shown in Section 2.2. Tonnage figures have been calculated from the maximum payload for each aircraft type and multiplying by 65% to give an indication of tonnage for the main route (either import or export). Air freight carriers generally calculate the price of the main route to cover their costs. Backloads therefore generate additional profit for the airline but are not essential to the operation of the route since the cost has been covered by the main journey.

Table 3 Export tonnage by year and ICAO design code

	Class C	Class D	Class E	Class F	Total freight outbound
Y1	0	0	0	0	0
Y2	2,474	21,700	30,485	2,028	56,687
Y3	3,961	22,841	31,374	3,042	61,218
Y4	4,340	39,192	43,178	4,056	90,765
Y5	4,543	39,192	44,495	4,056	92,286
Y6	5,056	40,333	45,145	5,070	95,604
Y7	6,206	42,487	45,774	6,084	100,551
Y8	6,544	43,628	46,424	7,098	103,694
Y9	6,882	43,628	47,053	7,098	104,660
Y10	7,936	45,783	47,911	8,112	109,742
Y11	8,254	47,614	50,481	8,436	114,785
Y12	8,584	50,615	52,500	8,774	120,473
Y13	8,927	52,640	55,307	9,125	125,999
Y14	9,284	54,746	57,520	9,490	131,039
Y15	9,656	58,169	59,820	9,869	137,515
Y16	10,042	60,496	62,213	10,264	143,015
Y17	10,444	64,250	64,702	10,675	150,070
Y18	10,861	66,820	67,290	11,102	156,073
Y19	11,296	69,493	69,982	11,546	162,316
Y20	11,748	72,273	72,781	12,008	168,809

3.2.3 In terms of imports/exports and backloads, the following conservative assumptions and calculations have been used:

- Dedicated freight airlines (US) – 80% import/20% export
- Dedicated freight airlines (Africa) – 100% import with a 5% backload from Year 3, rising to 10% in Years 5 and 6, with an additional 5% increase added every two years
- Integrator movements – 100% outbound with a backload (import) calculation of 20% included in Years 2 and 3, rising by an additional 5% every two years
- Integrator feeders – 100% inbound (import) traffic with 10% backload possibility added to Year 5, 15% to Year 9, and 20% thereafter
- Fresh fish and spider crabs – 100% export with a backload potential of 5% from Year 3 with an additional 5% added every two years thereafter
- Middle East airlines – both import and export with backload possibilities
- Live animal operations – both in and outbound to show return journeys for most animals

- Pakistani airlines – export from Manston with backloads starting at 10% rising slowly to 30%
- Postal Services – export with a possibility of small backloads starting at 5% and rising gradually to 20%
- Russian airlines – all export from Manston with strong backload possibilities starting at 50%, rising to 70%
- Niche freight operations – generally imports with backload potential commencing at 10% rising to 30% over time
- Military movements – outbound only
- Humanitarian and medevac – outbound only

3.2.4 The freight forecast by number of tonnes and ICAO design code for imports from Manston Airport is shown in Table 4. These figures have been calculated using the same principles as for exports shown above.

Table 4 Import tonnage by year and ICAO design code

	Class C	Class D	Class E	Class F	Total freight inbound
Y1	0	0	0	0	0
Y2	4,462	12,269	22,121	1,014	39,865
Y3	5,138	13,010	27,515	1,673	47,335
Y4	9,092	28,932	36,071	2,231	76,326
Y5	9,768	28,932	40,524	2,231	81,455
Y6	10,444	30,943	41,402	3,042	85,832
Y7	14,669	31,628	42,410	3,650	92,357
Y8	16,021	33,411	43,289	4,259	96,979
Y9	17,542	33,411	43,373	4,259	98,585
Y10	18,218	35,194	44,330	4,867	102,609
Y11	18,947	36,601	46,982	5,062	107,592
Y12	19,705	39,254	49,812	5,264	114,034
Y13	20,493	40,824	51,899	5,475	118,691
Y14	21,510	43,742	55,003	5,694	125,949
Y15	22,371	46,047	58,232	6,415	133,064
Y16	23,266	49,278	61,673	6,672	140,889
Y17	24,196	51,249	64,140	6,939	146,524
Y18	25,164	55,427	67,908	7,771	156,271
Y19	26,171	57,644	70,624	8,082	162,522
Y20	27,218	61,576	74,750	8,405	171,949

4 Manston Airport passenger forecast

4.0.1 Whilst RiverOak will be focusing on the development of Manston as a freight-focused airport, passenger services will be encouraged to increase revenue potential and to provide a service to local people. The airport could provide landing slots at convenient times that are not available at other airports in the South East. Infrastructure will be developed to handle both passenger and air freight traffic, as shown in Section 5. As with Southend Airport, which grew quickly from just over 4,000 passengers per year in 2010 to over one million by 2014. Since 2014, passenger numbers have dropped to around 700,000 following the removal of one of Easyjet's four aircraft that were based at the airport[8]. This highlights the importance for a regional airport of an airline basing aircraft at the airport.

4.0.2 The passenger forecast for Manston has been calculated from specific airline movements and, for the charter market, an estimate of the number of movements Manston is likely to handle. Market intelligence has been used to calculate the short to medium-term forecasts, with a 4% increase, year-on-year from Years 11 to 20. The calculation used to forecast the number of passengers to be handled takes the capacity of each aircraft type and applies an average load factor of 65% for the scheduled KLM flight (gauged from previous Manston figures) and 90% for all other services, an average industry norm.

4.0.3 Specifically, the forecast shown in Table 5 includes:

- Scheduled carrier (such as KLM) operating a twice-daily service to a major hub. This equates to four movements per day, seven days per week totalling 1,456 movements per year in Years 3 to 20.
- A LCC basing two aircraft at Manston during Years 3 to 5 and three aircraft thereafter. These aircraft are forecast to operate with five daily movements during the summer months and four during the winter. LCCs account for 3,276 movements per year from Years 3 to 5 and 4,914 thereafter to Year 10. An incremental increase of 4% has been applied from Year 11 to Year 20.
- Charter flights include for one flight per day (two movements) for 12 weeks of the year and others operating five flights (10 movements) per day for five days of the week and for twenty weeks of the year. This totals 200 movements in Year 3, 240 in Year 4, and 280 from Year 5 to Year 10 with an incremental increase of 4% thereafter.
- Cruise ship flights for 26 weeks of the year commencing with one flight (two movements) per week, increasing to two flights from Year 7. This totals 52 annual movements from Years 4 to 6 and 104 from Years 7 to 10 with a 4% increase thereafter.

Table 5 shows the 20-year passenger forecast by movements and numbers for each ICAO design code of aircraft.

[8] http://www.southendairport.com/images/annualreports/LSA-AR-2016-Web.pdf

Table 5 Manston Airport 20-year passenger forecast

	Class C Moves	Class C Numbers	Class D Moves	Class D Numbers	Total passenger movements	Total passenger numbers
Y1	0	0	0	0	0	0
Y2	0	0	0	0	0	0
Y3	4,932	662,768	0	0	4,932	662,768
Y4	4,972	669,572	52	10,296	5,024	679,868
Y5	5,012	676,376	52	10,296	5,064	686,672
Y6	6,650	954,999	52	10,296	6,702	965,295
Y7	6,650	954,999	104	20,592	6,754	975,591
Y8	6,650	954,999	104	20,592	6,754	975,591
Y9	6,650	954,999	104	20,592	6,754	975,591
Y10	6,650	954,999	104	20,592	6,754	975,591
Y11	6,858	990,171	108	21,416	6,966	1,011,587
Y12	7,074	1,026,749	112	22,272	7,186	1,049,022
Y13	7,299	1,064,791	117	23,163	7,416	1,087,954
Y14	7,532	1,104,354	122	24,090	7,654	1,128,444
Y15	7,775	1,145,500	127	25,053	7,902	1,170,553
Y16	8,028	1,188,291	132	26,055	8,160	1,214,347
Y17	8,291	1,232,794	137	27,098	8,428	1,259,892
Y18	8,564	1,279,078	142	28,182	8,707	1,307,259
Y19	8,849	1,327,212	148	29,309	8,997	1,356,521
Y20	9,144	1,377,272	154	30,481	9,298	1,407,753

5 Infrastructure requirements

5.0.1 This section presents the infrastructure forecasts that have been made by Viscount Aviation, Osprey Consulting Services and the RPS Group. The section considers the infrastructure requirements for freight, passengers, and for aviation fuel. A series of assumptions have been made in order to produce the schedule of infrastructure requirements. For example, it is assumed that the airport operator will provide direct handling services for all operations except in the case of integrators. For integrators, it is assumed that the integrator will provide handling either directly or through a contracted third party, with the integrator renting premises from the airport. It is also assumed that the airport will operate an aviation fuel farm directly buying fuel on the open market.

5.1 Air freight infrastructure requirements

5.1.1 Infrastructure requirements at the airport for freight include stands for aircraft, warehouse space, and parking for trucks. These requirements are linked to the forecasts shown in the previous section and are detailed by year of operation in Table 6.

Table 6 Freight infrastructure requirements

	Freight stands	Warehouse space m²	Truck parking
Y1	0	0	0
Y2	7	9,903	16
Y3	8	11,427	18
Y4	12	18,064	28
Y5	13	29,305	29
Y6	13	20,736	30
Y7	14	22,695	32
Y8	14	24,324	33
Y9	14	27,096	46
Y10	14	27,400	35
Y11	15	29,650	37
Y12	15	32,346	39
Y13	16	34,956	41
Y14	16	38,072	43
Y15	16	41,628	45
Y16	17	45,425	47
Y17	17	49,432	49
Y18	18	54,321	52
Y19	18	59,061	54
Y20	19	64,906	57

5.1.2 These infrastructure developments will be carried out in four building phases, which will ensure Manston Airport is prepared to meet the forecast demand. These building phases are:

- Prior to opening the airport,
- Year 4,
- Year 10, and
- Year 15.

5.1.3 There will be no traffic in Year 1, as effort will be focused on accelerated redevelopment of the airport. This traffic-free environment will allow construction to take place without the disruption from an operational airport schedule. The number of stands for freighter aircraft will increase from 8 at commencement of operations, increasing to 14, then 16, and to 19 in Year 10. Warehousing will be increased in line with these building phases.

5.1.4 The forecast shown has been annualised but mapping a daily schedule requires assumptions to be made to reflect likely arrival and departure schedules. Aircraft are unlikely to arrive and depart evenly throughout the day but tend to coincide at busy times. This means that infrastructure plans must take account of the need to handle higher than average numbers of aircraft at peak times.

5.2 Passenger infrastructure requirements

5.2.1 Passenger traffic infrastructure requirements include aircraft stands, terminal capacity for departures, arrivals and landside activities, and car parking. These requirements are shown by year of operation in Table 7.

5.2.2 As the forecast shows, passenger infrastructure will not be in place for the first two years of operation. This is to allow the operator to focus on air freight markets and to ensure passenger infrastructure, particularly a new terminal building, is in place before the commencement of passenger operations. Table 7 shows that operations will start with three stands for passenger aircraft, with a fourth being added in Year 15.

5.2.3 In terms of the passenger terminal, which is separated into departure, arrival and landside areas, Table 7 shows the forecast requirement for the number of passengers per hour that will need to be accommodated. The car-parking requirement is also shown in Table 7.

Table 7 Passenger infrastructure requirements

	Stands	Terminal capacity (pax per hour)			Car parking
		Departures	Arrivals	Landside	
Y1	0	0	0	0	0
Y2	0	0	0	0	0
Y3	3	124	31	62	1,069
Y4	3	171	43	85	1,097
Y5	3	171	43	85	1,108
Y6	3	171	43	85	1,557
Y7	3	171	43	85	1,574
Y8	3	171	43	85	1,574
Y9	3	171	43	85	1,574
Y10	3	171	43	85	1,574
Y11	3	171	43	85	1,632
Y12	3	171	43	85	1,692
Y13	3	171	43	85	1,755
Y14	3	171	43	85	1,820
Y15	4	171	43	85	1,888
Y16	4	171	43	85	1,959
Y17	4	171	43	85	2,032
Y18	4	171	43	85	2,108
Y19	4	171	43	85	2,188
Y20	4	171	43	85	2,271

5.2.4 The current parking for passenger aircraft is sufficient to allow space for three stands, which will be sufficient for operations until Year 15 when a further stand will be required. Terminal capacity provided from commencement of operations is forecast to be sufficient until at least Year 20.

5.3 Fuel storage and transport

5.3.1 The airport also requires fuel storage so that aircraft can refuel before departure. The volume of fuel required is calculated on the number of movements, type of aircraft, and their forecast destination. Table 8 shows the volume of fuel required to be stored at Manston Airport by year. The table also shows the forecast for delivery of fuel to the airport by road and rail, by year and per day. The forecast uses an average truckload of 38,000 litres whilst the rail forecast averages 19 containers per train carrying 43,000 litres per container. It is assumed that road transportation will be used in the early years with RiverOak investigating other options including rail and sea transportation in the longer term.

Table 8 Fuel storage requirement

	Volume (KLitres)	Storage (Litres)	Road delivery (38,000 litres)	Road delivery per day	Rail delivery (19x43,000 litres)	Rail delivery per day
Y1	0	0	0	0	0	0
Y2	98,457	600,000	2,591	7.10	121	0.33
Y3	118,904	700,000	3,129	8.57	146	0.40
Y4	176,859	1,000,000	4,654	12.75	216	0.59
Y5	181,305	1,000,000	4,771	13.07	222	0.61
Y6	198,072	1,100,000	5,212	14.28	242	0.66
Y7	189,271	1,000,000	4,981	13.65	232	0.63
Y8	192,141	1,000,000	5,056	13.85	235	0.64
Y9	192,513	1,100,000	5,066	13.88	236	0.65
Y10	195,197	1,100,000	5,137	14.07	239	0.65
Y11	201,215	1,200,000	5,295	14.51	246	0.67
Y12	209,209	1,200,000	5,506	15.08	256	0.70
Y13	217,383	1,200,000	5,721	15.67	266	0.73
Y14	226,024	1,300,000	5,948	16.30	277	0.76
Y15	235,010	1,300,000	6,184	16.94	288	0.79
Y16	244,356	1,400,000	6,430	17.62	299	0.82
Y17	254,076	1,400,000	6,686	18.32	311	0.85
Y18	264,185	1,500,000	6,952	19.05	323	0.89
Y19	274,698	1,600,000	7,229	19.81	336	0.92
Y20	285,620	1,600,000	7,516	20.59	350	0.96

The reduction in requirement for fuel between Years 6 and 7 reflects forecast upgrades to more efficient aircraft, including swaps from the Boeing 767 to the Airbus 330.

6 Conclusion

6.0.1 This report presents the forecasts for Manston Airport and establishes the rationale for retaining Manston as an airport, essential to the UK's national aviation network. Manston Airport can be operational in as little as two years from the transfer of its ownership to RiverOak. Its location, its 100 previous years of operation, and the considerable local backing mean it is without comparison in the UK. No other airport in the South East is so well supported. There will always be those who are against aviation and airport development but Manston receives the on-going support of a large number of the residents of Thanet as demonstrated is Volume I of this series of reports.

6.0.2 This report and the others in the series, show that Manston Airport is a valuable local, regional and national asset, providing airport capacity badly needed by the UK. Without additional runway capacity, the UK is losing potential trade, particularly with non-EU countries. Due to its size, location and lack of airspace constraints, Manston is the only viable option in the South East.

6.0.3 The forecasts presented in this report show that Manston Airport, in excess of the requirement for a National Strategic Infrastructure Project (NSIP), has the potential to attract and accommodate at least 10,000 cargo movements per year from the sixth year of its operation. Freight movements will increase gradually, in line with capacity, to a forecast 17,000 by Year 20. In addition, the airport will be able to handle a number of passenger flights, connecting Kent to the rest of the world. Passenger flights are expected to start in Year 3 of operation with the airport handling around 660,000 passengers, increasing to around 1.4 million by Year 20 of operation. Infrastructure requirements include stands for freighter and passenger aircraft, warehousing, a passenger terminal, and fuel storage. Construction will be undertaken in four phases to meet the forecast demand.

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