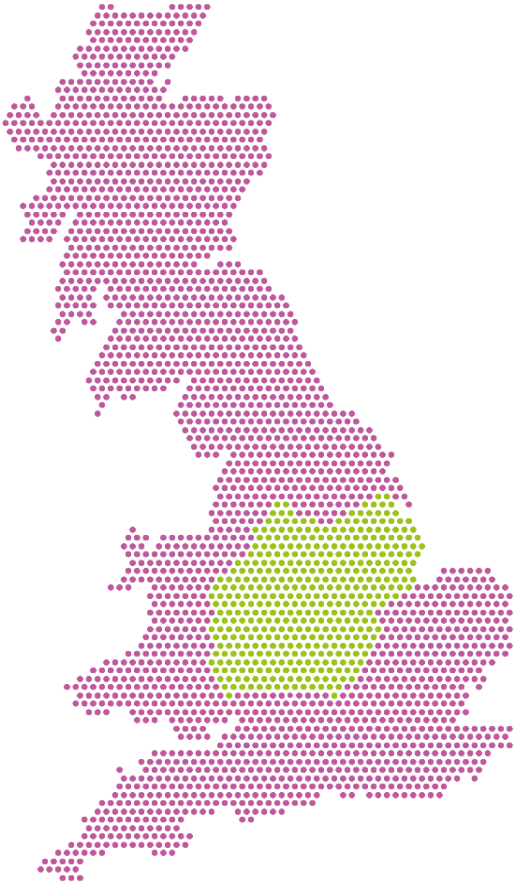

Narrative Report

Midlands Connect – Work Package 5b International Gateways

16 November 2016

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Contents

Executive summary

The Midlands region has £210bn GVA produced and 10.3 million inhabitants, and is the second largest economy and the second largest conurbation of the UK after the London and Southeast region. The Midlands is also the 'export powerhouse' of the UK, with 17% of national exports originating in the region and a growth rate that is forecast to be above the national average. On 25 October 2016, the Government announced its support for a new runway at Heathrow to address the capacity constraints of the Southeast. This is a positive news for the UK aviation industry – now it is the opportunity to put forward the Midlands aviation connectivity requirements. The Midlands market and the London market are complementary: there is no conflict between the Heathrow decision and supporting the growth of airports serving the Midlands region.

The Midlands has thriving businesses developing their activities in the region, a growing regional economy and increasing high-value export volumes. Air connectivity and accessibility are key requirements for businesses, especially in a context of globalised markets and rapidly growing emerging economies, leading to worldwide aviation demand that is forecast to double in the next 20 years to 7.2 billion annual passengers. Aviation connectivity for the Midlands must be on the agenda of decision makers so that the powerful asset that is Midlands region can maximise its economic potential and deliver benefits for the country's economy as a whole.

The key air access gateways to the Midlands are Birmingham Airport and East Midlands Airport. These airports served 15 million passengers in 2015, while the East and West Midlands regions were the origin or destination for 20 million air travellers. This indicates that Birmingham and East Midlands airports generally cater well for the demands of air travellers in the region, but that there is scope for improvement.

These two airports are central to this Narrative Report, which contains the findings of the work undertaken by Mott MacDonald as part of Midlands Connect *Work Package 5b – International Gateways*. It is an evidence-based study that covers four analysis themes that are of absolute importance to support Midlands businesses growth, as summarised below and elaborated in the report:

1. The air business passenger market in the Midlands

Birmingham Airport is generally successful in serving the needs of businesses travellers in its catchment area (mainly the West Midlands) with a good range of destinations and short access time. Business passengers are time sensitive travellers and choose airports primarily based on availability of direct connections with convenient schedules, and access time to airports. Markets where accessibility can be improved are Eastern Europe (where a large share of travellers use London Luton Airport) and North America (where a majority of passengers choose London Heathrow airport).

Businesses in the East Midlands region are less well-served. Where direct services are available (mainly on domestic routes), East Midlands Airport is chosen. Otherwise this segment of passengers travels to Birmingham or airports further away such as the London airports (Heathrow, Luton and Stansted), or Manchester Airport..

Structural changes such as reduction or removal of APD can benefit the accessibility for air passengers by improving the viability of new services. In a globalised world with emerging economies, it is important also to work towards continued liberalisation of international Air Service Agreements in order to allow airlines to serve emerging markets to sustain and develop trade.

2. Surface access issues and potential impact of HS2 on air business passengers

Most business people drive – or are driven – to the airport. Road journey times are generally good, with convenient motorway access, and are predicted to stay broadly the same, with road improvements balancing traffic growth. Air travellers need access to the airports early in the morning and late in the evening, particularly business travellers making day-return journeys. Public transport connectivity is poor at these times for both Birmingham and especially East Midlands airports.

The first phase of HS2 between London and Birmingham will make rail competitive with road journey times from the Midlands to Heathrow. This increases surface access mode choice, but does not fundamentally change the attractiveness of Heathrow compared to more local airports in the Midlands.

In the other direction, HS2 will reduce access times from London and the Southeast to Birmingham Airport, putting it on a par with Luton and Stansted. But given the expense of travelling by High Speed Rail, the models predict that this will not – by itself – lead to a substantial shift of passengers to Birmingham Airport.

3. Potential overflow from the Southeast airports to Midlands airports

If not solved, the airport capacity constraints in the Southeast are expected to result in a shift in airport choice a proportion of passengers, which could choose to fly from the Midlands airports instead of London airports. The areas of origin of these passengers is not restricted to London or the Southeast but extend to the immediate neighbouring regions – especially the Southwest and East of England. The over spilled volumes of traffic would provide an upside to the Midlands airports, in particular from 2040 onwards when the London airports network reaches full capacity.

4. Air freight in the Midlands

There is continued demand for the speed and reliability benefits that air freight offers. Industries that require transport of time-sensitive and high-value commodities such as the overnight small package integrators (eg, DHL and UPS) as well as shippers of perishables, consumer electronics, high-fashion apparel, pharmaceuticals, industrial machinery, and automobile components recognize the value of air freight, and this value will continue to play a significant role in their shipping decisions.

East Midlands airport is well positioned to remain the key air freight point of operations for domestic freight and mail services. The same is true for freight operations from/to the EU, as good freighter connectivity exists between East Midlands and the other major European cargo hubs of DHL and UPS. The challenge of the EU market segment exists in the impact of Brexit on the trade relations between the United Kingdom and the EU and the level of access of the UK to the Single European Market going forward.

It is understood that part of the East Midlands Airport business plan is growing the annual freight throughput from 300,000 tonnes to 1 million by 2030-2035. East Midlands Airport benefits from unrestricted 24h operations. Its primary UK competitor airport, London Stansted, has night restrictions limiting the number of night movements and 'noise points'. As Stansted's passenger services grow, there is increasing demand for night movements for this passenger traffic, creating an opportunity for East Midlands Airport to increase its night cargo operations.

Outline of strategic interventions

The analysis of gaps and opportunities for each of the above areas has identified possible strategic interventions to support the development of the Midlands air connectivity in the years ahead.

- **Surface access development**
  - Business access by public transport can be improved through links to existing rail services, by providing a more regular rail service to East Midlands Parkway, and easing connections to airport services at Birmingham New Street

- Possibility of offering early morning and late evening services that would benefit the business travellers' community should be analysed.
- Specific works to improve surface access at the airport – in particular the connectivity between motorways and local roads should be undertaken.
- Maximising the opportunity of HS2 to reduce travel time by rail to the airports – in particular to Birmingham Airport from the nearby regions.

- **Airport route development, marketing and policy**
  - Aviation in the UK is largely a private sector endeavour – airlines and airports tend to be privately owned and make significant efforts to grow their businesses. Traffic on most routes is made up of a mix of business passengers as well as leisure and visiting friends and relatives (VFR) – to achieve profitability for new routes, all of these segments should be considered.
  - This study considers the business passengers segment needs. To maximise the impact of the proposed schemes, a joined-up approach is recommended, where packages of route development support pull resources from stakeholders based on joined-up thinking that combines the airports' profitability goals with the creation of additional business-oriented connections. This will need to also address the needs of leisure and VFR components of traffic.
  - About 80% of business trips are spread amongst Top 25 European destinations and each of these routes requires focus as some destinations benefit specific sectors of the local economy. An example is Berlin, an important route for train and aircraft manufacturer Bombardier, however it is not within in the Top 10 European destinations.
  - Improvement of air connectivity to the US through marketing support of direct scheduled flights to the US main business centres from Birmingham airport could be a priority. Current US-market services are constrained by Heathrow's dominance of the US market, making route development from Birmingham difficult. Birmingham is well placed to be a regional alternative to London Heathrow and is able to attract a critical mass of traffic from the Midlands as well as traffic from other principal regional cities that will be connected via HS2 such as Manchester, Leeds and Sheffield.
  - The Midlands could also support airlines operating routes to European hubs that would allow an increased connectivity to the US without introducing back-tracking to passenger's itineraries. The timing of such services should be set in a way to maximise passengers' connectivity at hubs (ie the number of possible flights on which passengers can connect to). The aim should be to maximise the one-stop services and to reduce two-stop journeys that require travel into London.
  - Such flights should be operated by airlines allowing "hubbing" (ie signatory of the IATA interlining agreements) and should be scheduled to minimise connecting times at the hubbing airport. For instance, improved connectivity to Dublin by Aer Lingus from East Midlands airport would allow business passengers from the East Midlands region to reach one of the leading Western European markets and provide multiple options for onward connectivity to the US.
  - For Birmingham, the list of improved connections should include those airports where passengers currently tend to use airports outside of the Midlands and where the analysis of frequencies at Birmingham Airport has shown gaps in services: Madrid (which would allow further connectivity to South America), Zurich (which would allow connections to European and Asian airports) and Moscow.
  - East Midlands Airport's range of route development objectives should be aimed at the major demand centre of Amsterdam, Brussels and Dublin. These three routes are already served from the airport and the target would be to increase the share of business passengers using East Midlands Airport in relation to the total volumes currently choosing other airports. This could be achieved for instance through increased frequencies and optimisation of schedules to meet business requirements. All of these airports would allow increased onward connectivity. Frankfurt and Paris are not currently served and should be considered as a potential destination from East Midlands Airport.

- Route development should also aim to expand towards developing economies outside of Europe such as China and India, as Asia in general is forecast to achieve the strongest economic and traffic growth in the future. The airports should be able to react to the shift in demand that will occur as local Midlands businesses increasingly trading with these countries. To achieve this, Air Service Agreements must be updated and reviewed by Government in order for airlines to be able to serve these globalised business communities.
- Investment in marketing: the perception of some stakeholders is that Birmingham Airport's improved connectivity to Europe is not well understood by the companies that arrange corporate travel plans. There is a tendency by companies to view London Heathrow as the default airport of choice even when considerable time (and cost) savings could be achieved by flying from Birmingham Airport.
- Marketing effort would be needed to promote Birmingham Airport as a London metropolitan airport once HS2 starts operations. In the interim, the potential for cooperation between Birmingham-based airlines and rail franchises operating between London Euston and Birmingham International should be explored. Midlands Connect can encourage the adoption of a business model that allows passengers to jointly purchase train tickets and airline tickets, allowing a seamless and protected surface journey between London and Birmingham International, with an onward international connection from Birmingham Airport.

1 Introduction

1.1 Scope of report and report structure

This *Narrative Report* contains the findings of the work undertaken by Mott MacDonald as part of the Midlands connect – Work Package 5b – International gateways. The background to the study and an overview of the key trends in the global and regional aviation industry is presented in this introductory chapter. The business passenger's aviation market is analysed in Chapter 2 and focuses on identifying the characteristics of the business passenger travelling to and from the Midlands. It is followed by Chapter 3, which examines current surface access issues. Chapter 4 reports on the future improvements to the road and rail network in the UK, with a focus on HS2. Chapter 5 reports on the findings of the analysis of potential overspill of traffic from the Southeast, as a consequence of the capacity crunch at London airports. Air cargo plays a vital role in the economy of the UK. Its importance and the key role of East Midlands Airport are analysed in Chapter 6. Finally, Chapter 7 reports on the strategies that emerge from this work package. It is complemented by the next steps planned under the scope of Work Package 5b and recommendation on further tasks that could be necessary to maximise the opportunity of Midlands Connect.

The aim of this introductory chapter is to define the regional context and global trends surrounding the aviation industry. An initial overview of the two Midlands airports is followed by an analysis of the key aviation growth drivers and the impact of these drivers on future traffic around the World, in Europe and in the UK. Airport-specific growth plans and UK-related issues are then examined in more detail.

1.2 Sources of data and information used in this report

This study was developed through the analysis of data and news items sourced from ACI, Airbus, Boeing, CAA, CAPA, DfT, HS2 Ltd, IATA, ICAO, Sabre MIDT, SRS Innovata as well as the Airport Commission material (forecasts and associated reports). Demographic and economic data were sourced from Cambridge Econometrics, Office of National Statistics (ONS) and Office for Budget Responsibility (OBR). Various stakeholders were consulted as part of the development of this document, these are listed in Table 1.

Table 1: Stakeholder engagement key facts and figures

Category	Name	Profile
Airports	Birmingham Airport (BHX)	Birmingham Airport is the gateway to Birmingham and the West Midlands region. One of the busiest airports in the UK outside London. It hosts services by over 25 scheduled airlines to domestic, international and intercontinental destinations. The airport throughout in 2015 was 10.2 million passengers, with long-haul traffic being 21% higher than 2014.
	East Midlands Airport (EMA)	East Midlands Airport is located in Castle Donington close to the cities of Derby, Leicester and Nottingham. It serves domestic and international destinations and is the largest UK airport in terms of pure freighter movements. In 2015 4.5 million passengers travelled via East Midlands airport.
DfT	Department for Transport	UK Government Department responsible of the UK transport network

Category	Name	Profile
Airlines	easyJet	easyjet is one of Europe's leading airlines, operating on over 820 routes across more than 30 countries with a fleet of over 250 aircraft. Easyjet fly more than 70 million passengers a year. The airline operates from Birmingham airport. It is considered a low cost carrier with a relevant business passenger focus.
	Flybe	Flybe is Europe's largest regional airline with 218 routes serving 10 countries, operating from a total of 75 departure points, 40 UK and 35 European airports. Flybe operates more UK domestic flights than any other airline Birmingham airport is one of the key operating bases for the airline.
	Ryanair	Ryanair carries 117 million passengers per year. on more than 1,800 daily flights from 84 bases, connecting over 200 destinations in 33 countries on a fleet of over 350 Boeing 737 aircraft, with a further 315 Boeing 737's on order, with the objective of growing traffic to 180 million per year by 2024. Ryanair presence is in the Midlands is focused on East Midlands Airport where it serves mainly leisure-oriented destinations.
Business travel management companies	AMEX Business Travel	American Express Global Business Travel provides end-to-end corporate travel and meetings program management – for companies of all sizes and across all industries.
	Click Travel	Based in Birmingham, Click Travel is a travel management company.
Business networks and organisations	D2N2LEP	D2N2 is the Local Enterprise Partnership (LEP) for Derby, Derbyshire, Nottingham and Nottinghamshire.
	East Midlands Chamber of Commerce	The Chamber is the leading business organisation in the East Midlands. With a growing membership of more than 3,900 businesses and 3,000 affiliates, it is the second largest chamber of commerce in the country.
	Greater Birmingham Chambers	The Greater Birmingham Chamber of Commerce aim is to connect, support and grow local businesses. Accredited by the British Chambers, it has acted as the voice of local businesses since 1813. GBCC is headquartered in Edgbaston, Birmingham, and covers six geographic divisions and three themed Chambers.
Local companies	Bombardier Rail	Bombardier is the world's leading manufacturer of both planes and trains. Its vast offering of products includes trains, rail equipment and control solutions for all market segments, as well as business jets and commercial aircraft. Bombardier has a significant presence, a strong track record and established history in the UK with both its Aerospace and Transportation divisions.
	Tulip	Based in Warwick, Tulip is one of Britain's leading food companies, supplying everything from retail to food services, wholesale and export markets.

Source: Mott MacDonald

1.3 Midlands airports profile

Birmingham Airport and East Midlands Airport are they key airports in the Midlands region and serve the local community as main gateways for business and leisure related air traffic. The two airports are central to the narrative in this report due to role they play both for the Midlands air passengers and in the local economy context.

As with 41% of European airports and 79% of UK airports, both Midlands airports are fully or partially privately owned. Details about airport ownership shareholders of the two local airports are reported in Table 2. The Ontario Teachers Pension Plan (OTPP) which owns 48.25% of Birmingham Airport owns also 100% of Bristol Airport and since February 2016 is part of a Consortium that acquired the company that owns and operates London City Airport. OTPP also owns 39% of Brussels Airport and has significant stakes in Copenhagen airport. Manchester Airports Group (MAG) owns Manchester Airport, London Stansted Airport, East Midlands Airport and Bournemouth Airport. Media has reported on the international expansion aspiration of MAG, with offices being opened in New York. The two airport operators are therefore backed up by global companies that have the know-how, networks, assets and ambition to grow their investments. This means that Birmingham and East Midlands airports are run by companies whose aim is to maximise their return on investment which translates into increased connectivity to the World for passengers.

Table 2: Midlands airports ownership

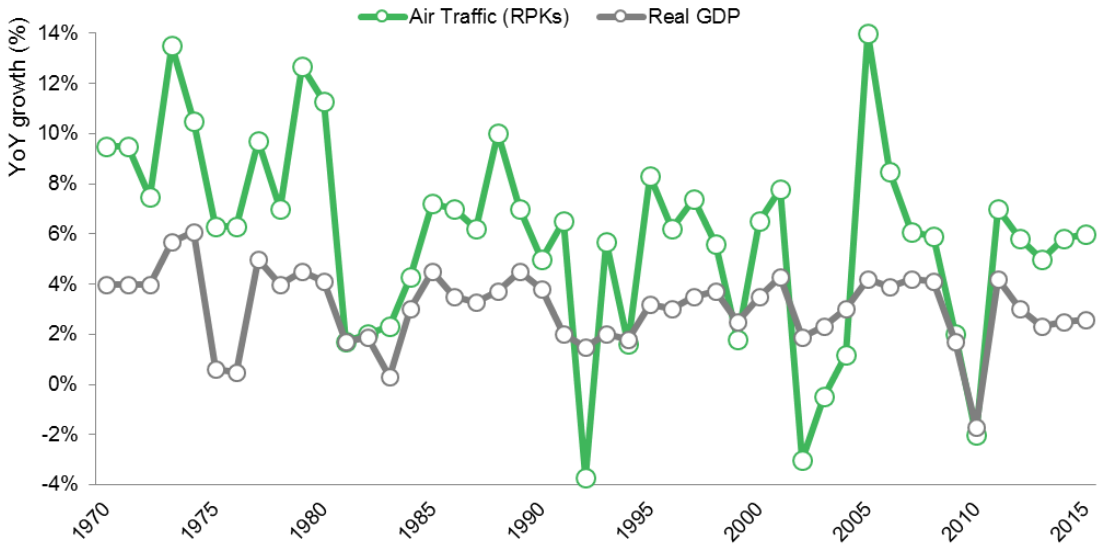
Airport	Airport code	Name of airport operator	Ownership of airport operator	% Shares	Shareholder name
Birmingham Airport	BHX	Birmingham Airport Limited	Mostly private	49% 48.25% 2.75%	Metropolitan Boroughs of the West Midlands AGIL – Ontario Teachers Pension Plan AESOP – Birmingham Airport Staff Trust
East Midlands Airport	EMA	Manchester Airports Group (MAG)	Mostly Public	35.5% 35.5% 29%	IFM Investors City Council of Manchester Greater Manchester local authorities

Source: Mott MacDonald analysis of ACI Europe Report – The Ownership of Europe's Airports 2016

1.4 Global aviation market growth context

Amongst the drivers of air traffic demand, economic growth is the primary driver of demand, both as it largely explains past performance and it forms the basis of forecast continued growth. Figure 1 shows the correlation of Gross Domestic Product (GDP) growth and air traffic growth, measured in Revenue Passenger Kilometre (RPKs) flown. In recent years, air travel has grown significantly more rapidly than growth in GDP.

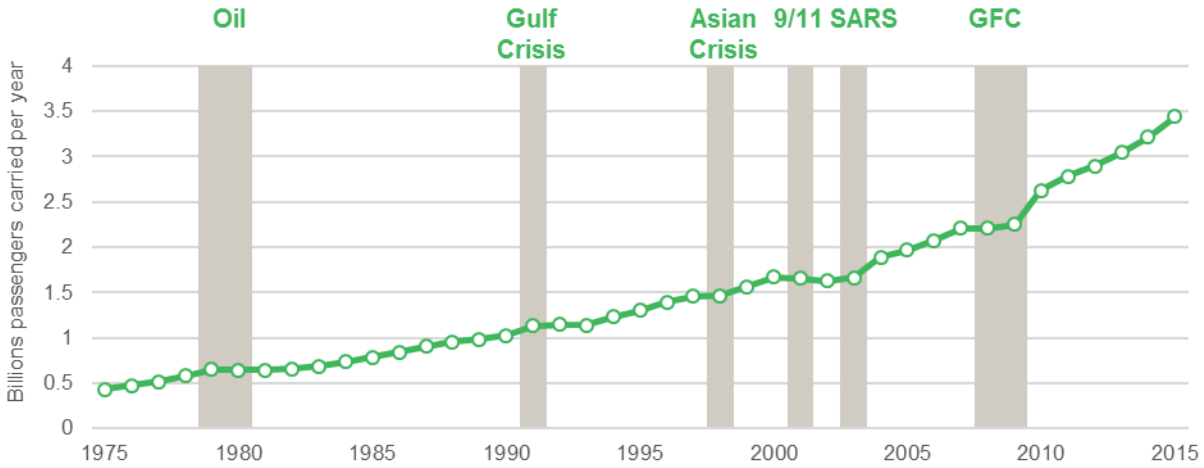
Figure 1: Air Traffic (RPKs) vs Real GDP between 1970 and 2015



Source: ICAO, IHS Economics, Airbus

However, there is a risk of overstating economic activity as a driving force to air traffic growth, especially during a downturn, as Figure 2 illustrates below. Although the air transport industry is subject to occasional market shocks, the industry's demand is resilient; services are often seen as essential, and spending on discretionary trips for vacations or family events is frequently high priority. Over the past 30 years, the aviation industry has experienced recessions, oil-price shocks, near pandemics, wars, and security threats, yet traffic has continued to grow on average at 5 percent annually.

Figure 2: Global air passengers carried and world crises



Source: ICAO, IHS Economics, Airbus

The demand for air travel has been growing on a year on year basis, the number of passengers have roughly doubled every 15-20 years and this is expected to continue in the future. The expected growth rate is between 3.7% and 4.8%. Figure 2 shows that economic and political tensions have a negative effect on the growth of the aviation industry. However, the data also shows that the negative effects will generally only be felt for a short period of time.

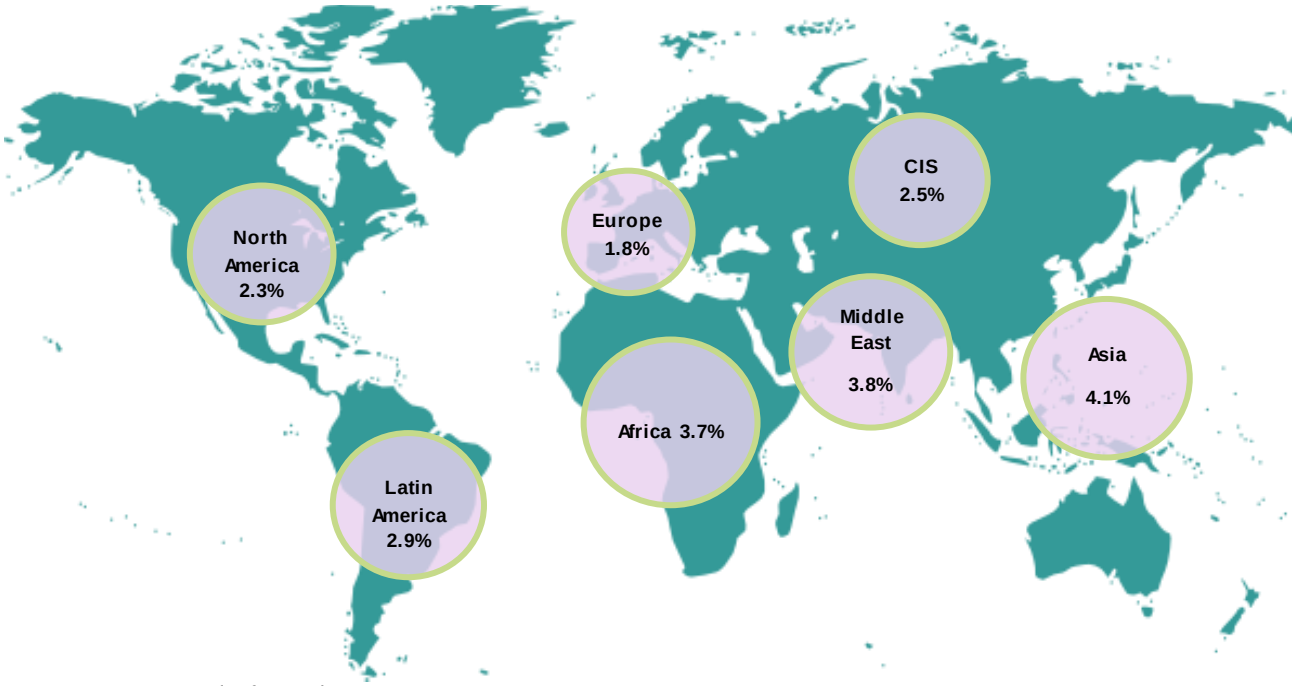
1.5 Drivers of long-term traffic growth

As shown in Figure 1 there is a strong correlation between GDP growth and the growth in air travel, nonetheless this is not the only economic factor that can have a positive effect on the growth of passenger numbers. The composition of the population of the country, the total population numbers and the GDP per capita are equally important. Since the majority of trips is made by people in the labour force, a country with a growing and young population can expect growth in passenger numbers. Similarly, if due to growing GDP the middle class in a country is developing, the market for air travel grows too. Another important factor is urbanization - by 2035 it is anticipated that 62% of the world population will live in cities. Because more people live in cities, the demand for travel increases. Lastly, international trade and investment links require the availability of enough travel possibilities to target cities/countries.

For the long term economic outlook at a global and regional level, recent forecasts agree that structural transformation and policy reforms are the key drivers that will allow for the necessary industrial capacity and global trade that will ensure a sustained economic growth in the long term. IHS Economics (which forms the basis for the Boeing, Airbus, Bombardier and Embraer long term forecasts) and the Japan Aircraft Development Corporation (JADC) in their Worldwide Market Forecast both project global economic growth of 2.9% per annum for the period of 2015-2034 (Figure 3).

Meanwhile, according to the Economist Intelligence Unit, the global economy is projected to grow at a lower level, around 2.5% on average for 2020-2030, 2.1% for 2030-2040 and 1.8% for 2040-2050[1]. Stronger growth is forecast for the Africa & Middle East region through to 2030. The Americas are forecast to grow at about the global average rate, while Europe is expected to grow more slowly in the long term. These developments are reflected in the changes of the regional shares of global GDP, illustrated on Figure 4.

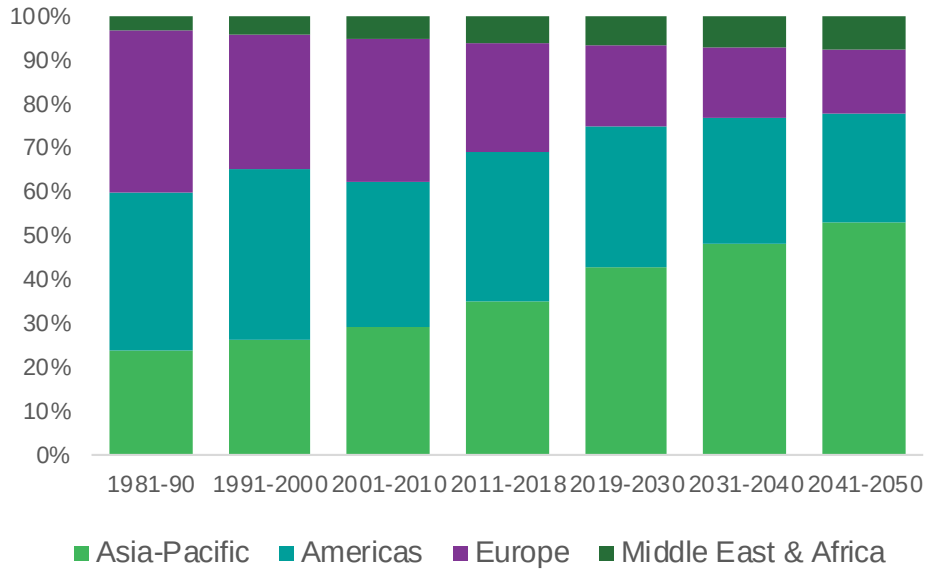
Figure 3: IHS Economics projections of Real GDP annual growth by region for 2016-2035



Source: IHS Economics for Boeing CMO 2016-2035

[1] EIU Global Forecasting 2050 – Long-term key trends

Figure 4: Regional share of global GDP



Source: Economist Intelligence Unit, 2016

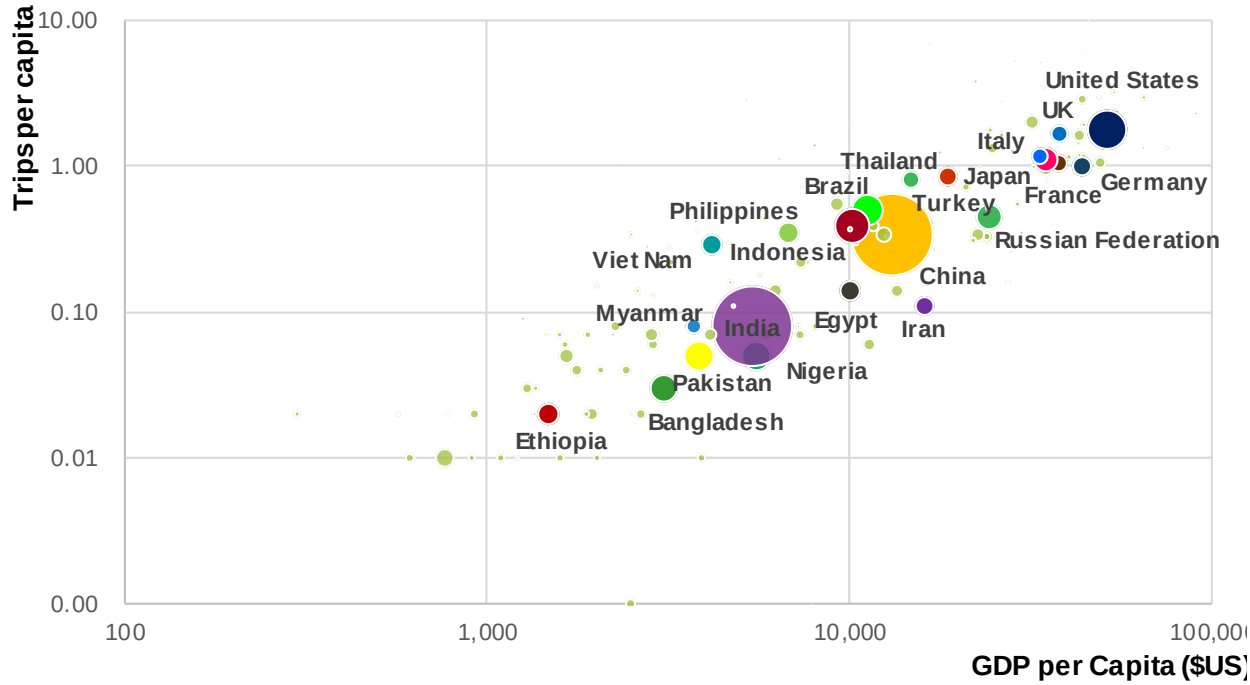
Another useful economic indicator for air travel demand is per capita income, which is a measure of disposable income and correlates strongly with a country population's propensity to fly. Within a given region, propensity to fly as measured in number of trips or in revenue passenger kilometres (RPK) that generally increase with per-capita income.

Generally, markets that are more open are more responsive to changes in per capita income because airlines are freer to add routes, frequencies, and seats to capture demand. In a more regulated environment, demand may increase with GDP per capita, but lower service quality and higher pricing may restrain travel growth. Geography may also influence travel within a region, with islands or poorly connected land masses necessitating more air travel. Emerging countries are developing large new middle class populations through increased GDP per capita and wider distribution of wealth. This means that more people in developing countries are reaching the threshold of wealth where discretionary air travel becomes possible.

Demand for air travel continues to increase rapidly when GDP per capita reaches about $5,000 to $10,000[2] per annum. Figure 5 shows the relationship of trips per capita to the GDP per capita by country, with bubble size proportionate to the country's population.

[2] JADC Worldwide Market Forecast 2016-2035

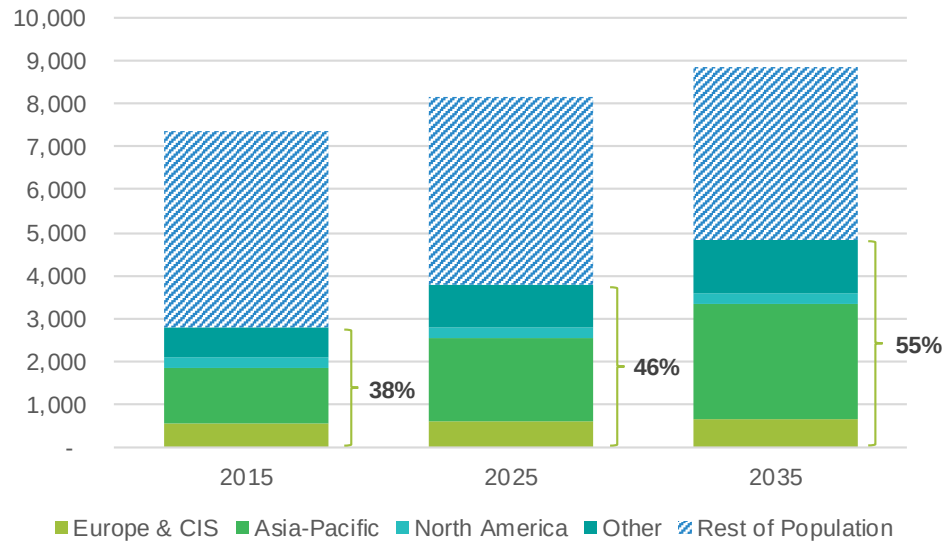
Figure 5: Propensity to fly in 2015 (logarithmic scale)



Source: Sabre, WBG, IHS, Airbus

Demographic changes affect both the overall GDP growth rates and growth in demand for air travel. The growth of working age population is expected to have a major impact on the expansion of the middle class population of emerging economies, as is identified by Airbus and Oxford Economics on Figure 6.

Figure 6: Middle class population's regional breakdown and share of world population – Present and Forecast

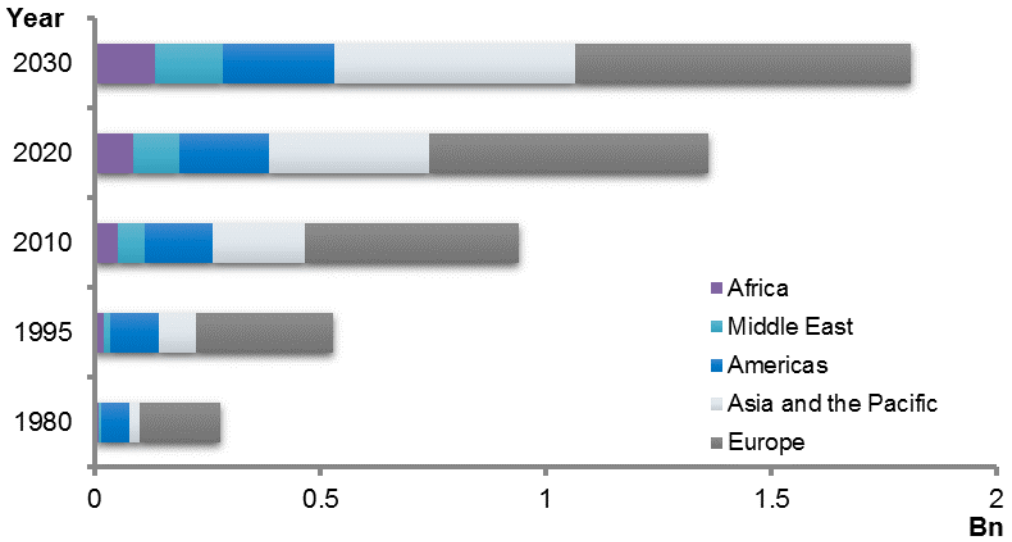


Source: Oxford Economics, Airbus GMF 2015

According to the UN World Tourism Organisation (UNWTO), tourism has grown almost uninterrupted over time, despite occasional shocks, demonstrating the sector's strength and resilience. The

following 20 years look promising for the performance of international tourist arrivals as shown in Figure 7. Most of the growth will be captured by tourist flows into emerging economies, as their tourism product develops and as the income of their middle class population increases. This trend translates into an average annual visitor increase of 4.9% to 2020 and of 3.8% between 2020 and 2030. Advanced economies will also attract additional visitors, albeit at a slower rate, with a 2.6% annual growth on average to 2020 and 1.8% annual growth on average from 2020 to 2030.

Figure 7: International tourist arrivals history and projections by region of destination



Source: UNWTO, 2016

1.6 Long-term passenger forecast

As part of their long term strategic planning, Airbus and Boeing publish their forecasts of air travel demand for the next 20 years. These two market outlooks provide insights on the manufacturers perceptions of global and regional growth of commercial aviation, based on macroeconomic indicators, aircraft orders and industry expertise. The global air traffic growth is projected by both manufactures at 4.5-4.8% which expect Asia Pacific to be the region with the highest expected growth rate over the next 20-year period. Half of the new passengers in the next 20 years will be travelling to, from or in the Asia-Pacific region. Driven by the region's strong economic development, more than 100 million new passengers are projected to enter the market annually. The slowest growing area is Europe with a predicted annual growth rate of 2.5%, this will still add an additional 536 million passengers to the market.

According to IATA, by 2036, 7.2 billion passengers will travel by air annually. The forecast nearly doubles the 3.8 billion passengers expected to utilise air transport in 2016. As in the aircraft manufacturers forecasts, Asia-Pacific region is forecast to provide over half of the new passengers over the next 20 years. China will take the top spot as world's largest aviation market by 2029, overtaking the US. India will be the third largest market – surpassing the UK. The growth segmented by region is forecast to be:

- **Middle East** – CAGR of 5% between 2016 and 2036 with 258 million new passengers to enter the market for a total of 414 million.
- The **Asia-Pacific** region will see its air passenger totals rise 4.7% over the period, with 1.8 billion new passengers for a total of 3.1 billion.
- **Latin America** will see an influx of 658 million new passengers for a total of 345 million passengers annually, a 3.8% rise.
- **North American** passengers will increase by 2.8% over the period with 536 million new passengers for a total of 1.3 billion.

- The **European** market will add an additional 570 million passengers, up 2.5%, over the period, for a total market of 1.5 billion passengers.
- **Africa** is forecast to grow by 5.1% per annum in the next 20 years with 192 million additional passengers.

1.7 Long-term cargo forecast

World air-cargo volume, in spite of exogenous shocks arising from economic and political events and natural disasters, grew at an average of 5.2 % per year over the last three decades. After a period of stagnation that followed the global economic slowdown, air cargo traffic started to recover in late 2013. There is continued demand for the speed and reliability benefits that air freight offers. Industries that require transport of time-sensitive and high-value commodities such as perishables, consumer electronics, high-fashion apparel, pharmaceuticals, industrial machinery, and automobile components recognize the value of air freight, and this value will continue to play a significant role in their shipping decisions. The restructuring of logistics chains to serve the rapidly growing e-commerce industry also requires the unique capabilities that air cargo provides and offers a new area of growth.

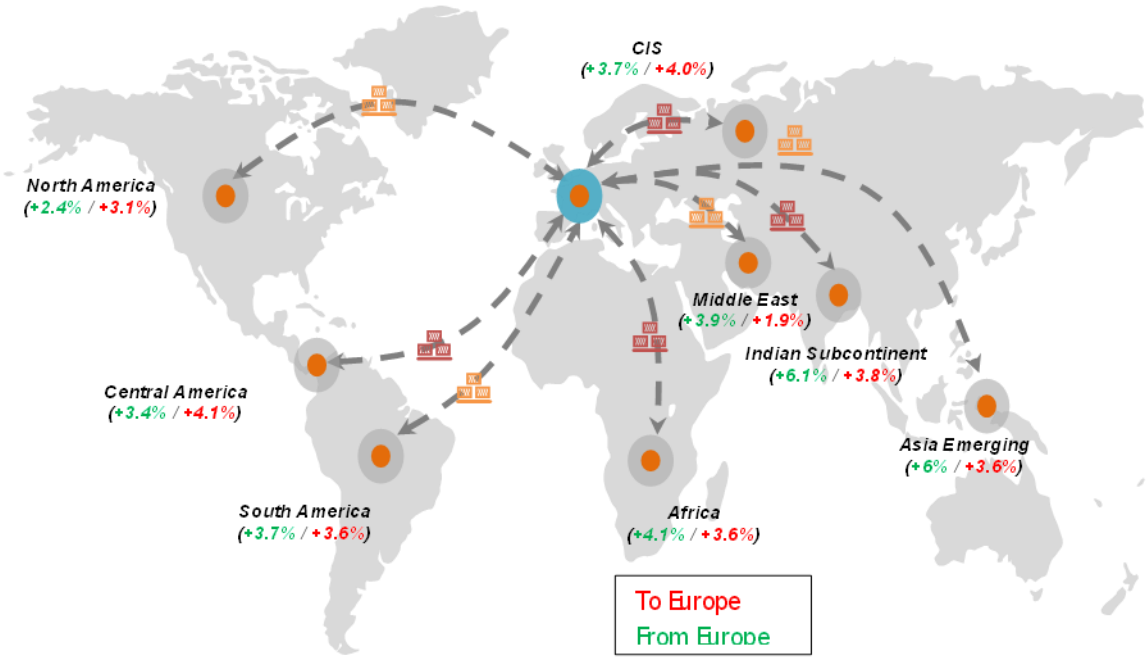
As global GDP and world-trade growth accelerate, air cargo traffic, as measured in revenue tonne-kilometres, is projected to grow an average 4.2% per year over the next 20 years. In turn, air-cargo traffic will grow, and sustained growth should lead to improvements in capacity balance and yields.

Figure 8: Relationship of global trade to International and Domestic Air Freight – Year on year growth

Source: ACI World Traffic Reports, CPB World Trade Monitor, WTO

For Europe freight flows in particular, the following figure helps with illustrating what are the anticipated growth rates of air cargo volumes between Europe and its major trading partners. For European exports carried by air, the Indian subcontinent and the various Asian emerging economies will be the key growth end markets, with 6.1% and 6% pa respectively. For imports, the flows from Central America and again the Indian subcontinent, emphasizing the importance of this partner to Europe, will show the highest growth rates, with 4.1% and 3.8% pa.

Figure 9: Air freight flows from/to Europe - Growth projections for 2015-2035



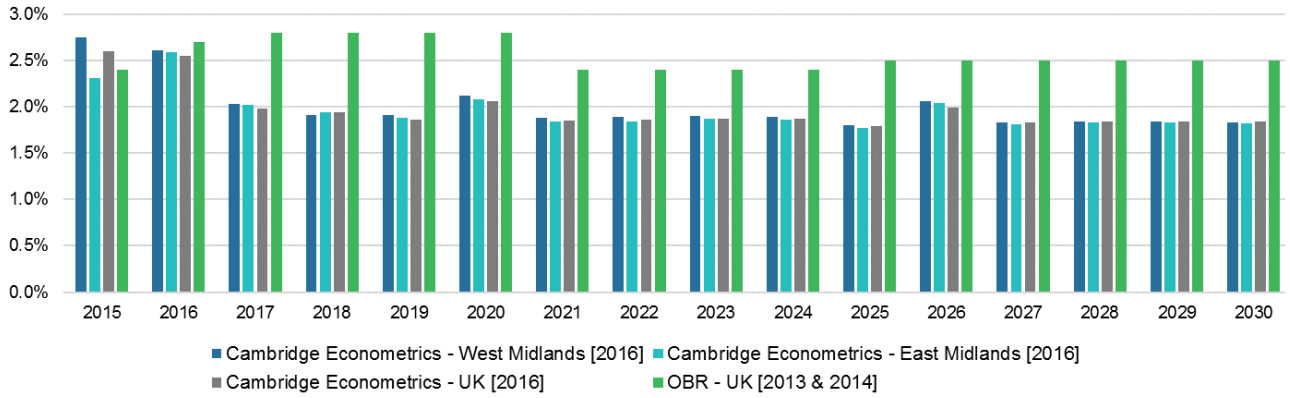
Source: Boeing

1.8 Midlands airports growth in the global context

The recent Government announcement of its support to the development of a third runway at Heathrow has provided clarity in a debate that lasted decades. The Government had previously formed an independent commission (the "Airport Commission", *AC*) to inform on the options available concerning additional capacity creation in the Southeast. The Final Report of the commission was issued in July 2015.

Detailed traffic forecasts for all UK airports were developed as part of the AC work for a various range of scenarios. Section 1.4 stressed the relevance of macroeconomic conditions, especially GDP growth, as drivers of traffic growth. Figure 10 reports on the differences in GDP growth assumed by the AC model (based on a combination of OBR data from July 2013 and March 2014) and the latest GVA growth rates projections issued by Cambridge Econometrics (CE) as part of the Midlands Connect project. While the base year growths are largely in line among the two sources, it is noted that every year between 2017 and 2030 the national growth rate forecast by CE is circa 0.7 percentage points lower than the OBR rate. OBR data for 2016 was not published due to the Brexit vote. Traffic forecasts are due to be updated by the end of 2016 by the Department for Transport (DfT). In the interim, the reason for such discrepancy will be investigated.

Figure 10: Comparison of GVA growth rates 2015-2030 by region and by source for UK

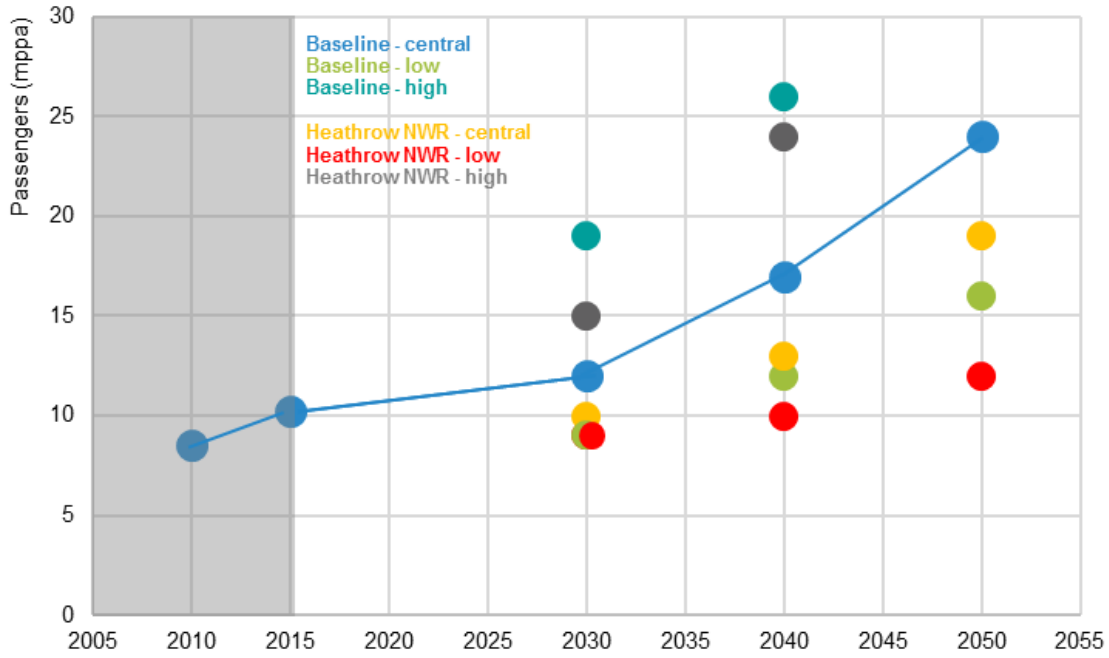


Source: Mott MacDonald analysis of Airport Commission - Strategic Fit: Forecasts, November 2014, OBR forecast July 2013 (for the years 2019-2030) and March 2014 (for the years 2014-2018), Cambridge Econometrics forecasts for GVA by region 2015-2030

Figure 11 and Figure 12 show the traffic forecasts for Birmingham and East Midlands airports under the AC's *Assessment of need* scenario. This is one of the five scenarios that were run by the AC and although it should not be considered a "central" scenario, it is based on central projections of macroeconomic forecast published by the Office for Budgetary Responsibility (OBR), OECD and IMF which drive future growth. The data presented below is for a *carbon-traded* scenario, where it is assumed that carbon emissions from flights departing UK airports are traded in the carbon market. The opposite case is known as *carbon-capped* case, where traffic growth is constrained by a cap in carbon emissions with no trading of carbon permits. The AC also considered various airport expansion options. The figures below include the baseline option (no new runway available in the Southeast) and the LHR NWR option (Heathrow Airport Northwest Runway). These two cases provide respectively the upper and lower bound of traffic growth for the Midlands airports with other expansion options (Gatwick 2nd runway and Heathrow Airport Extended Northern Runway) causing traffic volumes at Birmingham and East Midlands between the abovementioned boundaries. Low and high cases were calculated around each central projection. According to the AC there is a 20% probability that the outcome demand will be lower than the low forecast and 20% probability that the outcome demand will be higher than the forecast for each combination of scenarios, capacity development option and carbon trading case.

The blue lines in Figure 11 and Figure 12 represent the actual traffic in 2010 and 2015 for each airport and the forecast pattern for 2030, 2040 and 2050 under the baseline / central case. While the AC Final Report was issued in November 2014, the model was calibrated using 2011 airport traffic. The visual analysis of Birmingham growth pattern between 2015 and 2030 indicates that the airport has grown more than forecast in the past few years – 2015 performance was already above three of the cases reported by the AC. The wide vertical range between the Heathrow NWR and baseline outturns indicates the impact that having a new runway in the Southeast might have on traffic at Birmingham. This will be analysed in more detail in Chapter 5. High case forecasts for 2050 have not been reported by AC as the model runs cannot continue beyond 2042 in the high case.

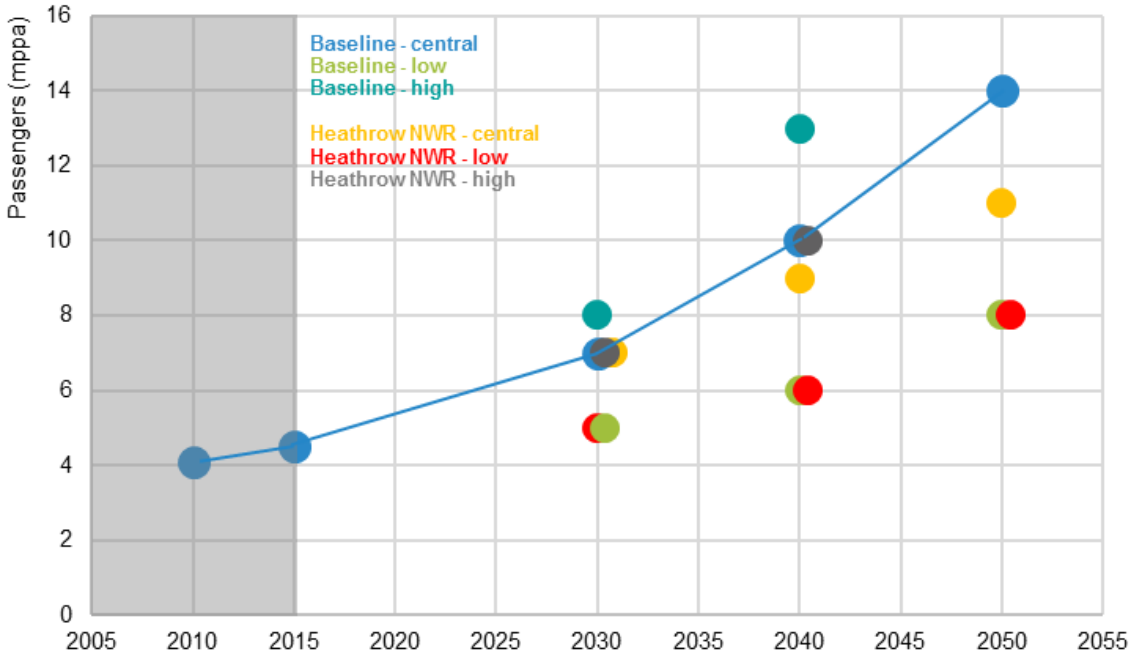
Figure 11: Birmingham airport passengers forecast – Baseline vs Heathrow North-West runway scenario for base, low and high cases – Assessment of need - carbon traded scenario



Source: Mott MacDonald analysis of CAA and Airports Commission - Strategic Fit: Forecasts, November 2014

Compared to Birmingham airport, East Midlands forecast traffic is less reliant on the implementation of additional capacity in the Southeast. To meet the 2030 forecast, the growth between 2015 and 2030 should be slightly above the last 5 years performance.

Figure 12: East Midlands airport passengers forecast – Baseline vs Heathrow North-West runway scenario for base, low and high cases – Assessment of need - carbon traded scenario



Source: Mott MacDonald analysis of CAA and Airports Commission - Strategic Fit: Forecasts, November 2014

As evidenced in Table 3 below, the strong growth of Birmingham airport is underlined by its 0.1% gain in market share of Non-London traffic in the past 5 years. This contrasts with the declining trend set by the AC forecast for both baseline and Heathrow NWR options. The same cannot be said for East Midlands which in the past 4 years although gaining 400,000 additional passengers has not grown its share of Non-London traffic.

Table 3: 2010 and 2015 airports performance and 2030 forecast for Baseline and Heathrow North-West runway scenario Assessment of need - carbon traded scenario, central case

	2010	2015	2030 baseline	2030 Heathrow NWR
Birmingham	8.5	10.2	12	10
East Midlands	4.1	4.5	7	7
London	127	154	184	205
Non-London	83	97	130	126
UK	210	251	314	331
Birmingham% Non-London	*10.2%*	*10.3%*	*9.2%*	*7.9%*
Birmingham% UK	*4.0%*	*4.0%*	*3.8%*	*3.0%*
East Midlands % Non-London	*4.9%*	*4.6%*	*5.4%*	*5.6%*
East Midlands % UK	*2.0%*	*1.8%*	*2.2%*	*2.1%*

Source: Mott MacDonald analysis of CAA data and Airport Commission - Strategic Fit: Forecasts, November 2014

1.9 Enablers for growth

This section reports on two elements that are recognised to affect traffic growth at regional UK airports, namely the Air Passenger Duty (APD) and Air Service Agreements (ASA).

1.9.1 UK Air Passenger Duty (APD)

The UK Air Passenger Duty (APD) has been first levied in 1994 to cover the environmental costs of air travel and because the industry had only been lightly taxed until then, considering the still prevailing exemption from VAT and fuel duty. Every passenger on a flight originating at a UK airport is required to pay APD at the time of booking the ticket. This applies to flights on all aircraft with a take-off weight exceeding ten tonnes and with over 20 seats. Passengers arriving on an inbound flight to the UK are exempted from the tax and so are travellers connecting at UK airports. Since 2015, APD also excludes children under the age of 12, which has been extended to 16 years in March 2016. While APD usually incurs at all UK airports, there are some exceptions. These include direct long-haul flights over 2,000 miles from airports in Northern Ireland, as well as all flights from airports in the Scottish Highlands and Islands.

The level of APD increases with flight length and cabin class. It was initially set at £5 for short-haul and £10 for long-haul routes, but these amounts have been raised several times since 1994. The most recent adjustments apply from April 2017. As illustrated in Table 4, APD will remain unchanged for short-haul services, £13 for economy and £26 for all other classes, while it will grow from £73 to £75 for long-haul routes in economy class and from £146 to £150 for long-haul routes in all other classes. Passengers travelling on aircraft with less than 19 seats, but weighing over 20 tonnes, will experience an increase of £12 to £450. This category includes most business jets.

Table 4: APD rates applied 1st April 2017 (vs APD rates applied 1st April 2016)

Distance (miles) from London to destination country's capital (Band)	Economy class	Any other cabin class	Travel on aircraft > 20 tonnes and < 19 seats
0 – 2,000 miles (Band A)	£13 (£13)	£26 (£26)	£78 (£78)
> 2,000 miles (Band B)	£75 (£73)	£150 (£146)	£450 (£438)

From 2015 on, flight length was split in only two destination bands. Before that, flights longer than 2,000 miles were divided into three additional categories.

The rate of APD is currently determined by the HM Revenues & Customs (HMRC). However, from 2018 on, the Scottish Parliament receives the decision-making power over the level of APD at airports in Scotland and already announced to first cut the rate by 50%, before abolishing it completely. This has triggered calls from various sectors for a review of the APD applicable at English airports.

Since the introduction of the APD, airlines, airports, tourism associations and consumer protection bodies have strongly criticised and questioned the reasonableness of the tax. Besides claiming that APD negatively affects air travel demand and results in financial losses, they also highlighted the limitations it imposes on macroeconomic growth. A study published by PwC in 2013 revealed that an abolition of APD could increase UK GDP by 0.45% within the first 12 months, enhance travel demand, foreign investment and exports and consequently drive business growth and job creation. The level of these gains are estimated to be sufficient to offset the financial losses affecting the public treasury with the abolition of the tax.

At the same time, governmental institutions and economic researchers also stress the value of APD. In this context, they particularly highlight that the aviation industry is still excluded from VAT and fuel tax, resulting in annual savings of around £10 billion for the sector, which is notably higher than the £3.2 billion APD receipts estimated for the period between 2016 and 2017. Moreover, the financial loss in public funds caused by an abolition of APD would require authorities to reallocate or cut public spending, as well as raise tax in other sectors to develop alternative income sources. In response to the APD's assumed negative effect on air travel demand and tourism volume, the supporters also

point out that an abolition and subsequent decline in air fares would rather drive outbound travel demand and outbound spending. Therefore, it would not result in the intended domestic economic growth targeted by APD opponents. In addition, an abolition of APD is neither expected to have a significant positive impact on inbound nor on business travel demand. While the latter is less sensitive to price changes compared to domestic travellers, journey time rather than price levels is the decisive factor for the latter.

"Visit Scotland and Edinburgh Airport stated the Scottish Government detailing their plans and timetable on cutting Air Passenger Duty (APD) will help deliver a domestic tourism boom. The airport also said the details will make confirmation of a direct route to China "within touching distance"

CAPA news, 23 October 2016

As mentioned above Scottish Parliament is planning to remove APD and it has been reported by the Climate Change Committee, which suggests the Scottish Government's 50% reduction to Air Passenger Duty (APD) can be achieved with minimal environmental impact. The report, entitled "Reducing Emissions in Scotland Progress Report 2016", states that cutting APD by 50% would lead to an increase in flights and that any potential increase in CO2 would amount to only 0.1% of total Scottish emissions. According to Edinburgh Airport CEO, a "50% cut to APD in one move will incentivise airlines to bring more aircraft to Scotland which in turn will deliver greater inbound tourism and business opportunities creating new jobs and stimulating the economy to the tune of GBP300 million gross value added per year"

"This tax discourages business, investment, British people going on holidays… Where other countries have abolished these taxes, they have seen an immediate positive effect on the economy, and that's what the UK needs to consider"

International Airlines Group CEO Willie Walsh – Bloomberg, 8 September 2016

Amongst the other parties that have expressed their support for the abolition or reduction in APD are: easyJet, Ryanair, Belfast International Airport, Consumers England and Wales, Airport Operators Association (AOA). Flybe CEO Saad Hammad stated in June 2016: "APD is a barrier to regional development and a barrier to tourism, it needs to be ditched completely, or at the very least made more equitable (Airport-Business, 29 June 2016). He also added that APD is "levied disproportionately on regional flights - a typical domestic passenger can be charged up to 19 times the tax per-kilometre of a passenger on a long-haul flight". A similar position was taken by bmi regional CEO Peter Simpson (CAPA, 1 March 2016). British Air Transport Association (BATA), the trade body that represents UK airlines, stated that "there is compelling economic and political case for abolition of APD to improve the UK's international competitiveness, boost trade, increase productivity, encourage inbound tourism and support the travelling public"

"The UK has the highest aviation tax worldwide. This puts it at a competitive disadvantage as other European hubs take traffic and business away from the UK precisely because of APD"

Thomas Reynaert, MD Airlines for Europe (A4E), CAPA 8 September 2016

"Ryanair state that to enable them to offer Business frequencies from Birmingham and East Midlands airports there would have to be an abolition of the APD tax"

Ryanair – Midlands Connect stakeholder engagement

1.9.2 Air Service Agreements

Besides the economic drivers, ease of travel influences the growth of passenger numbers worldwide. To create the benefits that ease of travel brings, inputs from governments and airlines are required. If an airline wants to operate on an international route it is required that the country where the airline is registered has an agreement with the country where the airline wants to fly to. This air service agreement can specify the number of routes, airlines, flights and seats that are allowed on a daily or weekly basis. A liberal air service agreement allows airlines to pick up passengers at any airport in a country and bring them to any destination in another country. This is essential for the development of traffic and offering the right services to the right groups of passengers. The governments influence on this part is its ability to negotiate the appropriate air service agreement, while the airlines need the right business model in order to offer the services demanded by travellers.

The UK currently benefits from the EU liberalised aviation market. Any airline owned and controlled by nationals of EU member states is free to operate anywhere within the EU without restrictions on capacity, frequency or pricing. This is extended to countries part of the European Common Aviation Area (ECAA). The ECAA covers 36 countries and 500 million people. Beyond the internal European aviation market, a country's EU membership brings the benefits to its airlines afforded by air services agreements that are negotiated with third party countries at an EU level on behalf of all member states.

The most important of these is the so-called EU-US open skies agreement, which allows the airlines of both parties to the agreement to fly from anywhere in the EU to anywhere in the US and vice versa (although it does not allow access to domestic markets).

The Brexit vote puts uncertainty on the status of these agreements, however it is expected and fundamental that UK at least maintains existing traffic rights upon exiting the EU.

Air services to countries outside the EU, where negotiating authority has not been passed to EU level, remain the competence of the individual member state. The UK policy generally seeks to open up and liberalise these agreements to enable airlines to operate freely and competitively.

At the end of October 2016 the Department for Transport (DfT) UK has signed a new ASA with China to double the cap of weekly passenger flights from 40 to 100 for each side. During 2014 Chinese airlines were using only half of their allocation of traffic rights but in Summer 2016 this figure has peaked to 35 weekly flights, leading to Chinese airlines calling for urgent expansion of the bilateral agreement. The new agreement also removes the previous cap that airlines from each side could only serve six points. That cap had not been reached. The UK needs to continue to be proactive in the expansion of air service agreements to allow increased connectivity to the emerging markets which

are likely also to be those that suffer from the capping of frequencies and destinations. This will benefit the UK economy and regions with increased number of airports being allowed to be connected to international emerging economic centres.

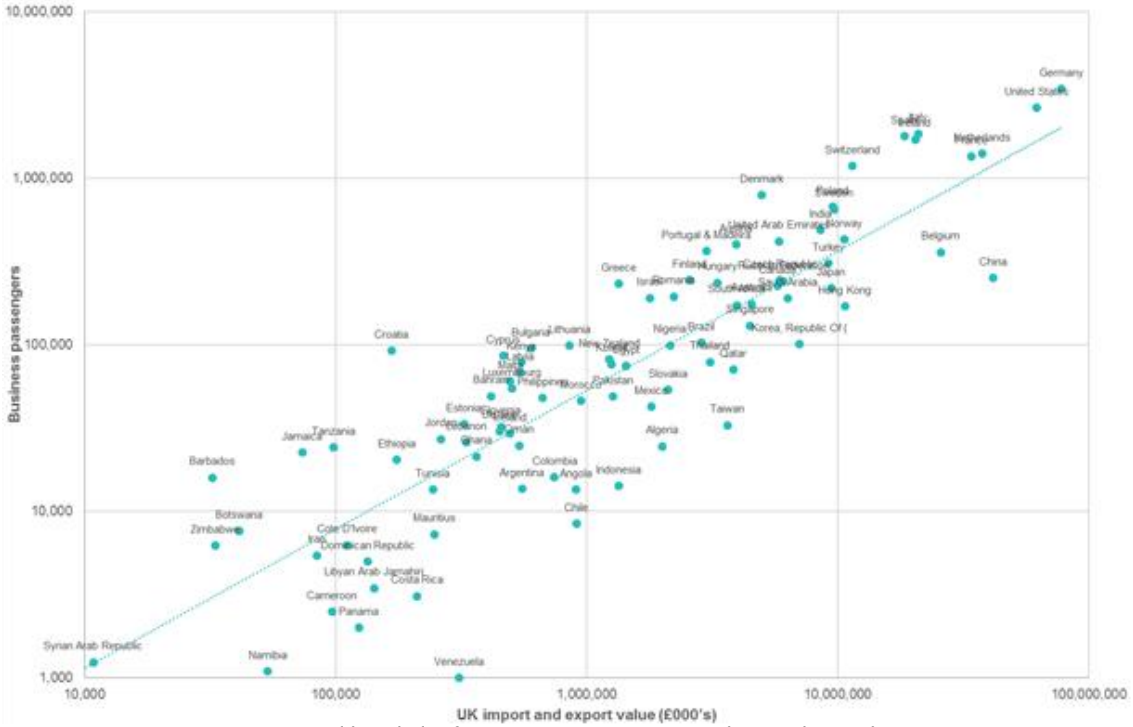
Part of the DfT Aviation Policy Framework 2015 plan is the extension of fifth freedoms to Gatwick, Stansted and Luton airports. Fifth freedoms are the rights granted to allow an airline of one country to land in a different country, pick up passengers and carry them on to a third country. According to the DfT "the UK has long had a general presumption in favour of liberalising fifth freedoms from airports outside the Southeast.", with the aim of improving connectivity and optimising the user of scarce capacity at London's airports. The CAA position is that this policy would deliver net benefits to UK interests when applied to airports outside the Southeast. The Government believes that such a policy should be extended to Gatwick, Stansted and Luton and in 2011 it was announced that a consultation would be started on this matter. According to DfT, this policy would be subject to the same conditions that apply to the UK's existing regional fifth freedoms policy, namely that the grant of such rights would be subject to a case-by-case consideration within the context of the current position in the UK's bilateral aviation relationship with the country concerned.

2 The air business passenger market

2.1 Airports – Connecting the Midlands businesses to the World

Air connectivity is essential for businesses to thrive in a globalised economy. The availability of air transport connections between countries is the cornerstone of the movement of people, goods and services in a timely manner. As Figure 1 indicates, UK trade value by country is highly correlated to the number of passengers travelling for business purposes, emphasizing the indispensable nature of airports as enablers of international growth of UK businesses.

Figure 13: UK trade in value and UK business passengers flows by country



Source: Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data and ONS data

Focusing on the Midlands, as much as 12% of the national economy GVA is produced in the region. The industries that create the highest GVA for the Midlands are also those that generate the highest amount of business passengers, highlighting again the importance of air links for the region. As indicated in Figure 14 there is a correlation between the number of business passengers and the corresponding GVA in value of the industry however there are specific industries such as manufacturing and real estate, which appear to produce less passengers in relation to the GVA they generate.

Figure 14: Correlation between Midlands industry GVA and Midlands business passengers in that industry

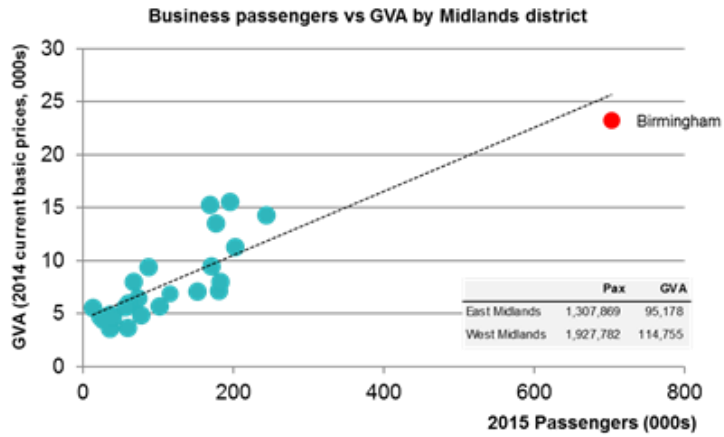
	Industry by GVA	
1	Manufacturing	14%
2	Wholesale and retail trade; repair of motor vehicles	11%
3	Real estate activities	9%
4	Human health and social work activities	6%
5	Education	6%
6	Construction	6%
7	Professional, scientific and technical activities	5%
8	Transportation and storage	4%
9	Administrative and support service activities	4%
10	Public administration and defence; compulsory social security	4%
	% of total	**70%**

	Business passengers in the Midlands by industry	
1	Wholesale and retail trade; repair of motor vehicles	17%
2	Education	10%
3	Computer, electronic and optical products	7%
4	Public administration; education; health	7%
5	Machinery and equipment not elsewhere classified	6%
6	Transportation and storage	5%
7	Professional, scientific and technical activities	5%
8	Business service activities	5%
9	Manufacturing	4%
10	Construction	4%
	% of total	**70%**

Source: Mott MacDonald analysis of CAA data and Cambridge Econometrics data

When the data is analysed at a district level, a strong correlation between the GVA generated by district and the number of business air passengers is evident. The Midlands businesses require aviation connectivity to be able to grow and compete globally.

Figure 15: Business passengers' vs GVA by Midlands district

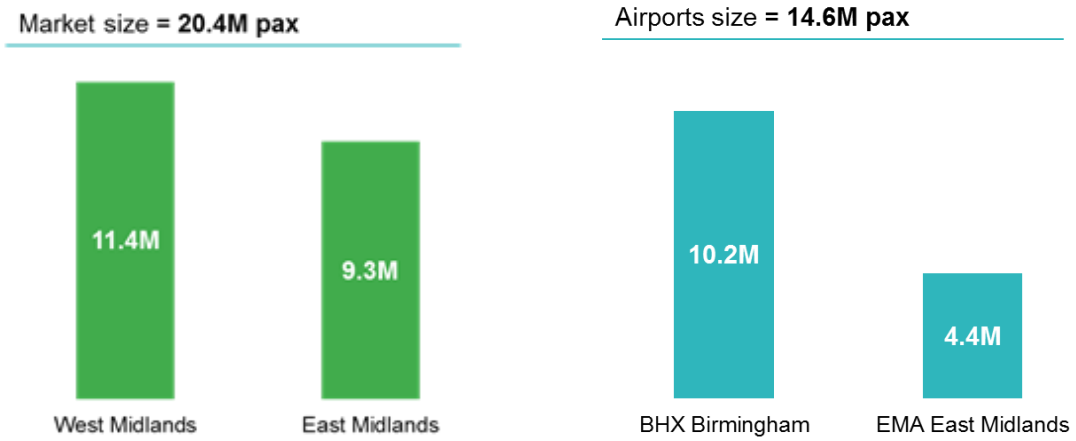


Source: Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data and Cambridge Econometrics data

2.2 Size of the market

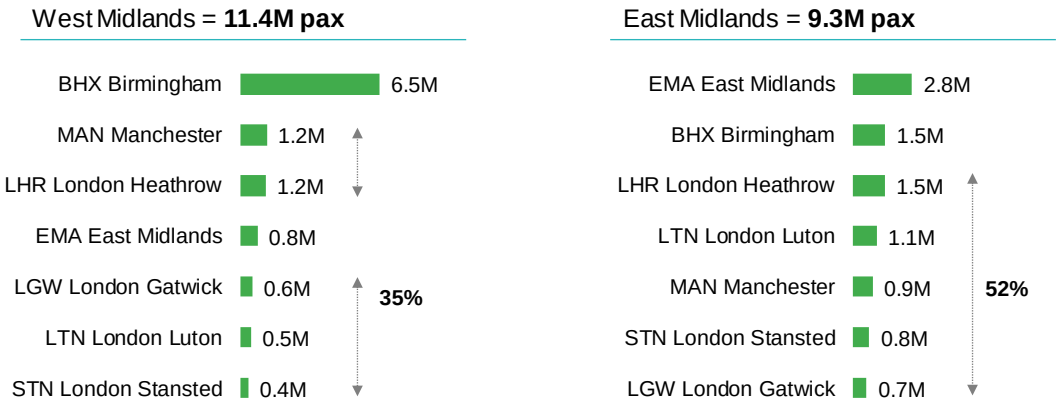
The overall size of the Midlands aviation market for 2015 is 20.4 million passengers, originating or ending their journeys in the region. The two major airports in the region, Birmingham and East Midlands, handle 14.6 million passengers. The majority of these passengers' origin is within the Midlands; however, the airports manage to attract passengers from other regions as well, while a part of the 20.4 million passengers with origin or final destination in the Midlands use airports outside of the Midlands region (e.g. London Heathrow) for their trips.

Figure 16: Midlands – Size of the aviation market



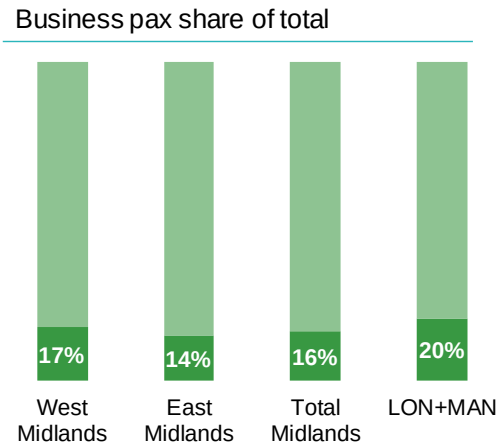
Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Figure 17: Airport choice trends



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Figure 18: Share of business passengers



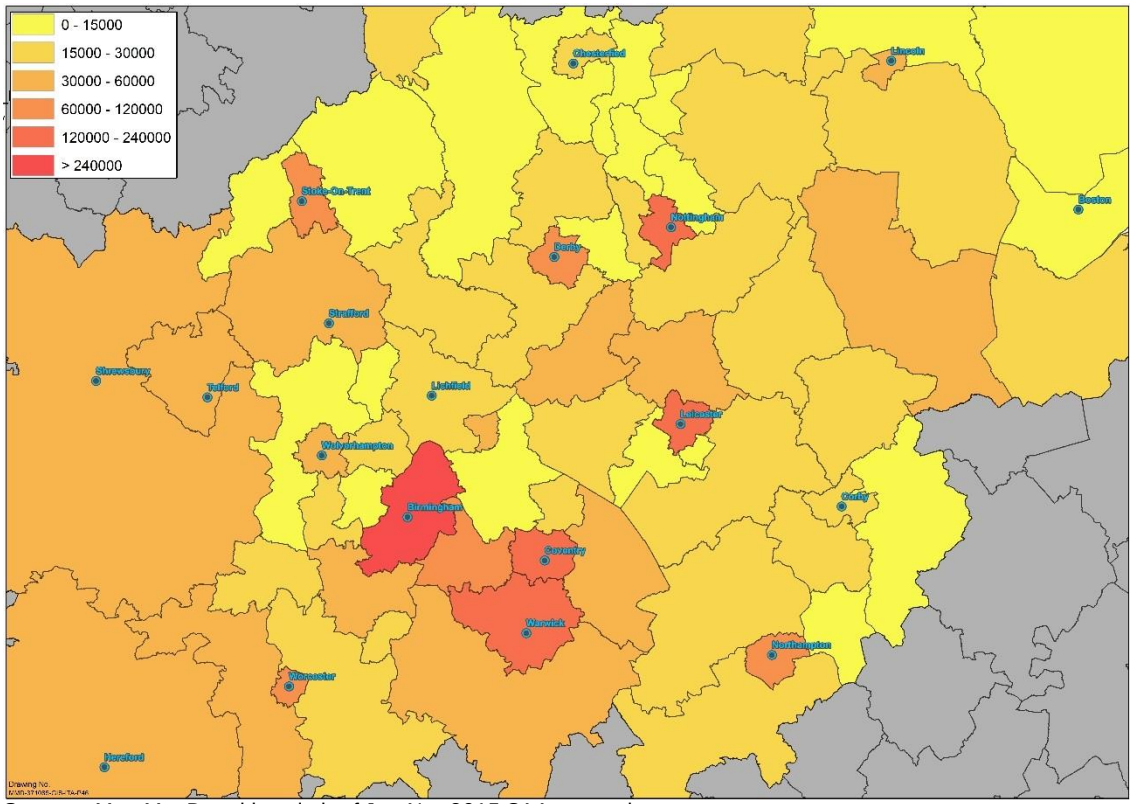
West Midlands = 2M business passengers
East Midlands = 1.3M business passengers

Midlands ▶ 3.3M business passengers

Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

The Midlands economy accounted for 3.3 million business passengers in 2015 (16% of total regional passengers), out of which 1.9 million initiated or ended their trip in West Midlands, while 1.3 million did so in the East Midlands region. As indicated in Figure 19 the key originating areas of business traffic correspond to the largest cities: Birmingham and Solihull, Coventry, Leicester, Northampton, Derby and Warwick all generated business passenger volumes over 100,000 in 2015. Birmingham LAD itself generated 700,000 business passengers, over 20% of total business passengers in the Midlands.

Figure 19: Air business passengers trip origin by Local Authority District (LAD) for West and East Midlands



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

The majority of these passengers travelled to international destinations. Western Europe was the leading destination region, followed by Eastern Europe and North America. Germany is the single largest destination country for the Midlands business passengers, followed by Ireland, Netherlands and Spain. The countries ranking is a function of the trade volumes between the UK and the foreign country, as indicated in Figure 13.

Figure 20: Airport of choice for Midlands business traffic

West Midlands

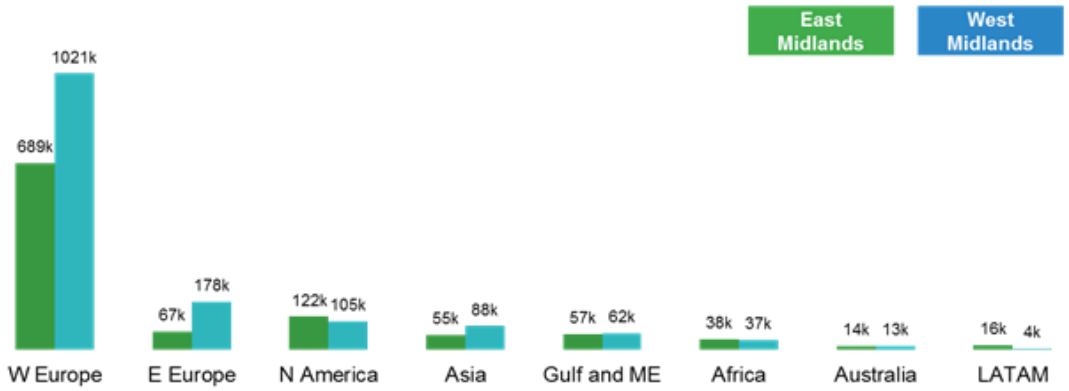
Pax	0.4M	1.1M	0.1M	0.1M	0.2M	1.5M	1.9M
	DOM	W EU	E EU	N AM	RoW	INT	TOT
BHX Birmingham	88%	69%	5%	10%	33%	54%	62%
EMA East Midlands	3%	1%	3%	0%	0%	1%	1%
LGW London Gatwick	1%	3%	0%	8%	5%	3%	3%
LHR London Heathrow	1%	11%	32%	72%	54%	22%	18%
LPL Liverpool	1%	1%	3%	0%	0%	1%	1%
LTN London Luton	0%	2%	46%	0%	0%	6%	5%
MAN Manchester	6%	9%	3%	10%	8%	8%	8%
STN London Stansted	0%	4%	9%	0%	0%	4%	3%

East Midlands

Pax	0.3M	0.7M	0.1M	0.1M	0.2M	1.1M	1.3M
	DOM	W EU	E EU	N AM	RoW	INT	TOT
BHX Birmingham	25%	27%	3%	0%	13%	20%	21%
EMA East Midlands	52%	11%	10%	0%	0%	8%	16%
LGW London Gatwick	2%	5%	1%	6%	4%	5%	4%
LHR London Heathrow	0%	18%	6%	87%	64%	32%	26%
LPL Liverpool	0%	0%	0%	0%	0%	0%	0%
LTN London Luton	8%	11%	50%	0%	4%	11%	11%
MAN Manchester	10%	10%	5%	7%	13%	9%	10%
STN London Stansted	2%	19%	24%	0%	1%	14%	12%

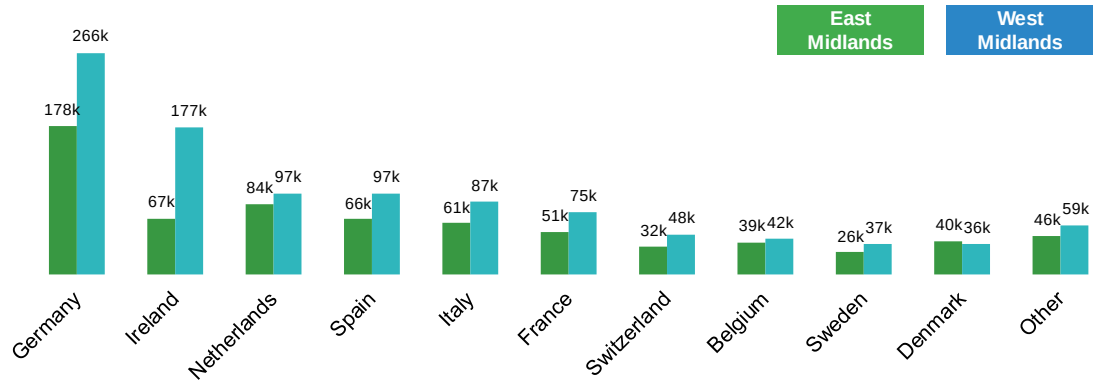
Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Figure 21: Midlands business passengers' final destination by region



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Figure 22: Midlands business passengers' final destination by region – Western Europe



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Table 5 indicates the number of airports that are connected to a selected list of British airports. These airport pairs are categorised as being either mainly "business" or "leisure" routes. Business routes have been categorised as those where either the volume of business passengers according to the CAA passenger survey is above 150,000 in 2015 or the share of business passenger out of total passengers is above 30% (whereas the national average is of 20%). As expected the number of business routes from EMA is the lowest of the sample, while Birmingham share of business routes out of total is the second highest of the sample, just behind Heathrow.

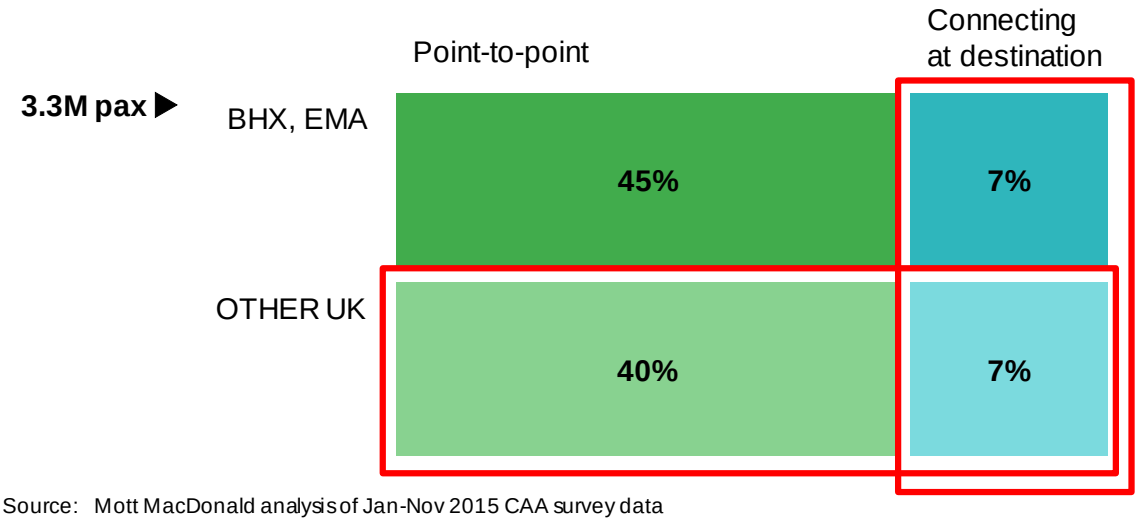
Table 5: Number of business and leisure routes by airport

	Business	%	Leisure	%	Total
LGW London Gatwick	63	*29%*	154	*71%*	217
LHR London Heathrow	91	*47%*	101	*53%*	192
MAN Manchester	74	*40%*	112	*60%*	186
STN Stansted	42	*23%*	137	*77%*	179
BHX Birmingham	53	*44%*	68	*56%*	121
LTN London Luton	36	*31%*	81	*69%*	117
EMA East Midlands	20	*25%*	59	*75%*	79
LPL Liverpool	24	*38%*	39	*62%*	63

Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Even through Birmingham appears to have a good mix of business routes out of the total airport offer, only 45% of the Midlands business passengers reach their destination with a one-leg flight from the local Midlands airports. As many as 40% travel to other UK airports and 14% need to undertake two-leg journeys to reach their final destination. While it is unlikely that the two airports can expand to reach any destination desired by business passengers, there is still room for route development potential to re-capture part of the demand that spilled to other airports or that require connections at foreign hubs.

Figure 23: Midlands: characteristics of airport choice of business passengers



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

In summary, Birmingham airport appears to serve the businesses well needs in its catchment area (mainly the West Midlands) with a good range of destinations and short access time. Business passengers are time sensitive travellers and choose airports primarily based on availability of direct connections and access time to airports. Markets whose accessibility can be improve are Eastern Europe (currently a large share of travellers use Luton Airport) and North America (where majority of passengers choose London Heathrow airport)

Businesses in the East Midlands region are less well-served. Where direct services are available (mainly on domestic destination) – East Midlands Airport is chosen. Otherwise this segment of passengers travel to Birmingham or airports further away such as Manchester, London Heathrow, Luton or Stansted. The catchment areas of Birmingham and East Midlands airport overlap with Birmingham being in the stronger position for business-oriented services while East Midlands is in a stronger position for low-cost leisure services and freight traffic

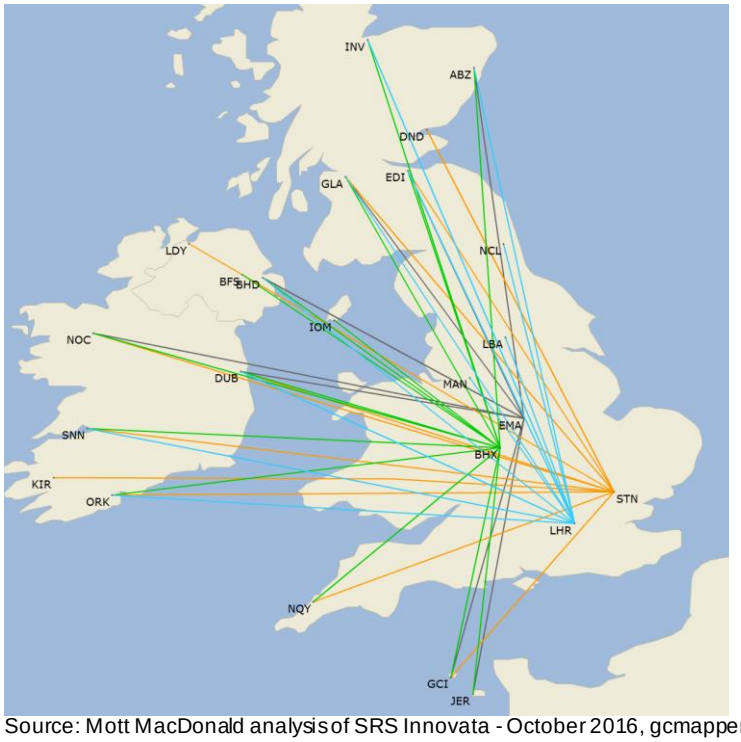
AMEX Corporate Travel state that the journey time to LHR is not seen as excessive from the Midlands area. Click travel state there is a preference to taking a long haul service from Heathrow as opposed to a connecting service from East Midlands or Birmingham. The opinion of these two travel management companies underlines the current travel patterns. Perception of the local airports as business-oriented gateways is also important. East Midlands Chamber of Commerce stated that a new business lounge has been well received in efforts to make the airport more attractive to the business community

2.3 Analysis of the Midlands airport route network

This section of the report reviews the route portfolio of Birmingham (BHX), East Midlands (EMA) in comparison respectively to London Heathrow (LHR) and London Stansted (STN).

The map in Figure 24 shows the UK Domestic connectivity from London Heathrow and Stansted, highlighting the good connectivity these airports have. Similarly, Birmingham offers a good domestic network. East Midlands has a more limited offering.

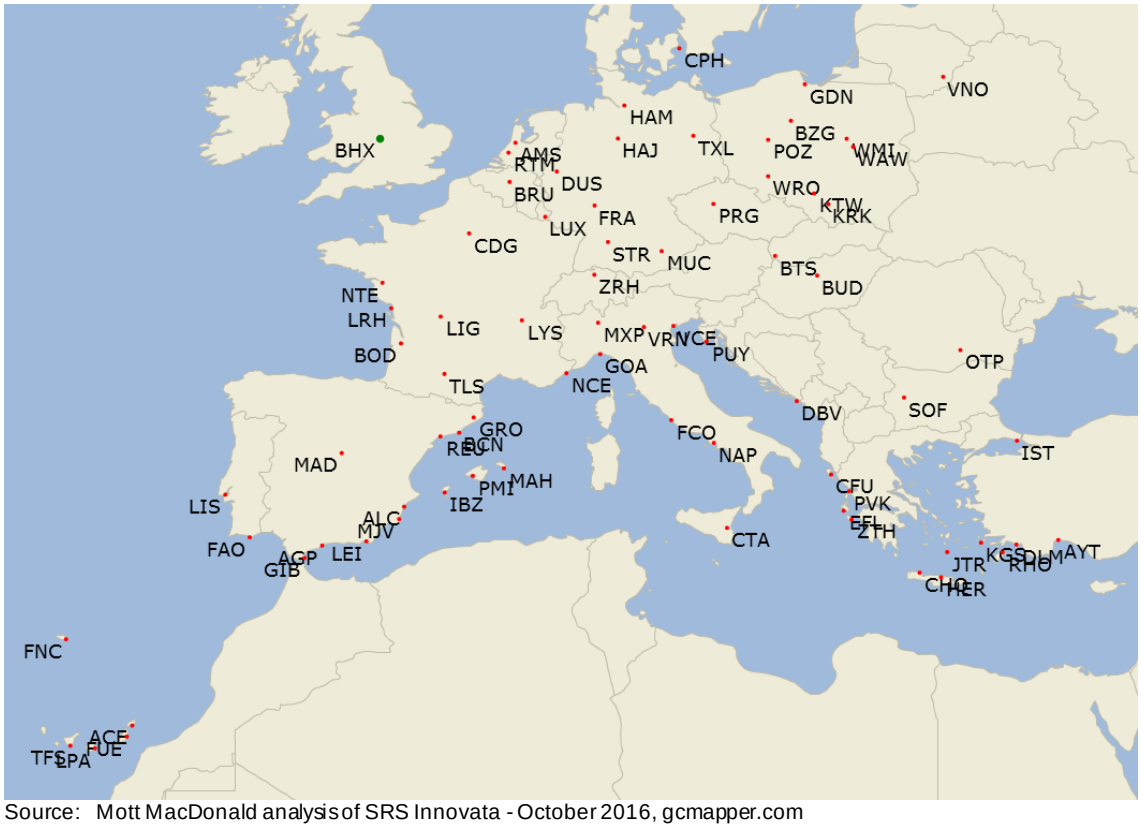
Figure 24: Route Network BHX, LHR, STN and EMA to UK and Ireland destinations



Source: Mott MacDonald analysis of SRS Innovata - October 2016, gcmapper.com

Birmingham Airport's European route map in Figure 25 details a good range of European points served, with some of the key business capitals served e.g. Paris, Brussels, Madrid and Dusseldorf. There is certainly still room for further development, in terms of frequencies addition and number of routes served.

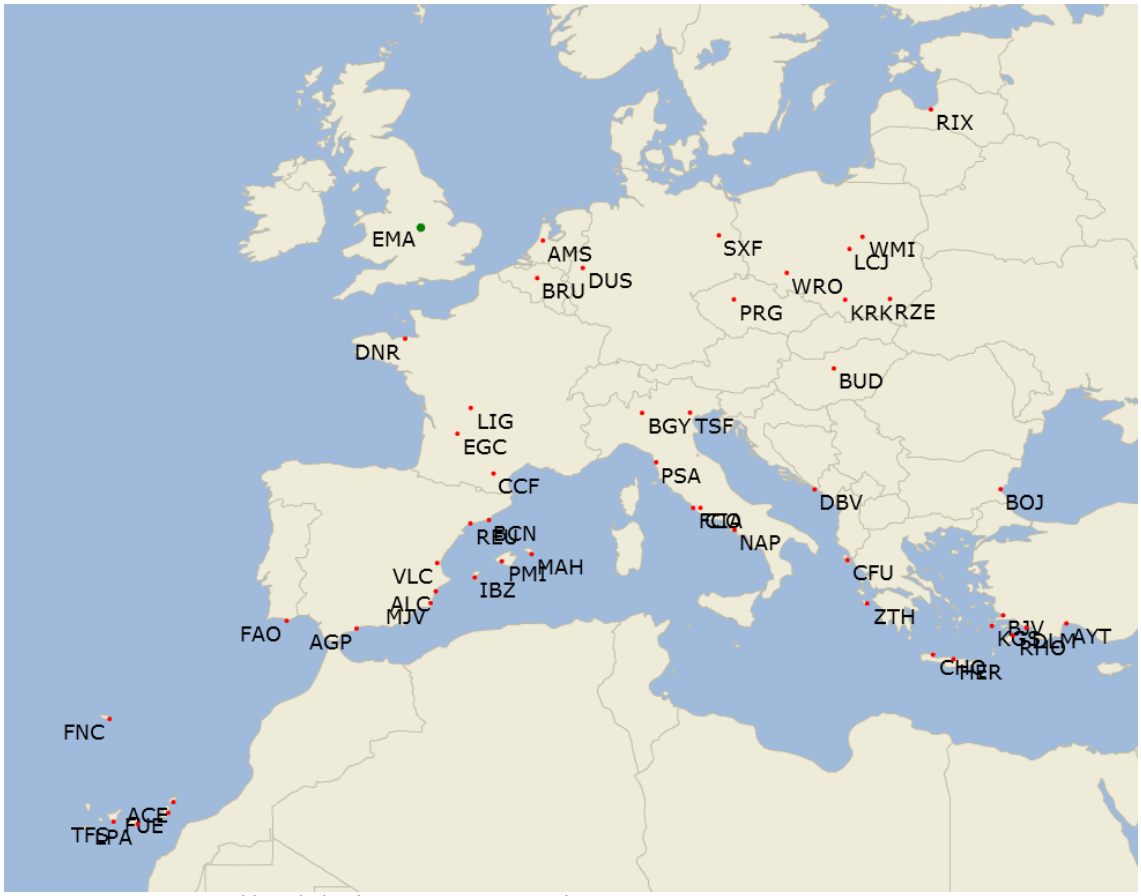
Figure 25: Route Network BHX to European Destinations



Source: Mott MacDonald analysis of SRS Innovata - October 2016, gcmapper.com

In comparison to the Birmingham airport European route network, the East Midlands route map in Figure 26 highlights the leisure focus of the destination portfolio. With the exception of Amsterdam, Brussels and Dusseldorf there are many opportunities to develop business city destinations.

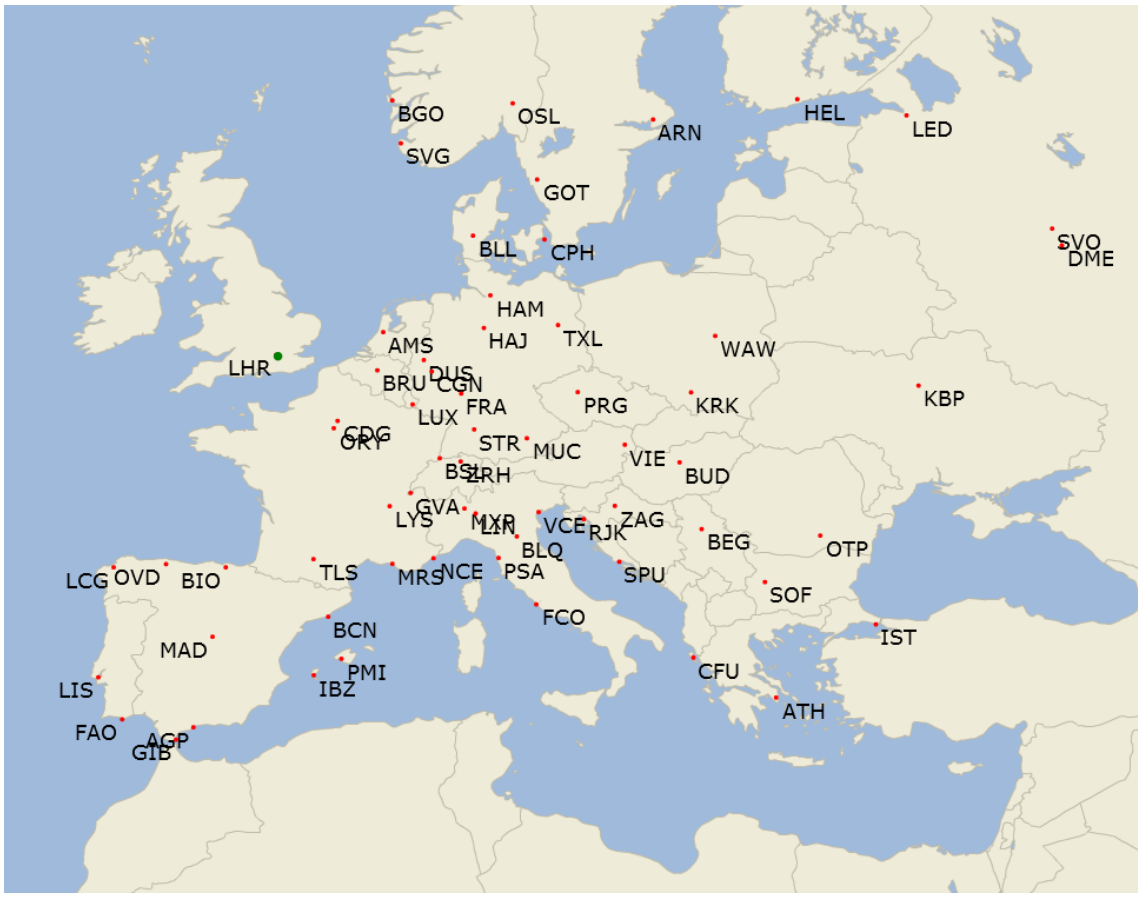
Figure 26: Route Network EMA to European Destinations



Source: Mott MacDonald analysis of SRS Innovata - October 2016, gcmapper.com

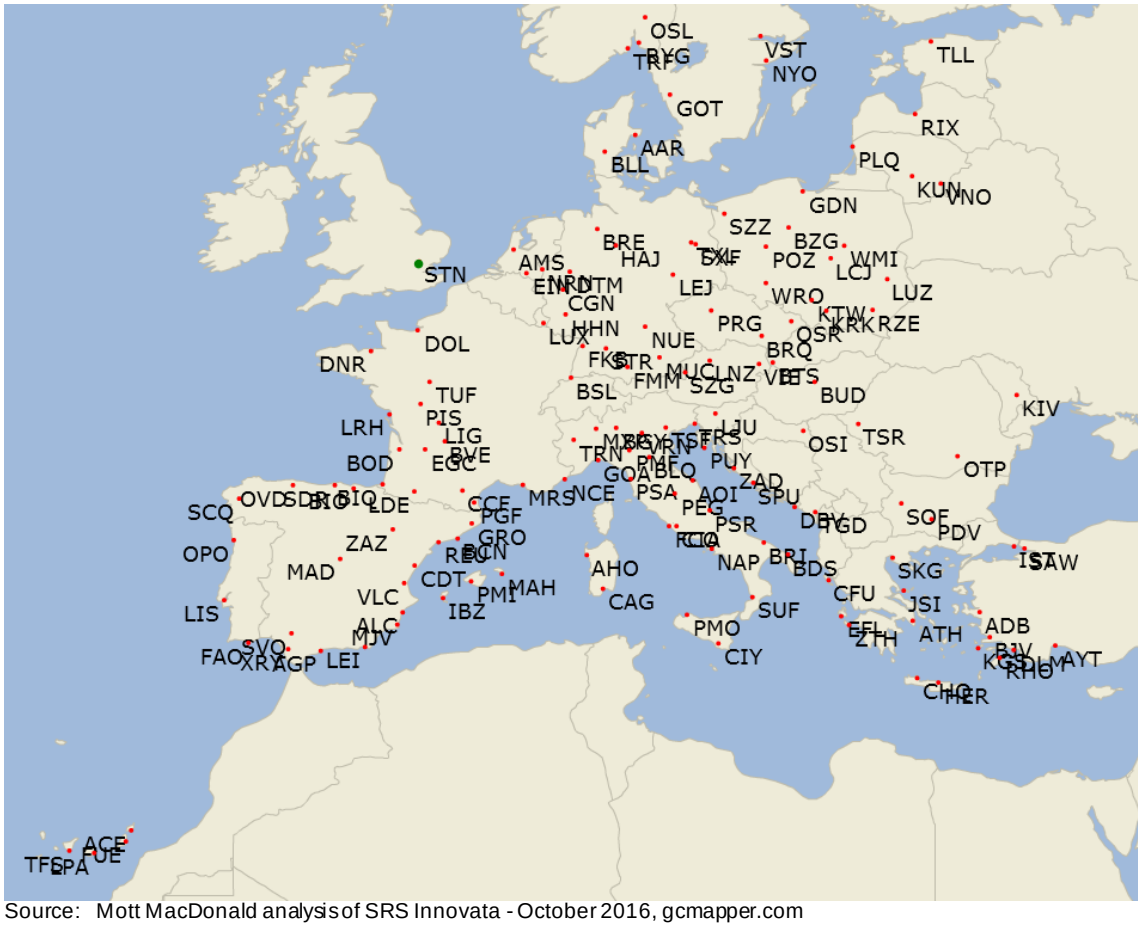
As expected, Heathrow's European destination route map focus is on the key European business primary airports. As a result, its actual European network in terms of destination count is limited in comparison to Stansted (Figure 27 and Figure 28).

Figure 27: Route Network LHR to European destinations



Source: Mott MacDonald analysis of SRS Innovata - October 2016, gcmapper.com

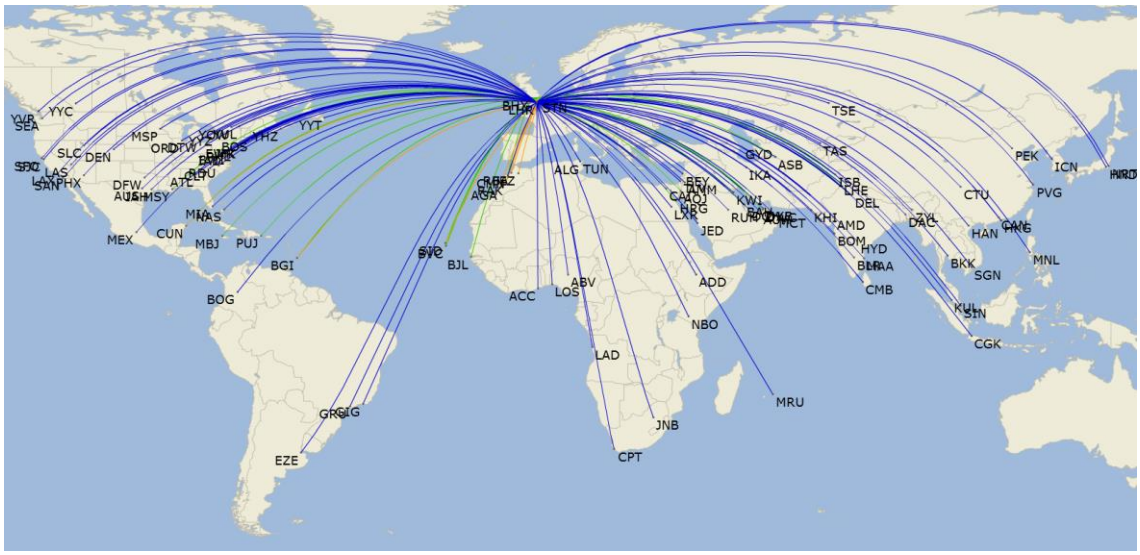
Figure 28: Route Network STN to European destinations



Source: Mott MacDonald analysis of SRS Innovata - October 2016, gcmapper.com

London Stansted's dominance by Ryanair results in it being able to offer more European destinations than any other airport in the World. It is also interesting to note from Figure 29 that it has yet to secure any significant scheduled long haul link. The same figure demonstrates the extent of Long Haul destinations that London Heathrow offers.

Figure 29: Route Network LHR, STN, BHX, EMA – Worldwide excluding Europe



Heathrow Stansted Birmingham
Source: Mott MacDonald analysis of SRS Innovata - October 2016, gcmapper.com

A key factor in determining the business traveller's choice of departure airport is frequency of service. Figure 30 and Figure 31 demonstrates the advantage London Heathrow has over Birmingham on the New York service: 138 weekly services operate from LHR versus 6 weekly services from Birmingham

Finally, to conclude the importance of frequency, Figure 32 details the number of seats available on the New York route for 2016. In total London Heathrow offers 2.5 million seats against 103,000 at Birmingham.

Figure 30: Weekly services to JFK from LHR and BHX

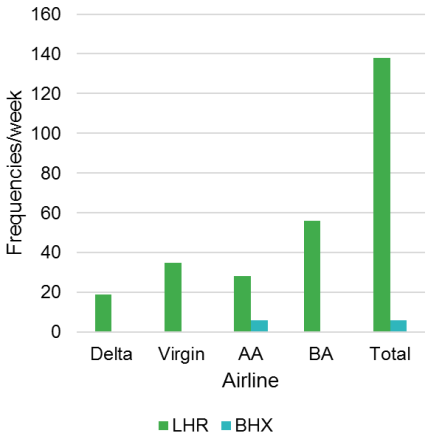
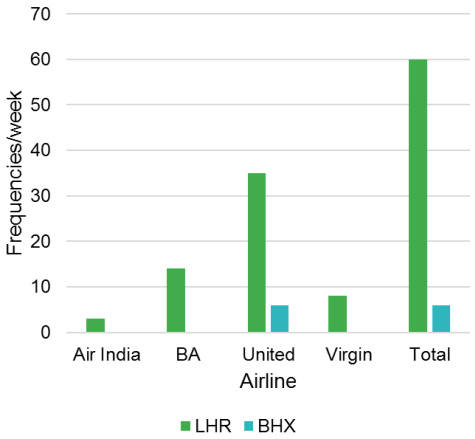


Figure 31: Weekly services to EWR from LHR and BHX

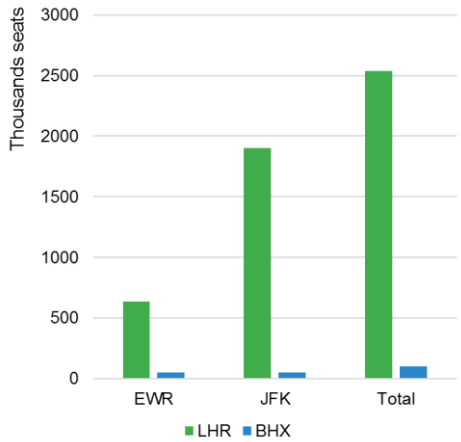


LHR = London Heathrow, BHX = Birmingham, JFK = New York Kennedy, EWR = New York Newark

Source: Mott MacDonald analysis of October 2016 SRS Innovata data

Source: Mott MacDonald analysis of October 2016 SRS Innovata data

Figure 32: Yearly seats to JFK from LHR and BHX



Source: Mott MacDonald analysis of 2016 SRS Innovata data

2.4 Key destination analysis for the Midlands business air passengers

The data presented in Figure 33 to Figure 38 aim to summarise graphically the airport choice of Midlands business passengers on domestic, European and intercontinental routes. The analysis is subdivided between West Midlands and East Midlands passengers and covers all domestic destinations and the top 50 destinations for each market segment and sub-region. Final destination airport, initial airport of choice and passenger volumes are all presented, with an indication of whether

the final destination was reached with a direct flight or whether a connection was required. The data was sourced from the CAA surveys conducted at major UK airports in 2015.

The large majority of the 420 thousands domestic business traffic from the West Midlands travels to Scotland and Northern Ireland. Birmingham is the airport of choice for these passengers (90%), with East Midlands (3%), Liverpool and Manchester being second choice. East Midlands airport dominates the airport choice of the 235 thousands East Midlands business passengers, with the main routes being again to Scotland and Northern Ireland. While 52% of these passengers choose East Midlands, the secondary airport of choice is Birmingham (25%), followed by Manchester (9%) and London Luton (8%).

It is understood that some areas of the Midlands are almost equidistant to the Midlands airports and airports located outside the region (Manchester, Heathrow, Luton and Stansted), leading to passengers preferring to travel from these airports, especially when connectivity from these airports is better than the Midlands'.

The variation in airport choice by end destination shows that while some routes are well catered by Birmingham airport (ie Milan and Dusseldorf), with few passengers necessitating to travel outside the region, there are routes such as Moscow, Munich, Stockholm and Zurich were high share of passengers choose alternative airports. For Eastern European destinations generally Luton offers good services and this is reflected in the figures below.

It should be noted that the data presented below refers to 2015 CAA survey – since the survey was undertaken Birmingham has expanded its route network. As an example the Birmingham-Prague route was not operated from in 2015 but has been started in 2016. This shows that Birmingham is making the efforts to operate those routes that are significant for business passengers as indicated by the CAA survey data.

East Midlands lack of business-oriented European air services is evidenced in Figure 36. Passengers to Amsterdam, the leading destination for business travellers, are spread amongst 6 UK airports, with East Midlands share being only the fourth out of six. Birmingham captures part of this demand however there is no a clear pattern showing that it is the first airport of choice for this passenger segment.

While the volumes of traffic to Europe are clearly different between East and West Midlands, the differences fade out upon the analysis of the intercontinental traffic demand. Birmingham captures market share on Delhi, Dubai and Istanbul (classified as Asia in this case) as it is directly connected to these cities. The data indicates that business passengers generally fly from Heathrow for both West and East Midlands cases.

Case study: West Midlands to New York JFK

The data indicates that the number of business passengers that have flown to New York JFK from West Midlands in 2015 were only 2,400 with leisure passengers totalling 65,000.

According to the CAA survey data none of the business passengers from West Midlands used the direct service from Birmingham airport, while 8,000 out of the 65,000 leisure passengers have used the direct service from Birmingham.

All business passengers travelling from West Midlands to JFK were captured by the surveys taking place between 12pm and 5pm.

Looking at the times at which surveys took place across the UK airports for business passengers travelling to New York JFK, it is apparent that the busiest hours are between 12pm and 4pm with the volume of hourly passengers interviewed being between 40% and 100% more than at 7am or 9am.

The peak hour for leisure passenger flows to New York JFK across UK airports are between 8am and 10am with hourly flows being on average 50% higher than in the afternoon hours (12pm-4pm).

These figures indicate that the timing of the direct flight from Birmingham to New York JFK (mostly at 8:45am in 2015 and 9:50 in 2016) is not ideal for business passengers as this segment prefers to fly at later hours of the day rather than flying on a morning service from Birmingham.

As the CAA survey is not undertaken in airline business lounges, it is possible that some of the business passenger volumes are not represented in the CAA statistics. This could explain the complete absence of business passengers in the Birmingham-New York JFK figures.

In conclusion, it should be noted that the CAA surveys are only indicative for smaller flows, but they do suggest that business requirements are currently not being met by the direct flights offered on this route.

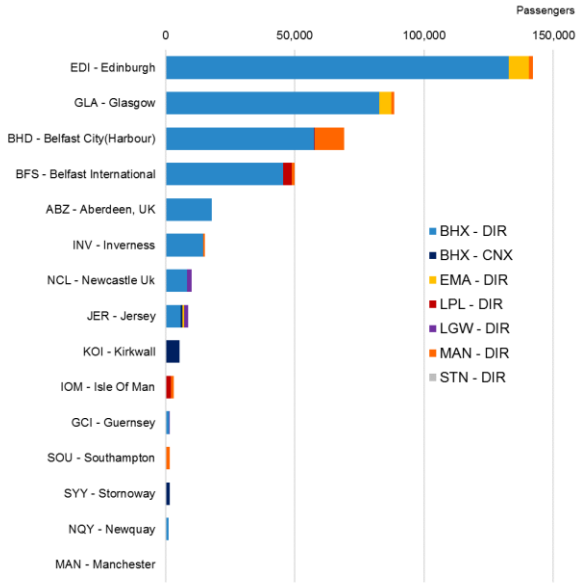
Table 6 summarises an analysis of the connectivity between the Midlands airports, Heathrow and Stansted to the top 40 European airports. The aim is to understand what are the differences in frequencies between the four airports and whether these frequencies allow business passengers to undertake day trips to European cities, a feature that is being valued positively by the business community. Each connection is scored against a set of criteria ranging from no direct flights to daily direct flights that allow daily returns on both sides – as an example a Birmingham-Dublin day trip would be feasible as well as a Dublin-Birmingham.

All airports in the top-20 list are connected to London Heathrow with frequencies that allow daily return on both sides. Birmingham achieves the same score on 4 routes. It would appear that traffic tends to leak to other airports when the route scoring is lower. An example would be Zurich from Birmingham – as many as half of the passengers choose London Heathrow while the frequency scoring is suboptimal.

The same applies for East Midlands - it is noted that the largest volumes of business passengers departing from the airport travel to Dublin, which is also the airports' highest scored connection in terms of frequencies.

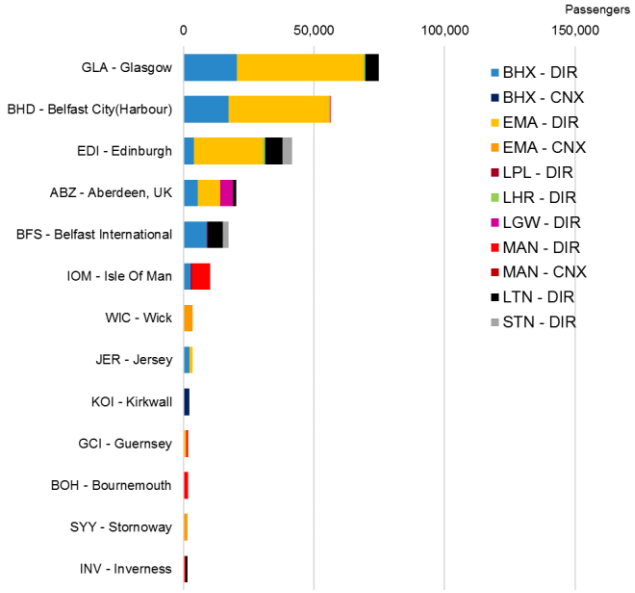
Examples of stakeholder view on connectivity from the Midlands are from local companies Bombardier and Tulip. Bombardier Rail based in Derby state it is not always possible to take a flight to Berlin from EMA as it is not a daily operation. There are good surface links from Derby to Luton, which offers an excellent business frequency on the Berlin route. Tulip, based in the West Midlands state business routes to CPH from Birmingham are generally good, with a preference to travel from BHX and connect onward in Denmark, as opposed to taking a direct flight from STN

Figure 33: Domestic final destinations for West Midlands business passengers



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Figure 34: Domestic final destinations for East Midlands business passengers

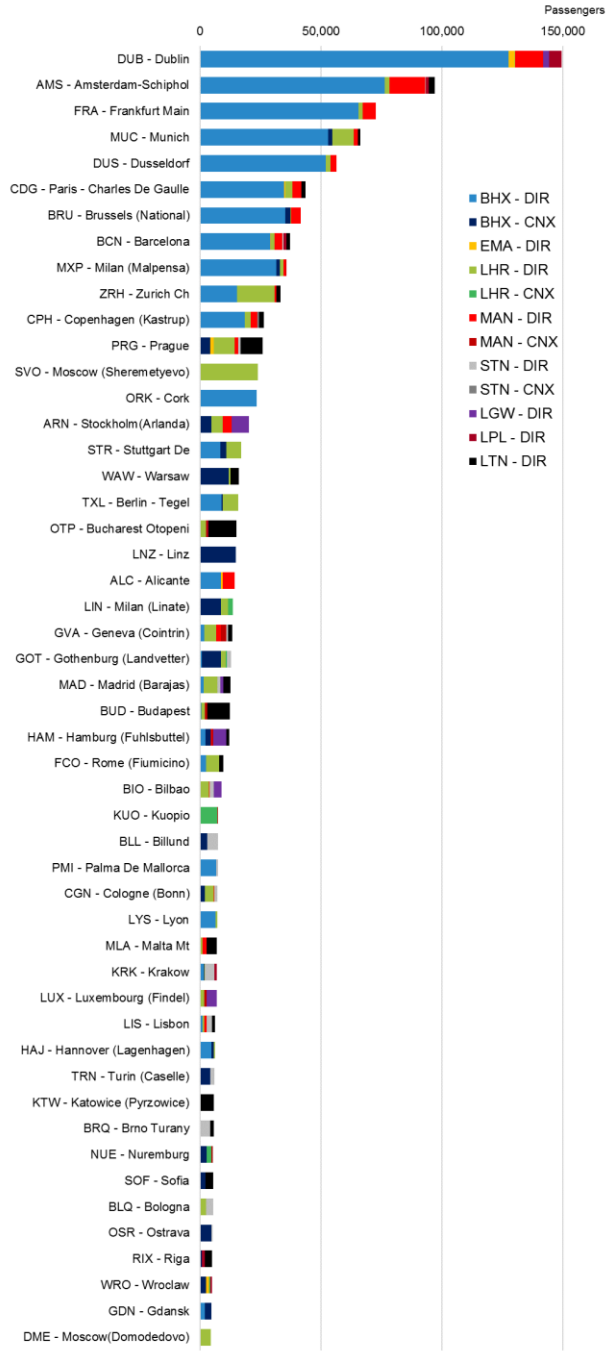


Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Notes: Airport decoding: BHX = Birmingham, EMA = East Midlands, LGW = London Gatwick, LHR = London Heathrow, LTN = London Luton, LPL = Liverpool, STN = London Stansted, MAN = Manchester

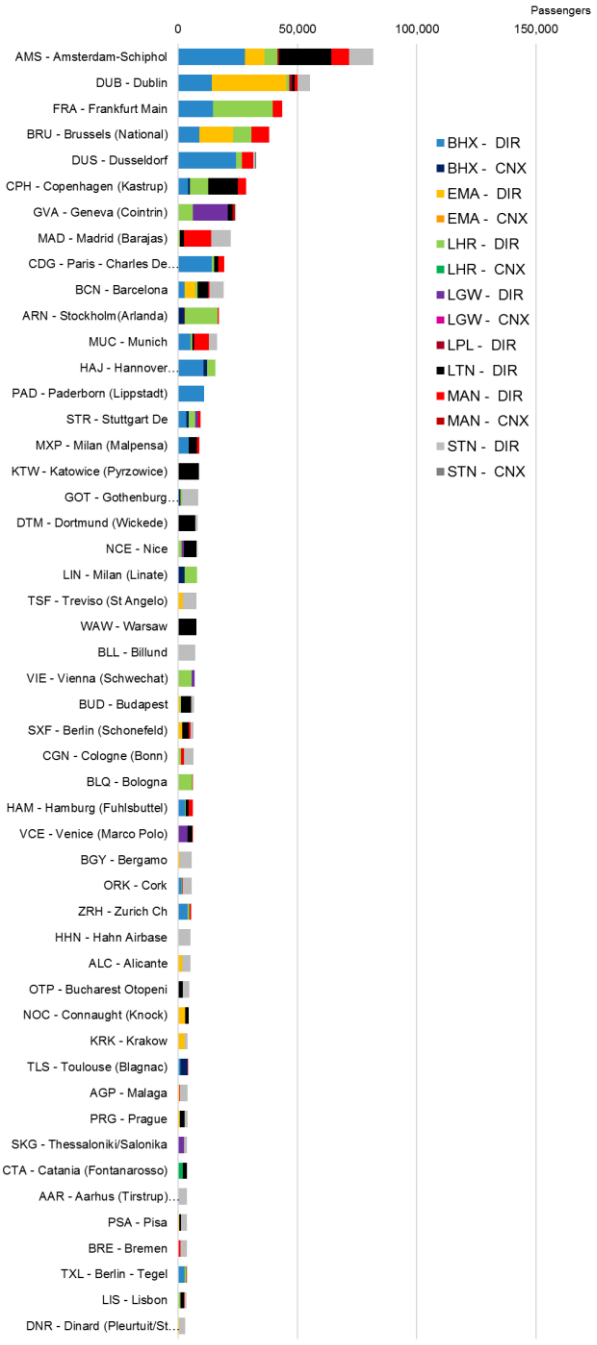
DIR = direct flight to final destination; CNX = connection required to reach final destination

Figure 35: Top 50 European final destinations for West Midlands business passengers



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Figure 36: Top 50 European final destinations for East Midlands business passengers

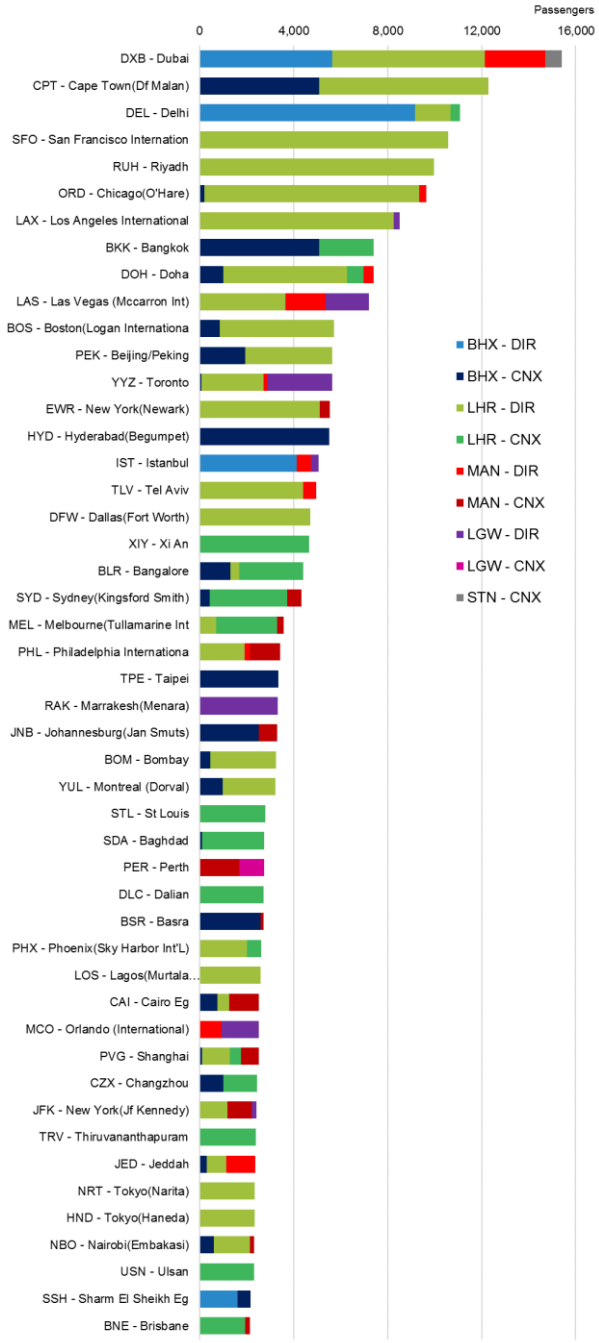


Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Notes: Airport decoding: BHX = Birmingham, EMA = East Midlands, LGW = London Gatwick, LHR = London Heathrow, LTN = London Luton, LPL = Liverpool, STN = London Stansted, MAN = Manchester

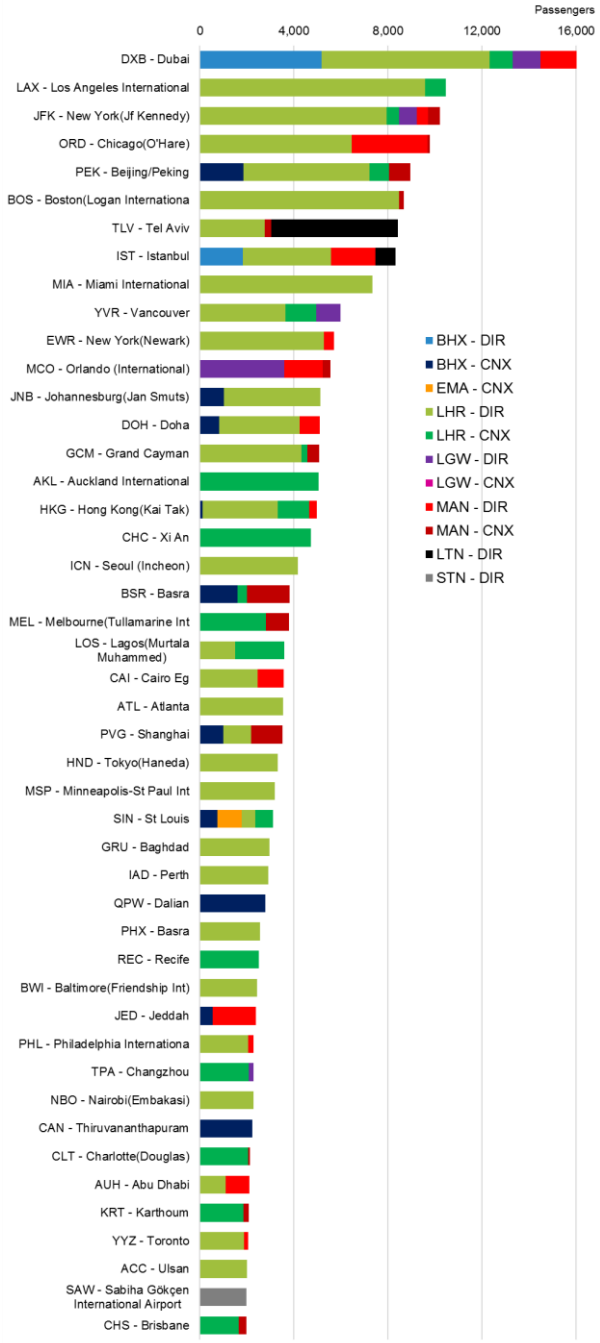
DIR = direct flight to final destination; CNX = connection required to reach final destination

Figure 37: Top 50 worldwide final destinations for West Midlands business passengers



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Figure 38: Top 50 worldwide final destinations for East Midlands business passengers



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Notes: Airport decoding: BHX = Birmingham, EMA = East Midlands, LGW = London Gatwick, LHR = London Heathrow, LTN = London Luton, LPL = Liverpool, STN = London Stansted, MAN = Manchester

DIR = direct flight to final destination; CNX = connection required to reach final destination

Table 6: Weekly frequencies benchmark for top-40 European airports on sample week

			BHX Birmingham		EMA E. Midlands		LHR Heathrow		STN Stansted	
	Airport	City Code	Freq.	Score	Freq.	Score	Freq.	Score	Freq.	Score
1	Istanbul	IST	22		0		118		32	
2	Paris	PAR	76		0		234		0	
3	Moscow	MOS	0		0		84		0	
4	Frankfurt	FRA	48		0		256		28	
5	Amsterdam	AMS	152		14		246		46	
6	Madrid	MAD	22		0		180		56	
7	Rome	ROM	12		6		152		70	
8	Munich	MUC	36		0		197		14	
9	Barcelona	BCN	46		14		118		56	
10	Milan	MIL	32		6		178		84	
11	Berlin	BER	20		6		130		54	
12	Brussels	BRU	34		14		118		0	
13	Copenhagen	CPH	30		0		151		0	
14	Zurich	ZRH	24		0		178		0	
15	Oslo	OSL	0		0		125		0	
16	Dublin	DUB	130		42		290		112	
17	Vienna	VIE	0		0		124		14	
18	Stockholm	ARN	0		0		168		0	
19	Düsseldorf	DUS	94		12		138		0	
20	Lisbon	LIS	0		0		128		42	
21	Athens	ATH	0		0		102		28	
22	Helsinki	HEL	0		0		98		0	
23	Geneva	GVA	0		0		180		0	
24	Hamburg	HAM	12		0		106		0	
25	Warsaw	WAW	4		6		66		50	
26	Nice	NCE	8		0		98		10	
27	Ankara	ESB	0		0		0		0	
28	St. Petersburg	LED	0		0		14		0	
29	Prague	PRG	8		4		66		42	
30	Cologne-Bonn	CGN	0		0		36		64	
31	Stuttgart	STR	36		0		62		12	
32	Budapest	BUD	6		4		56		42	
33	Bucharest	OTP	4		0		42		28	
34	Lyon	LYS	14		0		42		0	
35	Venice	VCE	8		0		28		0	
36	Marseille	MRS	0		0		42		18	
37	Toulouse	TLS	0		0		42		0	
38	Porto	OPO	0		0		0		36	
39	Bologna	BLQ	0		0		42		26	
40	Bergen	BGO	0		0		24		0	

Source: Mott MacDonald analysis of SRS Innovata data – Sample weekly frequencies in May 2016 - Decoding of scores: No Service, Less than one daily flight, Daily flight, Less than a daily return (one-side), Daily return (one-side), Less than one daily return flight (two sides), Daily returns from both sides possible Introduction

3 Airports surface access baseline analysis

3.1 Introduction

This chapter aims to review the current airport surface access travel times for passengers ending or starting their trip in the Midlands region. Metrics such as average surface access travel time, airport of choice, mode of transport are overlaid and analysed. These metrics are sourced from the CAA airport passenger survey for January-November 2015 undertaken at Birmingham, East Midlands, Liverpool, Manchester, London Heathrow, London Gatwick, London Stansted, London Luton. London City data was not available as part of this analysis. Surface access metrics give a combined measure of (1) how long it takes to reach an airport from the passengers' points of origin and (2) whether the airport provide the desired connections to a specific area of the World.

3.2 Key airports location and catchment area

Summary tables comparing the catchment areas at sample airports are shown in Table 7 and Table 8, while Birmingham and East Midlands catchment areas by isochrones are presented in Figure 40 and Figure 42. In the critical 0-90 minutes driving range, the London airports cover about 50% more population than Birmingham and East Midlands. In terms of GVA, the London airports cover between 33% and 41% of the National GVA – an amount that is about double that of the Midlands airports. The Midlands airports' 0-90 minutes' population and GVA catchments are similar in magnitude to that of Manchester airport.

These figures do not include rail connectivity, which can play a key role in accelerating passengers journey times at airports that are located further away from the centres, as in the case of London Gatwick and London Stansted, two airports that capture the least population and GVA in the 0-30 minutes' driving range.

Table 7: Comparison of population by road isochrones for key airports – isochrones in minutes and cumulative population in thousands

	LHR	LGW	LTN	STN	BHX	EMA	LPL	MAN
0-30	2,333	908	1,122	597	2,283	1,648	1,085	2,138
0-60	10,839	7,150	7,984	8,381	6,701	7,133	5,230	6,944
0-90	19,499	16,896	18,481	16,877	11,671	12,847	8,624	12,912

Source: Mott MacDonald analysis of ONS data and ArcGIS online

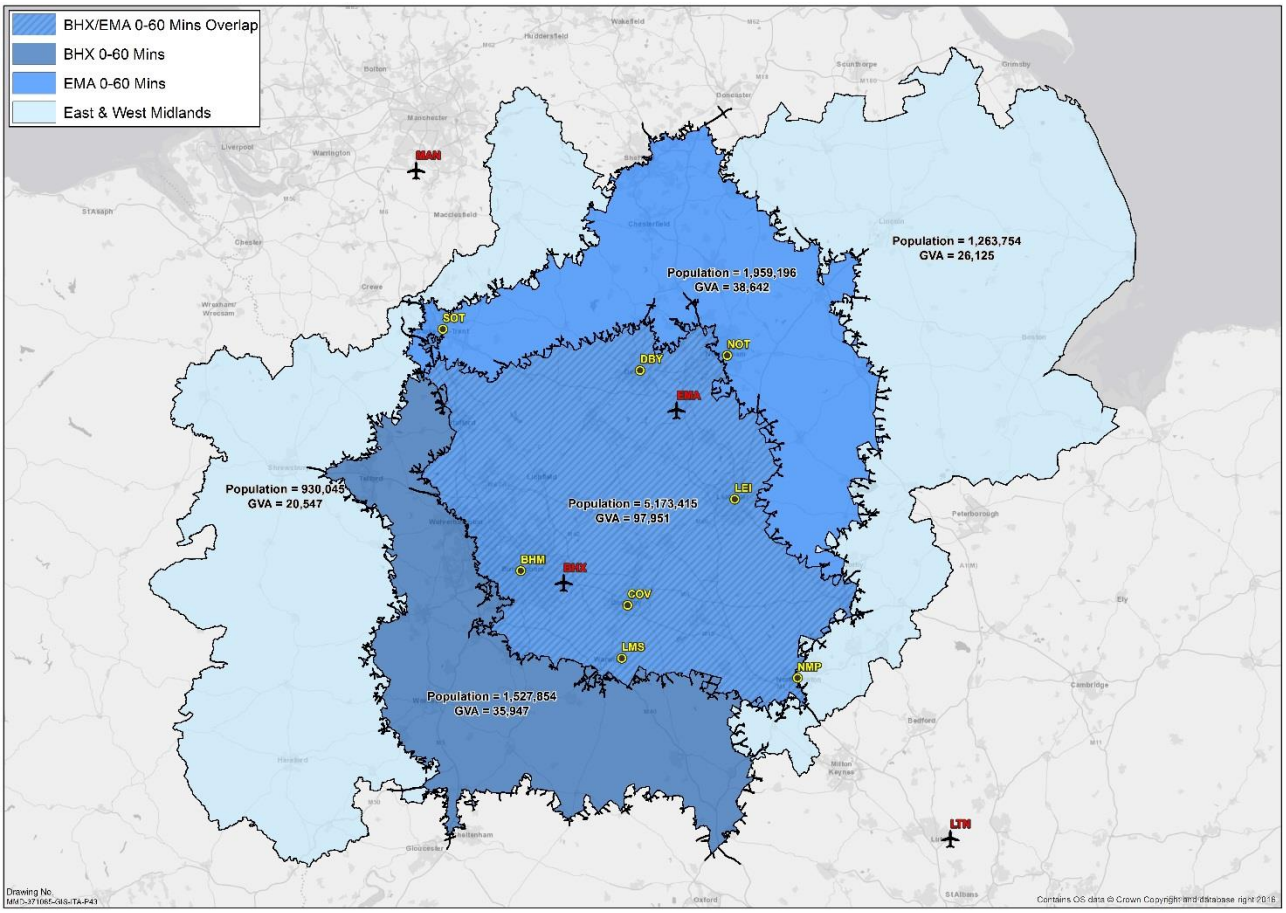
Table 8: Comparison of GVA by road isochrones for key airports – isochrones in minutes and cumulative GVA as % of total UK GVA

	LHR	LGW	LTN	STN	BHX	EMA	LPL	MAN
0-30	4%	1%	2%	1%	3%	2%	2%	3%
0-60	27%	11%	20%	17%	9%	9%	7%	9%
0-90	41%	35%	38%	34%	16%	17%	11%	16%

Source: Mott MacDonald analysis of ONS data and ArcGIS online

Figure 39 shows the 60 minutes driving time catchment areas for Birmingham Airport and East Midlands airports in three formats: 1) the area that is uniquely covered by Birmingham Airport (dark blue), 2) the area that is uniquely covered by East Midlands Airport (light blue) and 3) the area that is shared between the two airports. The remaining area of the West and East Midlands that is not covered by the 0-60 minutes catchment areas is represented in pale blue.

Figure 39: Birmingham Airport and East Midlands Airport 0-60 minute driving catchment with detail of area population and GVA



Source: Mott MacDonald analysis of ONS data and ArcGIS online – Red labels: Airports - BHX = Birmingham, EMA = East Midlands, LTN = London Luton, MAN = Manchester. Yellow labels: Key cities – BHM = Birmingham, COV = Coventry, DBY = Derby, LEI = Leicester, NOT = Nottingham, NMP = Northampton, SOT = Stoke on Trent.

Out of the 10.8M inhabitants of the Midlands region 8.6M (or 80%) are located less than a one-hour drive from Birmingham and/or East Midlands airports. About half of the population (488%) has the possibility to reach both regional airports in a travel time that is equal or less than 60 minute drive.

Birmingham Airport and Midlands Airport catchment area cover 172,540M of the combined 219,122M produced in the whole region, equating to a coverage of 78% of the local economy.

These figures show that the two airports are being able to cover most of the midlands in terms of population and business areas. Table 11 indicates that the peripheral position of Shrewsbury, Lincoln and Northampton – relative to the two regional airports' location, does not allow a drive time below 60 minutes for those passengers deciding to fly out of Midlands airports. This indicates that there are pockets that are currently not well connected but due to their peripheral position these might well be closer to other regional airports (Manchester in the North, Leeds in the East, London Luton and Stansted in the East).

Table 9: Midlands Airports 0-60 minutes driving time catchments characteristics – exclusive and overlapping areas (% of regional volumes)

	Total catchment		Exclusive catchment		Overlapping catchment	
	Population	GVA (£)	Population	GVA (£)	Population	GVA (£)
Birmingham Airport	6.69M (62%)	133,898M (60%)	1.52M (14%)	35,947M (16%)	5,17M (48%)	97,951M (45%)

	Total catchment		Exclusive catchment		Overlapping catchment	
East Midlands Airport	6.70M (62%)	136,593M (62%)	1.95M (18%)	38,642M (17%)	5,17M (48%)	97,951M (45%)

Table 10: Midlands area not covered by the 0-60 minutes driving time catchment area

	Population	GVA (£)
Midlands area outside 0-60 catchment	2.19M (20%)	46,672M (21%)

Source: Mott MacDonald analysis of ONS data and ArcGIS online

Table 11: Cities and towns of the Midlands and relative driving time to regional airports

Legend

Every part of the city/town can reach airport(s) in 0-60 mins	Some part of the city/town can reach airport(s) in 0-60 mins	Every part of the city/town cannot reach airport(s) in 0-60 mins

Region	City/town	0-60 mins from BHX	0-60 mins from EMA	0-60 mins from EMA and BHX
West Midlands	Birmingham			
West Midlands	Burton upon Trent			
West Midlands	Coventry			
West Midlands	Dudley			
West Midlands	Newcastle-under-Lyme			
West Midlands	Nuneaton			
West Midlands	Redditch			
West Midlands	Shrewsbury			
West Midlands	Solihull			
West Midlands	Stoke-on-Trent			
West Midlands	Sutton Coldfield			
West Midlands	Telford			
West Midlands	Walsall			
West Midlands	West Bromwich			
West Midlands	Wolverhampton			
West Midlands	Worcester			
East Midlands	Chesterfield			
East Midlands	Derby			
East Midlands	Leicester			
East Midlands	Lincoln			
East Midlands	Mansfield			
East Midlands	Northampton			
East Midlands	Nottingham			

Source: Mott MacDonald analysis of ONS data and ArcGIS online

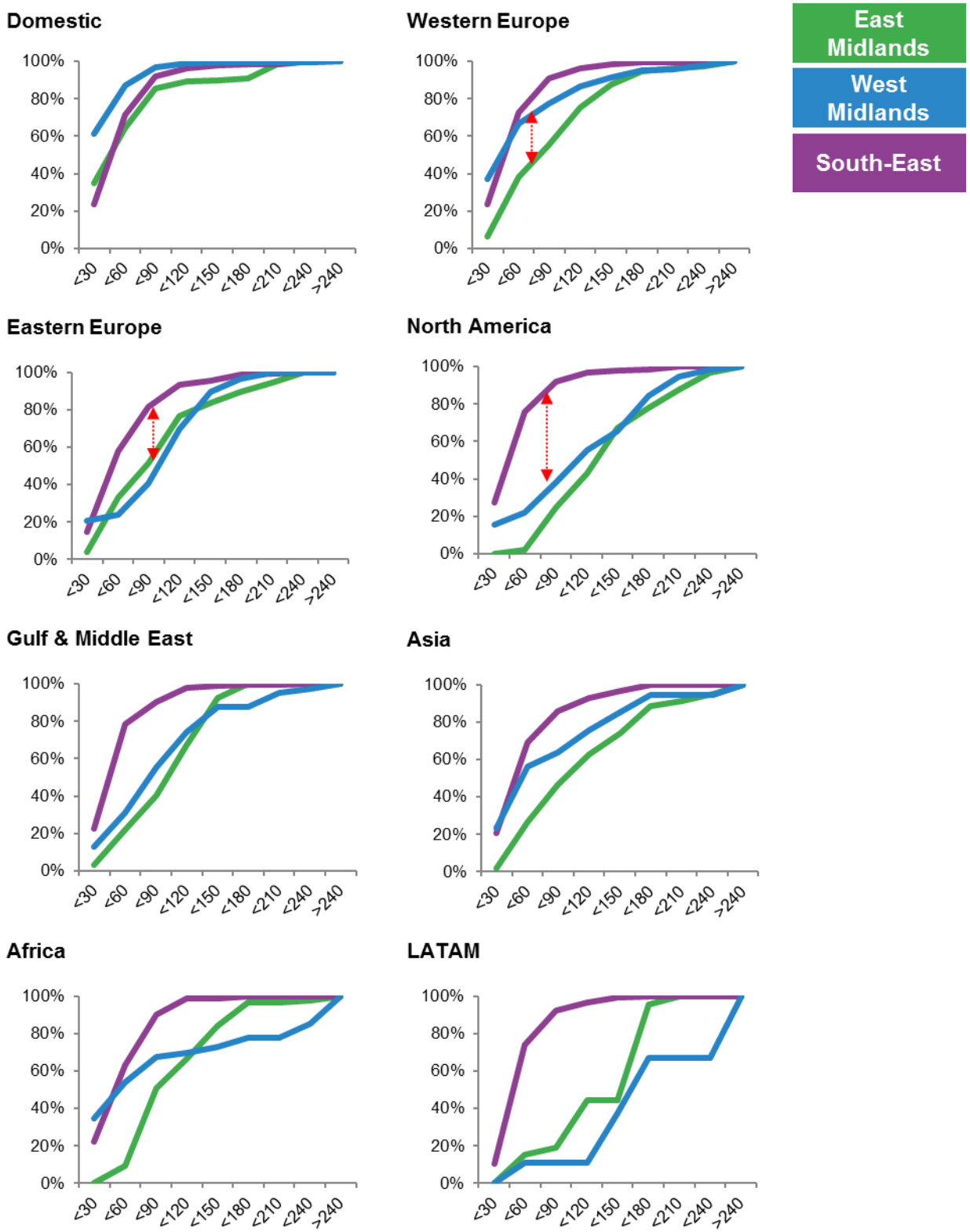
3.3 Airport surface access trends

As indicated in Figure 40 and in more detail in Table 12, the surface access journey time for business passengers travelling from the Midlands to their chosen airport is not uniform. In general, Midlands business passengers travelling from an origin in East or West Midlands are for a longer time on their way to the airport, compared to those that choose to use airports in the Southeast as a starting point for their journeys. This is particularly true for business trips from East Midlands to Western Europe and from the whole region to North America, when compared to the same trips originating in the Southeast.

Surface access time for business passengers travelling to domestic destinations out of West Midlands is the smallest of the sampled regions, with an even better performance compared to the Southeast – the region that has been selected as "best in class". This is in part due to the solid domestic network provided by the based-carrier Flybe. Accessibility for Western European traffic out of West Midlands is slightly lower than the Southeast.

The longer travel times impact the overall surface travel costs, both in monetary and comfort terms, for business travellers, which influences negatively the attractiveness of the Midlands as a place for setting up a business base.

Figure 40: Midlands business passengers – Journey time to airport by final destination



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Table 12: Average surface access travel time (in minutes) for business passengers by UK region of trip origin and by final destination

	East Midlands	West Midlands	Southeast
Domestic	65	35	55
Europe			
Western Europe	101	65	56
Eastern Europe	105	101	69
America			
North America	144	123	54
Caribbean	168	218	70
Central America	180	135	53
South America	102	180	51
Africa			
North Africa	126	168	66
Central Africa	143	n/a	50
West Africa	125	45	55
East Africa	112	88	57
Southern Africa	90	45	71
Asia and Australia			
Middle East	115	104	56
Gulf	99	99	55
Central Asia	108	111	70
Asia sub-continent	125	57	54
Far East	130	134	57
Southeast Asia	133	67	71
Australia	174	158	59

Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

The relatively longer journey times for business passengers travelling from the East Midlands to most final destinations are a function of fewer air connectivity options from East Midlands airport leading to passengers requiring to travel from the main East Midlands cities to Birmingham Airport (located further away from East Midlands Airport) and also linked to a relatively high share of leakage of traffic to other airports.

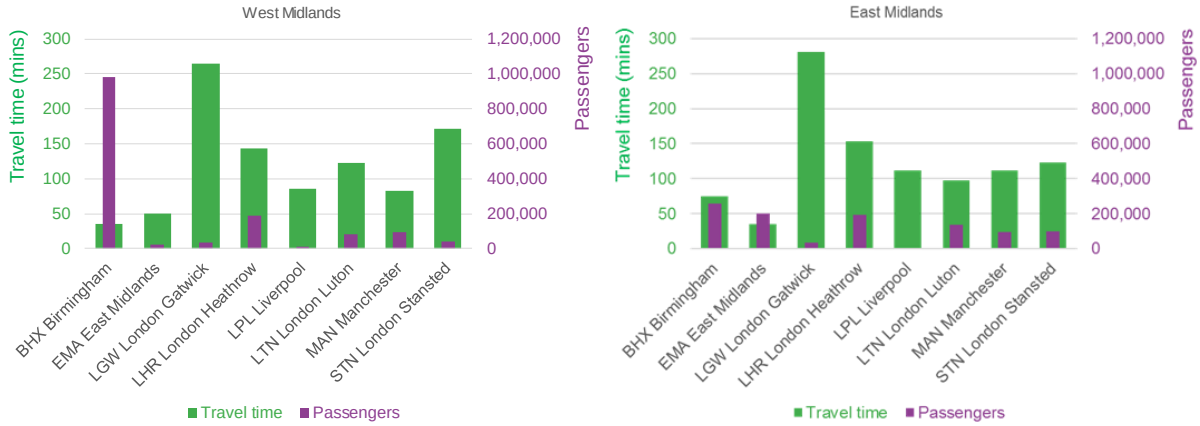
Improved surface access to Midlands airports would benefit both Birmingham and East Midlands airports, as it would expand their catchment areas. This would make stronger business cases for attracting airlines to develop new direct services to the Midlands. To sum up, the above can provide an explanation for the fact that 50% of the business passengers state “connectivity” issues as the reason behind their choice to use airports outside the Midlands region when flying on business trips.

Figure 41 indicates travel time and number of passengers according to the CAA passengers survey. The number of business passengers starting their journey either in the West or East Midlands and their corresponding airport choice is compared to the average surveyed surface access travel time to each airport.

Traffic from the West Midlands broadly chooses to fly from Birmingham airport - where it benefits from an average surface journey time of only 35 minutes – whereas 190,000 passengers travel on average 2.15 hours to reach Heathrow Airport. In the East Midlands only 20% of business passengers choose to fly from the local East Midlands (EMA) airport, with average surface access journey time of 35 minutes. 250,000, or 25%, of passengers undertake 1.15 hours’ journeys to reach Birmingham airport – and as many as 193,000 passengers travel 2.30 hours to reach London Heathrow. These metrics would suggest that while Birmingham Airport well serves its closest and main catchment area in terms of business-oriented services, there is a lack of local connectivity at East Midlands airport, which is compensated by travelling to Birmingham and Heathrow on relatively long journeys considering the

time sensitivity of business travellers. For both airports there is an evidence of significant volumes of traffic spilling to London Heathrow with surface access journey times above two hours. These figures would support the theory that there is a sub-optimal amount of direct and/or indirect intercontinental connectivity from both airports.

Figure 41: Travel time vs passengers by airport for West and East Midlands

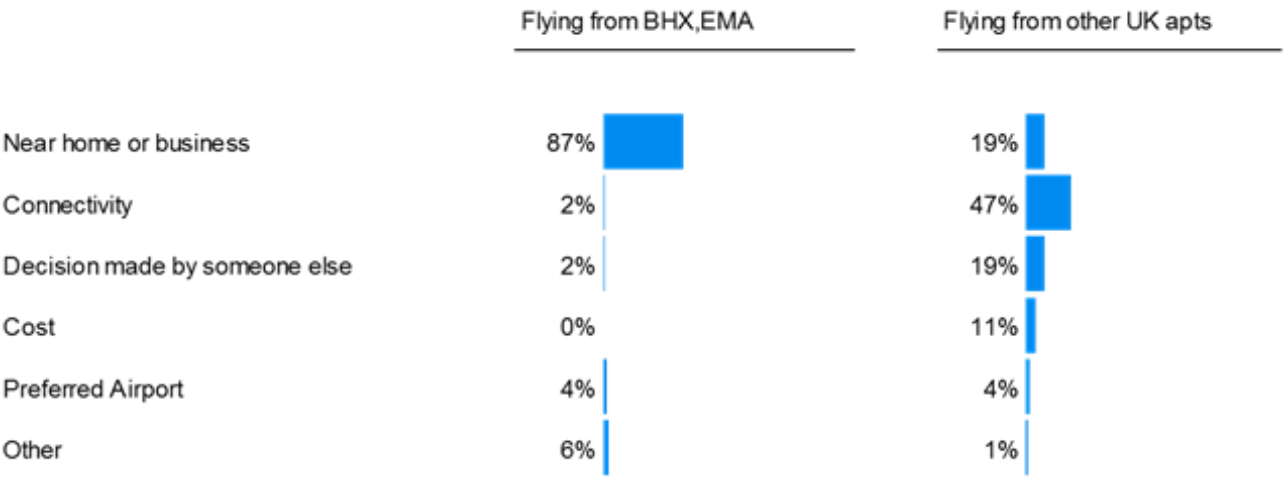


Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data – Note: number of passengers refer to those passengers for which journey time is available.

The comparison of the data presented in Figure 41 and Table 13 above would suggest that West Midlands shortcomings in terms of average surface access time are caused by lack of direct services or frequencies to specific long-haul markets, especially the US, rather than being a wider accessibility problem. If Birmingham Airport was to expand the portfolio of served routes to business-oriented destinations, there would be a decrease in average surface access times due to more passengers choosing to fly out of Birmingham. Improvements in surface access would have only a limited impact.

For East Midlands region it is recognised that the volumes of business passengers flying out of East Midlands airport are comparatively low, considering that passengers that are using the local airport travel only 35 minutes to access the airport. It is then evident that the route network out of East Midlands does not cater for the business passengers' needs. In recent years, the airport has been unable to attract routes that would connect the business community to larger European hubs, though they remain keen to explore opportunities to do so. Decreasing the surface access time to Birmingham and London Heathrow would also help businesses reach their destinations quicker.

Figure 42: Midlands business passengers – airport choice factor by airport



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Table 14: Midlands business passengers – Mode of transport

BHX Birmingham

Car	43%
Taxi	19%
Bus-Birmingham Airport Air Rail Link	16%
Birmingham Airport Air Rail Link	6%
Other	5%
Taxi-Bus-Birmingham Airport Air Rail Link	5%
Bus	3%
Car-Bus-Birmingham Airport Air Rail Link	3%

EMA East Midlands

Car	57%
Taxi	27%
Bus	13%
Other	3%

LHR London Heathrow

Car	41%
Taxi	23%
Bus-Tube	10%
Other	9%
Bus	9%
Bus-Tube-Heathrow Express	3%
Taxi-Bus-Tube	3%
Car-Bus	2%
Taxi-Bus	2%

LGW London Gatwick

Car	39%
Bus	19%
Bus-Bus	11%
Car-Bus	11%
Taxi-Bus	9%
Other	7%
Rail	4%

LTN London Luton

Car	73%
Other	8%
Bus	7%
Taxi	6%
Bus-Luton airport parkway shuttle bus	6%

STN Stansted

Car	73%
Bus	8%
Bus-Tube-Stansted Express	7%
Taxi	6%
Other	6%

MAN Manchester

Car	66%
Taxi	21%
Bus	6%
Car-Bus	4%
Taxi-Bus	2%
Other	1%

Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

3.4 Airport choice and modal split

Maps in Figure 48 to Figure 50 are thematic maps built upon data sourced from the CAA passenger survey. Data is elaborated at a Local Authority level for business passengers travelling to and from the Midlands[3]. More detailed versions of the maps are presented in Appendix B.

[3] As the CAA survey allows passengers to provide blank responses to its questions, there may be gaps in the data. The analysis considered only non-blank response. As there might be different quantities of blank response

3.4.1 Business passengers and their choice of airports

The four maps in Figure 48 refer to average surface access time for business passengers' itineraries ending in Domestic destinations, Western Europe, Eastern Europe and North America. The data is presented in a "heat map" format – darker areas indicate longer journey times compared to brighter areas. The corresponding market volume and airport of choice by Local Authority District (LAD) is indicated in the pie chart.

Overall the maps indicate that passengers make rational choices – they tend to choose the closest airport wherever there is a connection that suits their travel needs. The availability of domestic services at both Birmingham and East Midlands translates into relatively short surface access journey times from most LADs. The other end is represented by the North American traffic patterns: passengers broadly tend to use London Heathrow as airport of choice for transatlantic journeys. Part of the Northern areas of the Midlands also choose Manchester airport while demand for Birmingham airport is concentrated in the LADs surrounding Birmingham. It is likely that with wider awareness of Birmingham's direct flights to the US there would be a broader catchment area surrounding Birmingham airport. The impact of the leakage of traffic to Heathrow are longer surface access journey compared to journeys to closer regions.

As in the case of other destination regions, Western European traffic is concentrated at the main economic centres of the Midlands. Average surface access time for all of the centres is worsened compared to the domestic case, as some part of the demand is not served by the local airports but rather from London airports – mainly Luton and Stansted.

Traffic to Eastern Europe is smaller in volumes compared to that of Western Europe. There is a general tendency of flying out of London Luton, due to the vast offer to Eastern European cities which caters for the Midlands businesses demand.

3.4.2 Public transport availability at early morning and late evening airport peaks

Stakeholders have mentioned that in some instances public transportation access to Midlands airports is not optimal, especially for East Midlands airport. Flybe stated that business services from East Midlands rely on an early morning departure, however passenger transport links to the airport at this time are poor. D2N2 LEP, the Local Enterprise Partnership for Derby, Derbyshire, Nottingham and Nottinghamshire stated that the biggest challenge for EMA is public transport connections, especially for the 9000 staff employed around the Business parks associated with the airport.

An important factor to consider in surface access is the availability of early and late trains to and from the airport. Business routes will typically require a 07:00 departure, requiring check-in and from around 05:30.

In the development of early and late trains London Stansted Airport and the Stansted Express can be analysed by way of an example. The Stansted Express is operated by Greater Anglia linking London Liverpool Street and Tottenham Hale with Stansted Airport. Trains operate every 15 minutes, using new 8 carriage rolling stock.

The train link takes 47 minutes from London Liverpool Street. The journey time has gradually increased since the introduction of the link in 1991, when a journey time of around 40 minutes was possible. This is largely due to the addition of commuter stops (Harlow Town and Bishops Stortford). The line suffers congestion from North London onwards, and so faster journey times will need investment in more track.

In the initial stages of Stansted's development prime time departure slots were within the 07:00 hour for business departures. As the airport has grown and low cost market introduced, departure times have moved forward, now generally starting around the 06:00 hour. Working the time line back this dictates a 04:30 check-in (allowing 1.5 hours), requiring a 03:30 (allowing 1 hour, just for any en-route

s by different question types, the average journey times by area might vary for the same area. As an example average surface access journey time for South Holland might be higher when looking at airport of choice compared to when the mode of transport is analysed due to the fact that fewer responses were provided for the selected mode of transport.

delays) London departure.

Stansted has always suffered from its lack of early morning train arrivals. The airport has generally relied on the excellent frequency of the 24-hour coach operation. Maintenance work on the track has always been a reason for the difficulty in providing early morning services, but the demand now is significant.

To begin to address the issue Greater Anglia have now introduced a 03:40 London Liverpool Street departure which arrives at Stansted at 04:30, however this only operates on Monday, Friday and Saturdays and is at the expense of late airport departures into London.

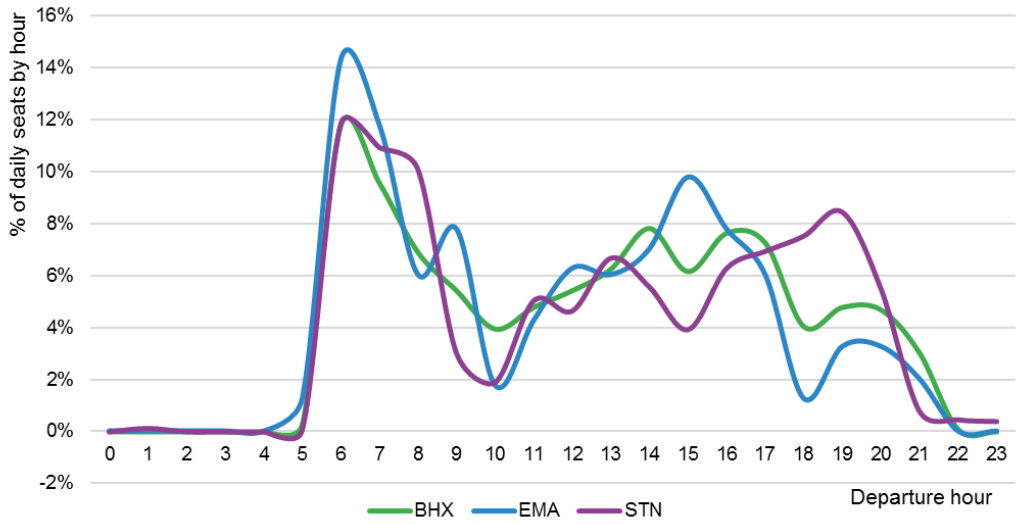
Additionally, on a Monday and Friday a 04:10 departure arriving at 05:00 is in place. The first daily departure (Mon-Sun) is at 04:40 arriving at Stansted at 05:39. Clearly these two departures are not feasible for a 06:00 departure.

There is still some way to go meeting the obvious demand. As the airport continues to fill these slots, and the London Underground expands it services to 24 hours the demand will grow.

The improvements made above should start to account for an increase in modal split to train, and make the airport more attractive to the business passenger. The train operator has introduced some competitive pricing such as group save that competes with the coach operators.

Figure 43 demonstrates that East Midlands Airport and Birmingham sees a high proportion of their daily departures in the morning peak and so having the ability for passengers to arrive comfortably by train/bus for this departure time is important.

Figure 43: Percentage of hourly departure by airport



Source: Mott MacDonald analysis of SRS Innovata data

3.4.3 Leisure passengers and their choice of airports

Figure 49 represents average surface access time for leisure passengers' itineraries ending their journeys in Domestic destinations, Western Europe, Eastern Europe and North America. The corresponding market volume and airport of choice by local authority district is indicated in the pie chart.

Although leisure passengers are not part of the core analysis of this study, it is interesting to note some characteristics in leisure passengers airport choice behaviour. Demand by LAD tends to be

more dispersed and less related to the economic centres. Airport choice broadly follows the patterns described for business passengers.

3.4.4 Business passengers and their modal split

Figure 50 represents average surface access time for business passengers' itineraries ending their journeys in Domestic destinations, Western Europe, Eastern Europe and North America. The indication of the main mode of transport used to reach the airport by business passengers and their relative volume is indicated in the pie chart.

The majority of passengers use car or taxi although a wider mix of modes is used at main cities. Passengers travelling from Birmingham LAD tend to use rail and Birmingham Air Rail Link to reach the airport on flights to all destinations. Coventry originating passengers also use rail services to reach the airport, as there are direct connections to Birmingham International Airport station. The share of rail users is highest for passengers travelling to Heathrow to reach North American destinations as significant shares are recorded for Birmingham, Nottingham, Derby, Rugby and Warwick.

During the stakeholder engagement process it was noted that the M6/M42 junction is the biggest surface access challenge for Birmingham Airport, this was mentioned by both Birmingham Airport and Flybe.

3.5 Midlands airports public surface access characteristics

3.5.1 Birmingham Airport – Access via rail

Birmingham International Station is the closest railway station to BHX. In 2015, 20% of passengers and 8% of staff at BHX accessed the airport via rail (BHX Surface Access Strategy, 2015-2020).

Birmingham International is directly linked to the airport passenger Terminal by SkyRail. The SkyRail is free, operates about every 2 minutes when the rail station is open and the journey takes less than 2 minutes.

- **Birmingham (Centre) -** Birmingham New Street is 9 minutes on a direct train, with up to 7 trains per hour (tph) to/from Birmingham International. A considerable number of journeys to/from Birmingham International require passengers to change at Birmingham New Street. The first arrival at Birmingham International from Birmingham New Street is 05:38. The last departure towards New Street is 01:24.
- **London (Euston) -** 4 tph operate to London Euston (3 Virgin Trains, 1 London Midland). The journey takes approximately 01:15 with Virgin Trains or 02:00 with London Midland. The first arrival from Euston is 07:33 (Virgin Trains, departs Euston 06:20). The last departure from Birmingham International is 23:20 (arrives at Euston 01:15).

The table below shows whether connections from a range of regional locations to different flights (for assumed business locations) can be made via train.

Figure 44: Weekday early morning air departures from Birmingham and rail services from main cities

Weekday Departures (AM) from BHX

Origin	First Train to Birmingam International Depart	Arrive	Skyrail Link* 00:10	06:25 Belfast (BFS)	06:05 Frankfurt (FRA)	06:10 Brussels (BRU)	06:20 Amsterdam (AMS)	06:30 Glasgow (GLA)	06:30 Berlin (TXL)	06:35 Paris (CDG)	06:50 Amsterdam (AMS)	06:55 Rotterdam (RTM)	07:00 Edinburgh (EDI)	07:00 Dusseldorf (DUS)	07:15 Munich (MUC)	07:15 Stuttgart (STR)	07:55 Amsterdam (AMS)	08:00 Dublin (DUB)
Birmingham (Centre)	05:29	05:38	05:48															
Wolverhampton	05:00	05:38	05:48															
Coventry	05:50	06:04	06:14															
Rugby	05:38	06:04	06:14															
Northampton	05:16	06:04	06:14															
Leicester	06:17	07:45	07:55															
Nottingham	05:32	07:45	07:55															
Stoke-on-Trent	06:07	07:13	07:23															
Derby	06:10	07:13	07:23															
Sheffield	05:30	07:13	07:23															
Milton Keynes	05:37	06:45	06:55															
Peterborough	06:10	08:20	08:30															
Stafford	05:24	06:39	06:49															
Burton	06:20	07:13	07:23															
Tamworth	06:31	07:13	07:23															
Nuneaton	06:18	07:04	07:14															
Warwick	05:52	07:13	07:23															
Stratford-Upon-Avon	06:06	07:37	07:47															
London Euston (LM)	05:34	07:47	07:57															
London Euston (VT)	06:20	07:33	07:43															

Legend – colour coding corresponds to time between arrival at airport and departure: **<30 mins**, **30-60 mins**, **>60 mins** - *SkyRail link: 10 minutes added to journey to take into account the transfer from the airport to Birmingham international station

Source: Mott MacDonald analysis of Birmingham Airport website, Flightradar24 and National Rail

For outbound trips this is based upon the arrival at BHX to be 10 minutes later than the arrival at Birmingham International Station (to allow for the transfer via Skylink). For passengers arriving at BHX within 30 minutes of the scheduled flight departure time, this has been coded red (assuming the passenger will not make the flight). For passengers arriving 30-60 minutes before the scheduled flight departure time, this has been coded amber. For passengers arriving more than 60 minutes before the scheduled flight departure time this has been coded green (assumed the passenger will comfortably make the flight).

The table shows that for many flights before 08:00, access via rail is limited (particularly to and from the East Midlands, Staffordshire and Warwickshire). For passengers arriving at BHX, rail connections are available for many regional locations until 22:00.

Figure 45: Weekday late evening air arrivals from Birmingham and rail services to main cities

Weekday Arrivals (PM) to BHX

Origin	Last Train from B'ham International Depart	Arrive	Skyrail Link* 00:10	21:00 Stuttgart (STR)	21:05 Paris (CDG)	21:15 Berlin (TXL)	21:35 Dusseldorf (DUS)	21:35 Belfast (BHD)	21:35 Brussels (BRU)	21:40 Edinburgh (EDI)	21:40 Amsterdam (AMS)	21:50 Rotterdam (RTM)	22:10 Hannover (HAJ)	22:15 Glasgow (GLA)	22:15 Frankfurt (FRA)	22:20 Rome (FCO)	22:35 Dublin (DUB)	22:35 Munich (MUC)
Birmingham (Centre)	01:24	01:36	01:14															
Wolverhampton	01:24	02:16	01:14															
Coventry	00:05	00:16	23:55															
Rugby	23:20	23:43	23:10															
Northampton	23:20	00:40	23:10															
Leicester	21:53	23:20	21:43															
Nottingham	22:35	00:16	22:25															
Stoke-on-Trent	22:05	23:17	21:55															
Derby	22:35	23:53	22:25															
Sheffield	22:35	02:15	22:25															
Milton Keynes	23:20	00:17	23:10															
Peterborough	19:53	22:13	19:43															
Stafford	22:46	23:53	22:36															
Burton	22:35	23:39	22:25															
Tamworth	22:35	23:28	22:25															
Nuneaton	22:20	23:13	22:10															
Warwick	22:46	00:13	22:36															
Stratford-Upon-Avon	21:53	23:23	21:43															
London Euston (LM)	22:05	00:21	21:55															
London Euston (VT)	23:20	01:15	23:10															

Legend – colour coding corresponds to time between arrival at airport and departure: **<30 mins**, **30-60 mins**, **>60mins** – *SkyRail link: 10 minutes added to journey to take into account the transfer from the airport to Birmingham international station

Source: Mott MacDonald analysis of Birmingham Airport website, Flightradar24 and National Rail

The timing of services to Birmingham International on a Sunday has been identified as an issue, with none of the assessed locations able to access Birmingham International station before 08:39. Access from the East Midlands, Staffordshire and Warwickshire is further limited on a Sunday (e.g. the first service from Leicester arrives at 11:39 on a Sunday).

3.5.2 Birmingham Airport – Access via bus

In 2015, 8% of passengers and 16% of staff at BHX accessed the airport via bus/coach. There are currently five local bus services which access the Airport and/or Birmingham International Station:

- 900/900A (connecting Birmingham and Coventry)
- 966 (connecting Erdington and Solihull)
- 97/97A (Birmingham City Centre to Birmingham Airport – 24/7)
- 75/75A (connecting Sutton Coldfield and Birmingham International Station)
- 91 (connecting Chelmsley Wood and Birmingham International Station)

The 900/900A/957 Airport Link operates between the passenger terminal and Birmingham / Coventry city centres every 20 minutes during the day and every 30 minutes on evenings and Saturdays. The first weekday arrival from Birmingham is 05:02, and the first arrival from Coventry is 04:43. The last departures from Birmingham International are 00:54 (towards Birmingham) and 04:23 (towards Coventry). Services are reduced on Sunday although not considerably.

The 97/97A (Birmingham City Centre to Birmingham Airport) is a 24/7 service that serves the airport terminal every 10 minutes during the off-peak and hourly overnight.

The 966 (Solihull to Erdington, via BHX) operates 2 buses per hour throughout the day, and 1 bus per hour in the evening (Monday-Saturday). The first arrival from Erdington is 05:25, and the first arrival from Solihull is 05:44. The last departures from Birmingham International are 23:12 (towards Solihull) and 23:56 towards Erdington. Services are limited on Sunday.

The 75/75A (Sutton Coldfield to Birmingham International, requiring passengers to use the SkyRail for airport access) operates a frequent service between Birmingham International and Birmingham Business Park, although along the whole route it operates 9 services per day Monday-Friday (operating from 06:35 to 17:20). There is a reduced Saturday service and no Sunday service.

3.5.3 Birmingham Airport – Access via coach

National Express operate over 120 daily services to 35 main towns and cities across the UK. Direct services include Birmingham, Oxford, Luton, Milton Keynes and Manchester. It also connects to Heathrow, Gatwick, Luton and Stansted airports. National Express destinations also include Leicester and Nottingham (identified as locations with poor rail access to BHX), although the coach services to and from these locations are infrequent and take longer when compared to the equivalent rail services.

Megabus serve 16 destinations from BHX, although a review of the Megabus website shows these services to be infrequent (e.g. BHX/London operates once daily and BHX/Oxford operates twice daily).

The **Oxford Bus Company** provide a day and night coach service from Oxford to Birmingham Airport (via Warwick). There are 10 services a day in each direction, 7 days a week. The first service to BHX arrives at 04:00 (departed Oxford at 02:00 and Warwick at 03:15). The last service from BHX departs at 23:40. This service may help off-set the poor rail access from Warwickshire and Oxfordshire (particularly with the service operating the same timetable 7 days a week).

East Midlands Airport – Access via rail

The closest railway station to EMA is East Midlands Parkway, 4.9 miles away. Direct destinations to / from East Midlands Parkway include Sheffield, Derby, Nottingham, Leicester, Loughborough, Chesterfield, Kettering, Lincoln, and London St Pancras.

The current service pattern from London sees two trains per hour (one each to Sheffield & Nottingham), both leaving within 8 minutes of each other, whilst the two each hour to London also leave within 10 minutes of each other. The local service between Leicester and Lincoln Central via Nottingham also calls here once each way every hour.

- **Railink** - A major problem identified is the link from East Midlands Parkway to EMA. As advertised on the EMA website, the Railink provides a public transport link between EMA and East Midlands Parkway. The Railink is scheduled to operate 1 service per hour between 09:00 and 17:00 (services depart on the hour). The capacity of each vehicle is 6 passengers (+ luggage). The operation of this service is restricting for public transport users as the journey cannot be undertaken prior to 09:00 (unless done so via a private hire vehicle). Services are available outside of the scheduled timetable, although this will need to be organised in advance with the operator (Elite Cars).
- **Skylink** - The National Rail website has been reviewed regarding access to EMA. For many regional locations identified it is conceived best to travel via train to Derby, and connect to the Skylink bus service to / from EMA (as opposed to travelling via rail to East Midlands Parkway). Figure 46 shows whether connections from a range of regional locations to different flights (for assumed business locations) can be made via public transport (based upon EMA train and bus connections on the National Rail website).

The current service pattern from London sees two trains per hour (one each to Sheffield & Nottingham), both leaving within 8 minutes of each other, whilst the two each hour to London also leave within 10 minutes of each other. This means passengers may have to wait up to 52 minutes at East Midlands Parkway for a service towards London. Furthermore, for train passengers travelling via East Midlands Parkway, connections to EMA before 09:00 (via Railink) must be via bus/coach or private hire due to the lack of connection between EMA and East Midlands Parkway. Access via Leicester, Nottingham and Derby is considered good, with 24hr Skylink bus services operating. These services provide connections for rail passengers, although as shown in Figure 46 these are limited (particularly for flights before 09:35).

Figure 46: First train/bus to EMA airport by city and morning departing flights

Origin	First Train/Bus to EMA Depart	Arrive	06:30 Dublin (DUB)	06:30 Berlin (SXF)	08:45 Belfast (BHD)	08:45 Glasgow (GLA)	08:55 Edinburgh (EDI)	09:35 Barcelona (BCN)
Birmingham (Centre)	06:00	07:25						
Wolverhampton	05:24	07:25						
Coventry	05:51	07:57						
Rugby	06:06	07:57						
Northampton	05:45	07:57						
Leicester	Skylink Bus							
Nottingham	Skylink Bus							
Stoke-on-Trent	06:33	08:17						
Derby	24hr	Bus						
Sheffield	05:05	06:43						
Milton Keynes	05:21	08:37						
Peterborough	06:52	09:02						
Stafford	05:24	07:57						
Burton	06:51	07:57						
Tamworth	06:39	07:57						
Nuneaton	06:20	07:57						
London St Pancras	05:45	08:37						
London St Pancras	07:24	09:10						

Legend – colour coding corresponds to time between arrival at airport and departure: **<30 mins**, **30-60 mins**, **>60mins**
Source: Mott MacDonald analysis of East Midlands Airport website, Flightradar24 and National Rail

Figure 47: Last train/bus from EMA airport and evening arriving flights

Origin	Last Train/Bus from EMA Depart	Arrive	19:05 Brussels (BRU)	19:35 Belfast (BHD)	20:00 Glasgow (GLA)	20:45 Edinburgh (EDI)	20:45 Dublin (DUB)
Birmingham (Centre)	21:47	23:25					
Wolverhampton	21:47	01:03					
Coventry	21:47	00:16					
Rugby	20:47	22:31					
Northampton	20:47	23:20					
Leicester	Skylink Bus						
Nottingham	Skylink Bus						
Stoke-on-Trent	20:47	22:50					
Derby	Skylink Bus						
Sheffield	23:47	02:15					
Milton Keynes	20:47	22:54					
Peterborough	19:47	23:46					
Stafford	20:47	23:00					
Burton	21:47	22:54					
Tamworth	21:47	23:05					
Nuneaton	20:47	22:17					
London St Pancras	20:47	23:46					

Legend – colour coding corresponds to time between arrival at airport and departure: **<30 mins**, **30-60 mins**, **>60mins**
Source: Mott MacDonald analysis of East Midlands Airport website, Flightradar24 and National Rail

3.5.4 East Midlands Airport – Access via bus / coach

The following section summarises bus and coach services to / from EMA.

Skylink – Derby (for journeys to and from Sheffield, Chesterfield, Birmingham and other destinations to the north and west of the UK connecting via rail). The Skylink bus connects this station with the airport up to every 20 minutes, seven days a week, with a journey time of around 36 minutes. For rail journeys via Derby passengers can connect onto airport buses by buying a combined train and bus 'add-on' ticket from the railway station.

Skylink – Nottingham (for journeys to and from Lincoln and destinations to the east of the UK, connecting via rail). The Skylink Express buses connect this station with the airport every 30 minutes, seven days a week with a journey time of around 30 minutes, stopping right outside the Station.

Skylink - Long Eaton (for journeys to and from London and destinations to the south of the UK, connecting via rail). The Skylink bus connects this station with the airport up to every 20 minutes, seven days a week, with a journey time of 20 minutes.

Skylink services are summarised as follows:

Table 15: Skylink service pattern

Skylink	Monday-Friday	Saturday	Sunday
Nottingham (55 min journey)	24hr service 3 bph 04:00-19:00 and 1bph outside of these times	24hr service 3 bph 04:00-19:00 and 1bph outside of these times	24hr service 2 bph 04:00-19:00 and 1bph outside of these times
Derby (45 min journey)	24hr service 2-4 bph 04:00-20:00 and 1bph outside of these times	24hr service 2-4 bph 04:00-20:00 and 1bph outside of these times	24hr service 2 bph 05:00-20:00 and 1bph outside of these times
Leicester (50 min journey)	24hr service 2-4 bph 04:00-20:00 and 1bph outside of these times	24hr service 2-4 bph 04:00-20:00 and 1bph outside of these times	24hr service 2 bph 05:00-20:00 and 1bph outside of these times

Source: Mott MacDonald analysis of Skylink website

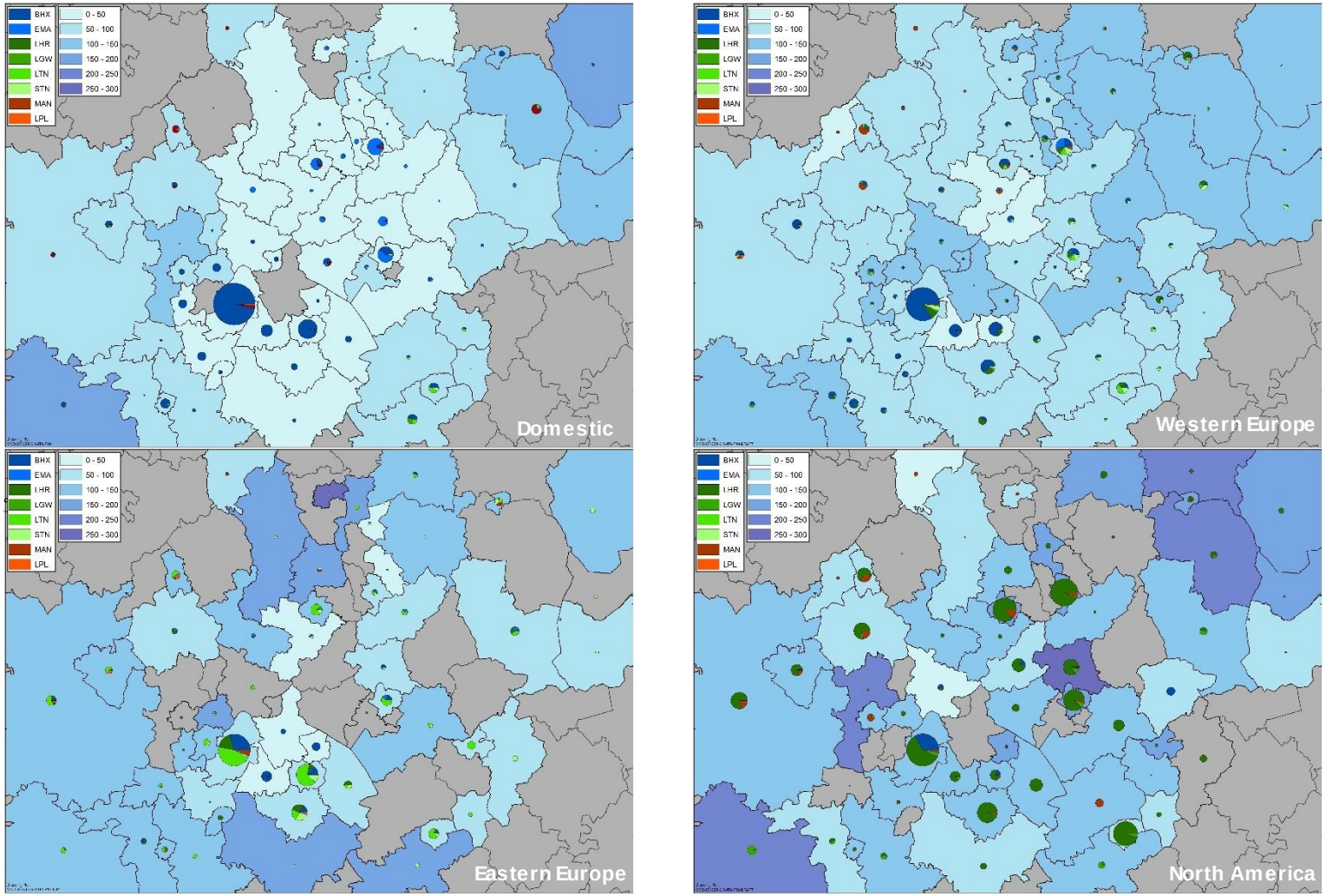
The **Skylink Express (Nottingham)** operates up to every 20 minutes (although generally every 30 minutes), seven days a week, with a journey time of around 30 minutes departing from Broadmarsh Bus Station; a 5-minute walk from Nottingham Railway Station. The first weekday service arrives at EMA at 04:57, and the last service departs EMA at 23:00. There is a reduced service operating at weekends.

Airlink is a direct service to Coalville, running every 60 minutes during the day, Monday to Saturday (no services on Sundays). The first service from Castle Donnington arrives at EMA at 07:36 and the last service departs EMA at 19:05.

National Express operates direct services connecting EMA with Sheffield and Leeds as well as Luton and Heathrow and Gatwick Airports. There are 10 daily services operating in each direction.

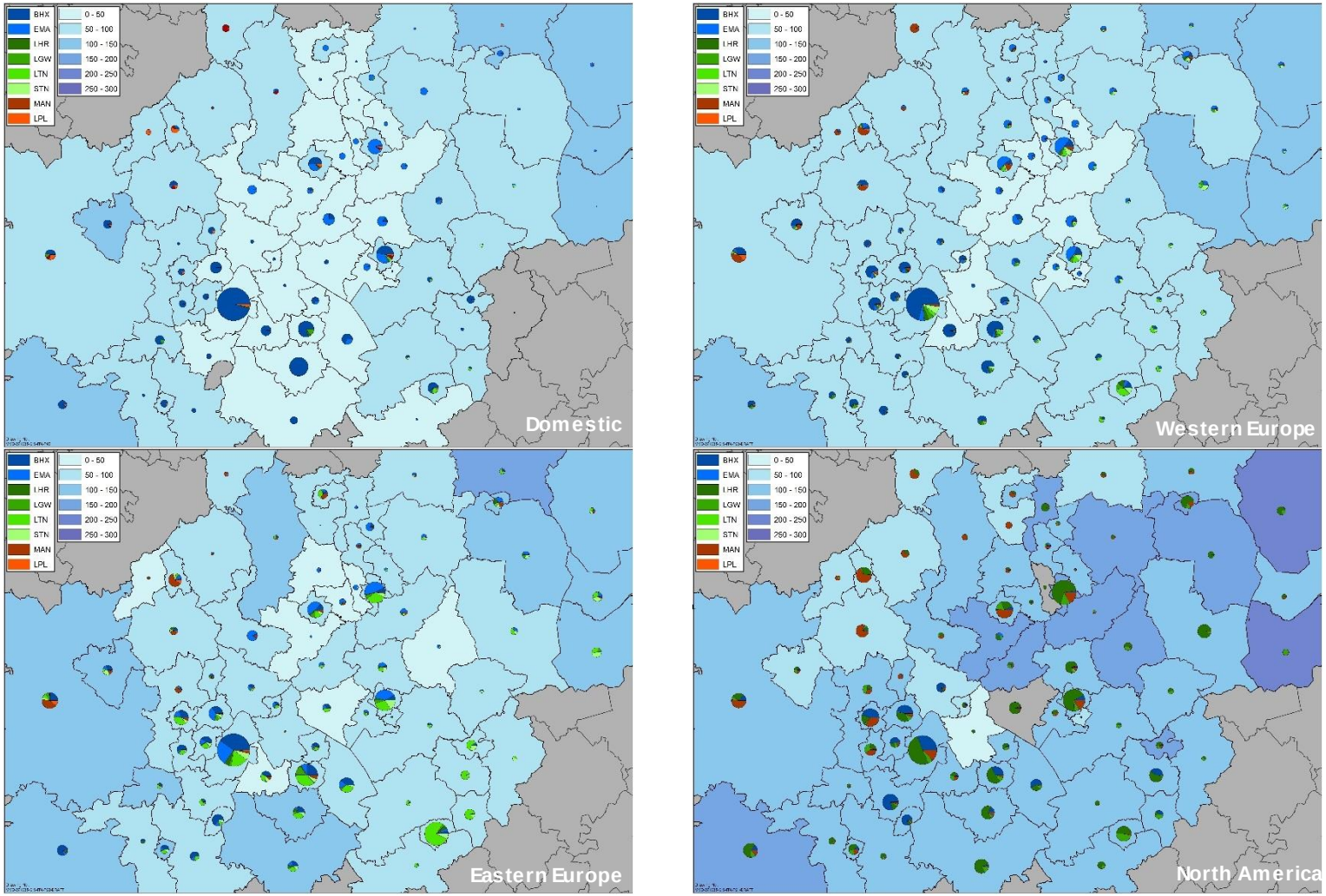
Buses / coaches are the principal public transport travel mode to East Midlands Airport. The usage of the network of Skylink services has grown over the past ten years from around 200,000 bus users in 2004 to over 1.7 million passengers in 2013/14. Bus and coach access to EMA is considered good, with many public transport passengers having to change modes from rail to coach to access EMA. There is a good 24hr service operating from a range of locations, as shown in this section.

Figure 48: Business passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map)



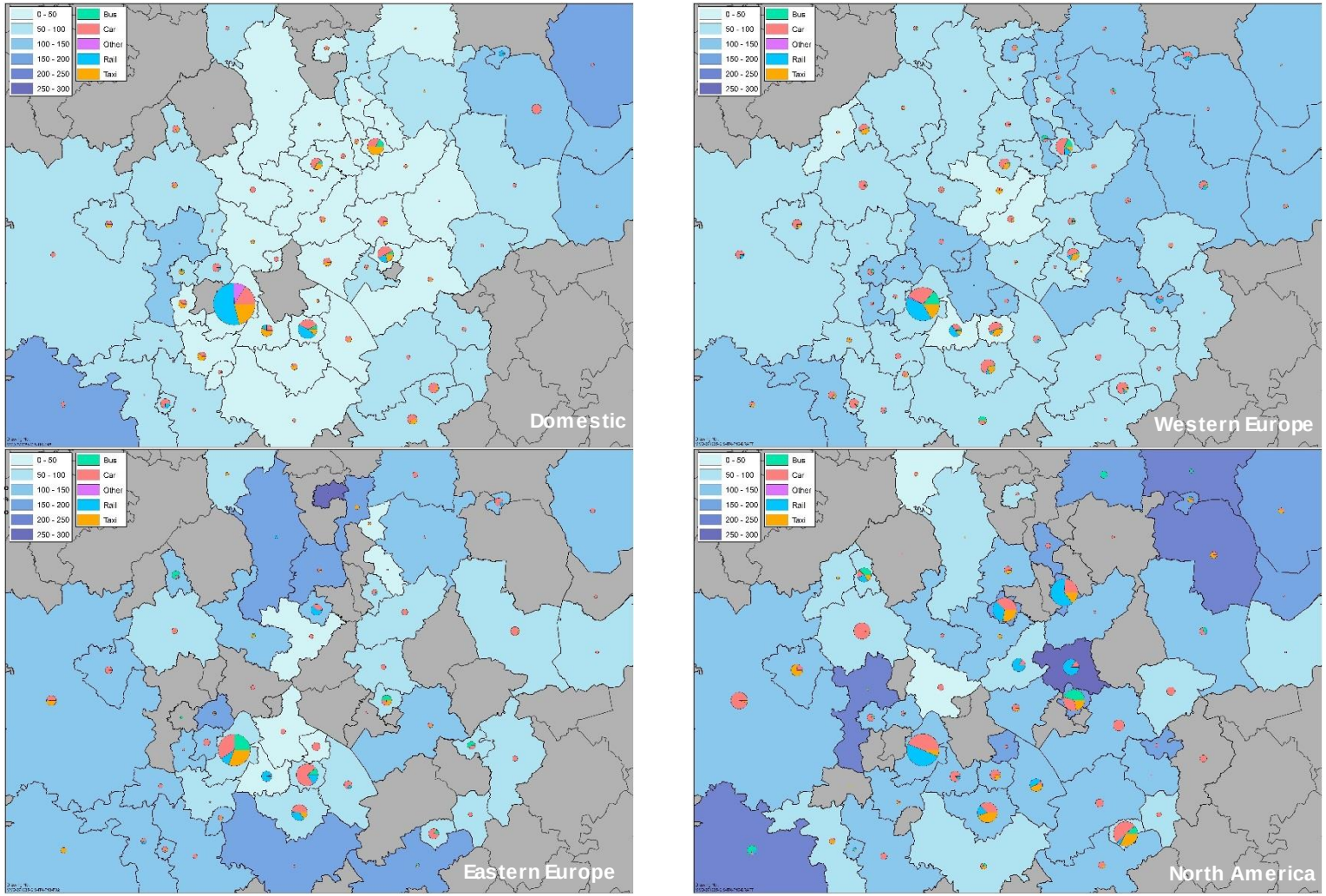
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 49: Leisure passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map)



Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 50: Business passengers volumes and travel mode (pie chart) and average surface access journey time (heat map)



Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

4 High Speed Two and other surface access developments

4.1 Introduction

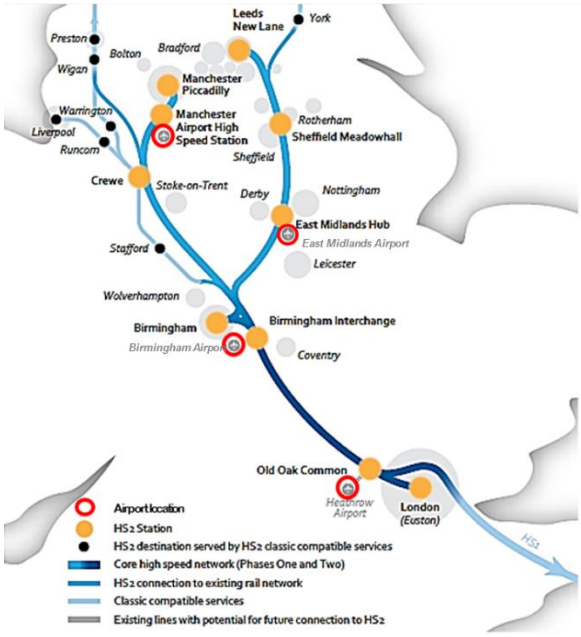
In this chapter the HS2 impact on travel times to airports from the Midlands and the impact of road improvement works on travel times are analysed. The data is sourced from the DfT Long Distance Model data (LDM) which is the basis for the surface access module of the Airport Commission and DfT aviation forecasts.

HS2 is a planned high-speed train line between London-Euston and the North of the UK. Construction is supposed to start in 2017 and is divided into several phases. Phase One connects London and Birmingham in the West Midlands and is planned to be finished by 2026. Phase Two, opening in 2033, continues in a Y-shape from the West Midlands to Manchester in the North West and to Leeds in Yorkshire and Humberside. However, decisions on the exact routing of Phase Two will only be made at the end of 2016.

The HS2 network is illustrated in Figure 51 while Figure 52 schematises the UK surface transport network in 2033. The rail and road networks represented in the map are those that are loaded into the DfT LDM. The map evidences how both HS2 phases are taken into account in the model (respectively in 2026 and 2033).

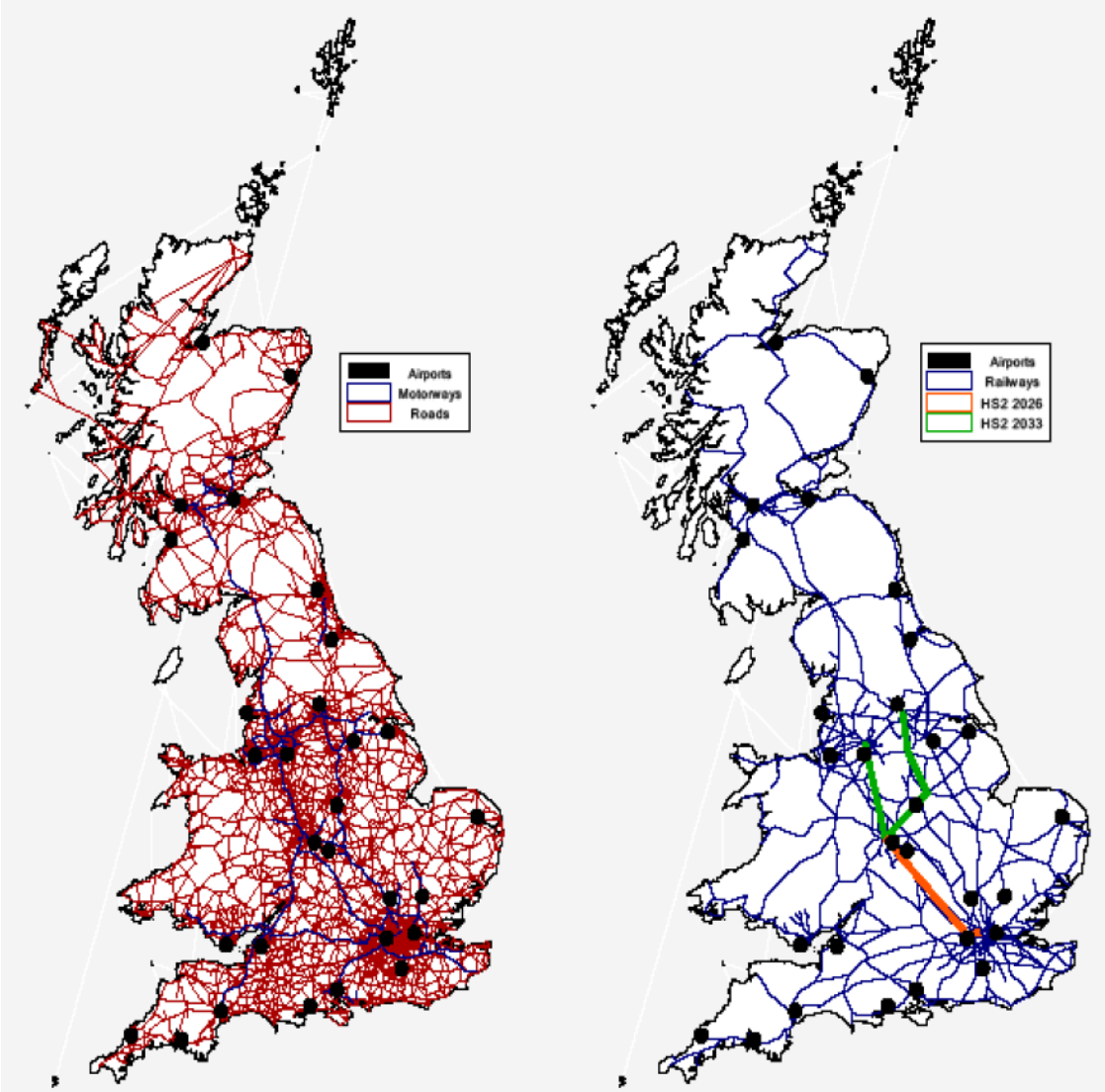
Data from the DfT LDM for the base year 2008 and forecast years 2020, 2030 and 2040 was sourced from DfT – the results of the data analyses are presented in the subsequent sections.

Figure 51: HS2 network in 2033 (Phase One and Two)



Source: Mott MacDonald analysis of HS2 Ltd. data

Figure 52: UK road, rail and airport infrastructure in 2033



Source: DfT Aviation Forecast 2013

As pointed out in Chapter 3, business passengers originating in the West or East Midlands currently have higher airport surface access times compared to those that start their journey in the Southeast. Although it has been highlighted that this is partly the result of airport connectivity being dissimilar between airports, surface access itself has also been named as reason. Improving the latter enlarges an airport's catchment area and thus also increases its attractiveness for airlines and helps route development activities. Connecting airports to the HS2 system and thus improving airport access times appears to play a vital role. While stops are planned at Birmingham and Manchester Airports, an interchange in London (Old Oak Common) would facilitate access to Heathrow. Moreover, East Midlands Airport could be reached via the East Midlands Hub station at Toton. In addition to this, HS2 is supposed to alleviate capacity issues at Heathrow. It is estimated that 6M annual domestic air trips could be transferred to rail and hence, free up space for international routes at the congested airport. HS2 would also ensure that these new air services are accessible for people living outside of London.

The following sections examine whether HS2 would notably change rail travel times from four UK regions and eight Midlands cities to various airports, including Manchester, Birmingham, East Midlands Airports, as well as the main London Airports. In addition, it also compares airport access times by road and rail before and after the introduction of HS2.

4.2 Impact of HS2 on airport access times

4.2.1 Regional level

This section evaluates the extent which HS2 affects average airport access times in the West and East Midlands, London and the Southeast. In this context, it compares average airport rail access time as of 2008 (base year included in the DfT LDM model) to average airport rail access time in 2020, 2030 and 2040. Average airport road access time from the West and East Midlands to various airports is included as a supplementary benchmark.

Figure 53 illustrates how rail and road travel time from the West Midlands to various airports change between 2008 and 2040. Major road improvement works are planned across the UK. Table 26 in Appendix A presents a detailed overview of major planned and completed surface transport projects. The information is sourced from the Strategic Fit Airports Commission Forecast document which is based on DfT LDM data.

Firstly, it emerges that despite the road network improvements, no considerable time savings are achieved between 2008 and 2040 and that airport road access time from the West Midlands to the airports under consideration does not improve.

Furthermore, it becomes evident that prior to the completion of HS2 Phase One in 2026, only little time savings are achieved. However, once this high-speed line between London and Birmingham is built, significant time savings of up to 60min are observed for London Airports (LCY, LHR, LTN, LGW, STN). Moreover, the finalisation of Phase Two by 2033, which improves connections to Manchester and Leeds, leads to notable time savings to MAN and EMA. As BHX is located in the West Midlands and already well connected to its region by the existing rail infrastructure, HS2 would not deliver considerable additional time savings.

When comparing road and rail access times from the West Midlands to the airports under consideration, travelling by car appears to be faster. Although the construction of HS2 results in time savings and rail access time converges to road access time, train journeys only become slightly faster than car journeys to three London Airports (LGW, LHR, LCY).

Figure 53: Average district to airport road vs rail travel time (min) – West Midlands

Source: Mott MacDonald Analysis of DfT data

These findings are further illustrated by Table 16, which compares the top 5 closest airports from the West Midlands by road and rail access time between 2008 and 2040 and evaluates whether the construction of HS2 has a notable impact on this ranking. BHX appears to be the closest airport by car and train in 2008 and 2040. However, the following positions show considerable differences. While EMA is the second closest airport by road access, it only ranks third by rail in 2008 and even fourth in 2040. Moreover, whereas LCY is among the top 5 closest airports by rail access, it does not appear in the top 5 closest airports by road access. The opposite is the case for LTN. Although the top 5 closest airports buy road and rail access from the West Midlands already differ prior to HS2 in 2008, it also emerges that an operation of the high-speed line would notably change the ranking again, making it even more different from 2008 results.

Table 16: Top 5 closest airports by road and rail travel time (min) – West Midlands

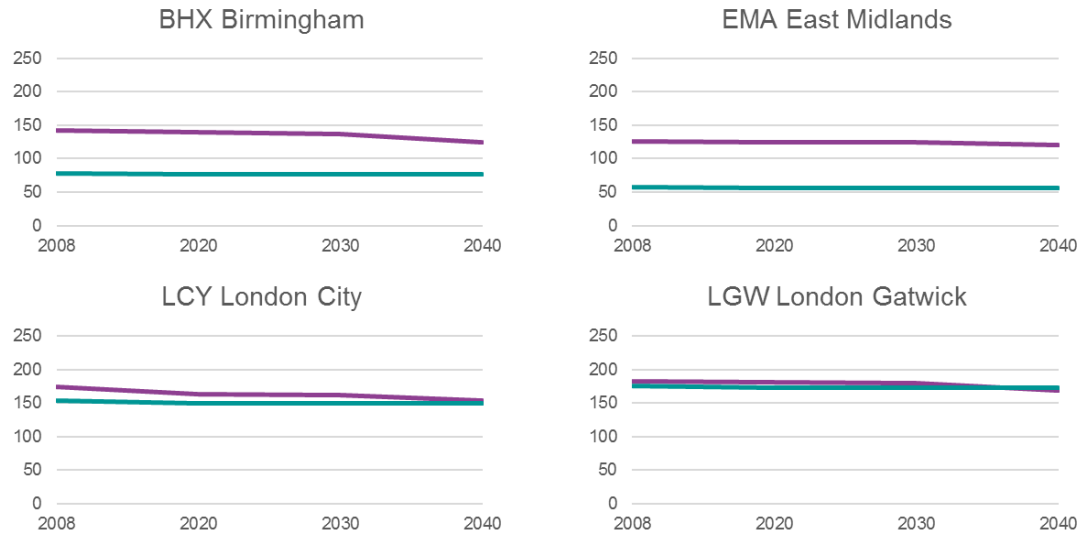
	Road 2008	Road 2040	Rail 2008	Rail 2020	Rail 2030	Rail 2040
1.	BHX (51)	BHX (50)	BHX (83)	BHX (82)	BHX (83)	BHX (83)
2.	EMA (77)	EMA (77)	MAN (149)	MAN (145)	LHR (128)	MAN (119)
3.	MAN (102)	MAN (99)	EMA (165)	EMA (162)	MAN (142)	LHR (130)
4.	LTN (126)	LTN (124)	LCY (185)	LHR (178)	LCY (146)	EMA (148)
5.	LHR (137)	LHR (135)	LHR (187)	LCY (179)	LGW (158)	LCY (149)

Source: Mott MacDonald Analysis of DfT data

Figure 54 shows the development of the average rail and road travel time from the East Midlands to various airports between 2008 and 2040. While the road development projects are not resulting in any road access time reductions from the East Midlands to the airports analysed, HS2 impacts average rail access times. The most considerable savings are achieved in 2040, when HS2 Phase Two is operational and connects the East Midlands with the high-speed line. It results that this new service particularly decreases rail access time to MAN (37min) and LHR (27min). In contrast, HS2 would not notably affect train journeys to BHX, EMA, LGW and STN, where time savings range between 6 min and 16min only.

When comparing road and rail access times from the East Midlands to the airports under consideration, it appears that except for LGW and LCY, travelling by car seems to be notably faster throughout the entire period. Despite the time savings achieved on train journeys through the construction of HS2, rail access times only fall below road access times at LGW and notably converge to car journey times at LHR and LCY.

Figure 54: Average district to airport road vs rail travel time (min) – East Midlands



Source: Mott MacDonald Analysis of DfT data

Table 17 further compares airport road and rail access times from the East Midlands and shows the top 5 closest airports by car and train journey between 2008 and 2040. Although the top two closest airports (EMA, BHX) do not differ with the choice of transport mode, notable variations emerge in the following ranking. While STN and MAN are one of the top 5 closest airports accessible by car, they are not listed among the closest airports by train journey time. The opposite can be observed for LCY and LHR. The latter even ranks third in 2030 when HS2 Phase One is completed.

Table 17: Top 5 closest airports by road and rail travel time (min) – East Midlands

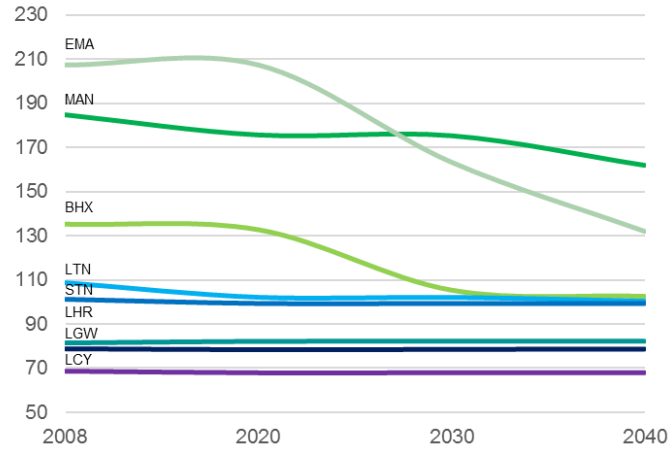
	Road 2008	Road 2040	Rail 2008	Rail 2020	Rail 2030	Rail 2040
1.	EMA (57)	EMA (56)	EMA (126)	EMA (124)	EMA (124)	EMA (120)
2.	BHX (78)	BHX (77)	BHX (142)	BHX (139)	BHX (137)	BHX (124)
3.	LTN (109)	LTN (109)	LHR (172)	LCY (163)	LHR (158)	LHR (145)
4.	STN (127)	STN (124)	LTN (173)	LHR (166)	LCY (161)	LTN (153)
5.	MAN (129)	MAN (126)	LCY (174)	LTN (170)	LTN (169)	LCY (153)

Source: Mott MacDonald Analysis of DfT data

Figure 55 presents the development of average rail travel time from London to various airports between 2008 and 2040. As the existing rail network in the London area offers well-developed connections to London Airports, HS2 would not deliver considerable additional time savings. In contrast, the operation of HS2 Phase One would already notably decrease rail access time to BHX (30min) and MAN (44min). Without doubt, the latter airport would benefit even more from the expansion of the high-speed line in Phase Two, which includes the development of a HS2 station at MAN itself and results in time savings of 75min compared to 2008. However, it appears that in this context, it is this HS2 stop at MAN which delivers a notable advantage. EMA, on the contrary, will only be located in proximity to a HS2 station and passengers would still require

another mode of transport to travel from the HS2 stop to the airport. Thus, HS2 would not considerably decrease train access time to EMA.

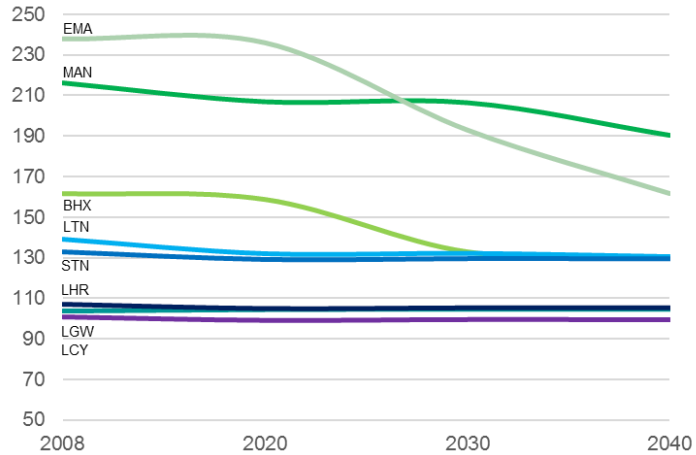
Figure 55: Average district to airport rail travel time (min) by region – London



Source: Mott MacDonald Analysis of DfT data

Figure 56 displays the effect of HS2 on average rail travel times from Southeast to various airports. Similarly, to the results illustrated above for the London region, HS2 would deliver the highest time savings of up to 76min on train journeys to MAN and BHX. The Southeast is already well-connected to London Airports. Additionally, HS2 only connects London to the Northern regions of the country. Therefore, it is unsurprising that rail travel times between the Southeast and London Airports would not change with the construction of HS2. In contrast, due to the faster connections from London to BHX and MAN, passengers from the Southeast would benefit considerably from the operation of HS2, which would decrease rail access time to BHX by 31min and to MAN by 76min.

Figure 56: Average district to airport rail travel time (min) by region – Southeast



Source: Mott MacDonald Analysis of DfT data

Overall, it emerges that HS2 would reduce rail access time between the Southeast and London to MAN the most, resulting in savings of up to 76min. This is followed by train journeys between the West Midlands and LHR (60min). As London airports are already well-connected to the various regions by the existing rail network, HS2 would not change average rail travel time considerably to these airports. The most notable

impact was observed from the West Midlands. It also appears, that out of the London Airports, LHR would probably benefit the most.

After comparing average airport road and rail access times from the West and East Midlands, it also becomes evident that the closest airports to these regions do not vary with the choice of transport mode and even the construction of HS2 does not change the positions. However, while the top two airports remain similar, the analysis also shows differences in the further course of the rankings. While some airports were listed in the top 5 closest by car access time, they were not among those with the shortest train journey or vice versa. These differences are even further intensified by the operation of HS2 in 2040.

4.2.2 City level

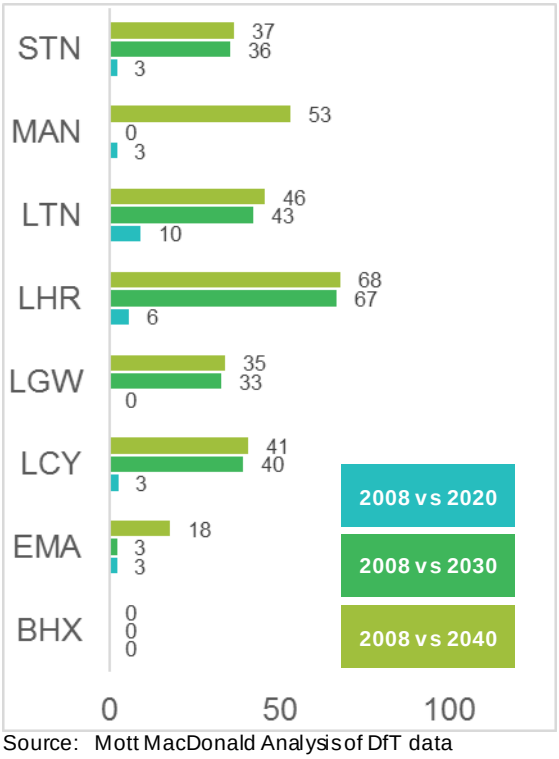
In this section is analysed the impact of HS2 on airport rail access times from eight main cities in the West and East Midlands.

Figure 57 to Figure 60 present the changes in airport travel time from cities in the West Midlands, namely Birmingham (Figure 57), Coventry (Figure 58), Stoke on Trent (Figure 59) and Wolverhampton (Figure 60). Airport rail access times from Birmingham and Wolverhampton appear to benefit the most from HS2. Besides savings of up to 68min to London Airports, Birmingham also notes a considerable reduction in journey time to Manchester (53min) once a faster connection between Birmingham and Manchester is developed during HS2 Phase Two. Wolverhampton already seems to benefit notably from the operation of HS2 Phase One between Birmingham and London in 2030, whereby rail time to London Airports records the highest savings between 38min and 67min. However, unlike Birmingham, no considerable improvements can be observed for journeys between Wolverhampton and Manchester. This could be driven by well-developed connections already provided by the existing rail network, as well as the lack of a HS2 station in Wolverhampton. Unlike Birmingham, no HS2 stop is planned, but the city would be served by classic compatible HS2 trains only.

Coventry sees the most notable savings in rail travel time to MAN (56min) and LHR (27min). Similarly to Birmingham, Coventry appears to profit from the improved train link between Birmingham and Manchester in HS2 Phase Two. The lowest reductions in train access time are recorded for Stoke on Trent. It emerges, that the city achieves most savings along with the operation of HS2 Phase One between Birmingham and London, which reduces travel time to LHR by 47min and LCY by 25min.

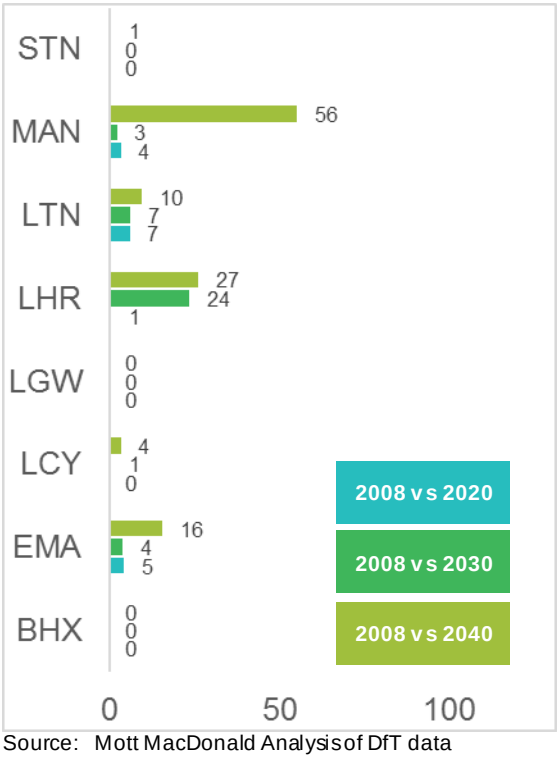
No significant improvements in rail access were observed from any city in the West Midlands to BHX and EMA. However, the former lies in the middle of the West Midlands itself and can already be conveniently reached through the existing rail infrastructure. EMA, in contrast, is located in the East Midlands and although the airport will be in proximity to the HS2 East Midlands hub station by 2040, this would not significantly improve rail access time from cities in the West Midlands.

Figure 57: Average time saving (min) Birmingham to airport rail travel time – West Midlands



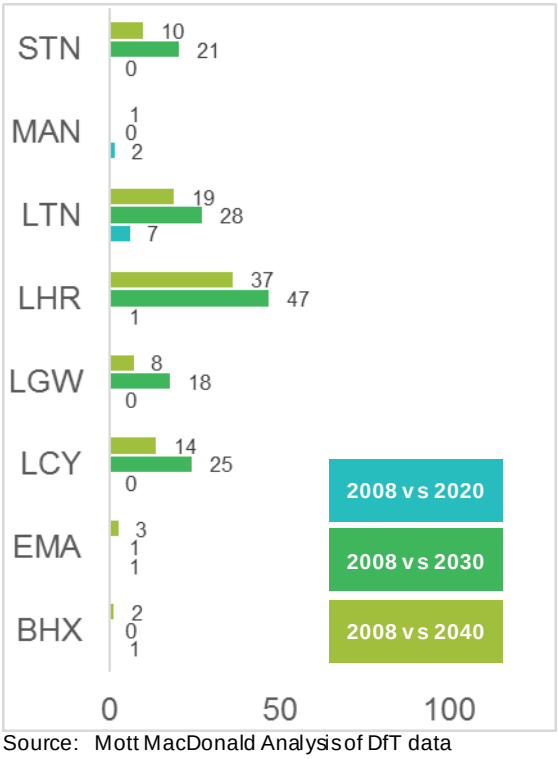
Source: Mott MacDonald Analysis of DfT data

Figure 58: Average time saving (min) Coventry to airport rail travel time – West Midlands



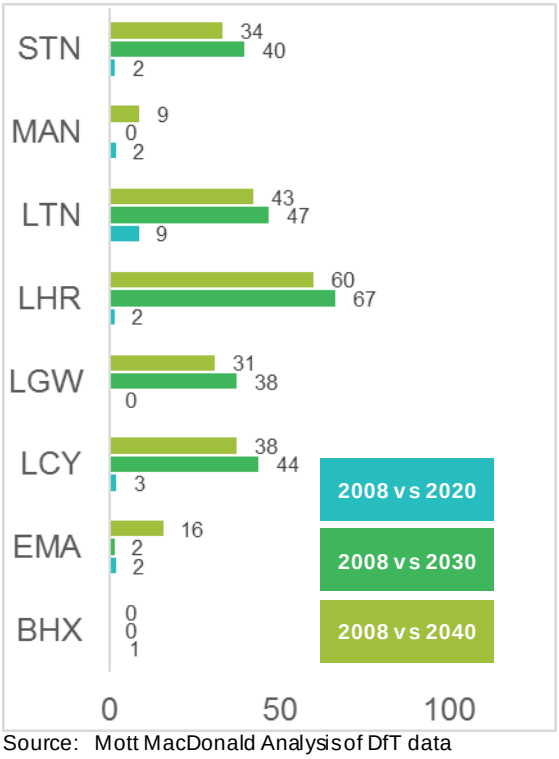
Source: Mott MacDonald Analysis of DfT data

Figure 59: Average time saving (min) Stoke on Trent to airport rail travel time – West Midlands



Source: Mott MacDonald Analysis of DfT data

Figure 60: Average time saving (min) Wolverhampton to airport rail travel time – West Midlands



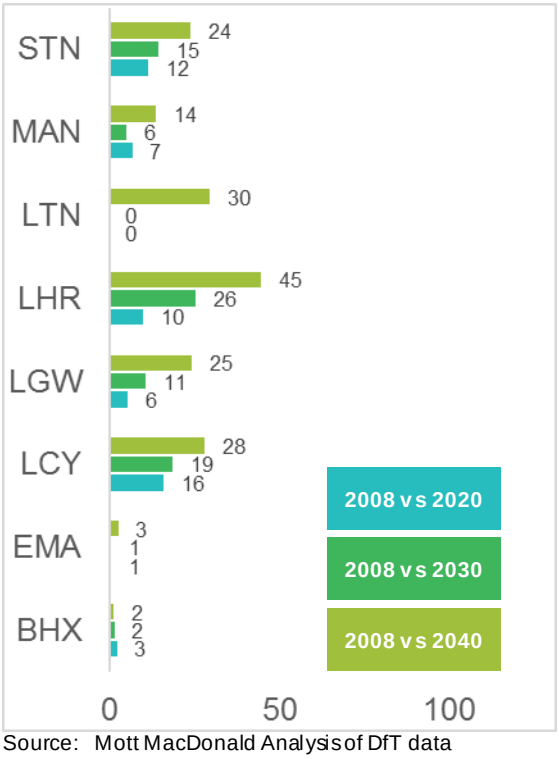
Source: Mott MacDonald Analysis of DfT data

Figure 61 to Figure 64 illustrate the time savings created by HS2 on rail journeys between various airports and four cities in the East Midlands, including Derby (Figure 61), Leicester (Figure 62), Northampton (Figure 63) and Nottingham (Figure 64).

The construction of HS2 Phase Two, which runs from Birmingham to Manchester and Birmingham to Leeds, would connect the East Midlands with the high-speed line. It is therefore unsurprising that the highest savings across all cities are observed in 2040. Nottingham experiences most improvements, recording notable travel time reductions to almost all airports, especially to those in the London region. In addition, the faster connections to Manchester and Birmingham also result in considerable savings on rail journeys to Manchester (48min) and BHX (31min). Derby records the most significant access time reductions to London Airports as well, with LHR leading the way (45min). However, unlike Nottingham, rail travel between Derby and MAN and BHX does not seem to improve notably with the introduction of HS2, although the cities are closely located to each other.

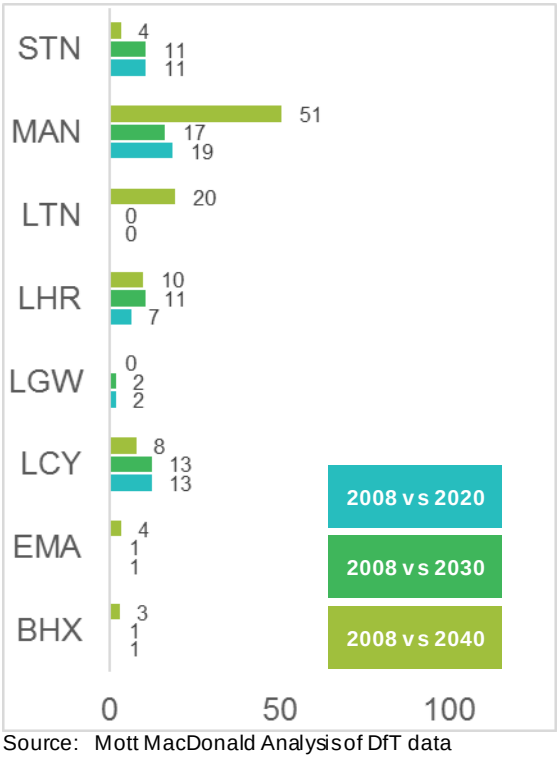
Leicester and Northampton appear to see the least improvements in train access to airports with the operation of HS2. As both cities lie outside the HS2 routes, the new railways would not deliver considerable additional time savings on southward journeys, but achieves the most notable reductions of up to 51min on northward travel to Manchester.

Figure 61: Average time saving (min) Derby to airport rail travel time – East Midlands



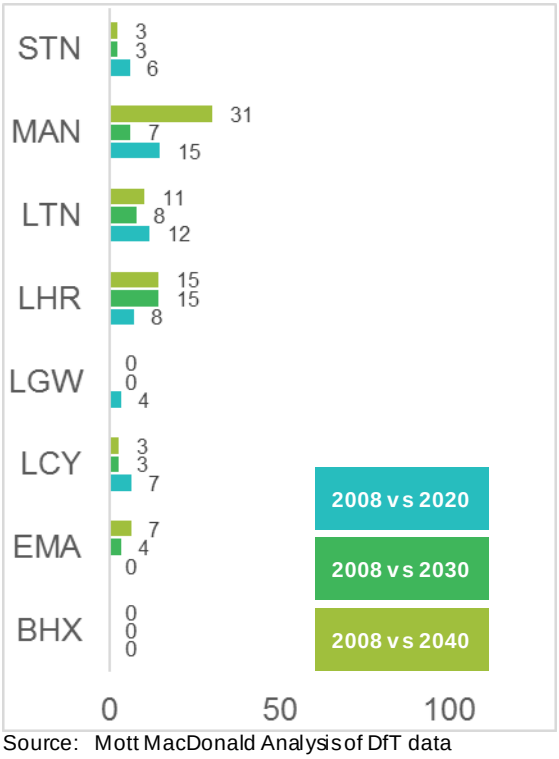
Source: Mott MacDonald Analysis of DfT data

Figure 62: Average time saving (min) Leicester to airport rail travel time – East Midlands



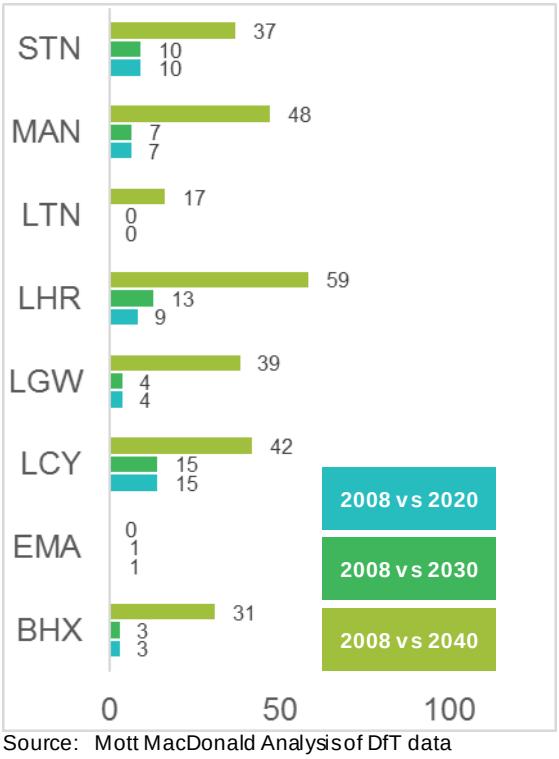
Source: Mott MacDonald Analysis of DfT data

Figure 63: Average time saving (min) Northampton to airport rail travel time – East Midlands



Source: Mott MacDonald Analysis of DfT data

Figure 64: Average time saving (min) Nottingham to airport rail travel time – East Midlands



Source: Mott MacDonald Analysis of DfT data

The analysis of airport rail access time from various cities in the West and East Midlands confirms the findings on the regional level illustrated before. While the highest savings are observed for London Airports, especially Heathrow, it also appears that especially the construction of HS2 Phase Two and the associated link between Birmingham and Manchester, would lead to a considerable improvement on rail journeys to Manchester.

4.3 Impact of HS2 on Birmingham Airport

Passenger traffic development at Birmingham Airport could benefit considerably from the operation of HS2, considering that access time is one of the decisive factors for passenger airport choice. Since HS2 will notably reduce travel time from London to Birmingham Airport, the densely populated London region could become part of Birmingham Airport's catchment area. In fact, HS2 could not only assist Birmingham Airport achieving higher passenger shares in its existing markets, but also entering regions which used to have no access to Birmingham Airport or were too far away. While before, travelling from London or the Southeast to Birmingham Airport involved multiple interchanges and long journey times, HS2 could provide a more seamless and fast access.

With Birmingham Airport becoming a feasible alternative for passengers from the London area, this would also help alleviating the capacity issues at the congested London Airports. In this context, there have been numerous successful examples of cooperation between airlines and railway companies across Europe. Air France, for instance, has teamed up with the French railway company SNCF and enables passengers to use one combined rail-air ticket and take the French high-speed train TGV from various locations across France to its hub at Paris Charles de Gaulle Airport. A similar concept has been implemented by Lufthansa, where high-speed rail replaced its feeder flights from Stuttgart and Cologne Airports to its hub at Frankfurt Airport.

This helped decreasing congestion at Frankfurt Airport and released capacity for more favourable long-haul routes. Today, more than 5.5 million annual travellers utilise long-distance trains from Frankfurt Airport. Amsterdam Schiphol Airport and KLM even operate an international scheme, which allows passengers to use the high-speed train Thalys between Brussels and Schiphol Airport. Check-in and bag-drop-off facilities at train stations further increase service quality and thus the attractiveness of the product.

Considering the prevailing capacity constraints at London Airports, it becomes increasingly difficult for airlines to expand their existing networks and for new carriers to enter the market. However, as HS2 makes Birmingham Airport a favourable alternative for passengers from the London area, it might also encourage airlines to launch new routes from Birmingham. This would further drive the airport's attractiveness and further decrease congestion at London Airports. The overall capacity gains would also strengthen the UK's competitive position in comparison to other European markets.

Although HS2 ticket prices would probably increase the cost of the overall journey, these could be offset by the benefits gained from reduced access time. Besides that, the geographical location of some London Airports including Stansted or Southend already requires London passengers to take express bus or rail services and spend considerable time on accessing the airport. This does not only illustrate the willingness of London passengers to make use of such services, but also shows that travelling to Birmingham Airport on HS2 could present a true alternative for London passengers. Birmingham Airport itself is convinced that it will be even faster than travelling to Stansted Airport[4]. In addition, express railway and bus companies frequently make use of special offers, which reduces the cost of travel. Similar deals could also be conceivable for HS2.

Numerous stakeholders have already highlighted the considerable benefits of HS2 for Birmingham Airport, including the Transport Committee of the House of Commons[5] and the Department for Transport[6], which both stress the accessibility improvements, the positive effects on overall UK air traffic and the decreased congestion at London Airports. Birmingham Airport itself acknowledges the considerable advantages of HS2 in its surface access strategy and works closely with decision makers to ensure that the best connectivity between the Airport and HS2 is established[7].

Overall, it emerges that through the operation of HS2, Birmingham Airport would become a feasible alternative for passengers originating in the London area. The arising opportunities and growing demand would not only encourage capacity expansion of existing carriers, but also attract new airlines to Birmingham. The increasing passenger volume and wide-ranging route network would thus strengthen Birmingham Airport's position among UK airports and drive its development as growing international airport.

Figure 65 shows current average travel time by London postcode to the closets and furthest London airport (excluding Southend). This is then benchmarked against Birmingham airport current access time and a proxy HS2 access time which has been assumed to be decreased by 30 minutes. This indicates how the access time for Birmingham airport becomes in line with London airports' access time. HS2 will bring Birmingham in London metropolitan area.

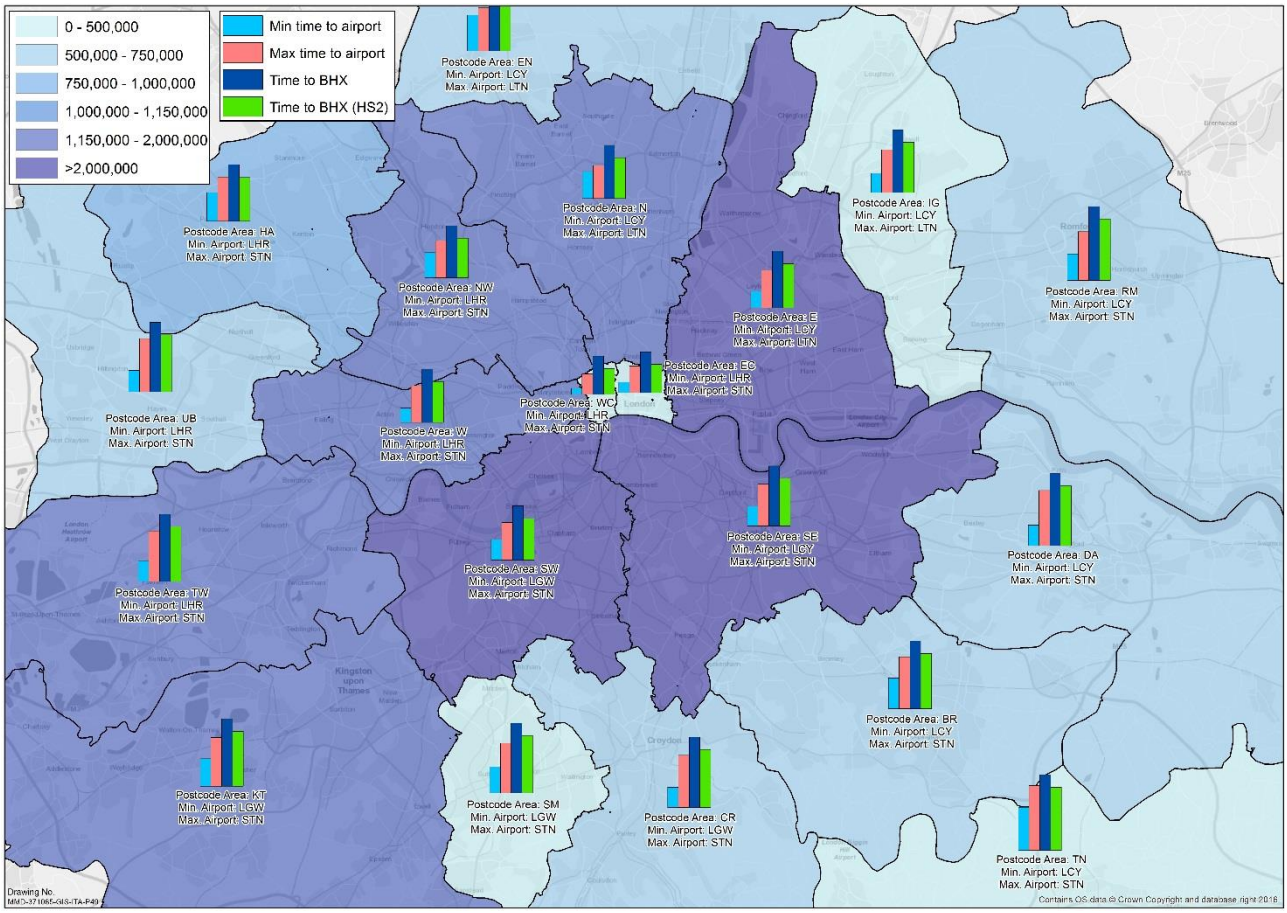
[4] http://www.bbc.co.uk/news/uk-england-birmingham-12557717

[5] http://www.publications.parliament.uk/pa/cm201516/cmselect/cmtrans/516/516.pdf

[6] http://www.railtechnologymagazine.com/Rail-News/hs2-needs-to-improve-connections-to-airports-transport-select-committee

[7] https://www.birminghamairport.co.uk/media/1699/bhx_surface-access-strategy-2015-final-may-2015.pdf

Figure 65: Average travel time from London by postcode area to London airports (excluding Southend) by fastest rail journey as a comparison to Birmingham airport journey and possible Birmingham airport journey time with HS2 *(assuming a 30 minutes decrease in journey time)* and in relation to 2015 passengers volumes by postcode area



Source: Mott MacDonald analysis of Google Maps API, CAA survey data Jan-Nov 2015, ONS data

The DfT aviation model assumes that the HS2 phase 1 will be implemented in 2026 (London-Birmingham) while the "Y" shaped HS2 extension from Birmingham to the North, connecting both Manchester and Leeds, is assumed to be operative in 2033. The Yorkshire and the Humber region will benefit from the eastern leg of HS2 through increased closeness to airports. The 2040 vs 2030 growth rate for traffic from this region flying out of Birmingham and East Midlands airports is in line or below the total airport growth for the same period under the baseline scenario, therefore according to the DfT model the opening of the eastern leg of HS2 will only be a minor contributing factor to the overall airports growth.

4.4 Further UK new rail infrastructure projects

Following the evaluation of the HS2 impact on airport rail access time, this section presents further major surface access projects across the UK.

In addition to HS2, there are several other major rail projects planned across the UK, some of which are also assumed to notably change airport access times. The Crossrail project can certainly be considered as one of them, constructing a new rail line between Reading in the West of London and Abbey Wood in the East, while also running via LHR. The train link is expected to be fully operational by 2020 and assumed to serve LHR with considerable additional capacity. Further major rail projects are outlined in Table 18.

Table 18: Major rail infrastructure projects UK as per DfT Long Distance Model (LDM) assumptions

Project	Year of introduction
Western Rail Access to Heathrow: provides better access to Heathrow for those travelling from the West with a new direct service from Reading	2020
Crossrail: new railway from Reading and Heathrow to Shenfield and Abbey Wood; 4 trains per hour (tph) serve Heathrow.	2020
Thameslink Programme: improving access to Gatwick	2020
Great Western, East Midlands and East Coast routes: significant journey time and frequency improvements.	2020
Northern Hub: significant improvements in frequency in the North of England	2020
London Underground: series of relatively small changes, including 15tph to Heathrow on the Piccadilly line.	2020
HS2 Phase One: a new high speed railway from London to West Midlands.	2026
HS2 Phase Two: extension of the new high speed railway to Manchester and Leeds. No spur to Heathrow is assumed.	2033

Source: Mott MacDonald Analysis of Strategic Fit Airports Commission Forecast data

5 Potential overflow from the Southeast airports

5.1 Introduction

The recent Government announcement of its support to the development of a third runway at Heathrow has put an end to a debate that lasted decades. The Government had previously formed an independent commission (the "Airport Commission" to inform on the options available concerning additional capacity creation in the Southeast. The Final Report of the commission was issued in July 2015.

According to the Airport Commission forecasts, demand at London airports will significantly exceed capacity by 2050, while already in 2030 airports will be already under significant pressure. The Commission suggests that moving traffic between London airports would only "delay the capacity crunch".

As indicated in Figure 66, according to the Airport Commission, London Heathrow has reached capacity in 2010 while the next London airport that is forecast to reach capacity Gatwick in 2020. This chapter attempts to evaluate the level which capacity limits have influenced the "spillage" of passengers from the Southeast which may choose to travel from Birmingham and East Midlands airports rather than the closer London airports.

The analysis presented below relates to the level of current potential "spillage" from the Southeast to the Midlands airports and is followed by the analysis of potential further spillage in 2030, 2040 and 2050. The two traffic scenarios from which forecast traffic is extracted:

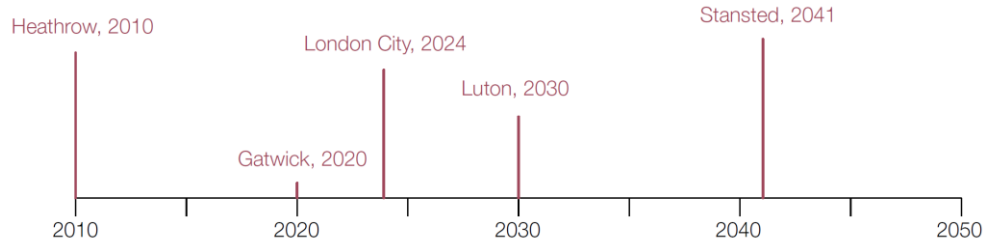
1) **"Do nothing" scenario** – in which London Heathrow is forecast to grow the least compared to all other scenarios and consequently spillage is assumed to develop highest of all scenarios.

2) **"Heathrow NWR" scenario** – New North-West runway built at Heathrow – in this case the traffic at LHR grows more than in any other scenarios with the assumption that spillage will be minimal.

The choice of scenarios does not represent a preference or indication on which of the Airport Commission proposed schemes should be implemented. It is merely a representation of the likely lower and upper bound of future traffic development at London Heathrow and therefore indicates the upper and lower bound of possible spillage of traffic from the Southeast area to non-London airports.

While a Government decision has finally been taken, this chapter is valuable as it identifies current spillage volumes, and the likely spillage volumes taking place in the future if the new runway is being delayed or postponed for any reasons.

Figure 66: Airport capacity timeline



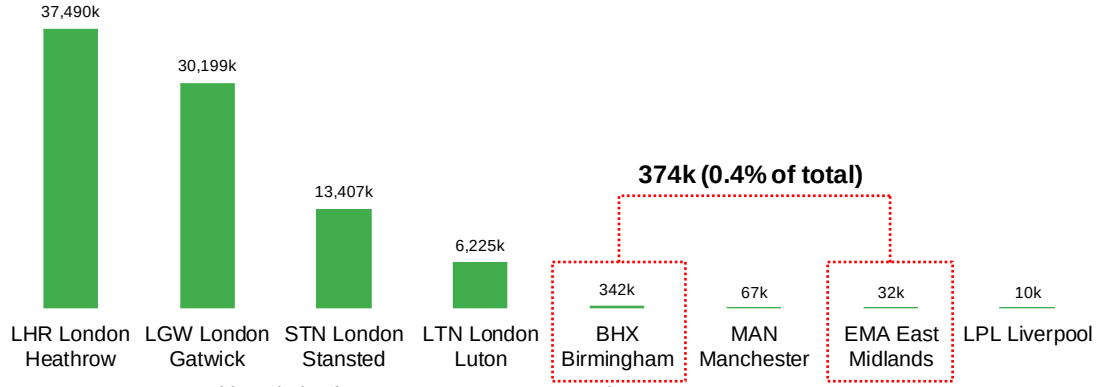
Source: Airport Commission – DP06: Utilisation of the UK's Existing Airport Capacity

5.2 Size of the market in the Southeast

CAA Survey data analysis indicates that the number of passengers originating or ending their trip in the Southeast region (including London) in 2015 was 87M, thus making this market the largest region In the UK terms of air passengers. It should be noted that this analysis is based on available CAA survey data for 2015 and that London City airport survey data was not obtainable. As illustrated in Figure 67, London Heathrow and London Gatwick capture 77% of the passenger's airport choice. Non-London airports are chosen by a minor group of travellers, with only 0.4% of total Southeast passengers fly out of the two Midlands Airports (374,000).

Birmingham captures 91% of the Southeast *spillage* of traffic from the Southeast. East Midlands does not appear as a feasible alternative solution to passengers from the Southeast. The analysis of current spillage then focuses on the characteristics of Southeastern flows flying out of Birmingham airport.

Figure 67: Airport choice by passengers ending or terminating their trip in the Southeast in 2015



Source: Mott MacDonald analysis of Jan-Nov 2015 CAA survey data

Only 45,000 London-based passengers have chosen to fly from Birmingham Airport. This figure would indicate that currently, although the capacity constraints at Heathrow, Birmingham is not perceived as an alternative travel solution. The airport is directly served from London by frequent trains (3 trains per hour by Virgin Trains) from London Euston, with journeys averaging 1.15 hours. The vast majority of the abovementioned spillage is originated in Berkshire, Buckinghamshire and Oxfordshire (275,000 passengers, equivalent to 73% of the total overflow from the Southeast). These are areas well connected to Birmingham by the motorway network. The districts that compose such volumes are reported in Figure 69.

Figure 68: Southeast passengers to Birmingham – Detail by county and district

342k to BHX Birmingham

From

Berkshire, Buckinghamshire and Oxfordshire	275k
London	45k
Surrey, East and West Sussex	11k
Hampshire and Isle of Wight	9k
Kent	1k

District	Passengers	Cumulative %
Cherwell District	91k	27%
Oxford District	58k	44%
Milton Keynes	47k	57%
Vale of White Horse District	16k	62%
West Oxfordshire District	15k	67%
Oxfordshire County Unspecified	11k	70%
Wycombe District	10k	73%
Other Berkshire, Buckinghamshire and	26k	81%

Source: Mott MacDonald analysis of CAA survey data

The relatively high share of traffic out of Berkshire, Buckinghamshire and Oxfordshire should not surprise as these are Southeast district that are closer to Birmingham Airport and are part of that area where the catchment area for London Heathrow and Birmingham Airport starts to overlap. Labelling these flows as "overflow" is not then completely accurate. As indicated in Figure 69, the airport choice drivers for passengers from Berkshire, Buckinghamshire and Oxfordshire that choose to fly from Birmingham are very different from the other Southeast areas.

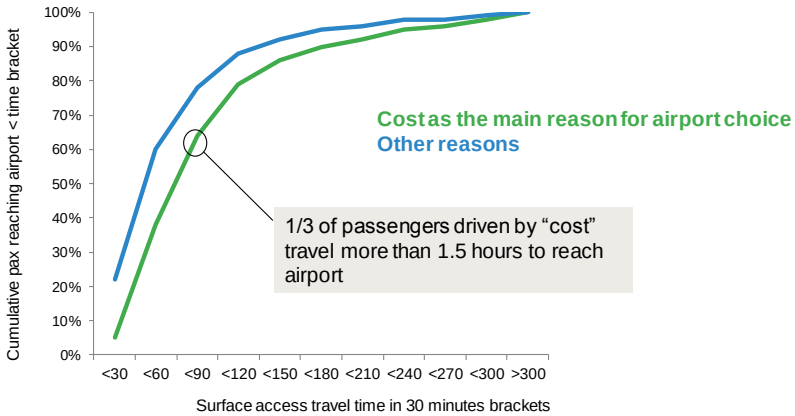
On the other hand, other Southeast passengers' main driver for flying from Birmingham is "cost". It could be argued that one of the effects of increasing capacity constraints at Heathrow is the rise in air fares relative to other London airports, as if passengers are required to pay a premium in order to fly from London's largest airport. Those passengers that are price-sensitive would then prefer to travel from other airports, even if this means spending more time accessing the chosen airport. Data reported in Figure 70 would reinforce this idea.

Figure 69: Southeast passengers to Birmingham – Airport choice factors

	Preferred airport	Connectivity	Cost	Decision made by someone else	Near business	Near home	Other
Berkshire, Buckinghamshire and Oxfordshire	47%	14%	14%	7%	1%	11%	5%
Other Southeast	10%	3%	42%	24%	0%	0%	21%

Source: Mott MacDonald analysis of CAA survey data

Figure 70: Airport surface access travel time comparison – passengers who choose airports based on "cost" vs other factors

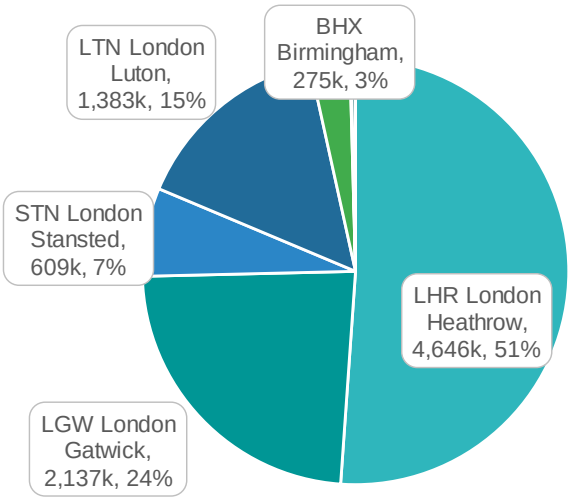


Source: Mott MacDonald analysis of CAA survey data

The passengers from Berkshire, Buckinghamshire and Oxfordshire that chose Birmingham airport are however a small share of total (3% as indicated in Figure 71), with 97% the remaining 97% choosing London airports. It is worth noting that London Gatwick is selected by 24% of these passengers even though the average surface access time is higher than that experienced to Birmingham (as per Figure 72). This is even more evident for Stansted: its market share is more than double that of Birmingham however passengers to Stansted need to undertake journeys that are on average one hour longer than those to Birmingham airport. At both Stansted and Gatwick passengers declare that "cost" and "connectivity" (Figure 73) are the key reasons for travelling so much further than to Birmingham.

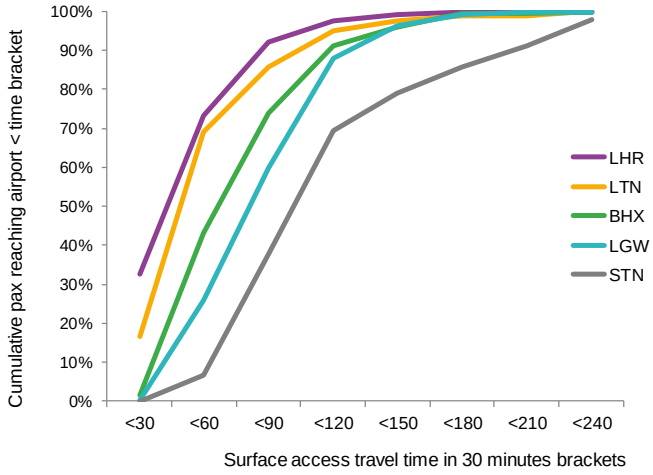
Birmingham is less likely chosen because of its sometimes perceived "closeness to home" compared to London Luton and Heathrow for passengers in Berkshire, Buckinghamshire and Oxford. The CAA survey would suggest that these passengers might have both airports as viable options however they select Birmingham as their "preferred airport" and are willing to undertake longer journeys to reach their preferred airport.

Figure 71: Berkshire, Buckinghamshire and Oxfordshire airport choice



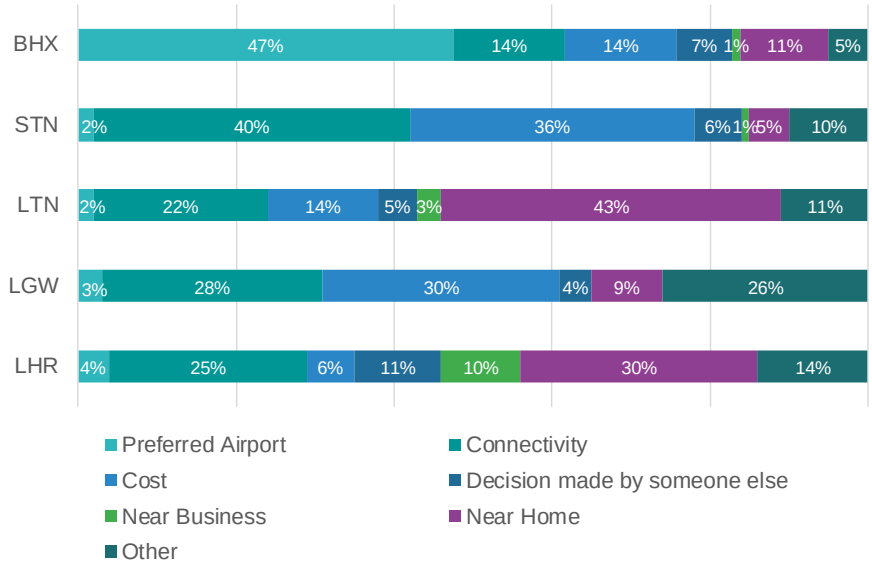
Source: Mott MacDonald analysis of CAA survey data

Figure 72: Berkshire, Buckinghamshire and Oxfordshire airport choice and surface access time



Source: Mott MacDonald analysis of CAA survey data

Figure 73: Berkshire, Buckinghamshire and Oxfordshire airport choice and reason



Source: Mott MacDonald analysis of CAA survey data

5.3 Future overflow from the Southeast

The tables below represent the number of passengers from the Southeast in the different cases according to the Airport Commission forecasts for the two scenarios described above: "do nothing" and Heathrow 3rd Northwest runway". Table 19 shows the number of passengers choosing Birmingham by case and district for 2030, 2040, 2050 while the same data is presented in Table 20 for East Midlands airport. Finally, the data from the two tables is then consolidated Table 21, which represent the difference by year, airport of choice and district of

origin between the two scenarios representing the lower and upper bound of traffic at Heathrow (and therefore the assumed upper and lower bound of overflow from the Southeast).

The forecast would suggest that the improvements in rail infrastructure planned in 2026 (HS2 Phase 1 – improving connectivity of Birmingham airport to London), would have a marginal impact in term of increasing volumes of passengers from the London area to Birmingham, totalling 221,000 for the "do nothing" case – and 131,000 for the Heathrow 3rd runway scheme. These volumes would not signify a step-change in the air traffic dynamics between London and Birmingham at least for 2030.

The situation drastically changes from 2030 onwards, as the 2040 forecast show that while a new runway would be enough to cater for the London demand, with spillage similar in volume to the 2030 levels, without a new runway the spillage would more than double from the previous decade in 2040 (520k vs 227k). Without a runway by 2050, the overflow would double again raising up to 1,200k passenger using Birmingham out of London. In parallel, volumes from London to East Midlands would grow as well but at a smaller magnitude than Birmingham.

The same pattern is clearly visible for the rest of the Southeast, in particular for Berkshire, Buckinghamshire and Oxfordshire. The absolute number of Birmingham passengers deriving out of the decision of not introducing capacity in the Southeast would equate to 206k, 706k, 1,631k respectively in 2030, 2040 and 2050.

Overall, while the overflow effect equates to 300k in 2030, the true effects of the capacity constraints are evident in 2040 (+1,090k) and 2050 (+2,768k) as presented in Figure 70.

Table 19: Number of passengers from the Southeast to BHX Birmingham airport by case

	2030		2040		2050	
	Do nothing	**LHR_N WR**	**Do nothing**	**LHR_N WR**	**Do nothing**	**LHR_N WR**
Southeast (England)	**650k**	**443k**	**1,263k**	**557k**	**2,825k**	**1,194k**
Berkshire, Buckinghamshire and Oxfordshire	536k	366k	1,057k	478k	2,278k	1,047k
Hampshire and Isle of Wight	62k	44k	102k	46k.	200k	83k
Kent	9k	6k	18k	7k	53k	13k
Surrey, East and West Sussex	42k	26k	86k	26k	294k	51k
London	**227k**	**131k**	**520k**	**136k**	**1,411k**	**274k**
Inner London - East	42k	25k	97k	25k	265k	52k
Inner London - West	155k	87k	357k	92k	947k	185k
Outer London - East and North East	16k	11k	37k	11k	104k	23k
Outer London - South	13k	9k	29k	8k	95k	14k
Outer London - West and North West	81k	47k	181k	48k	533k	89k
Total	**876k**	**574k**	**1,784k**	**693k**	**4,236k**	**1,467k**

Source: Mott MacDonald analysis of DfT aviation forecast

Table 20: Number of passengers from the Southeast to EMA East Midlands airport by case

	2030		2040		2050	
	Do nothing	**LHR_N WR**	**Do nothing**	**LHR_N WR**	**Do nothing**	**LHR_N WR**

	2030		2040		2050	
Southeast (England)	**160k**	**148k**	**305k**	**187k**	**730k**	**313k**
Berkshire, Buckinghamshire and Oxfordshire	143k	132k	279k	172k	637k	277k
Hampshire and Isle of Wight	6k	6k	10k	5k	34k	14k
Kent	2k	2k	4k	2k	16k	7k
Surrey, East and West Sussex	8k	8k	13k	7k	44k	16k
London	**83k**	**80k**	**130k**	**89k**	**351k**	**136k**
Inner London - East	24k	24k	40k	29k	90k	40k
Inner London - West	46k	44k	66k	46k	190k	65k
Outer London - East and North East	9k	9k	21k	11k	55k	24k
Outer London - South	3k	3k	4k	3k	16k	6k
Outer London - West and North West	27k	25k	54k	30k	156k	49k
Total	**243k**	**227k**	**435k**	**276k**	**1,081k**	**449k**

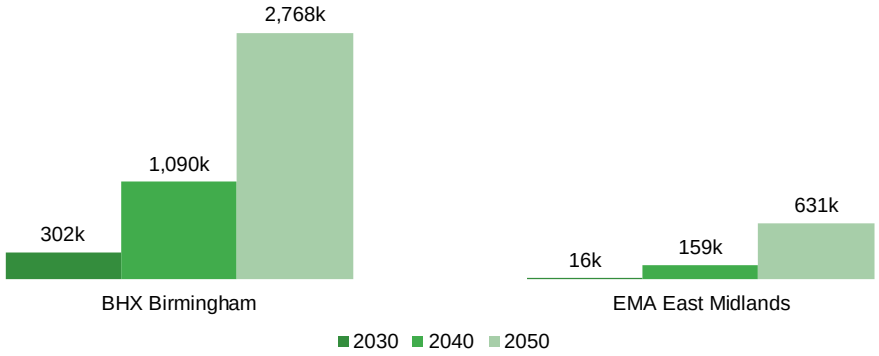
Source: Mott MacDonald analysis of DfT aviation forecast

Table 21: Number of passengers from the Southeast overflowing to Midlands Airports – computed as the difference in passengers between the "Do Nothing" and "London Heathrow 3rd North-West runway" scenarios

	BHX Birmingham			EMA East Midlands		
	2030	**2040**	**2050**	**2030**	**2040**	**2050**
Southeast (England)	**206k**	**706k**	**1,631k**	**12k**	**118k**	**417k**
Berkshire, Buckinghamshire and Oxfordshire	169k	579k	1,231k	11k	106k	359k
Hampshire and Isle of Wight	18k	56k	117k	1k	5k	19k
Kent	3k	11k	40k	0k	2k	10k
Surrey, East and West Sussex	16k	60k	243k	1k	5k	28k
London	**96k**	**385k**	**1,137k**	**3k**	**41k**	**215k**
Inner London - East	17k	72k	213k	1k	11k	50k
Inner London - West	68k	265k	762k	2k	19k	125k
Outer London - East and North East	6k	27k	81k	0k	9k	31k
Outer London - South	5k	21k	81k	0k	1k	9k
Outer London - West and North West	34k	133k	443k	1k	24k	107k
Total	**302k**	**1,090k**	**2,768k**	**16k**	**159k**	**631k**

Source: Mott MacDonald analysis of DfT aviation forecast

Figure 74: Potential forecast overspill to Midlands airport from the Southeast



Source: Mott MacDonald analysis of DfT aviation forecast

The amount of possible overspill according to the DfT airport forecasts reaches 11.5% of total Birmingham airport traffic in 2050 in case that no further capacity is provided in the Southeast. In 2030 this volume is limited to 2.6% of total airport traffic.

Table 22: Potential forecast overspill to Midlands airport from the Southeast in relation to the total airport traffic forecast

	2030	2040	2050
Birmingham Airport with LHR 3rd NW Runway	10.4M	13.0M	18.8M
Birmingham Airport with Baseline forecast	11.7M	17.0M	24.0M
Total overspill	*1.3M*	*4M*	*5.2M*
of which potential overspill from SE	*0.3M*	*1.1M*	*2.8M*
SE overspill as % of Baseline forecast	*2.6%*	*6.4%*	*11.5%*
SE overspill as % of total overspill	23%	*28%*	*53%*
East Midlands airport with LHR 3rd NW Runway	7.4M	9.2M	11.2M
East Midlands Airport with Baseline forecast	7.5M	10.1M	13.9M
Total overspill	*0.1M*	*0.9M*	*2.7M*
of which potential overspill from SE	*0.0M*	*0.2M*	*0.6M*
SE overspill as % of Baseline forecast	0.2%	1.6%	4.5%
SE overspill as % of total overspill	*0%*	*22%*	*22%*

Source: Mott MacDonald analysis of DfT aviation forecast

Table 22 shows the total overspill at Birmingham and East Midlands airports split between total overspill and Southeast originating overspill. The relatively low percentages of the Southeast overspill in relation to the total overspill (ranging between 23% and 28% in 2030-2040) for Birmingham are explained by the fact that there will be a component of East Midlands, East of England and South West starting to use Birmingham airport. These three regions would account cumulatively for 35% of the overspill in 2040. In East Midlands case the overspill is evident from 2040. While Southeast overspill accounts for 22% of total gain in 2040 and 2050, East of England and South West overspill is forecast to be 38% of total in 2040.

Although this is not directly linked to capacity constraints in the Southeast, it has been reported that some of the end-users of the forecasts (ie airport operators) have raised concerns about the way the DfT model allocates passengers between airports once new surface services such as HS2 are introduced. Moreover, in recent years the long-haul low-cost business model has emerged in particular with Norwegian airline starting flights from Gatwick to US destinations. It is likely that the DfT model does not capture this trend and that in

the next few years there will be an increasing number of long-haul low cost carriers operating outside of London Heathrow thus shifting the long-haul demand to regional airports.

If not solved, the capacity constraints in the Southeast would cause a shift in airport choice for millions of passengers, which would choose to fly from the Midlands airports instead of London airports. The areas of origin of these passengers is not restricted to London or the Southeast but extend to the immediate neighbouring regions – especially South-West and East of England. The over spilled volumes of traffic would provide an upside to the Midlands airports in particular from 2040 onwards when the London airports network reaches full capacity.

6 Air freight

6.1 Overview of the air freight market within a global and UK context

Air cargo is a crucial enabler of the global economy, providing a vital link for international trade, helping countries gain access to international markets and allowing globalisation of production. According to IATA, in 2015 freight tonne kilometres expanded by 2.3%, and airlines transported 51.5 million metric tons of goods valued at nearly $6 trillion. The total value of goods transported by air, represents 35% of all international trade, while it accounts for less than 1% of total international trade volumes. Although air cargo continues to carry more goods than ever before, the industry is witnessing a shift of some goods to ocean freight and integrators.

Almost 40% of UK trade with non-EU countries by value is transported by air. In addition, air cargo operations at regional and national airport hubs form a significant source of employment and contribute to the local economy. Although there has been a steep decline in rates, air freight is still significantly more expensive compared to other modes of freight transport. It is therefore generally only used for specific categories of cargo, of much higher value, as can be seen in the following table:

Table 23: Value to weight ratio of goods for UK international (extra-EU) trade, 2007

	Value per kilo (£)		
	Export	Import	Total
Air	£90.93	£30.77	£42.78
Channel Tunnel	£14.76	£20.29	£16.11
Miscellaneous	£1.23	£1.43	£1.26
Sea	£1.20	£0.47	£0.58

Source: DfT, Overseas Trade Statistics 2007, HMRC

The users of air freight services are those with high value or process critical goods where the shipping cost, although high, is marginal in proportion to the total cost of the cargo or the importance of the timely transportation of the goods for the functionality of businesses. Main industries that rely on the flexibility, speed and security that air freight provides are pharmaceuticals and related sectors, electronics and telecoms, vehicles and transportation equipment and engineering and information technology firms. Another key group of users of larger scale air freight are those industries that trade in goods with limited life-cycle. For those perishable goods, such as fish or fresh fruit, minimal transit time is essential to ensuring that the goods arrive at market in optimal condition.

Air freight is transported either in the belly-hold capacity of scheduled passenger flights or in dedicated freighters on routes with high volumes. Those two options have shaped the air freight operations into two distinct models in the UK and world-wide:

- The air freight forwarding model
- The integrated air freight model

The air freight forwarding mode is the typical model adopted by major scheduled airlines. It utilises the hold capacity beneath the passenger cabins (belly-hold) of mostly wide-bodied aircraft, to transport freight on the long haul passenger route network of the airline. Within the short haul network of the airline, due to capacity limitations and additional handling and turn-around requirements, freight is transported by road instead of air.

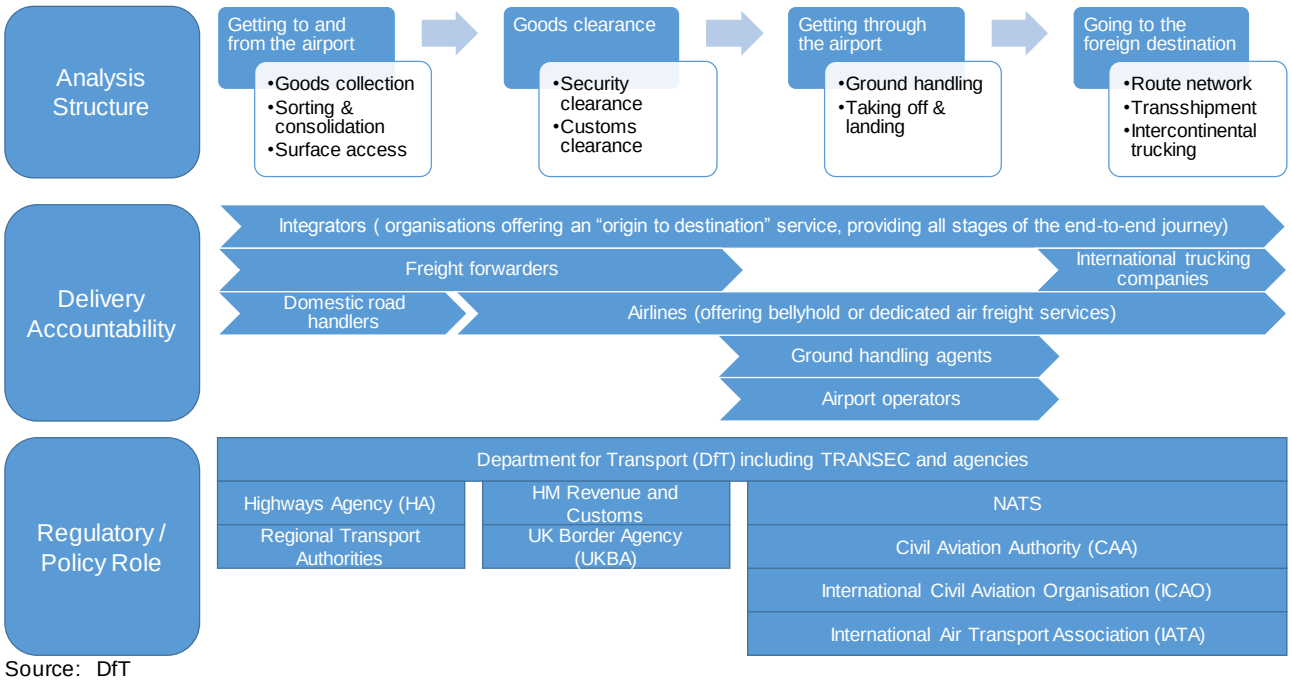
The second model's main idea, carried out by the integrators, is to provide an express or next-day delivery service to customers. Integrators offer a complete origin to destination service on short-haul routes using dedicated freighter aircraft. They are responsible for the collection of the cargo, surface transport to the airport, the air leg and then delivery to the final destination. According to the DfT, up to 98% of express freight volume is business-to-business traffic.

Sometimes belly-hold capacity is used by integrators, buying space to cover their needs, while there are airlines that operate dedicated freighter services on high volume routes, or their whole operations are exclusively about cargo. Mail is carried in a similar way to integrated air freight, using either dedicated freighters or using capacity on scheduled airlines.

Finally, it is important to note that apart of direct air freight services, there is a significant part of UK air freight flows which is consolidated from short haul flights or trucks from a range of origins and is transferred onto long haul flights for onward shipment. This process is called transhipment.

The main processes that air freight goes through in order to reach its destination for each operation model, along with the various regulatory bodies involved in each process are schematically outlined below, as explained by the DfT in its publication "The air freight end-to-end journey".

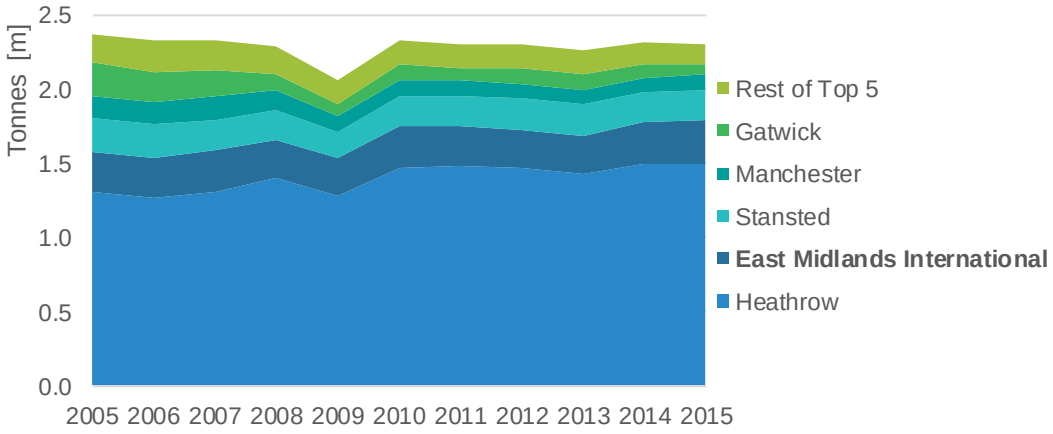
Figure 75: The air freight end-to-end journey in the UK



Source: DfT

6.2 Air freight baseline - size of the market

Figure 76: Annual freight volumes (in tonnes) between 2005 and 2015 for the top performing UK airports

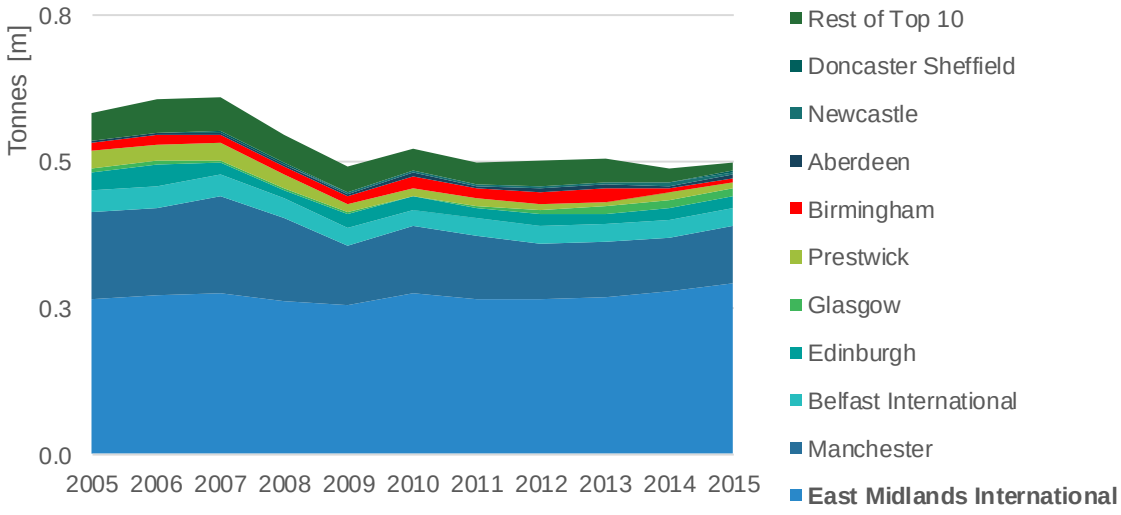


Source: Mott MacDonald analysis of CAA data

At first glance, it is obvious that London Heathrow airport has historically captured the lion's share of the UK air freight market, serving the UK capital's freight forwarding needs and acting as the main hub of one of the largest European airlines in terms of cargo, IAG, parent company of British Airways.

While London Heathrow has been increasing its air freight market share over the past decade, this has not happened at the expense of UK's second busiest airport in terms of cargo volumes, East Midlands International Airport (EMA). EMA has managed to grow its air freight market share from 11.2% in 2005 to 12.6% in 2015, when it transported about 300k tonnes of cargo volumes. A major hub for DHL Air UK, EMA has established air cargo operations, that surpass those at other key airports in the region, such as Birmingham or Manchester airports.

Figure 77: Annual freight volumes between 2005 and 2015 for the top performing UK regional airports



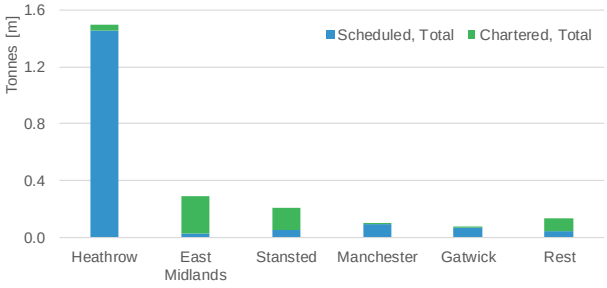
Source: Mott MacDonald analysis of CAA data

Accounting for air freight operations only in the UK regions, the dominant position of EMA is evident, followed by Manchester and Belfast International airport. Birmingham airport, the other representative of the Midlands on the graph, has historically captured much lower cargo volumes, and is lately below 10k tonnes of annual cargo throughput. As a result, within this chapter, emphasis will be given on air cargo operations at East Midlands airport, and their significance for the whole Midlands region and its businesses.

6.3 Air freight characteristics

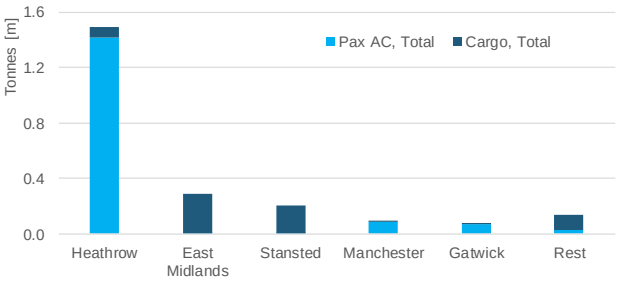
Delving in the secondary characteristics of air freight operations at the busiest UK airports, it is noticeable that there are great differences in their operations, that will be further analysed below. East Midlands airport freight volumes are transported predominantly by chartered operations, in contrast with Heathrow, where almost all air cargo volumes are carried on scheduled services. This is also noticeable in the aircraft types used for air cargo transportation; at East Midlands airport full freighters are responsible for the majority of cargo volumes, while at Heathrow, Manchester and Gatwick air freight is transported almost exclusively in the belly-hold of passenger aircraft.

Figure 78: 2015 scheduled vs chartered cargo operations for the top performing UK airports



Source: Mott MacDonald analysis of CAA data

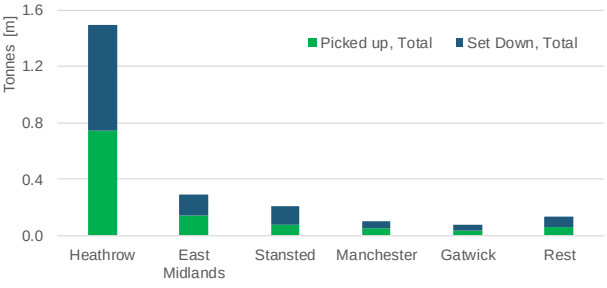
Figure 79: 2015 full freighter vs bellyhold cargo volumes at the top performing UK airports



Source: Mott MacDonald analysis of CAA data

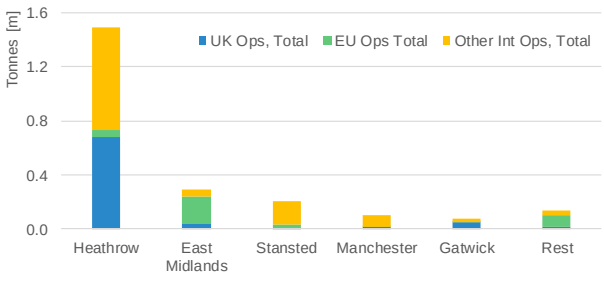
Overall, set down cargo volumes are higher across all Top 5 airports, indicating a general trend of higher import than export volumes by air between the UK and its trade partners. Finally, cargo volumes at EMA are transported mostly by European operators. However, it is the only airport among the Top 5 where this occurs, as most cargo operations are carried out by other international operators or in the case of Heathrow, evenly split between UK and other international operators.

Figure 80: 2015 picked up vs set down cargo volumes at the top performing UK airports



Source: Mott MacDonald analysis of CAA data

Figure 81: 2015 cargo operations by carrier registration for the top performing UK airports

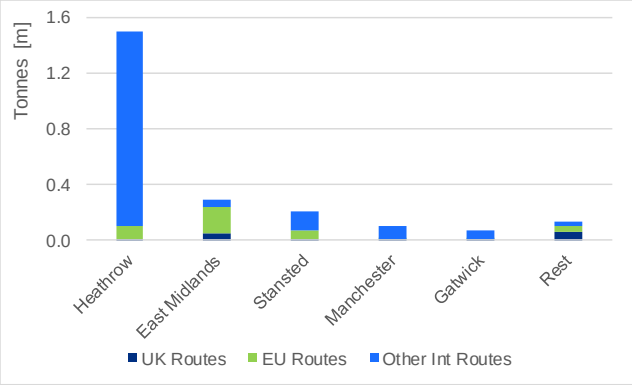


Source: Mott MacDonald analysis of CAA data

6.4 Summary of cargo route network

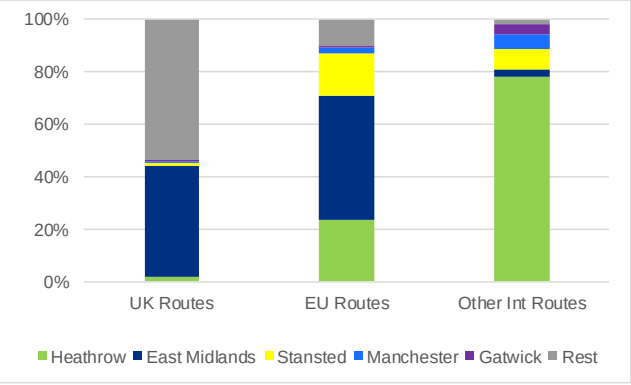
Regarding the destinations of air freight volumes that leave UK airports, the majority lie outside of the UK or the EU. Exception to this is East Midlands airport, where most of the air freight routes are within the European Union. Furthermore, EMA is the only airport in the top 5 with noticeable domestic freight operations. In contrast, Heathrow and particularly Manchester and Gatwick airports transport air freight between the UK and non-European destinations.

Figure 82: 2015 cargo volumes on UK, EU and other international routes at the top performing UK airports



Source: Mott MacDonald analysis of CAA data

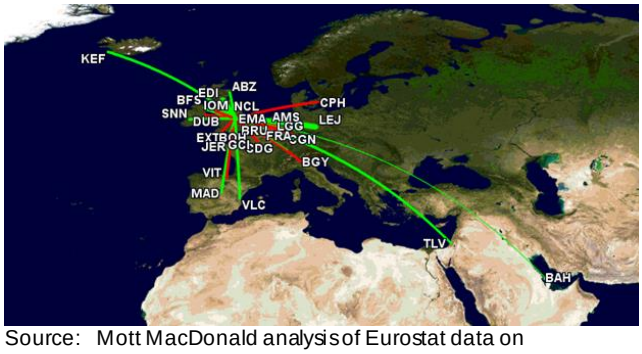
Figure 83: 2015 airport market share of cargo volumes on UK, EU and other international routes



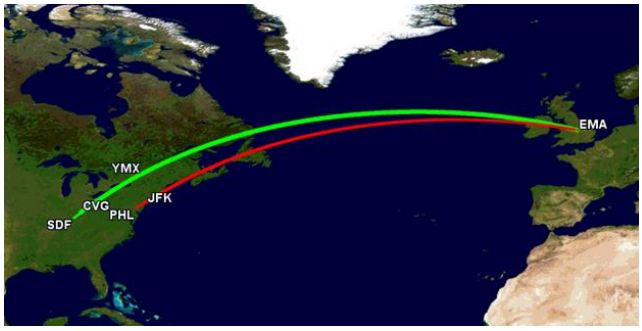
Source: Mott MacDonald analysis of CAA data

With almost 30 destinations worldwide, served at least once a week, EMA is a cargo focus point for all the major package delivery and logistics companies, namely DHL, UPS and TNT. The figure below depicts the performance of the short and long haul cargo network from East Midlands airport, with the majority of the routes witnessing a growth in cargo volumes compared to 2005. Top performing routes from the airport to Leipzig, Cologne and Brussels also account for cargo volumes that continue their journey to the Middle and Far East, reaching major cargo hubs such as Dubai and Shanghai.

Figure 84: EMA cargo volume change between 2005 and 2015 on short (left) and long (right) sector length routes.



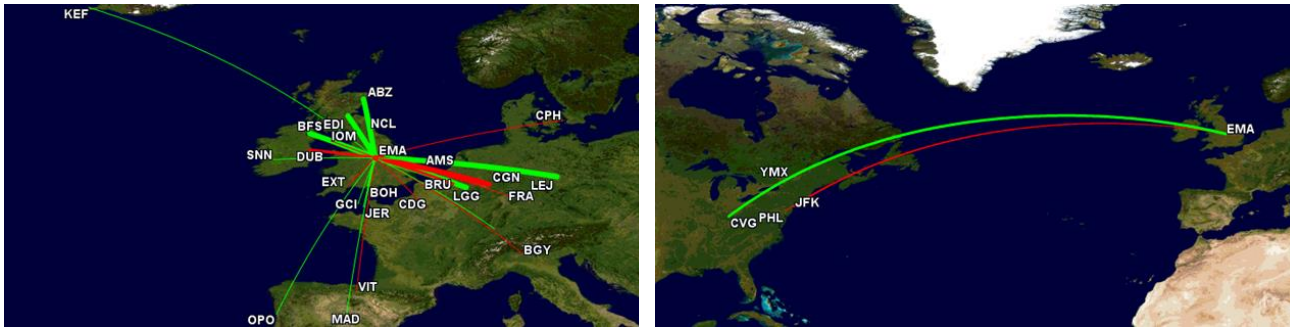
Source: Mott MacDonald analysis of Eurostat data on gcmapper.com



Legend: %CAGR 2005-15 >0% -%CAGR 2005-15 <0%
Line size represents volumes in 2015
>20K Tonnes — >1K Tonnes — <1K Tonnes —

Belfast, Edinburgh and Aberdeen are also amongst the top performing cargo destinations from EMA, both in cargo volumes and movements, reflecting the importance of the airports as a domestic air cargo hub. Of note are the high frequency direct cargo connections of EMA with the east coast of North America, which indirectly link the airport to major cargo hubs on the west coast, such as Anchorage and Los Angeles.

Figure 85: EMA cargo movements change between 2005 and 2015 on short (left) and long (right) sector length routes.

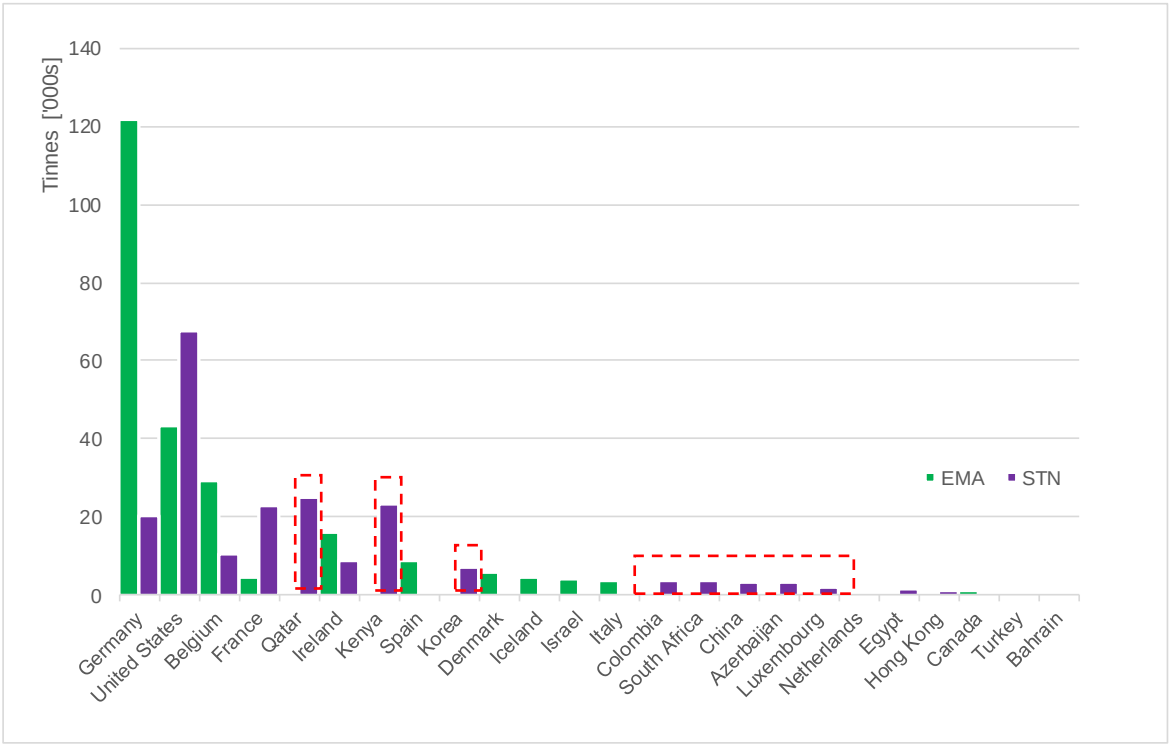


Source: Mott MacDonald analysis of Eurostat data on gcmapper.com

Legend: +%CAGR 2005-15 -%CAGR 2005-15
Line size represents movements in 2015
>1K ATMs >0.5K ATMs <0.5K ATMs

Useful remarks can be drawn from the comparison of EMA's international network with the closest competitor in cargo operations, Stansted airport (although they both belong to the same company, Manchester Airports Group, MAG). At Stansted airport, apart from the significant FedEx operations, which account for most of the volumes to the United States, there are also notable volumes directly moved to Qatar, Kenya and Korea, destinations lacking from EMA. Furthermore, there are a number of long haul destinations operated directly from Stansted airport, which are not replicated in EMA's international route network. However, the shear cargo volumes that are transported to Germany and Belgium (and in most parts forwarded to onwards destinations), account for the bigger size of cargo volumes at EMA despite the fewer number of countries directly served from the airport. FedEx recently acquired TNT Express, another large player in the industry - this can change the dynamics of the cargo business in the region as TNT is a key operator at East Midlands airport.

Figure 86: International cargo volumes in 2015 by country for EMA and STN



Source: Mott MacDonald analysis of Eurostat data – Countries indicated in red are directly served from Stansted but not from East Midlands airport

In contrast to the extensive cargo links of EMA, Birmingham airport has a clear focus on passenger operations, serving only a handful of direct cargo destinations. The cargo volumes transported between Birmingham airport and Newark, Delhi, Istanbul and Dubai are predominantly on passenger flights (belly-hold freight). The route to Dubai, operated by Emirates transports the highest cargo volumes from the airport, but its performance has dropped since both a decade and five years ago. It should be noted that Birmingham Airport freight volumes for 2015 are currently under revision. It has been communicated by the airport operator that freight performance will be adjusted – it is expected that 2015 performance will be higher than 2014 volumes. As additional long-haul flights are introduced at BHX, the available belly-hold capacity increases leading to a better cargo offer from the Midlands.

Figure 87: BHX cargo volume change between 2005 and 2015 on its route network.

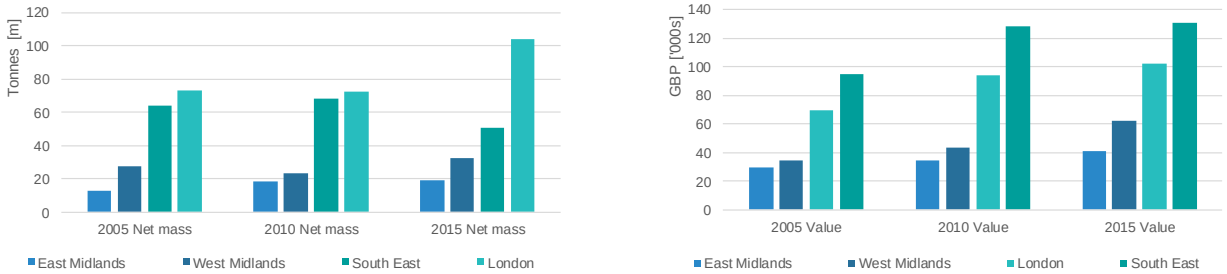
Source: Mott MacDonald analysis of Eurostat data on gcmapper.com

Legend: +%CAGR 2005-15 -%CAGR 2005-15
Line size represents volumes in 2015
>1K Tonnes — <1K Tonnes —

6.5 Trade summary

When benchmarked against London and the Southeast, it is clear that the trade volumes and value from/to the Midlands are at a lower base. East Midlands trade value has grown modestly during the past decade, while trade volume growth has stalled since 2010. For the West Midlands, while trade value has grown significantly since 2015, there was a contraction of the trade volumes between 2005 and 2010, possibly due to the general decline in trade following the Global Financial Crisis.

Figure 88: Trade value and net mass comparison between the Midlands and the Southeast for 2005, 2010 and 2015

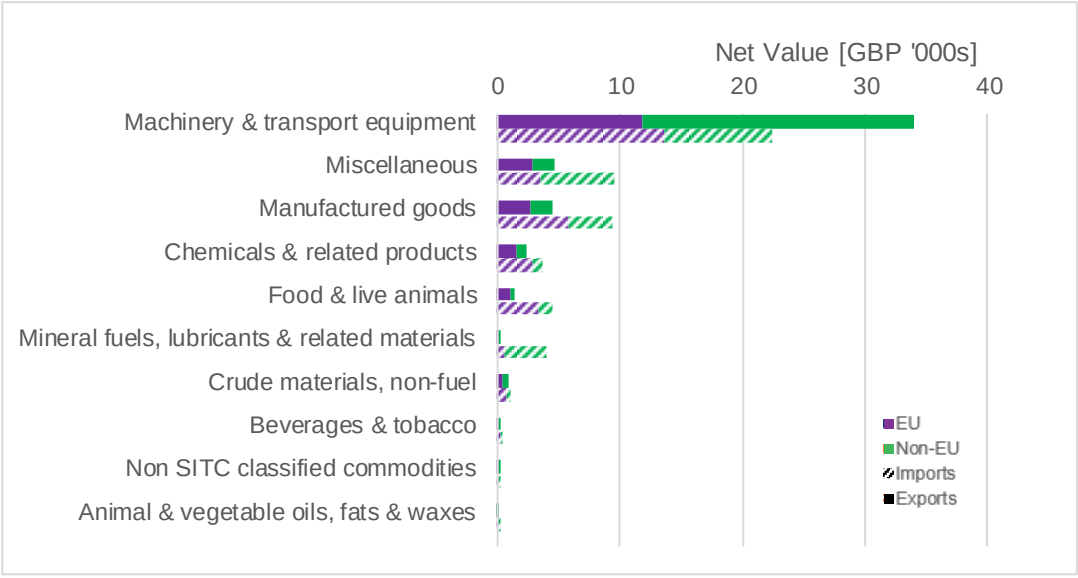


Source: Mott MacDonald analysis of UK Trade Info data

In the past year, the most valuable traded commodity of the Midlands was machinery & transport equipment. The Midlands businesses exported over GBP 30bn worth of items included under this category, with the majority destined for non-EU countries. In terms of trade volumes, the vast majority of imported volumes to the Midlands consist of mineral fuels from Non-EU countries and in particular from Norway. Crude non-fuel materials accounted for the highest volumes of exports from the Midlands, most frequently to a European destination.

For trade volumes most relevant to air cargo (perishable and high value goods), general conclusions can be drawn from the figure on this page. Apart from highly valuable transport equipment items (e.g. aircraft parts), which are exported mostly outside of the EU, Midlands businesses make most of their trade exchanges within the European Union.

Figure 89: Trade value for the Midlands in 2015 by SITC (Standard International Trade Classification) category



Source: Mott MacDonald analysis of UK Trade Info data

6.6 Demand for air cargo in the Midlands

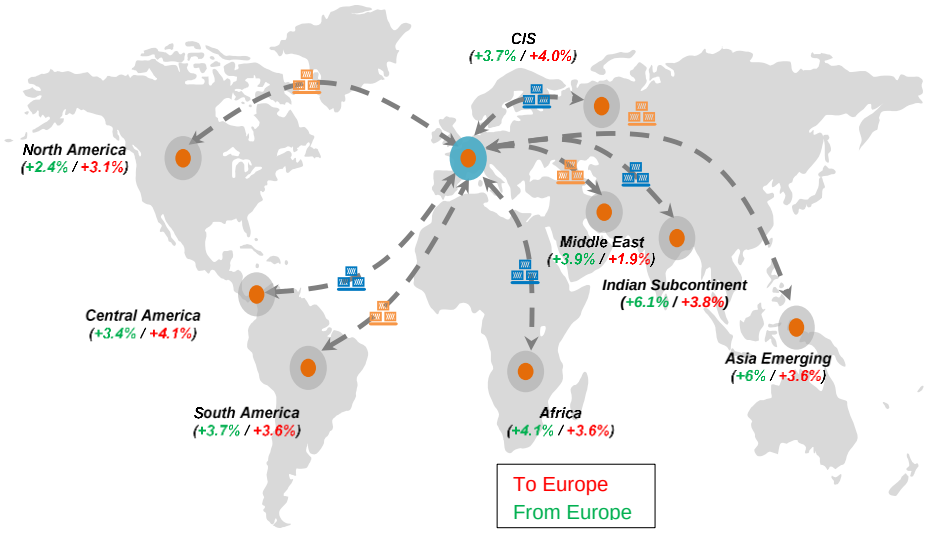
The June 23rd referendum on Brexit, that resulted in the United Kingdom's decision to leave the European Union, is bound to have an impact on the UK economy and the trade relationship that the United Kingdom

will have with its EU trade partners. Although there is great uncertainty on Brexit's effects on air travel, IATA's preliminary estimates suggest that the number of UK air passengers could be 3-5% lower by 2020, due to an expected downturn in economic activity and a fall in the GBP exchange rate. Over the longer term air freight would also be affected by lower UK international trade levels. Furthermore, when the UK does formally exit the EU the OECD estimates that UK trade volumes could fall by 10-20% over the long run (to 2030), relative to its baseline projections. In part, the international trade impacts will depend upon the nature and timing of trade agreements and relationships negotiated by the UK which still remain highly uncertain.

Focusing away from Brexit and its impact on air freight, at a global level, the world economy and industrial production, which are primary leading indicators of air cargo traffic, are forecast to recover and return to long-term trend growth rates in 2017. As global GDP and world-trade growth accelerate, air cargo traffic, as measured in revenue tonne-kilometres, is projected by Boeing to grow an average 4.2% per year over the next 20 years.

For Europe freight flows in particular, the following figure helps with illustrating what are the anticipated growth rates of air cargo volumes between Europe and its major trading partners. For European exports carried by air, the Indian subcontinent and the various Asian emerging economies will be the key growth end markets, with 6.1% and 6% per annum respectively. For imports, the flows from Central America and again the Indian subcontinent, emphasizing the importance of this partner to Europe, will show the highest growth rates, with 4.1% and 3.8% pa.

Figure 90: Air freight flows from/to Europe growth projections for 2015-2035



Source: Boeing Current Market Outlook 2016

6.7 Access of air cargo services to the Midlands

As the second busiest airport in terms of air freight, and the first UK airport in terms of "pure cargo operations", EMA has been successful at developing a "freighter friendly" masterplan, that provides a high level of services to all the members of the air freight supply chain. As such, the airport enables the access of air cargo services to the Midlands businesses, both in terms of facilities and processes available, but also in terms of surface access to the airport.

Significantly, the airport's service offering extends from the cargo airline operators to the cargo charter brokers, cargo handling agents, freight forwarders and major cargo shippers there. EMA offers unrestricted 24h operating licence, all-year-around provision of customs and border inspection posts for the clearance of

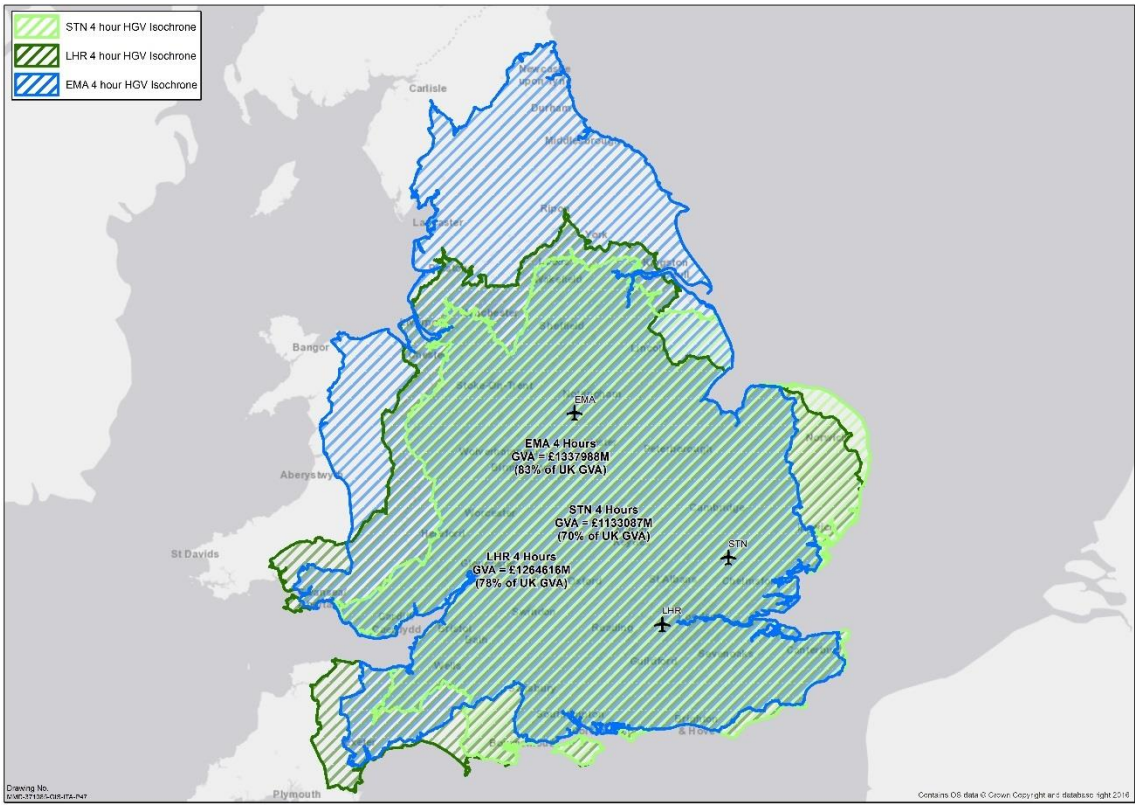
animal products. There are also no slot restrictions, while the all-weather landing system on the runway means that operations are rarely disrupted.

Major ground service agents provide specialist cargo handling cargo services that enable cargo integrators to handle their shipments with great efficiency. EMA is also licenced to handle dangerous goods, radioactive materials and outsized and specialist cargo, following a series of investments on cargo infrastructure at the airport.

Regarding surface access, East Midlands airport is in a highly advantageous position to serve not only the Midlands, but most of England and Wales. With its centrally location in the UK, nearly 90% of the England & Wales area is within a 4-5h truck drive-time.

East Midlands strategic pivotal position is proven in Figure 91. Within 4 hours drive from the airport 83% of the national GVA is reached, against 78% for Heathrow and 70% for Stansted. The map in Figure 91 further suggest that EMA is also better positioned than the competitors in terms of being centrally located between the major national economic centres.

Figure 91: HGV driving time isochrones and percentage of national GVA covered (1,2,3,4,5 hours driving time) from East Midlands, Heathrow and Stansted Airports



Source: Mott MacDonald analysis of ONS data and ArcGIS online

Table 24: Percentage of national GVA covered by 0-4 hours HGV driving time

	EMA East Midlands	LHR London Heathrow	STN London Stansted
0-4 hours	83%	78%	70%

Source: Mott MacDonald analysis of ONS data and ArcGIS online

M1, the trunk motorway of the UK's road network is within direct and immediate access to the EMA via a dual carriageway about 2 miles long. Furthermore, the Stoke-Derby (M6-M1) road joins the M1 at the same junction, while M/A42 from Birmingham joins the M1 within a mile of EMA. This allows EMA to have direct motorway or trunk road access to every major city in the country, enabling operators to provide effective pick-up and delivery services from London and Bristol in the south to Manchester and Newcastle in the north.[8]

6.8 Opportunities for air freight developments in the Midlands

EMA has managed to develop passenger and freight operations that complement each other and are treated with equal importance. Express freight services are recognised as an increasingly important economic sector and an essential contributor to the capabilities and competitiveness of other sectors of both the Midlands and the UK economy. At the same time, leisure passenger operations at the airport link the region with most European summer destinations, providing amble recreational options to the population of the Midlands.

EMA is well positioned to remain the key air freight point of operations for domestic freight and mail services. The same is true for freight operations from/to the EU, as good freighter connectivity exists between EMA and the other major European cargo hubs of DHL and UPS. The challenge of the EU market segment exists in the impact of Brexit on the trade relations between the United Kingdom and the EU and the access level of the UK to the Single European Market going forward.

For the timely and cost efficient operation of either air cargo or leisure services, the 24h unrestricted operations at the airport are paramount. Night cargo operations allow for decongested and for the most part undisrupted passenger services during the day time, while also maximise the utilisation of the airport assets and provide to Midlands businesses the advantages of fast track next-day shipment deliveries. Finally, in order for EMA and the Midlands to remain in the forefront of UK air freight, the regional and airport developments should give emphasis to improved rail and road connectivity for future congestion to be avoided, as well as to the balancing of passenger and air freight operator's needs. Given the congestion at London Heathrow and the decade-long timeline for the realisation of any additional Southeast runway plan, as expected by most industry experts, the opportunity is there for EMA to capitalise on its unique cargo operation and location advantages and grow its share of the UK air freight market. It is understood that this is part of the airport business plan, with a target of growing the annual freight throughput from 300,000 tonnes to 1 million by 2030-2035.

[8] Why EMA?, MAG Website. Expedian

7 From gaps to strategic interventions

7.1 Introduction

In this section are reported the strategies that emerge from this aviation-related work package. The schemes suggested in Table 25 summarise the possible areas of interventions. The iterative and multidisciplinary nature of Midlands Connect leaves the list open to further ideas and schemes. This opportunity is analysed in this section as well as recommendation on further tasks that could be necessary to maximise the opportunity of Midlands Connect.

7.2 Strategic interventions

Table 25: Emerging strategy – interventions

Type	Package Name	Problems (economically)	What the potential solutions are	What the benefits could be (economically)
Aviation - 1	**Airport development – Surface access development**	▪ East Midlands businesses passengers market not well served leading to extended surface access journey times. The same problem affects West Midlands traffic to North America and Eastern Europe ▪ Economic impact on the region as longer journeys translate into higher travel cost for business passengers. ▪ The longer travel times influence negatively the attractiveness of the Midlands as a place for setting up a business base compared to other locations	▪ Business access by public transport can be improved through links to existing rail services, by providing a more regular rail service to East Midlands Parkway, and easing connections to airport services at Birmingham New Street. Introduction of express coach services (ie between Nottingham-Birmingham Airport and Leicester-Birmingham Airport) would also improve connectivity. ▪ Possibility of offering early morning and late evening services that would benefit the business travellers' community should be analysed. ▪ Specific works to improve surface access at the airport – in particular the connectivity between motorways and local roads should be undertaken. ▪ Maximising the opportunity of HS2 to reduce travel time by rail to the airports – in particular to Birmingham Airport from the nearby regions.	▪ Decreased journey time – generalised travel cost savings. ▪ Improved position of the Midlands as a region where business can be located leading to more economic growth. ▪ Increased airport catchment areas – stronger business cases for airports to attract new airlines – meaning more competition on routes and potentially lower fares for passengers. ▪ Increased passengers at Midlands airports would lead airport and related businesses to hire more employees, benefitting the local economy (direct, indirect and induced aviation impact on the economy). `
Aviation - 1	**Airport route development, marketing and policy**		▪ Aviation in the UK is largely a private sector endeavour – airlines and airports tend to be privately owned and make significant efforts to grow their businesses. Traffic on most routes is made up of a mix of business passengers as well as leisure and visiting friends and relatives (VFR) – to achieve profitability for new routes, all of these segments should be considered. ▪ This study considers the business passengers segment needs. To maximise the impact of the proposed schemes, a joined-up approach is recommended, where packages of route development support pull resources from stakeholders based on joined-up thinking that combines the airports' profitability goals with the creation of additional business-oriented connections. This will need to also address	

Type	Package Name	Problems (economically)	What the potential solutions are	What the benefits could be (economically)
			the needs of leisure and VFR components of traffic. ▪ About 80% of business trips are spread amongst Top 25 European destinations and each of these routes requires focus as some destinations benefit specific sectors of the local economy. An example is Berlin, an important route for train and aircraft manufacturer Bombardier, however it is not within in the Top 10 European destinations. ▪ Improvement of air connectivity to the US through marketing support of direct scheduled flights to the US main business centres from Birmingham airport could be a priority. Current US-market services are constrained by Heathrow's dominance of the US market, making route development from Birmingham difficult. Birmingham is well placed to be a regional alternative to London Heathrow and is able to attract a critical mass of traffic from the Midlands as well as traffic from other principal regional cities that will be connected via HS2 such as Manchester, Leeds and Sheffield. ▪ The Midlands could also support airlines operating routes to European hubs that would allow an increased connectivity to the US without introducing back-tracking to passenger's itineraries. The timing of such services should be set in a way to maximise passengers' connectivity at hubs (ie the number of possible flights on which passengers can connect to). The aim should be to maximise the one-stop services and to reduce two-stop journeys that require travel into London. ▪ Such flights should be operated by airlines allowing "hubbing" (ie signatory of the IATA interlining agreements) and should be scheduled to minimise connecting times at the hubbing airport. For instance, improved connectivity to Dublin by Aer Lingus from East Midlands airport would allow business passengers from the East Midlands region to reach one of the leading Western European markets and provide multiple options for onward connectivity to the US. ▪ For Birmingham, the list of improved connections should include those airports where passengers currently tend to use airports outside of the Midlands and where the analysis of frequencies at Birmingham Airport has shown gaps in services: Madrid (which would allow further connectivity to South America), Zurich (which would allow connections to European and Asian airports) and Moscow. ▪ East Midlands Airport's range of route development objectives should be aimed at the major demand centre of Amsterdam, Brussels and Dublin. These three routes are already served from the airport and the target would be to increase the share of business passengers using East Midlands Airport in relation to the total volumes currently choosing other airports. This could	

Type	Package Name	Problems (economically)	What the potential solutions are	What the benefits could be (economically)
			be achieved for instance through increased frequencies and optimisation of schedules to meet business requirements. All of these airports would allow increased onward connectivity. Frankfurt and Paris are not currently served and should be considered as a potential destination from East Midlands Airport. ▪ Route development should also aim to expand towards developing economies outside of Europe such as China and India, as Asia in general is forecast to achieve the strongest economic and traffic growth in the future. The airports should be able to react to the shift in demand that will occur as local Midlands businesses increasingly trading with these countries. To achieve this, Air Service Agreements must be updated and reviewed by Government in order for airlines to be able to serve these globalised business communities. ▪ Investment in marketing: the perception of some stakeholders is that Birmingham Airport's improved connectivity to Europe is not well understood by the companies that arrange corporate travel plans. There is a tendency by companies to view London Heathrow as the default airport of choice even when considerable time (and cost) savings could be achieved by flying from Birmingham Airport. ▪ Marketing effort would be needed to promote Birmingham Airport as a London metropolitan airport once HS2 starts operations. In the interim, the potential for cooperation between Birmingham-based airlines and rail franchises operating between London Euston and Birmingham International should be explored. Midlands Connect can encourage the adoption of a business model that allows passengers to jointly purchase train tickets and airline tickets, allowing a seamless and protected surface journey between London and Birmingham International, with an onward international connection from Birmingham Airport.	

Source: Mott MacDonald

7.3 Next steps under WP5b – International Gateways

This Narrative Report includes all aspects of aviation-related themes concerning the Midlands. Surface access gaps and opportunities are analysed in the context of their impact of aviation demand. As the surface transport-related schemes are finalised by the other work packages, these proposed interventions could be assessed from an aviation perspective. The outcome of this analysis would be to enhance the description of the benefits of those surface-access schemes that could have some benefits on airport accessibility.

7.4 Recommended further work

The work undertaken so on Work Packages 5b has comprised of the detailed review of aviation aspects of the Midlands region and through the analysis of market gaps a series of improvements and interventions were proposed. Below are listed further areas of analysis that emerged during the WP5b workstream:

a) *Evaluation of wider economic benefits of improved aviation connectivity:* to support the business cases for route development and airport surface access improvement schemes, it is suggested that an economic assessment model is run to calculate the benefits in terms of gross value added (GVA), investment benefits and employment salary that are connected to each scheme.

b) *Public transport accessibility to airports:* stakeholder engagement has indicated that there is a lack of public transport accessibility to airports at specific hours of day: early morning and late evening. The early morning connectivity is required to reach airports in connection to the first wave of departures while late evening public transport is linked to the last wave of arrivals. More research can be undertaken on this subject using specific tools that analyse all of the public transport network in the Midlands region in order to quantify the need and location of possible new airport-related public transport services.

c) *Route development to emerging markets:* while market data is available for all those markets that are currently reached either directly or indirectly by the Midlands passengers, there is a lack of available information on the emerging markets (ie India, China, Indonesia, Colombia) that could support focussed route development activities, especially in the mid to long-term. for the longer term. Further analysis would be required to pinpoint the markets that require attention.

d) *Leisure and VFR market components:* WP5b focuses on the needs of the business passengers. The other two key components of traffic are leisure and Visiting friends and Relatives (VFR). Airlines rely on a mix of the three components to "fill-up" the planes and few routes are able to be profitable on business-passengers only. Therefore, analysis of the leisure and VFR market would be necessary to support route development incentivisation and planning.

e) *HS2 impact*: further work is recommended on the analysis of the likely impact of HS2 on the Midlands airports in terms of catchment area expansion to understand how Birmingham Airport in particular can get "closer" to the London Metropolitan area. More work can be undertaken to understand the potential of rail-air connectivity from London via Birmingham International station.

Appendices

A. Major road infrastructure projects UK

Table 26: List of major road infrastructure projects assumed in the DfT Aviation Forecast models

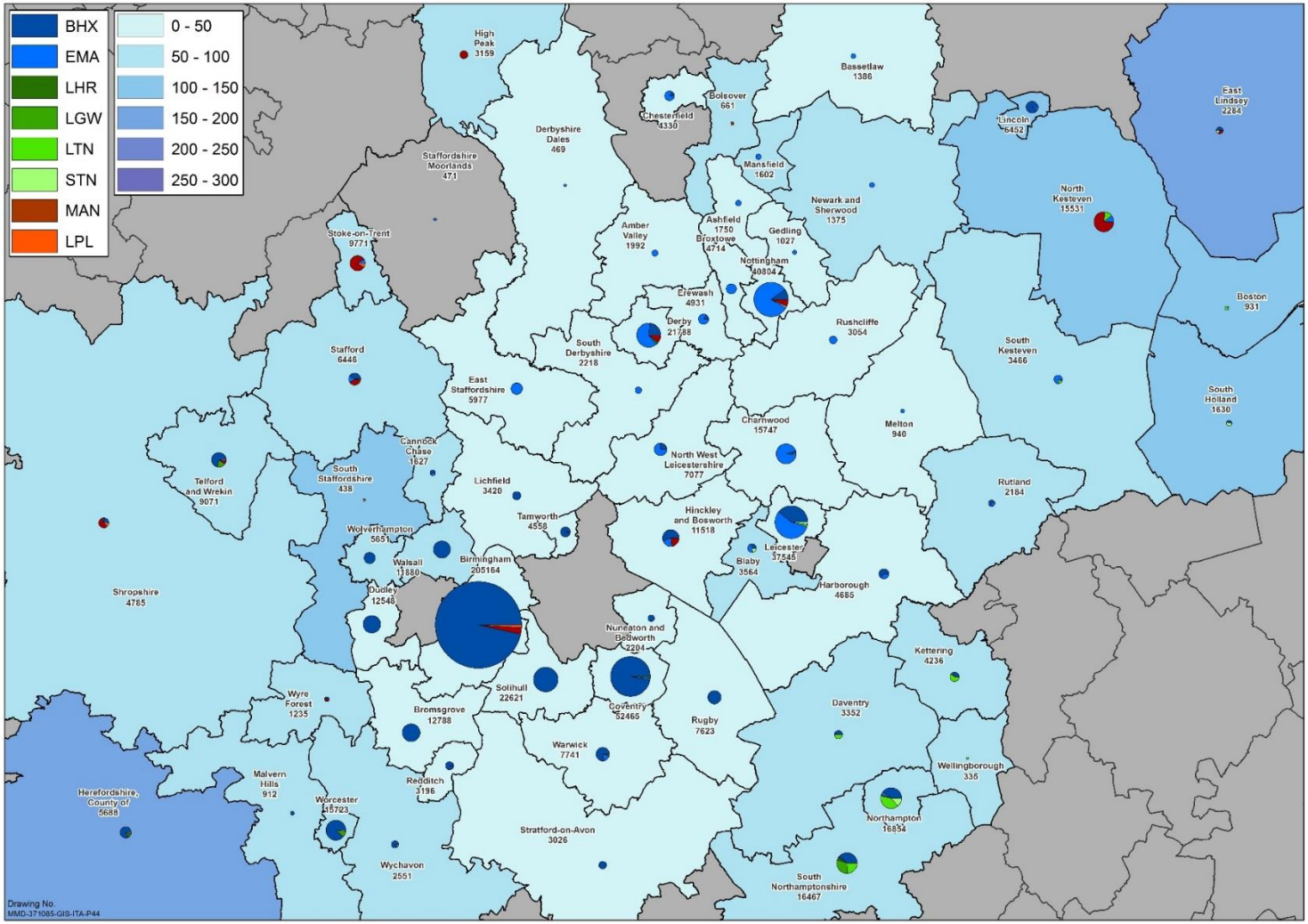
Road Name	Scheme	Highways Agency Status
M1	Junction 6a-10 Widening	Completed
M1	Junction 28-31 HSRU	Planned (complete year 2015)
M1	Junctions 10-13 HSRU	Complete year 2014
M1	Junctions 25-28 Widening	Current
M1	Junctions 24-25 HSRU	Current
M4	Junction 19-20 HSRU	Planned Complete year 2014
M5	Junction 15-17 HSRU	Planned Complete year 2014
M6	Junction 11a-19 Widening	Planned
M6	Junction 4-5 HSRU	Planned
M6	Junction 8-10a HSRU	Completed
M6	Junction 5-8 HSRU	Planned Complete year 2014
M6	Carlisle to Guards Mill Extension	Completed
M20	Junction 3-5 HSRU	Candidate (development, subject to VfM)
M25	Junction 16-23 Widening	Completed
M25	Junction 27-30 Widening	Completed
M25	Junction 1b-3 Widening	Current
M25	Junction 23-27 HSRU	Planned Complete year 2014
M25	Junction 5-7 HSRU	Planned Complete year 2014
M42	Junctions 3a-7 HSRU	Current
M62	Junction 25-30 HSRU	Completed in 2013
M74	M74 Completion	Current
M80	M80 Stepps to Haggs	Current
A1	Dishforth to Barton Improvement Scheme	Current
A5 – M1	Dunstable Northern Bypass	Planned (complete year 2016/17)
A11	Improvements (dualling)	Complete year 2014
A14	Ellington to Fen Ditton	Planned
A14	Kettering Bypass Widening	Planned
A21	Tonbridge to Penbury	Current
A23	Handcross to Warninglid	Planned Complete year 2014
A30	Temple to Higher Carblake Improvement	Planned (complete year 2016/17)
A46	Newark to Widmerpool Improvement	Current
A421	Bedford to M1 Junction 13	Complete
A453	Widening (M1 Junction 24 to A52 Nottingham)	Planned (complete year 2015)
A595	Parton to Lillyhall Improvement	Completed
M1	Junction 32-35a HSRU	2015/16
M1	Junction 39-42 HSRU	Planned (Complete year 2015)
A160/A180	Improvements	Planned (complete in 2016/17)

Road Name	Scheme	Highways Agency Status
A21	Dualing	Planned
M60, M62	M60 Jn8 – M62 Jn20	Planned (Complete year 2014)
M6	Junction 10a-13	Planned (Complete year 2015)
M8, M73 and M4	New motorway and junction improvements	Complete in 2017
A487	Caernarfon to Bontnewydd	Planned (start in 2014)
A465	Dualling of the A465 Heads of the Valleys road	Complete year 2015
A477	from St Clears to Red Roses	Complete year 2014
A3	A3 Hindhead	Completed in 2011
A556	A556 Knutsford to Bowden	Complete year 2016/17
M3	M3 J2-4a	Planned (complete in 2015/16)

Source: Mott MacDonald Analysis of Strategic Fit Airports Commission Forecast data

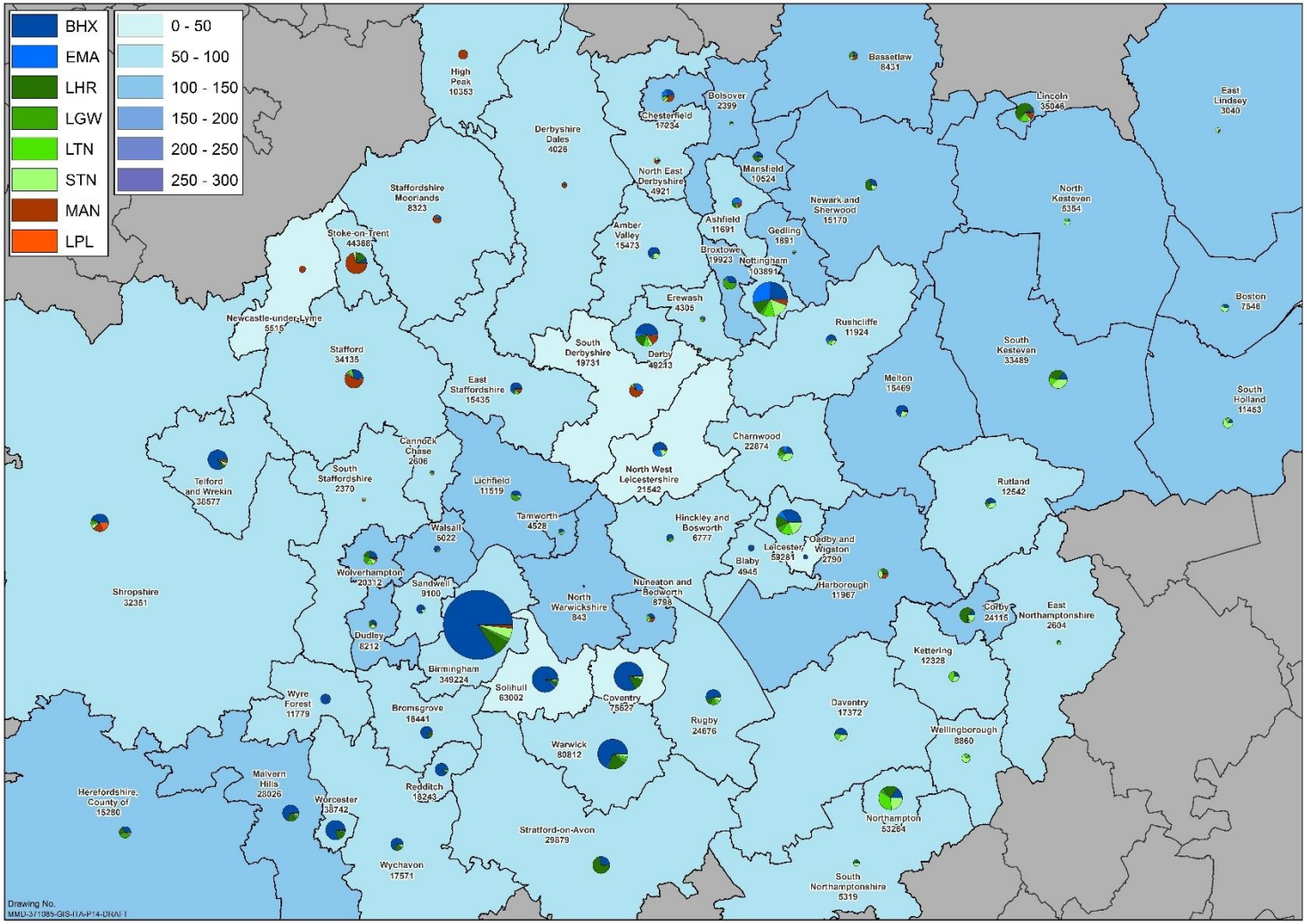
B. Passengers volumes and characteristics maps

Figure 92: Business passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – Domestic market



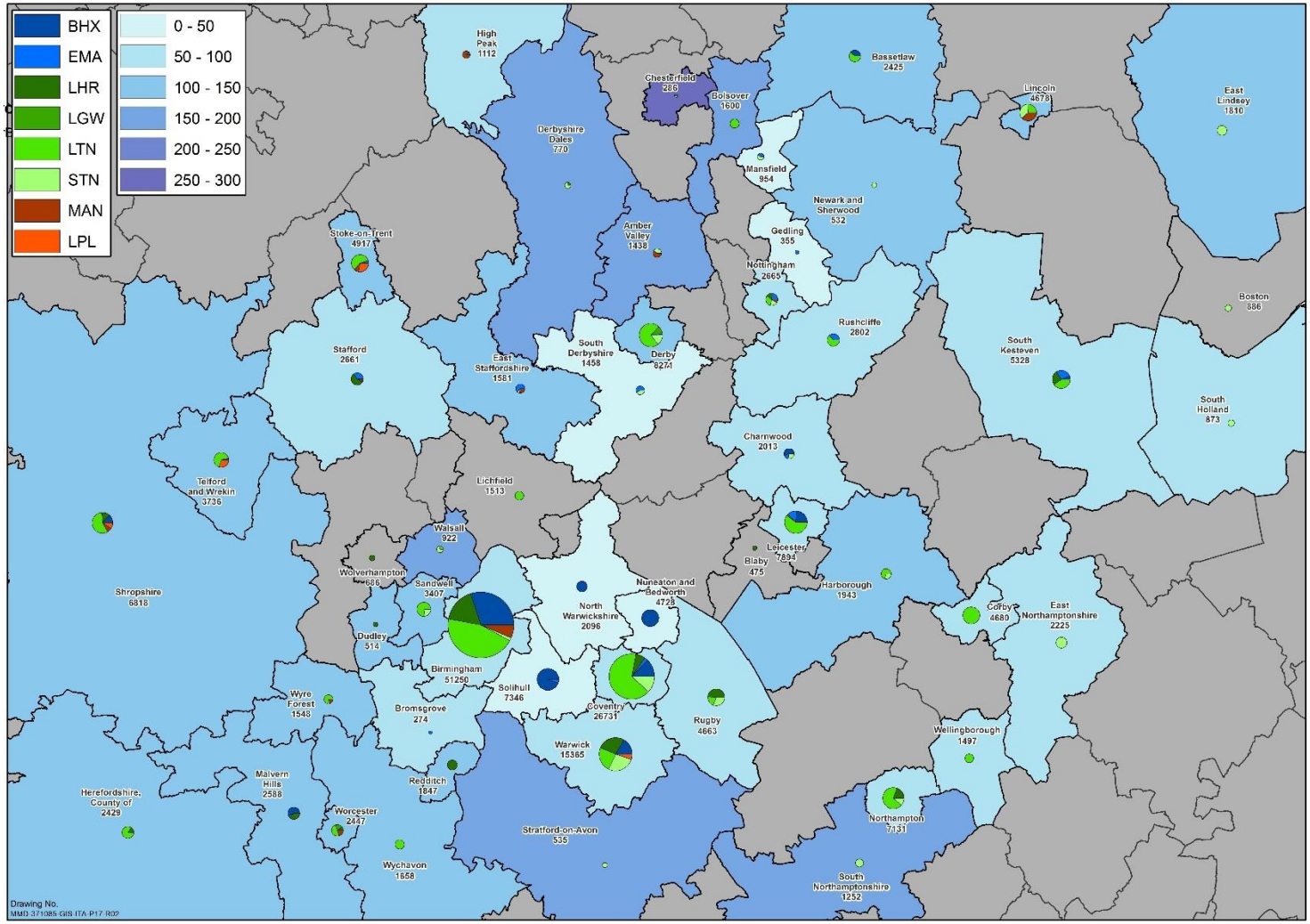
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 93: Business passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – Western Europe market



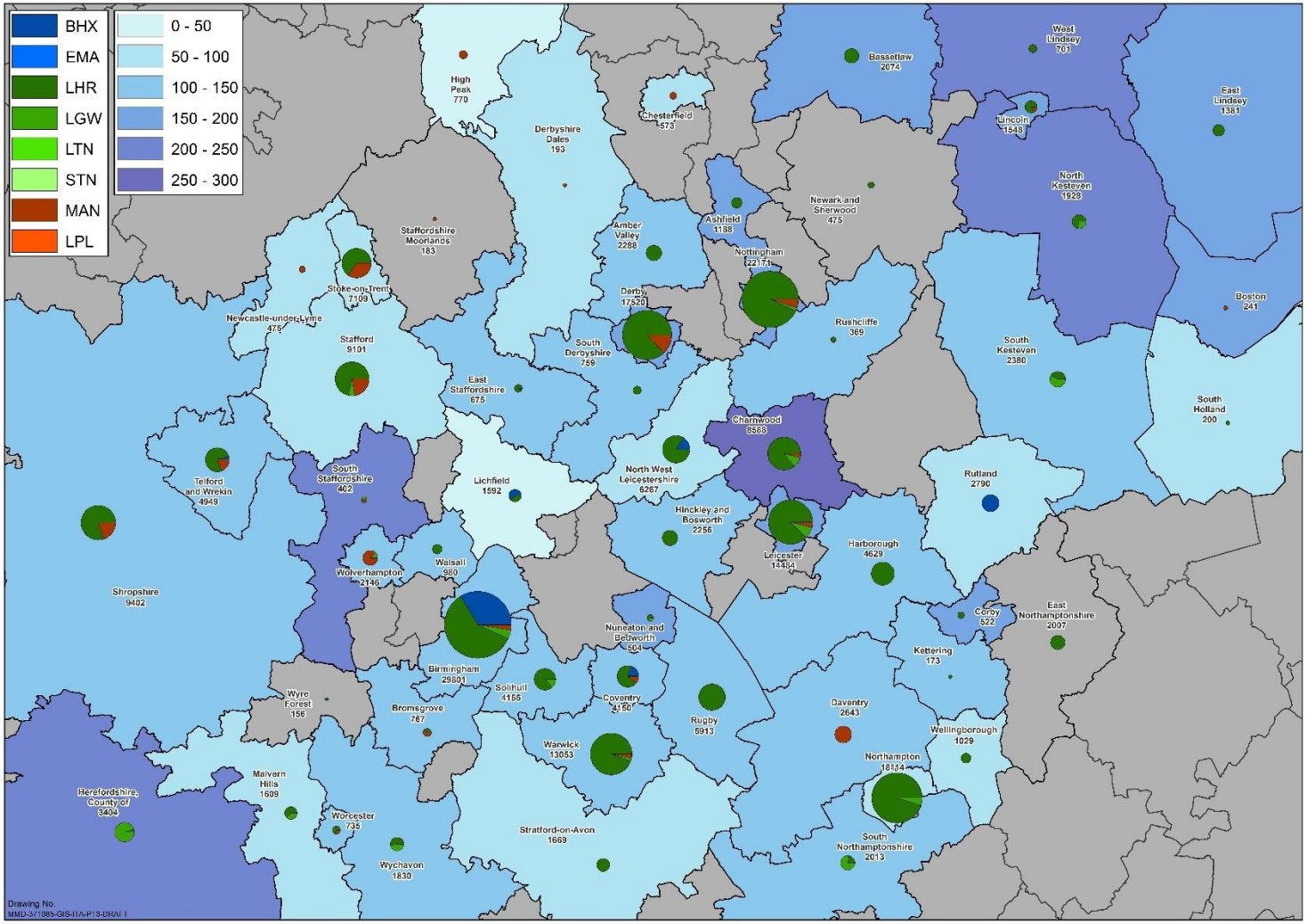
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 94: Business passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – Eastern Europe market



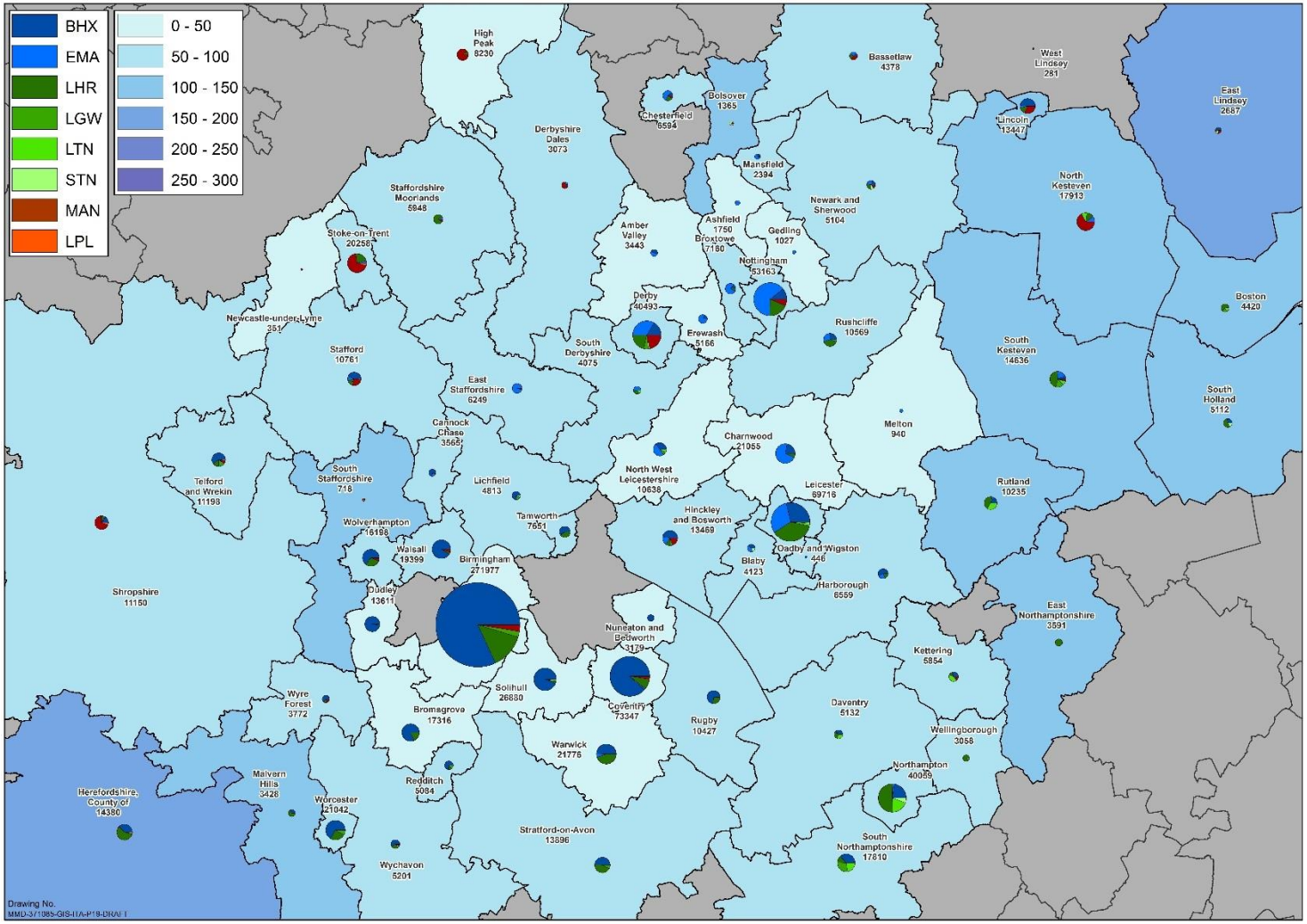
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 95: Business passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – North American market



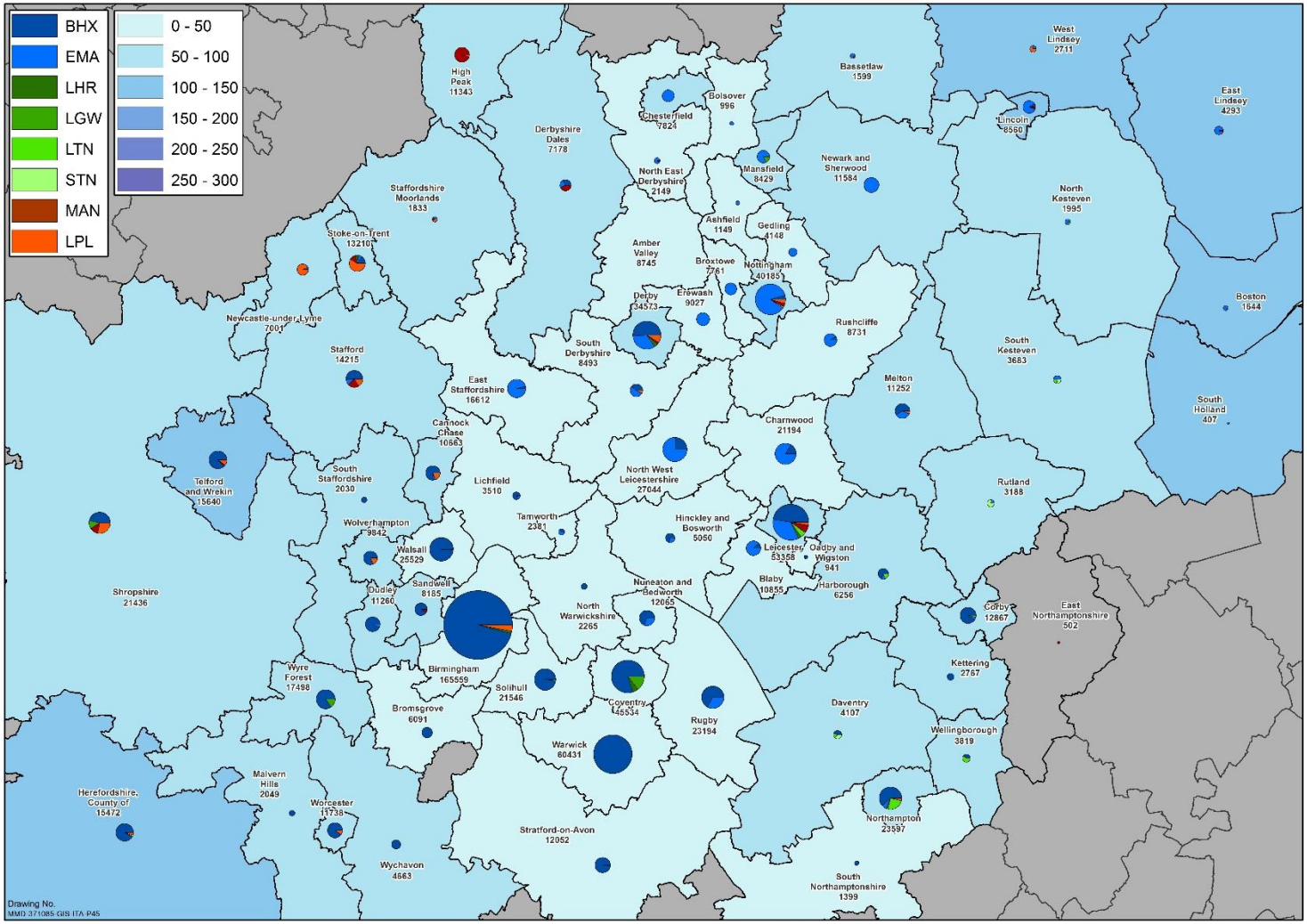
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 96: Business passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – Rest of the World



Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 97: Leisure passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – Domestic market



Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 98: Leisure passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – Western Europe market

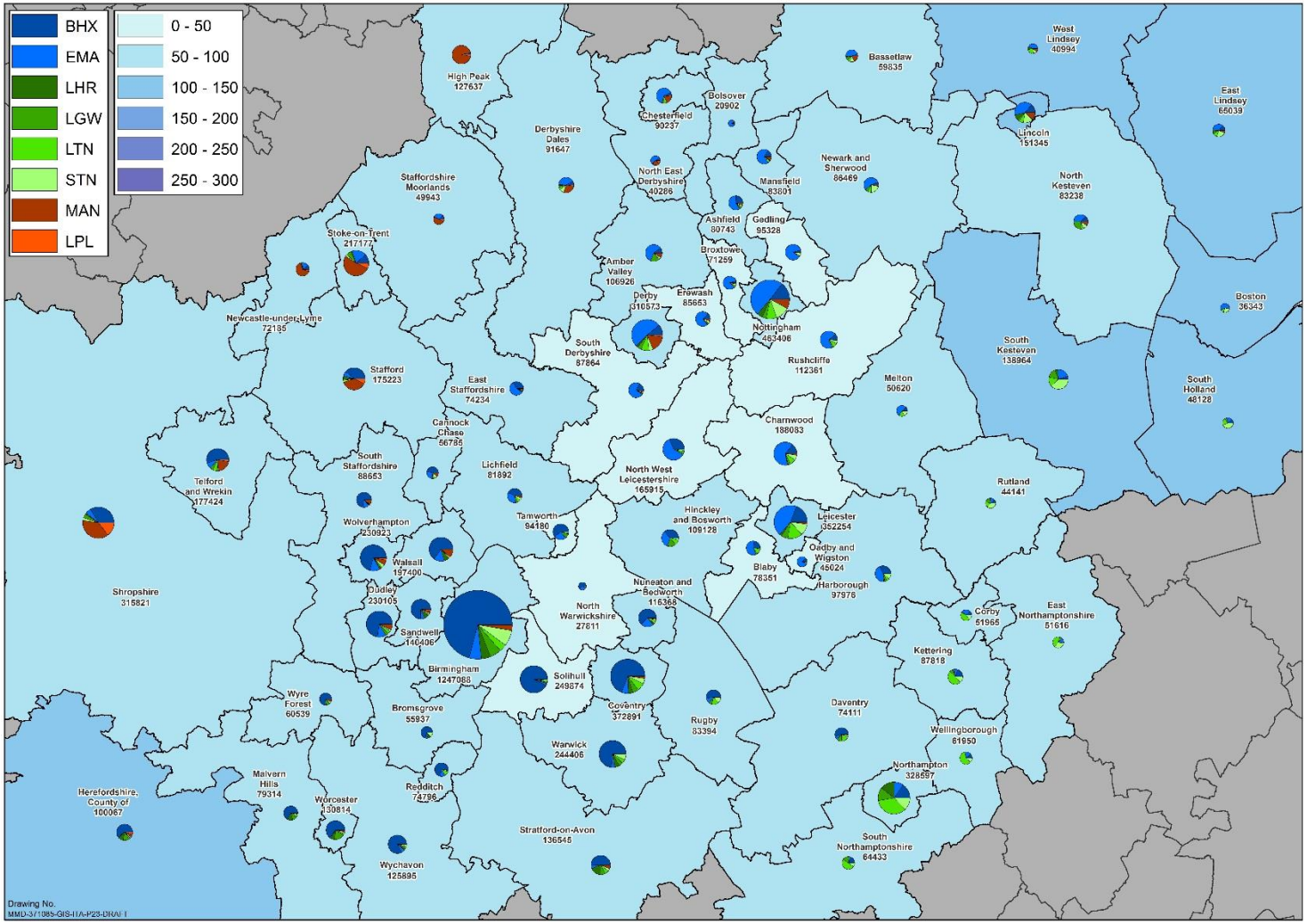


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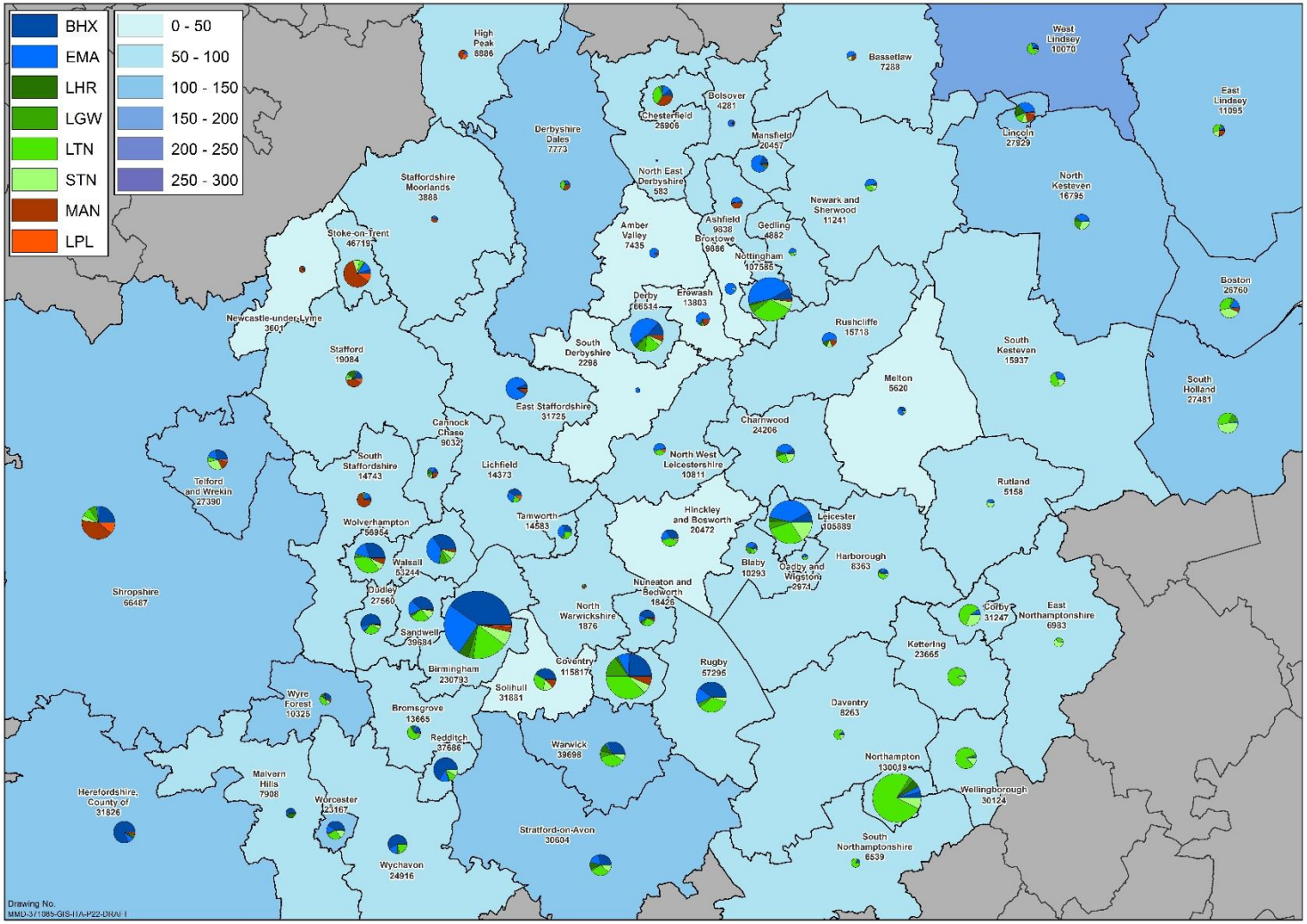
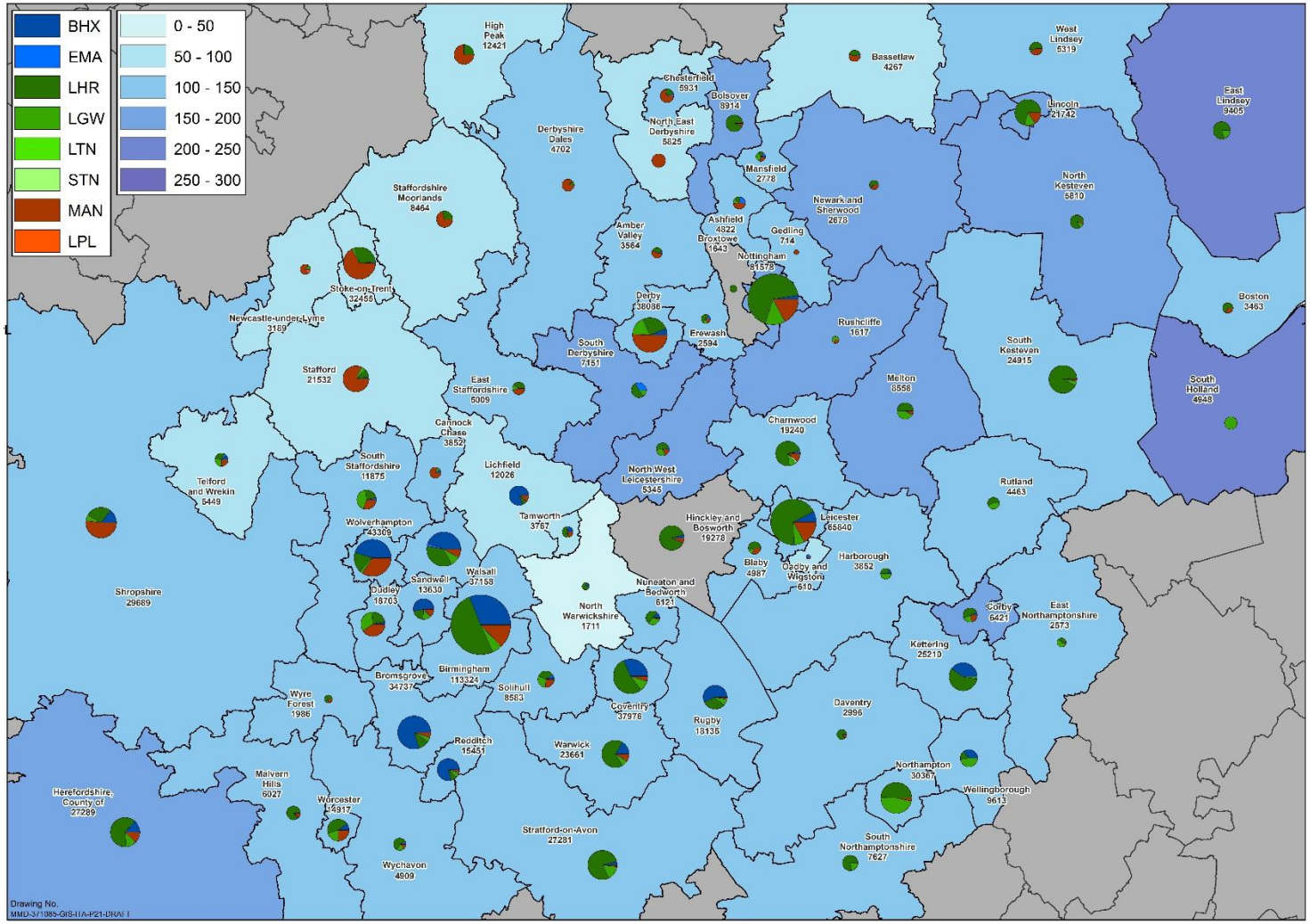
Figure 99: Leisure passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – Eastern Europe market



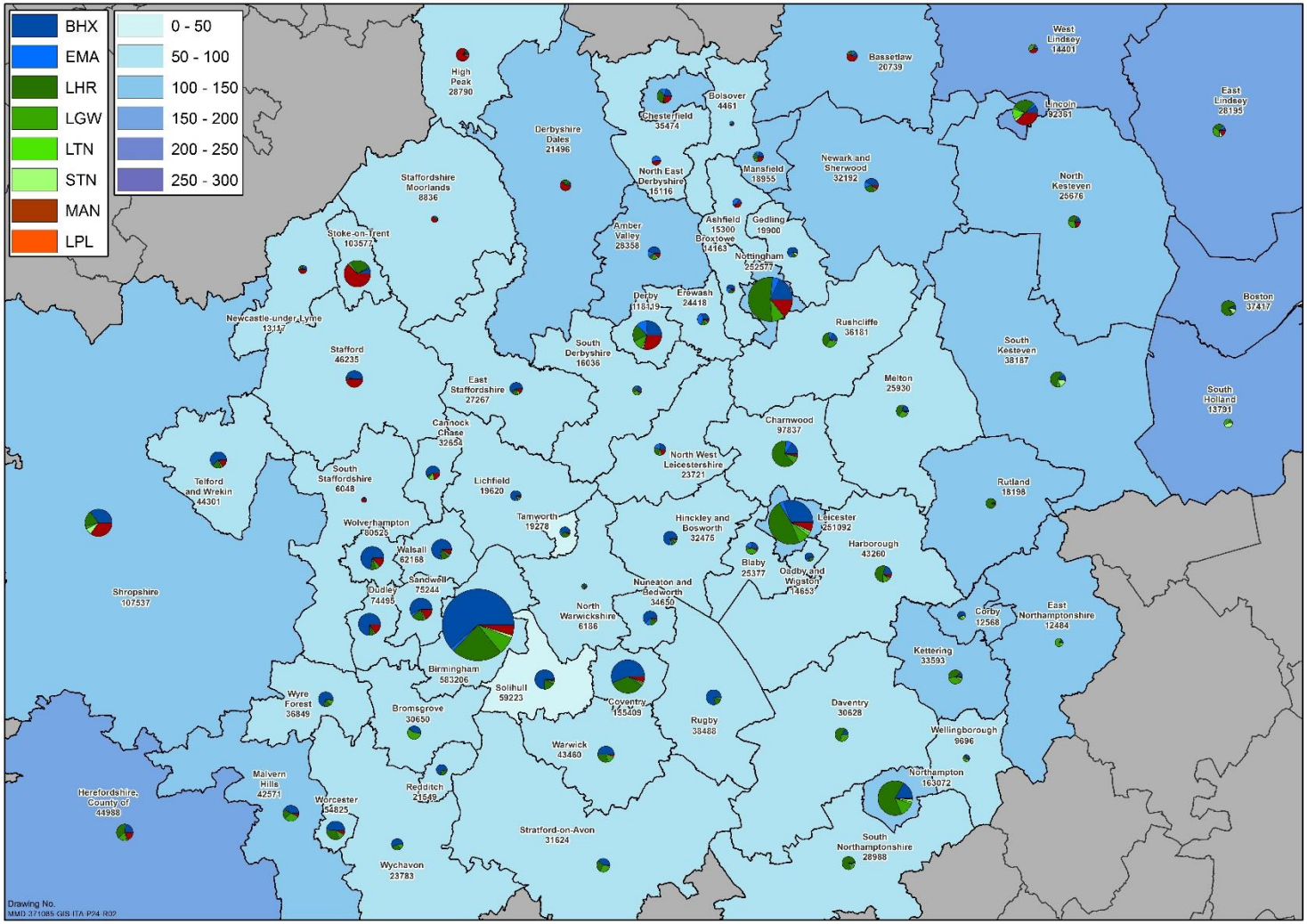
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 100: Leisure passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – North American market



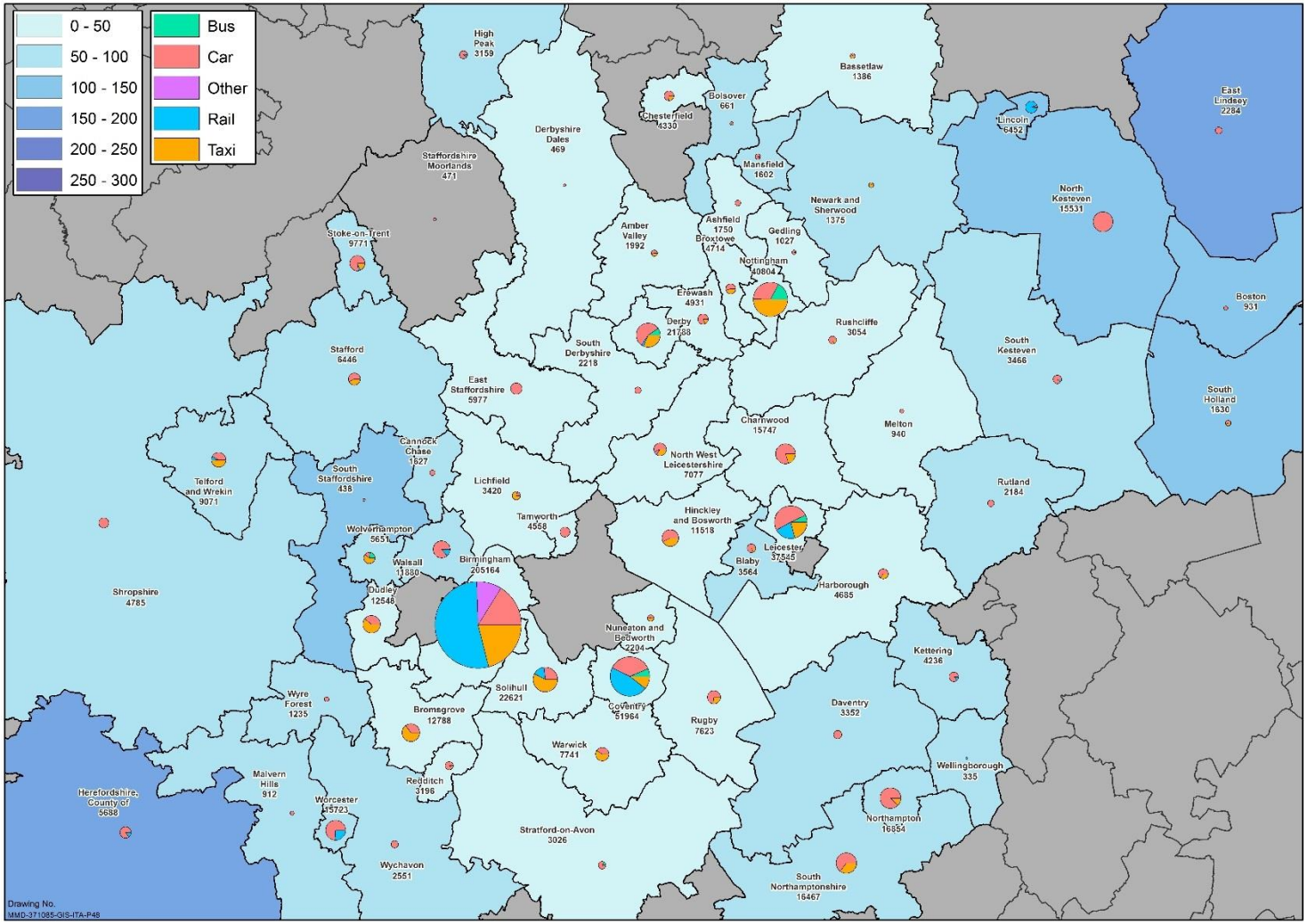
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 101: Leisure passengers volumes and airport of choice (pie chart) and average surface access journey time (heat map) – Rest of the World



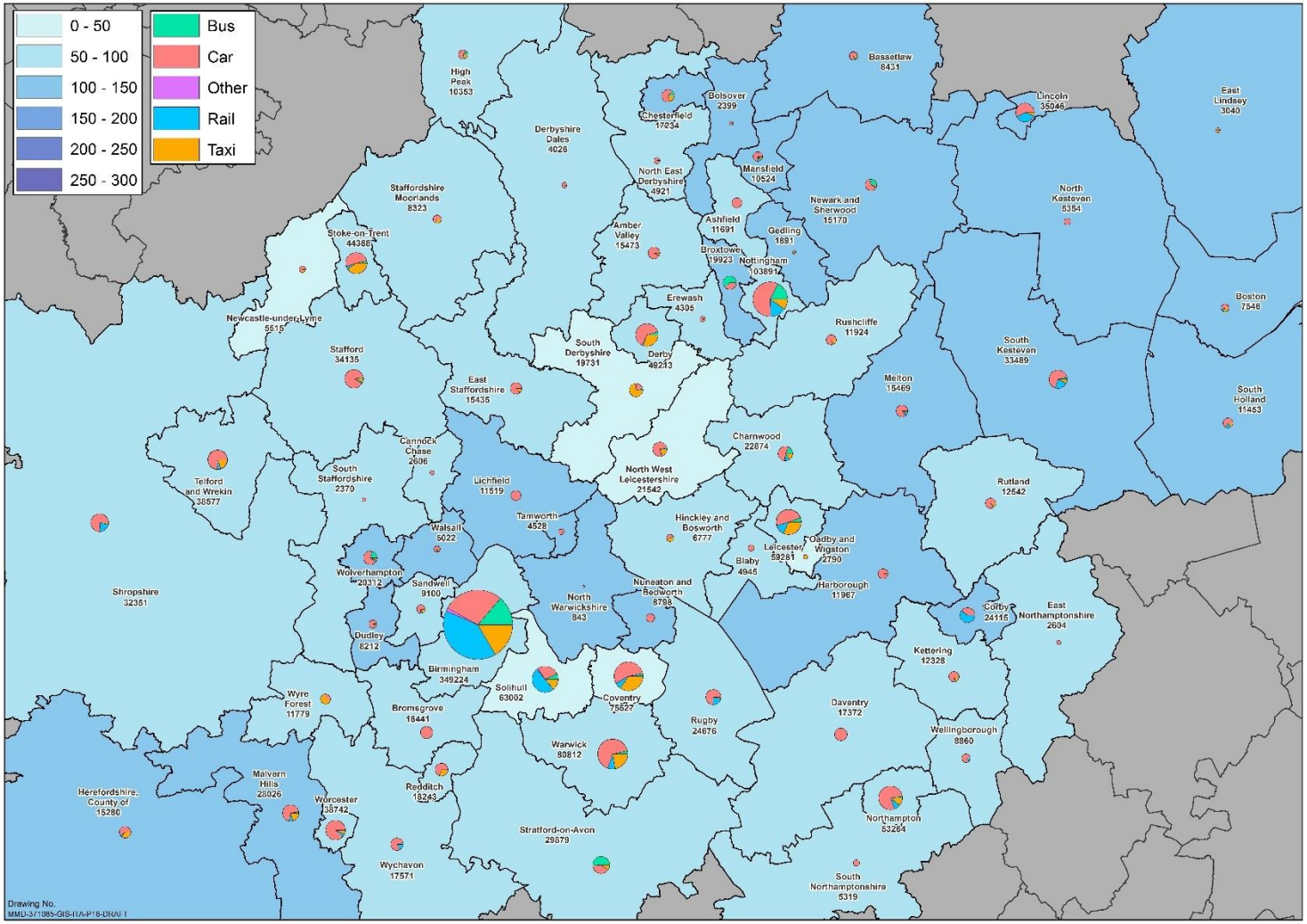
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 102: Business passengers volumes and travel mode (pie chart) and average surface access journey time (heat map) – Domestic market



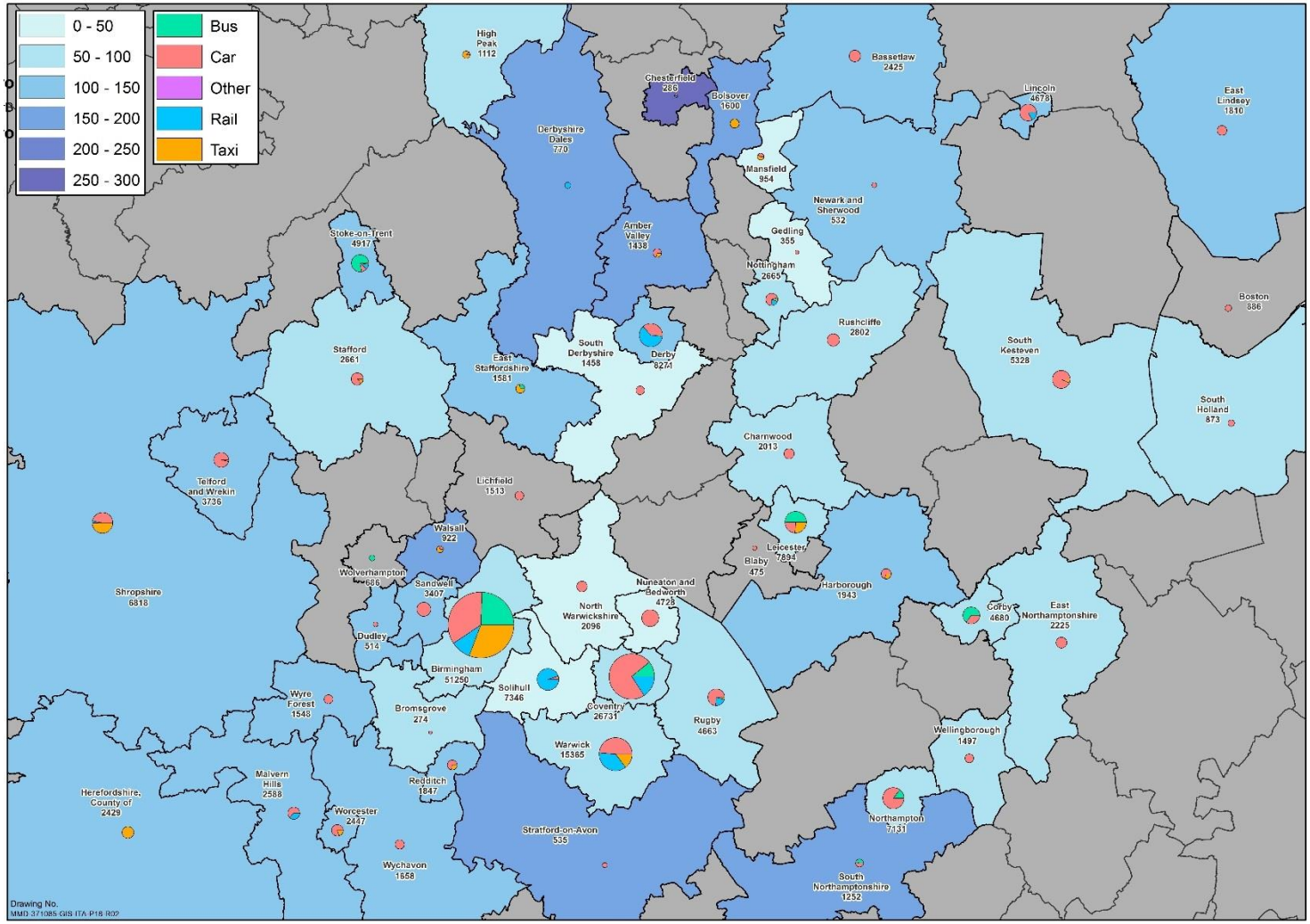
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 103: Business passengers volumes and travel mode (pie chart) and average surface access journey time (heat map) – Western Europe market



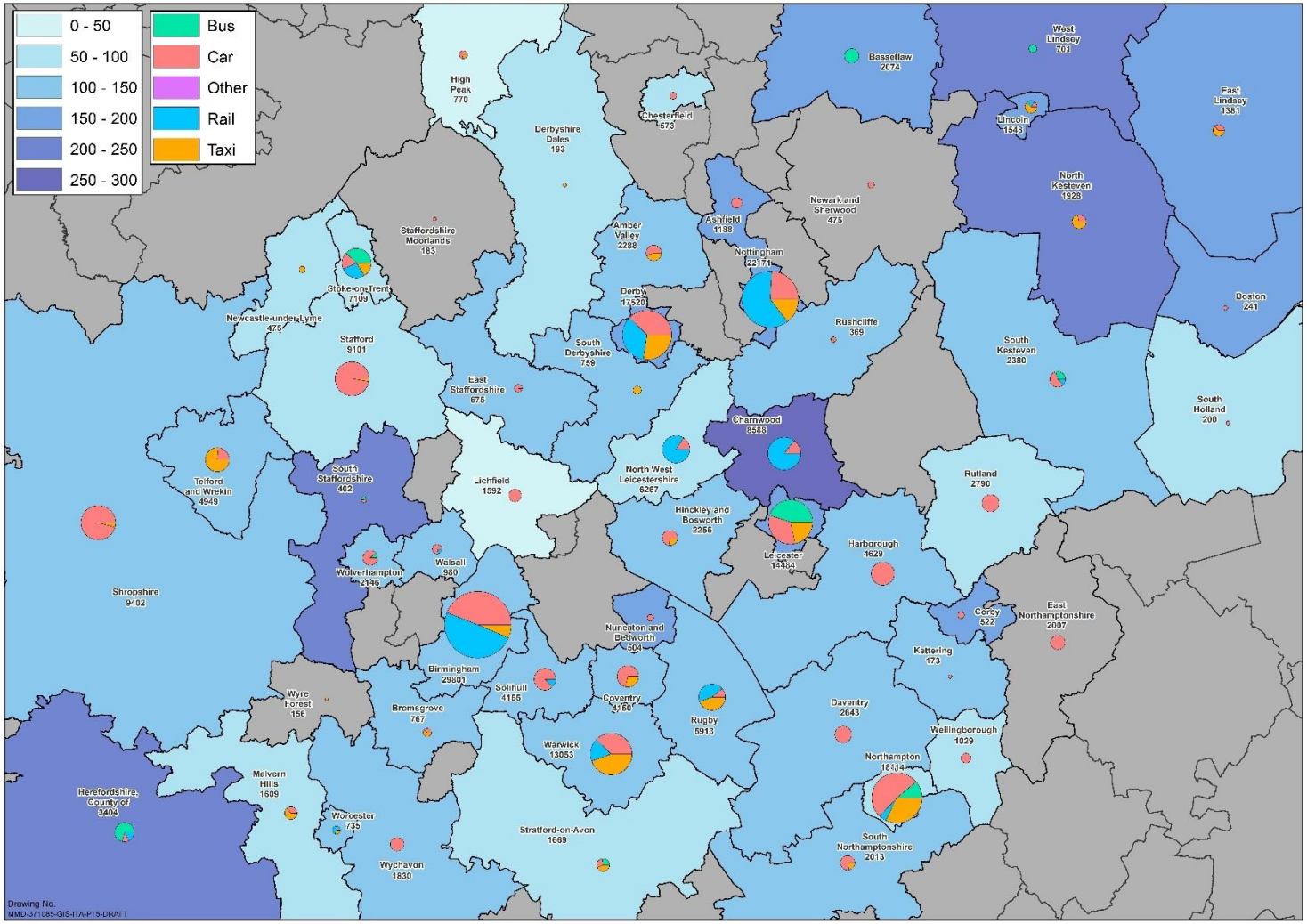
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 104: Business passengers volumes and travel mode (pie chart) and average surface access journey time (heat map) – Eastern Europe market



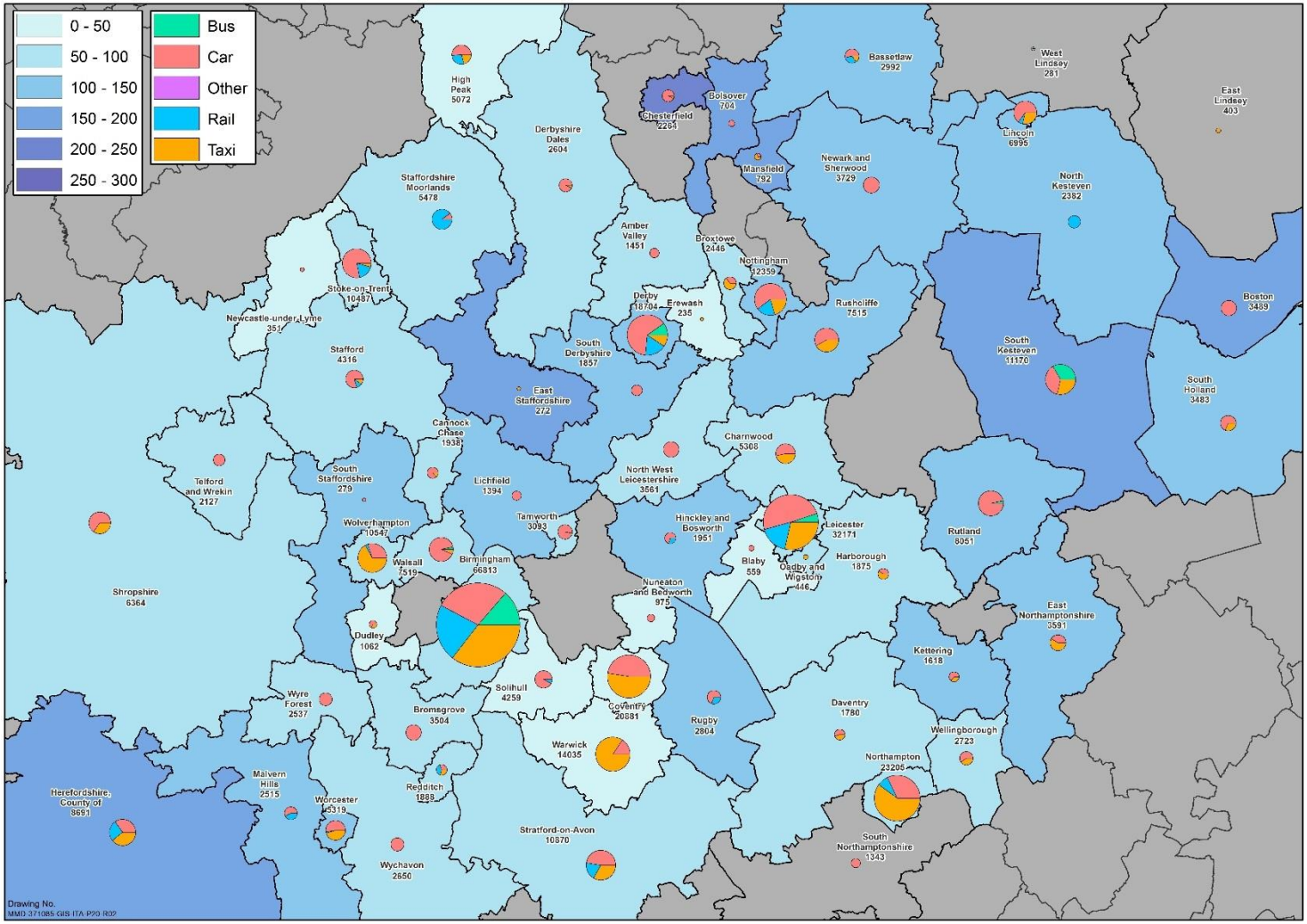
Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 105: Business passengers volumes and travel mode (pie chart) and average surface access journey time (heat map) – North American market



Source: Mott MacDonald analysis of Jan-Nov 2015 DfT survey data – BHX = Birmingham, EMA = East Midlands, LHR = London Heathrow, LGW = London Gatwick, LTN = London Luton, STN = London Stansted, MAN = Manchester, LPL = Liverpool

Figure 106: Business passengers volumes and travel mode (pie chart) and average surface access journey time (heat map) – Rest of the World



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