



Bristol Airport Traffic Displacement Estimation

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Client Reference



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Author: Katie Tang

Jacobs U.K. Limited

Cottons Centre, Cottons Lane
London SE1 2QG
United Kingdom
T +44 (0)20 3980 2000

www.jacobs.com

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Appendix A. Additional Information

1. Scope

As part of our work with North Somerset Council, we have been reviewing the Economic Impact Assessment report undertaken by York Aviation on behalf of Bristol Airport. Other stakeholders have also reviewed/challenged part of the methodology, in particular York Aviation's initial assumption of zero displacement of economic benefits. In response to comments, York Aviation applied Homes and Community Agency (Additionality Guide Fourth Edition 2014) recommended displacement values of 25%, 50% and 75% to North Somerset, the West of England and the South West & South Wales respectively.

Table 1 Economic Impact of Bristol Airport Expansion¹

Region	Economic Impact (GVA £m) with 0% displacement	Housing and Community Agency recommended displacement (%)	Economic Impact (GVA £m) with displacement
North Somerset	£90m	25%	£70m
West of England	£210m	50%	£110m
South West & South Wales	£390m	75%	£100m

As a result, we have been asked to estimate the magnitude of new trips served by Bristol Airport that are displaced from other airports (moving from other UK airports) as a result of the proposed airport expansion, and basing these on the forecast produced by Bristol Airport Ltd.

The rest of this document sets out our approach in estimating the displacement and our findings.

Our approach is a high-level approach, given the timescales available and the purpose of the exercise. A full detailed assessment would require significantly more time and resources and was deemed to be disproportionate given the stage at which the project is currently at.

Note that this report has been prepared exclusively for North Somerset Council and no liability is accepted for any use or reliance on the report by third parties.

This report should be read in full with no excerpts to be representative of the findings.

¹ Development of Bristol Airport to Accommodate 12 million Passengers per annum: Economic Impact Assessment, York Aviation, November 2018; Response to Comments Received, York Aviation, March 2019

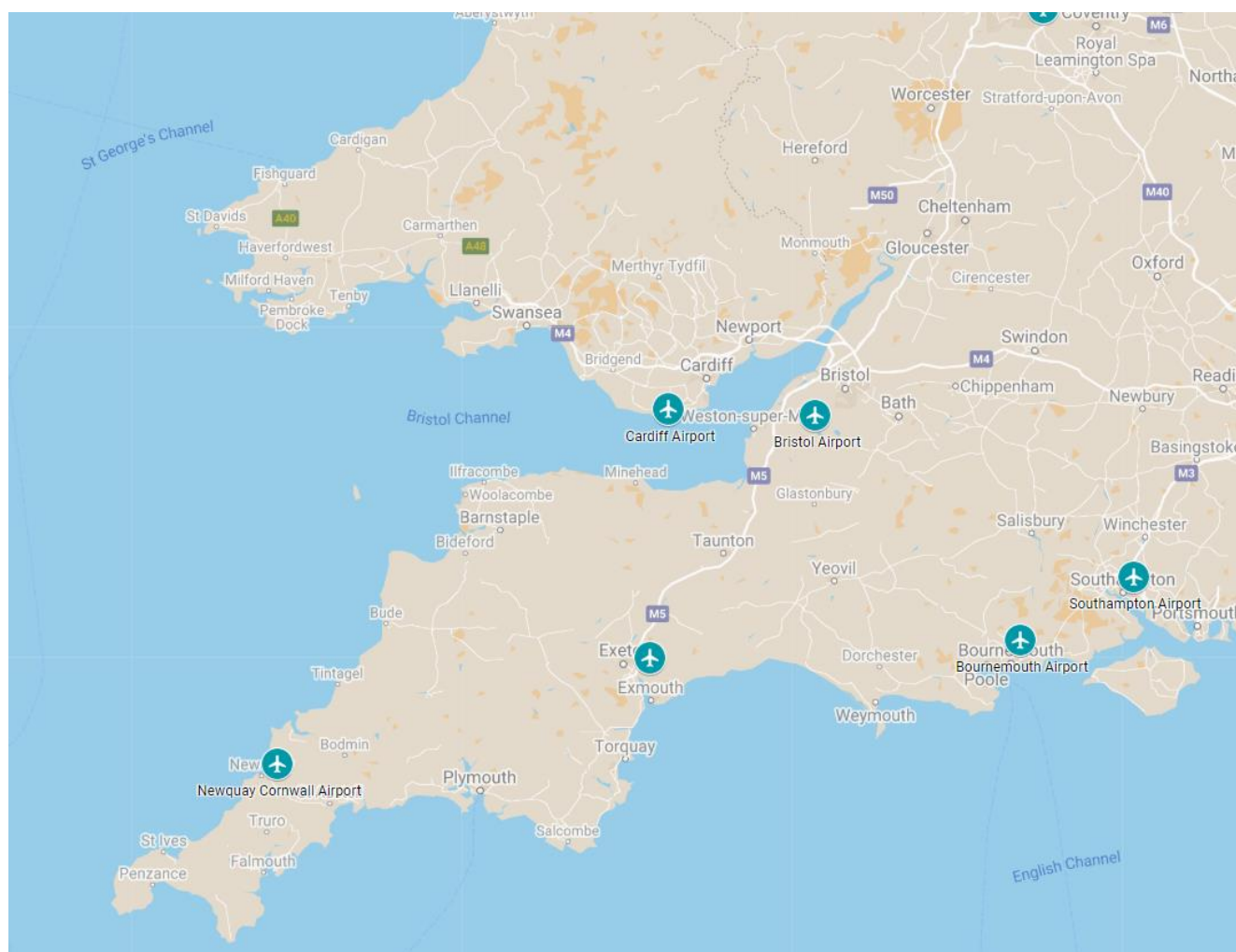
2. Methodology

2.1 Introduction

Considering these geographical regions, we can assume that there is no displacement for North Somerset. Anyone living in North Somerset will most probably use Bristol Airport anyway, given its proximity to the airport.

As West of England and South West & South Wales are encompassing larger regions, this will overlap with competing airports, such as Cardiff, Bournemouth, Exeter and Newquay airports. When Bristol Airport expands, some of the passengers who originally would have flown from a competing airport, may choose to fly from Bristol instead, perhaps due to improved flight schedules and routes offered.

Figure 1 Map of South West and South Wales Airports



2.2 Market Segmentation

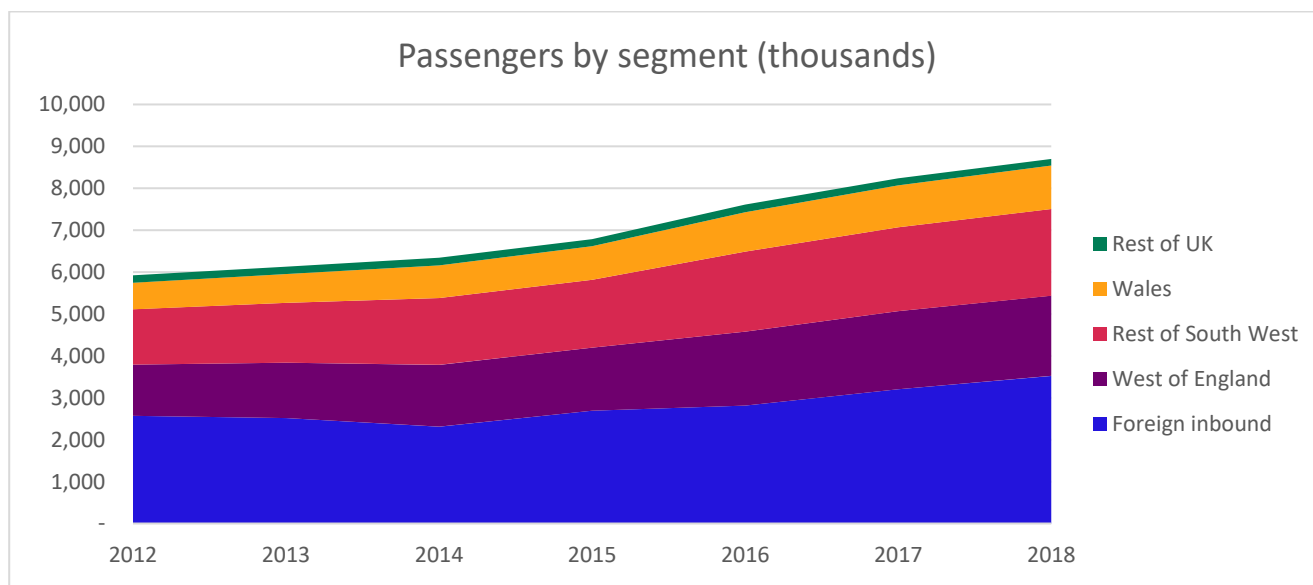
In order to estimate displacement factors for West of England and South West & South Wales, we have segmented the traffic at Bristol Airport by the following:

- Foreign inbound – non-UK based passengers flying into Bristol (as these should not be included in the economic benefits to the UK regions)
- UK outbound from West of England

- UK outbound from the rest of South West
- UK outbound from Wales
- UK outbound from the rest of the UK

As passenger numbers were only provided on a total level (historical and forecast), we have made the following assumptions using trusted data sources to form our base historical data. See Figure 2 and Table 2 below.

Figure 2 Passenger Segmentation



Source: Jacobs analysis

Table 2 Passenger Segmentation Assumptions

Passenger Segment		Estimated Passengers in 2018	Estimated Proportion of Passengers in 2018	Assumptions and Data Sources
Total passengers at Bristol Airport		8,699,529	100%	CAA, up to 2018 (8.7 million), note that the full year figure for 2019 was not yet available.
Foreign inbound passengers		3,520,876	40.5%	Used Marketing Information Data Tapes (MIDT) air ticketing database, which states where the ticket was purchased from. Point of sale country has been used as a proxy to whether the passenger is UK-based or from abroad. This is a standard approach in air traffic forecasting techniques. Passengers who bought tickets from outside the UK have been consistently c.40% each year since 2011.
UK outbound passengers	From West of England	1,915,946	22.0%	From CAA survey data, which identifies where Bristol Airport passengers are coming from. Although only the 2012 survey had the data at a detailed enough level for the West of England, we have made appropriate assumptions based on the changes seen for the South West region below.

Passenger Segment		Estimated Passengers in 2018	Estimated Proportion of Passengers in 2018	Assumptions and Data Sources
	From the rest of South West	2,069,040	23.8%	From CAA survey data, which identifies where Bristol Airport passengers are coming from. The survey for Bristol Airport was only conducted in 2000, 2003, 2008, 2012 and 2015, so we have looked at the historical trend over the 15 years, and applied suitable assumptions for each year up to 2018.
	From Wales	1,036,459	11.9%	Same methodology as for the South West. The share of passengers from Wales has been increasing gradually since 2000.
	From the rest of the UK	157,208	1.8%	The remaining proportion of the total is from the rest of the UK, c.3.0% of UK outbound total in 2018, or 1.8% of total passengers.

2.3 Regression Analysis

For each segment, we then looked at the historical trend in passengers against various potential demand drivers, in order to identify relationships between these, so that we could apply the same relationships going forward for the forecast years. Our assumptions, data sources and commentary are detailed below, as well as our R^2 regression results in Table 3 below. All other regression checks (coefficient, significance and t stat) also showed significance.

Table 3 Demand Driver Assumptions

Passenger Segment		Demand Driver	Commentary	Regression Results (R^2)
Foreign inbound passengers		IMF Euro Area GDP Oct 2019	As most foreign travellers are from Europe, this segment will be driven by the Europe's economy. We have used IMF's Euro Area GDP (historical and forecast) as we believe this to be a realistic forecast.	0.90
UK outbound passengers	From West of England	NTEM South West Employment 2017 adjusted using WebTAG UK GDP (2019 vs 2017)	<p>We would ideally use GVA as a potential demand driver of traffic, as it is more representative of the economy as a whole. However, a GVA forecast for West of England or for South West region is not publicly available, so we have used employment instead, which is considered as an indicator for economic growth.</p> <p>On top of this, Bristol Airport does have a higher proportion of passengers travelling on business, compared to other airports, according to the CAA survey in 2015 (17% for Bristol, Cardiff 13%, East</p>	0.97

Passenger Segment		Demand Driver	Commentary	Regression Results (R ²)
			<p>Midlands 6%, Gatwick 14%, Liverpool 10%, Luton 14%).</p> <p>As a result, regression results with employment are good.</p> <p>Note that we have adjusted the NTEM 2017 employment forecasts by considering the change in WebTAG UK GDP forecasts from March 2017 and from October 2019, as economic forecasts are now more conservative, particularly for the next few years.</p>	
	From the rest of South West	NTEM South West Employment 2017 adjusted using WebTAG UK GDP (2019 vs 2017)	As above	0.97
	From Wales	NTEM Wales Employment adjusted using WebTAG UK GDP (2019 vs 2017)	As above but using employment figures for Wales	0.94
	From the rest of the UK	N/A	<p>This final segment is a lot smaller (1.8% of total traffic in 2018) and has ranged from 160,000 passengers to 182,000, with fluctuations between 2011-2018. We were not able to identify any suitable demand drivers for this segment.</p> <p>From looking at the historical trend, we have decided to keep this constant for the future years, at the historical average of 172,000.</p>	N/A

3. Results

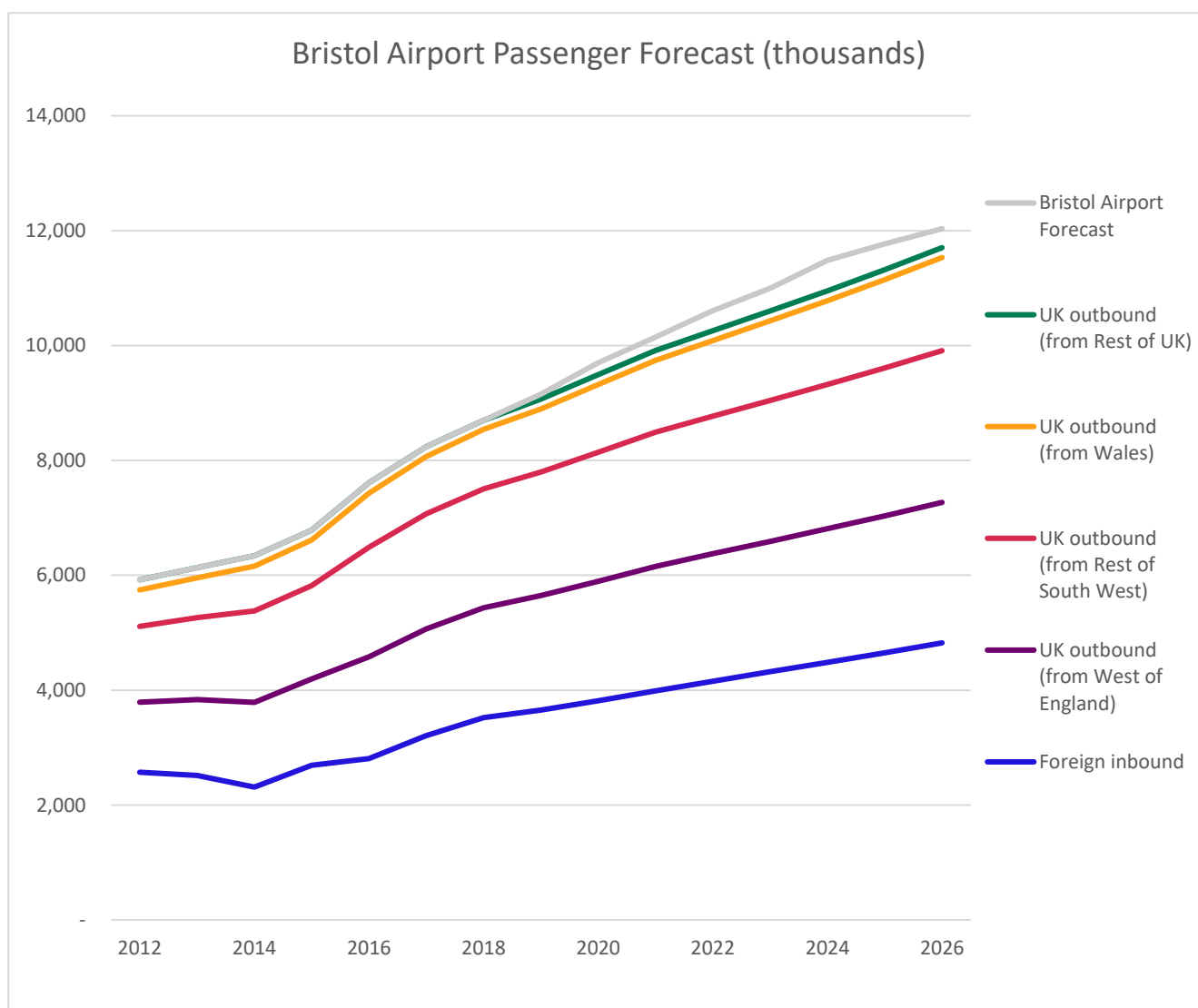
3.1 Passenger Forecast

Using the above modelling methodology, our Bristol Airport passenger forecast reaches 11.7 million by 2026. Note that this is an unconstrained scenario, where we are considering natural growth in demand due to the economy and propensity to fly. This is similar to Bristol Airport's forecast, which reaches 12.0 million in 2026.

Note that the Department for Transport's aviation forecast from 2017 estimates Bristol Airport to have only 8.7 million passengers by 2026. It also does not take into account the airport expansion and is slightly out of date. Our forecast uses actuals up to 2018 (which shows Bristol already handling 8.7 million passengers now) and uses more up to date economic forecasts.

Figure 3 below shows our Bristol Airport passenger forecast in a stacked line chart. The green line for 'UK outbound (from rest of UK)' is our resultant total forecast. This should be compared with the Bristol Airport forecast (grey line). It should be noted that we have assumed that there are no material improvements made to regional surface access which may alter observed historical trends and airport choice behaviours in the region.

Figure 3 Bristol Airport Passenger Forecast (Source: Jacobs analysis)



3.2 Displacement Factors

Forecasted passengers using Bristol Airport from the proposed expansion is likely to either newly generated airport users, or will have come from competing airports, such as Cardiff Airport, Bournemouth Airport, Exeter Airport and Newquay Airport, etc.

Without detailed data on displacement, catchment areas of the competing airports and uncertainty in future airline growth strategies, we can only assume that the geographical profile of airport passengers using Bristol will follow current observed trends. Table 4 below shows the proportion of passengers that are forecasted to use Bristol airport in 2026 from each region.

Table 4 Proportions of Passengers from each Region in 2026

Region	Proportion of passengers from each region (out of UK outbound total)
West of England	35%
Rest of South West	38%
South Wales ²	17%
Rest of Wales	7%
Rest of UK	3%
Total UK outbound	100%

Source: Jacobs analysis

Assuming that forecasted passengers at Bristol airport from each of the above region are displaced users from other airports in the same region, we can use the above proportions to infer that economic benefit generated from these extra passengers is also displaced economic activity, i.e. the benefit already existed within the region and it is just being moved to Bristol.

We note that this is a conservative treatment as airport expansion at Bristol has the potential to generate new airport users who otherwise would not have chosen to travel by air. In this case, the economic benefits generated from the expansion is likely to be higher than those estimated.

We would expect the displacement factor to increase with the size of the geographical area given the proportion of total airport passengers increases.

Potential GVA impact by region factoring in potential displacement, have been calculated by applying the proportion of passengers by region (as set out in Table 4) to the incremental GVA impact for the region as estimated by York Aviation. For example, the incremental impact for West of England (£120m) is equivalent to gross West of England GVA impact (£210m) minus the North Somerset impact (£90m).

² South Wales passenger proportion derived from Wales estimate and pro-rating using relative population size. Based on mid-year 2018 population statistics, South Wales accounts for 71.20% of total Wales population.

The impact by region is based on the cumulative net additional impact and the implied displacement factor estimated as the potential GVA impact factoring displacement relative to the gross GVA impact estimated by York Aviation.

We have assumed that there is no displacement at the North Somerset level as there is no alternative airport choice and so the estimated gross benefits are likely to be totally additional at the North Somerset level.

Table 5 Summary of Estimated Additional Economic Impact (£m; percentages)

Region	Cumulative Gross Economic Impact (£m GVA, York Aviation)	Incremental GVA Impact by Region (£m)	Proportion of Pax (based on forecast; %)	Net Additional GVA Impact (£m)	Cumulative Additional GVA Impact (incl. displacement; £m)	Implied displacement factor (%)
North Somerset	90	90	0%	90	90	0%
West of England	210	120	36%	77	167	20%
South West & South Wales	390	180	55%	81	248	36%

Source: Jacobs analysis and York Aviation