

Review of Economic Impact Assessment – For Bristol Airport Expansion Project

Prepared for North Somerset Council

February 2019

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Document history

Bristol Airport Expansion

Review of Economic Impact Statement

This document has been issued and amended as follows:

Version	Date	Description	Created by	Verified by	Approved by
0.1	February 2019	Draft Review	AC / PC / KG	ВТ	





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Introduction

1.1 Introduction

Jacobs have been commissioned by North Somerset Council (NSC) to undertake a review of the Economic Impact Assessment prepared by York Aviation on behalf of Bristol Airport Limited (BAL -herein known as the applicant) for the proposed expansion of Bristol Airport. The applicant is seeking to obtain outline planning permission for the development; and has submitted an application for consent to NSC: (Ref: 18/P/5118/OUT).

The Economic Impact Assessment (EIA) sets out a range of qualitative and quantitative evidence to assess the impact of future airport expansion, considering the effect on Gross Value Added (GVA) and employment, as well as taking a view of broader economic welfare effects via a socio-economic costbenefit analysis. The report is titled: Development of Bristol Airport to Accommodate 12 Million Passengers Per Annum: Economic Impact Assessment (York Aviation Final Report, November 2018).

It is noted that findings from the EIA also feed into:

- Chapter 15 of the Environmental Impact Assessment and accompanying appendices and tables, and
- Section 5.4 of the Planning Statement.

This Report documents the findings of our review of the EIA.

1.2 Reviewers

The following staff have undertaken the main review:

Name	Title	Qualifications	Section(s) of the EIA reviewed
Alex Coulthard	Technical Director		Chapter 4 - 7
Péter Connell	Principal Consultant		Chapter 4 - 7
Ben Tirunawarkarisu	Technical Director		Chapter 4 - 7
Konstantina Glykopoulou	Consultant		Chapter 4

1.3 Structure of the Report

We have considered the whole of the EIA, including Chapters 1 - 3 (which provide background, a profile of the airport and economic and policy context), though our report focuses on a review of Chapters 4 - 7, as these chapters present the approach, analysis, and findings relating to the economic impact of the existing airport, its proposed expansion, as well as the socio-economic cost benefit analysis and a consideration of regeneration and social impacts. We have highlighted in bold specific questions or points for further clarification arising from our review in the following sections.

1.4 Current Economic Impact - Chapter 4

This chapter of the EIA sets out an assessment of the current economic impact of Bristol Airport, including the analytical approach taken and data sources used to underpin the economic modelling.

Sections 4.2 – 4.6 outline the analytical framework underpinning the approach to estimation of the current economic impact. It disaggregates the way in which the airport interacts with the economy into a series of discrete and quantifiable elements. The first of these is the 'economic footprint' effect, with the categorisation broken down between Direct, Indirect, and Induced effects:

- **Direct** economic footprint effects employment and GVA (gross value added) **directly** related to operation of the airport and located at the airport or immediate vicinity.
- Indirect ("type I") effects employment and gross value added in the airports' supply chain, with a wider geographical and sectoral dispersal. These can be measured by applying a multiplier to Direct jobs.
- Induced ("type II") effects the activities of the airport and its supply chain provide income to households. Households spend this money, leading to further employment and GVA in the economy. Again, Induced impacts can be estimated by applying a multiplier to Direct jobs.

In addition to the economic footprint effects, wider impacts reflect the benefits to the region through increased business connectivity and the inbound tourism facilitated by the airport.

Economic Footprint

Sections 4.7 – 4.16 explain the approach to quantifying the economic footprint effects. The components are as per categorisations for other UK airport economic impact assessments undertaken by York Aviation (e.g. Luton, Edinburgh). Direct jobs are estimated (section 4.8) from a 2018 survey undertaken by BAL, with the distribution taken from Bristol Airport Staff Travel Plan in 2017. It would be helpful if the relationship between this figure (3,480 FTE's) and those contained in table 4.1 (showing Direct, Indirect and Induced jobs) could be clarified.

Our understanding is that Indirect and induced jobs have been measured by applying a multiplier to the Direct jobs total, an approach that has been adopted on other similar airport studies elsewhere (including those undertaken by York Aviation). This is a complex area and the intention is to capture the economic benefits further down the supply chain - and from expenditure of wages in the supply chain - within the study areas. The report does not provide detail on how Direct GVA is calculated (in particular, it is not the earnings of airport operations, as these include the "indirect" effects of the airport's supply chain), the scale of the multiplier, the granularity at which it is applied, and whether a separate multiplier has been applied to Direct GVA to calculate indirect GVA. It would be helpful if detail underpinning this could be included in a technical appendix.

We have sought to benchmark the implied indirect and induced employment multipliers against others in the public domain. A survey of values elsewhere (including a 2014 PWC literature review undertaken for the Airports Commission) suggests significant variation between airports, with a key factor influencing the size of the multiplier being the size of the local area being considered, with larger multipliers applying to larger catchment areas. The Bristol Airport EIA follows this pattern, with the ratio of Indirect & Induced vs Direct jobs and GVA higher for the *South West and South Wales* study area than for *North Somerset* (Table 4.1). The footprints should be expected to increase with greater local areas, in particular:

- Some airport workers, part of its **direct** economic footprint, do not live in North Somerset, but more of them live in the West of England and more still in the wider South West & South Wales region;
- The **indirect** footprint comes from the airport supply chain, some of which will be found in North Somerset, a greater proportion in the West of England, and so on;
- The **induced** footprint comes from households' earnings from the direct and indirect footprint; parts of these will support activities directly in North Somerset, but a greater share of this expenditure will support activity in the West of England, and so on.

The table below shows the multiplier calculated from a number of previous studies sourced from the Airports Commission literature review, with the implied Bristol Airport values also shown. The York Aviation values for Bristol Airport are shown, with the same information shown in a scatter chart. The latter indicates that the multiplier estimated for Bristol are not out of line with benchmarked values.

	Study Year	Passengers	Regional Population ¹	Indirect and Induced Multiplier ²
Amsterdam Schiphol	2001	52.6	1.6	1.95
Atlanta	2009	94.4	5.5	1.77
Cologne-Bonn	2008	9.1	2.8	1.77
Denver	2013	52.6	5.3	1.76
Copenhagen	1991	24.1	1.7	2.9
Edinburgh	2009	9.8	0.5	1.45
Manchester	2008	20.7	7.1	2.5
Minneapolis	2012	33.9	3.4	1.81
Paris (Orly & CDG)	2013	90.6	12	2.3
Bristol (N Somerset)	2018	8.2	0.2	0.85
Bristol (WoE)	2018	8.2	1.1	1.00
Bristol (SW & S Wales)	2018	8.2	7.4	1.55
Scotland (whole air transport sector) ³	2015	n/a	n/a	1.8

Table 1: Indirect multipliers: wider benchmarking of Bristol Airport

Source: PWC literature review (Airports Commission)

1 - Bristol study area population calculated from Table 3.1 of York Aviation Report

2 - Bristol Airport multipliers calculated from Table 4.1 of York Aviation Report

3 – Sourced from Scotland Input-Output Tables



Figure 1: Indirect multipliers: wider benchmarking of Bristol Airport

This comparison of Bristol against this basket of comparator airports should be treated with a degree of caution, in that Bristol has a number of characteristics that differ from some of the others shown. It is not a large hub airport and does not handle long-haul traffic. It also has a relatively small business market. However, a key observation from the comparison is that the Bristol indirect multipliers are at the bottom end of a range for a given Study Population Area size, thus giving a degree of assurance that these multipliers are not significantly overstated.

Clarification questions relating to Table 4.1 of the York Aviation report: why is the ratio of Indirect & Induced vs Direct jobs different from Indirect & Induced vs Direct FTE's for the study areas? Similarly, can clarification be provided on the relative scale of the 'direct' GVA and jobs in Table 4.1, e.g. West of England is responsible for only 30% more GVA than North Somerset but >100% more FTEs.

It would be helpful if the steps undergone in arriving at the GVA and employment estimates in Table 4.1 can be elaborated on in further detail, possibly within an Appendix.

Table 4.1 reports induced demand, but it is not clear how this has been distinguished, as our understanding it requires type II multipliers which are not published in the ONS input-output tables for the UK (but are published for Scotland). It is also not apparent how direct GVA has been calculated. If this is firms' incomes then this represents demand for the industry's final products, not GVA; the indirect effects in input-output tables capture the share of an industry's products that represent *value added* in other sectors of the economy.

Section 4.11 explains the approach to using Specialised Location Quotients in estimating regional input coefficients and multipliers. Based on the academic paper reference (*Estimating regional input coefficients and multipliers: The use of FLQ is not a gamble*), there are four formulae for the location quotients (LQs), namely the Flegg (FLQ), the simple (SLQ), the cross-industry (CILQ) and the round (RLQ). It is concluded that the FLQ is the most appropriate estimator as it shows a better performance than the other LG's. Specifically, from the scope of econometrics:

- FLQ ranks as an overall better performer than the alternatives;
- FLQ is statistically significant at the 5% level in six regions. It is noted though that six regions is a relatively small sample on which to base the recommendations.

The paper (p.20) notes the challenges in determining a value for δ (a parameter use in the in the formula for calculating FLQ). The selection of δ is crucial as an inappropriate value can lead to unreliable results. What method has been adopted for calculation of this parameter?

Also, a key assumption in the EIA is that the results... "are then further adjusted to reflect the greater need for external trading relationships within areas at a sub-national level and in smaller economies (stated in 4.11)". Is this consistent with the statement in the academic paper (note 17) that the FLQ should only be applied for national input-output tables excluding imports from abroad.

Wider Impacts

Sections 4.17 to 4.31 outline and quantify the approach to estimating the wider economic impacts of Bristol Airport. The key contributing factors are from productivity benefits arising from improved connectivity, and from inbound tourism.

A key consideration for wider economic impacts is whether there are market failures in the non-transport markets - has this been considered?

WebTAG (unit A2.1) recommends considering land use changes which can affect the types of wider economic impacts and the calculation of them and the user benefits. What assumptions have been made around land use changes?

Productivity

The approach to estimating productivity impacts from increased business opportunities (with businesses choosing to be located so as to maximise opportunities to conduct business) is based on an approach developed by Oxford Economics for TfL as part of the Airports Commission process. As outlined in 4.22, It assumes a statistical relationship between the level of business air travel and air freight within a defined study area to the total factor productivity in the economy. By this relationship a 10% increase in combined business air travel and air freight results in a 0.5% increase in productivity in the economy. Our understanding is that this relationship relates to national impacts, with local economic impacts limited by a relative paucity of robust inter-regional trade data within the UK.

Based on the Oxford Economics report, the aforementioned model was used for a new hub airport in the South East. The model used data from UK industries and service sectors and refers to the long-term productivity performance of the UK national economy. **Can York Aviation comment on the validity of applying this statistical relationship at a sub-national level?** It is notable that the existence of an Airport could make local firms more productive, but also allows firms from further afield to serve markets in the local area potentially at the expense of local firms.

York Aviation have developed an approach of using a generalised cost model to estimate the level of business travel from each of the study areas that is solely reliant on Bristol Airport. It would be helpful if more detail can be provided on the model and analytical approach taken to develop the analysis and result discussed in 4.23 and 4.24. It would also be useful to have greater detail on an explicit link between this approach and the numbers contained in Table 4.2. For example, can York Aviation show in an Appendix the generalised cost figures, the incremental business traffic attributable for the airport, the elasticity values applied, and how the incremental GVA and employment estimates have been developed?

Table 4.2 reports productivity but the number of FTE appear high – an increase in the number of FTEs would reflect other effects and not higher productivity *per se*.

The GVA numbers seem large, but then the absence of Bristol Airport could have a large effect and there *could* certainly be a large producer surplus associated with business travel.

The influence of business connectivity on business location decisions in principle is a sound one. A number of studies have shown that ease of access to markets, customers and clients is amongst the top of the list of factors that businesses consider when deciding on a business location. Access to air services is a significant element of that. Other studies have shown that proximity to an airport have had a beneficial impact on productivity. However, not enough detail is provided here to provide confidence in the scale of the values presented.

Tourism impacts

4.28 and 4.29: The economic impact of inbound tourism is estimated to be much smaller than that obtained from business productivity, and the methodology outlined, is predicated on applying an average spend per overseas visitor to the study areas and working through to an impact on GVA. A key assumption here is that overseas visitors..."will either come to the region via Bristol Airport, as the known gateway to the area, or not come at all (stated in 4.30)". This statement is not backed up with evidence and appears to be a key assumption behind the numbers in Table 4.4. It would be helpful if York Aviation supply evidence to support the statement and indeed provide more detail to relate their outlined approach to the numbers appearing in Table 4.4 more explicitly. Also, the recent weakness of sterling is mentioned here as a strong contributor to influx of visitors – are they implicitly or explicitly assuming this will continue at current levels?

In section 4.30 The report makes the point that the loss of regional economic activity through outbound tourism is a non-trivial one to estimate, making the assertion that inbound and outbound leisure trips have different levels of dependency on Bristol Airport. We would agree that this is a complex issue because of supply side effects (e.g. working more to save for a holiday). The report makes the point that inbound passengers would cease to visit the region if BA did not exist (as discussed above), whereas outbound passengers are far more likely to travel anyway from an alternative airport, and hence the loss of local expenditure is not attributable to Bristol Airport for this market. **This assertion is contentious and really does need to be supported by evidence**. On this basis our view is that the figures in Table 4.4 represent an optimistic scenario, and there is scope for them to be offset by the outbound tourism impacts (it should be borne in mind that the UK outbound tourism market is more than five times as large as the overseas market for Bristol Airport).

1.5 Economic Impact of Increasing Capacity to 12 MPPA – Chapter 5

Section 5.3: it would be helpful if Section 4 can be referenced here to show how the approach relates to employment levels mentioned in that section. What elasticities have been assumed? Are they sound in the context of aviation economic impact?

It appears that the values presented reflect an increase of 20% in the airport's activity, i.e. there are no economies of scale in airport operation and no diminishing returns. This seems unlikely to be appropriate in relation to the 'productivity' column, as one would expect the most important business trips to be undertaken already (and recent growth in UK aviation demand has been oriented towards leisure trips, and so one might expect these to be a growing proportion of Bristol Airport demand if the airport expands). However, in table 5.2 the numbers in the 'Productivity' column are circa 20% higher than in Table 5.1, and in our view the increment should be smaller.

It is worth capturing that tables 5.1 and tables 5.2 present the results of an 'accounting exercise', the first column presents the share of employment and GVA in each region *associated* directly *with* Bristol Airport, and the second column the shares *associated with* the supply chain of the airport and the expenditure of earnings from the airport and its supply chain.

Table 5.3 claims to present the economic *impact* of growth. This is different from the economic activity *associated with* the airport, because the expansion of airport will lead to a *redistribution* of activity towards the airport: they are not *'additional'*.

It is not reasonable to argue that employees working at Bristol Airport and its supply chain would be standing idle if the airport did not exist; in relation to the induced (type II) effects, households would not be earning money from the operations of the airport to cause economic activity elsewhere, but neither would households with income from other sources spend money at the airport, and some of this expenditure might move into other sectors of the economy.

Some airport employees might move from elsewhere in the country to the West of England (i.e. additional workers can come to work at or around the airport but not from the local unemployed), but it is unlikely to be all of them. One would generally expect the degree of *additionality* to *decline* as the geographic area expands (because the degree of displacement is likely to increase, e.g. if someone leaves a job in South Wales to move to Bristol to work at the Airport) but the converse is observed in the report.

The Treasury sets a high bar for these supply side effects or 'additionality':

"Multiplier effects are further economic activities which result from either labour supply or direct labour demand effects. They are likely to have limited additionality..." (Green book p39)

"In keeping with the HM Treasury Green Book guidance, the economy is assumed to operate at full employment in the long run, such that only transport investments which increase the supply of labour can increase the number of jobs at the national level. In the absence of labour supply impacts, changes in the demand for labour will lead to 100% displacement of employment at the national level; employment would be displaced from other industries or locations." (TAG unit A2.3, p3)

Are the 800 directly created jobs / 700 FTEs assumed to be incremental for the whole of the UK? **Some discussion around the robustness of additionality effects would be helpful.**

It is noted that the report is silent on the impact of Bristol Airport as a driver or facilitator of Foreign Direct investment (FDI). It could be expected to have a positive impact here and it would be helpful to get the York Aviation View on this.

The report is also silent on the possible impacts of Brexit on the scale of economic benefits that could be achieved through expansion. This is a key strategic sensitivity. Brexit scenarios are clearly a difficult area to forecast, however it would appear that conducting business with the EU will become more challenging after March 29th and it could be argued that the proportion of new trips through Bristol Airport made for business purposes is likely to be reduced as a result. **What might be the impact of this on the values contained in Tables 5.1 – 5.3**?

5.15 – Construction. It is difficult to know where construction-related employment will be sourced from but, as stated in the report, it seems reasonable to assume that compared to larger scale construction projects, a higher proportion will be from the local region. However, there may well be constraints that

dictate where labour will come from at varying stages of the build and fitout. The underlying principles need further examination/evidence.

1.6 Socio-Economic Cost Benefit Analysis – Chapter 6

This chapter outlines the approach to estimating the social benefits associated with Bristol Airport capacity increasing from 10mppa to 12mppa. The report states it has adopted the same conceptual framework as the economic elements of WebTAG. The different sources of monetised benefit are itemised (in descending order of magnitude) as follows:

- Air fare savings
- Surface access time
- Flight time savings
- Surface access cost
- Airport Company Benefits
- Government Revenue
- Construction Cost

Please confirm whether the NPVs are in real or nominal terms and the discount rate applied. Have environmental impacts been considered here? Carbon costs are briefly discussed but the report is silent about noise, air quality, or other possible environmental impacts.

In following WebTAG guidance it is not clear whether the 'rule of a half' approach has been taken in outlining these socio-economic benefits, i.e. the benefits for the additional demand (in going from 10mppa – 12mppa) should be accrued at a lower rate than for the trips that were already being made (i.e. the 10mppa). This is discussed in TAG Unit 1.3. It would be helpful if York Aviation could address this question. Specific points on individual components of socio-economic benefit are discussed below.

Air Fare Savings

In the York Aviation report over half of the socio-economic benefit from the expansion is down to air fare savings, with £832m savings in air fare costs versus using an alternative airport, though stating that this is an order of magnitude estimate. The approach to this estimate appears to be questionable, in that it assumes that those passengers switching from the Bristol Airport substitute would automatically face higher fares, the evidence being a table of average fares for domestic and short haul routes from competing airports. These average fares are likely to reflect the different proportions of business passenger usage (and business fares available) at competing airports, and the different basket of destinations served (which may on average be more expensive to fly to than those served from Bristol) and failure to adjust for these factors would lead to a substantial overestimate of this component. If fares are higher elsewhere than at Bristol and this reflects operator profits, then this lost surplus should be logged as a cost in the cost-benefit analysis.

There are further complications associated with this analysis. There are benefits to existing passengers from higher frequency services at Bristol (because they will get a flight nearer to when they want to travel) but then losses at other airports if Bristol does grow (because c.70% of demand moves away from other airports, p 58). If the airport does grow with c.1.4m passengers moving from other airports, then some passengers will travel to Bristol Airport even though they live (relatively) near another airport. It is not clear whether this impact has been taken account of in the analysis. **A response from York Aviation to these points would be helpful.**

Surface Access Time

Bristol Airport catchment data has been used to estimate the travel time to competing airports in the event that Bristol Airport capacity is capped. How have York aviation taken account of the mix of in / outbound passengers and journey purpose in this analysis? Has the market been segmented when applying VoT to convert to a generalised cost?

Flight Time Savings

It is difficult to see how this component is a plausible contributor to social-economic benefits arising from limits on Bristol Airport expansion. The rationale is that some passengers will face an interchange if their intended destination is not served directly by the substitute airport. However, some may travel to/from nearby airports, and the mix of destinations served by other airports might change if they carry additional passenger traffic displaced from a counterfactual larger Bristol Airport. **Can York Aviation provide examples of destinations where passengers have to travel via a hub airport to reach their destination as a result of no direct flights being available from alternative airports?**

Airport Company Benefits

Is this the increase in BAL profits from increasing from 10mppa to 12mppa? Can you provide more detail on how this component is estimated?

Construction Costs

How have these been derived?

1.7 Regeneration and Social Impacts – Chapter 7

This chapter discusses the potential impact of Bristol Airport expansion on job creation in areas of deprivation, with particular reference to those in Weston Super Mare and South Bristol. Our understanding (section 7.3) is that the new job creation assumes the same distribution of residency as those currently employed at the airport. **Can York Aviation confirm whether this is the case?**

The 190 new direct jobs created in these two areas is consistent with the total direct jobs attributable to the airport capacity expansion, i.e. 800 direct on-site jobs overall shown in the York Aviation report, Table 5.3.

The report is silent on the types of jobs these will be – it will be helpful if York Aviation elaborate on this point.

Has consideration been given to whether the requisite skill-sets in these areas will be sufficient to fill the newly created roles?

Section 7.6 – this section could do with expanding to show what active steps BIL has taken to develop and retain talent, and to attract new employees. The section touches on these areas, but more concrete examples of initiatives would strengthen the section.

1.8 Conclusions

The Bristol Airport EIA relates to the proposed expansion of Bristol Airport to accommodate 12m passengers per annum. Or review of the EIA has focused on Chapters 4 – 7, the chapters that discuss the approach and quantify the different sources of economic benefit. In summary, our review has found that:

- Chapter 4: We find that the approach to estimating the current economic "footprint" is broadly sound, with indirect and induced multipliers of a magnitude that is in line with those from other studies. However, we raise some specific questions around quantification of benefits, and suggest more detail to help link the discussed approach with the quantified values.
- Chapter 5: We are concerned about the claims around causality, with the assumption that the increased activity associated with airport is entirely *additional* without supporting evidence when the Treasury's recommended default assumption is that evidence should be provided. Some discussion of the impact of airport expansion on Foreign Direct Investment, and of the impacts of Brexit on incremental benefits would be helpful.
- Chapter 6: we raise questions around the scale of some of the components of socio-economic benefits, particularly those relating to air fare savings.
- Chapter 7: more detail could be provided on what sort of jobs will be created, and how the skill-sets in the identified areas of deprivation will match the requirements of the new jobs.

References

PWC: Local Economy Literature Review for Airports Commission (2014)

Oxford Economics: Impacts on the UK economy through the provision of international connectivity (2013).

InterVISTAS: Economic Growth at European Airports (2015)