

The economic impact of an expanded Gatwick Airport: Consultation response

Consultation submission | Dr Alex Chapman and Marc Postle | November 2021

Summary

The New Economics Foundation (NEF) were commissioned by the Gatwick Area Conservation Campaign (GACC) to provide an initial high-level commentary on the economic components of the consultation documents published by the Airport ahead of a prospective application for a Development Consent Order from the Planning Inspectorate. This analysis is not exhaustive, and we have not undertaken to assess all of the relevant economic methods which have been applied by Gatwick Airport and their economics consultants Oxera. This analysis should be seen as a guide to some of the more significant economic issues to be considered when appraising the proposed airport expansion. The consultation points raised by NEF are summarised in table form below.

NEF identify a number of material concerns with the economic case put forward by Oxera on behalf of the airport. Perhaps the most significant of these is the Airport's presentation of the monetary costs of the greenhouse gas emissions resulting from the proposed scheme. NEF analysis suggests if government guidance had been followed accurately and up-to-date inputs used, the overall net present value of emissions would change from -£2bn to at least -£13bn. Under current policy, this cost would be incurred by the state and wider society, with material ramifications for the scheme's overall benefit-cost profile.

The second issue we identify relates to the Airport's assumptions around future growth in business air travel. While it is not clearly stated in Oxera's report, there appears to be an assumption that a large number of new business trips would be created by the airport expansion, as opposed to business passengers simply switching their chosen airport. Indeed, the economic case is heavily dependent on this development. This assumption does not seem credible in light of recent sector trends and global events, as demonstrated in evidence we present herein. The economic appraisal should be revised, more transparency provided, and a much more cautious business travel assumption tested.

The reliance of the Airport's business case on business passenger benefits is underscored by the weak case put forward by Oxera in a number of other domains. For instance, Oxera

recognise that the expansion is highly unlikely to generate any national-level employment gains, or any net gain in tax revenue. Oxera struggle to quantify significant benefits in the areas of foreign direct investment and productivity. Perhaps most concerningly, analysis of the tourism impacts of the proposed scheme is entirely absent. Once quantified, tourism impacts are likely to be highly negative due to Gatwick's status as an airport predominantly serving UK residents and facilitating overseas spending via international tourism.

The proposed expansion is likely to result in relocation of jobs, spending, and business from wider areas to the vicinity of the airport. No economic assessment of the distributional implications of this displacement in terms of individual wellbeing has been conducted. Given the relative affluence of the majority of authorities in the vicinity of the airport, and the government's strategic levelling-up agenda, this issue is in need of deeper consideration.

Through our assessment we identify a number of areas where further data, explanation, or evidence is required in order for Gatwick's appraisal to be adequately assessed. Until this required detail is provided it is not possible to make a complete re-assessment of the project's benefit-cost profile and net present value to society. However, we can say with some certainty that the true value is significantly lower than that presented, and it is likely that the final re-modelled value range will include negative values.

Summary of consultation comments

No.	Comment
1	Gatwick Airport should test the economic impact of an alternative scenario in which the pandemic has a more significant lasting impact on air travel than has been explored in the presented scenarios.
2	Following the pandemic, there can be no confidence in claims that there will be any net growth in business air passenger travel as a result of this project. Gatwick Airport's central forecast scenario should assume zero growth at the national level.
3	Gatwick Airport have not, and likely cannot, substantiate their position that this expansion will materially change future business travel behaviours or underlying demand when compared with the baseline scenario.
4	Gatwick Airport should clarify the level, passenger type, and locations of any air traffic and air passenger displacement which takes place as a result of the proposed expansion.
5	Oxera should disaggregate the sources of their consumer benefits and producer costs.

6	Oxera should justify their apparent assumption of growth in business passenger numbers in the economic impact assessment, particularly in light of recent sector trends and pandemic impacts.
7	Oxera should present appropriate Other Cost estimates without Shadow Costs, disaggregating by flight type and passenger categories where able.
8	A quantitative assessment of the net impact of the scheme on flows of tourism spending in the UK should be provided, and the implications discussed.
9	Out of date carbon values have been used. The analysis should be repeated with the correct values.
10	The carbon costs calculation should be re-run using annual emissions timeseries forecasts as inputs for every year for which there are available data, rather than linear interpolation between years. Any emissions which have been excluded without explanation should be justified.
11	The value of non-CO ₂ climate impacts should be quantified and shown alongside the carbon costs.
12	The value of the emissions resulting from inbound air traffic movements should be quantified and presented in the economic analysis.
13	The monetised value of the emissions resulting from the scheme is significantly higher than presented by Oxera, across all scenarios, emissions categories, and sensitivities. The net present value of the scheme is significantly lower than presented by Oxera.
14	Oxera do not expect there to be any material benefit to employment at the national level resulting from the project. Gatwick Airport should ensure their wider documentation and communications relating to the expansion reflect this insight.
15	Oxera should clarify whether their method for calculating local/regional catalytic employment impacts evidences a causal link between air travel growth and employment growth.
16	Oxera should clarify whether their method for calculating catalytic employment impacts takes account of saturation of the UK travel market and other emerging trends, and explain whether the method applied remains appropriate for application in 2021.
17	Oxera should present a more balanced picture of the evidence relating to the causal link between air transport and employment, including citing recent studies which either show no causation, or failed to identify a causal link.

18	Oxera should present uncertainty ranges alongside their catalytic job forecasts.
19	A distributional impact assessment should be conducted to assess the relative value of the jobs lost and gained to those people experiencing the change.
20	Oxera should provide a more complete economic narrative for their inclusion of imperfectly competitive market benefit and, given the magnitude of the change, should produce supplementary economic modelling to substantiate the multiplier result.
21	Oxera recognise that their estimates of increased Air Passenger Duty receipts do not reflect the project's net impact on government revenues as the project may also result in reduced tax take in other areas of the economy. Government revenue benefits should be removed from Table 4.17 and any similar subsequent presentations.
22	A corrected and updated scheme benefit-cost assessment could well point towards a scheme with negative net present value to society. At present, the proposed expansion represents an unattractive proposition from a public interest perspective.

Introduction

The New Economics Foundaton (NEF) were commissioned by the Gatwick Area Conservation Campaign (GACC) to provide an initial high-level commentary on the economic components of the consultation documents published by the Airport ahead of a prospective application for a Development Consent Order from the Planning Inspectorate. This primarily constitutes the Preliminary Environmental Information Report (PEIR) and the Economics Impact Assessment (EcIA). This analysis is not exhaustive, and we have not undertaken to assess all of the relevant economic methods which have been applied by Gatwick Airport and their economics consultants Oxera. This analysis should be seen as a guide to some of the more significant economic issues to be considered when appraising the proposed airport expansion.

Forecasts

Air traffic forecasts are a key input to the economic modelling. Forecasts affect the negative side of the benefit-cost assessment, for example through the assumed future quantity of air traffic movements and therefore the level of additional noise, air quality, and greenhouse gas emissions, all of which have negative monetary value in economic appraisal. Forecasts also determine the number of passengers which are assumed to move through the airport in future years, hence impacting on the need for workers and the arrival of new jobs to the area. Forecasting and economic appraisal have a dynamic relationship, with economic factors, such as economic growth and taxation policy, reflecting back on relative levels of demand for aviation.

The applicant recognises that their main forecasts are optimistic in regard to future passenger numbers. This is in part because Gatwick Airport have assumed that the 3rd runway at Heathrow Airport will not go ahead, and therefore there will be less competition for the available pool of passengers.¹ The Airport assumes a 13 million passenger increase from 2032 onwards will result from the expansion. Built into this forecast is an assumption that passenger numbers will recover from the Covid-19 pandemic by 2024/25 and will have caught up with pre-pandemic forecasts by 2028. By the time the expansion is at full capacity in 2032, the pandemic will have no material impact on passenger numbers. It is not made clear whether the forecasts include any specific covid-related impacts on the sub-group of passengers flying for business purposes.

¹ Gatwick Airport (2021) Preliminary Environmental Information Report Appendix 4.3.1: Forecast Databook.

It is worth noting that the Department for Transport seemed to suggest a different view regarding the impacts of the pandemic when it stated in the recent Jet Zero Consultation Evidence and Analysis document:²

“Our scenarios are based on 2017 DfT forecasts of passenger demand and therefore do not take into account the impact of COVID-19 on aviation demand. To address the short-term fall in emissions, an uncertainty band has been added to the graphs covering 2020-2024. However, it is likely that the impacts of COVID-19 on passenger behaviour and demand will continue to be felt long after this. For example, Waypoint 2050 estimates that long-term global air traffic forecasts could be around 16% lower in 2050 than previously predicted” (p.10)

Oxera also test a sensitivity scenario with different passenger demand growth rates. Oxera model a scenario in which passenger demand reaches the level it achieves in the core scenario in 2047 five years later, and calculate back from this point to arrive at slower relative growth rates. However, as Oxera also apply this process to the baseline traffic forecasts, the impact this has on the ‘uplift’ in passenger numbers resulting from the proposed expansion project is very limited. For example, instead of increasing by 13 million in 2032, passenger numbers appear to increase by around 11 million in the sensitivity scenario. Sensitivity analysis should be used to test plausible futures with more material impacts on future demand growth.

Consultation comment 1: Gatwick Airport should test the economic impact of an alternative scenario in which the pandemic has a more significant lasting impact on air travel than has been explored in the presented scenarios.

While it is important to have robust forecasts of future passenger growth, particularly when determining whether there is need for a proposed expansion, the precise number of future passengers at a particular airport can become a distraction when conducting economic appraisal. As both the positive and negative impacts of airport expansion typically rise and fall in proportion with air traffic movements and passenger numbers, the precise number of passengers can in fact be of lesser relevance. What matters most is the relative merit of each additional passenger, and whether the societal benefits of their flight outweigh the costs. As a result, where forecasts do become of critical importance to the economic appraisal is when determining what proportion of passengers are *new* travellers (as opposed to passengers who would otherwise have flown from another airport) and what *type* of passenger will be using the airport in future (e.g. business or leisure).

² DfT (2021) Jet Zero Consultation: Evidence and Analysis. July 2021. Department for Transport.

Business passenger forecasts

While business passengers make up only a small minority of overall departures in the UK, and typically less than 15% of passenger departures at Gatwick Airport, the benefits which are claimed to accrue from business passenger departures are often critical to the overall case for airport expansion. Take for example Table 4.9 of Oxera's assessment,³ this summarises the total benefits to users of the proposed scheme under different price floor assumptions. In these scenarios between 65% and 75% of all of the scheme's user benefits accrue from business passengers, these figures carry all the way through the appraisal and are implicit in Table 4.27 (p.73), which presents the claimed national net present value of the scheme.

Given the critical importance of benefits accruing to business passengers for the Airport's expansion case, it is vital to interrogate both the forecasts which underpin claims around future business passenger demand, and the method through which additional business passengers are converted into benefit (or net present value).

In relation to the applicant's forecasts of future business passengers at the airport, there is text stating that Gatwick's forecasts assume a consistent proportion throughout the forecast, at "around 15%".⁴ However, the data tables show this is not actually precisely correct. In fact, around 11-12% of the new passengers generated by the expansion are projected to be flying for business, and the airport's total proportion of business passengers is projected to remain at around 13% throughout the period. In absolute terms, the airport expansion is projected to increase business passenger numbers by around 1.5 million from 2032 onwards.

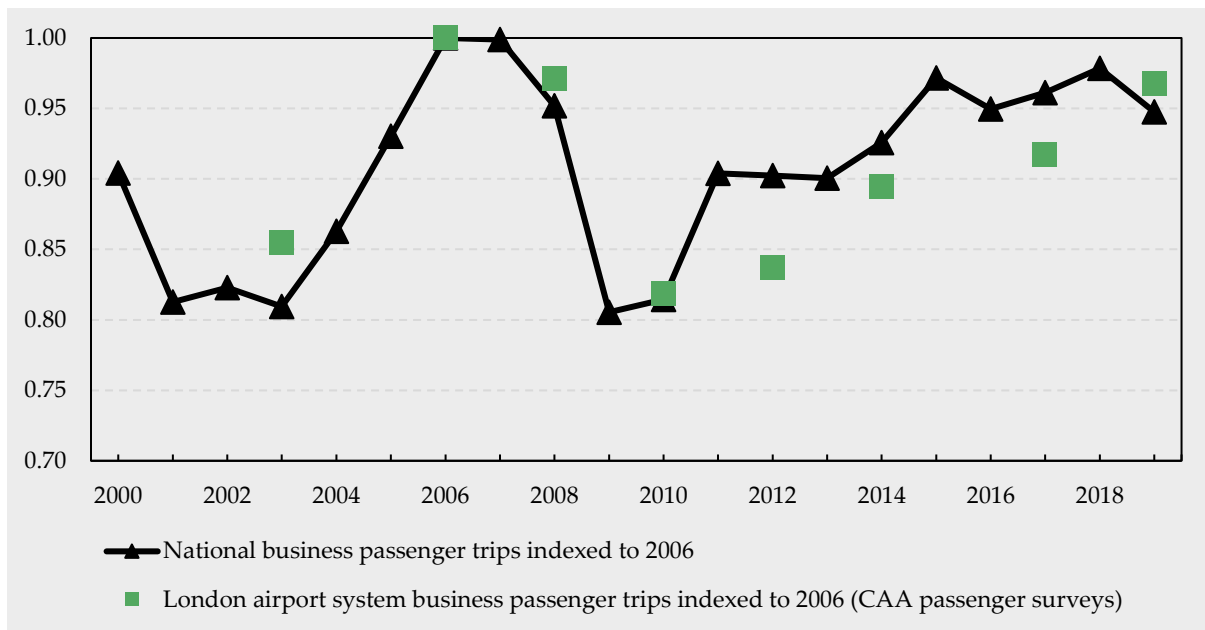
It is not explicitly stated by Gatwick Airport or Oxera whether the new business passengers projected at the airport are entirely new travellers, or travellers displaced from other airports. A large collection of recent evidence points towards the potential stagnation or even decline of business use of air travel over the medium to long-term. Government data shown in Figure 1 highlights that business air travel in the UK, in absolute numbers, has never recovered from its peak in 2006, a point also highlighted recently by McKinsey.⁵

³ P.45 Oxera (2021) Economic impact of the northern runway project. Gatwick Airport.

⁴ Page 11. Gatwick Airport (2021) Preliminary Environmental Information Report Appendix 4.3.1: Forecast Databook.

⁵ <https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/back-to-the-future-airline-sector-poised-for-change-post-covid-19>

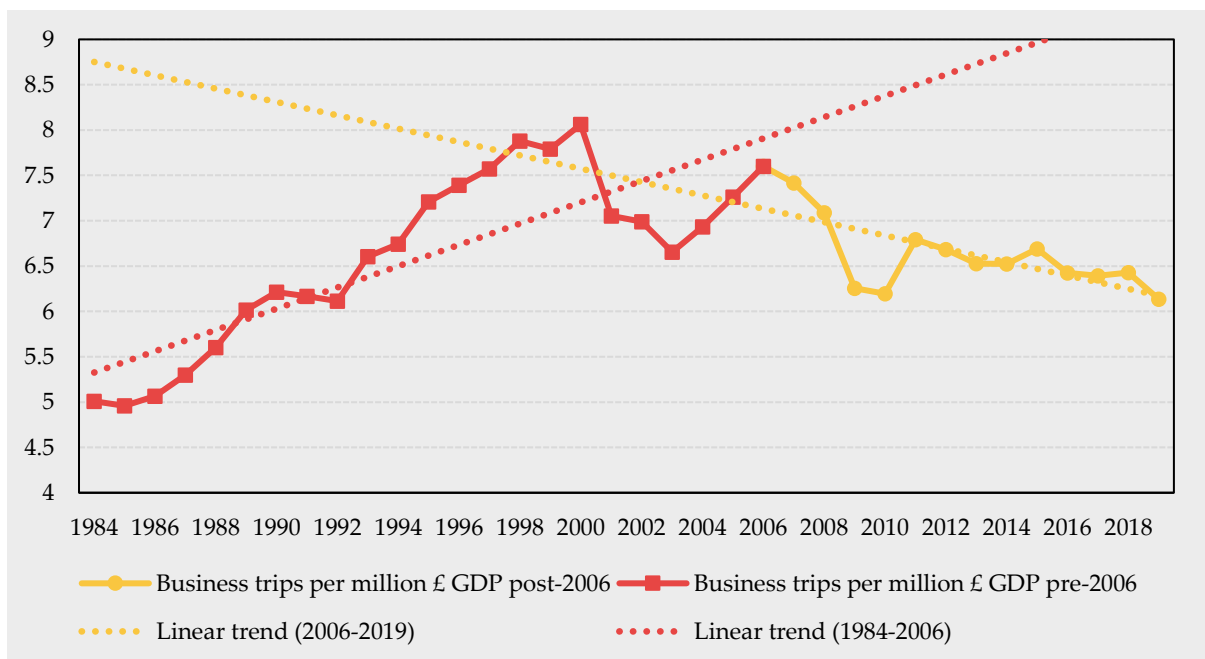
Figure 1: Business passenger numbers at the national and London-Airport System levels indexed to 2006.



Source: *Travelpac, Office for National Statistics, and Civil Aviation Authority*

These numbers can be combined with data on the UK gross domestic product as shown in Figure 2. This highlights the relative ‘business aviation intensity’ of the UK economy. The relationship between business air travel and national economic output appears to break somewhere between 2000 and 2006. Post-2006, a clear trend emerges of declining business use of air travel relative to GDP.

Figure 2: Trends in the number of business passenger air trips per million (£) UK GDP



Source: *GDP monthly estimates and Travelpac, Office for National Statistics*

Also visible in Figure 2 is the impact of major crises on aviation use of business travel. Very significant drops are seen after the September 11th attacks in 2001 and the financial crisis of 2007/08. The 2020/21 pandemic is likely to have a similar impact in driving down business use of air travel. Indeed, there is an argument that the pandemic has had features which will put unprecedented downward pressure on business use of air travel.

Many sources suggest remote working is here to stay.^{6 7 8} Airline executives, such as at Star Alliance,⁹ Delta,¹⁰ and Lufthansa¹¹ have stated their expectation that the business travel market segment will shrink permanently by between 10% and 30%. Aviation sector consultancy IdeaWorks have released a report projecting a 19% to 36% decline in the size of the business air travel segment.¹² Furthermore, a report by McKinsey reviewing the vulnerability of the business air travel sectors of different developed nations suggests the UK's sector is the most vulnerable of all 10 nations assessed, with only 23% of the UK's business travel market categorised in its 'early rebounders' group, and 49% in the 'longer-term disrupted' group.¹³ The decline in business use of air travel is expected to come as a result of a rethink of business priorities, including initiatives to reduce carbon emissions, and shifts to online communication tools. A survey by Bloomberg recently suggested 84% of global large businesses are planning to cut back their use of air travel post-pandemic.¹⁴ Another survey by Deloitte suggested as many as 80% of businesses now have plans to

⁶ The Wall Street Journal (2020), Remote Work is Here to Stay. Bosses Better Adjust. Available at: <https://www.wsj.com/articles/remote-work-is-here-to-stay-bosses-better-adjust-11596395367>

⁷ Institute of Directors (2020) Home-working is here to stay, new IoD figures suggest. Available at: <https://www.iod.com/news-campaigns/news/articles/Home-working-here-to-stay-new-IoD-figures-suggest>

⁸ McKinsey & Company (2020) What's next for remote work. Available at: <https://www.mckinsey.com/featured-insights/future-of-work/whats-next-for-remote-work-an-analysis-of-2000-tasks-800-jobs-and-nine-countries>

⁹ <https://www.ft.com/content/867a5342-c94c-43f6-9783-a817443c9471>

¹⁰ <https://www.wsj.com/articles/covid-19-pandemics-impact-on-business-travel-hitting-local-economies-11610879401>

¹¹ <https://www.flightglobal.com/strategy/lufthansa-chief-says-fleet-and-failures-can-offset-corporate-travel-slump/142730.article>

¹² IdeaWorks (2020) The Journey Ahead: How the pandemic and technology will change airline business travel. December 2020

¹³ McKinsey and Company (2020) For corporate travel, a long recovery ahead. August 2020. URL: <https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/for-corporate-travel-a-long-recovery-ahead#>

¹⁴ <https://www.bloomberg.com/news/features/2021-08-31/will-business-travel-come-back-data-show-air-hotel-travel-forever-changed>

commit to reducing their environmental impact, and that reducing flight frequency may well represent low-hanging fruit in achieving this aim.¹⁵

Consultation comment 2: Following the pandemic, there can be no confidence in claims that there will be any net growth in business air passenger travel as a result of this project. Gatwick Airport's central forecast scenario should assume zero growth at the national level.

In his evidence to the 2021 inquiry into the expansion of Bristol Airport, John Siraut, Director of Economics and Global Technical Lead for Transport Economics at Jacobs, stated, in relation to the development of new business productivity as a result of the expansion of Bristol Airport:

"My balanced view is that an economic assessment would assume that the marginal productivity benefits from expansion are effectively zero. There is no guarantee that additional business destinations will be available in 2030 or that businesses will not be able to successfully undertake their activities on-line in future."

That conclusion is predicated on the fact that the elasticity of business demand is known to be less elastic than leisure. This implies that if there *were* to be increased business demand for air travel in future, this demand would displace leisure demand at constrained airports. As such, in both the baseline and development scenarios, business demand would be satisfied. In this context, there is no marginal benefit to expansion.

It isn't impossible for there to be additional business passenger growth. It requires that there be sufficient need within the business economy, and a development or change that provides something genuinely new. Gatwick Airport have not adequately evidenced their position in either of these areas and, given trends in the business travel market over the past decade, and the impact of the pandemic, it is difficult to see how such a position could be substantiated.

Consultation comment 3: Gatwick Airport have not, and likely cannot, substantiate their position that this expansion will materially change future business travel behaviours or underlying demand when compared with the baseline scenario.

¹⁵ <https://www.ainonline.com/aviation-news/air-transport/2021-08-03/deloitte-predicts-cautious-recovery-business-air-travel>

Displacement

Both Gatwick Airport's forecasting document, and Oxera's economic assessment are somewhat opaque in their approach to displacement. As far as NEF could discern, at no point is it made explicitly clear what proportion of the new passengers which are forecast to use Gatwick Airport under the expansion scenario are actually new and additional at the national level.

Information presented in Chapter 15 of the PEIR on climate change would seem to suggest the applicant is expecting net zero displacement of air traffic, as emissions are presented as additional, at least at the UK level. Oxera's modelling on Air Passenger Duty also seems to suggest most passengers will be new travellers, though these numbers do seem somewhat low if all 13m passengers using the expanded airport were new travellers. The absence of any valuation of journey time changes transferring to/from the airport in Oxera's economic assessment also points to a zero-displacement conclusion. However, we could not find this clearly stated in Gatwick's documentation.

Other statements in the PEIR suggest displacement is expected, however, for example in the justification presented for excluding Heathrow R3. Here Gatwick Airport claims that "*traffic levels at Gatwick would be likely to decline in the period immediately following the opening of R3*".¹⁶ This suggests that Gatwick Airport and Oxera believe that displacement would be substantial within the London Airport System if Heathrow were to provide additional capacity.

In the event that net passenger numbers are additional at the national level, it remains important for Gatwick Airport to set out their assumptions around business passenger displacement. In the unlikely scenario that the overall increase in net passenger numbers of 13 million is additional at the national level, it would remain plausible that the business passenger component of that growth would not be additional. This could occur for example, if business passengers shifted away from Heathrow and Luton Airports but were backfilled at those airports by new leisure passengers.

Both the PEIR and economic assessments focus on passengers at the London Airport system level. Figure 4.3 of Oxera's assessment would appear to show that Gatwick Airport's growth forecasts do not result in any net displacement in absolute passenger numbers from other London airports. Somewhat confusingly, however, footnote 87 of Oxera's assessment would seem to suggest that displacement of passengers *is* expected, stating:

¹⁶ Page 2. Gatwick Airport (2021) Preliminary Environmental Information Report Appendix 4.3.1: Forecast Databook.

“With the Project, only an increase in the revenue of Gatwick Airport is expected. However, some of this increase may be due to switching passengers. The total increase in revenue of the whole system would therefore be less.” (p.42)

In addition, we could not locate any information regarding net changes in business passengers at the London Airport System Level. As such, we have an unresolved issue as to the extent of air travel displacement resulting from the proposed expansion.

Consultation comment 4: Gatwick Airport should clarify the level, passenger type, and locations of any air traffic and air passenger displacement which takes place as a result of the proposed expansion.

In regard to economic impacts, Oxera are up front that the majority of the economic impacts seen at Gatwick Airport as a result of the expansion will be displaced activity, rather than new activity. Although here, we are referring not just to displaced air travel, but to economic activity displaced within the economy more broadly, for example consumer spending displaced from other domestic leisure industries to aviation and international tourism.

Oxera state:

“these direct, indirect and catalytic impacts are known as the ‘footprint’ of Gatwick Airport. While much of this might be displaced from other parts of the UK or other employment within the local area, the impact on the local economy would be significant.” (p.4)

As a result of this, Oxera do not expect there to be any national improvements in employment resulting from the scheme:

“We therefore do not expect the Project to have material supply-side employment effects that would generate employment impacts at a national level” (p.52)

Oxera also suggest there is insufficient evidence to claim there will be any additional tax receipts at the national level resulting from the project, stating:

“Such effects will be additional to the benefits quantified in this appraisal only if they do not displace other taxable spending in the UK. We do not quantify these benefits in the absence of evidence on how passengers’ transport choices would change with the Project” (p.56)

Benefits to business passengers

Benefits to business travellers are calculated using a ‘consumer surplus’ methodology, broadly as recommended by the Department for Transport in its Transport Analysis Guidance. In Table 4.6 Oxera set out their estimates of average fare levels under the baseline and project scenarios. The project is expected to significantly reduce flight ticket prices, notably long-haul flight ticket prices which fall from an average of £594 to £505 in the year

2038. This dramatic decline is likely a key driving force behind the large user benefits presented in the national economic impact assessment.

Our understanding of the consumer/producer surplus modelling approach utilised is that no net present value can be generated from pre-existing passengers, simply welfare transfers between airlines and passengers. While the distribution of costs and benefits may re-balance between producer and consumer with a change in ticket price, the net surplus remains unchanged.

In notes on page 46 it is identified that *“Business and leisure passenger benefits are sums of benefits to existing and new passengers in each market”*. This decision obscures the source of the large net present value claimed in the form of consumer surplus. (£11.3bn in the central scenario).

Consultation comment 5: Oxera should disaggregate the sources of their consumer benefits and producer costs.

In the EcIA and the PEIR the proportion of new business passengers at Gatwick Airport that are new to the London Airport System or the UK as a whole has not been set out clearly. Some proportion of the 1.5 million new business passengers at Gatwick Airport are likely simply displaced from another airport. Without this information we cannot identify the proportion of the consumer surplus which is being generated from the business passenger market segment. Our assessment of the data that is presented, including Oxera’s various sensitivity scenarios, is that a number of business passengers, potentially in the hundreds of thousands, are indeed assumed to newly travel as a result of the expansion. If true, this assumption seems very difficult to justify given the evidence presented above on trends in the business traveller market.

Consultation comment 6: Oxera should justify their apparent assumption of growth in business passenger numbers in the economic impact assessment, particularly in light of recent sector trends and pandemic impacts.

Costs to airlines

Determining the costs to airlines is a key step in the passenger welfare calculation. The airline costs set a floor on the extent to which shadow costs can be transferred between passengers and airlines, as well as the possible welfare benefit that new passengers can unlock.¹⁷ Typically, for there to be a welfare benefit to passengers from expansion, there

¹⁷ DfT (2018) TAG Unit 5.2: Aviation Appraisal. Department for Transport

must be scope for aviation businesses to reduce prices. This is only possible if aviation businesses have scope to reduce their prices without hitting the implicit limit of their fixed and other costs.

It is worth noting the contrast between Oxera's definition of other airline costs and that of the DfT, from whom they derive their proportions. The DfT describe the Other Costs:

*"These are mainly aeronautical charges, fleet, labour and sales and administration costs."*¹⁸

The Aviation Forecasts go on to provide estimates of the Other Costs in pence per passenger kilometre as well as a forecast of the evolution of this cost type between 2016 and 2050.

Oxera, however, describe Other Costs on page 36 in a similar, yet methodologically distinct manner which has significant implications for further modelling, as *"all fare elements not attributed to fuel, carbon and APD"*. Including the Shadow Costs in this broader definition allows for an assumption that there is substantial flexibility in this portion of fares, (i.e. significant scope to reduce prices) particularly across different passenger types that are exposed to different values of Other Costs. The approach used of running sensitivity analyses that Other Costs can't be reduced below 25%, 50%, or 75%, makes an assumption that all types of flight are equally exposed to Other Cost, which is not true, and also makes an assumption that airlines have significant available slack in which they can cut costs such as aeronautical charges (over which they have no control), fleet costs, labour costs, and sales costs – all of which have been areas where airlines have concentrated substantial cost cutting over the last decades. While there may be additional slack in some of these categories it seems unlikely that there is as much as slack in the key category of business passengers.

Consultation comment 7: Oxera should present appropriate Other Cost estimates without Shadow Costs, disaggregating by flight type and passenger categories where able.

Tourism impacts

No assessment of the economic impacts of change in the tourism economy resulting from the proposed expansion has been conducted by Gatwick Airport or Oxera. Footnote 138 of Oxera's report states: *"We are considering whether further analysis on this aspect could be conducted for inclusion in the Economic Impact Report submitted in support of the Environmental Statement."*

The main function of Gatwick Airport is to move UK residents overseas on their international leisure trips. In 2019 58% of all terminating passengers were travelling for this

¹⁸ DfT (2017) UK Aviation Forecasts. Department for Transport

purpose. Just 22% of passengers were foreign residents on leisure trips to the UK, and fewer still were flying domestically for business purposes. The point of appraisal is to assess the relative size of material impacts of a scheme, both positive and negative. While it is true that the quantitative measurement of tourism impacts has some nuance to it, it is highly irregular that the impacts of the main function of the proposed scheme are limited to a welfare assessment of leisure passengers. The impacts of transferring a significant chunk of spending out of the UK economy and into overseas destinations is not considered, nor is the impact of the expansion on the domestic tourism sector quantitatively considered. Our position is that this contravenes guidance in both the Treasury's Green Book and the Department for Transport's Transport Analysis Guidance. The Green Book states, for example:

"When considering proposals from a UK perspective the relevant values are viewed from the perspective of UK society as a whole... The relevant costs and benefits which may arise from an intervention should be valued and included in Social CBA unless it is not proportionate to do so. The priority costs and benefits to quantify are those likely to be decisive in determining the differences between alternative options." (Green Book, 5.7)

The main function of the airport as a piece of transport infrastructure must be recognised as 'decisive' in determining the differences between the two options (project or no project). The balance between outbound and inbound tourism, and the material negative economic impacts of outbound tourism are in fact critical to appraising a scheme. This is reflected in the 2018 report provided to the DfT by Peak Economics which looks at regional connectivity. Albeit referring specifically to the question of regional airport expansion, Peak Economics set the following question as one of three principle diagnostic tests of the wider economic impact of an airport appraisal:

"Is it likely to generate net positive tourism to the region (i.e. the increase in tourism to the region more than compensates for any increase in outbound tourism)?"¹⁹

An additional consideration is the role Gatwick Airport plays in the UK's national tourism strategy. It is important to note that lower levels of outbound tourism and consequent reductions in spending overseas (as resulting in the baseline, no project scenario) would be well aligned with the government's objectives for UK tourism at-large. Since 2011 the UK has had a clear strategy in favour of incentivising uptake of domestic tourism by UK

¹⁹ Peak Economics (2018) Wider Economic Impacts of Regional Air Connectivity. Report to the Department for Transport.

residents. Indeed, the DCMS 2011 Tourism Strategy explicitly states a desire to balance the proportion of inbound and outbound international tourists.²⁰

“we must create an underlying trend of rebalancing this area of the visitor economy. There will be big variations from year to year but, over time, our goal should be to persuade more of us to holiday at home. In measurable terms we should increase the proportion of UK residents who holiday in the UK to match those who holiday abroad each year”(p.16)

This sentiment is matched in more recent government policy documents. The UK Government’s 2021 Tourism Recovery Plan²¹ has a key focus on improving the competitiveness of domestic tourism against outbound international tourism, stating its objective:

“Whilst leisure travel and overnight stays in self-contained accommodation have been permitted in England since 12 April, the return to outbound tourism was not permitted until 17 May and various restrictions on overseas travel remain in place even now. The UK government wants to embrace this opportunity by boosting domestic demand, making domestic stays attractive and marketing the UK’s assets...

Whilst the outbound travel market will thankfully return as people start to book their holidays overseas, the government also wants to embed domestic travel as a sustained customer behaviour – ensuring not only that people enjoy the Great British Summer in 2021 but that people who take domestic trips across the UK this year do so again and again in years to come” (p.33)

Given the importance of these objectives in UK Government policy, a holistic assessment of the impacts of expanding Gatwick Airport would quantitatively assess the relative impacts of changes in both inbound and outbound tourist trips on the UK’s tourism economy and balance of trade and analyse these against the government’s tourism policies, in addition to calculating the welfare changes of leisure passengers.

Consultation comment 8: A quantitative assessment of the net impact of the scheme on flows of tourism spending in the UK should be provided, and the implications discussed.

Environmental impacts

Three environmental impacts are monetised by Oxera in their assessment, noise, air quality, and climate change. At this stage we have not checked or reproduced Oxera’s calculations under noise and air quality. We note that these impacts, while of great significance to local communities, hold a proportionately low economic value when assessed against

²⁰ DCMS (2011) Government Tourism Policy. Department for Culture, Media, and Sport

²¹ DCMS (2021) The Tourism Recovery Plan. Department for Digital, Culture, Media & Sport.

Department for Transport guidelines and hence may have little impact on the overall benefit-cost profile of the scheme. It is important to note however, that the science in this area, particularly in relation to air quality impacts, is still developing and there is scope for impacts to be of a much more significant magnitude than those presented. Oxera present a 'high' impact sensitivity test on air quality which estimates the societal cost of the expansion at -£423.2m, a level which would be material to the consideration of the overall scheme's economic profile, particularly considering a planning balance at a local level.

Greenhouse gas emissions

Oxera have presented an estimate of the monetised value of the greenhouse gas emissions resulting from the project. NEF's assessment is that this value is incorrect, the method used is flawed and the input values used are out-of-date. It is also the case that international emissions (i.e. inbound flights) and non-CO₂ emissions from aviation have been omitted in apparent contradiction of government guidance.

Oxera's estimates of the cost of emissions is calculated using the Department for Business Energy and Industrial Strategy's (BEIS) old set of carbon values for appraisal. These were updated in September 2021 to reflect the UK's adoption of a 2050 net zero target.²² Use of the correct carbon values for appraisal will significantly increase the net present value of carbon costs.

Consultation comment 9: Out of date carbon values have been used. The analysis should be repeated with the correct values.

Oxera's central estimate of the net present value of emissions is £2bn. In order to verify Oxera's method NEF first attempted to replicate Oxera's calculation using the old carbon values, including using DfT prices from 2019 rather than the BEIS prices updated in 2020. We were unable to do so, and found that Oxera appear to have significantly understated the carbon costs of the scheme even when utilising the same out-of-date inputs. NEF's like-for-like assessment produced a central net present emissions value of £4.1bn in 2010 market prices.

We were able to identify the source of around £800m of the £2.1bn variance between the two estimates as a result of a weakness in Oxera's method. Oxera state in footnote 168 that they used linear interpolation between emissions estimates in the years 2018, 2029 and 2038. This choice will result in a significant understatement of emissions. As shown in Table 10.1.1 of Appendix 15.4.1 of the Preliminary Environmental Information Report, emissions do not

²² BEIS (2021) Valuation of greenhouse gas emissions: for policy appraisal and evaluation. Department for Business, Energy and Industrial Strategy

develop in a linear fashion. Indeed, peak scheme emissions are hit in 2032 and reduce slightly by 2038. As Gatwick Airport have access to fully annualised emissions data, it is unclear why Oxera conducted their modelling on such a limited set of data points. As the impact of this decision is so significant new modelling should urgently be presented. NEF were not able to explain the remaining £1.3bn variance between the like-for-like test. Either Oxera have made an error in their calculations, in their presentation, or there is a factor affecting the calculation which is not adequately explained in the report text.

Consultation comment 10: The carbon costs calculation should be re-run using annual emissions timeseries forecasts as inputs for every year for which there are available data, rather than linear interpolation between years. Any emissions which have been excluded without explanation should be justified.

Oxera's estimates of the scheme's emissions costs omit the non-CO₂ effects of air travel on the climate (also referred to as its impact on radiative forcing). Guidance released by BEIS in July 2021 advises that, where possible, the non-CO₂ effects should be quantified, stating:

"Where appropriate, proportionate and possible to identify the impact of the proposal on emissions overseas or that occur outside the target framework (e.g. radiative forcing from aviation), the change in emissions overseas should be valued..."²³

In this case it is eminently possible to value the non-CO₂ effects of air travel via application of a 1.9 times multiplier recommended by BEIS in its guidance on company greenhouse gas reporting.²⁴ The Department for Transport recommend this multiplier be applied as a sensitivity test in their Transport Analysis Guidance.²⁵ It is worth noting that recent research cited by the European Commission has highlighted the potential that a significantly higher multiplier nearer 3.0 may be appropriate.²⁶

Consultation comment 11: The value of non-CO₂ climate impacts should be quantified and shown alongside the carbon costs.

²³ BEIS, July 2021, Valuation of Energy Use and Greenhouse Gas. Department for Business, Energy and Industrial Strategy

²⁴ BEIS (2021) Greenhouse gas reporting: Conversion factors 2021: methodology. Department for Business, Energy and Industrial Strategy

²⁵ DfT (2018) TAG Unit 5.2: Aviation Appraisal. Department for Transport

²⁶ European Commission (2020) Report from the Commission to the European Parliament and the Council: Updated analysis of the non-CO₂ climate impacts of aviation and potential policy measures pursuant to EU Emissions Trading System Directive Article 30(4). Full length report.

Another feature of recent BEIS guidance is a renewed emphasis on ensuring that ‘international’ or ‘overseas’ emissions impacts of projects are valued. This is clear in the quote provided above from BEIS’ July 2021 paper, and was reinforced in its September 2021 policy paper announcing the new carbon values.²² Increases in greenhouse gas emissions which occur internationally as a result of a project must be valued:

“A policy or project that increases or decreases GHG emissions domestically or internationally relative to a “business as usual” scenario is required to quantify the change in emissions, and then apply the carbon values.”

Oxera’s analysis of the carbon costs of the scheme excludes CO₂ and non-CO₂ emissions from incoming flights. Airports often exclude inbound CO₂ emissions from their calculations as, from a national emissions accounting standpoint, these emissions are often captured in the accounts of foreign nations. However, this is not a national emissions accounting exercise, this is a project impact appraisal. As such, and in accordance with the guidance presented above, incoming flight emissions should be quantified and valued.

Consultation comment 12: The value of the emissions resulting from inbound air traffic movements should be quantified and presented in the economic analysis.

NEF have re-calculated the values presented by Oxera using a more accurate methodology, using the new BEIS carbon values, and including the non-CO₂ impacts of aviation. NEF’s recalculation results, presented in Table 1 suggest the net present value of the scheme’s greenhouse gas (GHG) emissions is very significantly higher than presented by Oxera, under all assumptions and sensitivities. NEF present disaggregated costs, showing carbon prices paid for traded emissions, and emissions abatement costs for all emissions.

Consultation comment 13: The monetised value of the emissions resulting from the scheme is significantly higher than presented by Oxera, across all scenarios, emissions categories, and sensitivities. The net present value of the scheme is significantly lower than presented by Oxera.

Table 1 Present value (2029-2088) of monetised impacts of increased GHG emissions (£bn)

Carbon Prices	Low	Central	High
Aviation, UK Traded CO ₂ emissions only*	£0.6	£1.3	£2.0
Aviation, international Traded CO ₂ emissions only*	£0.6	£1.2	£1.9
Carbon Values	Low	Central	High
Aviation, UK CO ₂	£3.6	£7.2	£10.8
Aviation, UK non-CO ₂	£3.2	£6.4	£9.6
Aviation, non-UK	£6.8	£13.6	£20.4
Construction	£0.1	£0.3	£0.4
Surface Access	£0.2	£0.4	£0.7
Total, less traded value	£12.7	£25.4	£38.0
Total, UK less traded value	£6.5	£13.0	£19.5
Oxera carbon cost estimates	£0.9	£2.0	£3.1

*Traded values are calculated using BEIS traded carbon values for UK policy appraisal

Employment

Through section 5C of their report Oxera set out their approach to calculating claimed increases in employment at the local and regional level, with a largest ‘catalytic’ impact area representing the majority of Southeast England. The approach is bottom-up, building employment impact estimates out from initial projections of the number of new direct employees at the airport. Direct and indirect (supply chain) job impacts are presented but, while there will likely be local increases in job numbers in these categories as a result of the expansion, these jobs are specific to aviation, and do not represent the impact of the scheme on employment within the region as a whole. We note that Oxera do not expect any net job creation resulting from the scheme at the national level:

“We therefore do not expect the Project to have material supply-side employment effects that would generate employment impacts at a national level” (p.52)

Consultation comment 14: Oxera do not expect there to be any material benefit to employment at the national level resulting from the project. Gatwick Airport should ensure their wider documentation and communications relating to the expansion reflect this insight.

However, Oxera present an additional employment forecast, which projects jobs growth at the regional level. This is described as the project’s catalytic impact, and effectively aims to capture net job number changes within the region. The methodology is presented in Appendix 8. The methodology followed is adopted from an academic paper published in

2010 by Marco Percoco²⁷ and uses regression techniques to look at the relationship between employment and air transport at a regional level.

We note a number of broad concerns about Oxera's reliance on this approach:

1. The chosen study is presented alongside a list of five others which are cited as evidence that "increased air traffic is positively associated with local employment" (p. 196). We first note here the use of the term 'associated'. This is the correct terminology, as it is also true that the cited studies do not necessarily show causation, only correlation. We are concerned that the method applied by Oxera does not adequately justify that the increase in air travel will *cause* employment growth. Causation is a notably sticky issue and many academic studies have struggled to get to grips with it.²⁸

Consultation comment 15: Oxera should clarify whether their method for calculating local/regional catalytic employment impacts evidences a causal link between air travel growth and employment growth.

2. Second, we note that the studies presented in evidence by Oxera are notably old, published in 1999, 2000, 2003, 2007, 2010, and 2012. We are concerned that the data used in these studies will not adequately reflect more recent emerging evidence of the saturation of developed country transport-markets. As discussed by Zhang and Graham (2020)²⁹ and Arvin (2015)³⁰ which suggest historic trends may not be adequate reflections of future developments.

Consultation comment 16: Oxera should clarify whether their method for calculating catalytic employment impacts takes account of saturation of the UK travel market and other emerging trends, and explain whether the method applied remains appropriate for application in 2021.

3. Third, we note with concern that the Oxera have not presented a number of more recent peer-reviewed studies which could not evidence a causal link between air

²⁷ Percoco, M. (2010). Airport activity and local development: Evidence from Italy. *Urban Studies*, 47(11), 2427–2443.

²⁸ Zhang, F., & Graham, D. J. (2020). Air transport and economic growth: a review of the impact mechanism and causal relationships. *Transport Reviews*, 40(4), 506–528. 7

²⁹ Zhang, F., & Graham, D. J. (2020). Air transport and economic growth: a review of the impact mechanism and causal relationships. *Transport Reviews*, 40(4), 506–528. 7

³⁰ Arvin, M. B., Pradhan, R. P., & Norman, N. R. (2015). Transportation intensity, urbanization, economic growth, and CO2 emissions in the G-20 countries. *Utilities Policy*, 35, 50–66.

travel growth and employment. Vivjer et al. (2016) explore this link across 112 regions (NUTS2) of Europe, including 16 regions of England.³¹ They find no causal evidence linking increased air transport to increased overall employment in any English regions. Such a link is only evidenced in a combination of major European tourist destinations (such as southern France and Spain) and in extremely remote regions, including northern Scotland and Finland. Similar findings were identified by Mukkala and Tervo (2013) who also analysed a regional sample inclusive of multiple UK datapoints, finding no causal relationship running from air traffic to employment in core regions (within which Gatwick Airport sits).³² These conclusions are supported by work by Küçüköнал and Sedefođlu (2017), whose sample also includes the UK.³³

Consultation comment 17: Oxera should present a more balanced picture of the evidence relating to the causal link between air transport and employment, including citing recent studies which either show no causation, or failed to identify a causal link.

4. Fourth, we note that when Oxera’s catalytic employment estimates are presented in the main text, in Table 5.9, no uncertainty bounds are presented. Regression model outputs should be presented alongside appropriate uncertainty bounds, especially when the validity of the underlying modelling approach is questionable.

Consultation comment 18: Oxera should present uncertainty ranges alongside their catalytic job forecasts.

Finally, we note Oxera’s conclusion in paragraph A8.25 that displacement of employment is likely as a result of the proposed expansion. A key question for consideration is not just whether jobs are created, but for whom, and whether jobs are taken from or given to the people who need them most. No analysis assessing the distribution of employment impacts (positive and negative) across local areas is presented. It is, therefore, not possible to say how this intervention would intersect with the government’s levelling up agenda.

Consultation comment 19: A distributional impact assessment should be conducted to assess the relative value of the jobs lost and gained to those people experiencing the change.

³¹ Vijver, E. Van de, Derudder, B., & Witlox, F. (2016). Air Passenger Transport and Regional Development: Cause and Effect in Europe. *Promet – Traffic & Transportation*, 28.

³² Mukkala, K., & Tervo, H. (2013). Air Transportation and Regional Growth: Which Way Does the Causality Run? *Environment and Planning A: Economy and Space*, 45(6), 1508–1520.

³³ Küçüköнал, H., & Sedefođlu, G. (2017). The Causality Analysis of Air Transport and Socio-economics Factors: The Case of OECD Countries. *Transportation Research Procedia*, 28, 16–26.

The wider economic impact of aviation growth

In this section we discuss the ‘wider’ economic impact of aviation growth. This looks at impacts which are experienced beyond the local area of the intervention and speaks to the airport’s role in the productivity of the national economy. In the academic literature a general consensus has emerged that during a certain, early, phase of a country’s development, air passenger growth can support GDP growth. However, there is growing academic evidence that these effects weaken as a country becomes more developed and more connected.³⁴ Many studies have struggled to identify a causal relationship between higher air passenger numbers and increased GDP growth in more developed nations,^{35, 36} including in samples inclusive of UK data.³⁷ Some studies have even found a negative relationship³⁸ with others suggesting this may link to the extractive impacts of aviation in regions with a heavy bias towards outbound tourism.³⁹ Other studies suggest that transportation intensity has reached “saturation” in many developed nations and as such the causal relationship between incremental changes in air travel and economic growth has broken.⁴⁰

The established consensus around the economic benefits of expansion of the aviation sector in the UK must be reviewed. Claims made by industry representatives should be subjected to rigorous analysis utilising the very latest available data, and methods should not rely on economic relationships (‘elasticities’) developed and calibrated on data more than a decade old, as is commonly the case. The Department for Transport itself is guilty of this, utilising in its 2021 Jet Zero Consultation analysis elasticities connecting the economy and demand for

³⁴ AitBihiOuali, L., Carbo, J. M., & Graham, D. J. (2020). Do changes in air transportation affect productivity? A cross-country panel approach. *Regional Science Policy & Practice*, 12(3), 493–505.

³⁵ Mikkala, K., & Tervo, H. (2013). Air Transportation and Regional Growth: Which Way Does the Causality Run? *Environment and Planning A: Economy and Space*, 45(6), 1508–1520.

³⁶ Rashid Khan, H. U., Siddique, M., Zaman, K., Yousaf, S. U., Shoukry, A. M., Gani, S., Sasmoko, Khan, A., Hishan, S. S., & Saleem, H. (2018). The impact of air transportation, railways transportation, and port container traffic on energy demand, customs duty, and economic growth: Evidence from a panel of low-, middle-, and high -income countries. *Journal of Air Transport Management*, 70, 18–35

³⁷ Küçükönel, H., & Sedefoğlu, G. (2017). The Causality Analysis of Air Transport and Socio-economics Factors: The Case of OECD Countries. *Transportation Research Procedia*, 28, 16–26.

³⁸ Sahin, O., Can, N., & Demirbas, E. (2019). The Effects of Infrastructure Determinants on Economic Growth: European Union Sample. *Eurasian Journal of Business and Economics*, 7(13), 11–27.

³⁹ Allroggen, F., & Malina, R. (2014). Do the regional growth effects of air transport differ among airports? *Journal of Air Transport Management*, 37, 1–4.

⁴⁰ Arvin, M. B., Pradhan, R. P., & Norman, N. R. (2015). Transportation intensity, urbanization, economic growth, and CO2 emissions in the G-20 countries. *Utilities Policy*, 35, 50–66.

air travel which were calibrated on data spanning 1984 to 2008, therefore entirely excluding changes since the financial crisis of 2007/08.⁴¹

Wider economic impacts of an expanded Gatwick Airport

Oxera make broad brush statements carrying some conviction that the expansion of Gatwick Airport will bring benefits in the form of new jobs, business benefits, increased productivity, and benefits to the 'wider economy'. These can be seen for example in Oxera's Executive Summary points 1.5 and 1.12. It is our position that these claims are not substantiated, and are not supported by the evidence in the latest academic literature, nor indeed by the evidence presented by Oxera. Here we review the evidence supporting the scheme's 'wider economic impacts'.

Imperfectly competitive markets

Oxera present quantified impacts from output increase in imperfectly competitive markets. These are said to be worth £4bn to £5.8bn. But these figures are calculated through application of a simple multiplier which was calibrated in 1999. NEF were not able to access this source paper, but note it is now 22 years since its publication. Before using the simplified method suggested by the DfT, the onus in guidance is still on a scheme proposer to produce an economic narrative⁴² that shows that a relevant market is imperfectly competitive and that the project will relieve some of those constraints. The market should be described, the "small number of providers" should be identified, evidence for "barriers to entry" should be given, and there must be evidence that these providers have market power.⁴³

On page 51 Oxera fail to describe any specific markets that are imperfectly competitive that would be impacted by the scheme; at best it can be read that they imply all businesses that involve travel and all businesses that involve freight. Our previous comments regarding the extremely weak evidence base underpinning business passenger benefits applies here, as the productivity benefit figure is derived predominantly from business passenger welfare gains.

Consultation comment 20: Oxera should provide a more complete economic narrative for their inclusion of imperfectly competitive market benefit and, given the magnitude of the change, should produce supplementary economic modelling to substantiate the multiplier result.

⁴¹ To evidence this a trail must be followed from the Jet Zero Consultation which utilises the 2017 Aviation Forecasts, then onwards to older iterations of the DfT Aviation Forecasts for which the elasticities used in 2017 were originally developed.

⁴² Department for Transport (2019) TAG UNIT A2.2 Appraisal of Induced Investment Impacts

⁴³ Department for Transport (2019) TAG UNIT A2.1 Wider Economic Impacts Appraisal

External cost

Oxera quantify a small marginal external cost to the scheme resulting from congestion worth -£3.3m in net present value.

National supply-side employment

Oxera do not expect the scheme to generate any national supply-side employment benefits.

Productivity impacts

Oxera suggest there will be a small benefit resulting from the displacement of jobs from the wider South East region to Gatwick Airport as a result of the increased productivity levels seen in the vicinity of the airport. This is estimated to be worth £0.2bn in net present value. Within this is £0.1bn of new tax revenue.

Oxera suggest there will be £0.7bn in local productivity benefits resulting from business agglomeration in the vicinity of the airport. However, this figure is not substantiated at the national level as it does not consider loss of employment density in other areas.

Tax revenue

Oxera are not able to substantiate any quantified changes in tax take at the national level. This is because increases in APD take may be offset by losses in tax revenue resulting from other forms of spending seen in the baseline scenario. Indeed, it is possible that the scheme could result in a net reduction in tax revenues. Table 4.17, in which Oxera summarise the project's wider economic impacts appears to contain an error on this topic. Oxera present £4.7bn of 'government revenue' benefits, this same presentation is repeated in Table 4.27 and is implicit in numbers presented in further tables. This is despite their own analysis in sections 4.104 and 4.108 clearly explaining the reasons why their own estimate of the increased Air Passenger Duty receipts cannot be considered to equate to overall changes to government tax revenues.

<p>Consultation comment 21: Oxera recognise that their estimates of increased Air Passenger Duty receipts do not reflect the project's net impact on government revenues as the project may also result in reduced tax take in other areas of the economy. Government revenue benefits should be removed from Table 4.17 and any similar subsequent presentations.</p>

Tourism impacts

No tourism impacts are evidenced or quantified. As discussed above, this potentially hides very significant negative wider economic impacts of the proposed scheme.

Foreign Direct investment

Oxera do not quantify any foreign direct investment benefits and trade benefits resulting from the scheme. Oxera rightly recognise that these have not been adequately substantiated in wider literature.

Net value of wider economic impacts

Oxera summarise the project's wider economic impacts in Table 4.17. After deducting the erroneous inclusion of additional government revenues, the wider economic impacts of the scheme which have been quantified are minimal. These impacts are also heavily dependent on a single multiplier sourced from a 1999 research paper, which NEF have not been able to validate the appropriateness of.

Considering the above aspects, and particularly the omission of potentially significantly negative impacts resulting from incentivisation of outbound tourism, it is notable that the scheme's wider economic impacts represent a relatively unattractive proposition, especially in light of its significant environmental impacts. We would note that, to the most part, the weaknesses in the evidence base, and the existence of multiple negative outcomes, is recognised by Oxera. Indeed, for the most part Oxera have provided a carefully reasoned assessment. However, correction of a number of key errors, re-appraisal of business passenger impacts, the recent updates to the government's carbon values, and the inclusion of omitted environmental impacts result in a very significant change to the overall benefit-cost profile of the proposed scheme. NEF propose that the scheme may in fact carry a negative net present value and could therefore represent an unattractive proposition from a public interest perspective.

Revised estimate of overall scheme value

We require more information from Oxera in order to be able to calculate a revised total scheme net present value. The corrections, updates and improvements suggested herein are sufficient to very significantly reduce the values presented by Oxera (£13.3bn - £24.7bn), and the final range is likely to include negative values.

Consultation comment 22: A corrected and updated scheme benefit-cost assessment could well point towards a scheme with negative net present value to society. At present, the proposed expansion represents an unattractive proposition from a public interest perspective.

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