

# The costs and benefits of runway extension

## A Summary of the report for the States of Guernsey

13 March 2020

Confidential

**Provisional Analysis: findings will be reviewed in light of the impact of the Covid-19 pandemic on air travel**



# The States of Guernsey commissioned Frontier to assess the costs and benefits of runway extension.

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The States of Guernsey commissioned Frontier Economics Ltd to undertake an economic analysis of a proposed extension to Guernsey Airport's runway. The proposal is to increase runway length to between 1,700 and 1,799 metres. This research follows a decision taken by the Assembly to direct the Committee for Economic Development to present a business case and cost benefit analysis for the extension of the runway at Guernsey Airport to achieve a length of at least 1,700m.

The full report:

- evaluates the business case for the extension and associated net economic benefits. The extension scenario modelled is a new runway length of 1740m with traditional "runway end safety area" (RESA). This scenario is modelled against the business-as-usual scenario of no extension.
- Undertakes a high level analysis of environmental costs and social impacts of the extension relative to a no-extension scenario.

This document provides a summary of the full detailed report and is intended to highlight the main evidence and findings. The full report provides a more comprehensive overview of all the evidence, references, modelling and results.

The context for this research includes several previous studies undertaken by the States on the question of connectivity by air and sea, the adoption by the States (in November 2018) of its Investment Objectives for Air and Sea Route Policy Development. These objectives emphasise the agreement by the States to develop air and sea links that, amongst others:

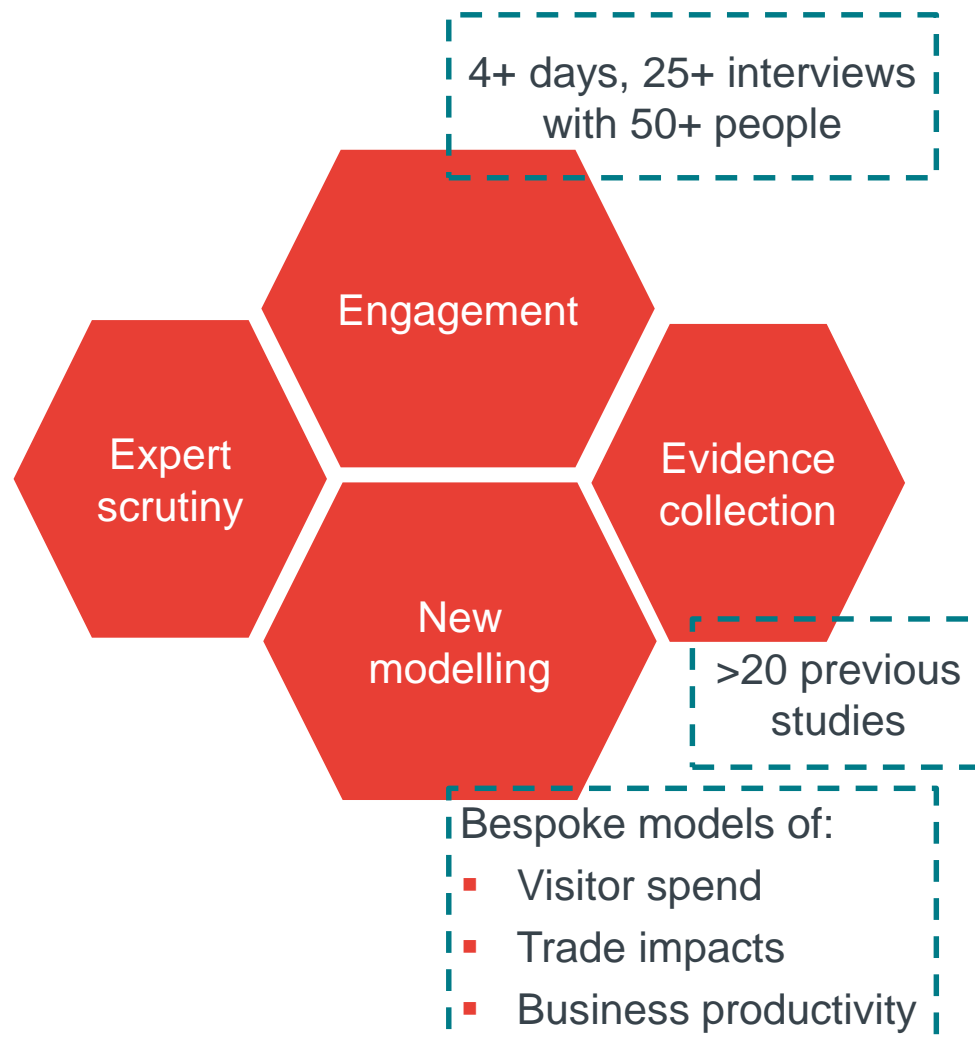
- Encourage development of regional (UK and Europe) connectivity
- Attract carriers with proven international connectivity
- Broaden UK and European connectivity
- Improve access for Bailiwick residents to specialist healthcare and emergency evacuation services

The States also issued a Policy Letter on the basis of the Strategic Review.. The investment objectives include core strategic objectives of meeting the needs of residents, enabling economic growth and increasing visitor numbers. They also include specific objectives relating to affordability, connectivity and reliability. In articulating these three specific objectives, the States recognised the tensions that could exist between them for different groups of users. The tension is sometimes described as a policy trilemma in that a single investment or policy decision may not be able to achieve all three simultaneously.

Finally, the States also commissioned modelling of changes to air connectivity and passenger numbers as a result of an extension of the runway within the ranges set out by the strategic review. That modelling is a direct input into this study. █

# We have consulted widely, reviewed existing evidence and developed new economic models to understand the impact of a runway extension.

The analysis and conclusions that we have reached follow extensive meetings, review of quantitative and qualitative evidence and new economic modelling.



Notwithstanding the evidence collection, a number of wider factors not included in the analysis could be important:

- Guernsey's economy has specific characteristics. It is necessary to exercise caution when applying methods and estimates developed for applications in other economies.
- There are many other factors that may limit the extent to which historical data from Guernsey will predict the future (e.g. future trading arrangements between Guernsey and the EU).
- Technological developments might affect how and by whom the runway is used and the impact of that use (e.g. possibilities for alternative fuel aircraft, role of remote working and meeting).

Given these and related uncertainties, we have consistently adopted an approach that biases our analysis towards increasing costs and reducing benefits (i.e. it is a 'conservative' approach). These include:

- Using the upper end of cost estimates for the runway and incentives
- Using lower bound estimates for business growth impacts
- Assuming no real increase spend per visitor over time
- Plus other technical assumptions (e.g. choice of discount rate, break even analysis, extent of "cannibalisation")

# Our framework identifies four categories of activity through which increased visitor numbers & connectivity feed in to wider economic impacts.

Impact of runway extension on air connectivity (routes and destinations) relative to no extension case

Change in passenger numbers

Changes in flight schedules and aircraft

Residents

Visitors

Access to services/  
facilities off-island

Outbound  
business  
travel

Inbound  
business  
travel

Leisure

1  
Social impacts

2  
Business facilitation  
and macro-economic  
impacts

3  
Impact of spending  
and macro-economic  
impacts

4  
Environmental impacts

Adjusted to ensure  
*additionality* (e.g. shift of  
visitors from sea routes,  
'cannibalisation')

For example – improved **access** to healthcare treatments, sporting and cultural links; **loss** of land and local amenities

For example – **expansion** of existing business, creation of new business, reduced loss of existing business

For example – increased **spending** on hotels, in restaurants and on activities.

For example – changes in greenhouse gas **emissions** and **noise**

# We have developed a specific analytical approach to understand the benefits in each of those four categories.

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For two of the categories, we estimate the economic benefits in terms of *additional* (i.e. above the no-extension scenario) Gross Value Added (GVA):

- **Benefits generated through spending by business and leisure visitors.** To estimate this we: (i) model the effects of runway extension on visitor arrivals, to estimate increases in visitor numbers (including potential displacement, 'cannibalisation', from sea to air routes); (ii) model the effects of increased visitor arrivals on spending in Guernsey; and (iii) model the effects of additional on-island spending in terms of Guernsey's GVA. This analysis draws on evidence that includes the different spending habits of different types of visitors.
- **Business facilitation and expansion effects that result from improved connectivity.** To estimate the impacts on business we use two different methodologies: (i) a *top down* approach drawing on econometric estimates of the relationships between business travel, trade, and productivity; and (ii) a *bottom up* approach drawing on econometric estimates of relationships between reliability of air-connectivity, business travel and productivity. We use two different approaches because of the uncertainty associated with business impacts: one or two businesses changing their behaviour could have a significant impact on an economy the size of Guernsey and it is inherently difficult to predict such individual decisions. In-keeping with our broader, conservative, approach, both estimates look only at the financial services sector. We focus on financial services for two reasons. First, they provided the most evidence about the importance of connectivity and potential benefits from improving connectivity. Second, it is in-keeping with our 'conservative' approach because it means we would likely be understating the total benefits should other sectors outside finance also benefit from the extension.
- Separately, we have considered evidence from stakeholders regarding the potential negative impacts of the no-extension status quo on the finance sector, attributed to sub-optimal levels of reliability and connectivity. This includes evidence submitted about firms migrating to other jurisdictions, or choosing to open new offices elsewhere.

There may be **other benefits** resulting from runway extension. These include:

- **Tax revenues to the States** estimated on the basis of GVA increases estimated via the visitor spending and business expansion channels
- **Social benefits** such as
  - Access to healthcare services off-island; and
  - Access to sport and cultural activities and connections, both in Guernsey and off-island.

These other benefits are not included in our formal estimate for GVA impacts but provide supplementary information on the nature and distribution of benefits that may arise. We present quantitative and qualitative evidence on these through the report.

The benefits are based on projections of the runway extension's effects on routes and passenger movements into and out of Guernsey. Projections assume a continuation of the States' quasi-open skies policy. Under this policy, services to and from Guernsey are liberalised and subject to competition, with the exception of the Gatwick route, the rights to which remain under the States' control.

# We have, similarly, developed an approach to understand the corresponding costs in each of the four categories – and the no-extension scenario.

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The **costs** of the proposed runway extension comprise a range of quantitative and qualitative indicators:

- The **resource cost** of runway expansion: the costs of building the longer runway and associated financial incentives that will likely be required to attract new carriers. The construction cost estimates have been developed by separate engineering experts appointed by CfED.
- The **environmental costs** of net changes in emissions and noise associated with changes in air traffic, and of the extension programme; and
- **Social costs** resulting from changes in land use associated with the extension programme.

Of these, we include the resource costs and the monetary value of costs associated with emissions in the formal estimate of GVA impacts. We recognise that there are a wider set of social and related costs that may also affect Guernsey residents. Those are documented alongside the GVA estimates.

## The no-extension scenario

We report the net benefits of a runway extension relative to a **no-extension scenario** in which the runway remains at its current length. These estimates:

- Project annual business and leisure visitors to Guernsey by air routes to stabilise at 180,000; We also model additional sensitivities around this projection that investigate the impact of a continued fall in visitors from air routes of between 1% and 2% per year based on historic trends over different time periods.
- Include resource costs of £10m that will be incurred for runway maintenance at intervals of roughly 10-15 years even without an extension; and £8 million (in present value terms. PV) that will be allocated to route incentives, front loaded in the first 10 years.(as would also happen in the extension case).

Our analysis does not consider the impact of the extension on particular routes or carriers. This issue has received particular attention in the context of FlyBe's recent cessation of operations and ongoing discussions about Aurigny. The modelling approach is based on the profitable operation of air routes, and the link between runway extension and the profitability of servicing Guernsey by carriers that optimise their decisions across their entire network.

The **quantitative results** presented on the next page are based on projected increases in annual visitor numbers (for both business and leisure purposes) under an extension scenario relative to a no-extension scenario. We have estimated three different scenarios

- a *high scenario* based on visitor projections using research commissioned by the States and undertaken by ASM;
- a more conservative *intermediate scenario* based on our adaptation and re-estimation of the ASM projections; and
- a "*break-even*" scenario, in which we estimate the minimum increment in passenger numbers required for the project costs to be covered by solely by the benefits arising from increased spending by visitors..

# The economic benefits of extending the runway are likely to outweigh the costs over a 40 year period.

Our analysis projects the following annual increases in visitors by air relative to the no-extension base case:

- **High Scenario:** 61,000 additional visitors per year.
- **Intermediate scenario:** 20,000 additional visitors per year.
- **Break even scenario:** 8,200 additional visitors per year.

The table below summarises the results of our modelling of the net benefits of runway extension across the three visitor number scenarios described above and on the previous pages.

The results are increases in Gross Value Added (GVA) to the Guernsey economy over-and-above the no-extension baseline scenario and reported in net present value (NPV) terms for the (standard) 40-year lifetime of the project, using a 3.5% discount rate.

Scenario (visitor impact)	High	Intermediate	Break-even
GVA impact: visitor spending effects (over 40 years)	£627m	£201m	£85m
GVA impact: business expansion effects (top down, over 40 years)	£153M	£86M	£21m
Resource costs of 1740m traditional RESA (total cost)	– £84m	– £84m	– £84m
Social cost of increased emissions (present value over 40 years)	– £9m	– £2m	– £1m
<b>Net benefits (visitor spending effects only)</b>	<b>£534m</b>	<b>£115m</b>	<b>£0m</b>
<b>Net benefits (including business expansion effects)</b>	<b>£687m</b>	<b>£201m</b>	<b>£21m</b>

The net benefits from the visitor spending alone are sufficient to cover the costs associated with runway extension

The net benefits from visitor spend for the “break even” scenario by definition: we have created a scenario to examine how many additional visitors would be needed to cover the runway costs. The answer: just over 8,000 per year.



# There are a variety of benefits that are not captured in the headline GVA analysis.

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## Fiscal benefits

We estimate fiscal benefits as increased tax revenues collected by the States as a result of the increase in GVA brought about by the additional visitor spending and business expansion resulting from the runway extension. We estimate these increases for both the visitor spend channel and the business expansion channel. The estimates assume that current tax structures and rates remain unchanged. The calculation splits increased GVA into increased profit and increased earnings net of social security and pension contributions. We then assume that profits are taxed at 10% for the finance sector, that there is no corporate tax for other sectors, and that net personal income is taxed at 20%.

Our estimates suggest that the present value (over 40 years) of the additional tax revenue is **around £8 million in the break even case, just under £27 million in the intermediate case, and around £65 million in the high case**. These benefits are not additional to the overall project benefits. They represent how a portion of these benefits gets re-distributed to the Treasury as a result of existing taxes.

## Health benefits

Guernsey residents are referred to specialists and institutions off-island for treatments not available locally. We received evidence that, in 2019, 11,622 movements (outbound and inbound) took place. This represents in the order of 5,300 Mainland visits for medical reasons (which will include multiple journeys for some patients) in addition to which some travel is undertaken by people accompanying those receiving medical help. The vast majority of these trips are to the UK, with Southampton as the preferred destination on account of its proximity. Data on referrals suggest that around 54% of referrals are for patients that are outside the age range of 18 to 60. Patients in this range are more likely to require assistance via another accompanying adult.

Improved connectivity reduces the cost of travel, benefiting the States (which finance patients' travel) and also residents when an accompanying person is required. Better connectivity may also reduce the duration of visits, and thus time-costs, stress and related issues for patients and accompanying adults.

## Other social benefits

We also received submissions that emphasised that connectivity is important for cultural and sporting activities (including sports competitions and cultural festivals), both in terms of hosting events and in terms of residents participating in and accessing events and activities off-island.

Facilitating the hosting of events may carry spillover benefits in terms of impacts on businesses, and also in terms of increasing the attractiveness of Guernsey to visitors and residents. The ability to attend events in the UK may have benefits in terms of developing higher calibre athletes and enhanced cultural offerings.

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# There are also costs that may not be fully captured in the GVA analysis.

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## Environmental cost of changes to air traffic

- We estimate (and include in the net GVA figures) the quantity of **increased CO<sub>2</sub> emissions** as a result of increased connectivity. We include them in the GVA figures by multiplying the estimated increase in emissions by the monetary value of the social costs of the emissions. This monetary value is the standard value recommended by UK HM Treasury to reflect the damage caused by the emissions.
  - Under the high visitor scenario, annual greenhouse gas emissions would increase by up to 12 kilotonnes per year (equivalent to around 5% of Guernsey's annual greenhouse gas emissions). The social cost of these emissions over the 40-year life of the project is around £9 million (net present value).
  - Under the intermediate visitor scenario, emissions would increase by up to 2 kilotonnes (equivalent to up to 1% of Guernsey's annual greenhouse gas emissions). the social cost of these emissions over the life of the project is around £2 million in net present value terms..
- We recognise that, at a similar time to this work, the States is considering Guernsey's energy policy – including its ambition to contribute to tackling climate change. Depending on that policy, there may be further non-quantified issues arising from additional greenhouse gas emissions.
- The increase in connectivity is also expected to **increase noise levels**, particularly around the airport. This is difficult to estimate with precision given the many factors that need to be accounted for. We estimate that noise levels could increase by around 5 to 15% under both the high and intermediate scenarios compared to their current levels. These increases should be understood in the context of the relatively low number of aircraft movements in Guernsey and the fact that noise levels were likely higher a few years ago than they are now because of changes in the fleet serving Guernsey.

## Other environmental costs and social impacts

The runway extension may also require the in-filling of a valley east of the runway, road closures or diversions to two roads (La Villiaze and Route des Blicqs), and the loss of two farmhouses and five houses. If the runway extension goes beyond 1740m further changes may be required. We assume that private losses are compensated for by the state in line with past practice but recognise this may not always capture the full impacts.

The potential social costs of these activities include: congestion costs; and amenity values (i.e. the losses associated with the value attached by residents using these assets).

**Our analysis** of these issues, while informed by available information and data, is at a high level and **should be extended through further research** as part of the next steps should the States approve further work on the extension.

# The analysis presented in this summary and in the main report provides evidence relating to the strategic investment objectives agreed in the November 2018 Policy Letter.

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Pursuant to the Policy Letter of November 2018, the States of Deliberation approved the Air and Sea Route Policy Development and Investment Objectives in December 2018

The findings presented in this Summary – and in the detailed report – and associated analysis can be set out against these objectives. It is important to note that we take into account the view of the CfED that no one investment will address, on its own, the issues of connectivity, reliability and affordability of air links, or the wider economic and social objectives that may be promoted by addressing these issues.

Objective	Findings from this analysis
Meet future requirements of residents of Guernsey	The analysis presents evidence of economic and social benefits to residents
Enable economic growth	Quantified gains through visitor spending effects on GVA and through business expansion effects.
Increase visitor numbers	Projections of high and intermediate case visitor increases
Affordability: Incentivise airlines to help stimulate market growth through lower fares	The modelling projects fare reductions as a result of increased service provision
Affordability: Attract carriers with capability to sustainably offer market competitive fares	Projected increase in route offer and flights. The analysis assumes the provision of route development incentives over 10 years
Connectivity	The analysis demonstrates the potential for a wider range of routes and destinations.
Reliability	Extension increases the likelihood of attracting established carriers that optimise operations across networks, and who would be able to service Guernsey by deploying aircraft that are deployed on their network as a whole.