The Wellington airport extension

A review of the cost benefit analysis

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tailrisk economics
te maha hoki o nga pihikete

About Tailrisk economics

Tailrisk economics is a Wellington economics consultancy. It specialises in the economics of low probability, high impact events including financial crises and natural disasters. Tailrisk economics also provides consulting services on:

- The economics of financial regulation
- Advanced capital adequacy modelling
- Stress testing for large and small financial institutions
- Regulatory compliance for financial institutions
- General economics.

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A review of the cost benefit analysis

Recently, the Wellington International Airport Company released a cost benefit analysis of the airport longhaul capability extension proposal that purports to show that the economic benefits are $2.090 million, and are 6.8 times the capital cost.

However, the benefits appear to be substantially overstated and are driven by projections of long haul passenger numbers that are not credible, and favourable assumptions that boost the subsequent benefits for New Zealand. In critical markets high growth rates have been trended forward without regard to converence to higher income country norms, and no regard has been given to the prospect of global warming policy initiatives designed to slow air traffic growth.

A more realistic assessment of the project would show much lower and possibly negative net benefits.

It appears that one of the purposes of the report is to make a case for central and local funding of the airport extension. Putting in public money to secure benefits of $2090 million for New Zealand seems like a good deal. However, the case for a public subsidy is not made. If the airport is as successful in attracting long-haul flights as the report claims, then the extension will be a commercially viable investment. There is no need for a government or local authority subsidy.

The relevant reports are lengthy, but the critical weaker points are obvious and are discussed below.

Passenger numbers

The passenger numbers projection numbers are critical as they drive the net benefit assessment.

The projections were prepared by InterVISTA, an international consultancy. Their approach, as we understand it, was basically as follows:

First, there was an analysis of the Wellington longhaul passenger market based on passenger destination and itinerary information.

Second, the current market numbers are projected forward using a variety of analytical techiques with some judgment overlays.

Next, the used the Luthanasa route planning model to assess the impact of a direct Wellington route on passenger numbers.

Fourth, the results from the modelling are subject a kind of sense test. A list of prospective airline users was developed. This was limited to airlines currently serving New Zealand, on the grounds that a new airline would almost invariably fly to Auckland. A exception is made for United Airlines that does not currently fly to New Zealand, but is assumed to be a good prospect to reenter the New Zealand market by flying to Wellington.

They then do a walk through of the prospects for each airline and produce feasibility/profitability assessments.

All of the prospects turn out to be feasible and are assumed to start up over the 2020 decade. By the end of that decade there are about 30 return longhaul flights a week operating to Wellington.

The modelling process raises a number of questions particularly with the inbound passenger projections, which dominate the numbers.

- Has the Wellington market been accurately defined? The assessment of the current long-haul market is based on passengers with itineraries that end in Wellington, and who have routed through other airports to get here. But some of those may have wanted to stop in those airports and would not be interested in a direct Wellington flight. Did the interinary based information capture only those passengers who flew to Wellington immediately from the intermediate stop?

- How good are the forward passenger projections? As we will see below the benefits to New Zealand from inbound passenger growth are heavily influenced by the 'other Asia' market. But there is no discussion at all in the air traffic forecasts paper of the economic prospects of this group or of the nature of the market. All we are told in the risk analysis section of the paper is the following:

  Forecast GDP growth over the forecast period. Based on average of forecasts received from various banks and other sources. Variance based on historical variance of Other Asia regional GDP from past 20 years and potential future GDP growth.

  The forecast real growth rate is 7.9 percent. Combined with an assumed elasticty on GDP of 1.5 (with some tapering towards the end of the modelling horizon) this generates high passenger growth numbers (a twenty-two fold increase). The average growth rate over 45 years is wrong. At some point the other Asian economies will converge to higher income economy growth rates.

- How good is the Lufthansa model at understanding the detail and subtleties of the New Zealand inbound market – for example the location of key tourist attractions – and to what extent are the results driven by user assumptions. The outputs of any model are only as good as the assumptions that go into it, and from the discussions

in the report it appears that the inputs may not have been based robust evidence based analysis.

- The outputs seem to be dependent on hub and network effects. This may work with one network, but the first entrant may weaken the impact for airlines with hubs located nearby. It is assumed that four Asian airlines will fly here. Was the impact of flights from one hub on the prospects for the others properly taken into account?

The sense test assessments do not appear very to be compelling. We will illustrate this point by examining what they had to say about their strongest prospect, Singapore Airlines. The following is the discussion in its entirety.

Singapore has everything going for it to launch a new service to Wellington. As the closest Asian hub to New Zealand, albeit 8,521 kilometres, Singapore can take advantage of the disparate travel destinations of New Zealand flyers and aggregate them via Singapore on to flights bound for Europe, Asia, the Middle East, the Americas, etc. Singapore has taken advantage of its proximity to New Zealand with flights to both Auckland and Christchurch for years. Specifically, Singapore operates a double daily service to AKL and a daily service to CHC. Given that these current services give them a substantial presence in those two markets, it would likely make sense for them to consider expansion into a new station in New Zealand, such as WLG, rather than adding capacity at their existing stations.

Although not the largest local market in Asia (that honour belongs to Bangkok), Singapore has the second highest amount of total traffic, which includes connecting traffic. It is only a few connecting passengers short of Hong Kong for the largest market, including both local and connecting traffic. Because of Singapore's extreme southern position on the Malay Peninsula in Asia, Singapore Airlines is always looking for more southerly points to feed its hub and balance the northern destinations. Hence, Wellington could be another good spoke to feed the Singapore hub. In addition, Singapore Airlines and Air New Zealand belong to the Star Alliance and they have requested approval for a joint venture partnership. Hence, there is a strong opportunity for these airlines to work together while travellers in both directions can take advantage of frequent flyer reciprocity and code-sharing into New Zealand's interior as well as beyond Singapore to the myriad number of destinations in their network. Finally, Singapore has always been good about continually renewing and expanding its fleet. Currently, Singapore has both 787-10s and A350-900s on order to refresh its fleet and the expected improvements in performance from these new aircraft may strengthen the potential for a WLG service.

Taking each of the points made in turn:

Singapore can take advantage of the disparate travel destinations of New Zealand flyers and aggregate them via Singapore

The problem here is that Singapore is already doing this via its Auckland and Christchurch routes and it is unlikely that a route to Wellington would induce much additional demand. There is no analysis of passenger volumes on the New Zealand Singapore route (as there should have been), but we understand it is heavily dominated by Singapore Airlines. The Wellington region market to the Singapore destination is small, just 16.6 per day, and the induced demand from Wellington on the consultant's own analysis will be just a handful of additional passengers.

So it is difficult to to see how the Wellington market would excite much interest when most of the passengers will already be picking up Singapore flights from Christchurch or Auckland.

Substantial existing presence in New Zealand means it makes sense to add a new route

This doesn't obviously follow. Singapore has long-haul flights into European countries which are much larger than New Zealand, but this does not mean that they find in attractive to fly into every possible desination with a market size as big as Wellington's. The UK, Germany and Italy are served by two gateways, and other European countries by just one. Singapore flies to Barcelona but not to the Spanish capital Madrid.

Singapore needs more southern destinations to balance northern ones

Getting a north-south 'balance' is unlikely to be a real objective for Singapore, particularly as the effect of the new destination will not alter their passenger numbers to and from New Zealand significantly. There is no evidence in the report of discussions with Singapore on their route development strategies.

Singapore is a big regional hub

The size of the regional hub is not the determining factor. The question is how much additional demand will be generated for Singapore by offering a direct Wellington connection. There is no indepth market analysis that might shed light on this question in the report, but the answer to the question is, probably very little. Most tourists will want to start their New Zealand visits in Auckland and Christchurch, and of those who want to go to Wellington first, it is unlikely that many would be put off a New Zealand trip altogther by having to route through other airports.

Singapore has always been good about continually renewing its fleet.

This is not relevant.

From the above analysis the following passenger projections are generated.

Table 1: Wellington-Singapore service

	Current forecasts	**5 years in the future forecasts**
Number of services	4-5	6-7
Load factor	88	89
Weekly passengers	2177	3565
% Wellington	19	21
% Connecting Wellington	3	3
% Connecting at hub	78	75

We assume that the current forecasts relate to the first year of service and the 5 year forecasts are five years later.

Looking at the current forecast numbers it is not clear how the domestic numbers (about 480 per week – or 240 each way) were derived from the current number of Wellington region passengers to Singapore (16.6 per day or 116 per week). It is unlikely that a four day a week service would capture the whole of the current market when there is the option to fly daily through Auckland or Christchurch, so even the present market size is a favourable starting point. So some fairly optimistic assumptions must have been made about on travel from Singapore and about market growth up to 2020.

On the demand from foreign travellers from Singapore and beyond, the assumption of 1700 per week equates to 850 each way or 44200 per year. Statistics New Zealand data shows that the total number of foreign arrivals from Singapore in the year to October 2015 was 160,000. Given the relative unattractiveness of Wellington as an entry point (again, how many tourists want to start in Wellington and do a figure eight tour, rather than starting from Christchurch or Auckland?), the implied market share for Wellington looks to be optimistic.

Increase in foreign vistor numbers

The projected increase in foreign vistor numbers are set out in table 5-11 of the Intervistas report. The increases are assumed to be all additional vistors for New Zealand and account for half of the net benefits from the runway extension. The following are the current market numbers and projected increases generated by the airport extension.

Table 2 Inbound additional passenger numbers ('000)

Year	Australia	China	Japan	Other Asia	UK	USA	Pacific	Other	Total
2015 (base)	314	11	9	30	22	37	6	31	460
2025 (increases from base)	51	15	1	40	3	13	1	4	115
2035	63	28	1	105	6	31	-	8	244
2045	86	34	1	136	9	41	1	11	320
2060	114	37	2	177	11	48	1	14	404

Looking at the numbers, we don't think it at all credible that a significant number of additional visitors will arrive from Australia based on just the possibiity of an increase in competition on one transtasman route and a possible new route to Perth.

With respect to the long haul destinations the projections are dependent on the accuracy of the current size of the Wellington market estimates as we noted above. If this has been overstated then it is likely that the increases will be too. Again the numbers don't look convincing. Will 31,000 Americans come to New Zealand in 2035 just because they can fly direct to Wellington?

The big driver of the results is other Asia. The overall market grows from 30,000 to 662,000 by 2060 and 177,000 are additional for New Zealand. Even In the earlier years the additional arrivals are significant. All this is must be mainly driven from a relatively small relevant population base - Singapore, Malaysia, Hong Kong and Thailand. Total New Zealand arrivals from that group were 140,000 in the year to October 2015. Several other large Asian countries (Indonesia and Philippines and shortly Vietnam) already have a one stop route to Wellington, as do Indians out of Delhi.

So do the additional visitor numbers numbers feel plausible? We don't think so.

The Cost Benefit Analysis

The major contributions to the cost benefit analyis outcome, which shows net benefits have a present value of $2090 million, are the following:

- Net benefits for New Zealand travellers
- Net benefits for New Zealand airfreight users
- Net benefits for service providers to foreign visitors
- GST receipts from foreign visitor expenditures.

Benefits to New Zealand travellers and airfreighters

The present value of the net benefits to airfreighters and passengers is estimated to be about $920 million.

It is difficult to assess the respective net benefits for passengers and airfreighters from the reported numbers. The benefits to airfreighters are reported as close to zero but the gains to passengers look, on the reported methodology, to be too high. What may have happened here is that some of the airfreight gains have been subsumed in the reported passenger benefits.

The passenger gains are generated by the savings in time and the cost of connecting flights. At between $171 - $406 per flight per passenger they look high and are partially driven by the assumed high cost of travellers time. ($57 per hour for private and $73 for business travellers). These figures are materially higher than the figures that would be used for transport related cost benefit analysis in New Zealand.

The benefits are dependent on the projections of New Zealand passenger numbers. It appears (as our discussion of the Singapore example suggests) that they are optimistic.

On the airfreight benefits there is no analysis of the airfreight market for each destination. It is simply assumed that 3.8 tons of airfreight will go with each outbound flight. So for Singapore for example, it assumed that weekly airfreight will be 15.2 tons from the beginning of the service. It is not clear whether this is realistic.

Benefits to New Zealand of services to foreign tourists.

The net present value of the net benefits is about $1000 million.

There are two critical issues with the analysis.

First, as we discussed above, the additional overseas visitor numbers are way too optimistic.

Second, the estimate of producer surplus (45 percent of tourist revenue) is too high. Margins in the tourist and hospitality industry are much lower than that. A MBIE guidance document, that puts the share of intermediate inputs at 25 percent, is cited to support the argument that the 45 percent is a conservative figure. In a cost benefit analysis, the opportunity cost of all inputs should be included, not just intermediate goods.

If we assume (probably still generously) that the additional vistor numbers are one third of the projection, and that producer surplus is one third as high as assumed, then we are looking at net benefits of around $100 million.

GST income
This is estimated at $184 million. On the above assumptions this comes down to $20 million.

The discount rate
This is a very risky investment proposition and a good case could be made for a higher discount rate. The sensitivity analysis suggests that a 10 cent real discount rate would not would not make much difference. It will make a significant difference, but possibly this has been masked by the presentation of the impact on the gross benefit ratio.

Impact on cost benefit outcomes
All of the issues raised here go the same way and cumulatively would reduce the net present value to a number that is much lower then the $2,090 million mid-point. There is a material risk that there could be no net benefits.

Risk analysis

There is a risk analysis in the passenger forecast paper which generates the high and low scenarios. This seems to be primarily focussed on the impact of economic risks to passenger numbers. It is not clear whether, and to what extent, that model risk (uncertainties about the mean traffic numbers that are generated by the Lufthansa Route planning model and other assumptions about market share) have been taken into account. As model risk is a major consideration here it should have been captured in the high and low projections.

Global warming

At some point global warming concerns will bite on airtraffic growth. However, there appears to be no discussion at all of this risk in the documents.

Who should pay?

Two main options for who should pay for the cost of the run way extension are canvassed:

- Local and central government
- User charges

Local and central government

The case for central government paying has to be based on the external benefits (those not captured by the users of the servicses and the airport), but as we have argued these external benefits are not very high. The Minister, Steven Joyce, has already given a luke warm response to the suggestion that the government contribute, and his officials will do doubt provide advice which will consider the issues that we have raised.

There is an argument that there will be some positive impact on the Wellington region because visitors will spend more time and money in Wellington, but this cost benefit analysis does not provide a detailed assessment of that effect. A proper assessment based on realistic passenger number estimates would probably generate a very modest net benefit.

User charges

The user charges assessment is based on the assumption that existing users of the airport would be levied, and it it is argued that this would inefficient compared to broad based tax funding.

What is missing here is the obvious. Existing users of the airport should not be charged for a capital investment that does not provide them with benefits. But the longhaul users, who will benefit, certainly should bear the cost. If the CBA is to be believed, there $1 billion of benefits to domestic users and they should be prepared to pay part of that surplus to cover the capital cost of the extension.

Further, on the numbers there will be more than three times as many foreign as domestic passengers, and on the same logic they should also be prepared to pay for the convenience of a direct Wellington flight.

The study shows that the benefits to Wellington airport are $317 million and the costs $378 million, so only a modest increase in airport charges, which would be passed on in fares and freight charges, would more than suffice to meet Wellington Airport‘s hurdle rate of return. If Wellington Airport believes its own numbers then they will extend the airport without any central or local goverment subsidy.

Our understanding is that there is a proposal abroad that that Wellington Airport should contribute $75 million, the Wellington City Council $90 million, the Regional Council $60 million, and the Government $100 million. The Government appears unlikely to come to the party. Nor should the Wellington Council and regional body. This is a commercial investment that should proceed, or not, on its commercial merits.