



Final Report: 27 February 2014

Estimating the Regional Economic Importance of Auckland Airport

PREPARED FOR

Auckland International Airport Limited

Authorship

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1 Executive Summary

Context and Scope of Report

Auckland Airport is New Zealand's largest airport and our main gateway to the world. In 2013, 155,000 flights carried more than 14 million passengers and moved more than \$13 billion of freight. To assist the airport's submission on the Auckland Unitary Plan, this report assesses its regional economic importance by considering:

1. The economic impacts of the airport company as a business in its own right,
2. The economic impacts of the wider airport area,
3. The airport's role in facilitating tourism and trade, and
4. A range of other benefits provided to local businesses and consumers

Methodology

The majority of the report is based on a particular type of analysis called multiplier analysis, which estimates both direct economic effects, and also flow-on effects. The latter arise from the interrelated nature of business supply chains, in which the outputs of one firm become inputs to another, and vice versa. These business interactions are traced throughout the regional economy to determine the overall economic impact of the airport and its associated activities. Effects are measured in terms of regional GDP, incomes and employment.

The remainder of the analysis is more exploratory in nature, and focuses on the wider macroeconomic contributions made by the airport, particularly with respect to international tourism and trade. In addition, it briefly lists a range of other important benefits provided by the airport.

Economic Model

In order to accurately estimate the economic impacts of the airport company and wider airport complex, a detailed economic model was developed. This was particularly important, because a number of inter-linkages exist between the companies that comprise the airport, and failing to account for these would have caused the impact estimates to be systematically overstated. Each potential source of double-counting was therefore carefully identified and managed to ensure that the resulting estimates of economic impact were robust and reliable.

Economic Impact of the Airport Company as a Business Entity

As noted above, the first part of the analysis related to the economic impact of the airport company as a business in its own right. This refers to the entity otherwise known as Auckland International Airport Limited (AIAL), which owns and controls the majority of airport assets, but which accounts for only a fraction of airport activity and hence total airport impacts.

The following table shows the overall economic impact of AIAL in 2013 ignoring wider airport activity. In summary, the airport company directly contributed \$322 million in regional value added (GDP), 330 fulltime equivalent jobs and \$36 million in household incomes. Including flow-on effects, its contribution was \$415 million in regional GDP, 1,730 fulltime equivalent jobs and \$92 million in household incomes.

Table 1: Estimated Economic Impacts of AIAL in 2013

Impact Measures	Direct	Flow-On	Total
Value-Added (\$m)	\$322	\$93	\$415
Employment (FTEs)	330	1,400	1,730
Household Incomes (\$m)	\$36	\$56	\$92

To consider AIAL’s potential future impacts, we quantified the relationship between historic impacts and historic passenger numbers, and overlaid future passenger projections to derive high-level estimates. According to our analysis, by 2044, the airport company alone could contribute more than \$1.1 billion to Auckland’s GDP including flow-on effects.

Economic Impact of the Wider Airport Complex

Next, we estimated the regional economic impacts of the wider airport complex, which comprises both the general airport precinct plus a range of nearby industrial activities. The analysis involved a number of detailed steps, all of which are explained at length. The following table shows the resulting impact estimates for 2013 (excluding the economic impacts of AIAL itself).

Table 2: Estimated Impacts of the Wider Airport in 2013 (excl. AIAL)

Impact Measures	Direct	Flow-On	Total
Value-Added (\$m)	\$1,430	\$1,670	\$3,100
Employment (FTEs)	12,200	19,200	31,400
Household Incomes (\$m)	\$920	\$880	\$1,800

To summarise: including flow on effects, the wider airport complex is estimated to contribute \$3.1 billion to regional GDP, 31,400 jobs and \$1.8 billion in household incomes.

Combined with the estimated airport company impacts above, these suggest that the overall operation of Auckland airport and associated activity contributed the following to Auckland’s economy in 2013:

- \$3.5 billion in value added (GDP)
- 33,100 jobs, and
- \$1.9 billion in household incomes.

Airport’s Role in Facilitating International Tourism

In addition to the significant economic activity that occurs in and around it, the airport also plays a number of other important roles in the regional and national economies. Of these, one of the most significant is its role in international tourism.

As a distant island nation, international tourism is very important. For instance, in 2013:

- 2.7 million international visitors travelled here, up from 1.7 million in 2000,
- Tourism contributed almost 9% to national GDP,

- 172,100 people were employed directly or indirectly in tourism-related sectors, accounting for 8.8% of national employment, and
- 72% of all international visitors arrived at Auckland Airport.

While Auckland airport clearly already plays a significant role in our tourism industry, it will become even more important because it is the main arrival port for tourists from China – our fastest-growing and highest-yielding international market. Indeed, 92% of all visitors from China landed at Auckland Airport last year, and the number of these visitors has more than doubled since 2009. Further, according to official tourism forecasts, Chinese visitors will spend over \$1.2 billion in New Zealand by 2019, or about \$2,700 per person. This is more than double the forecast average spend of visitors from our biggest market, Australia.

Clearly, Auckland airport is a critical component of our tourism supply chain, and will become even more important in future.

Airport's Role in Facilitating Trade

While sea freight accounts for the bulk of trade volumes due to its lower cost structure, air-freight still plays a key role in the export of just-in-time and perishable goods that achieve a much higher return than their sea-freight counterparts. In addition, air freight is critical to the movement of goods that are low in weight but high in value. This is why air-freighted goods were worth around 50 times more per kilogram than sea-freighted goods last year.

Just as Auckland Airport has a dominant share of international tourist arrivals, so too does it have a dominant share of international air freight. For instance, in 2013, Auckland Airport moved 92% of airborne imports and 81% of airborne exports by weight. By value, it carried 94% of air imports and 72% of air exports.

Imports and exports via Auckland Airport are both dominated by industrial parts and machinery. These accounted for 23% of all exports and 25% of all imports, with over \$10 billion of these products moved via Auckland Airport between 2010 and 2012.

Other key imports and exports include medical/optical/photographic parts and machinery, audio/video parts and machinery, pharmaceuticals, gems and precious stones. All are examples of high-value, low-weight, time-critical commodities.

Overall, imports via Auckland Airport outweigh exports. Specifically, for every dollar of goods exported, \$1.92 of goods are imported. However, there are some particular goods where exports via Auckland Airport outweigh imports. These include food and plant products, particularly fish, crustaceans, live animals, flowers and dairy products.

Other Strategic/Economic Benefits

Finally, we identified and summarised a range of other strategic/economic benefits provided by Auckland Airport. These include:

- **Fostering and Maintaining Business Relationships** – while new technologies such as videoconferencing can be useful, many companies still consider face-to-face contact important for winning business. As one might expect, Auckland airport accounts for a significant share of business related international (and domestic) travel. In fact, in 2013 Auckland Airport accounted for 76% of international business arrivals, and 82% of international business departures.
- **Other Benefits of Increased Connectivity** - In addition to fostering business relationships and enabling tourism and trade, increased connectivity provides a range of other benefits by raising business productivity. These productivity impacts manifest through two main channels: (i) through the effects on domestic firms of increased access to foreign markets and increased foreign competition in the home market; and (ii) through the freer movement of investment capital and workers between countries. In addition, improved connectivity can make it easier for firms to invest overseas, thereby further boosting economic performance.
- **The Airport as a Major Growth Node** – Since 1999, the Mangere South census area unit (which encapsulates the Airport) experienced the highest non-residential floorspace growth of all census area units in New Zealand (and was 48 times the national average). This rampant growth is expected to continue with the airport having up to 400 hectares of land available for commercial development, and with it adopting a place-based strategy to capitalise on this major opportunity. As a result, the airport is likely to be a significant node of future economic growth and development.
- **Direct Customer Benefits** – One of the key benefits provided by the aviation sector are those accruing to its customers. In economics, these customer benefits are measured by the associated consumer surplus. Put simply, this equals the difference between what a consumer would have been willing to pay for a good or service, and what they actually pay. According to a recent study by Oxford Economics, the consumer surplus for aviation is about a third of the airfare. Since New Zealanders (including businesses and Government) spent around \$3 billion on airfares last year, total consumer benefits may be around \$1 billion per annum.
- **Economic Impacts of Future Capital Expenditures** - According to the airport's latest investor presentation, it intends to spend around \$2.4 billion on core infrastructure over the next 30 years. Using multiplier analysis, we estimated that this could boost regional: GDP by \$2 billion, employment by 27,800 full time jobs, and household incomes by \$1.4 billion. It is also worth noting that these capital expenditures are unlikely to feature much (if any) public funding. Thus, not only will future capital works provide significant economic benefits, but they will also not create any significant fiscal strain on the Government.
- **Contribution to Taxes and Council Rates** - The airport company is a major contributor to both local and central Government finances via its rates and tax payments. For example, during the financial year ended 30 June 2013, the

airport paid over \$58 million in corporate income tax and a further \$5 million or so in Council rates.

- **Convenience and Social Inclusion** - Large international airports like Auckland Airport provide direct convenience benefits by reducing the length of surface commutes required to access air services. In doing so, they improve connectivity and improve quality of life. Without air services, remote areas (such as NZ) would be denied easy and continued participation in the modern world, and hence reduce social inclusion.

Summary and Conclusion

This report has estimated the regional economic impacts of Auckland airport and found that it generates and supports a diverse range of economic activity. In doing so, it makes a significant contribution to regional GDP, provides employment for thousands of people and generates many millions of dollars in regional income. In addition, the airport plays a critical role in facilitating international tourism and trade and also provides a range of strategic benefits, particularly by strengthening connectivity and enabling international engagement. This is why Auckland airport is arguably New Zealand's most important strategic infrastructure asset.

2 Introduction

2.1 Context and Purpose of this Report

Auckland Council has released its proposed Unitary Plan, and Auckland International Airport is lodging a submission. This report seeks to inform the airport's submission by assessing its economic importance to the Auckland region.

2.2 About Auckland Airport

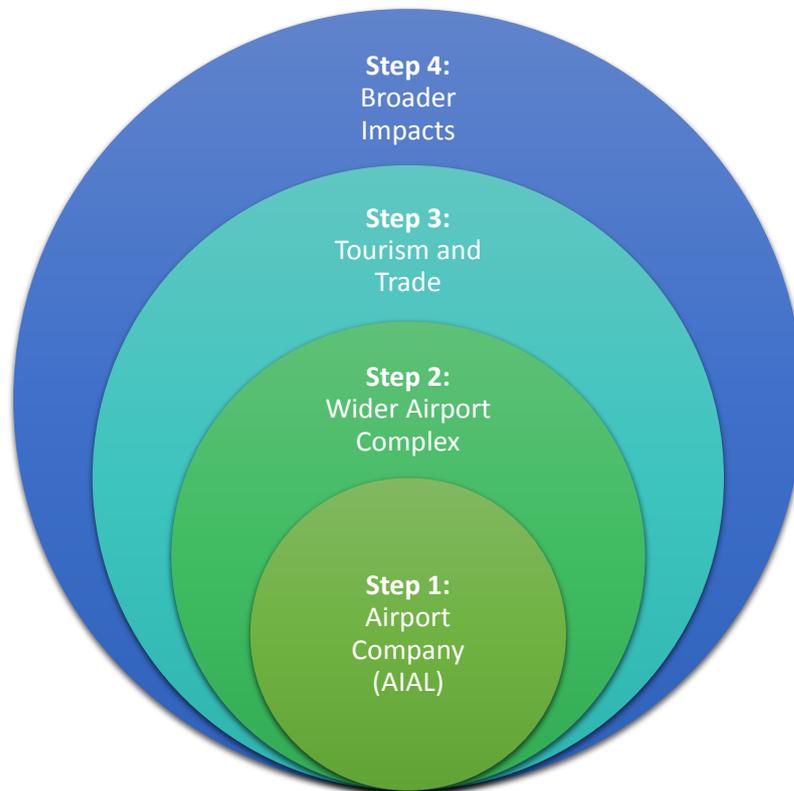
Auckland Airport is New Zealand's largest airport, and the second largest in Australasia by international passenger numbers. It operates non-stop 365 days a year, and **in 2013 there were:**

- 155,000 annual aircraft movements,
- 14 million annual passengers,
- \$13 billion in annual freight movements, and
- 65,000 daily vehicle visits

2.3 Components of the Analysis

This report estimates the economic importance of Auckland airport in several steps. It starts with a fairly narrow focus on the airport company itself, then gradually expands to include a range of broader impacts. This approach is reflected in the figure below.

Figure 1: Components of the Analysis



Specifically, this report considers the economic importance of the airport based on:

1. The economic impacts of the airport company as a business in its own right,
2. The economic impacts of the wider airport complex
3. The airport's role in facilitating tourism and trade, and
4. A range of other benefits provided to local businesses and consumers

At each step (or in each successive layer of effects in Figure 1), the benefits increase substantially in value and reach, but also become increasingly harder to measure with any degree of confidence.

2.4 Structure of this Report

The remainder of this report is structured as follows:

- **Section three** describes our overall approach to the analysis.
- **Section four** estimates the economic impacts of the airport company as a business entity in its own right.
- **Section five** estimates the economic impacts of the wider airport complex, including associated industrial activity.
- **Section six** discusses the value of international tourism to New Zealand and describes the airport's role in facilitating it.
- **Section seven** briefly describes the value of airfreight and the airport's role in transporting it, and
- **Section eight** summarises a range of other benefits provided by the airport.

3 Methodology

This section briefly describes key aspects of our methodology.

3.1 Introduction to Multiplier Analysis

The economic impacts of the airport company and wider airport complex have been estimated using a specific type of analysis called multiplier analysis. This incorporates a highly-detailed matrix – called an input-output table – which shows the particular set of inputs that each sector requires to produce its own outputs. As a result, it reveals how the various sectors of an economy are interrelated.

Consider the following example. Suppose a local construction company wins a large building contract. In addition to labour requirements, the company will need to source a range of building products from its suppliers to complete the job. These suppliers, in turn, will need to source various inputs from their own suppliers, and so on. The input-output table traces all these interdependencies so that the wider economic impact of the new building work can be estimated.

Specifically, the economic impacts estimated by multiplier analysis comprise three parts, (the second and third of which are often grouped together as ‘flow-on effects’).

1. **Direct Effects** – these are the direct effects of the entity (or entities) in question.
2. **Indirect effects** – these are the overall economic impacts of the wider supply chain that supports the entity in question. It captures the full range of inter-industry impacts arising from the direct effect.
3. **Induced effects** – the direct and indirect effects will result in increased employment, and hence increased household income. A proportion of this new income will be spent in the regional economy, and give rise to further economic stimulus. This is known as the induced effect.

The overall economic impact is the sum of the direct, indirect and induced effects. These effects are measured in terms of:

- Value added (GDP),
- Employment, and
- Household incomes

3.2 Advantages and Limitations of Multiplier Analysis

Like all types of analysis, multiplier analysis has its advantages and limitations. The key advantages are that it:

- is able to estimate the economic impacts of a wide range of activities,
- can estimate both direct effects and flow-on effects,
- is relatively simple and transparent, and
- relatively easy to explain.

However, multiplier analysis makes a number of limiting assumptions, including:

- that production functions exhibit constant returns to scale, so that a doubling of all inputs leads to a doubling of all outputs
- there are no supply constraints,
- there is no short-term substitution between capital and labour, and
- relative prices are fixed.

While these assumptions may not always hold true, multiplier analysis is widely used for this sort of analysis, and we consider it the best method for the job at hand. Accordingly, we use it here to estimate economic impacts.

3.3 Bottom-Up vs Top-Down Multiplier Analysis

There are a number of different ways to implement a multiplier analysis. The most complex is a bottom-up multiplier analysis, in which an organisation's structure and operation is examined at length to determine its overall economic footprint and hence resulting economic impacts. This was the approach used to estimate the impacts of the airport company as a business entity in its own right.

At the other end of the spectrum are top-down multiplier analyses. These take a much more pragmatic approach, and convert the output of a firm to estimates of economic impacts using pre-defined multipliers. These multipliers are sourced by 'solving' the input-output table so that all the inter-industry linkages are boiled down to a smaller set of numbers (i.e. the multipliers). This was the approach used to analyse the economic impacts of the wider airport complex. i.e. the numerous airport-related businesses in and around the airport.

3.4 Input Output Table Used in the Analysis

The specific input output table used in the analysis was supplied by Butcher Partners, and reflects the Auckland regional economy as at 2007. This table is the latest available and has been widely used for analyses of this sort over the last few years.

3.5 Regional vs National Impacts

Throughout this report, we report impacts only for the Auckland region. In all cases, the corresponding national impacts are at least as great as, if not greater than, the Auckland regional impacts.

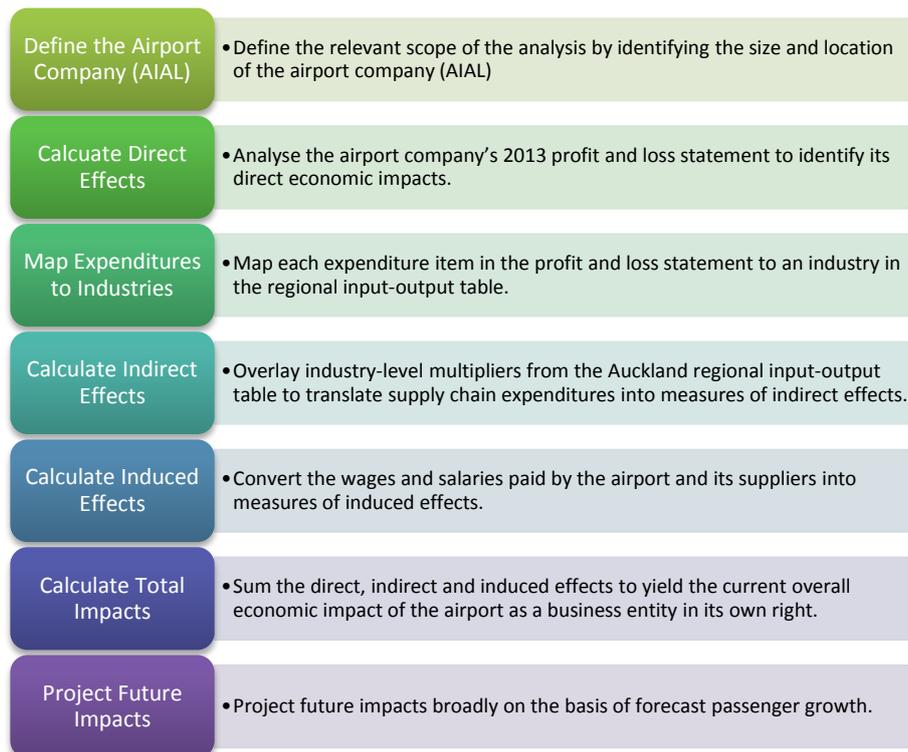
4 Impacts of the Airport Company (AIAL)

This section estimates the current and future economic impacts of the airport company–Auckland International Airport Limited (AIAL) – as a business entity in its own right.¹

4.1 Steps in the Analysis

Figure 2 shows the key steps in the analysis:

Figure 2: Methodology Used to Estimate Impacts of the Airport Company Itself



The rest of this section works through each step.

4.2 Definition of Airport Company

To begin, we must first define what is meant by the airport company. In technical terms, it refers to the publicly-listed entity known as Auckland International Airport Limited (AIAL). In practical terms, it refers to the company that owns and controls the bulk of the airport's assets. However, the airport company itself is not responsible for many of the airport's day-to-day operations, most of which are performed by other organisations on the airport's land. As a result, the economic impacts derived in this section capture only a small fraction of total airport impacts. The majority are picked up in the next section, which analyses the economic impacts of the wider airport complex.

¹ Some of the discussion in this section has been adapted from a 2013 Covec report titled *How businesses that serve tourists add value to the New Zealand economy*.

As shown in the figure below, the airport company is currently located a small distance from the terminals on Leonard Isitt Drive.

Figure 3: Location of AIAL Relative to the Airport Terminals

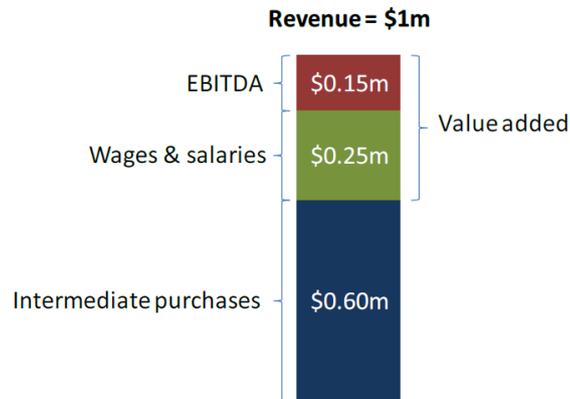


4.3 Direct Impacts

The airport, like all other businesses, adds value to the economy by purchasing goods and services from other organisations (intermediate purchases), transforming them through its “production processes” and selling the resulting goods and services to its own customers. Described in this way, value-added (or GDP) simply captures the difference between an organisation’s own revenues and the intermediate purchases it makes to earn those revenues.

As shown in the diagram below, a firm’s contribution to value-added can also be measured simply by adding its earnings before interest, tax depreciation and amortisation (EBITDA) to its wages and salaries payments. The two produce identical results, at least in theory, and the particular method used to calculate value-added will often reflect the information available.

Figure 4: Two Ways of Calculating Value Added (GDP)



Since the profit and loss statement provided by the airport was very detailed – excellent for the calculation of flow-on effects – the simplest option was to just add its wages and salaries payments to its EBITDA. This resulted in an estimated direct contribution to value added of \$322 million for the year ended 30 June 2013. Over the same period, the airport employed 330 fulltime equivalent staff and paid salaries and wages of \$36 million. These metrics represent the airport company’s direct contribution to the economy for the past financial year, and are summarised in Table 3.

Table 3: Direct Economic Impacts of AIAL in 2013

Impact Measures	Direct Effects
Value Added (\$m)	\$322
Employment (FTEs)	330
Household Incomes (\$m)	\$36

Please note that the impacts above relate only to the daily operations of the airport company itself. Hence, they do not reflect the significant economic activity that occurs in and around the terminals, which is captured in the analysis of the wider airport complex.

4.4 Indirect Impacts

Each year, the airport purchases goods and services from a wide range of suppliers, who in turn purchase items from their own suppliers and so on. The movement of money through these supply chains allows other businesses in the economy to further redistribute the original expenditure and add value via their own production processes, giving rise to indirect impacts.

To measure the indirect (supply chain) impacts of the airport’s annual expenditures, we:

1. Determined the proportion of each of the 79 expenditure items in its profit and loss statement that was likely spent in Auckland²

² This was done based on our understanding of the airport’s supply chains and also by using some simple rules of thumb.

2. Mapped the resulting estimated Auckland expenditures to industries in the input-output table, and
3. Overlaid the corresponding multipliers to determine indirect impacts.

Before showing the results, Table 4 first shows the composition of the airport's annual expenditures, which totalled \$118 million. This was dominated by salaries and wages (34%), repairs and maintenance (8%), outsourced operations (8%) and marketing (also 8%).

Table 4: Composition of Airport Expenditure for Year Ended 30 June 2013

Expense	Cost \$m	Share
Salaries & Wages (incl ACC etc)	\$40	34%
Repair & Maintenance	\$10	8%
Outsourced Operations	\$10	8%
Marketing	\$9	8%
Rates	\$7	6%
Cleaning	\$7	6%
Electricity	\$6	5%
Consultancy	\$5	4%
Promotions	\$4	4%
Insurance	\$3	2%
Other Expenses	\$17	15%
Total	\$118	100%

Next, the following table shows the estimated geographic spread of expenditures based on our line-by-line allocations. In summary: Auckland is estimated to receive 84% of airport expenditures, the rest of New Zealand 12%, and overseas 4%.

Table 5: Estimated Destination of AIAL Expenditures

Expenditure Destinations	Cost \$m	Share
Auckland	\$99	84%
Rest of NZ	\$14	12%
International	\$4	4%
Total	\$118	100%

Finally, following are the estimated Auckland regional indirect impacts based on the inputs and assumptions above.

Table 6: Indirect Economic Impacts of AIAL in 2013

Impact Measures	Indirect Effects
Value-Added (\$m)	\$55
Employment (FTEs)	921
Household Incomes (\$m)	\$35

In summary: the airport's expenditures give rise to further economic impacts, which include full time employment for 921 people, household incomes of \$35 million and \$55 million in additional value added.

4.5 Induced Impacts

The airport and its suppliers employ hundreds (if not thousands) of people and pay them each a wage or salary. A lot of this income will be re-spent in the regional economy and thus give rise to further economic stimulus, known as the induced effect.

To estimate induced effects, we identified the total amount paid to airport and supply chain employees, stripped out taxes, savings and leaked expenditure, then allocated the remainder to different expenditure categories using the Household Economic Survey (HES). Then we overlaid the corresponding industry multipliers from the input-output table to determine the corresponding regional economic impacts.

For the sake of this exercise, we assumed that:

1. 33% of household income was lost to taxes and savings,
2. 10% of the balance was spent outside the region, and
3. the remaining 90% was spent in Auckland

These give rise to the following estimates of induced impacts for 2013.

Table 7: Induced Economic Impacts of AIAL in 2013

Impact Measures	Induced Effects
Value-Added (\$m)	\$39
Employment (FTEs)	477
Household Incomes (\$m)	\$21

The induced economic impacts of the airport and its suppliers adds a further \$39 million to regional GDP, 477 fulltime equivalent jobs, and \$21 million in regional household incomes.

4.6 Overall Economic Impacts

The following table summarises the overall economic impacts of the airport as a business entity for the year ended 30 June 2013.

Table 8: Overall Economic Impacts of AIAL in 2013

Impact Measures	Direct	Indirect	Induced	Total
Value-Added (\$m)	\$322	\$55	\$39	\$415
Employment (FTEs)	330	921	477	1,728
Household Incomes (\$m)	\$36	\$35	\$21	\$92

To summarise: including flow-on effects, the regional economic impacts of the airport company as a business entity in its own right are:

- \$415 million in regional value added
- 1,728 fulltime equivalent jobs, and
- \$92 million in regional household incomes.

4.7 Projected Future Impacts

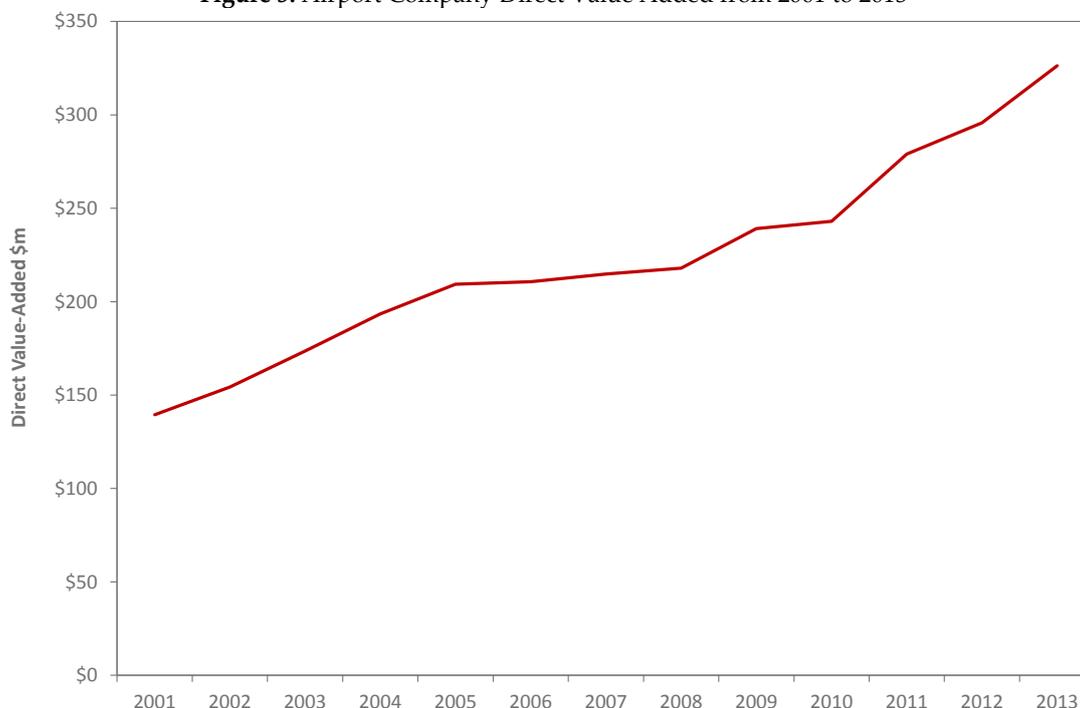
In addition to estimating the airport company's current impacts, we also wanted to produce high-level forecasts of future impacts for value-added (GDP). After testing several potential methodologies, we found that passenger numbers provided the best explanatory power. Accordingly, we formed a statistical relationship between historic economic impacts and historic passenger volumes, and used that relationship to project future economic impacts on the basis of future passenger projections.

Following are the key steps in the analysis:

1. Create a time series of annual economic impacts from 2001 to 2013 (the longest period over which reliable information was available).
2. Identify annual passenger numbers over the same period
3. Create a scatter plot of passenger numbers against direct value added
4. Fit a trendline to the scatter plot
5. Obtain forecasts of future passenger numbers
6. Apply the trendline to the passenger forecasts to yield estimates of future value added.

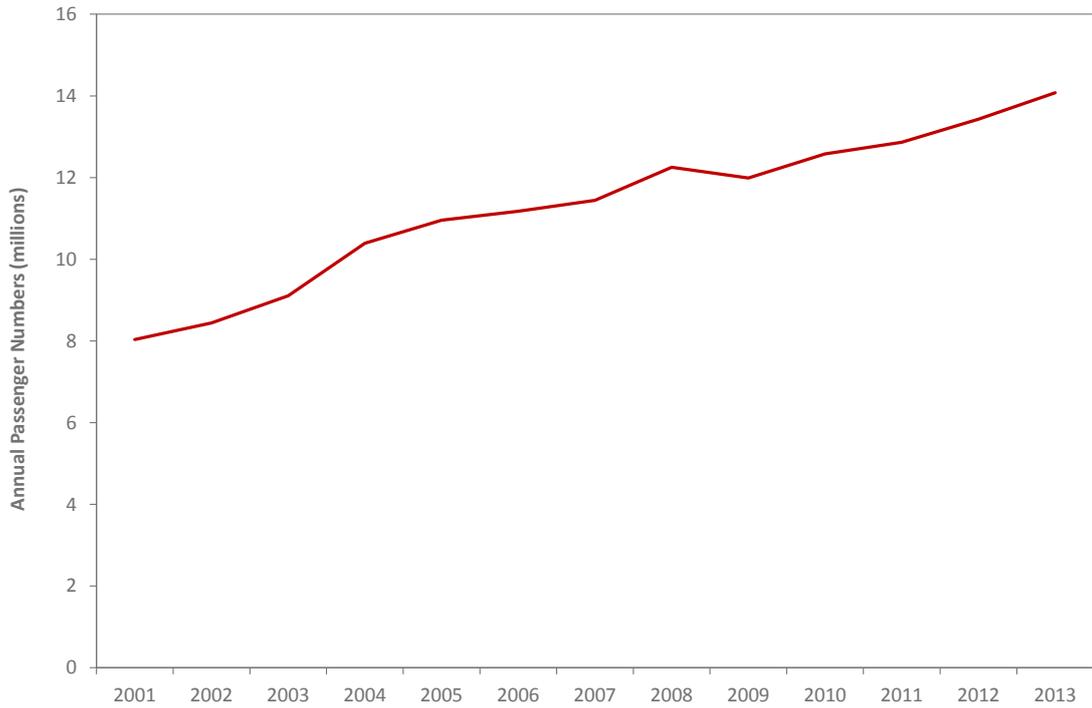
To begin, Figure 5 shows the airport company's direct contribution to value added from 2001 to 2013. This has increased from \$139 million in 2001 to \$322 million in 2013 – an annual growth rate of 7.3%.

Figure 5: Airport Company Direct Value Added from 2001 to 2013



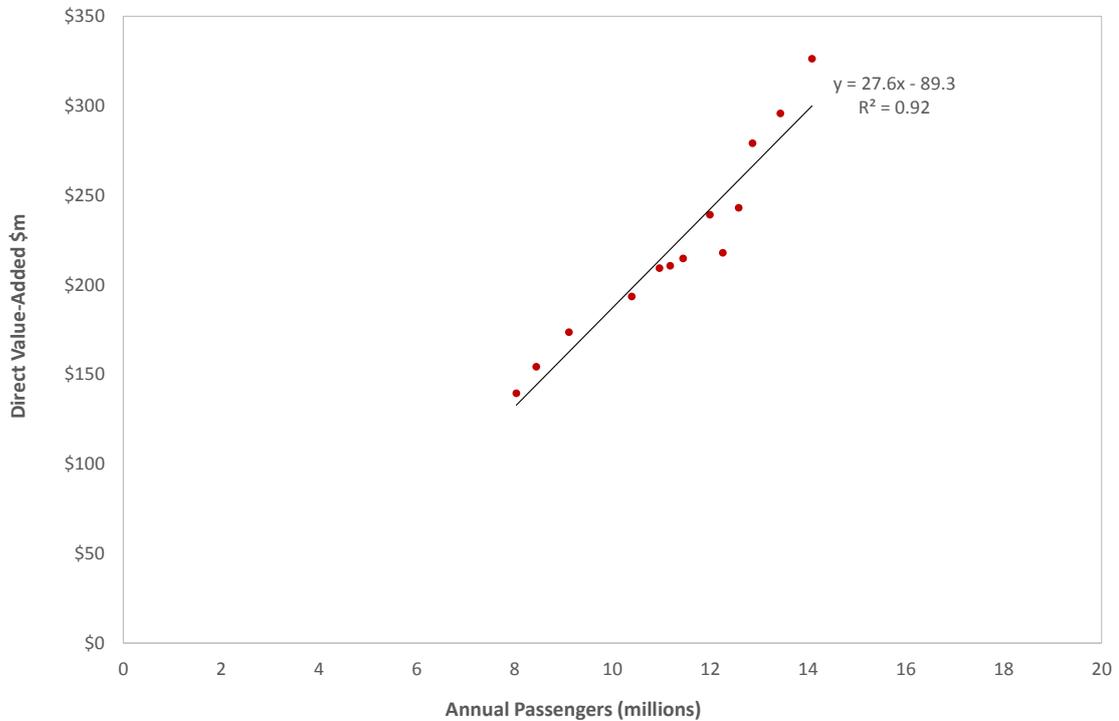
Next, we sourced historic passenger numbers, which are graphed below. These have also grown steadily, with an annual growth rate of 5% between 2001 and 2013.

Figure 6: Auckland Airport Passenger Volumes (by Financial Year)



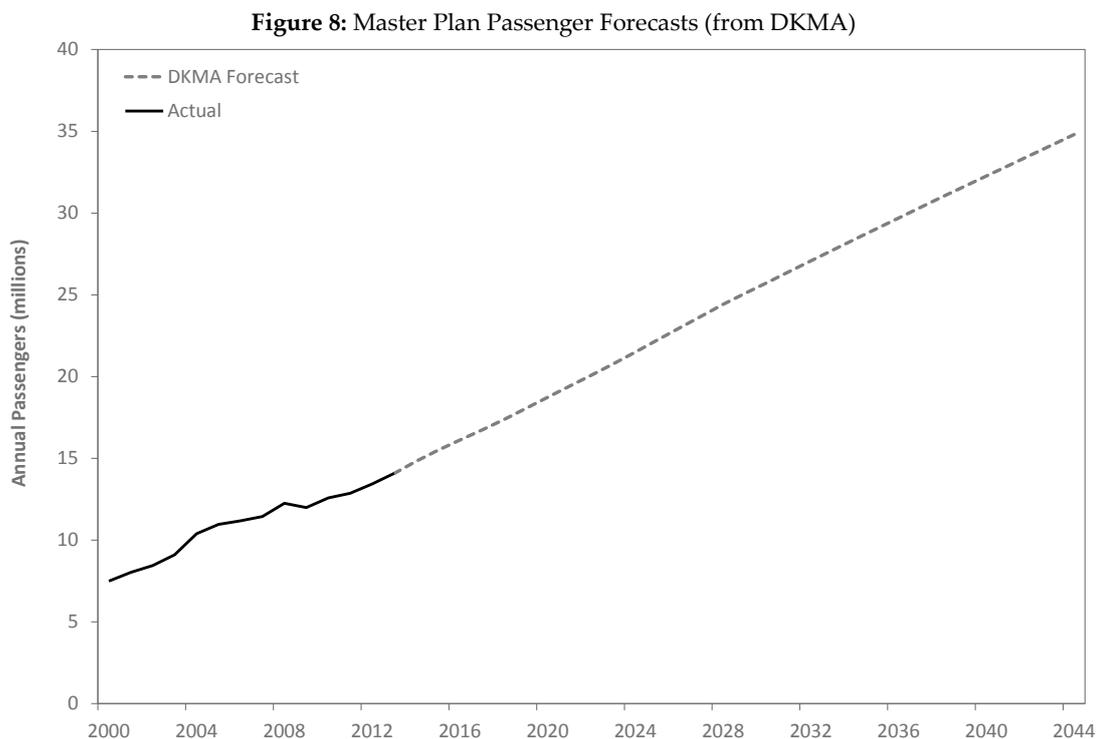
To identify a statistical relationship between the variables, Figure 7 creates a scatter plot of value added versus passenger numbers, and adds a linear trendline.

Figure 7: Scatter Plot of Passengers vs AIAL Direct Value Added



The R^2 value attached to the trendline suggests that there is a good statistical fit between the variables. In fact, the value of 0.92 means that variation in passenger volumes alone “explained” 92% of variation in direct value-added.

To generate forecasts of direct-value added using this relationship, we just needed forecasts of future passenger volumes. These were provided by DKMA - an airport market research and advisory services company – on behalf of the airport and are shown in the figure below. While these are indicative and subject to considerable uncertainty around macro-economic trends, they stress the importance of ensuring adequate future capacity to meet demand.



Finally, we fed the passenger forecasts above into the trendline equation to project the airport company’s direct contribution to value-added. The results of the analysis suggest that the airport company’s direct contribution to value added could reach \$870 million per annum by 2044.

If we now assume that flow-on effects grow pro-rata, the airport company’s overall contribution to regional value-added could be as follows by 2044:

1. Direct - \$872m
2. Indirect - \$149m
3. Induced - \$106m
4. Total - \$1,127m

According to our calculations and underlying assumptions, by 2044, the airport company alone could contribute more than \$1.1 billion of value added to the Auckland regional economy (including flow-on effects).

5 Impacts of the Wider Airport Complex

This section analyses the economic impacts of the wider airport complex.

5.1 Steps in the Analysis

Figure 9 shows the key steps in the analysis:

Figure 9: Methodology for Assessing Economic Impacts of the Wider Airport Complex



5.2 Geographic Extent of the Wider Airport Complex

The first step was to define the geographic extent of the wider airport complex. To this end, we grouped neighbouring, airport-related businesses into two areas:

1. **An airport precinct** – this encapsulates the two airport terminals and a number of airside businesses, such as flight caterers, and
2. **An industrial zone** – this is the large business zone to the north, which houses a large number of airport-related activities, including freight and logistics.

The following map, which is based on 2013 meshblock boundaries, shows the geographic extent of each area as defined in the remainder of the analysis.

Figure 10: Geographic Extent of the Wider Airport Complex



5.3 Employment Within the Airport Complex

Detailed employment data was used to determine the nature of economic activity occurring within the airport complex. The following table shows a snapshot as at February 2013, the latest date for which data is currently available.

Table 9: Airport Complex Employment as at February 2013

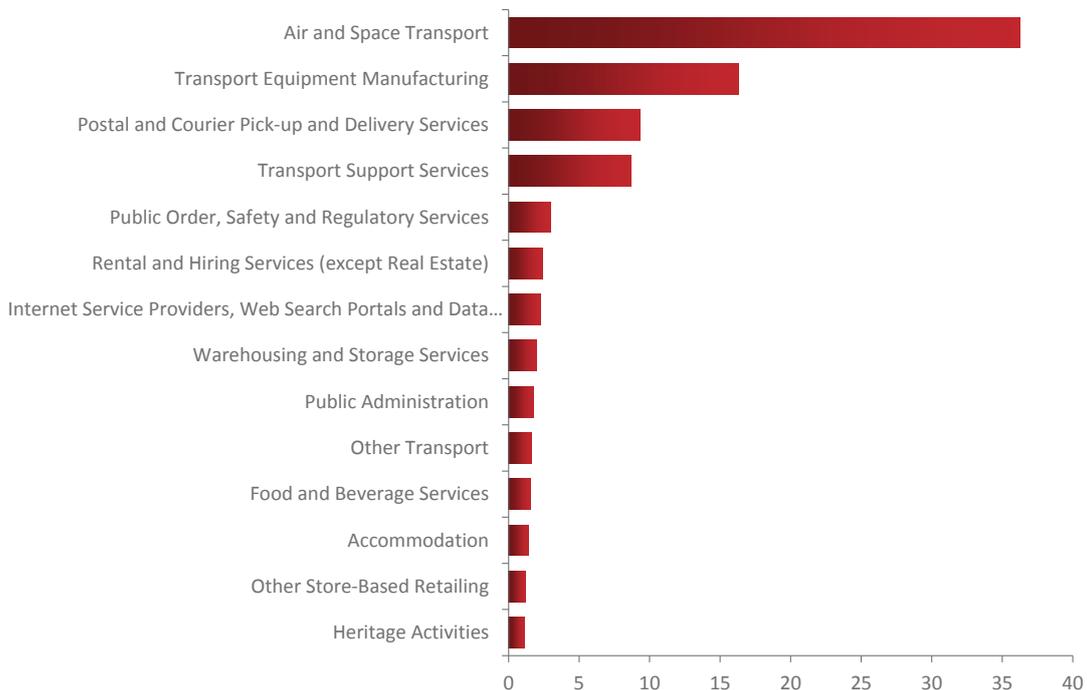
Level 1 Industries	Airport Precinct	Industrial Zone	Complex Total	Complex Shares	Regional Share
Accommodation and Food Services	1,150	362	1,512	7%	7%
Administrative and Support Services	60	735	795	4%	6%
Agriculture, Forestry and Fishing	0	23	23	0%	1%
Arts and Recreation Services	39	24	63	0%	2%
Construction	9	95	104	1%	5%
Education and Training	9	97	106	1%	8%
Electricity, Gas, Water/Waste Services	25	9	34	0%	1%
Financial and Insurance Services	84	15	99	0%	4%
Health Care and Social Assistance	51	38	89	0%	10%
Information Media & Telecoms	75	12	87	0%	3%
Manufacturing	1,259	1,235	2,494	12%	11%
Mining	3	0	3	0%	0%
Other Services	113	364	477	2%	3%
Professional, Scientific & Tech Services	112	266	378	2%	11%
Public Administration and Safety	1,066	36	1,102	5%	5%
Rental, Hiring and Real Estate Services	216	483	699	3%	2%
Retail Trade	874	194	1,068	5%	10%
Transport, Postal and Warehousing	5,998	3,715	9,713	48%	5%
Wholesale Trade	78	1,384	1,462	7%	8%
Totals	11,221	9,087	20,308	100%	100%

Table 9 shows that a broad range of economic activity occurs within the wider airport complex, but (as expected) there is a significant concentration of transport, postal and warehousing activity. In fact, transport, postal and warehousing activity accounts for nearly half of all employment within the airport complex, compared to only 5% for the Auckland region.

To better understand the nature of economic activity occurring within the airport complex, we estimated location quotients. These measure the relative importance of different industries to a particular area relative to the regional average. Specifically, the location quotient for each sector is calculated by dividing its share of local area employment by the corresponding share of regional employment. For instance, if a certain sector represents 20% of local employment but 10% of regional employment, the location quotient for that sector is $20\%/10\% = 2$. Thus, location quotients greater than one reflect sectors in which an area specialises, and vice versa.

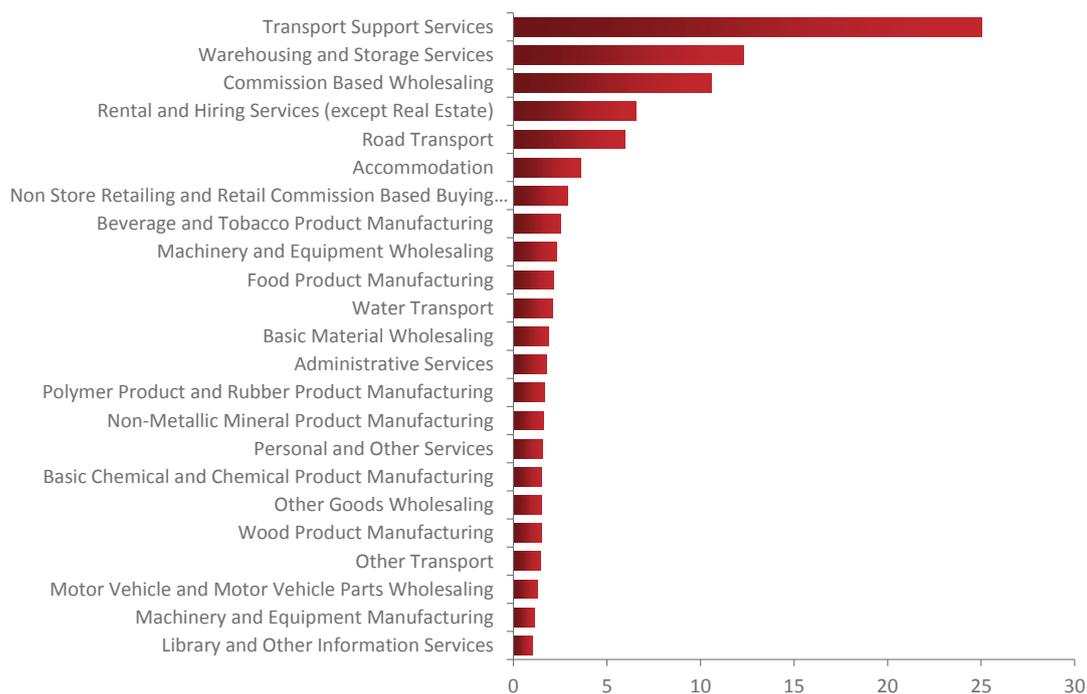
With that definition in mind, the following chart shows all industries in the airport precinct whose location quotient was greater than one. As expected, economic activity is dominated by airport-related businesses. For instance, the share of employment in air and space transport is 36 times higher than the regional average.

Figure 11: Location Quotients for the Airport Precinct



Next, the following graph shows the location quotients for the industrial zone. These reveal large concentrations of activity in sectors related to the storage and distribution of goods (amongst other things).

Figure 12: Location Quotients for the Industrial Zone



Finally, we note that not only does the nature of airport economic activity differ from the regional average, but so too does its historic rate of growth. For instance, between 2000 and 2013, regional employment grew 25%. However, over the same period, employment within the airport complex grew more than twice as fast (58%).

5.4 Airport-Related Shares

To determine the economic impact of airport-related businesses in the wider airport complex, we first needed to determine the extent to which these businesses were indeed airport-related. With so many businesses to work through – more than 900 – it was not feasible to consider each individually. Instead, we worked through each of the detailed 260 industry classifications and allocated a proportion of each industry’s employment as airport related. In many cases, a zero percentage was assigned, while for many others the percentage was high.

The allocations were guided by a range of information, including site visits, desktop research, information provided by the airport and our own previous experience. The exercise was also performed separately for the two areas that comprise the catchment (precinct and industrial) so that the assumed degree of airport dependency could differ between them on an industry-by-industry basis. Where allocations were uncertain we erred towards lower figures to ensure that our resulting estimates of economic impacts were conservative. The appendix also conducts some simple sensitivity tests to show the impacts of different assumptions around airport-related activity shares.

The following table shows the results of these allocations after grouping them up to high-level industry codes. Overall, 85% of employment in the airport precinct was assumed to be airport-related, and 55% of employment in the nearby industrial area.

Table 10: Shares of Airport Complex Employment Attributed to the Airport

High Level Industries	Precinct	Industrial
Accommodation, Food Services	65%	85%
Administrative and Support Services	55%	40%
Agriculture, forestry, fishing and hunting	0%	0%
Arts and Recreation Services	70%	55%
Construction	35%	0%
Education and Training	80%	50%
Electricity, gas and water supply	50%	0%
Finance and insurance	0%	0%
Health Care and Social Assistance	50%	50%
Information Media and Telecommunications	0%	0%
Manufacturing	100%	5%
Mining	0%	0%
Other Services	55%	35%
Professional, Scientific and Technical Services	45%	15%
Public Administration and Safety	100%	40%
Rental, Hiring and Real Estate Services	95%	95%
Retail trade	45%	15%
Transport and storage	100%	95%
Wholesale trade	50%	5%
All Industries	85%	55%

5.5 Conversion from Employment to Turnover

The preceding step produced a detailed list of industries along with estimates of the amount of employment in each considered to be airport related. The next step was to convert these estimates of airport-related employment into turnover by industry. This was done using the Annual Enterprise Survey, which provides detailed financial information for more than 100 different industries. By mapping the industries in the catchment to the industries in the survey and overlaying the survey's estimates of turnover per employee, the following industry-level turnover estimates were derived.

To summarise: Our analysis suggests that around \$2.6 billion of airport-related economic activity occurs within the airport precinct (excluding AIAL), and a further \$1.1 billion in the nearby industrial zone. All up, around \$3.7 billion of airport-related economic activity is estimated to occur in the wider airport complex each year (again, excluding AIAL).

Table 11: Estimated Airport-Related Turnover excluding AIAL (\$ millions)

High-level Industries	Precinct	Industrial	Total
Accommodation, Food Services	\$58	\$27	\$85
Administrative and Support Services	\$4	\$29	\$33
Agriculture, forestry, fishing and hunting	\$0	\$0	\$0
Arts and Recreation Services	\$3	\$1	\$5
Construction	\$1	\$0	\$1
Education and Training	\$1	\$4	\$5
Electricity, gas and water supply	\$3	\$0	\$3
Finance and insurance	\$0	\$0	\$0
Health Care and Social Assistance	\$2	\$1	\$3
Information Media and Telecommunications	\$0	\$0	\$0
Manufacturing	\$311	\$10	\$321
Mining	\$0	\$0	\$0
Other Services	\$6	\$13	\$19
Professional, Scientific and Technical Services	\$9	\$7	\$17
Public Administration and Safety	\$317	\$4	\$321
Rental, Hiring and Real Estate Services	\$76	\$165	\$241
Retail trade	\$97	\$9	\$106
Transport and storage	\$1,675	\$790	\$2,465
Wholesale trade	\$32	\$73	\$105
All Industries	\$2,595	\$1,134	\$3,729

5.6 Industry Mapping and Multiplier Overlay

Next, we mapped airport-related industries to industries in the input-output table so that multipliers derived from the latter could be applied to the turnovers of the former to produce the gross impacts reported below.

5.7 Gross Impacts

Table 12 shows the estimated economic impacts of nearby, airport-related businesses. Please note that these include some double-counts, which are removed in the next step.

Table 12: Gross Economic Impacts of the Wider Airport Complex

Value Added (\$m)	Precinct	Industrial	Total
Direct	\$980	\$670	\$1,650
Indirect	\$770	\$280	\$1,050
Induced	\$600	\$250	\$850
Total	\$2,340	\$1,200	\$3,540
Employment (FTEs)	Precinct	Industrial	Total
Direct	9,500	5,100	14,600
Indirect	10,500	2,400	13,000
Induced	6,600	2,000	8,700
Total	26,700	9,500	36,200
Household Income (\$m)	Precinct	Industrial	Total
Direct	\$740	\$320	\$1,060
Indirect	\$430	\$160	\$590
Induced	\$290	\$120	\$410
Total	\$1,460	\$600	\$2,060

To summarise: the *gross* economic impacts of the wider airport complex (excluding AIAL but including flow-on effects) are estimated to be:

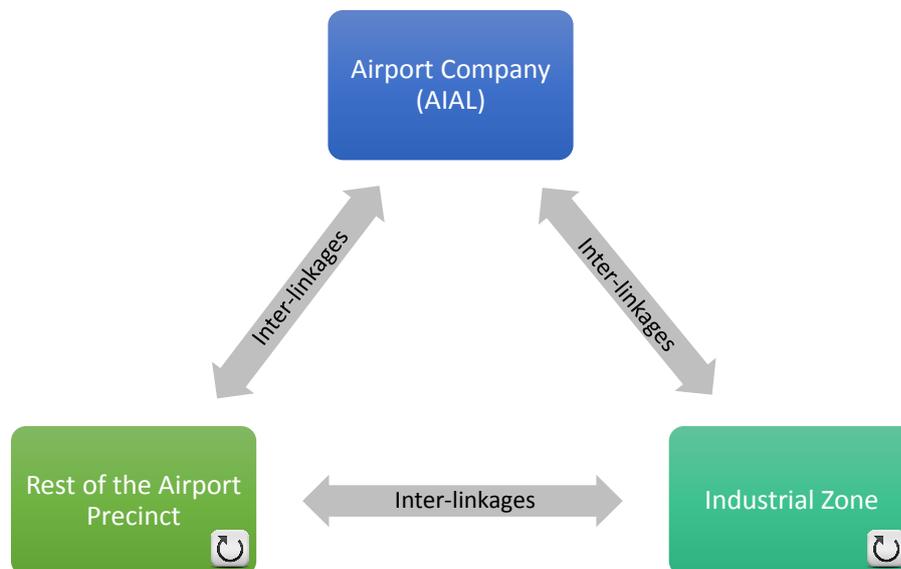
- \$3.5 billion in regional value added
- 36,200 fulltime equivalent jobs, and
- Over \$2 billion in regional household incomes.

5.8 Accounting for Cross-Linkages

One of the key steps in a multiplier analysis is to identify the underlying supply chain for the entity (or entities) in question, so that flow-on effects can be determined. In most cases, this is straightforward. However, because this part of the analysis considers the economic impact of hundreds of businesses simultaneously, the situation becomes more complex.

The problem is that, unless interactions between these businesses are explicitly taken into account, the analysis will inadvertently count some impacts more than once and hence cause impact estimates to be overstated. To understand the nature of the problem, consider the simple diagram below, which depicts the airport company, plus companies in both the industrial zone and airport precinct.

Figure 13: Representation of Inter-Linkages and Intra-Linkages



The grey lines connecting each box represent inter-linkages, in which the outputs of one group are inputs to another. For instance, rental space provided by the airport company (which would be counted as one of its outputs) would also be counted as an input to the retailers that occupy those spaces. If this is not taken into account, then some of the direct impacts attributed to one group of businesses will also be counted as indirect impacts for another group.

In addition to these inter-linkages, which occur *between* groups, there will also be linkages that occur *within* groups. For instance, the outputs of one business in the

industrial zone may be supplied to a neighbouring business, who in turn may supply their outputs to yet another nearby business. These so-called intra-linkages are represented by the small curved arrows at the bottom right of each box.³

To properly account for all these inter- and intra-linkages when estimating economic impacts, we constructed a highly-detailed model that enabled us to identify – and then control for – supply relationships between firms. In doing so, we were able to control for potential double-counting and thus improve the accuracy of our impact estimates.

The appendix contains more information about how inter- and intra-linkages were handled in the analysis, as well as their effects on our estimates of economic impact. For now, it is enough to know that the following types of double-counts have been explicitly estimated and removed to arrive at net economic impacts.

- a) **AIAL company expenditures** – these occur when the airport company purchases goods and services from other businesses in the airport complex.
- b) **AIAL wages** – these occur when the airport company’s employees purchase goods and services from other businesses in the airport complex.
- c) **AIAL revenues** – these occur when the airport company sells goods and services to other businesses in the airport complex.
- d) **Inter-catchment linkages** – these occur when businesses in the airport precinct purchase goods/services from businesses in the industrial zone, and vice versa.
- e) **Intra-catchment linkages** – these occur when businesses in the airport precinct purchase goods/services from one another (and similarly for businesses within the industrial zone).

Following are the estimated double counts produced by our model, which were subtracted from the gross impacts above to yield the net impacts below.

³ This icon does not appear in the Airport company box, because it is only one firm and hence there is no scope for intra-linkages to occur.

Table 13: Double-Counted Impacts to be Removed

Value Added (\$m)	Precinct	Industrial	Total
Direct	\$140	\$80	\$220
Indirect	\$110	\$30	\$140
Induced	\$60	\$30	\$90
Total	\$310	\$130	\$440
Employment (FTEs)	Precinct	Industrial	Total
Direct	1,700	600	2,400
Indirect	1,300	200	1,600
Induced	700	200	900
Total	3,700	1,100	4,800
Household Income (\$m)	Precinct	Industrial	Total
Direct	\$100	\$40	\$140
Indirect	\$60	\$20	\$80
Induced	\$30	\$10	\$40
Total	\$190	\$70	\$260

5.9 Net Impacts

Finally, Table 14 shows the estimated net economic impacts of the airport complex.

Table 14: Net Economic Impacts of the Wider Airport Complex

Value Added (\$m)	Precinct	Industrial	Total
Direct	\$840	\$590	\$1,430
Indirect	\$650	\$250	\$900
Induced	\$540	\$220	\$760
Total	\$2,030	\$1,060	\$3,090
Employment (FTEs)	Precinct	Industrial	Total
Direct	7,800	4,400	12,200
Indirect	9,200	2,200	11,400
Induced	6,000	1,800	7,800
Total	23,000	8,400	31,400
Household Income (\$m)	Precinct	Industrial	Total
Direct	\$640	\$280	\$920
Indirect	\$380	\$140	\$520
Induced	\$260	\$110	\$370
Total	\$1,270	\$530	\$1,800

To summarise: the *net* economic impacts of the wider airport complex (excluding AIAL but including flow-on effects) are estimated to be:

- \$3.1 billion in regional value added
- 31,400 fulltime equivalent jobs, and
- \$1.8 billion in regional household incomes.

5.10 Summary

This section has estimated the economic impacts of the wider airport complex (excluding the airport company itself). Adding these to the estimated economic impacts

of the airport company suggest that **the overall economic impacts of the airport and associated activities (including flow-on effects) are:**

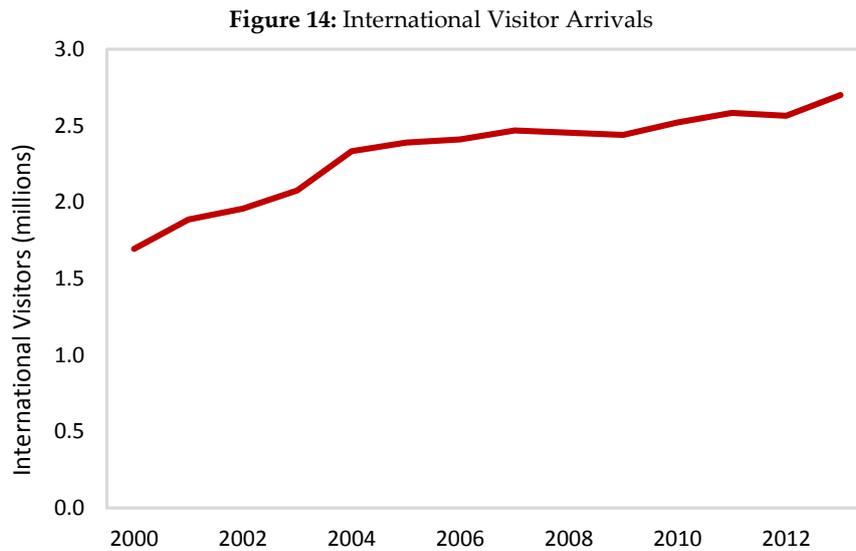
- \$3.5 billion in regional value added
- 33,100 fulltime equivalent jobs, and
- \$1.9 billion in regional household incomes.

6 Airport's Role in International Tourism

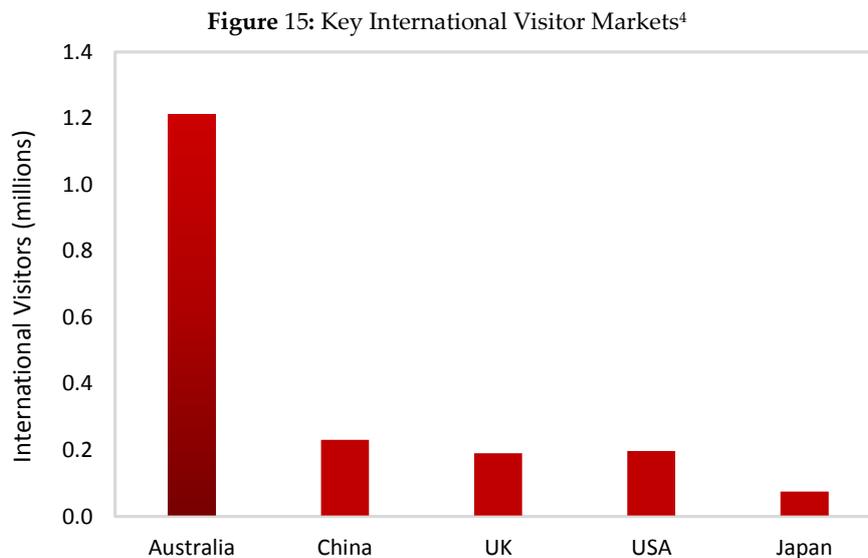
This section briefly describes the size and value of New Zealand's international tourism market, and then explains the airport's role in facilitating it.

6.1 Overview of International Tourism Market

In 2013, 2.7 million international visitors travelled to New Zealand, up from 1.7 million in 2000. This represents a compound average growth rate (CAGR) of 5% per annum. Figure 14 shows the underlying trend.

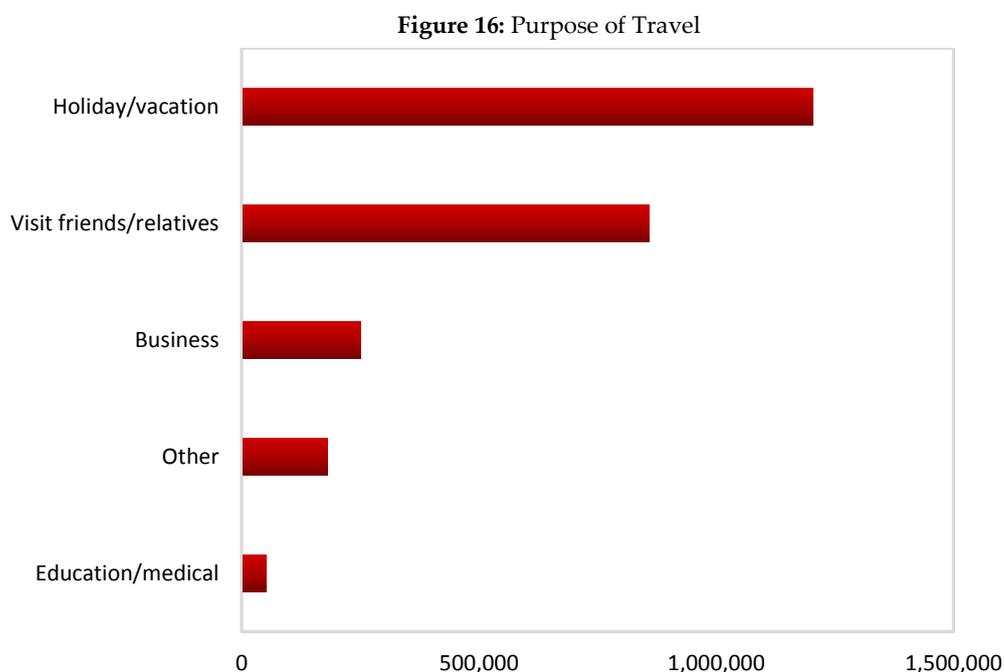


As shown below, Australians dominate international arrivals, followed by visitors from China, the UK, the USA and Japan. Collectively, these five markets accounted for almost 75% of all international visitors last year.



⁴ Key Tourism Statistics, MBIE, 17 January 2014

Figure 16 shows that holidays and vacations are the number one reason international visitors come to New Zealand, followed closely by visits to friends and family. Other common travel purposes include business, education and medical reasons.



6.2 Overall Value of International Tourism to New Zealand

As one of NZ's largest export industries, tourism is one of the leading sources of income and in 2013 contributed almost 9% of national GDP.⁵ Between 2010 and 2013, the direct contribution of tourism to New Zealand's GDP increased by 14.2% - far outstripping growth in the rest of our economy.⁶ The following table shows the core industries that comprise the tourism sector and the direct value added that each derives from it.

Table 15: Core Tourism Industries and their Direct Tourism Value added in 2013 \$m

Tourism-Related Industries	Direct Tourism Value Added \$m	Percentage Shares
Accommodation	787	12%
Food and beverage services	864	14%
Road, rail and water passenger transport	279	4%
Air transport	870	14%
Other transport, transport support, & travel/tour services	695	11%
Rental and hiring services	392	6%
Arts and recreation services	389	6%
Retail trade	887	14%
Education and training	726	11%
All non-tourism related industries	461	7%
Total Industry	6,349	100%

⁵ 17 January 2014, Key Tourism Statistics, MBIE

⁶ 2013 Tourism Satellite Account, Statistics New Zealand

In 2013, 172,100 people were employed directly or indirectly in tourism-related sectors, accounting for 8.8% of national employment.⁷ This has been growing steadily at more than 2% per annum for several years. The following table replicates the table above, but this time shows tourism-related employment across tourism-related industries.

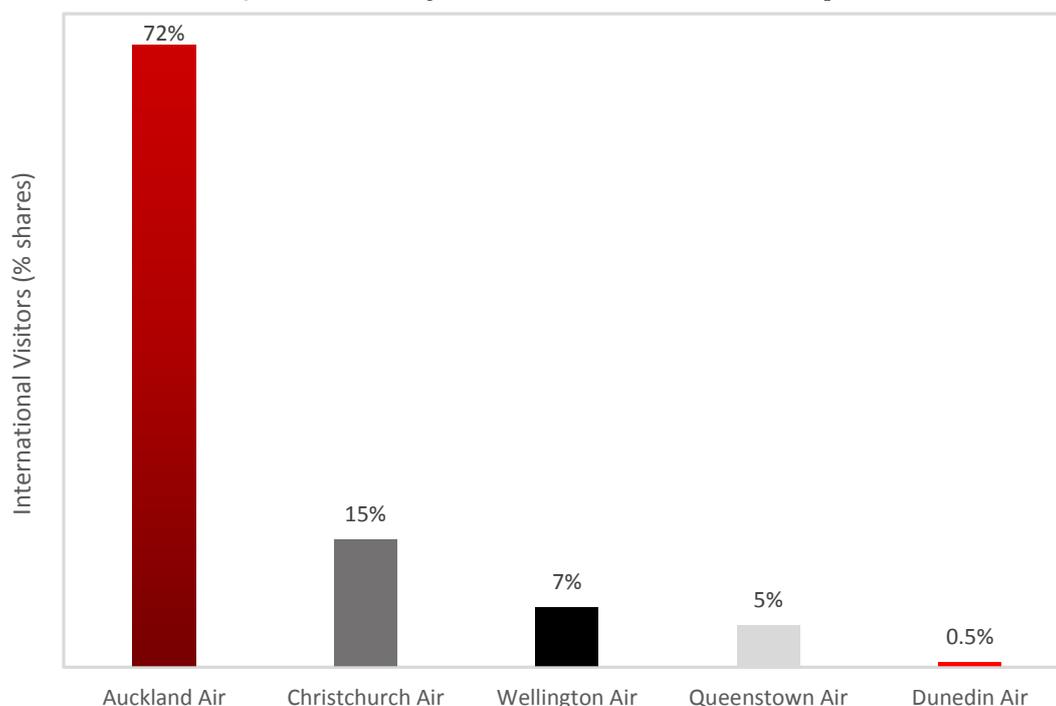
Table 16: Core Tourism Industries and their Tourism-Related Employment in 2013

Tourism-Related Industries	Direct Tourism Employment	Percentage Shares
Accommodation	16,500	16%
Food and beverage services	22,500	21%
Road, rail and water passenger transport	3,200	3%
Air transport	6,900	7%
Other transport, transport support, & travel/tour services	3,800	4%
Rental and hiring services	1,700	2%
Arts and recreation services	4,300	4%
Retail trade	13,400	13%
Education and training	11,600	11%
All non-tourism related industries	21,400	20%
Total Industry	105,400	100%

6.3 Airport's Role in Facilitating International Tourism

As shown in the figure below, around 72% of all international visitors arrival in New Zealand via Auckland International Airport. As a result, Auckland airport plays a major role in generating and sustaining the significant tourism-related economic activity outlined above.

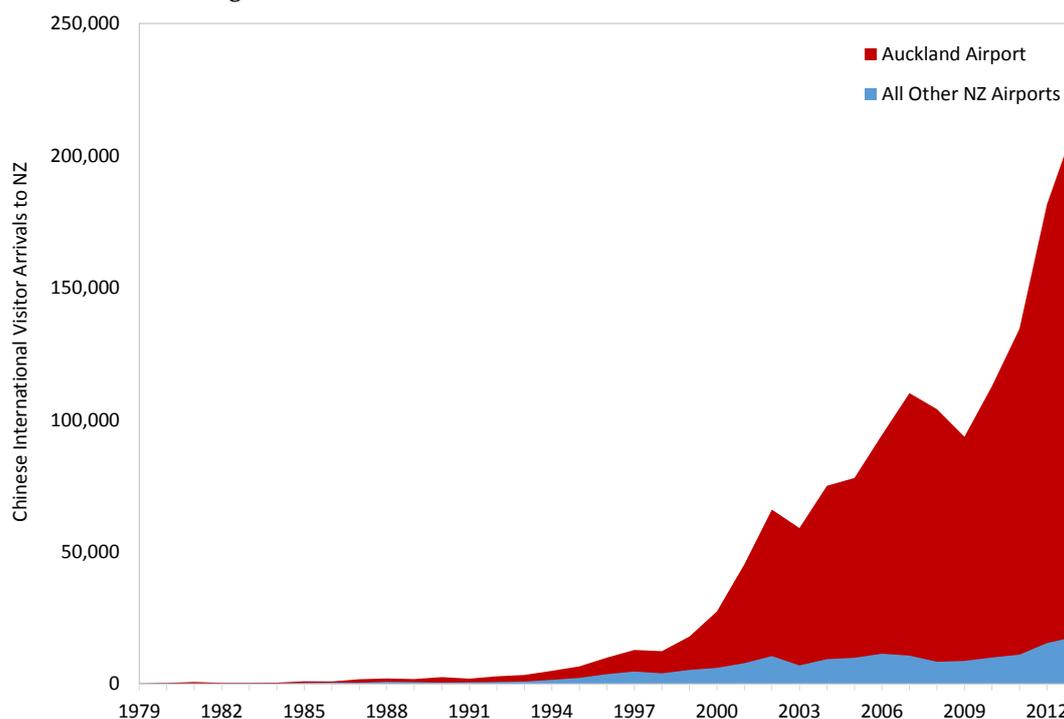
Figure 17: Percentage of International Arrivals at NZ Airports



⁷ ibid

While Auckland airport clearly already plays a significant role in our tourism industry, it is likely to become even more important in future via its association with the Chinese market. As shown above, China is currently the second biggest international visitor market. However, it has grown very rapidly in the last few years, and is expected to do so again in the foreseeable future. In fact, since 2009, Chinese international visitor numbers have grown 126%, which translates to a compound annual growth rate of 23%. Further, as illustrated below, nearly all of these visitors arrived at Auckland Airport.

Figure 18: Chinese International Visitor Arrivals to New Zealand



In addition to being a high-growth market, Chinese visitors are also very high-yielding. For instance, according to official tourism forecasts⁸, Chinese visitors will spend over \$1.2 billion in New Zealand by 2019, or about \$2,700 per person. This is more than double the forecast average spend of visitors from our biggest market, Australia. Further, the airport itself has found that Chinese visitors tend to spend more than two and a half times as much as its terminals as other international visitors.⁹

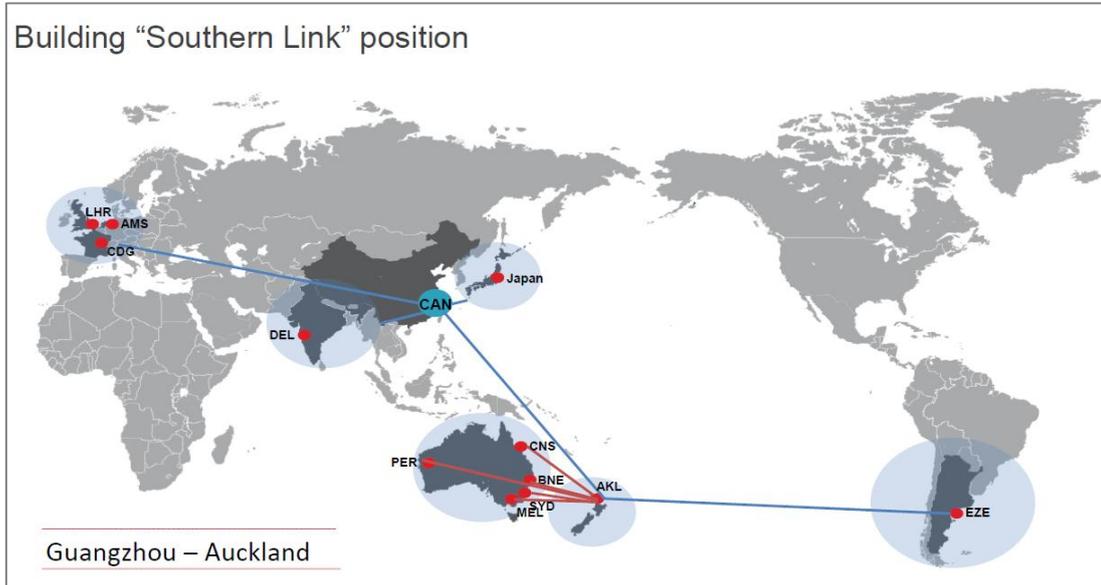
The importance of this market – and the airport’s role in fostering it – reflect a conscious strategy on the part of the airport company. Its recent investor presentation includes a key strategy called “building the southern link position” which (amongst other things) aims to strengthen ties with China. For example, the following diagram from the investor presentation shows potential future ties with Guangzhou airport (CAN), and the impact that they could have on future connectivity with other key destinations.

⁸ Op cit

⁹ Auckland Airport, *Faster, Higher, Stronger 2013 – Investor Day Presentation* (November 2013)

Thus, while Auckland airport is already a key player in New Zealand's tourism market, it is likely to become even more so over time.

Figure 19: Screenshot from the Airport Company Investor Presentation (Nov 2013)



7 Airport's Role in Facilitating Trade

This section assesses Auckland Airport's role in New Zealand's air-trade industry.

7.1 Role of New Zealand's Air Trade Market

Freight services are essential to New Zealand given its remote location relative to the world's consumer and investor markets. While sea freight accounts for a large majority of trade volumes due to its lower cost structure, air-freight still plays a key role in the export of just-in-time and perishable goods that achieve a much higher return than their sea-freight counterparts. In addition, air freight is critical to the movement of goods that are low in weight but high in value. In fact, last year air-freighted goods were worth around 50 times more per kilogram than sea-freighted goods.¹⁰

7.2 Auckland Airport's Market Share

In 2013, Auckland Airport moved 92% of airborne imports and 81% of airborne exports by weight.¹¹ By value, it carried 94% of air imports and 72% of air exports.¹²

7.3 Types of Goods Freightied Via Auckland Airport

The following tables show the top 20 goods imported and exported via Auckland Airport over the three years from 2010 to 2012.

Table 17: Top 20 Imports by Value via Auckland Airport from 2010 to 2012 (\$m)

Type of Goods Imported	Value Imported \$m From 2010 to 2012
Boilers, industrial parts and machinery	6,936
Audio/video parts and machinery	6,112
Medical/optical/photographic parts and machinery	3,090
Pharmaceuticals	2,351
Aircraft machinery and parts	1,241
Gems and precious stones	996
Apparel (non-knitted)	609
Books, newspapers and magazines	598
Knitted apparel	459
Vehicles and vehicle parts (excl trains/trams)	361
Chemical products (not elsewhere stated)	332
Plastics and plastic parts	321
Cosmetics, perfumes and essential oils	303
Toys, games and sports equipment	257
Handbags and other leather goods	195
Iron or steel parts	188
Furniture, bedding etc	179
Clocks and watches (including parts)	178
Works of art	176
Tools, implements, cutlery etc	175

¹⁰ Statistics New Zealand

¹¹ *ibid*

¹² *ibid*

Table 18: Top 20 Exports by Value via Auckland Airport from 2010 to 2012 (\$m)

Type of Goods Exported	Value Exported \$m From 2010 to 2012
Boilers, industrial parts and machinery	3,266
Medical/optical/photographic parts and machinery	1,532
Audio/video parts and machinery	1,511
Gems and precious stones	1,195
Fish and Crustaceans	780
Aircraft machinery and parts	760
Live Animals	486
Pharmaceuticals	451
Apparel (non-knitted)	260
Knitted apparel	245
Plastics and plastic parts	215
Works of art	205
Meat	205
Miscellaneous Food	204
Dairy products, eggs, honey	177
Vegetables	159
Furniture, bedding etc	148
Trees, plants and flowers	123
Fruit and nuts	114
Iron or steel parts	100

The tables above reveal a number of interesting insights about goods moved via Auckland airport. For instance:

1. Both imports and exports are dominated by industrial parts and machinery. These accounted for 23% of all exports and 25% of all imports. Further, between 2010 and 2012, over \$10 billion of these products were moved via Auckland Airport.
2. Other key imports and exports include medical/optical/photographic parts and machinery, audio/video parts and machinery, pharmaceuticals, gems and precious stones. All are examples of high-value, low-weight, time-critical commodities.
3. Overall, imports via Auckland Airport outweigh exports. Specifically, for every dollar of goods exported via Auckland airport, \$1.92 of goods are imported.
4. However, there are some particular goods where exports via Auckland Airport outweigh imports. Specifically, New Zealand exports a lot more food and plant products than it imports, particularly fish, crustaceans, live animals and dairy products.

7.4 Summary

Freight is integral to New Zealand's productivity and represents a multi-billion dollar industry. Auckland Airport has secured a dominant market share of the air-freight industry, which is dominated by high-value/low-weight/time-critical goods. As such, Auckland Airport will continue to be the key player in this important industry into the foreseeable future.

8 Wider Strategic/Economic Benefits

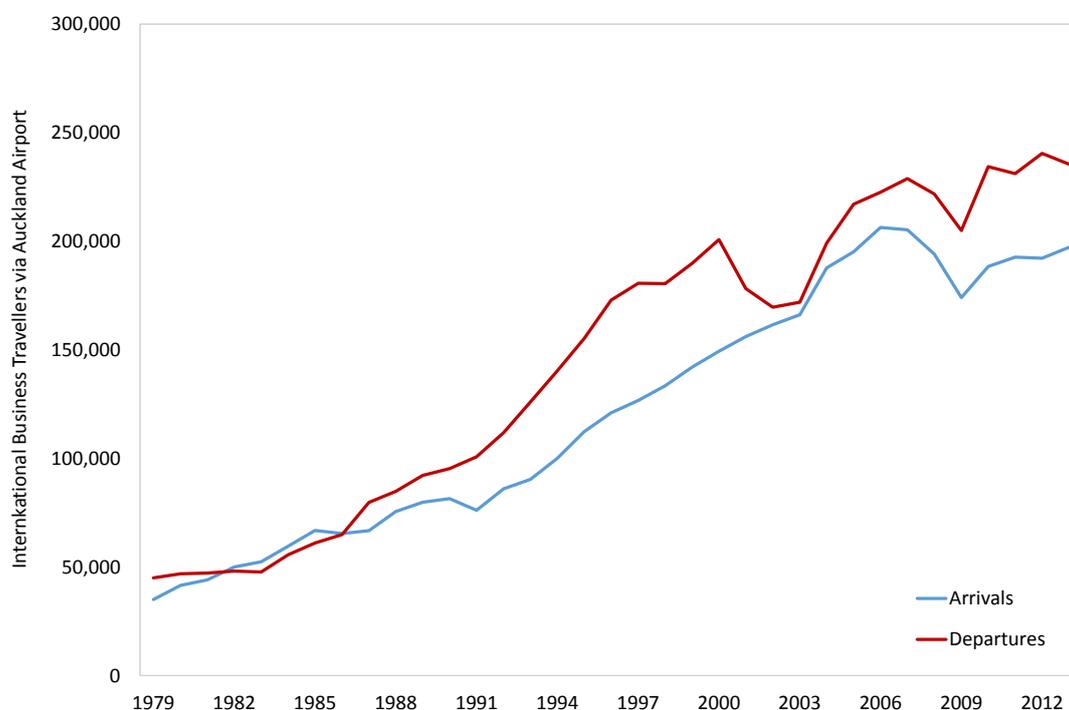
This section briefly lists a number of other key strategic and economic benefits provided by Auckland airport.

8.1 Fostering and Maintaining Business Relationships

One of the most important benefits of air travel – over and above those already discussed – is the ability to foster and maintain business relationships. Indeed, while technologies such as videoconferencing can be useful, many companies still consider face-to-face contact important for winning business. For instance, a recent survey¹³ of over 2,200 business people found that 87% rate face-to-face meetings as essential for securing new business and 95% agreed that such meetings are critical to building long-term relationships. Further, more than half said that restrictions on the numbers of flights they take for work would hurt their business.

As one might expect, Auckland airport accounts for a significant share of business related international (and domestic) travel. In fact, in 2013 Auckland airport accounted for 76% of international business arrivals, and 82% of international business departures. The graph below shows the trend in international business travellers via Auckland airport since the late 1970s.

Figure 20: International Business Travellers via Auckland Airport



¹³ *Managing Across Distance in Today's Economic Climate: The Value of Face-to-Face Communication*, Harvard Business Review Analytic Services for British Airways, 2009: <http://tinyurl.com/7h8nrqg>

8.2 Wider Benefits of Increased Connectivity

In addition to fostering business relationships and enabling tourism and trade, increased connectivity provided by modern airports delivers a range of other benefits. This point was neatly summarised in a recent report on the benefits of air trade by the Air Transport Action Group (ATAG)¹⁴, which noted:

“Arguably, the largest economic benefit of increased connectivity comes through its impact on the long-term performance of the wider economy through enhancing the overall level of productivity. A rise in productivity in firms outside the aviation sector comes through two main channels: through the effects on domestic firms of increased access to foreign markets and increased foreign competition in the home market; and through the freer movement of investment capital and workers between countries.

Improved connectivity:

- opens up new markets and boosts exports while at the same time increases competition and choice in the home market from foreign-based producers, encouraging firms to specialise in areas where they possess a comparative advantage;*
- can drive down costs and prices for firms that have a comparative advantage (such as innovative products and services), benefiting domestic consumers in the process;*
- opens domestic markets to foreign competitors, which can also be an important driver for reducing unit production costs, either by forcing domestic firms to adopt best international practices in production and management methods or by encouraging innovation;*
- can benefit domestic customers through competition by reducing the mark-up over cost that firms charge their customers, especially where domestic firms have hitherto enjoyed some shelter from competition.”*

Further, the report notes:

“Improved connectivity can further enhance an economy’s performance by making it easier for firms to invest outside their home country, which is known as foreign direct investment (FDI). FDI necessarily entails some movement of staff: whether for technical know-how, management oversight, or servicing and meeting customers. Increased connectivity also allows firms to exploit the speed and reliability of air transport to ship components between plants in distant locations, without the need to hold expensive stocks of inventory as a buffer. Less tangibly, but just as important, improved connectivity increases passenger traffic and trade. This, in turn, can lead to a more favourable environment for foreign firms to operate in — greater links to the outside world often drive a more conducive global business environment.”

Indeed, ever-increasing global connectivity is a major catalyst for economic growth, which in turn can help improve quality of life for the world’s population.

¹⁴ Aviation – Benefits beyond borders. Report by Oxford Economics to the Air Transport Action Group, March 2012. Available here: <https://www.iaa.ie/media/aviationbenefitsbeyondborde.pdf>

8.3 The Airport as a Major Growth Node

As shown by the analysis in section 5, the area around the airport is home to a large number of businesses, many of which are airport-related. However, what is not clear from that section is the significant rate of growth that has occurred in the vicinity of the airport over recent times.

To illustrate this point, we obtained detailed building consent data by census area unit (CAU) back to 1999 for the whole of New Zealand. The file, which contains over 430,000 rows of data, shows that the Mangere south CAU (which encapsulates the airport) experienced the highest rate of non-residential floorspace growth of all CAUs in New Zealand. In fact, consents for more than 800,000m² of new non-residential floorspace were granted during that period, as summarised in the table below. This was 48 times higher than the average rate of growth across the remaining 1,800 or so CAUs in New Zealand.

Table 19: Consents for New Floorspace in the Mangere South CAU since 1999

Building Types	New Floorspace m²
Educational Buildings	12,099
Factories and Industrial Buildings	68,820
Hotels/Motels etc	22,273
Offices, Administration Buildings	129,870
Shops, Restaurants, Taverns	15,468
Social, Cultural, Religious	6,339
Storage Buildings	551,699
Total	806,568

Clearly, the general area around the airport has been a major growth node over the last 10 to 15 years, and this is expected to continue. For instance, the airport notes that it has between 300 and 400 hectares of land available for commercial development, and that this will be a major focus going forward.

To capitalise on the opportunities that lie ahead, the airport has adopted a place-based strategy.¹⁵ This seeks to move away viewing from developments as simply a collection of projects toward a range of interventions that foster a community feel. These interventions include:

- Landscape entrance features and connections
- Amenities such as playing fields, playgrounds, and mountain bike trails
- Landmark buildings, and
- Events

As a result, the airport is likely to be a very significant node of future economic activity.

8.4 Direct Customer Benefits

Like most businesses, one of the key benefits provided by the airport and related activities are those accruing to its customers. In economics, these customer benefits are

¹⁵ Auckland Airport, *Faster, Higher, Stronger 2013 – Investor Day Presentation* (November 2013)

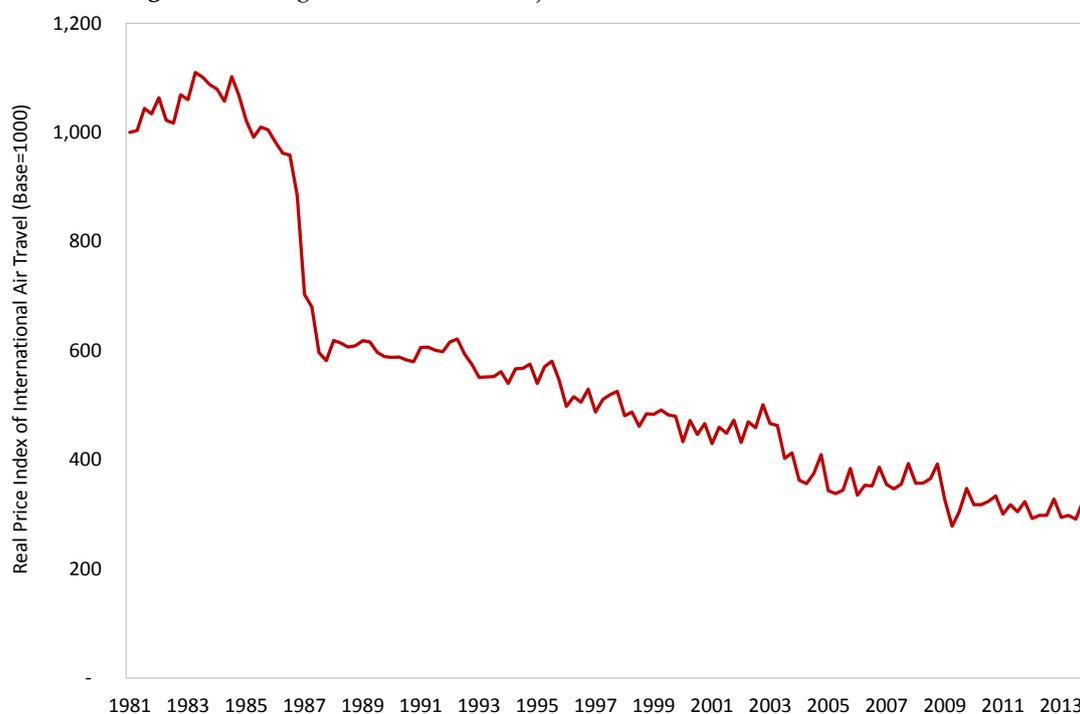
measured by the corresponding consumer surplus. Simply put, the consumer surplus equals the difference between what a consumer would have been willing to pay for a good or service, and what they actually pay. For instance, if someone pays \$100 for a pair of jeans but would have been willing to pay \$200, the consumer benefit/surplus is \$100.

Unfortunately, measuring the consumer surplus for a particular commodity or industry can be fraught with difficulty, usually because consumer willingness to pay is unknown. However, a recent study by Oxford Economics in the UK suggested that the consumer surplus for aviation was about a third of the airfare.

Now, according to the New Zealand Household Expenditure Survey 2013, households spent over \$1.5 billion on airfares last year. Further, according to the Tourism Satellite Account, businesses and the Government spent a further \$1.5 billion, bringing total expenditure on airfares to about \$3 billion. Assuming – as per the Oxford Economics analysis – that consumer benefits equal a third of airfares, this translates to annual consumer benefits of around \$1 billion in 2013.

While this estimate is clearly significant, future benefits are likely to be even larger as incomes rise and the costs of international air travel fall, making travel more affordable. In fact, as shown in the graph below, the real (inflation-adjusted) price of international airfares in New Zealand have fallen more than 65% over the last 30 years. As this trend continues, more and more people will reap the benefits of international air travel.

Figure 21: Changes in the Inflation-Adjusted Cost of International Travel for NZ



Further, as Auckland (and New Zealand's population) continues to grow, the resulting critical mass will make a larger number of city-pair routes economic, meaning that

direct flights to a greater range of destinations will likely be available in future. This, in turn, will reduce travel times and costs, providing further consumer benefits.

8.5 Economic Impacts of Future Capital Expenditures

According to the airport's latest investor presentation (dated November 2013), it intends to spend around \$2.4 billion on core infrastructure over the next 30 years. These expenditures will create significant economic impacts over and above those of the airport's daily operations, which were analysed in depth earlier in this report.

To estimate the indicative regional impacts of these expenditures, we again used multiplier analysis. The following table shows the estimated impacts on the Auckland region.

Table 20: Indicative Impacts of Future Capital Works

Impact Measures	Direct	Indirect	Induced	Total
Value-Added (\$m)	\$410	\$1,090	\$560	\$2,060
Employment (FTEs)	5,710	16,110	6,000	27,820
Household Incomes (\$m)	\$320	\$790	\$270	\$1,380

In summary, including flow-on effects, the airport's future capital works programme could boost regional:

- GDP by \$2 billion,
- Employment by 27,800, and
- Household incomes by \$1.4 billion.

It is also worth noting that these capital expenditures are unlikely to feature much (if any) public funding. This self-sufficiency is in direct contrast to other forms of public transport, such as rail and buses, where operating and capital costs are all heavily subsidised. Thus, not only will future capital works provide significant economic benefits, but they will also not create any fiscal strain on the Government.

8.6 Contribution to Taxes and Council Rates

The airport company is a major contributor to both local and central Government finances via its rates and tax payments. For example, during the financial year ended 30 June 2013, the airport paid over \$58 million in corporate income tax and a further \$5 million or so in Council rates.

8.7 Convenience and Social Inclusion

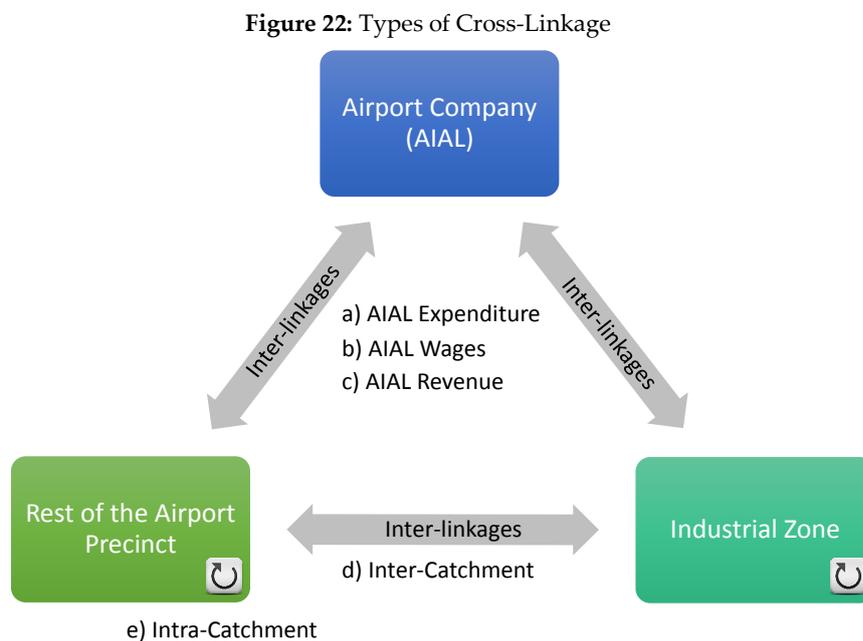
Large international airports like Auckland Airport provide direct convenience benefits by reducing the length of surface commutes required to access air services. In doing so, they improve connectivity and improve quality of life. Without air services, remote areas (such as NZ) would be denied easy and continued participation in the modern world, and hence reduce social inclusion. The provision of well-connected airports, on the other hand, improves social inclusion and strengthens social fabric.

Appendix 1: Detailed Cross Linkage Analysis

In section 5, we estimated the economic impacts of the wider airport complex. Part of that included identifying and removing double counts caused by inter- and intra-linkages. This appendix documents our assumptions for that aspect of the analysis in more detail.

A1:1 Nature of the Problem

This report estimates the regional economic impacts of both the airport company itself, plus two other business areas nearby (the airport precinct and the industrial zone). Figure 22 depicts these and shows the various cross-linkages between and within them.



As shown above, the analysis accounts for five types of cross linkage, namely:

- f) **AIAL company expenditures** – these occur when the airport company purchases goods and services from other businesses in the airport complex.
- g) **AIAL wages** – these occur when the airport company’s employees purchase goods and services from other businesses in the airport complex.
- h) **AIAL revenues** – these occur when the airport company sells goods and services to other businesses in the airport complex.
- i) **Inter-catchment linkages** – these occur when businesses in the airport precinct purchase goods/services from businesses in the industrial zone, and vice versa.
- j) **Intra-catchment linkages** – these occur when businesses in the airport precinct purchase goods/services from one another (and similarly for businesses within the industrial zone).

The rest of this appendix explains how we estimated the size of each effect so that it could be removed from the analysis.

A1:2 AIAL Company Expenditures

To remove double counts associated with airport company expenditures, we needed to estimate what proportion of each expenditure line item represented turnover for other firms in the wider airport complex. The following table shows our assumptions.

Table 21: Airport Company Expenditures Allocated To Firms Nearby

Expense	% Spent in Mangere
Postage & courier	80%
R&M Marine vessels	75%
Staff training & travel	50%
Other personnel costs	20%
Staff functions & awards	20%
Staff recruitment	20%
Asset disposals	20%
Commission paid	20%
Directors fees & expenses	20%
Research & Maintenance	10%
Fire protection	5%
Fuel	4%
Cleaning	3%

Applying these assumptions to the airport's expenditure line items resulted in the turnover of other nearby firms reducing by \$1.4 million.

A1:3 AIAL Company Wages

Just as the airport company itself spends money in the wider airport complex, so too will its employees. For this part of the analysis, we assumed that 10% of employee purchases occurred in the wider airport complex. This resulted in the turnover of nearby firms reducing by \$1.6 million.

A1:4 AIAL Company Expenditures

Some of the airport's revenue will be obtained from businesses in the local area. In this case, the indirect effects of these downstream industries has already been counted in the direct impacts of the airport company itself. To remove this double-count, we needed to determine how much of the airport's revenue was derived from nearby. To this end, we assumed that the airport would not derive any revenue from businesses in the nearby industrial area (Ascot industrial park and surrounds). Rather, any revenue derived from nearby businesses would come from others within the airport precinct itself.

The following table shows the share of each airport company revenue item assumed to come from other businesses in the airport precinct.

Table 22: AIAL Revenue Captured from Rest of the Airport Precinct

Turnover Item	Turnover	% from Precinct	\$ from Precinct
Airfield Income	\$81,572,874	10%	\$8,157,287
Passenger Services Charge	\$120,242,306	0%	\$0
Retail Income	\$124,308,084	0%	\$0
Car rental - office	\$252,448	100%	\$252,448
Car rental storage	\$67,108	100%	\$67,108
Counter rentals	\$2,715,019	100%	\$2,715,019
Food and beverage revenue	\$44,910	100%	\$44,910
Other hotel income	\$44,423	100%	\$44,423
Rooms revenue	\$2,729,128	100%	\$2,729,128
Transport other	\$1,961	100%	-\$1,961
Rates Recoveries	\$4,179,585	100%	\$4,179,585
Car Park Income	\$40,369,631	0%	\$0
Interest Income	\$16,535,673	0%	\$0
Other Income	\$20,492,298	0%	\$0
Transport License Fees	\$6,038,327	0%	\$0
Rental income	\$49,552,055	100%	\$49,552,055
Total Turnover	\$469,145,830		\$67,743,925

This turnover translated to \$36 million of value-added, 253 FTEs and \$12 million of household incomes, all of which was removed from the indirect impacts of firms in the airport precinct.

A1:5 Inter-Catchment Double-Counts

Firms in the industrial zone may purchase goods from firms in the airport precinct, and vice versa, again resulting in double-counts. Since it was impossible to undertake a detailed survey of these interdependencies, we instead assumed that 10% of all revenues earned the airport precinct were derived from businesses in the industrial zone, and vice versa.

While the analysis was fairly sensitive to this assumption, 10% is conservatively large. In reality, many firms will derive very little (if any) revenue from firms nearby, making 10% a sensible upper limit on this assumption.

The result of this step was to remove \$373 million of turnover (and its associated impacts) from the analysis.

A1:6 Intra-Catchment Double-Counts

The final step was to remove double counts caused by interactions *within* the airport precinct and industrial area because the indirect impacts of the upstream firm are also counted in the full impacts of the downstream firm. Again, it was impossible to survey all firms to determine the location of their customers, so some high-level assumptions were made. As a result, \$54 million of direct value added, 875 FTEs and \$37 million of household incomes were removed from the estimated impacts of the wider airport complex.

A1:7 Overall Extent of Double Counts Removed

The following table shows the extent of economic impacts removed from the analysis as a result of the steps above. These are considered to be highly conservative. In other words, these are believed to significantly overstate the true extent of any double counts, but have been used to ensure that the resulting net impacts for the wider airport complex are not overstated.

Table 23: Double-Counted Impacts Removed

Value Added (\$m)	Precinct	Industrial	Total
Direct	\$140	\$80	\$220
Indirect	\$113	\$28	\$142
Induced	\$61	\$25	\$86
Total	\$314	\$133	\$448
Employment (FTEs)	Precinct	Industrial	Total
Direct	1,726	628	2,354
Indirect	1,309	246	1,555
Induced	667	207	873
Total	3,702	1,081	4,783
Household Income (\$m)	Precinct	Industrial	Total
Direct	\$104	\$40	\$144
Indirect	\$56	\$15	\$72
Induced	\$29	\$12	\$40
Total	\$189	\$68	\$256

Appendix 2: Detailed Airport Activity Shares

Following are the detailed airport share allocations underlying table 10 on page 20.

Table 24: Detailed Airport-Related Employment/Activity Shares

6 Digit ANZSIC Industries	Precinct Employees	Airport Share	Industrial Employees	Airport Share
Accommodation	150	80%	305	80%
Air and Space Transport	3,739	100%	27	100%
Aircraft Manufacturing and Repair	1,250	100%	25	100%
Airport Operations and Support Services	780	100%		
Ambulance Services	12	80%		
Amusement and Other Recreation	6	80%	15	80%
Cafes and Restaurants	286	40%	36	40%
Catering Services	595	80%		
Central Government Administration	420	100%	3	100%
Child Care Services	30	50%	35	50%
Clothing Retailing	45	50%	21	50%
Corporate Management Services	100	50%	120	50%
Courier Pick-up and Delivery Services	490	100%		
Customs Agency Services	3	100%	170	100%
Department Stores	75	50%		
Electrical Services	6	50%	50	50%
Employment Services	35	25%	140	25%
Fish and Seafood Wholesaling	6	50%		
Flower Retailing	6	80%		
Freight Forwarding Services	210	100%	2,126	100%
Fuel Retailing	18	80%		
Investigation and Security Services	420	100%	27	100%
Newspaper and Book Retailing	55	100%		
Other Agricultural Product Wholesaling	3	50%	39	50%
Other Electrical Goods Wholesaling	3	50%	82	50%
Other Industries	285	0%	3,887	0%
Other Personal Accessories Retailing	15	20%		
Other Public Order and Safety Services	200	100%		
Other Specialised Food Retailing	28	25%	50	25%
Other Store-Based Retailing n.e.c.	540	40%	45	40%
Other Transport n.e.c.	12	80%	9	80%
Other Transport Support Services n.e.c	29	90%	53	90%
Other Warehousing and Storage	95	50%	480	50%
Parking Services	80	80%	135	80%
Passenger Car Rental and Hiring	210	100%	385	100%
Petroleum Product Wholesaling	30	100%	24	100%
Pharmaceutical & Toiletries Wholesaling	3	50%	112	50%
Pharmaceutical and Toiletries Retailing	3	80%		
Postal Services	250	100%	15	100%
Professional & Scientific Wholesaling	6	50%	30	50%
Pubs, Taverns and Bars	50	50%	6	50%
Regulatory Services	26	50%	6	50%
Road Freight Transport	60	50%	575	50%
Seafood Processing	9	80%	9	80%
Sports and Physical Recreation Venues	15	50%		
Supermarket and Grocery Stores	65	50%		
Takeaway Food Services	60	50%	15	50%
Technical and Vocational Training	9	80%	24	80%
Travel Agency Services	25	100%	6	100%
Waste Treatment and Disposal Services	25	50%		
Zoological and Botanic Gardens	18	80%		

Appendix 3: Airport Share Sensitivity Testing

As noted in the body text, an important part of the analysis was to estimate the share of surrounding economic activity that was truly airport related (as opposed to merely being located nearby). We used a range of information to arrive at our estimated shares, erring on the side of lower shares wherever uncertainty existed to ensure that the resulting impact estimates were conservative. For the sake of transparency, however, we now show the sensitivity of the results to changes in these assumptions. Specifically, we show the impact of increasing or decreasing each allocation by plus or minus 10 percentage points.

Table 25: Sensitivity of Airport Complex Impacts to Assumed Airport-Related Shares

Output	-10%	Baseline	+10%
Value Added (\$m)	\$2,730	\$3,090	\$3,320
Employment (FTEs)	28,000	31,400	32,800
Household Incomes (\$m)	\$1,590	\$1,800	\$1,940

As we can see in the table above, the results are somewhat sensitive to changes in these assumptions but not overly so. If anything, they reinforce the importance of erring on the lower side wherever possible, which was our default approach.