

# PROPERTY ECONOMICS



**POTENTIAL ECONOMIC  
IMPACTS OF OPERATIONAL  
CONSTRAINTS ON  
CHRISTCHURCH AIRPORT**

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### CONTACT DETAILS

Phil Osborne

Mob: 021 557702

Email: [phil@propertyeconomics.co.nz](mailto:phil@propertyeconomics.co.nz)

Web: [www.propertyeconomics.co.nz](http://www.propertyeconomics.co.nz)



## TABLE OF CONTENTS

|  |    |
|--|----|
| 1. INTRODUCTION.....   | 4  |
| 2. CHRISTCHURCH INTERNATIONAL AIRPORT OPERATIONS .....                           | 5  |
| 2.1. LAND USE ACTIVITIES AND NOISE CONTOURS.....                                 | 6  |
| 2.2. CHRISTCHURCH INTERNATIONAL AIRPORT ECONOMIC SIGNIFICANCE...                 | 6  |
| 2.3. FREIGHT .....   | 7  |
| 2.4. PASSENGERS.....   | 7  |
| 2.5. EMPLOYMENT.....   | 8  |
| 3. CONTRIBUTION TO REGIONAL AND DISTRICT PROSPERITY AND ECONOMIC WELLBEING ..... | 9  |
| 4. POTENTIAL IMPACTS ON AIRPORT OPERATIONS AND ECONOMIC CONTRIBUTION .....       | 11 |
| 5. POTENTIAL ECONOMIC RISKS TO CIA OPERATIONS AND THE SOUTH ISLAND ECONOMY ..... | 13 |



## 1. INTRODUCTION

The purpose of this assessment is to provide understanding of the potential economic impacts associated with other land use activities within Christchurch International Airport (CIA) noise contours.

These impacts are based on an assumption that by providing for more noise sensitive activities under these contours the level of community annoyance will increase. International examples would suggest that this has the potential to lead to restrictions on the airport's activities, either through the intensity or scheduling of these activities.

This economic report provides an understanding of the level and extent of economic activity within Christchurch and the South Island that would be placed 'at risk' under an example of airport constraint.

For the purpose of this report a curfew has been assessed ranging from 11pm to 7am (internationally a typical curfew). The report assesses the potential level of economic impact by providing an unconstrained (without additional airport restrictions) and a constrained position relating to impacts on the airport's future operation potential, and by association the economic activity contributed to the City and wider community.



## 2. CHRISTCHURCH INTERNATIONAL AIRPORT OPERATIONS

Christchurch International Airport is the second largest airport in New Zealand and represents a nationally and strategically significant infrastructure asset supporting national accessibility for passengers and business that supports economic well-being well beyond the borders of both the Canterbury Region and the South Island.

The operation and importance of CIA goes beyond national and international passenger transportation and includes:

- Air freight and Mail
- Antarctic Operations
- Disaster response and recovery
- Helicopters
- Flight Training
- Maintenance
- Significant business location

It also plays a part in providing for flights that are unable to land elsewhere in New Zealand due to delays and other operational restrictions.

There are several unique aspects to CIA and its location in the roles it provides:

- Largest and most strategically important airport in the South Island
- Internationally placed for access, and providing capacity for operations to Antarctica
- The second longest runway in the country (providing the only runway capable of catering for wide bodied aircraft)
- CIA is also the second busiest airfreight port in the country
- There is no current curfew with CIA operating 24 hours, 7 days a week.

These roles require substantial and long term infrastructure and capital provision, between 2014 and 2019 CIAL invested circa \$600m in new capital expenditure with the majority of this investment provided to support freight and logistics growth.

CIA plays a vital role in both the regional and national economies, facilitating freight and passenger movements directly to Australia, China, Singapore, Hong Kong and the Pacific Islands. Its function also goes beyond its own direct operations and includes safeguarding other airports such as Auckland when acting as an alternative if aircraft are unable to land there. This in itself provides improved competitiveness for the New Zealand air transport market.

## 2.1. LAND USE ACTIVITIES AND NOISE CONTOURS

Aircraft noise is recognised as one of the most significant issues faced by airports today. While improved technologies have made plane engines quieter, there is an increasing conflict between aircraft noise, which is an unavoidable outcome, and urban populations.

CIA is no exception to the pressures and effects that arise from this conflict. CIAL's approach to managing noise effects and community pressure is through land use planning and management. CIAL seeks to avoid strict abatement or operational restrictions as these risk curtailing Airport operations.

The result, in terms of planning, has been the development of clear noise contour maps identifying the extent of noise and the potential to impact upon noise sensitive land use activities. Activities under the Airport Noise Contours are controlled, to varying degrees depending on their level of compatibility, to limit the effects of noise on the community and at the same time safeguard the critical CIA operations.

## 2.2. CHRISTCHURCH INTERNATIONAL AIRPORT ECONOMIC SIGNIFICANCE

One of the three key objectives of the New Zealand Civil Aviation Authority is, 'A vibrant aviation system is one that makes a strong contribution to the wellbeing of New Zealanders, through enabling quality of life, and supporting a strong economy.'

In order to have regard for the benefits of facilitating the efficient operation of CIA, it is necessary to recognise the significance that its operation has to the regional economy. CIA fulfils an extremely important and unique role for the Canterbury regional and South Island communities. It serves, not only as a significant employer for the region, but also as a conduit for visitors and commerce into the region and the wider South Island.

The Canterbury Regional Policy Statement explicitly recognises the significant contribution of CIA specifically in relation to land use activities, which demonstrates the priority given to protecting the efficient operation and use of CIA. In particular, the CRPS requires that new development only be provided for if it doesn't affect the efficient operation, use, development, upgrading and safety of existing strategic infrastructure.

In assessing the significance of CIA, it is important to distinguish between the types of impacts the Airport's presence and operations has on the economy. There are essentially four categories of impacts and benefits attributable to this facility:

1. **Direct Benefits:** economic impacts (benefits) derived from the actual spending / expenses incurred through the operations of CIA.
2. **Indirect Benefits:** increased activity brought about by those firms and their employees, who supply CIA and its operations
3. **Induced Benefits:** are measured in terms of the additional income that will be spent in the area due to increased business activity through those directly or indirectly employed through CIA operations
4. **Catalytic Benefits:** activity that is facilitated by CIA operations such as tourism, trade (businesses operating through imports or exports). This is the likely overall impact on the economy of not having CIA present.

### 2.3. FREIGHT

Given the expansion of high value goods in a modern economy the influence of an efficient, competitive international airport is as crucial as a modern seaport or an efficient road network. For example, in 2019 CIA moved (via both exports and imports) approximately 5,952 tonnes of manufactured goods (20% of total tonnes moved in New Zealand) valued at over \$3.5b. This value was a major contributor to both the Region and the South Island, as a whole materially contributing to the total economic contribution found in the following section.

The ownership of national airports has, until recent times (primarily post-1980), been held in the public's hands due to their importance and economic significance. While the increasing need for efficiencies has resulted in privatisation of the industry, CIA has maintained public ownership. CIA's current, and the historic dominance of, public ownership at national airports illustrates:

- Recognition of airports significant economic contribution; and
- Recognition of operational 'externalities', that the 'public good' generated by airports far outweighs its own operational costs and benefits.

CIA plays a fundamental role in the shipping of goods from a much wider area and therefore is critical to the economic and social well-being of all residents within the South Island. The presence and efficient operation of CIA enables the Canterbury region as a whole, and the districts that make up this area, to maintain a competitive environment for economic development as well as enhancing residents' quality of life through access to these services.

CIA is responsible for exporting over \$3b of cargo a year<sup>1</sup> to other ports. This in itself has huge positive flow-on effects through the rest of Canterbury's economy with 'off' airport jobs such as storage and transportation directly linked to these volumes. The ability of CIA to move these large valuable cargos is vital for Canterbury, and in fact the South Island to remain competitive in the location of large, high value exporters and manufacturers.

CIA operates in a relatively unique environment within the aviation sector internationally in that it is a slot taker. CIA relies on this ability to function effectively and with a competitive advantage as it allows CIA to facilitate the passage of freight planes over periods of time that allow the continual movement of goods throughout the world.

This advantage has seen significant growth in exports and imports in the pre-Covid period of 2014 to 2019 by 100% and 150% respectively.

### 2.4. PASSENGERS

In 2019 CIA catered for over 10,800 international passenger flights. Subsequently, with the onset of COVID-19, this number reduced to less than a thousand in 2021. By 2027 however, CIA expects these numbers to be re-established

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<sup>1</sup> 2019





catering for an increasing number of international passengers to Christchurch and the South Island. By 2031 total passenger numbers are expected to have grown from 7 million (in 2019) to just under 8 million passengers.

Visitors originating at the airport bring with them over \$1b to the region with significant flow on effects from this spending. Although it is challenging to pinpoint how far reaching the economic impacts are for the presence of the airport it is clear that the current and future functionality of CIA is key to not only the Canterbury economy but to that of the whole South Island. The level of functionality is also key for CIA due to its position both in the freight chain for New Zealand but also for the Airport as a slot taker for passenger movements and the associated potential for visitor numbers.

The 'off' airport benefits to the region relate to those generated by activities that do not take place at the airport itself. Over 50% of visitor to the Canterbury Region arrive via CIA (as measured by Tourism Research Council NZ).

## 2.5. EMPLOYMENT

As an entity Christchurch Airport directly employs over 200 people generating \$187m<sup>2</sup> in revenue. While this alone would identify the business among Canterbury's largest business contributors, the economic activity facilitated makes it one of the largest single contributing strategic assets in the South Island.

Additionally, over 7,000 Employment Contributions (EC's)<sup>3</sup> are accommodated within the airport campus, making it one of, if not the, largest employment centres in the South Island. As identified in the following section, the level of economic activity supported through CIA creates over 28,000 jobs regionally.

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<sup>2</sup> 2020

<sup>3</sup> *Statistic New Zealand Employment Count*



### 3. CONTRIBUTION TO REGIONAL AND DISTRICT PROSPERITY AND ECONOMIC WELLBEING

While the level of both passenger and freight numbers has fallen sharply over the last 2 years (with Covid) the number of commercial aircraft movements is expected to rebound strongly over the next 10 years. Projections from CIAL indicate the recovery of international flight movements by 2027. The reliability and ability for CIA to meet future growth demands is critical to attracting and locating to the region many national and international businesses that would not otherwise situate themselves in Canterbury.

It is not only imperative that the ability for CIA to grow efficiently is protected, but that such certainty is expressed to the market. Given the pivotal role CIA plays in the regional economy even a small level of risk or uncertainty in terms of efficient ongoing operation and development would likely derogate from investment.

Facilitating and safeguarding potential growth at CIA is not just in the interest of CIAL but has a vital flow-on benefit to the whole community. The key to this activity is that it is, for the most part, unique and is unlikely to be replicated by the market elsewhere. The demand for flights and the volume required to service this demand reduces the potential for any reduction in CIA operations to be accommodated elsewhere in the South Island. Where businesses are unable to access critical, reliable and fast transportation, there will be pressure to move to areas that can supply these efficient transport links. This is likely to result in two potential outcomes, firstly, it may result in inefficient transportation options resulting in a less competitive environment for businesses in Christchurch and the South Island, and secondly it will result in the loss for some businesses which relocate out of the Canterbury Region and the South Island.

In 2012 it was estimated that CIA contributed \$2.13b to the regional economy, by 2017 this figure had risen to \$2.6b<sup>4</sup>. Over the next 3 years (to pre-Covid year ended March 2020) with growth passenger numbers as well as a continued regional growth in higher value-added production this figure is estimated at \$3.02b per annum.

To place this figure into context the largest contributing sector to the regional economy, Manufacturing, generated \$4.1b over the comparable period (with the only other sector contributing more being Construction at \$3.3b). It is also important to note that both of these sectors remain reliant of the facilitation of the Airport both for associated inputs and overall demand generation.

The contribution to GDP from CIA supports 28,625 jobs (ECs) within the region, constituting over 10% of Canterbury's employment. In terms of its wider economic significance, CIA contributes \$4.76b (7%) to South Island GDP.

Airports have always represented significant economic assets in any economy, from large cities to smaller tourist dependent locations. In more recent times, airports have widened the scope of their activities, driving locational

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<sup>4</sup> "Making Sense of the Numbers, Christchurch International Airport Economic impact assessment" Berl, December 2017

competitiveness for essential business activity. CIA is now a critical transportation link for a number of regional and South Island businesses.

A study in 2012<sup>5</sup> by the Air Transport Action Group (“ATAG”) found that 25% of all companies’ sales are dependent on air transport, while 70% of businesses reported that serving a bigger market is a key benefit of using air services. With \$3 trillion dollars of economic activity (*GDP*) generated by this industry globally the competition is fierce.

On top of the significant direct, indirect and induced economic impacts CIA has on the region there are two key benefits that are gaining increased prominence: Connectivity and Productivity.

A recent international survey has shown that 18% of businesses reported a lack of good air links had affected their location decisions, with 59% choosing alternative locations and 23% choosing not to make an investment. While a study undertaken by Oxford Economics<sup>6</sup> indicated a clear relationship between connectivity and productivity. It was estimated that a 10% increase in connectivity would lead to a 0.07% increase in annual GDP.

In summary the contribution made by the Christchurch Airport to the local economy includes:

- A regional contribution of over \$3b per annum;
- Growth over the past 9 years of over nearly \$1b to regional GDP;
- In 2020<sup>7</sup> the Airport created over 28,000 regional jobs;
- Over \$1.5b worth of goods were transported through CIA in 2020;
- Over \$1b worth of tourism spend was generated through the Airport in 2020, supporting over 9,000 jobs;
- 50% of visitors to Canterbury arrive via the airport;
- In 2020, CIA contributed \$4.76b to the South Island economy;
- The Airport accommodates 7,000 workers within its campus; and
- CIA directly employs over 200 workers, generating \$187m in revenue per annum and supporting a further 500 local jobs.

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<sup>5</sup> *Aviation Benefits Beyond Borders, Air Transport Action Group (ATAG), March 2012*

<sup>6</sup> *Oxford Economics, Economic Benefits from Air Transport, 2011*

<sup>7</sup> Year ended March 2020

#### 4. POTENTIAL IMPACTS ON AIRPORT OPERATIONS AND ECONOMIC CONTRIBUTION

As identified above CIA is a fundamental contributor to the regional and South Island economies. Its operations are fundamental not only to many high value businesses, but to the efficient movement of passengers internationally.

There is a direct link between management through land use planning and the level of economic contribution provided by efficient operations at CIA. A key consideration regarding the extent of this management is measuring the level of vulnerability of CIA's operations against the opportunity cost of restricting other activities. In terms of CIA and its position in the market, it is considered a 'slot taker', an airport that provides a flexible alternative to other ports. In accepting this role, and the economic benefits which flow to the community, CIA is ultimately vulnerable to operational constraints that would reduce this flexibility.

There are a number of practical risks that could eventuate from the development of conflicting uses that would result in pressure to constrain operations at CIA. For the purposes of this report the propensity for these constraints to occur have not been tested. This report has identified the potential level of economic risk associated with curfews, which is one method of operational constraint.

It is understood (from the Airbiz report<sup>8</sup>) that there are a number of other constraints that can be utilised to reduce the effects of noise including:

- a) Annual aircraft movement quotas or caps
- b) Daily or hourly aircraft movement caps restricting the number of arrivals or departures
- c) Preferential runway regimes (rotating use of runways and associated flight paths to "share" the noise burden) which are often "sub-optimal" in terms of runway or airspace capacity
- d) Development of additional runways to cater for air traffic growth, to ensure no additional noise burden is placed on current flight paths
- e) Other noise abatement and mitigation (noise charges, aircraft auxiliary power unit restrictions etc)

The potential economic impacts of airport curfews have become of topical interest as urban populations continue to expand and conflict with once isolated activities. Recent assessments of Perth Airport<sup>9</sup> found that a night time curfew could cost the Western Australian economy \$46.1b and 27,000 jobs by to 2040. More extreme noise management constraints such as those at Rotterdam Airport have decreased potential passenger numbers by over 60%<sup>10</sup>. As

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<sup>8</sup> Airbiz Report "Christchurch International Airport Outer Control Boundary and Airport Safeguarding" dated 10 June 2022.

<sup>9</sup> Perth Airport Night Time Curfew – Estimated Costs for Regional and National Economies, Jacobs Group 2015

<sup>10</sup> Modelling the Effect of Night Time Penalties on Commercial and Business Flights for Regional Airport Noise and Economics: Rotterdam Airport Case Study. Mohamed, Curran and Zwan, Delft university of Technology



discussed further in the next section, the potential for operational constraints at CIA poses a real threat to the economic benefits it provides to the region and South Island.

## 5. POTENTIAL ECONOMIC RISKS TO CIA OPERATIONS AND THE SOUTH ISLAND ECONOMY

While the following assessment considers the potential impact to CIA operations in a pre and post Covid environment, a risk associated with constraining CIA operations is post-Covid recovery. With dramatic decreases in trade movements, passenger numbers and corresponding tourism, the potential for reduced connectivity through CIA is likely to hamper the recovery of these sectors with increasing costs and reducing associated economic benefits.

While a curfew at CIA will inevitably lower the level of overall activity, primarily for freight, there are several other implications that are likely to impact the economy.

Given the location of CIA in the aviation market the Airport operates as a 'slot taker' making itself available for flights that are unable to be accommodated elsewhere. This provides CIA with a unique advantage and has resulted in such flights as that from Guangzhou. This flight arrives in Christchurch at 5.20pm and leaves at 10.30pm arriving back at Guangzhou at 5.30am, this allows for passengers to connect to the first wave of flights connecting to Asia. As identified later in this report the potential for flights such as this to be impacted by a curfew is based on the level of risk presented to the airlines through delays, this would require a flight to be rescheduled to the following day increasing costs, inconvenience, and the competitiveness of the flight as a whole. As identified later there are a number of other flights that would fall within the curfew times themselves<sup>11</sup>.

The inability to meet this role could reduce the range of destinations connected to Christchurch thereby reducing the markets from which Christchurch can attract tourist as well as trade and business development.

From the Airbiz report we understand that airlines may also choose to locate aircraft elsewhere given the reduced competitiveness at CIA. Limitations of night-time movements on aircraft can limit the crafts ability to be prepared for use. This would reduce the number of flights and the overall utilisation of aircraft.

The limitation of night-time air freight movements is also likely to reduce craft utilisation, increasing costs and route profitability. The impact on freight is not limited to volumes but also around time-critical or 'just in time' operations. CIA is the South Island hub for Parcelair's network, providing for overnight freight for both Freightways and NZ Post.

Parcelair facilitates the movement of 12 aircraft each night (7 days a week) shifting nearly 75,000 tonnes of overnight freight per annum. Given the level of network necessary to move this right through the South Island it is highly unlikely that this operation could be replicated at any other South Island airport. This would result in:

- Slower mail (likely to take 2 -3 days rather than overnight)
- Impact on perishable deliveries
- Impact upon Just in time businesses

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<sup>11</sup> Christchurch Airport Aircraft Noise Contours Update, October 2021 Airbiz, page 9

In addition to the quantified level of risk following there is the longterm loss of investment and businesses. The level of this potential loss relates to the downturn of longterm economic contribution as a proportion of the activity at risk. Longterm effects on investment could further reduce the ability of CIA to undertake current or future levels of operation. In terms of the wider impact on business investment, the reduction in transportation options is likely to impact upon businesses locational decisions, at this point the loss to the region is likely to be materialised as a loss to the whole South Island.

There have been a number of assessments that have directly linked the level of overall economic activity within an area with the level of air services:

- “The catalytic effect of the accessibility to air cargo services” Cech P. (2004) found that increased (or conversely decreased) air cargo services led to increased income and employment.
- 75% of businesses using air services said their business would be adversely affected if they were curtailed “High Fliers: Business Leaders’ View on Air Travel” UK Institute of Directors (2008). While a survey found that 30% of Chinese businesses would change their investment decisions because of constraints on air services (“Airline Network Benefits” IATA Economic Briefing No. 3 (2006).
- “The Economic Catalytic Effects of Air Transport in Europe” found that a 10% increase in air transportation increased business investment by 1.6% in the long run.
- “High-technology employment and hub airports”, Journal of Air Transportation management January 1999. This analysis found that the presence of a hub airport increased ‘high-tech’ employment by an average of 12,000 jobs in a region (based on 321 US metropolitan areas).

There is a wealth of data illustrating the relationship between the level of a region’s economic activity and the efficient operation and provision of air services within the market. Conversely a decrease in this connectivity and provision is likely to reduce this activity by a similar margin.

The level of economic activity ‘at risk’ is estimated utilising the methodology indicated in the introduction, comparing an unconstrained and constrained position. Two positions are essentially run through the economic model with a number of assumptions around what activities may be constrained. Under the unconstrained modelling there are no exogenous constraints placed on CIA’s ability to operate (as it currently does). The constrained model assess the level of activity that currently exists within the curfew (11pm to 6am) timeslot and considers the potential loss of this activity to the wider regional and South Island economies.

The unconstrained position is outlined in section 3 above with a 2019 contribution of \$3b regionally and \$4.7b throughout the South Island. These estimates were based on passenger numbers projected to increase from 7 million passengers per annum to just under 8 million<sup>12</sup> by 2031.

Additionally, while these projections proportionalised freight based on the increase in passenger movements, the resulting numbers were in line with the growth suggested by the Richard Paling report.<sup>13</sup> This linked a similar growth rate between CIA and Lyttelton Port.

It is estimated that with the proportional increase in freight and the increased passenger numbers the contribution to regional GDP made by CIA has the potential to exceed \$3.87b by 2031. This level of contribution at the South Island level would constitute economic activity circa \$6b per annum.

Conversely, the aforementioned numbers show if CIA had its ability to export large volumes of cargo on or offshore either reduced or removed altogether, the direct and indirect economic costs to the Canterbury Region and the wider South Island economy would be considerable and sustained.

There are a number of assumptions relating to the potential impact of constrained CIA operations under a night-time curfew including:

- Night-time freight currently makes up 51% of all freight volume from CIA
- Night-time freight currently makes up approximately 32%<sup>14</sup> of all freight value from CIA. The reduced proportional value is a representation of the lower export/import value of agricultural products.
- There are likely to be indirect, induced and catalytic values associated with the final product and the potential loss of business associated with constraints to air services
- The loss of potential passenger traffic has been conservatively assessed at 2.5% per annum, based primarily on flights that could be considered within a risk 'time zone' such as the South China 10.30pm flight. This is estimated based on CIAL published data insulating the number of passenger flights, within a 24-hour period that fly within the potential curfew timeframe<sup>15</sup>.

Based on these assumptions it is estimated that were the region to forgo the economic activity generated from the above constrained activities alone by 2031 this would equate to \$610m annually, and \$835m per annum in forgone economic activity for the South Island. This is in addition to some of the economic impacts identified in the preceding material.

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<sup>12</sup> Projections provided by Christchurch International Airport Limited.

<sup>13</sup> Richard Paling Consulting "Christchurch International Airport Review of freight trends", 2022 Table 5.1

<sup>14</sup> This figure is approximated based on the sectors associated with Just in Time logistics and the relative average value per tonne, based on the 2019 trade figures provided by Richard Paling.

<sup>15</sup> This equated to 5 arrivals and 10 departures over a 24 hour period.





In terms of employment this would equate to approximately 4,000 jobs regionally and 4,600 throughout the South Island.

Given this value is based on an annualised figure, the overall impact to 2031 (from 2022) would be in excess of \$4.8b.