Before an Independent Hearings Panel
appointed by the Waimakariri District Council

under: the Resource Management Act 1991

in the matter of: Submissions and further submissions in relation to the proposed Waimakariri District Plan, Variation 1 and Variation 2

and: Hearing Stream 10A: Future Development Areas, Airport Noise Contour, Bird Strike and Growth policies

and: **Christchurch International Airport Limited**
Submitter 254

Statement of evidence of Natalie Hampson (economics)

Dated: 2 February 2024

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STATEMENT OF EVIDENCE OF NATALIE HAMPSON

INTRODUCTION

1 My full name is Natalie Diane Hampson. I am the Director of Savvy Consulting. I was previously a Director at Market Economics from mid-2019 to the end of October 2023. I hold a Master of Science degree in Geography from the University of Auckland (first class honours).

2 I have worked in the field of economics for over 20 years for commercial and public sector clients, with a particular focus on economic assessment within the framework of the Resource Management Act. I have specialised in studies relating to land use analysis, assessment of demand and markets, the form and function of urban economics and growth, policy analysis, and evaluation of economic outcomes and effects, including costs and benefits.

3 Relevant to this evidence, I have extensive expertise in input-output based economic impact assessment (**EIA**), including having carried out EIAs for some of New Zealand's largest sporting events (such as hosting the America's Cup and the Rugby World Cup 2011), government funding (such as economic impact of funding Emirates Team New Zealand) and private sector developments (such as Silverlight Studios).

4 I have also played a leading role in numerous[1] housing and business capacity and demand assessments under the National Policy Statement for Urban Development (**NPS-UD**) (and its predecessor), as well as assessments associated with intensification plan changes[2] and Future Development Strategies for councils.[3] I provided evidence on Christchurch City's proposed plan change 14 for Christchurch International Airport Limited (**CIAL**) and another private sector submitter. I have previously provided evidence on Formative's Capacity for Growth Models in both Selwyn and Waimakariri Districts in relation to private plan changes and proposed District Plan submissions.[4] I am providing economic evidence for a number of submitters for the Waimakariri District Plan Review.

CODE OF CONDUCT

5 Although this is not an Environment Court hearing, I note that in preparing my evidence I have reviewed the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note

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1 Queenstown Lakes District Council 2018 and 2021, 2024 (ongoing), Rotorua Lakes Council 2021.

2 Queenstown Lakes District Council, Nelson City Council, Rotorua Lakes Council.

3 Rotorua Lakes Council.

4 Including in the Environment Court.

2023. I have complied with it in preparing my evidence on technical matters. I confirm that the technical matters on which I gave evidence are within my area of expertise, except where relying on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from my opinions expressed.

SCOPE OF EVIDENCE

6 I have been asked to comment on the relief sought by CIAL in relation to the proposed Waimakariri District Plan (*Proposed Plan*).

7 This brief of evidence addresses:

7.1 The significant economic contribution of the Christchurch International Airport (*Christchurch Airport / the Airport*);

7.2 The relief sought by CIAL on matters considered as part of this Hearing Stream 10A, with particular focus on the potential impacts on Kaiapoi; and

7.3 The Council's Section 42A report.

8 In preparing this evidence, I have read or relied on the following:

8.1 The evidence of Ms Smith for CIAL;

8.2 The evidence of Mr Sellars for CIAL;

8.3 The evidence of Mr Kyle for CIAL;

8.4 Waimakariri Residential Capacity and Demand Model – IPI 2023 Economic Assessment. Formative Ltd, 8 December 2023;

8.5 Review of Formative WCGM22 Development Model, Inovo Projects (Chris Sexton), 30 August 2023;

8.6 Private Plan Change 31 Response to Questions (Minute 5) by Mr Yeoman;

8.7 Private Plan Change 31 Independent Hearing Panel Decision Report, 27 October 2023;

8.8 Waimakariri District Proposed Plan (e-Plan) and Operative District Plan (e-Plan).

SUMMARY AND CONCLUSIONS

9 Airports and the activities directly related to and facilitated by them, have extensive value chains meaning that any change, positive or negative, in the system is bound to have a sizeable impact on contributions to value added and employment. The latest EIA modelling demonstrates that Christchurch Airport makes a significant contribution to the Canterbury economy.

10 Safeguarding the efficient operation and growth potential of the Airport in the Proposed Plan safeguards the significant economic contribution it makes to the regional and national economy. This means that ensuring that the Airport is appropriately recognised in the Waimakariri District Plan will be critically important.

11 CIAL's relief for existing residential areas is likely to have only a minor opportunity cost (and not an actual economic cost) on Kaiapoi's urban dwelling capacity, and this opportunity cost could be mitigated at the time of rezoning additional land outside of the Remodelled Air Noise Contour to address a potential shortfall of capacity to meet short/medium-term housing demand.

12 CIAL's relief for Future Development Areas (**FDAs**) will significantly reduce the housing capacity of the FDAs identified in the Proposed Plan in Kaiapoi. However, as these FDAs are not zoned, and additional FDAs can be identified as required, CIAL's relief will not adversely affect urban growth in Waimakariri District.

13 CIAL's relief for managing the risk of bird strike is likely to have little or no opportunity costs on most rural landowners within 13km of the Airport once mitigating factors are accounted for. Costs on the wider district economy are anticipated to be minimal. As such regulating bird strike risk activities within 13km of the Airport is considered to be the most efficient approach from an economic perspective.

ECONOMIC CONTRIBUTION OF THE AIRPORT

14 It is important for policy makers to understand the implications of proposed policy changes in economic terms. In this case, to understand the economic role the Airport plays in the local and wider economy. Only then can appropriately informed decisions be made on objectives, policies and rules that may have consequential effects on the safe and efficient operation of this nationally significant infrastructure.

15 The CIAL submission provides an overview of the role and operations of the Airport, and I don't repeat that information here. Rather, my evidence expands on the significant economic

contribution of the Airport, drawing on the recent EIA modelling I carried out (while working at Market Economics Ltd).

16 At the time of my evidence for Hearing Stream 1 dated 1st May 2023, that modelling was partially complete. This statement of evidence is based on the finalised results of that assessment, with the report attached in full at **Appendix 2**.

Economic Contribution of the Airport Year Ending February 2020

17 The economic contribution of the Airport is measured according to (direct, indirect and induced) value added (akin to GDP) and employment sustained over 1 year. The economic contribution is distinguished according to:

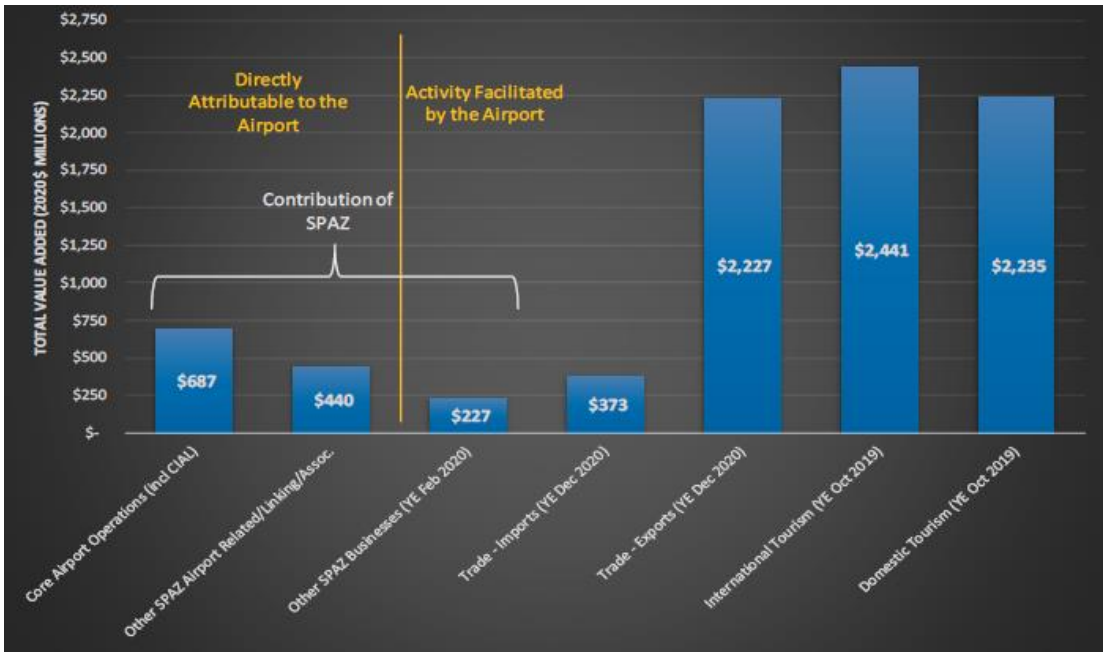
17.1 Business activity directly attributable to (dependent on) the Airport (inclusive of CIAL as a business entity) and located within the Christchurch Special Purpose Airport Zone (**SPAZ**); and

17.2 business activity that is facilitated by the Airport and air transport services, both inside the SPAZ and beyond. Facilitating tourism and export activity is, by far, the Airport's greatest contribution to the economy.

18 The value added contribution to the Canterbury Region economy from business activity directly attributable to the Airport is $\$_{2020}$717 million (sustaining approximately 6,560 additional jobs to those already in the SPAZ). The value added contribution to the Canterbury Region economy from business activity facilitated by the Airport is significantly greater at $\$_{2020}$4.59 billion (approximately 54,615 jobs sustained across the region).

19 The contribution that Christchurch Airport makes to the national economy is summarised in Figure 1. The national value added contribution to the economy from business activity directly attributable to the Airport is $\$_{2020}$1.13 billion (sustaining approximately 8,900 additional jobs to those already in the SPAZ). The national value added contribution to the economy from business activity facilitated by the Airport is significantly greater at $\$_{2020}$7.50 billion (approximately 79,580 jobs sustained nationwide).

Figure 1 – Christchurch Airport's Peak Economic Contribution (Year Ending February 2020) – Total National Value Added ($ Millions)



20 The economic contribution that the Airport makes specifically to Waimakariri District is largely (although not totally) driven by facilitated business activity. It is estimated that in the year ending February 2020, the Airport contributed:

20.1 $11.3 million in district value added (75 jobs) arising directly from Airport related/supporting businesses, and (to a lesser extent) core airport operations and businesses linking the Airport and end-users.

20.2 $12 million in district value added (104 jobs) in business activity facilitated by international imports passing through the Airport;

20.3 $178 million in district value added (1,981 jobs) in business activity facilitated by international exports passing through the Airport;

20.4 $34 million in district value added (435 jobs) in business activity facilitated by domestic tourists passing through the Airport; and

20.5 $27 million in district value added (291 jobs) in business activity facilitated by international tourists passing through the Airport.

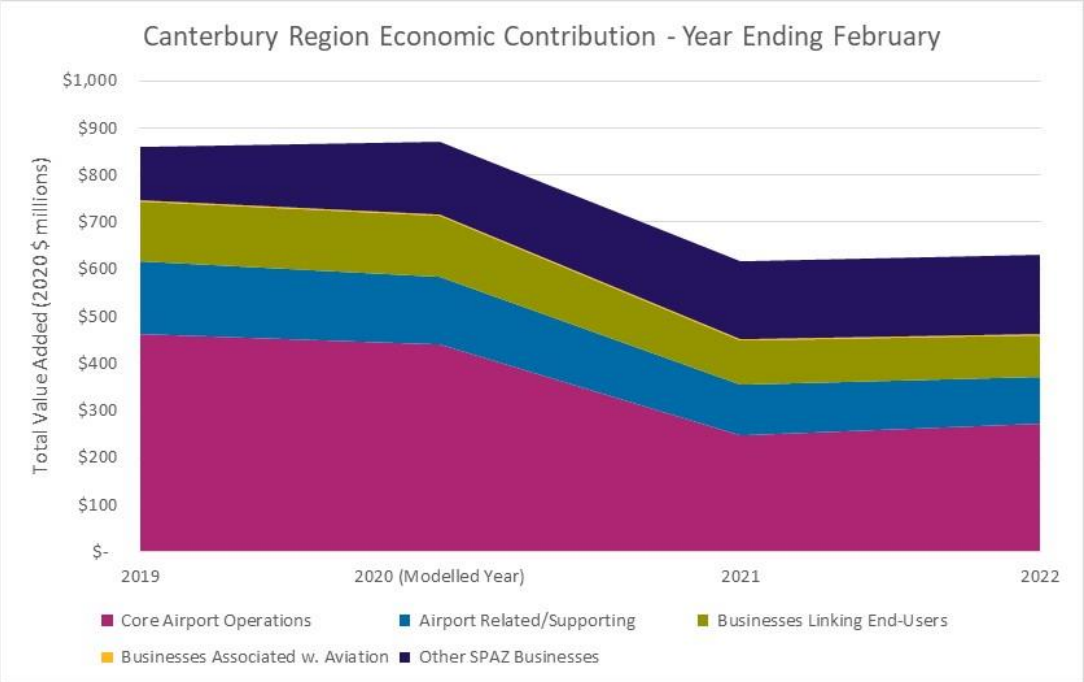
21 This is a combined economic contribution of an estimated $262 million in value added, and just under 2,890 jobs across the district – year on year, with potential for further growth so long as the Airport is safeguarded from risks that may result in constraints to its efficient and effective operation over the long-term.

Economic Risks if Christchurch Airport Operations are Constrained

22 The EIA modelling clearly demonstrates the economic significance of the Airport – based on a recent 'peak year' of employment and performance (i.e. the year end February 2020). What the modelling has also helped to demonstrate is how employment and value added sustained by the Airport can drop when air travel (passengers and freight) is constrained.

23 Figure 2 shows the value added results for Canterbury Region for all Airport related activity and facilitated business activity located in the SPAZ for the period 2019-2022.[5] Figure 2 does not include the facilitated contribution of international trade and tourism in the wider Region (beyond the SPAZ), but the trends would be the same.

Figure 2 – Value Added Contribution to the Canterbury Region 2019-2022 of Total SPAZ Business Activity by Relationship to the Christchurch Airport



[5] While unavailable, 2023 data is expected to have shown substantial recovery to pre-Covid 19 performance levels.

24 Covid-19 had an unprecedented effect on the Airport (and related) sector. Core airport operations (particularly airlines) were significantly reduced because of Covid-19 restrictions.

25 This analysis shows that when flights (and freight and passengers on those flights) are reduced - for whatever reason - then this has a flow-on effect for Airport related/supporting businesses in the SPAZ, as well as businesses linking the Airport with end-users in the SPAZ, and activities associated with aviation based in the SPAZ. As all of those businesses contracted (with substantial reductions in employment), so too did their spending across their supply chains – leading to a significant decrease in economic activity right across Canterbury Region.

26 The EIA results show that ensuring that Christchurch Airport can operate safely, efficiently, and to its potential, has significant economic benefits for the Canterbury Region. It is important, from an economic perspective, to manage reverse sensitivity effects in the Airport's 50dB L_{dn} Air Noise Contour and to manage bird strike risk in the operational area of the Airport (as proposed in CIAL's submission) if it ensures these benefits are preserved.

27 Any risk to Airport operation and efficiency will have tangible negative effects on many, diverse businesses and households across the Canterbury Region (and beyond). Such risks should be avoided where possible, or minimised where practicable in recognition of the strategic importance of this nationally significant infrastructure asset.

CIAL RELIEF ON THE PROPOSED PLAN

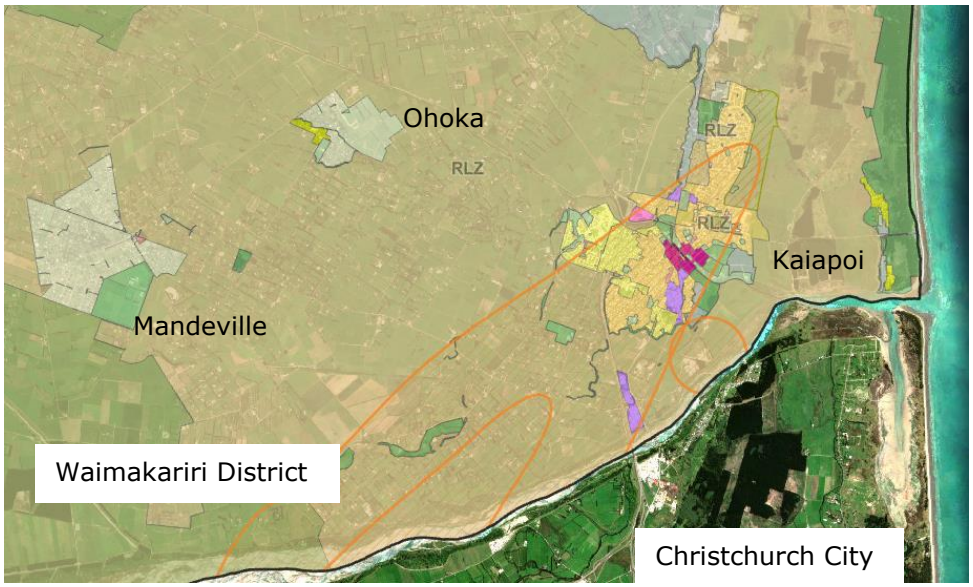
28 The following sub-sections of my evidence consider the potential costs of CIAL's proposed relief on the Proposed Plan, from an economic perspective. To clarify, this evidence does not consider changes made by Variation 1 or CIAL's submission on Variation 1. I have provided a separate brief of evidence in relation to Variation 1.

Dwelling Density within Existing Residential Zones under the 50dB L_{dn} Air Noise Contour

29 The Proposed Plan is the baseline against which the impact of CIAL's relief needs to be assessed. As notified, the Proposed Plan adopts the operative Christchurch International Airport 55dB L_{dn} and 50dB L_{dn} Air Noise Contours. The 50dB L_{dn} Air Noise Contour (being the larger extent) covers the majority of the Kaiapoi urban township

(5.8km^2) and 15.2km^2 of Rural Lifestyle Zone (**RLZ**) land to the south-west of Kaiapoi to the Waimakariri River (Figure 3).[6]

Figure 3 – Notified PDP Zoning and Airport Noise Contours



30 In the Proposed Plan, existing residential areas of Kaiapoi are notified as a combination of Medium Density Residential Zone (**MRZ**) (200sqm min lot size[7]) and General Residential Zone (**GRZ**) (500sqm min lot size[8]). Development in these zones, including of noise sensitive activities, that fall under the 50dB L_{dn} Air Noise Contour is enabled as permitted activities[9] in the Proposed Plan as illustrated in Figure 4.

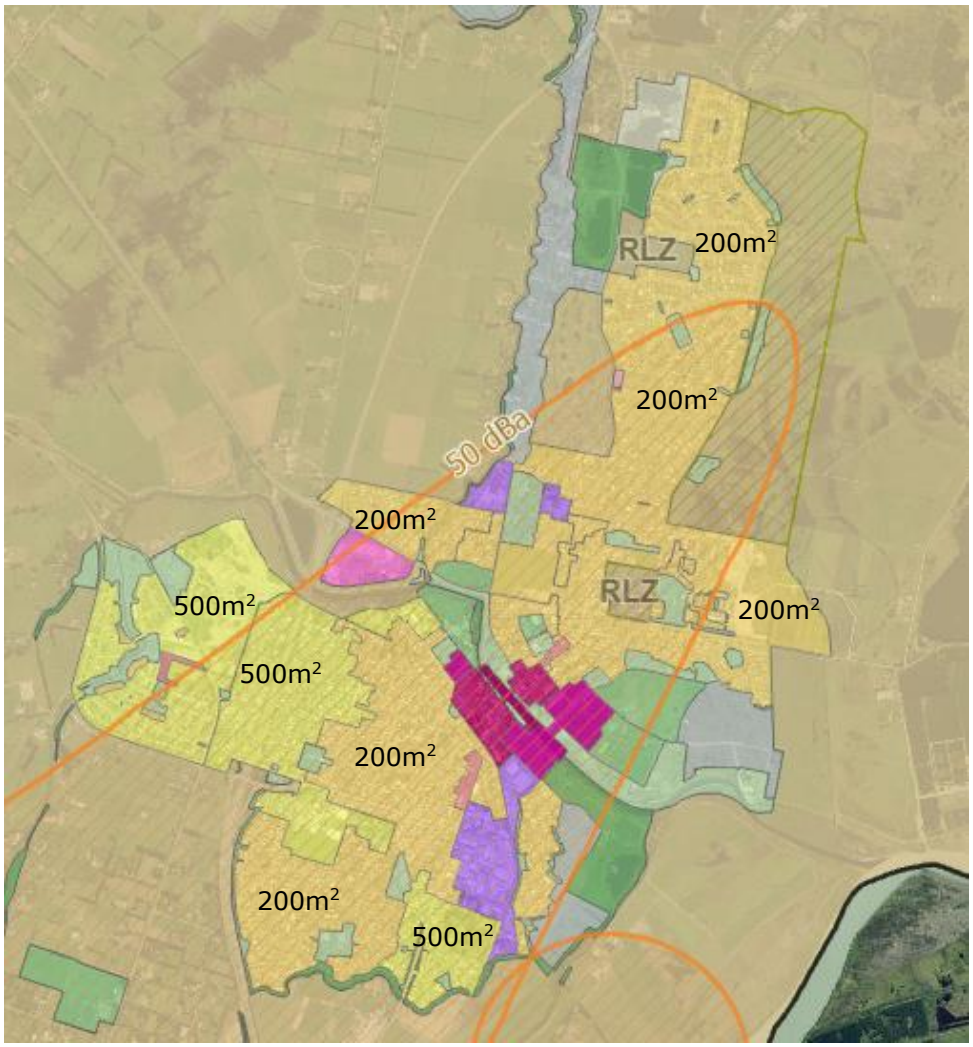
6 Area calculations sourced from the S32A Report – Qualifying Matter Airport Noise (page 5).

7 Pale orange in Figure 3 and 4.

8 Pale yellow in Figure 3 and 4.

9 Exceptions include, but are not limited to, Camping Grounds (Discretionary) and Multi-unit Residential Development (Restricted Discretionary).

Figure 4 – Notified PDP Residential Densities – No Density Distinctions Within the 50dB L_{dn} Air Noise Contour



31 The Proposed Plan has therefore intensified the density of housing that is 'plan enabled' in Kaiapoi compared to the Operative District Plan (**ODP**), which broadly provided a 300sqm and 600sqm minimum lot size mix in Residential 1 and 2 zones respectively and a range of average lot sizes in the Residential 7 zone (Silverstream) of between 200sqm and 540sqm.

32 The approach taken in the Proposed Plan will *potentially* supply more dwellings (and therefore residents) in the urban area affected by aircraft noise in Kaiapoi than would have been supplied under ODP densities. For the reasons explained in Ms Smith's evidence, the Proposed Plan therefore increases the risk of reverse sensitivity effects on the Airport. The *actual* net increase in dwellings within the 50dB L_{dn} Air Noise Contour under the Proposed Plan as notified depends on development capacity that is commercially feasible and

reasonably expected to be realised (**RER**) in the short, medium and long term. I discuss this further below.

33 CIAL's proposed relief is not to avoid further residential development but to limit intensification of existing residential zones proposed by the Proposed Plan within the 50dB L_{dn} Air Noise Contour, and instead apply the densities enabled in the ODP (i.e., 300sqm and 600sqm lot size thresholds).

34 CIAL propose that within the 50dB L_{dn} Air Noise Contour:

34.1 a 600sqm minimum lot size would be permitted in areas that were zoned Residential 2 under the ODP. This area is referred to as Area A in the map included in Mr Kyle's evidence;

34.2 a 300sqm minimum lot size would be permitted in areas that were zoned Residential 1 under the ODP. This area is referred to as Area B;

34.3 a 300sqm minimum lot size would be permitted in areas that were zoned Residential 7 under the ODP. This is included in Area B.

34.4 a 5,000sqm minimum lot size would be permitted in areas that were zoned Residential 4b under the ODP. This area is referred to as Area C.

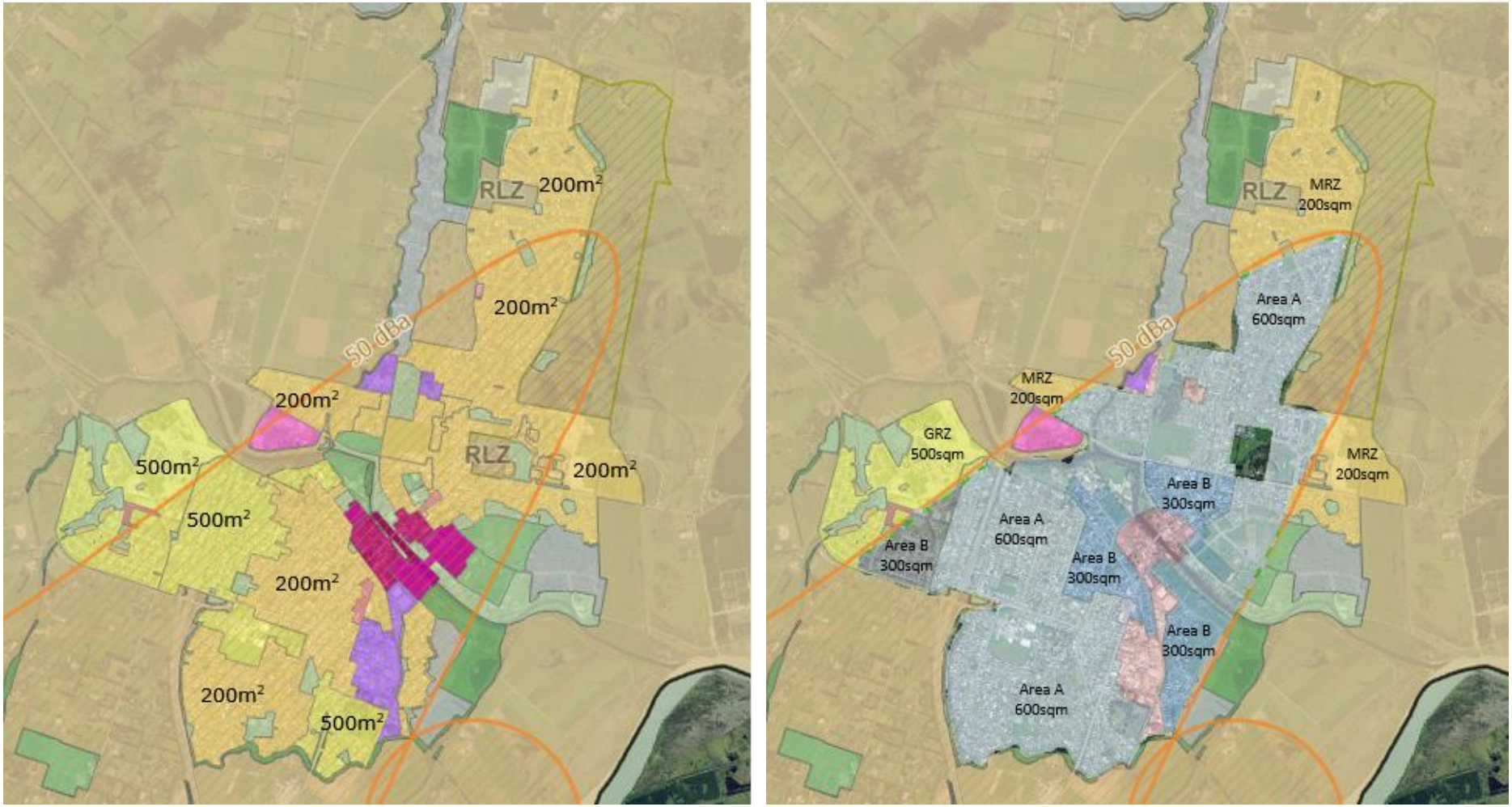
35 By maintaining status quo densities within the 50dB L_{dn} Air Noise Contour the CIAL relief creates a minor opportunity cost for some landowners relative to landowners outside of the 50dB L_{dn} Air Noise Contour, but not an actual economic cost to those landowners.

36 For some landowners, that potential opportunity cost relates to only a 100sqm decrease in permitted minimum lot sizes relative to the Proposed Plan (i.e. in areas where GRZ and MRZ in the Proposed Plan match Areas A and B respectively in the CIAL relief). For some other landowners, the potential opportunity cost relates to a 400sqm decrease in permitted minimum lot sizes relative to the Proposed Plan (i.e. in areas where proposed MRZ would instead become Area A, and at a 600sqm dwelling density).

37 Figure 5 roughly illustrates CIAL's relief applied to the operative 50dB L_{dn} Air Noise Contour compared with the Proposed Plan dwelling densities in existing residential areas.[10]

[10] Importantly, by roughly overlaying the ODP zoning inside the 50dB L_{dn} Air Noise Contour over the notified PDP zoning, Figure 5 does not take into account other zone changes in the Proposed Plan, to which CIAL's submission does not apply. This includes changes to the commercial zones, industrial zones, and open space zones.

Figure 5 – Proposed Plan Residential Densities (left) and CIAL Relief Residential Densities Applied to Operative 50dB L_{dn} Air Noise Contour (right)



38 The reason it is only a 'potential' opportunity cost for some landowners is because it depends on whether the property would have further subdivision potential (as vacant lots or for infill or redevelopment) under the Proposed Plan that is foregone by CIAL's relief. Most properties within the 50dB L_{dn} Air Noise Contour would be unlikely to yield one or more feasible additional dwellings under either proposal and so the CIAL submission would have no impact on either property values or the ability to develop for most landowners in existing residential areas.

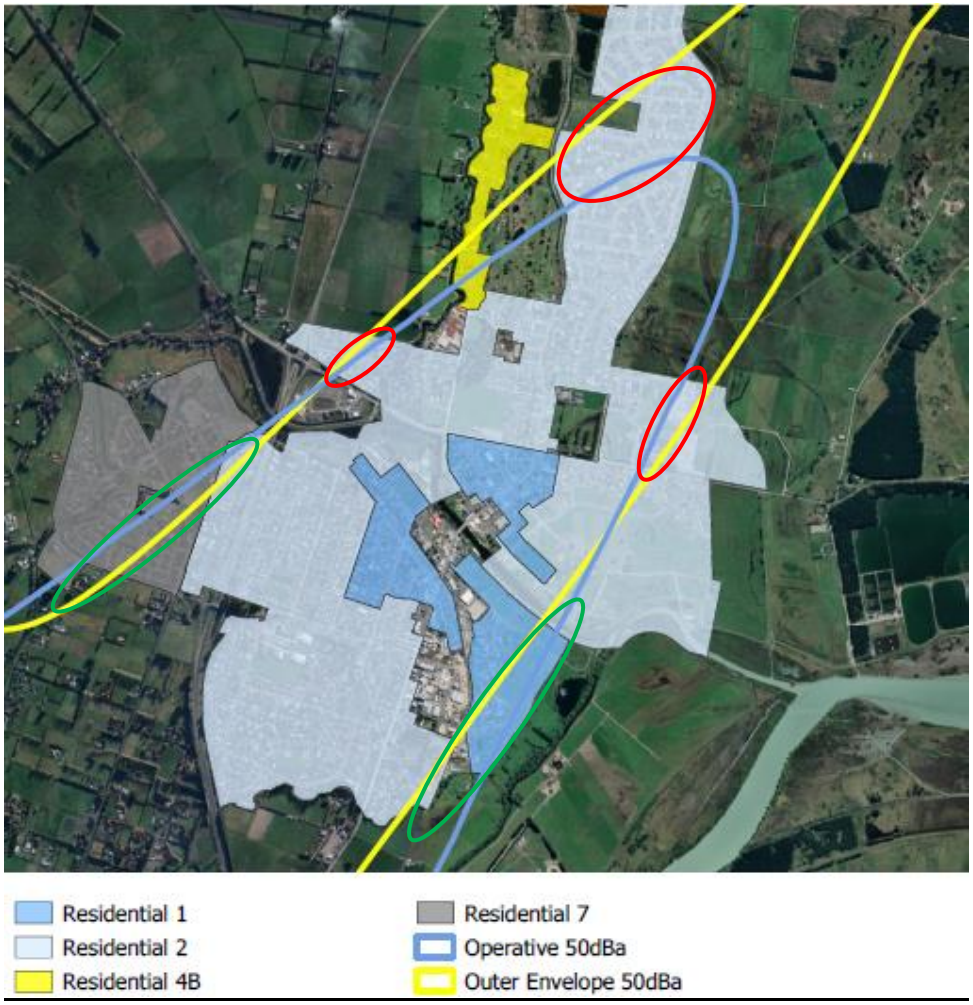
Dwelling Density within Existing Residential Zones under the Remodelled 50dB L_{dn} Air Noise Contour

39 As outlined in other evidence for CIAL, the Christchurch International Airport Air Noise Contours have recently been remodelled. As part of its submission, CIAL is seeking the inclusion of the Remodelled 50dB L_{dn} Outer Envelope Air Noise Contour in the Proposed Plan (*Remodelled Air Noise Contour*).

40 This is a minor change to the relief illustrated in Figure 5 above (right hand map), with some small existing residential areas in fact able to adopt the density of the Proposed Plan (shown in the green circles of Figure 6) and some small areas to be retained at the operative density of 1 dwelling per 600sqm (shown in the red circles of Figure 6). The same potential opportunity costs and caveats discussed above apply to these net additional properties included in the Remodelled Air Noise Contour.

41 Overall, I consider the net additional impact of the Remodelled Air Noise Contour on existing residential areas in Kaiapoi will be minor.

Figure 6 – Updates to CIAL Relief for Existing Residential Areas (Remodelled Air Noise Contour)



Wider Opportunity Costs for Kaiapoi's Existing Residential Areas

42 In this section I briefly address the wider economic effects of CIAL's relief within the operative and remodelled 50dB L_{dn} Air Noise Contour (i.e., other than effects on individual landowners).

43 As stated above, the actual opportunity cost on housing supply and growth in existing residential areas of Kaiapoi depends not on what dwelling density is plan enabled, but what housing capacity is commercially feasible and RER.

44 To help understand the significance of that opportunity cost, I have considered the Council's latest version of the Waimakariri Capacity for Growth Model (**WCGM 2022**).[11]

45 A limitation of using that model is that it estimates urban dwelling capacity in Kaiapoi, Woodend/ Pegasus and Rangiora based on the Proposed Plan zone provisions with Variation 1 applied. I have not found any publicly available report from Council which shows the results of the WCGM based on the provisions of the Proposed Plan only (i.e., from an earlier version of the WCGM). As such, the WCGM 2022 results are not the correct baseline against which the CIAL relief can be assessed, but it is still relevant.

WGGM 2022 Variation 1 Capacity, Demand & Sufficiency Results for Kaiapoi

46 The WCGM 2022 was a snapshot of capacity as at August 2022. Results for the three main urban townships are summarised in Table 1.

Table 1 – Dwelling Demand, Capacity and Sufficiency in the Short/Medium Term by Township, WCGM 2022

Residential Zones by Location	Parameter	WCGM 2022 Results *
Rangiora	Demand + Margin	1,260
	Feasible and RER Capacity	2,450
	Sufficiency	1,190
Kaiapoi	Demand + Margin	1,230
	Feasible and RER Capacity	1,290
	Sufficiency	60
Woodend/Pegasus	Demand + Margin	2,480
	Feasible and RER Capacity	2,200
	Sufficiency	- 280
Total Urban Area *	Demand + Margin	4,970
	Feasible and RER Capacity	5,940
	Sufficiency	970

Source: Formative, December 2023. * This is just the sum of the three main urban areas, not all residential zones in the Greater Christchurch Urban Area within Waimakariri District.

47 Further detail provided by Mr Yeoman (the author of the WCGM 2022) in response to questions raised during the hearing of Private

[11] Developed for Council by Formative Ltd, Mr Yeoman. Waimakariri Residential Capacity and Demand Model – IPI 2023 Economic Assessment, 8 December 2023.

Plan Change 31 (**PPC31**) provided further detail on the (unrounded) breakdown of short/medium-term feasible and RER dwelling capacity in Kaiapoi. It comprised of 718 dwellings in greenfield development areas[12] (56% of the Kaiapoi total capacity), 277 dwellings on vacant sites (22%) and 292 net additional dwellings through either infill or redevelopment of existing properties (23%).

48 The WCGM 2022 modelling showed that, with Variation 1 applied, there was at least sufficient dwelling capacity in Kaiapoi (and the combined urban townships) to meet projected short/medium-term demand (inclusive of the NPS-UD competitiveness margin). That is, demand for 1,230 additional dwellings over a 10 year period, or 20% of the district's total demand growth. The surplus of capacity is however only small.

49 The WCGM 2022 capacity modelling was closely scrutinised as part of PPC31 and, based on the evidence presented at that hearing, the Panel concluded that the WCGM 2022 was not as robust as it could be and that "*there is a very real likelihood that the model has overstated residential capacity*".[13]

50 The detailed ground truthing by Inovo Projects for PPC31 found a number of errors in development capacity assumed to be feasible and RER in the short/medium-term in the WCGM 2022.[14] This included (but is not limited to):

50.1 some sites that were not able to be developed for housing because of designations or other constraints,

50.2 the incorrect inclusion of the smaller (Momentum) FDA in the short/medium-term which is currently zoned RLZ; and

50.3 some new/alternative information on greenfield development yields.

51 It also provided a more current snapshot of capacity, as at August 2023, which significantly reduced the capacity remaining on vacant sites and in some greenfield areas due to development take-up.

52 Figure 7 shows the final results of the Inovo Project's capacity review for Kaiapoi alongside the WCGM 2022 results. Exclusion of the Momentum southern FDA accounts for a large share of the greenfield capacity reduction. Vacant sections reduced by 103

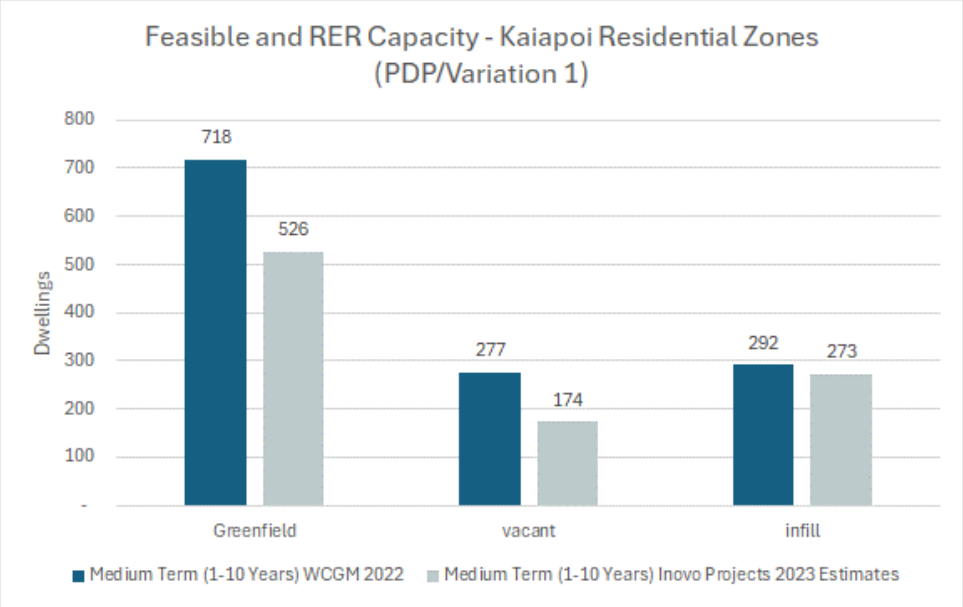
[12] Greenfield areas were identified/named as Beach Grove, Silverstream, Future Silver Stream, The Sterling (Retirement Village in Silverstream) and Momentum (new FDA Kaiapoi South), discussed further below.

[13] Page 36, PPC31 Panel Decision Report, .

[14] Review of Formative WCGM22 Development Model, Inovo Projects (Chris Sexton), 30 August 2023, attached to PPC31 supplementary evidence of Mr Akehurst,5 September 2023.

dwellings and infill/redevelopment capacity reduced by 19 dwellings. Combined, Inovo Projects estimated residential development capacity in Kaiapoi for 973 additional dwellings in the short/medium-term, compared to 1,290[15] estimated in the WCGM 2022.

Figure 7 – WCGM 2022 Kaiapoi Capacity Estimates Versus Inovo Projects 2023 Capacity Estimates – Short/medium-term



53 If one assumed the same short/medium-term dwelling growth (including the competitiveness margin, i.e., 1,230 dwellings) used in the WCGM 2022 is applied to a 2023 base year (to match the Inovo Project's capacity snapshot), then the total capacity estimated by Inovo Projects of 973, would not be sufficient to meet short/medium-term demand. There would be an indicative shortfall of 257 dwellings over the next 10 years (Table 2).

[15] Rounded.

Table 2 – Dwelling Demand, Capacity and Sufficiency in the Short/medium Term by Township, WCGM 2022 (Unrounded) vs Inovo Projects (August 2023)

Residential Zones by Location	Parameter	WCGM 2022 Results *	Inovo Projects Results **	Difference
Rangiora	Demand + Margin	1,260	1,260	-
	Feasible and RER Capacity	2,451	1,988	- 463
	Sufficiency	1,191	728	- 463
Kaiapoi	Demand + Margin	1,230	1,230	-
	Feasible and RER Capacity	1,287	973	- 314
	Sufficiency	57	- 257	- 314
Woodend/Pegasus	Demand + Margin	2,480	2,480	-
	Feasible and RER Capacity	2,196	1,400	- 796
	Sufficiency	- 284	- 1,080	- 796
Total Urban Area *	Demand + Margin	4,970	4,970	-
	Feasible and RER Capacity	5,934	4,361	- 1,573
	Sufficiency	964	- 609	- 1,573

Source: Formative, December 2023. * This is just the sum of the three main urban areas, not all residential zones in the Greater Christchurch Urban Area within Waimakariri District.

** Source: Supplementary Evidence of Mr Akehurst. Adopts WCGM 2022 demand + margin and Inovo capacity estimates. Assumes the 10 year growth applies from a 2023 base year.

Estimated WCGM 2022 Feasible and RER Capacity Short/medium-term Results for Kaiapoi Under the Proposed Plan

54 Within the context of a likely shortfall in short/medium-term capacity (at least according to Inovo Project's assessment) under Variation 1 zone provisions, it follows that under the lower Proposed Plan densities, feasible and RER capacity would be lower again (particularly for infill and redevelopment capacity), and the shortfall of capacity would be even greater in the short/medium-term.

55 I have set out my high-level assessment of how much lower feasible and RER capacity might be in existing residential areas of Kaiapoi under the Proposed Plan capacity scenario (i.e., excluding the capacity enabled by Variation 1) in **Appendix 1**.

56 In summary, having considered:

- the extensive parts of Kaiapoi where the WCGM 2022 Variation 1 results for Kaiapoi in the medium-term are likely to be the same or similar under a Proposed Plan capacity scenario, and
- the small parts of Kaiapoi where the WCGM 2022 Variation 1 results for are likely to be overstated to a minor extent (applying to some vacant and infill/redevelopment parcels) under a Proposed Plan capacity scenario,

57 I conclude that the WCGM 2022 results (and therefore the Inovo Projects capacity results) are a broadly suitable baseline against

which the impact of CIAL's proposed relief for existing residential areas can be considered. While unquantified, I consider that the available results (Table 2) are likely to overstate total Kaiapoi capacity in existing residential areas by only a minor degree relative to what would be anticipated to be shown under a Proposed Plan scenario.[16] The shortfall of short/medium-term capacity estimated by Inovo Projects would therefore be larger by a minor degree.

Impact of CIAL's Relief on Feasible and RER Capacity in Existing Residential Areas (Short/medium-term Capacity) Relative to the Proposed Plan Baseline

58 Without access to the parcel level WCGM results, estimating the impact of CIAL's relief on the Proposed Plan baseline capacity for existing residential areas (discussed above) is again limited to a high-level assessment. Spatially disaggregating areas where different densities apply is helpful. As such, the following draws on Figure 5 to highlight the scale of proposed changes.

59 I have taken into account the following in reaching my conclusion on the impact of CIAL's relief in existing residential areas:

59.1 Zoned greenfield capacity (as defined by the WCGM 2022)[17] in Kaiapoi is outside the Remodelled Air Noise Contour, therefore greenfield capacity under the Proposed Plan and CIAL Relief scenarios would be the same. CIAL's relief has no impact on this significant component of Kaiapoi's short/medium-term dwelling capacity.

59.2 As discussed in Appendix 1, the WCGM 2022 did not include any feasible and RER housing capacity in Kaiapoi on lots less than 300sqm. As CIAL's relief for Area B within the Remodelled Air Noise Contour (i.e. Operative Residential 1 Zone, but also including part of the Residential 7 Zone) was for a 300sqm minimum lot size, the vacant and infill/redevelopment capacity of the WCGM 2022 within these areas (while unknown) would also, in theory, remain unchanged. Therefore, CIAL's relief for Area B within the Remodelled Air Noise Contour is anticipated to have no impact on feasible and RER capacity relative to the Proposed

[16] This finding could be easily verified by Council by running a Proposed Plan capacity scenario. I am not aware that this has been done by Council, including for the s42A report for Stream 10A.

[17] I note that Mr Sellar's evidence also defines greenfield areas in Kaiapoi. While some of those fall within areas defined as greenfield developments in the WCGM, 2022, others do not (and fall within vacant, infill, and redevelopment capacity reported in the WCGM 2022), or fall within the Rural Zones of the Proposed Plan. As such, reference to greenfield areas used in my evidence is not directly comparable to Mr Sellar's evidence.

Plan in the short/medium-term under the Council's capacity modelling approach.

59.3 A portion of the area within the Remodelled Air Noise Contour retained at a density of 600sqm in CIAL's relief falls within area referred to in Variation 1 as the Flood Hazard Qualifying Matter (**Flood Hazard QM**) – Area B. This is mapped in Appendix 1, Figure A. The assessment in Appendix 1 on the dwelling capacity of this area in the Proposed Plan scenario confirmed a capacity of 17 additional feasible and RER dwellings in the medium-term. Even in the unlikely situation that all the feasible and RER capacity in the Flood Hazard QM Area B part of the GRZ (17 dwellings) are precluded by CIAL's relief for a 600sqm minimum lot size in that location, then the impact of CIAL's relief in that location relative to the Proposed Plan capacity is very minor. A loss of capacity for 17 dwellings accounts for just 1% of projected medium-term dwelling growth (inclusive of the competitiveness margin).

59.4 Similarly, in the other areas where the CIAL relief retains a 600sqm minimum lot size instead of 500sqm, I estimate that the CIAL relief would have an opportunity cost of 15-25 additional dwellings compared to the density of the Proposed Plan in those same locations. Again, the loss of capacity for 15-25 dwellings equates to around 1-2% of medium-term dwelling growth (including the competitiveness margin) in Kaiapoi – a very minor impact.

59.5 The remaining area to be considered within the Remodelled Air Noise Contour is the area that CIAL's relief retains at a 600sqm minimum lot size (Area A), rather than MRZ (200sqm minimum lot size) in the Proposed Plan. While the quantum of feasible and RER capacity that would apply in the WCGM under the Proposed Plan specifically in these areas (as vacant capacity or infill/redevelopment capacity) is unknown, I anticipate that the opportunity cost for housing growth in these parts of Kaiapoi attributable to the CIAL relief would be moderate.

60 When considering the aggregate impact of CIAL's relief discussed above, both proportionally and in the context of the mix of dwelling capacity that is greenfield, vacant and infill/redevelopment in the WCGM 2022 for Kaiapoi, I conclude that the total opportunity cost of CIAL's relief on feasible and RER dwelling capacity in Kaiapoi's existing residential areas is likely to be minor relative to capacity under the Proposed Plan.

61 The CIAL relief would still provide for some dwelling growth in the short/medium-term within the Remodelled Air Noise Contour in

Areas A and B, just less than would be anticipated under the Proposed Plan (by a minor amount).

62 My assessment is indicative only, and ideally the Proposed Plan capacity, and the impact of CIAL's relief would be run through the WCGM as two separate scenarios to more formally quantify the change in capacity outcomes (as it is designed to test these scenarios with relative ease).[18]

63 I also appreciate that the evidence by Inovo Projects for PPC31 suggested that Kaiapoi may not have sufficient capacity to meet housing demand over the short/medium-term (discussed above). In the face of an expected shortfall, any opportunity cost on dwelling capacity in the existing residential area takes on added importance.

64 However, the CIAL relief is not the cause of the short/medium-term shortfall, only a minor exacerbating factor that must be weighed up against the significant economic (and social) contribution of Christchurch Airport, including for current and future residents and businesses of Kaiapoi and the wider Waimakariri District that is safeguarded by CIAL's relief.

65 Council has the ability, including under Policy 8 of the NPS-UD, to zone additional residential land either in Kaiapoi (outside of the Remodelled Air Noise Contour) or elsewhere in the urban environment to address any short/medium-term capacity shortfall. A marginal increase in the rezoned land can mitigate any opportunity cost of CIAL's relief in the existing urban residential area.

Impact of CIAL's Relief on Future Development Areas

66 The two FDA areas in Kaiapoi – being the north-east FDA on the urban fringe of Kaiapoi and the smaller south FDA within the existing residential area – have been analysed in Mr Sellars' evidence in terms of the land areas and potential housing yield that fall under the operative 50dB L_{dn} Air Noise Contour and the Remodelled Air Noise Contour. I have drawn on figures supplied by Mr Sellars. While Appendix A of his evidence quantifies the net effect of the Remodelled Air Noise Contour in the FDAs (and excludes the area within the operative 50dB L_{dn} Air Noise Contour, I have considered the total effect of CIAL's relief regarding FDAs.

67 Table 3 is a summary table generated from data supplied by Mr Sellars. The Area ID relates to the map contained in Appendix D of Mr Sellars Evidence. It shows that 36% of the gross and net area of

[18] The issues raised by Inovo Projects would still apply. The change in capacity between a Proposed Plan and CIAL scenario is however likely to be more reliable even if the total quantum of short/medium-term capacity in each scenario is less reliable.

the FDAs is already within the operative 50dB L_{dn} Air Noise Contour.[19] This land is affected by a number of natural hazards which may impact final yield. However, assuming no constraints and assuming this land was fully utilised for residential land use, it could yield between 345-431 dwellings under a density of 12-15 dwellings/ha respectively according to the Proposed Plan.[20]

Table 3 – Impact of CIAL Relief on Kaiapoi FDAs

Location Relative to CIAL Relief	Mr Sellars' Area ID	Gross Area (ha)	Net Area (ha)	Yield (12 Dwellings/ ha)	Yield (15 Dwellings/ ha)
Not Impacted	A	7.9	6.9	83	104
Outside Operative, Inside Remodelled	B	18.5	16.2	194	243
Outside Operative, Inside Remodelled	C	0.2	0.2	2	3
Outside Operative, Inside Remodelled	D	17.0	14.9	178	223
Inside Operative	E	0.5	0.4	6	7
Outside Operative, Inside Remodelled	F	4.5	3.9	47	59
Inside Operative	G	7.3	6.4	77	96
Inside Operative	H	19.0	16.6	199	249
Outside Operative, Inside Remodelled	I	8.7	7.6	92	114
Not Impacted	J	0.8	0.7	8	11
Inside Operative	K *	6.0	5.3	63	79
Total NDA		90.4	79.1	950	1,187
Sub-Totals (n)					
Not Impacted		8.7	7.6	91	114
Outside Operative, Inside Remodelled		48.9	42.8	514	642
Inside Operative		32.8	28.7	345	431
Total NDA **		90.4	79.1	950	1,187
Sub-Totals (%)					
Not Impacted		10%	10%	10%	10%
Outside Operative, Inside Remodelled		54%	54%	54%	54%
Inside Operative		36%	36%	36%	36%
Total NDA		100%	100%	100%	100%
CIAL Relief (Full Extent of Remodelled) (n)		81.7	71.5	858	1,072
CIAL Relief (Full Extent of Remodelled) %		90%	90%	90%	90%

Source: Areas and Low Yield supplied by Mr Sellars. Net Developable Area based on 12.5% for Stormwater Infrastructure.

** I note that this yield is less than the 'developer' yield identified for this site in the WCGM 2022 (116 dwellings). This was however assessed under MDRS assumptions and a feasible and RER lot size of 300sqm.*

*** I note that even under the 15 dwellings/ha density, the total yield of the north-east FDA (1,108 dwellings) is less than in the WCGM 2022 (1,785 dwellings). This was however assessed under MDRS assumptions, and a feasible and RER lot size of 383sqm.*

68 The Remodelled Air Noise Contour includes a further 54% of the Kaiapoi FDAs outside the operative 50dB L_{dn} Air Noise Contour.[21] This land is affected by a number of natural hazards which may impact final yield. However, assuming no constraints and assuming this land was fully utilised for residential land use, it could yield

[19] Labelled as 'Inside Operative' in Table 3.

[20] And applying the yield approach in the CRPS.

[21] Labelled as 'Outside Operative, Inside Remodelled' in Table 3.

between 514-642 dwellings under a density of 12-15 dwellings/ha respectively according to the Proposed Plan.

69 Combined, 90% of the FDA land is within the Remodelled Air Noise Contour, equating to a potential dwelling yield of 858-1,072 under a density of 12-15 dwellings/ha respectively according to the Proposed Plan.

70 The CIAL relief seeks to avoid activities sensitive to airport noise (**ASANs**) within the FDAs that fall under the Remodelled Air Noise Contours in order to safeguard the efficient operation and growth potential of the Airport over the long-term. It does not preclude the development of land within the Remodelled Air Noise Contour for other activities that are not ASANs. However, the impact of that relief is that residential development is limited to 10% of the FDA area at the northern end and south-eastern tip of the north-east FDA. This area that sits outside the Remodelled Air Noise Contour has an indicative yield of between 91-114 dwellings under a density of 12-15 dwellings/ha.

71 The impact of CIAL's relief is a significant reduction in identified future housing capacity in Kaiapoi. In my experience producing HBAs[22] in Rotorua and Queenstown, it is not unusual for some long-term capacity indicatively identified in future growth strategies or spatial plans to be reduced, or even removed entirely when evaluated in more detail.

72 The implication is that additional future housing capacity needs to be zoned[23] or identified (preferably) in Kaiapoi outside the Remodelled Air Noise Contour, or alternatively elsewhere in the urban environment, to ensure that the Council is still meeting the requirement of the NPS-UD. That is, to ensure at least sufficient housing capacity is zoned or identified to meet projected long-term urban housing demand in Waimakariri District.

73 As FDAs are not zoned, and because the CIAL relief is likely able to be mitigated by zoning or identifying land elsewhere that can meet long-term urban housing demand, the CIAL relief does not create any direct costs on Kaiapoi's future growth and economic wellbeing. In other words, and assuming that any short/medium-term shortfall in Kaiapoi's residential capacity (discussed above) is addressed, there is still time available for additional long-term capacity to be

[22] Housing and Business Development Capacity Assessments (HBAs), as defined in the NPS-UD.

[23] Over and above additional land that may need to be zoned to address a projected shortfall of medium-term capacity according to the assessment by Inovo Projects, and exacerbated to a minor extent, by the CIAL relief in existing residential areas.

identified in appropriate locations that support efficient urban form outcomes and regionally and nationally significant infrastructure.

Economic Costs of CIAL's Relief for Managing Bird Strike Risk

74 This section considers briefly the potential economic costs of CIAL's proposed relief to manage the risk of bird strike at the Airport on rural landowners that are within 13km of the Airport and the wider Waimakariri community.[24] CIAL's relief seeks to manage bird strike risk by ensuring that there are appropriate rules to manage activities which may increase the risk of bird strike at the Airport. Proposed amendments/additions to the Proposed Plan include (but are not limited to):

74.1 Making farm quarries a discretionary activity (rather than permitted) if located within 13km of the Airport, with associated matters of discretion.

74.2 Making quarries a restricted activity (rather than discretionary) if located within 13km of the Airport, with associated matters of discretion.

74.3 Making waste management facilities within 13km of the Airport a non-complying activity, with the Airport to be notified of any applications.

74.4 No change in discretionary activity status of composting facilities but requiring applications within 13km of the Airport to notify the Airport.

74.5 Additional/similar controls on the following activities within 13km of the Airport: permanent artificial water bodies, excavation activities that result in specified water ponding, commercial pig farming, cattle feed lots, fruit tree farms, outdoor storage at fish and commercial food processing activities, sewage treatment and disposal facilities, conservation areas, recreational areas or golf courses greater than 2ha, abattoirs and freezing works.

74.6 Requiring a bird strike management plan to be prepared in consultation with CIAL for any bird strike risk activity proposed between 8km and 13km of the Airport as a permitted activity, and restricted discretionary activity within 8km of the Airport.

[24] I note that CIAL's relief may also impact on urban landowners. I have focussed on rural land implications on the basis that most bird strike risk activities are anticipated to located in rural areas.

75 Seeking to manage bird strike risk through the proposed amendments to planning controls has the potential to impose economic costs on landowners – in the form of increased transaction costs and opportunity costs for land use/development - and impact on the economy's overall efficiency.

76 To understand the significance of those potential economic costs it is important to consider the following mitigating factors:

76.1 The CIAL relief does not impact on existing legally established bird strike activities within 13km of the Airport.

76.2 The CIAL relief still provides a consenting pathway. This means that proposals for bird risk activities within 13km of the Airport are not precluded but could be approved if bird strike risk is appropriately managed.

76.3 Many of the bird risk activities already require resource consents. Therefore, the change in activity status, notification requirements or management plan requirements represent only a marginal change in status quo transaction costs. I do not consider such costs will be "*unreasonable*" as suggested in paragraph 134 of the S42A report.

76.4 The demand/incidence of some bird risk activities is relatively low. New waste management facilities, composting facilities and even golf courses for example are relatively uncommon, with any such facilities serving wide catchments and existing facilities likely to be able to grow to help meet increased demand. Growing in-situ is typically more efficient than creating entirely new facilities. Low demand for these sorts of activities (relative to population and employment growth) diminishes opportunity costs for affected landowners.

76.5 Not all rural properties within 13km of the Airport will be feasible/suitable for all bird risk activities. For example, a site may not have sufficient water to support orchard development, or a property may be too close to a residential zone, or a property may not have any aggregate resource. Opportunity costs are only limited to those bird risk activities that would be reasonably expected or feasible on a particular property.

76.6 Rural landowners within 13km of the Airport still have considerable scope to develop their land within the rules of the Proposed Plan. Strengthening the regulation around bird risk activities therefore only imposes a minor opportunity cost on the overall productive / development value of any one land parcel.

76.7 In terms of wider economic efficiency, it is relevant that the land within 13km of the Airport represents only a small share of the rural area of Waimakariri District. To the extent that the CIAL relief limits or discourages bird strike risk activities in that part of the district, there is still substantial capacity to meet demand for those activities beyond the 13km boundary. Only if those alternative locations are less efficient (particularly in terms of accessibility and vehicle travel distance) would there be potential for net additional economic costs. I consider that any such costs would be immaterial in the context of overall economic wellbeing.

77 Any residual economic costs/opportunity costs that may arise from CIALs proposed relief (after taking into account the above mitigating factors) need to be considered in conjunction with the potential direct economic costs to the Airport/Airlines in the event of a bird strike, and the potentially significant indirect costs that can flow from disruption to airline services (or even a catastrophic event), which can adversely affect business activity throughout Canterbury Region. I understand that these direct costs will be discussed by Ms Hayman for CIAL.

78 While it is not possible to place a quantitative cost on the proposed management approach it is highly unlikely that this would, to any degree, outweigh the potential economic costs of either the current level of bird strike risk or those that could occur if the risk increases.

79 While the economic costs associated with individual bird strikes are material, there is a further economic risk to the efficient operation of the Airport to the wider regional economy. In an extremely competitive environment, delays and additional costs have the very real potential of affecting the Airport's competitiveness. This in turn is likely to impact upon the significant and vital contribution that the Airport makes to the Canterbury Region economy.

80 Overall, I consider that applying more stringent regulations for new bird strike risk activities in an area that affects a relatively small portion of rural land and landowners in Waimakariri District is the most economically efficient approach when considered against the significant economic benefits of minimising bird strike risk and ensuring the safe operation of the Airport.

RESPONSE TO SECTION 42A REPORT

81 While I have read the S42A report for Stream 10A, it does not contain any evidence or assessment of economic costs and benefits of CIAL's relief that I can respond to. Some of the issues identified in the S42A report are however covered in my evidence above.

Dated: 2 February 2024

Natalie Hampson

Appendix 1 – <u>Estimated WCGM 2022 Feasible and RER Capacity Short/medium-term Results for Kaiapoi Under a Proposed Plan Scenario</u>

82 This appendix sets out my assessment to determine how much lower medium-term feasible and RER capacity may be in Kaiapoi under the Proposed Plan modelling scenario in the WCGM (i.e., excluding the capacity enabled by Variation 1)

83 Relevant to this evidence, 81% of modelled vacant, infill and redevelopment capacity in Kaiapoi was calculated on minimum lot sizes greater or equal to 400sqm and 19% was calculated as being feasible and RER on sites between 300-400sqm.[25] This means that the WCGM 2022 does not identify any non-greenfield sites less than 300sqm as being feasible and RER over the next 10 years in Kaiapoi[26]

84 Since the WCGM 2022 did not identify any feasible or RER dwelling capacity across existing residential zones in Kaiapoi less than 300sqm in lot size over the short/medium-term, the same capacity results would, in theory, be expected for the areas zoned MRZ in the Proposed Plan. This covers the majority of the residential zoned land within Kaiapoi and within the 50dBA L_{dn} Air Noise Contour (Figure 4), meaning that a significant share of capacity included in the WCGM 2022 can be relied on under a Proposed Plan capacity scenario.

85 The only area where the WCGM 2022 results would not be accurate (and would overstate capacity for a Proposed Plan capacity scenario) is the notified GRZ area which had a minimum lot size of 500sqm (Figure 4). I estimate the capacity of the GRZ in three discrete areas as follows.

86 First, 3 of Kaiapoi's greenfield areas modelled in the WCGM 2022 (Silverstream, Future Silverstream and The Sterling) fall within the GRZ and have a capacity of 270 under that model (and capacity of 196 according to Inovo Projects). This land was zoned under the ODP and I don't expect that the notified GRZ would change the dwelling yield expected for those development areas.

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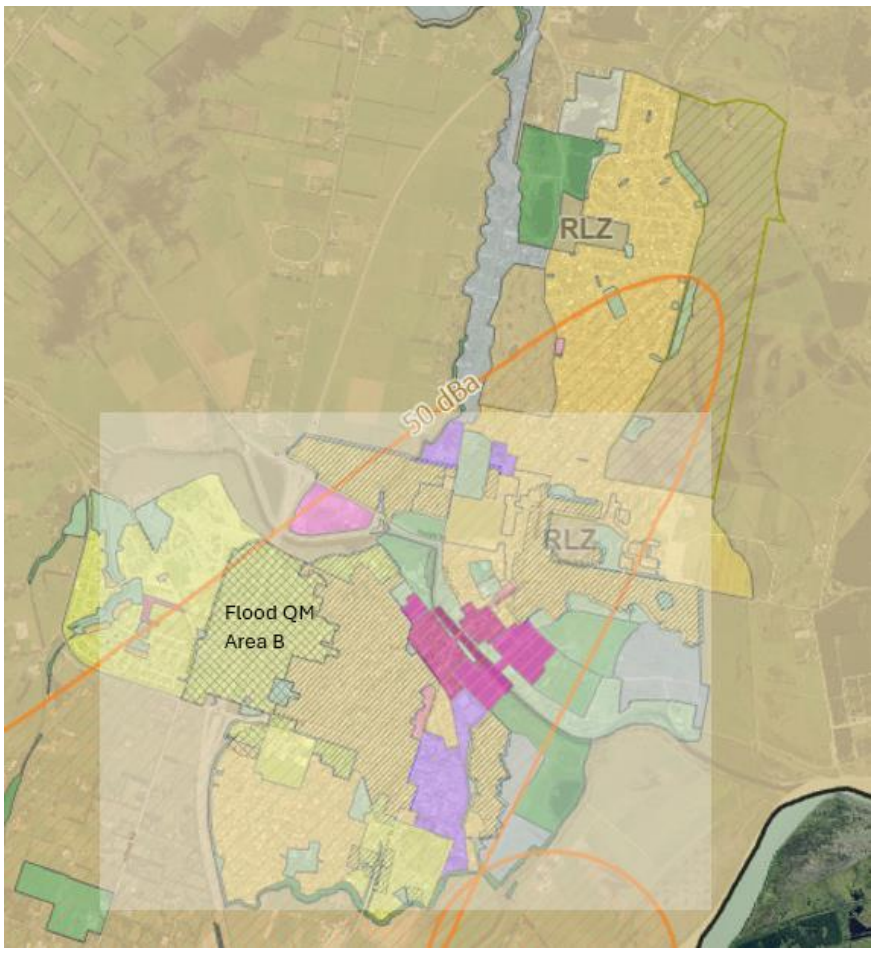
[25] Waimakariri Residential Capacity and Demand Model – IPI 2023 Economic Assessment, Formative, 8 December 2023, page 34.

[26] It is acknowledged that the Model did not allow for comprehensive/multi-unit developments, or which there are some examples occurring in recent times in Kaiapoi (in older properties) that are delivering higher densities (closer to plan enabled provisions). Since MDRS came into effect in the district, the average lot size of comprehensive developments has dropped to 215sqm, close but still lower than the density of the MDRZ without MDRS (Formative, 2023).

87 Second, as I do not have access to parcel level results from the WCGM 2022[27] I cannot confirm how much of the vacant and infill/redevelopment capacity of Kaiapoi sits within the extent of the notified GRZ. However, the impact of the Natural Hazard – Flood Qualifying Matter (**QM**) proposed via Variation 1 on WCGM 2022 capacity results for Kaiapoi was addressed in evidence for PPC31 and is helpful.

88 Area B of that QM would have a minimum lot size of 500sqm - the same as the notified GRZ - and it covers approximately half of the notified GRZ area in the Proposed Plan excluding the greenfield areas to the west (Figure A).

Figure A – Area B of the Variation 1 Flood Hazard Qualifying Matter (500sqm minimum lot size constraint) Relative to Notified Proposed Plan General Residential Zone Extent



[27] While I understand that this could have been requested (and may have been supplied by council), there was insufficient time for me to request and analyse that data for this evidence.

89 In response to written questions for PPC31, Mr Yeoman confirmed that the WCGM 2022 showed capacity for 27 additional feasible and RER dwellings in the medium-term in Area B of the Flood QM under Variation 1 provisions.[28] Limiting minimum lot sizes in Area B to 500sqm apparently eliminated 10 dwellings from the capacity results, leaving 17 feasible and RER dwellings in the Area B of the GRZ that are on lots 500sqm or above.[29]

90 Third, a visual inspection of Council GIS property data for the remaining areas of GRZ[30] suggests a larger number of sections that could be further subdivided or redeveloped to yield additional dwellings, compared to the land zoned GRZ within the Flood QM Area B.

91 Very indicatively, I estimate feasible and RER capacity of around 40-130 additional dwellings in these remaining parts of the GRZ under a Proposed Plan minimum lot size of 500sqm.[31] This capacity is based on around 20 parcels in those zone areas that exceeded 1,000sqm in size (i.e. the minimum threshold to yield one additional lot). However, I have insufficient information to contrast this with the existing capacity in the WCGM 2022 for these same land areas. Logically though, it is lower.

92 When considering the scale of the areas where capacity is known or expected to be lower relative the areas where capacity is likely to be the same as modelled in the WCGM 2022, I conclude that the WCGM would calculate a lower medium-term feasible and RER capacity without Variation 1 applied, and that the difference is likely to be only a minor reduction to published results.

93 Ideally Council would run a Proposed Plan capacity scenario in the WCGM to confirm my assumptions for Kaiapoi (and the other Main Urban Townships).

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28 Under MDRZ with MDRS, Variation 1.

29 PPC31, Mr Yeoman's response to Minute 5 Questions, page 4. In the long-term, Mr Yeoman indicated capacity for 27 additional dwellings if constrained to a minimum lot size of 500sqm.

30 I.e. excluding the greenfield areas to the west and Area B of the Flood QM. I also exclude land that is designated for non-residential use.

31 Depending on how the WCGM 2022 treats the large 'Blue Skies' site in the GRZ, this alone could count for a large number of lots (indicatively 90 at 500sqm minimum lot size).

Appendix 2 – Copy of The Economic Contribution of the Christchurch International Airport, Market Economics Ltd, August 2023.

The Economic Contribution of the Christchurch International Airport

31 August 2023 – Final

m.e consulting

The Economic Contribution of the Christchurch International Airport

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Executive Summary

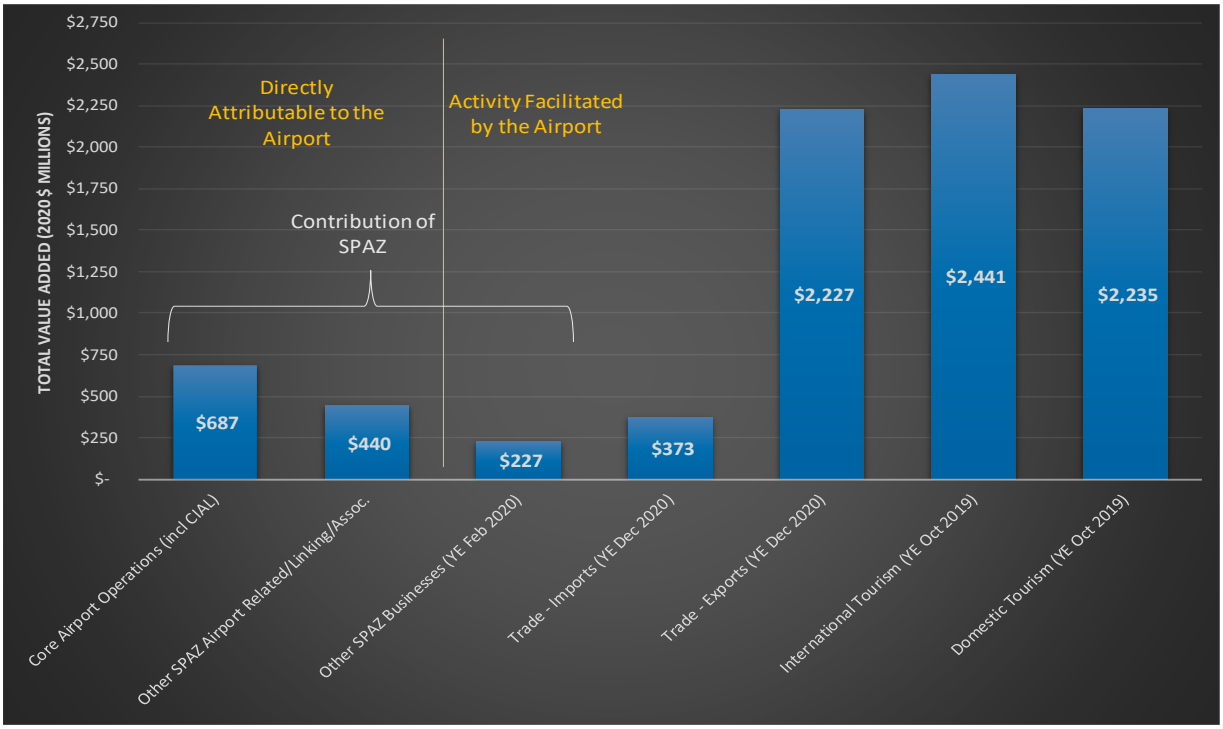
This report by Market Economics contains an assessment of the economic contribution of the Christchurch International Airport (Christchurch Airport / the Airport). The modelling relies on a range of data sources, including data supplied by Christchurch International Airport Limited (CIAL). This data is analysed and incorporated within an Input-Output based economic model using best practice methodologies and clearly stated assumptions.

The economic contribution of Christchurch Airport is an annual snapshot. To avoid under-representing the economic effect of the Airport, a 12 month period(s) prior to the start of New Zealand's Covid-19 response has been modelled. This shows the contribution of Airport, and its environs, at its most recent peak.

The economic contribution of Christchurch Airport is measured according to (direct, indirect and induced) value added (akin to GDP) and employment. It can be broken down by 109 industry sectors and six economic regions. Importantly, the economic contribution is distinguished according to business activity directly attributable to (dependent on) the Airport (inclusive of CIAL as a business entity) and located within the Special Purpose Airport Zone (SPAZ), and business activity that is facilitated by the Airport and air transport services, both inside the SPAZ and beyond.

The contribution that Christchurch Airport makes to the national economy is summarised in the graph below. The national value added contribution to the economy from business activity directly attributable to the Airport is $\$_{2020}$1.13 billion (sustaining approximately 8,900 additional jobs to those already in the SPAZ). The national value added contribution to the economy from business activity facilitated by the Airport is significantly greater at $\$_{2020}$7.50 billion (approximately 79,580 jobs sustained).

Christchurch Airport's Peak Economic Contribution - Total National Value Added ($ Millions)



1 Introduction

Market Economics (M.E) has been asked to assess the economic contribution, or significance, of Christchurch Airport and the wider Special Purpose Airport Zone (SPAZ) located in Christchurch City on behalf of Christchurch International Airport Limited (CIAL).

Airports are essential infrastructure that generate wide ranging social and economic benefits to regions. The speed, connectivity and convenience of air travel is a major factor promoting leisure and business travel and domestic and international freight activity, all of which are facilitated by airports.

This in turn sustains a range of additional business activity that directly supports or is related to the operation of airports, supports the needs of passengers using airports, or is aviation focussed. As a result, airports become significant hubs for business and employment activity in their immediate environs. However, the economic linkages of core airport and related activities are far reaching, and can be felt nationwide, especially for major metropolitan airports like Christchurch.

It is important for policy makers to understand the implications of proposed policy changes in economic terms. In this case, to understand the economic role Christchurch Airport plays in the local and wider economy. Only then can appropriately informed decisions be made on objectives, policies and rules that may have consequential effects on the safe and efficient operation of this nationally significant infrastructure. The objective of this report is to help build that understanding.

1.1 Scope

With reference to the economic contribution of Christchurch Airport, the following components are included in our assessment:

- The contribution of the Airport as a business unit.
- The contribution of core airport operations (not limited to CIAL).
- The contribution of businesses in the Airport environs – being the SPAZ in this instance.
- The contribution facilitated by the Airport (see below).

Not all business activity directly attributable to the presence of the Airport is captured in this Economic Impact Assessment (EIA). This includes businesses related to or supporting Airport operations that are located outside the SPAZ – some nearby in Christchurch City and some spread throughout New Zealand. A number of assumptions are needed to identify these businesses (with only limited data available to help verify those assumptions). As such, M.E has decided to exclude that component of economic contribution in the modelling – taking a conservative approach.

1.1.1 Facilitated Effects

An important characteristic of airports is that they can influence economic activities which are substantially greater than the economic activity of the airport itself. Airport infrastructure unlocks and supports a range of other activities. These activities, often called 'facilitated effects', form an important component of the overall contribution of airports.

Some economists hold the view that it is incorrect to include the facilitated effects of airports.[1] Our understanding of economies and economic activity is that airports and ports exist for a reason, and it is not appropriate to ignore their significance to other sectors within the economy. For many sectors, the availability of transport infrastructure – airport or seaport – is critical to some or all of their business activity, enabling trade with other regions or other countries. Without this transport infrastructure, some trade and economic activity would not have taken place, and the overall economic effects would be significantly understated.

Our approach to include facilitated effects is consistent with studies undertaken for the International Air Transport Association (IATA) and the Airports Council International (ACI) as well as a range of EIA's on airports carried out in New Zealand in recent years. The facilitated effects are identified separately and include:

- The spending associated with businesses benefiting from being located in the SPAZ, and occupying CIAL owned land, but that are not directly related to core aviation operations. Their presence in the SPAZ is facilitated by CIAL and they are an important source of revenue to CIAL, helping fund core airport operations.

- The economic effects associated with international importing and exporting of goods and the value chains of firms relying on air transportation to access markets. The scale of trade (and the value chain effects) facilitated by airports can be very large.

- A portion of spending associated with tourism (both domestic and international). Airport infrastructure provides an entry and exit point for many travellers. These travellers (i.e., passengers on flights) spend money within the local and regional economy, generating economic activity in the tourism sector with flow-on effects to the rest of the economy.

There are two important considerations when estimating the facilitated effects associated with the above:

1. What share of total value can be attributed to airports and air transportation?

2. What share of the value can be attributed to different regions throughout New Zealand?

Where possible, our estimates allow for these two considerations using available information. However, in some instances it is not practical to estimate the distribution of impacts across New Zealand's regions. In these cases, we have relied on a number of assumptions. These are discussed further throughout the report.

[1] See for example, Economic Impact of POAL, Covec, 2008.

1.2 Information Sources

Multiple secondary data sources were relied on for this EIA study, including detailed expenditure and revenue data for recent years supplied (in confidence) by CIAL. Where necessary, we sought further detail on this data with CIAL staff to develop a sound picture of Airport and SPAZ operations. CIAL's website was also helpful in this regard. The expenses by year were mapped to economic sectors and location of supplier, enabling the expenditure data to be used in our chosen modelling framework (discussed further below).

Other Airport data provided included:

- Flight movements by type and month.
- Passenger movements by type and month.

A range of other data sources were also considered and/or incorporated in the analysis, including:

- Christchurch District Plan zoning.
- Statistics New Zealand datasets:
    - Statistical boundaries;
    - Business Demography Survey (BD);
    - Imports and Exports Tables (national and by port);
    - Tourism satellite accounts; and
    - National Input-Output Table.
- Monthly Regional Tourism Estimates (MRTE) 2016-2020 from the Ministry of Business, Innovation and Employment.
- Aerial photographs, Google Street View, general web-based information.

1.3 Report Structure

This report begins with a brief discussion on the EIA approach applied and some of the nuances of the modelling and its interpretation (Section 2). Section 3 sets out the economic contribution results of activities directly attributable to Christchurch Airport. This includes a detailed analysis of the economic contribution of CIAL as a business unit, followed by a more high-level (desk-top) analysis of different groups of activities (businesses) related to the Airport and located in the SPAZ. Section 4 sets out the economic contribution results of economic activities facilitated by Christchurch Airport. Aspects of our approach in this section are discussed in more detail in appendices. Section 5 provides a summary of all EIA results and brief conclusions on the economic significance of Christchurch Airport.

2 Approach & Assessment Framework

This section describes the EIA approach and the specific methodology applied to estimate the economic contribution of Christchurch Airport. It explains how the economic contribution is measured, and the framework that guides the analysis and reporting of results. The recent performance of Christchurch Airport (and the wider SPAZ) is also discussed as the year selected for modelling makes a material difference to the economic contribution results. Due to Covid-19, M.E has not just selected the most recent year of economic activity as this would under-represent the economic role of the Airport.

2.1 EIA Methodology (Input-Output Modelling)

EIA is a particular economic analysis methodology designed to either understand the economic impacts of proposed investments and development in an economy or the economic contribution of existing activities. The analysis and interpretation undertaken for this report reflects a snapshot of the wider airport sector and its linkages at one point in time and is therefore a measure of the Christchurch Airport's contribution to the economy. This differs from economic 'impact'.

Economic impacts can be assessed in different ways and range from a 'with or without' scenario to a scenario where the effects of a 'next best alternative' is assessed and compared against the reference case. This is not the approach used here because the regional economy and Christchurch Airport have developed and grown together. It is not possible to revisit business investment and location decisions taken in the knowledge that the Canterbury Region does not have an international airport. Instead, the focus is on all activity that depends on, or is facilitated by, Christchurch Airport, irrespective of whether that activity would still operate in the Region (or even New Zealand) if the Airport infrastructure was not there.

The EIA model is based on Input-Output analysis which captures existing economic relationships. These relationships are expressed in a set of linear equations reflecting all market transactions for consumption in a given time period. As with all modelling approaches, Input-Output analysis relies on assumptions for its operation. Among the most important is the assumption that input structures of all industries (i.e., technical relationships) are fixed. In the real world, however, technical relationships will change over time. These changes are driven by new technologies, relative price shifts, product substitutions and the emergence of new industries. For this reason, Input-Output analysis is generally regarded as suitable for short-run analysis, where economic systems are unlikely to change greatly from the initial snapshot of data used to generate the base Input-Output tables. Input-Output analysis is, therefore, considered appropriate for the purpose of this study.

A bespoke Multi-Regional Input-Output (MRIO) table was developed for the EIA model by M.E. This MRIO table covers 109 industry sectors and six economic 'regions' and reflects the sectoral interactions (purchases, sales and other transfers) between sectors (as well as final demand sectors such as households)

and between those regions.[2] The MRIO table has a base year of 2020[3], and therefore all final inputs and outputs of the model are expressed in $2020.[4]

The methods used in this EIA are tested and proven and are employed globally by organisations looking to understand the economic contributions of airports to regional and national economies. They have been tested through significant peer review both academically and through industry review, and the approaches and findings have undergone scrutiny in the Environment Court.

2.2 Metrics Used to Explain Economic Contribution

The EIA model measures the economic contribution of Christchurch Airport using **value added** (synonymous with contribution to regional Gross Domestic Product), and **employment**. These two metrics tend to be used because they best represent the 'true' value of the contribution (or impact) to the local economy.

Value added is the principal measure of economic activity, and is estimated as operating surplus, wages and salaries paid to staff and working proprietors, depreciation, taxes and subsidies. The employment impacts are measured in terms of the count of employees (as well as estimated working proprietors) sustained.[5]

As well as estimating the direct valued added or employment effect of spending in the economy linked to Christchurch Airport,[6] the model also calculates the indirect effect. Indirect effects result from an industry stimulating the creation of further demand through the purchases that it makes in other sectors of the economy. For example, CIAL directly spends money on property maintenance services from the property maintenance services sector causing their output to increase to sustain the demands of CIAL. In turn, the property maintenance services sector purchases more inputs from other sectors to cope with their increased output. Each of these transactions in addition to the initial injection of demand, generates a degree of value added and employment in the economy, and requires additional worker time up the supply-chain.

In addition to the direct and indirect effects of demand, the model also estimates induced effects. Induced effects arise from the increased demand for goods and services made by households who have received increased income as a result of the direct and indirect effects. CIAL pays wages and salaries to staff, as do its suppliers. These workers then spend money in the economy generating a further round of value added and employment.

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[2] The economic regions in the model are Christchurch City, Selwyn District, Waimakariri District, rest of Canterbury Region, rest of South Island and rest of New Zealand (i.e., North Island). Results by region can be aggregated to give total Canterbury Region or total New Zealand for example.

[3] Year ending June.

[4] Depending on the year that is being modelled, this may require deflation or inflation on input expenditure data. M.E uses the Producers Price Index for these adjustments.

[5] This measure of employment is called the Modified Employment Count (MEC) by Market Economics.

[6] The economic contribution of CIAL as a business entity is based on detailed expenditure data supplied to M.E, while the economic contribution of all core airport operations (including but not limited to CIAL) and all facilitated business activity relies on average ratios of gross output/MEC derived from the MRIO.

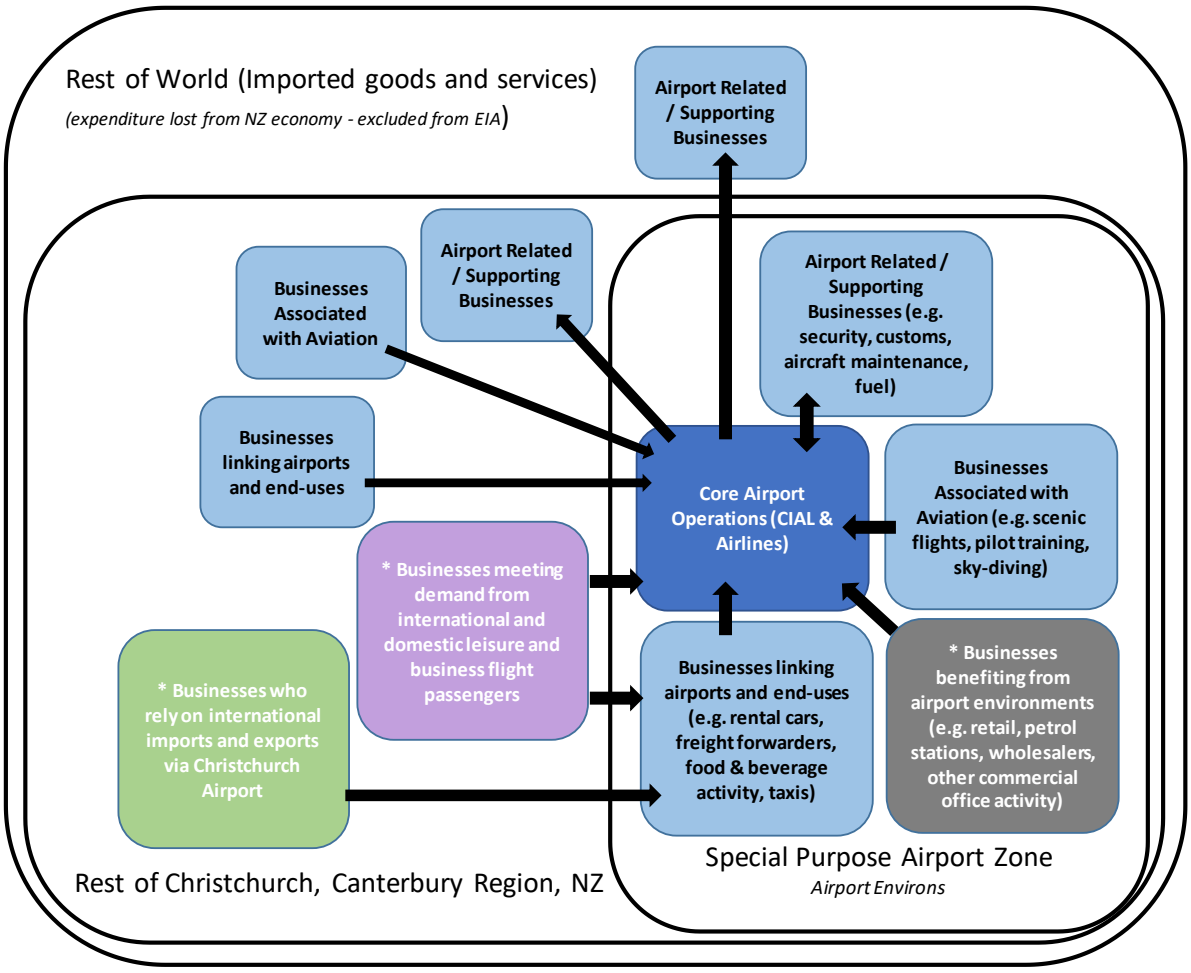
The total economic contribution of Christchurch Airport is the sum of the direct, indirect and induced value added and employment it sustains within the economy (directly or by facilitating further spending).

2.3 Components of Economic Contribution – Classification & Spatial Structure

As mentioned, airports directly sustain or facilitate a range of different business activities. Many of these businesses will be located in the immediate environs of an airport – in this case the SPAZ – and others will be located elsewhere in Christchurch, the Canterbury Region or New Zealand. A small number of businesses that support Christchurch Airport (i.e., sell goods and services) are located offshore. This is expenditure lost from the New Zealand economy and is therefore excluded from the EIA.

Figure 2-1 provides a summary of how different component parts of the economic contribution of Christchurch Airport have been assessed. These classifications are discussed in more detail in Section 3.

Figure 2-1 - Key Business to Business Relationship Able to be Captured in the Economic Contribution of Christchurch Airport



* = activity facilitated by the airport. All other activities are partly or wholly dependent on the presence of the airport
Direction of arrow indicates the direction of direct purchasing of goods/services.

Businesses (and specifically the employment in those businesses) in the SPAZ have been grouped to the five categories shown in Figure 2-1 by M.E at a detailed 6-digit ANZSIC level, and then aggregated to 109 economic sectors. Consideration has been given to the way in which businesses have been grouped in other airport EIAs completed around the country (by M.E), knowledge of many of the specific businesses in the SPAZ likely to be classified to each ANZSIC code (using detailed debtor data from CIAL), and web-based information on those businesses (where available). There is a degree of subjectivity in the grouping, and the results at the grouped level (but not the combined level) will be sensitive to the assumptions made.

The EIA model is limited to the economic contribution made by businesses (employment) inside the SPAZ as well as facilitated economic contributions outside the SPAZ and (where possible) ensuring no double counting between business groups/spending. As noted previously, businesses directly related to or supporting airport operations, or that are aviation focussed or linking the airport with end-users that are located outside the SPAZ, are excluded from scope but are still recognised in Figure 2-1 as they are a legitimate part of the Airport's overall economic contribution. Some examples of this excluded activity are:

- A portion of taxi activity, whereby they take passengers to/from the Airport.[7]
- Air-freight forwarding companies based in other commercial zones in Christchurch or neighbouring districts who utilise air-freight services but are not based in the SPAZ.
- Security, IT, food wholesale supply and other service providers supporting core Airport operations that are not based in the SPAZ. This may also include specialist aircraft mechanical service providers, training services, or specialist software providers/operators.
- Duty Free stores that are based in the Christchurch CBD and not the Airport terminal.

2.4 Selecting the Year to Represent the Airport's Economic Contribution

The EIA estimates the contribution that Christchurch Airport and wider SPAZ makes to the economy (in each economic region) over the course of one year. It is therefore an annual snapshot of its economic contribution, and this contribution will change over time. It is sensitive to changes in passenger and freight flows, with Covid-19 having a significant impact on air-travel since early 2020. It is also sensitive to the timing of capital expenditure (development) within the SPAZ by CIAL, and macro-economic conditions which impact business activity and employment generally.

2.4.1 Employment in the SPAZ

Employment in the SPAZ[8] (inclusive of CIAL) peaked in February 2020 at just under 8,790 jobs (Figure 2-2).

[7] This expenditure can also be captured as part of the facilitated expenditure of tourists.

[8] The SPAZ occupies the significant majority of a single SA1. The SA1 does however include a small are of rural/rural lifestyle land. M.E has excluded any primary production (including mining) activity employment on the assumption that this is not located inside the SPAZ.

Figure 2-2 – Time Series of total SPAZ Employment (MECs) YE February (SA1 Defined)

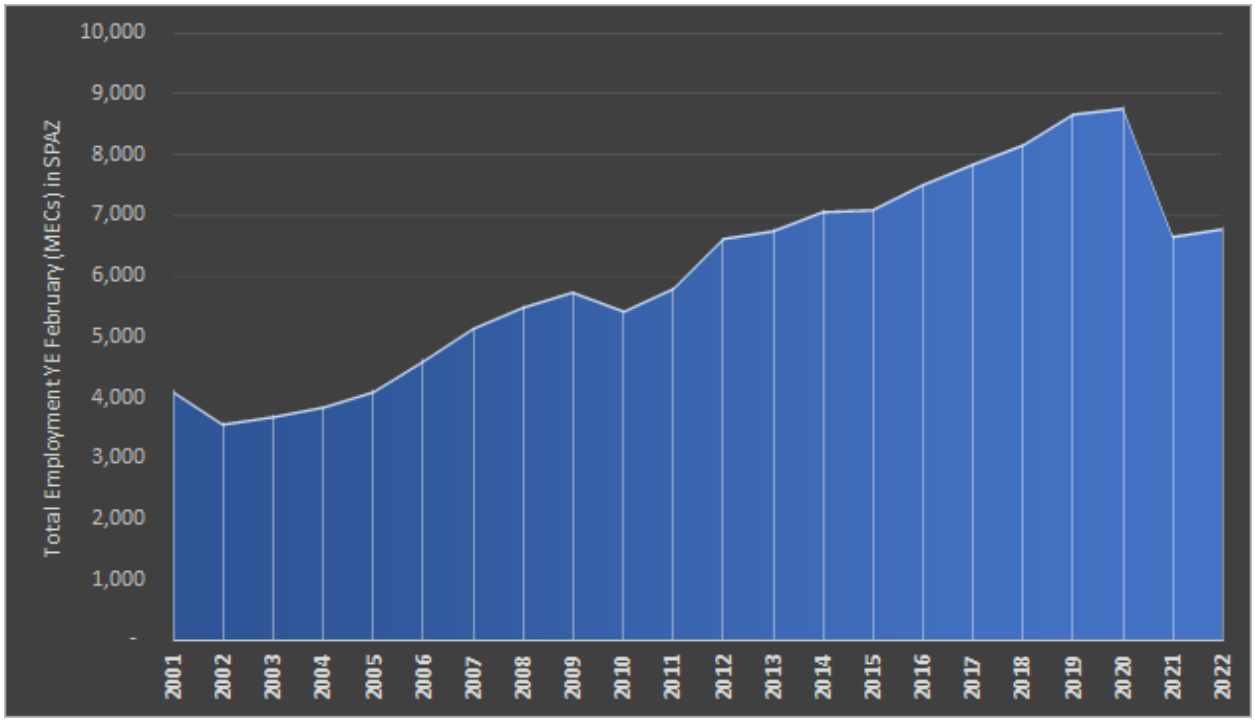
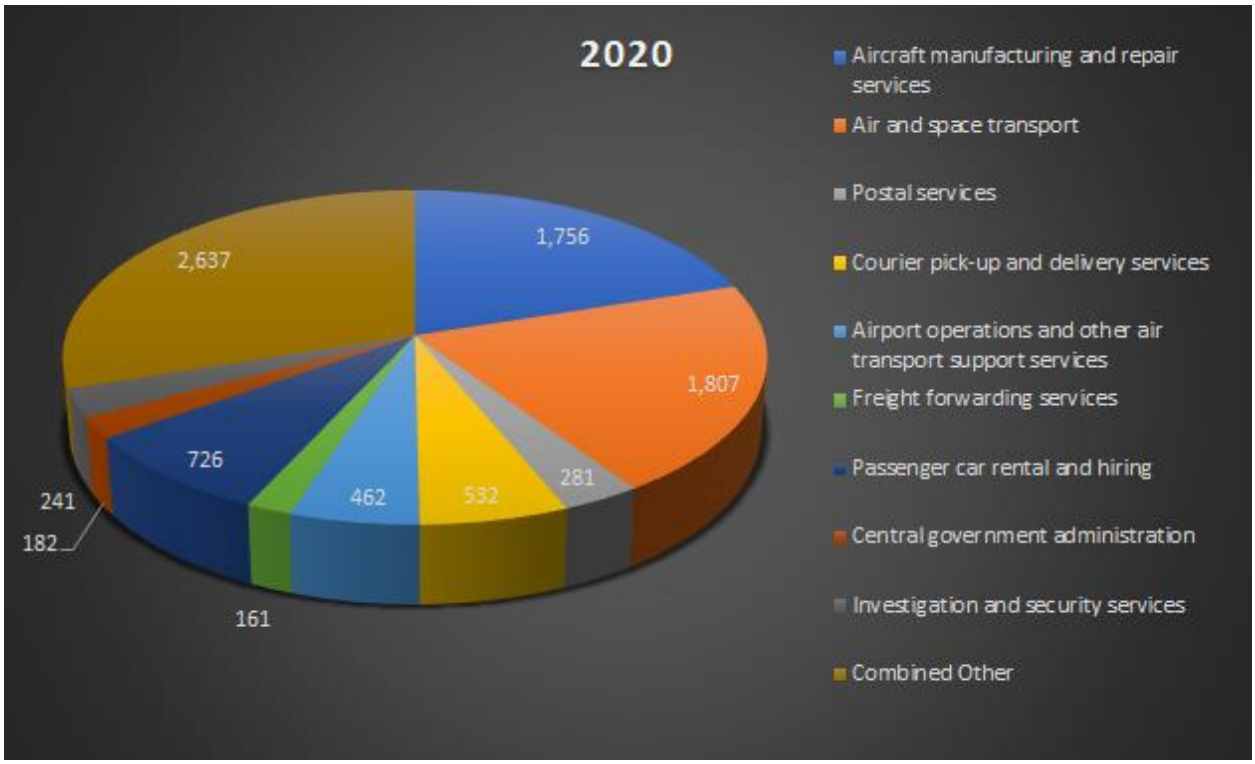


Figure 2-3 – Top 9 Industries in the SPAZ by Employment (MECs) in 2020 (6-digit ANZSIC)



This accounted for 4% of Christchurch City employment and 3% of Canterbury Region employment that year. 70% of the jobs in the SPAZ are concentrated in nine industries (Figures 2-3).[9] Total employment in the SPAZ dropped substantially in February 2021 due to the impacts of Covid-19, but increased slightly in February 2022 to just over 6,800. 2023 figures from StatisticsNZ are not yet available, but the data shows that several industries operating in the SPAZ are still suffering the global effects of Covid-19 (and are trying to recover to their previous peak).

Figure 2-4 shows the relative location of workers across the SPAZ.[10] This data is a sample of workers and is only available for 2021 (calendar year) – but the spatial distribution is expected to be similar under peak employment numbers (and when grossed up to the total)[11] – the larger the blue/white clusters, the more workers visited that location across the course of the year.

Figure 2-4 - Relative Distribution of Workers Within the SPAZ 2021 (Sample Mobile Phone Data)

[9] Source: StatisticsNZ Business Demography.

[10] More specifically, it shows the locations visited (for a sustained period) within the SPAZ by workers based in the SA1 encompassing the SPAZ. As such, it includes movements of workers, not limited to their workplace.

[11] The data is sourced from cell phone data which records movements of a sample of phone owners using GPS. Those movements have been cleaned to show destinations constituting a visit (i.e., to remove movement between destinations. The workplace SA1 of phone owners has been identified and provided as part of the data.

While only a sample of workers, Figure 2-4 shows that strong concentrations of employment in the SPAZ are based in and around the terminal, Sudima Hotel, Spitfire Square (shopping centre), Mustang Park (rental car depots) in the north and localised concentrations in Dakota Park (freight and logistics) to the south. The Hertz and VINZ locality is also showing a high concentration of SPAZ employment activity. Figure 2-5 helps make sense of the business precincts that define the SPAZ (as marketed by CIAL).

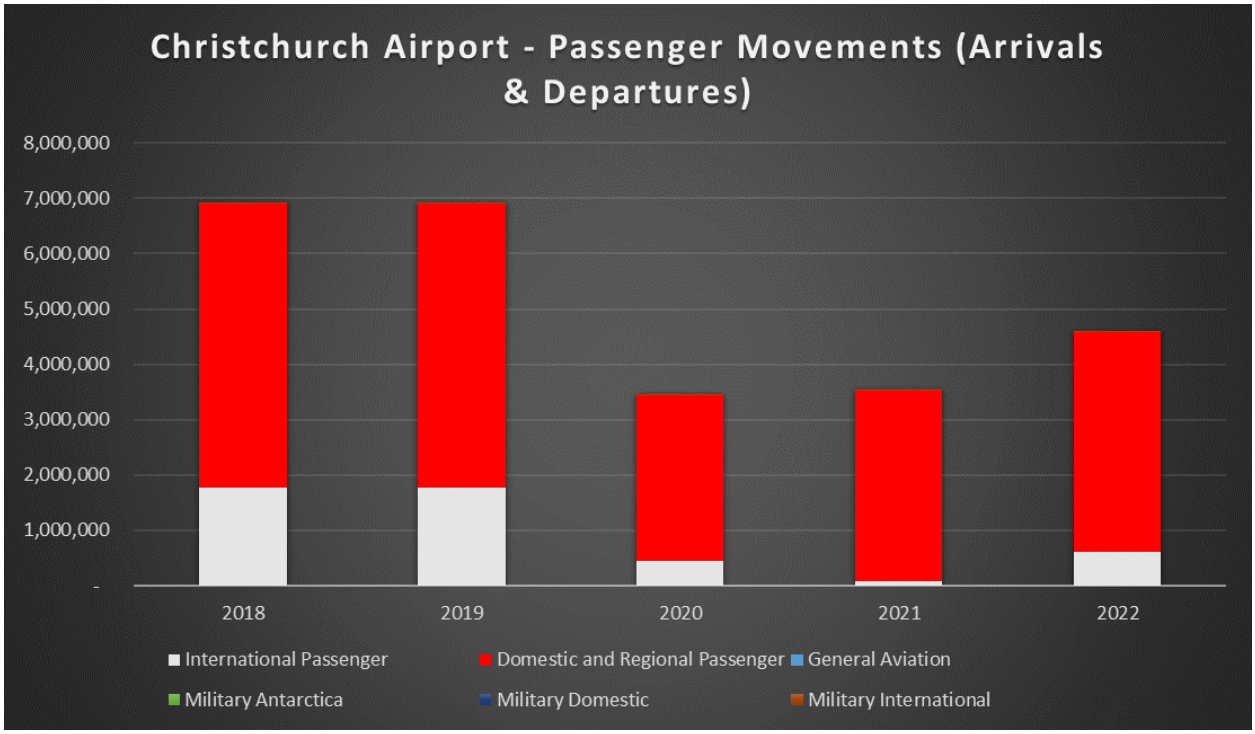
Figure 2-5 – Business Precincts within the SPAZ (source CIAL)

2.4.2 Passenger Movements

A total of 4.59 million passengers passed through the Christchurch Airport in the latest (2022) calendar year (arrivals and departures), with 87% on domestic flights and 13% on international flights. However, this total passenger count is just 66% of the total passengers that passed through the Airport in the 2019 calendar year - which reached 6.90 million. This again highlights that the recovery from Covid-19 is still ongoing. Even (main route) domestic flight passengers are only at 77% of pre-Covid-19 levels, which reflects the influence of the reduced number of international visitors taking domestic flights but also other economic factors (Figure 2.6).

In the 2019 peak year, passengers on international flights made up 26% of the total passenger count (compared to 13% in 2022). Indications from the first four months of 2023 are that the mix of domestic and international flight passengers is starting to return to 'normal'.

Figure 2-6 – Passenger Movement Trends by Year at Christchurch Airport (2018-2022 Calendar Years)



2.4.3 Flight Movements

Christchurch Airport not only caters for international and domestic flights (including key domestic routes and regional flights), but caters for a range of other scheduled and unscheduled flights. The trends for these other flight types over time are similar to those discussed above for passenger movements.

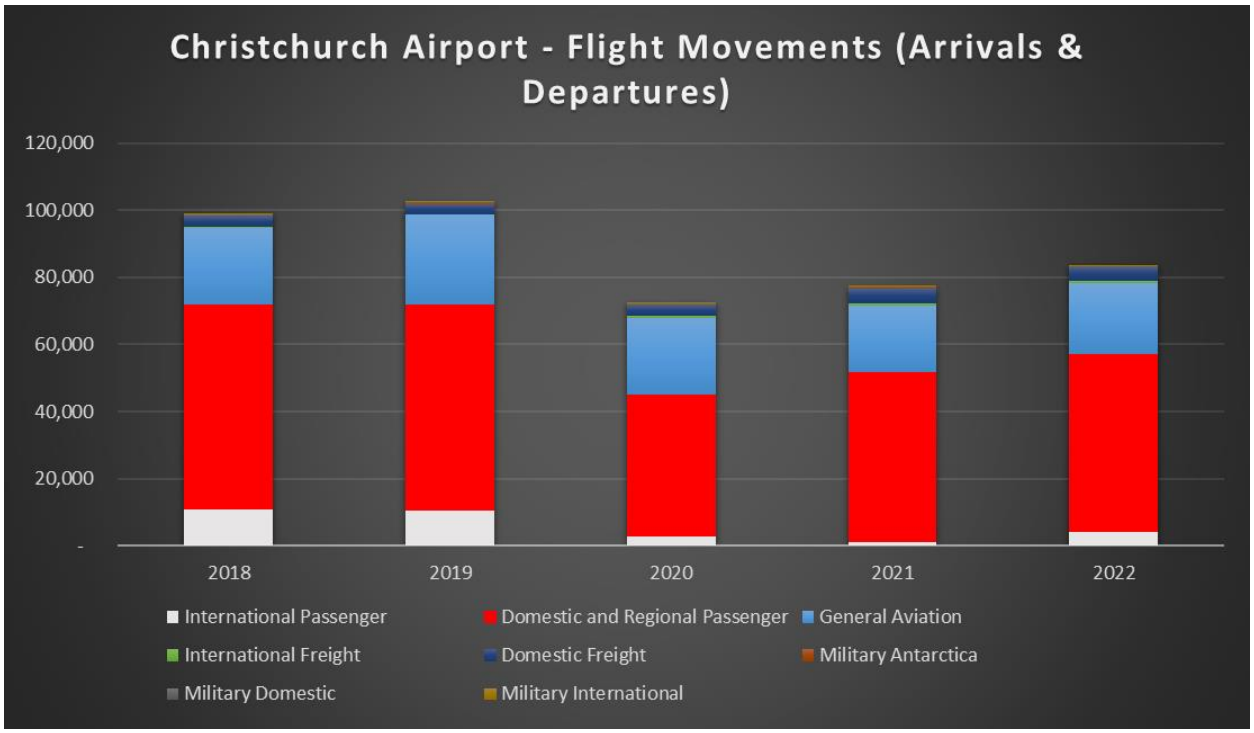
A total of nearly 84,500 flight movements were registered at Christchurch Airport in the 2022 calendar year (landings and take-offs),with 64% associated with domestic and regional passenger flights, and 5% associated with international passenger flights . This gives a combined total for scheduled passenger flight movements of nearly 57,300.

The balance of 2022 flight movements comprised 25% general aviation flights, 1% international freight flights, 5% domestic freight flights and 1% military flights. On average in the last five years (2018-2022), Christchurch Airport has handled 167 military flights to/from Antarctica, 527 domestic military flight movements and 50 international military flight movements per annum.

However, due to the ongoing recovery from Covid-19, these total 2022 flight movements are just 81% of the total flight movements that Christchurch Airport had in the 2019 calendar year - which reached nearly 102,300 flights (Figure 2-7). Domestic and regional passenger flights are at 87% of pre-Covid-19 levels and international passenger flight movements are at just 38%. On the contrary, Christchurch Airport has experienced steady growth in the number of freight flights since 2019. Freight played an increasingly important role thanks to the Government's International Air Freight Capacity scheme, which provided

funding post Covid-19 for dedicated freight flights (as opposed to sending goods on passenger flights), however, freight specific services have now started to decrease.[12]

Figure 2-7 - Flight Movement Trends by Year at Christchurch Airport (2018-2022 Calendar Years)



2.4.4 CIAL Expenditure

The effect of Covid-19 on flight and passenger movements has implications for a component of CIAL's revenue in any one year given that airlines are charged landing and/or passenger fees by CIAL. However, total annual operating expenditure by CIAL has been relatively stable between 2017 and 2022 due to having many fixed rather than variable costs.

Despite that, the nature of expenditure has changed across recent years with rent relief (for tenants in the SPAZ) and incentives (price subsidies) for airlines and promotion being relatively greater expenses in the years ending June 2020 and 2021 to try and manage the effects of Covid-19.

It is not possible for all annual operating expenditure provided to us by CIAL to be used in the EIA model. We have focussed on expenses associated with the purchase of tangible goods and services as well as wage and salary (and related) payments. This component of operating expenditure has been increasing gradually between 2018 and 2022. At the same time, capital expenditure (on infrastructure and new/upgraded buildings for example) has dropped significantly in 2021 and 2022.

[12] Source: CIAL submission on Waimakariri Proposed District Plan (paragraphs 11-12), dated 26 November 2021.

2.4.5 Modelling Implications

This all makes a material difference on what year is selected to examine the economic contribution of CIAL as a business entity, just as the variation in employment in the SPAZ by industry sector makes a material difference on what year is selected to examine the economic contribution of all SPAZ activities (i.e., total core airport operations, activities related to or supporting airport operations, businesses linking the airport with end-users and aviation focussed activity). This is because modelling the economic contribution of all Airport related SPAZ business activity is based on a more high-level employment-driven approach and not the detailed financial data approach used specifically for CIAL's economic contribution.

To avoid under-representing the economic contribution of Christchurch Airport due simply to the temporary effects of Covid-19:

- The results in Section 3 for CIAL as a business entity are based on the year ending June 2019. This financial year represents combined operating and capital expenditure by CIAL at its highest in recent years[13] – a level which CIAL would reasonably be expected to return to in the near future.

- The results in Section 3 for all business activity directly related to the Christchurch Airport are based on the year ending February 2020. As noted above, this employment snapshot in the StatisticsNZ Business Demography data represents peak employment in recent years. Again, this is a level of total employment that the SPAZ is expected to return to in the near future (and most likely exceed).

- The results in Section 4 for the economic contribution facilitated by Christchurch Airport are based on the year ending February 2020 for other business activity in the SPAZ, the year ending December 2020 for import and export activity, and the year ending October 2019 for domestic and international tourism activity. These variations in 12 month periods depend on how and when data is captured and published. Again, they are a level that is expected to be returned to in the near future.

[13] Noting that operating expenditure able to be included in the EIA model is in fact slightly higher in the year ending June 2022. Hence, the results are slightly conservative with respect to operating expenditure impacts.

3 Results – Directly Attributable

This section of the report steps through the results of the EIA modelling, starting with results on the economic contribution specifically of CIAL, followed by a broader breakdown of economic contributions for business activity within the SPAZ, grouped according to their relationship to core Airport operations (and as summarised in Figure 2-1 above).

3.1 Economic Contribution of CIAL Only

CIAL owns 792 hectares of rateable land in the SPAZ, with a current land value of just under $448 million, a total value of improvements of approximately $935 million and a combined capital value of $1.38 billion. It is a significant property owner and landlord, with the majority of businesses established in the SPAZ leasing land and buildings off CIAL.

CIAL has provided detailed expenditure (and revenue) data for recent years, including the share of that expenditure that is spent in each region of the economic model. M.E has coded that expenditure to match the model's industry sectors. As noted above, we have not entered all expenditure into the model, and have focused on purchases of goods and services, as well as payments of wages and salaries. Local government rates are a significant cost for CIAL (ranging from $6-$7 million per annum in recent years). This cost is not factored into the economic contribution and, for this and other reasons, the results are considered conservative.

Table 3-1 shows that CIAL as a business entity contributed $_{2020}$142 million in total direct, indirect and induced value added to the Canterbury Region economy in the YE June 2019 and $_{2020}$191 million in total value added to the New Zealand economy that year. It sustained total employment of 1,272 MECs in the Canterbury Region, and 1,552 MECs in New Zealand overall. This employment contribution is in addition to CIAL's own staff. The majority of the economic contribution is driven by capital expenditure, followed by operational expenditure and then wages and salaries.

Table 3-1 - Economic Contribution of CIAL as a Business Entity YE June 2019

Year Ending June 2019	Valued Added ($_{2020}$$ million)				Employment ($_{2020}$MECs) *			
	Operating Expenditure	Capital Expenditure	Wages & Salaries	Total Contribution	Operating Expenditure	Capital Expenditure	Wages & Salaries	Total Contribution
	Total Economic Contribution							
Waimakariri District	$ 0	$ 2	$ 1	$ 3	2	12	4	18
Christchurch City	$ 16	$ 93	$ 10	$ 120	198	820	93	1,111
Selwyn District	$ 0	$ 2	$ 1	$ 3	2	13	4	19
Rest of Canterbury	$ 2	$ 12	$ 3	$ 16	13	92	20	124
Total Canterbury Region	**$ 19**	**$ 108**	**$ 15**	**$ 142**	**215**	**936**	**121**	**1,272**
Rest of South Island (incl. Chathams)	$ 1	$ 5	$ 1	$ 8	10	47	12	69
North Island	$ 13	$ 23	$ 6	$ 42	66	118	29	213
Total New Zealand	**$ 33**	**$ 136**	**$ 22**	**$ 191**	**291**	**1,102**	**162**	**1,554**

Source: CIAL, Market Economics Ltd. Christchurch Airport EIA Model 2023.

Contribution captures expenditure on intermediate inputs and wages and salaries only. Excludes operating surplus, taxes (including rates), interest and imports.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

3.2 Economic Contribution of Core Airport Operations

For the purposes of this EIA, core Airport operations in the SPAZ include CIAL itself and other critical Airport operations and includes the airlines that operate from the SPAZ. Businesses operating a terminal for private jets within the SPAZ are included here. As Christchurch Airport plays an important role for New Zealand Defence Force activities, we have included this activity as part of the core Airport operations alongside other airlines. Christchurch Airport is also the base of Antarctic research operations in New Zealand which make a number of flights to Antarctica each year. This business activity is treated as part of the core operations of the Airport (akin to an airline) for the purpose of this EIA.

Table 3-2 shows that businesses that are part of core Airport operations in the SPAZ contributed $\$_{2020}$440 million in total direct, indirect and induced value added to the Canterbury Region economy in the YE February 2020 and $\$_{2020}$687 million in total value added to the New Zealand economy that year. They sustained total employment of 4,013 MECs in the Canterbury Region, and 5,377 MECs in New Zealand overall. This employment contribution is in addition to those employed in core Airport operations in the SPAZ in 2020.

Table 3-2 - Economic Contribution of Core Airport Operations in the SPAZ YE February 2020

Year Ending February 2020	Valued Added ($_{2020}$$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
	Core Airport Operations (Including CIAL)							
Waimakariri District	$ 1	$ 2	$ 3	$ 5	7	9	16	32
Christchurch City	$ 208	$ 79	$ 82	$ 369	1,968	741	743	3,452
Selwyn District	$ 2	$ 2	$ 3	$ 8	12	13	17	41
Rest of Canterbury	$ 21	$ 16	$ 22	$ 58	222	109	156	487
Total Canterbury Region	**$ 231**	**$ 99**	**$ 111**	**$ 440**	**2,208**	**873**	**932**	**4,013**
Rest of South Island (incl. Chathams)	$ 13	$ 12	$ 16	$ 41	117	101	141	359
North Island	$ 56	$ 63	$ 86	$ 205	224	334	448	1,006
Total New Zealand	**$ 301**	**$ 174**	**$ 213**	**$ 687**	**2,548**	**1,308**	**1,521**	**5,377**

Source: CIAL, Market Economics Ltd. Christchurch Airport EIA Model 2023.

Contribution captures expenditure on intermediate inputs and wages and salaries only. Excludes operating surplus, taxes (including rates), interest and imports.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

3.3 Economic Contribution of SPAZ Businesses Related/ Supporting Airport Operations

For the purposes of this EIA, activities related to, or supporting, Airport operations or aviation in general includes customs, security, emergency services, police and airline catering activity as well as wholesaling of petroleum products. It also includes aircraft maintenance. Christchurch Airport wouldn't be able to operate in the absence of these services. While most of these businesses and organisations are based within the SPAZ, a small number are not co-located. The economic contribution of those Airport related and supporting businesses located outside the SPAZ have not been included in the scope of the EIA.

Table 3-3 shows that businesses that are related to or supporting Airport operations (and located in the SPAZ) contributed $\$_{2020}$145 million in total direct, indirect and induced value added to the Canterbury Region economy in the YE February 2020 and $\$_{2020}$198 million in total value added to the New Zealand

economy that year. They sustained total employment of 1,387 MECs in the Canterbury Region, and 1,700 MECs in New Zealand overall. This employment contribution is in addition to those employed in those particular SPAZ businesses in 2020.

Table 3-3 - Economic Contribution of Businesses in the SPAZ Related to/Supporting Airport Operations YE February 2020

Year Ending February 2020	Valued Added ($_{2020}$$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
	Airport Related/Supporting Businesses in Special Purpose Airport Zone							
Waimakariri District	$ 0	$ 1	$ 1	$ 2	3	4	6	13
Christchurch City	$ 62	$ 28	$ 29	$ 118	647	267	258	1,173
Selwyn District	$ 1	$ 1	$ 1	$ 3	5	5	6	16
Rest of Canterbury	$ 9	$ 6	$ 8	$ 22	91	41	54	186
Total Canterbury Region	**$ 71**	**$ 35**	**$ 38**	**$ 145**	**747**	**317**	**323**	**1,387**
Rest of South Island (incl. Chathams)	$ 2	$ 4	$ 5	$ 10	15	29	41	85
North Island	$ 6	$ 15	$ 23	$ 44	32	78	119	228
Total New Zealand	**$ 79**	**$ 54**	**$ 66**	**$ 198**	**794**	**423**	**483**	**1,700**

Source: CIAL, Market Economics Ltd. Christchurch Airport EIA Model 2023.

Contribution captures expenditure on intermediate inputs and wages and salaries only. Excludes operating surplus, taxes (including rates), interest and imports.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

3.4 Economic Contribution of Businesses in the SPAZ Linking the Airport with End-users

For the purposes of this EIA, activities linking Christchurch Airport and aviation activities with end-users include:

a) Businesses directly associated with the Airport[14] that are there to service the needs of passengers rather than the operations of the Airport *per se*. This includes food and beverage businesses serving passengers while in the SPAZ,[15] accommodation located in the SPAZ, duty-free stores provided within the terminal, parking services, any travel booking services based in the SPAZ, and car rental companies based in the SPAZ.[16] Retail activities inside and outside the terminal are factored into the modelling elsewhere as explained in Section 4 of this report. While most of these businesses linking passengers with the Airport are based in the SPAZ, some are not (for example taxi companies and some duty-free businesses). Those outside the SPAZ are not captured in the EIA model.

b) Couriers, postal services and freight forwarders are also key businesses linking households and businesses with the Airport (i.e., to airlines transporting air freight). Again, the EIA captures those businesses located in the SPAZ,[17] but there are some businesses that still

[14] I.e., have a transactional relationship with CIAL. This may include paying a fee to conduct business in the SPAZ (such as gate charges), or leasing space/buildings from CIAL within the SPAZ.

[15] Located in the terminal, or elsewhere in the SPAZ. These businesses also benefit the SPAZ workforce.

[16] While all rental companies in the SPAZ are based in the Mustang Park precinct, some also have a presence within the terminal.

[17] These businesses are concentrated in the Dakota Park precinct.

access the Airport for freight reasons that are based outside the SPAZ. To be conservative, those less proximate businesses are not captured.

Table 3-4 shows that businesses that are helping to link the Airport with end-users (and located in the SPAZ) contributed $_{2020}$128 million in total direct, indirect and induced value added to the Canterbury Region economy in the YE February 2020 and $_{2020}$236 million in total value added to the New Zealand economy that year. They sustained total employment of 128 MECs in the Canterbury Region, and 236 MECs in New Zealand overall. This employment contribution is in addition to those employed in those particular SPAZ businesses in 2020.

Table 3-4 - Economic Contribution of Businesses in the SPAZ Linking the Airport with End Users YE February 2020

Year Ending February 2020	Valued Added ($_{2020}$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
	Businesses Linking Airport and End-Users Located in the Special Purpose Airport Zone							
Waimakariri District	$ 0	$ 1	$ 1	$ 2	2	4	5	12
Christchurch City	$ 52	$ 27	$ 24	$ 103	475	258	215	948
Selwyn District	$ 1	$ 1	$ 1	$ 3	5	6	5	16
Rest of Canterbury	$ 8	$ 6	$ 6	$ 20	63	41	45	149
Total Canterbury Region	**$ 61**	**$ 35**	**$ 32**	**$ 128**	**546**	**309**	**270**	**1,125**
Rest of South Island (incl. Chathams)	$ 3	$ 5	$ 5	$ 12	21	39	47	107
North Island	$ 26	$ 32	$ 37	$ 95	174	182	193	550
Total New Zealand	**$ 90**	**$ 71**	**$ 74**	**$ 236**	**741**	**531**	**510**	**1,782**

Source: CIAL, Market Economics Ltd. Christchurch Airport EIA Model 2023.

Contribution captures expenditure on intermediate inputs and wages and salaries only. Excludes operating surplus, taxes (including rates), interest and imports.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

3.5 Economic Contribution of Businesses in the SPAZ Associated with Aviation

For the purposes of this EIA, activities with aviation as a key focus or input into their business processes include scenic flight operators, sky diving operators, flight training providers and aero clubs. We have considered only those associated businesses located within the SPAZ. The SPAZ is also home to the International Antarctic Centre. While this tourist and educational attraction is not dependent on being near Christchurch Airport, it is linked to Antarctic research organisations that are dependent on the Airport to operate. They are therefore associated with aviation activity and included here. Overall, this is a relatively small group of businesses.

Table 3-5 shows that businesses that are associated with aviation (and located in the SPAZ) contributed $_{2020}$4 million in total direct, indirect and induced value added to the Canterbury Region economy in the YE February 2020 and $_{2020}$5 million in total value added to the New Zealand economy that year. They sustained total employment of 35 MECs in the Canterbury Region, and 47 MECs in New Zealand overall. This employment contribution is in addition to those employed in those particular SPAZ businesses in 2020.

Table 3-5 - Economic Contribution of Businesses in the SPAZ Associated with Aviation YE February 2020

Year Ending February 2020	Valued Added ($_{2020}$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
	Businesses in the SPAZ Associated with Aviation							
Waimakariri District	$ 0	$ 0	$ 0	$ 0	0	0	0	0
Christchurch City	$ 1	$ 1	$ 1	$ 3	16	7	6	30
Selwyn District	$ 0	$ 0	$ 0	$ 0	0	0	0	0
Rest of Canterbury	$ 0	$ 0	$ 0	$ 1	2	1	1	4
Total Canterbury Region	**$ 2**	**$ 1**	**$ 1**	**$ 4**	**19**	**8**	**8**	**35**
Rest of South Island (incl. Chathams)	$ 0	$ 0	$ 0	$ 0	2	1	1	4
North Island	$ 0	$ 0	$ 1	$ 2	2	3	4	9
Total New Zealand	**$ 2**	**$ 2**	**$ 2**	**$ 5**	**23**	**12**	**13**	**47**

Source: CIAL, Market Economics Ltd. Christchurch Airport EIA Model 2023.

Contribution captures expenditure on intermediate inputs and wages and salaries only. Excludes operating surplus, taxes (including rates), interest and imports.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

3.6 Summary of Economic Contribution Directly Attributable to the Airport

Table 3-6 and Figures 3-1 and 3-2 provide a summary of the total direct, indirect and induced economic contribution of business activity that is directly attributable to the Airport. In total, the value added contribution to the Canterbury Region economy is $\$_{2020}$717 million (approximately 6,560 additional MECs to those already in the SPAZ). When supply chains beyond the Canterbury Region are included, the total valued added contribution to the national economy is $\$_{2020}$1.13 billion (approximately 8,900 additional MECs to those already in the SPAZ).

Table 3-6 - Economic Contribution of Businesses in the SPAZ Directly Attributable to the Airport YE February 2020

Year Ending February 2020	Valued Added ($_{2020}$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
	Canterbury Region							
Core Airport Operations	$ 231	$ 99	$ 111	$ 440	2,208	873	932	4,013
Airport Related/Supporting	$ 71	$ 35	$ 38	$ 145	747	317	323	1,387
Businesses Linking End-Users	$ 61	$ 35	$ 32	$ 128	546	309	270	1,125
Businesses Associated w. Aviation	$ 2	$ 1	$ 1	$ 4	19	8	8	35
Total Core & Airport Related	**$ 365**	**$ 170**	**$ 182**	**$ 717**	**3,519**	**1,508**	**1,533**	**6,560**
	New Zealand							
Core Airport Operations	$ 301	$ 174	$ 213	$ 687	2,548	1,308	1,521	5,377
Airport Related/Supporting	$ 79	$ 54	$ 66	$ 198	794	423	483	1,700
Businesses Linking End-Users	$ 90	$ 71	$ 74	$ 236	741	531	510	1,782
Businesses Associated w. Aviation	$ 2	$ 2	$ 2	$ 5	23	12	13	47
Total Core & Airport Related	**$ 472**	**$ 301**	**$ 355**	**$ 1,127**	**4,106**	**2,274**	**2,527**	**8,906**

Source: CIAL, Market Economics Ltd. Christchurch Airport EIA Model 2023.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

While for a slightly different 12 month period, the total value added contribution of CIAL as a business entity accounts for approximately 28% of the national contribution from total core Airport operations in the SPAZ. In turn, total core Airport operations make up 61% of the overall economic contribution ($\$_{2020}$687

million), followed by businesses linking the Airport with end-users (21% of the total, $_{2020}$236 million)), and Airport related and supporting businesses (18% of the total, $_{2020}$198 million). Business activity associated with aviation and based in the SPAZ makes up less than 1% of the total national value added contribution of Christchurch Airport.

Figure 3-1 - Economic Contribution of Businesses in the SPAZ Directly Attributable to the Airport by Group YE February 2020

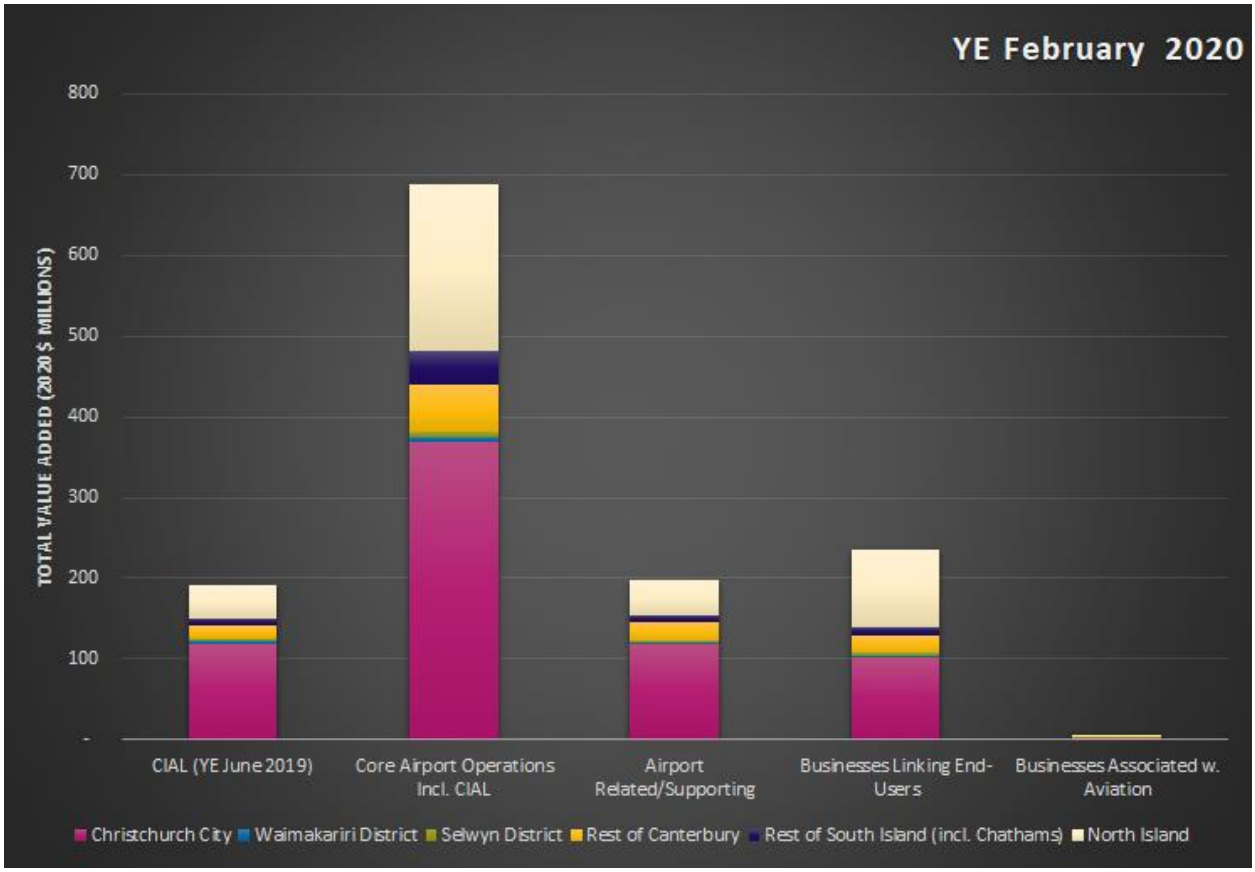
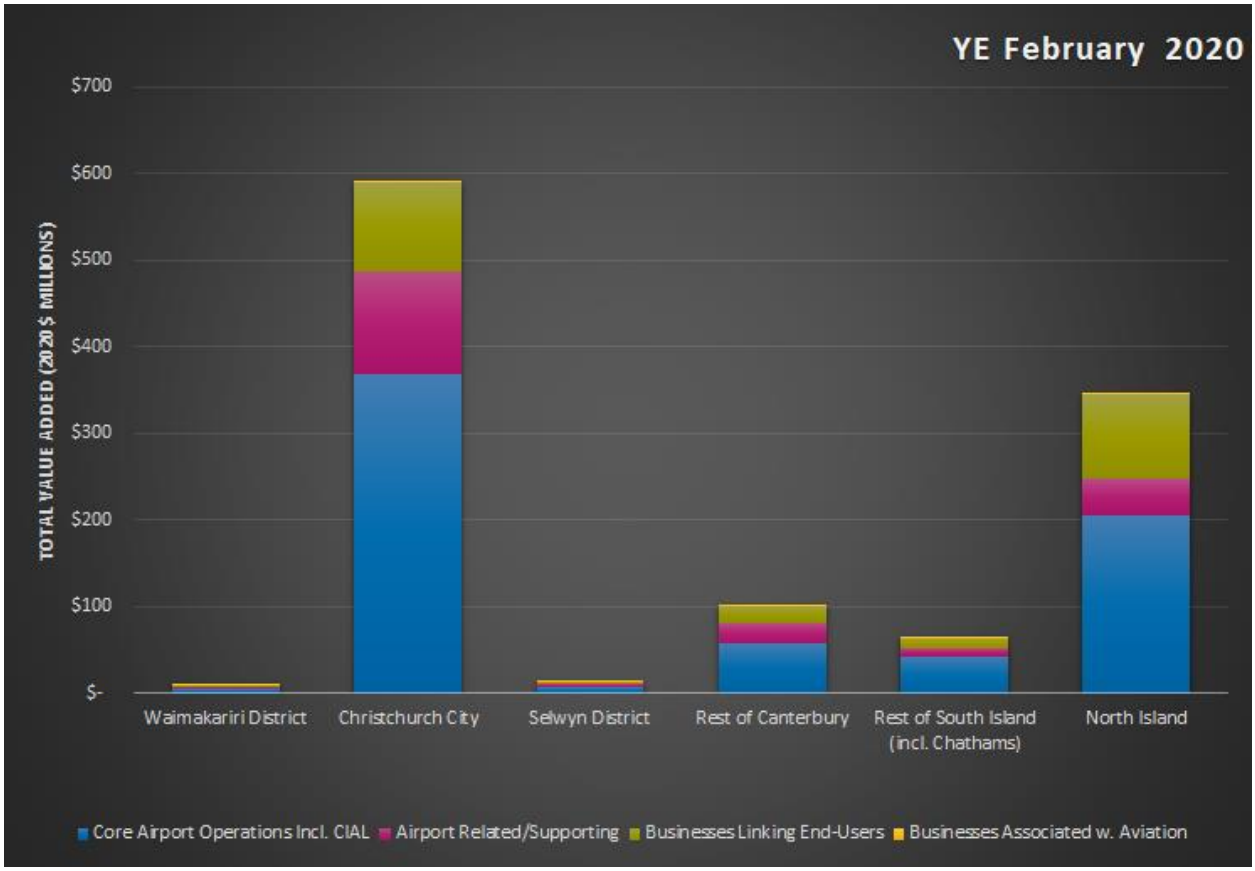


Figure 3-2 highlights the localised economic benefit of having an international airport. When value added across all supply chains of business activity attributable to the Airport is 'put on the ground', 53% of that economic contribution is felt within Christchurch City. Districts north and south of Christchurch (Waimakariri and Selwyn) make up 1% each of the total national value added. The rest of Canterbury receives 9% of the economic contribution, bringing the Canterbury Region share of the total to 64%. A further 6% of total value added is felt within the Rest of the South Island, and 31% is felt in the North Island.[18]

[18] This is expected to be driven largely by firms being head quartered in the North Island (likely Auckland).

Figure 3-2 - Economic Contribution of Businesses in the SPAZ Directly Attributable to the Airport by Location YE February 2020



4 Results – Facilitated Contribution

An important characteristic of airports is that they can influence economic activities which are substantially greater than the economic activity of the airport itself. These 'facilitated effects', form an important component of the overall contribution of airports.

4.1 Economic Contribution of Other Businesses Benefiting from Airport Environs

As shown in Figure 2-5, CIAL has created a number of precincts within the SPAZ that it markets to businesses considering an airport location.[19] This includes the Harvard Park precinct marketed as a 'trade and service precinct' which currently contains the Bunnings Warehouse. There is the Agri-Export precinct and the shopping centre (Spitfire Square).[20] Dakota Park is the 'freight and logistics' precinct and has attracted a range of wholesaling businesses (in addition to freight/postal companies), but other sorts of businesses as well (such as storage companies).

All up, there are a range of businesses that benefit from being close to airport related services and being close to a large, concentrated workforce or passenger base.

Figure 4-1 shows the relative distribution of visits within the SPAZ by people that do not live in the Canterbury Region. Again, it is a sample of cell phone owners from 2021 (so is largely New Zealand residents). While not all visits are necessarily linked to travel via Christchurch Airport, the results highlight the importance of some of these other businesses to visitors to the Region, especially those businesses located along the northern side of Memorial Avenue and in the north of the SPAZ.[21]

[19] https://www.christchurchairport.co.nz/commercial/

[20] Food and beverage services in this precinct are classified as directly airport related (services linking passengers with airports).

[21] A range of other businesses benefiting from being located in the SPAZ are not visitor facing businesses and so will not show up in Figure 4.1. They will however be captured in Figure 2-4 which shows workers in the SPAZ.

Figure 4-1 - Relative Distribution of Non-Canterbury Resident Visits Within the SPAZ 2021 (Sample Mobile Phone Data)

Some of the visitation patterns in Figure 4-1 are for businesses that are directly related to the Airport and discussed in Section 3 above. This includes businesses linking the Airport with end-users (i.e., food and beverage outlets, including McDonalds and other outlets in Spitfire Square, as well as rental car businesses and the Sudima Hotel). The International Antarctic Centre also shows a key concentration of visitors to the Region (and is treated as an aviation associated activity already discussed above).

These other businesses benefiting from the Airport environs and servicing visitors are therefore an important component of the SPAZ and their presence is facilitated by CIAL through the lease of sites/buildings. They are also an important revenue earner for CIAL that helps fund core Airport operations. They are included in the EIA, but their economic contribution is considered differently from other classified activities (i.e., as facilitated business activity).

Table 4-1 shows that businesses that benefit from being in the SPAZ contributed $\$_{2020}$153 million in total direct, indirect and induced value added to the Canterbury Region economy in the YE February 2020 and $\$_{2020}$227 million in total value added to the New Zealand economy that year. They sustained total employment of 1,349 MECs in Canterbury Region, and 1,773 MECs in New Zealand overall. This employment contribution is in addition to the significant employment in those particular SPAZ businesses in 2020.

Table 4-1 - Economic Contribution of Businesses Benefiting from Being in the SPAZ YE February 2020

Year Ending February 2020	Valued Added ($_{2020}$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
	Businesses in the Special Purpose Airport Zone Benefiting from Airport Environs							
Waimakariri District	$ 1	$ 1	$ 1	$ 3	8	7	7	22
Christchurch City	$ 57	$ 35	$ 29	$ 120	525	318	262	1,106
Selwyn District	$ 1	$ 1	$ 1	$ 4	11	8	6	26
Rest of Canterbury	$ 11	$ 7	$ 8	$ 26	89	53	55	197
Total Canterbury Region	**$ 70**	**$ 44**	**$ 39**	**$ 153**	**633**	**386**	**331**	**1,349**
Rest of South Island (incl. Chathams)	$ 3	$ 5	$ 5	$ 14	25	41	48	114
North Island	$ 11	$ 21	$ 28	$ 60	55	109	146	310
Total New Zealand	**$ 84**	**$ 70**	**$ 73**	**$ 227**	**713**	**536**	**524**	**1,773**

Source: CIAL, Market Economics Ltd. Christchurch Airport EIA Model 2023.

Contribution captures expenditure on intermediate inputs and wages and salaries only. Excludes operating surplus, taxes (including rates), interest and imports.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

4.2 Economic Contribution of International Imports and Exports

The international movement of freight provides a key connection between New Zealand firms and international markets. Most of New Zealand's imports and exports are moved with ocean going vessels but around 14% of goods, by value, are exported via air and nearly a quarter of imports, by value, (23%) are transported via air (2022). These goods tend to be of high value, with the weight of air freighted imports and exports (understandably) only representing small proportions of New Zealand's total freight by weight, at 0.41% of all imports and 0.25% of all exports. While Auckland Airport dominates air freight activity, Christchurch Airport still handles a large share of New Zealand's international freight by value with 1.0% of total imports and 2.6% of total exports (2022).

Overall, the value of goods exported through Christchurch Airport totalled $2.0 billion in the 2020 calendar year, representing the majority of the Airport's total freight (73%). The remaining 27% of freight was imported goods totalling $733 million in value for that year.[22]

The value of commodities classed within 'nuclear reactors, boilers, machinery and mechanical appliances'[23] ranks the highest across commodities imported (61%) and exported (73%) by value through Christchurch Airport. This class covers a range of machinery and parts which are used across a wide range of industries such as manufacturing and construction. Table 4-2 indicates that the Airport plays a key role in transporting other types of machinery and equipment too. These are items which are critical to the operation of a wide range of economic activity.

[22] Source: NZ.Stat (Statistics NZ).

[23] The Harmonised System of classifying commodities is an international approach, hence inclusion of 'Nuclear Reactors'.

Table 4-2 - Key Commodities Freighted Via Christchurch Airport (YE December 2020)

Exports			
Rank	Commodity (HS2)	Exports 2020 (FOB NZ$M)	Proportion of Total
1	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	$ 1,481	73%
2	Fish and crustaceans, molluscs and other aquatic invertebrates	$ 81	4%
3	Electrical machinery and equipment and parts thereof; sound recorders and reproducers; television image and sound recorders and reproducers, parts and accessories of such articles	$ 65	3%
4	Aircraft, spacecraft and parts thereof	$ 48	2%
5	Natural, cultured pearls; precious, semi-precious stones; precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin	$ 40	2%
6	Meat and edible meat offal	$ 35	2%
7	Fruit and nuts, edible; peel of citrus fruit or melons	$ 35	2%
8	Preparations of cereals, flour, starch or milk; pastrycooks' products	$ 31	2%
9	Albuminoidal substances; modified starches; glues; enzymes	$ 27	1%
10	Pharmaceutical products	$ 26	1%
	Other Exports	*$ 147*	*7%*
	Total Exports	**$ 2,016**	**100%**
Imports			
Rank	Commodity (HS2)	Imports 2020 (CIF NZ$M)	Proportion of Total
1	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	$ 449	61%
2	Electrical machinery and equipment and parts thereof; sound recorders and reproducers; television image and sound recorders and reproducers, parts and accessories of such articles	$ 65	9%
3	Aircraft, spacecraft and parts thereof	$ 45	6%
4	Optical, photographic, cinematographic, measuring, checking, medical or surgical instruments and apparatus; parts and accessories	$ 33	4%
5	Apparel and clothing accessories; not knitted or crocheted	$ 14	2%
6	Apparel and clothing accessories; knitted or crocheted	$ 10	1%
7	Vehicles; other than railway or tramway rolling stock, and parts and accessories thereof	$ 10	1%
8	Pharmaceutical products	$ 9	1%
9	Textiles, made up articles; sets; worn clothing and worn textile articles; rags	$ 9	1%
10	Rubber and articles thereof	$ 7	1%
	Other Imports	*$ 84*	*12%*
	Total Imports	**$ 733**	**100%**

Source: NZ.Stat (Calendar Year 2020)

Of the commodities imported at lower levels, 'clothing', 'specialised instruments' and 'pharmaceutical products' are within the top ten ranked commodities by value. 'Consumer electronics' within the 'electrical machinery classification', is another high value consumer good passing through the Airport.

Domestic food products are being exported through the Airport at reasonably significant levels. Seafood, meat, fruit and other processed food items all leave the country through the Airport, highlighting the role

the Airport plays within the supply chains of domestic food producers and manufactures (especially for high-value, perishable items).

The commodities which are imported and exported through Christchurch Airport have an important role within New Zealand's economy. With reference to exports, the goods need to be produced before being exported. This means that local value chains are influenced by the ability to sell goods offshore and that removing the link provided by Christchurch Airport would reduce the level of activity that could be sustainably undertaken.[24] Therefore it is possible to estimate the total value associated with producing the exported goods and view that value as a facilitated effect.

A similar position can be taken for imports. A portion of imported goods are used as intermediate inputs – supporting local production.[25] Removing the ability to source specific inputs via Christchurch Airport would influence local production processes.[26]

While we know the nature (and value) of goods transported via Christchurch Airport (Table 4.2), estimating the spatial distribution of the trade effects facilitated by Christchurch Airport is difficult because there is very limited information on where goods are shipped to/from. The EIA takes the approach of attributing international air-freighted goods passing through the Airport to businesses located across Canterbury (pro rata the distribution of known imports/exports by sector across MRIO regions within Canterbury). We note that the supply chains of those businesses are not limited to the Canterbury Region, and this is reflected in the results. Further detail on our modelling assumptions and approach is covered in Appendix A.

The estimated economic contribution facilitated by the freight role of Christchurch Airport is shown in Table 4-3 for imports and exports in the year ending December 2020. We consider only international freight and as such, the Airport's domestic air freight role is not represented and would be net additional to this facilitated economic contribution.

Table 4-3 shows that the value of goods imported through Christchurch Airport facilitated around $\$_{2020}300$ million in total direct, indirect and induced value added to the Canterbury Region economy in 2020 and $\$_{2020}373$ million in total value added to the New Zealand economy that year. This sustained total employment of approximately 2,890 MECs in Canterbury Region, and 3,320 MECs in New Zealand overall.

For goods exported through Christchurch Airport, this facilitated around $\$_{2020}1.77$ billion in total value added in the Canterbury Region economy, rising to $\$_{2020}2.23$ billion when the total value added contribution to the national economy is considered. This level of activity sustained around 18,198 MECs within Canterbury and 20,978 MECs across all of New Zealand in 2020.

Combined, the facilitated economic contribution of the Airport associated with international trade is significant. The total value added contribution to Canterbury Region facilitated by imported and exported goods passing through the Airport is estimated at $\$_{2020}2.07$ billion (nearly 21,090 MECs) and the total value added contribution to New Zealand is estimated at $\$_{2020}2.60$ billion (nearly 24,300 MECs).

[24] The level of influence is determined by the availability of suitable and cost effective substitute products.

[25] The remainder is imported by final demand sectors (i.e., households buying products from overseas).

[26] We note that some of the inputs and exports may be used/produced within the airport environs. In the Canterbury context, 3% of the region's employment is in the SPAZ meaning that only a small portion of the total trade effect can be attributed to the environs (and therefore double counted).

Table 4-3 – Facilitated Economic Contribution of International Trade YE December 2020

Year Ending December 2020	Valued Added ($_{2020}$$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
International Imports								
Waimakariri District	$ 6	$ 2	$ 3	$ 12	70	17	17	104
Christchurch City	$ 109	$ 57	$ 59	$ 224	1,138	562	530	2,230
Selwyn District	$ 9	$ 2	$ 4	$ 15	96	19	16	131
Rest of Canterbury	$ 20	$ 13	$ 16	$ 48	217	97	112	426
Total Canterbury Region	**$ 145**	**$ 74**	**$ 81**	**$ 300**	**1,521**	**695**	**675**	**2,891**
Rest of South Island (incl. Chathams)	$ -	$ 6	$ 8	$ 14	-	50	73	123
North Island	$ -	$ 21	$ 38	$ 59	-	111	195	306
Total New Zealand	**$ 145**	**$ 101**	**$ 127**	**$ 373**	**1,521**	**856**	**943**	**3,320**
International Exports								
Waimakariri District	$ 128	$ 15	$ 35	$ 178	1,678	128	175	1,981
Christchurch City	$ 354	$ 336	$ 292	$ 982	4,149	3,400	2,637	10,187
Selwyn District	$ 177	$ 24	$ 36	$ 238	2,008	195	155	2,358
Rest of Canterbury	$ 202	$ 86	$ 81	$ 369	2,501	606	566	3,673
Total Canterbury Region	**$ 862**	**$ 462**	**$ 443**	**$ 1,767**	**10,336**	**4,329**	**3,533**	**18,198**
Rest of South Island (incl. Chathams)	$ -	$ 51	$ 47	$ 98	-	446	416	862
North Island	$ -	$ 150	$ 213	$ 363	-	820	1,097	1,917
Total New Zealand	**$ 862**	**$ 663**	**$ 703**	**$ 2,227**	**10,336**	**5,596**	**5,046**	**20,978**
Total Facilitated Trade Contribution								
Waimakariri District	$ 134	$ 17	$ 38	$ 189	1,748	145	193	2,085
Christchurch City	$ 463	$ 393	$ 351	$ 1,206	5,287	3,962	3,167	12,417
Selwyn District	$ 187	$ 27	$ 40	$ 253	2,104	214	171	2,489
Rest of Canterbury	$ 222	$ 99	$ 97	$ 418	2,718	703	678	4,098
Total Canterbury Region	**$ 1,006**	**$ 536**	**$ 525**	**$ 2,067**	**11,856**	**5,024**	**4,209**	**21,089**
Rest of South Island (incl. Chathams)	$ -	$ 57	$ 55	$ 112	-	497	488	985
North Island	$ -	$ 171	$ 250	$ 422	-	931	1,292	2,223
Total New Zealand	**$ 1,006**	**$ 764**	**$ 830**	**$ 2,600**	**11,856**	**6,452**	**5,989**	**24,297**

Source: CIAL, Market Economics Ltd, StatisticsNZ. Christchurch Airport EIA Model 2023.

Contribution captures expenditure on intermediate inputs and wages and salaries only. Excludes operating surplus, taxes (including rates), interest and imports.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

Assumptions around the distribution across industries and regions is included in the Appendix A.

4.3 Economic Contribution of Domestic and International Passengers

Travellers incur costs and spend money during their travels. Some expenditure occurs before the traveller leaves their origin, but the largest proportion is spent at the destination(s). This expenditure drives the economic effects of tourism. The airport network connects origins and destinations making it possible for travellers to access tourism products.

While Christchurch Airport does not generate this expenditure directly, it facilitates the movement of tourists and other visitors, and therefore the creation of economic activity in the national and regional economy. The facilitated economic activity calculated in the EIA model includes international visitor spend and New Zealand resident spend on travel (both domestic departures by mainly Canterbury Region residents and domestic arrivals from non-Canterbury Region residents).

Unfortunately, much of the tourism related data commonly used for economic modelling of tourism is no-longer available. This includes data from the International Visitor Survey and Domestic Tourism Survey.[27]

[27] The Commercial Accommodation Monitor is another time series data set that ceased.

While we know the number of international visitors who are non-NZ residents arriving in New Zealand at Christchurch Airport (which in 2019 was 14% of all international arrivals in New Zealand), we do not know the share of domestic flight passengers arriving or departing at Christchurch Airport that are international visitors taking internal flights, versus New Zealand residents. This means that the total number of international visitors arriving in Christchurch by air is greater than the number that come directly into Christchurch from overseas. Similarly, data on the number of domestic visitors (overnight and day visitors) by district is no-longer published.

While many of these legacy tourism datasets ceased, the government did shift to more accurate data collection on international and domestic tourism spend by origin and destination and broad categories of spending.[28] This data also ceased in October 2020 due to Covid-19 and was replaced with an interim estimate of electronic transaction data spend.[29] However, the year ending October 2019 data has been relied on extensively for this analysis (representing a full 12 month period when tourism (including passengers numbers through Christchurch Airport) was at its peak and not yet impacted by Covid-19).

The limitation of the MRTE data is that it is not possible to derive how many domestic and international visitors account for the spending in any one location. Had this been possible, M.E could more easily link passenger counts with tourists and therefore tourism spending, although the travel flows of domestic and international tourists are also unknown, which creates further issues.[30]

Ultimately, M.E have relied on the MRTE data, with spending destinations aggregated to our six MRIO economic regions, and origin data grouped according to total international, Canterbury Region residents and non-Canterbury Region residents. M.E has then developed assumptions on what portion of that spending in each economic region (by origin) is likely to be associated with tourists travelling via Christchurch Airport. While sensitive to these assumptions, they have been sense checked against known parameters including Christchurch Airport's share of international visitor arrivals at the border (assuming that all international visitors have a similar spending profile in New Zealand), the location of alternative airports for domestic travel, and the scale and centrality of Christchurch within the South Island as a hub for road-based trips. Further detail on M.E's assumptions are contained in Appendix B. Overall, M.E estimates that foreign travellers entering at Christchurch Airport account for 14% of total international visitor spend in New Zealand (YE October 2019) and residents passing through Christchurch Airport account for 9% of all domestic visitor spend in New Zealand.

Once this portion of spending in each economic region (and industry sector) was estimated (as being linked to passenger travelling into or out of Christchurch Airport), this spending was run through the EIA model to estimate the contribution to total value added and employment. Care is needed not to double count the expenditure with airlines, rental car businesses, food and beverage outlets, other retail and service providers, accommodation and other business activity (including the International Antarctic Centre) located in the SPAZ and already captured in the economic contributions discussed above. The economic contribution of this SPAZ activity has been subtracted from the facilitated tourism results to get the net facilitated tourism contribution, summarised in Table 4-4 below.

[28] MBIE, Monthly Regional Tourism Estimates (MRTE).

[29] Unlike its predecessor, this data is not the grossed-up tourism spend.

[30] The Tourism Flows Model (2007) is now too old to be relied on.

Table 4-4 – Facilitated Economic Contribution of International and Domestic Tourism YE October 2019

Year Ending October 2019	Valued Added ($_{2020}$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Domestic Tourists								
Waimakariri District	$ 17	$ 5	$ 11	$ 34	338	38	59	435
Christchurch City	$ 388	$ 184	$ 215	$ 788	6,857	1,843	1,953	10,653
Selwyn District	$ 17	$ 7	$ 11	$ 35	361	45	54	460
Rest of Canterbury	$ 93	$ 41	$ 58	$ 193	1,762	312	414	2,488
Total Canterbury Region	**$ 516**	**$ 238**	**$ 296**	**$ 1,050**	**9,318**	**2,238**	**2,480**	**14,036**
Rest of South Island (incl. Chathams)	$ 169	$ 78	$ 93	$ 340	3,096	724	777	4,597
North Island	$ 222	$ 252	$ 371	$ 845	2,480	1,451	1,944	5,875
Total New Zealand	**$ 907**	**$ 568**	**$ 760**	**$ 2,235**	**14,893**	**4,414**	**5,201**	**24,508**
International Tourists								
Waimakariri District	$ 9	$ 6	$ 11	$ 27	186	43	62	291
Christchurch City	$ 474	$ 233	$ 271	$ 978	8,987	2,339	2,459	13,784
Selwyn District	$ 16	$ 9	$ 13	$ 39	345	63	64	472
Rest of Canterbury	$ 142	$ 57	$ 74	$ 273	2,650	421	523	3,593
Total Canterbury Region	**$ 641**	**$ 306**	**$ 370**	**$ 1,317**	**12,167**	**2,866**	**3,108**	**18,141**
Rest of South Island (incl. Chathams)	$ 252	$ 110	$ 122	$ 484	4,738	1,023	998	6,759
North Island	$ 87	$ 213	$ 339	$ 640	1,114	1,215	1,775	4,104
Total New Zealand	**$ 980**	**$ 629**	**$ 831**	**$ 2,441**	**18,019**	**5,104**	**5,881**	**29,004**
Total Facilitated Tourism Contribution								
Waimakariri District	$ 27	$ 11	$ 23	$ 60	523	81	121	726
Christchurch City	$ 863	$ 417	$ 487	$ 1,766	15,844	4,182	4,412	24,438
Selwyn District	$ 33	$ 16	$ 25	$ 75	706	109	118	932
Rest of Canterbury	$ 234	$ 99	$ 132	$ 465	4,412	733	936	6,081
Total Canterbury Region	**$ 1,157**	**$ 543**	**$ 666**	**$ 2,366**	**21,485**	**5,105**	**5,587**	**32,176**
Rest of South Island (incl. Chathams)	$ 421	$ 188	$ 215	$ 825	7,834	1,747	1,775	11,356
North Island	$ 310	$ 466	$ 710	$ 1,485	3,594	2,667	3,719	9,979
Total New Zealand	**$ 1,888**	**$ 1,197**	**$ 1,591**	**$ 4,676**	**32,912**	**9,518**	**11,081**	**53,511**

Source: CIAL, StatisticsNZ, MBIE MRTEs, Market Economics Ltd. Christchurch Airport EIA Model 2023.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

Further detail provided in Appendix B.

Table 4-4 shows that in the year ending October 2019, Christchurch Airport is estimated to have facilitated a total value added contribution of $\$_{2020}$1.32 billion in the Canterbury Region economy associated with international tourism spending outside of the SPAZ, increasing to $\$_{2020}$2.44 billion in total value added in the New Zealand economy that year. This facilitated international tourism activity sustained total estimated employment of approximately 18,140 MECs in Canterbury Region (outside the SPAZ), and 29,000 MECs in New Zealand overall. Canterbury Region accounts for the majority of the total facilitated value added of international tourists using Christchurch Airport (54% of the contribution), followed by the North Island (26%).[31]

Table 4-34 also shows that in the year ending October 2019, Christchurch Airport is estimated to have facilitated a total value added contribution of $\$_{2020}$1.05 billion in the Canterbury Region economy associated with domestic tourism spending outside the SPAZ, increasing to $\$_{2020}$2.24 million in total value added to the New Zealand economy that year. This facilitated domestic tourism activity sustained total estimated employment of approximately 14,040 MECs in Canterbury Region (outside the SPAZ), and 24,510 MECs in New Zealand overall. Canterbury Region accounts for the majority of the total facilitated value added of domestic tourists using Christchurch Airport (47%), followed by the North Island (38%).

[31] Noting that this spatial distribution is a combination of where the tourist spend directly occurs AND the supply chain of the businesses serving these tourists, so is not necessarily representative of where the tourist spending is estimated to occur.

Combined, the facilitated economic contribution of the Airport associated with international and domestic tourism is significant. The total value added contribution to Canterbury Region facilitated by international and domestic passengers passing through the Airport is estimated at $_{2020}$2.37 billion (nearly 32,180 MECs) and the total value added contribution to New Zealand is estimated at $_{2020}$4.68 billion (just over 53,500 MECs).

4.4 Summary of Economic Contribution Facilitated by the Airport

Table 4-5 and Figures 4-2 and 4-3 provide a summary of the total direct, indirect and induced economic contribution of business activity that is estimated to be facilitated by the Christchurch Airport. While each component of the facilitated effect relates to a slightly different 12-month period, when aggregated the total value added contribution to the Canterbury Region economy is $_{2020}$4.59 billion (approximately 54,600 MECs). When supply chains and tourism spending beyond the Canterbury Region are included, the total valued added contribution to the national economy is $_{2020}$7.50 billion (approximately 79,580 MECs sustained).

Facilitated international tourism spend makes up 33% of the overall facilitated value added economic contribution to New Zealand, followed by business activity associated with the value of internationally exported goods (30% of the total), and facilitated domestic tourism spend (30% of the total). Trade associated with the value of imported goods makes up just 5% of the total facilitated effect, and other business activity located in the SPAZ that is not Airport dependent makes up just 3% (although is still substantial at $_{2020}$227 million).

Table 4-5 - Economic Contribution of Businesses Activity Facilitated by Christchurch Airport 2019/2020

Year Ending as Stated	Valued Added ($_{2020}$ million)				Employment ($_{2020}$MECs) *			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Canterbury Region								
Other SPAZ Businesses (YE Feb 2020)	$ 70	$ 44	$ 39	$ 153	633	386	331	1,349
Trade - Imports (YE Dec 2020)	$ 145	$ 74	$ 81	$ 300	1,521	695	675	2,891
Trade - Exports (YE Dec 2020)	$ 862	$ 462	$ 443	$ 1,767	10,336	4,329	3,533	18,198
International Tourism (YE Oct 2019)	$ 641	$ 306	$ 370	$ 1,317	12,167	2,866	3,108	18,141
Domestic Tourism (YE Oct 2019)	$ 516	$ 238	$ 296	$ 1,050	9,318	2,238	2,480	14,036
Total Facilitated	**$ 2,233**	**$ 1,123**	**$ 1,231**	**$ 4,586**	**$ 33,974**	**$ 10,515**	**$ 10,126**	**$ 54,615**
New Zealand								
Other SPAZ Businesses (YE Feb 2020)	$ 84	$ 70	$ 73	$ 227	713	536	524	1,773
Trade - Imports (YE Dec 2020)	$ 145	$ 101	$ 127	$ 373	1,521	856	943	3,320
Trade - Exports (YE Dec 2020)	$ 862	$ 663	$ 703	$ 2,227	10,336	5,596	5,046	20,978
International Tourism (YE Oct 2019)	$ 980	$ 629	$ 831	$ 2,441	18,019	5,104	5,881	29,004
Domestic Tourism (YE Oct 2019)	$ 907	$ 568	$ 760	$ 2,235	14,893	4,414	5,201	24,508
Total Facilitated	**$ 2,978**	**$ 2,031**	**$ 2,494**	**$ 7,503**	**$ 45,481**	**$ 16,506**	**$ 17,595**	**$ 79,582**

Source: CIAL, StatisticsNZ, MBIE MRTEs, Market Economics Ltd. Christchurch Airport EIA Model 2023.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

Figure 4-2 - Economic Contribution of Airport Facilitated Business Activity by Type 2019/2020

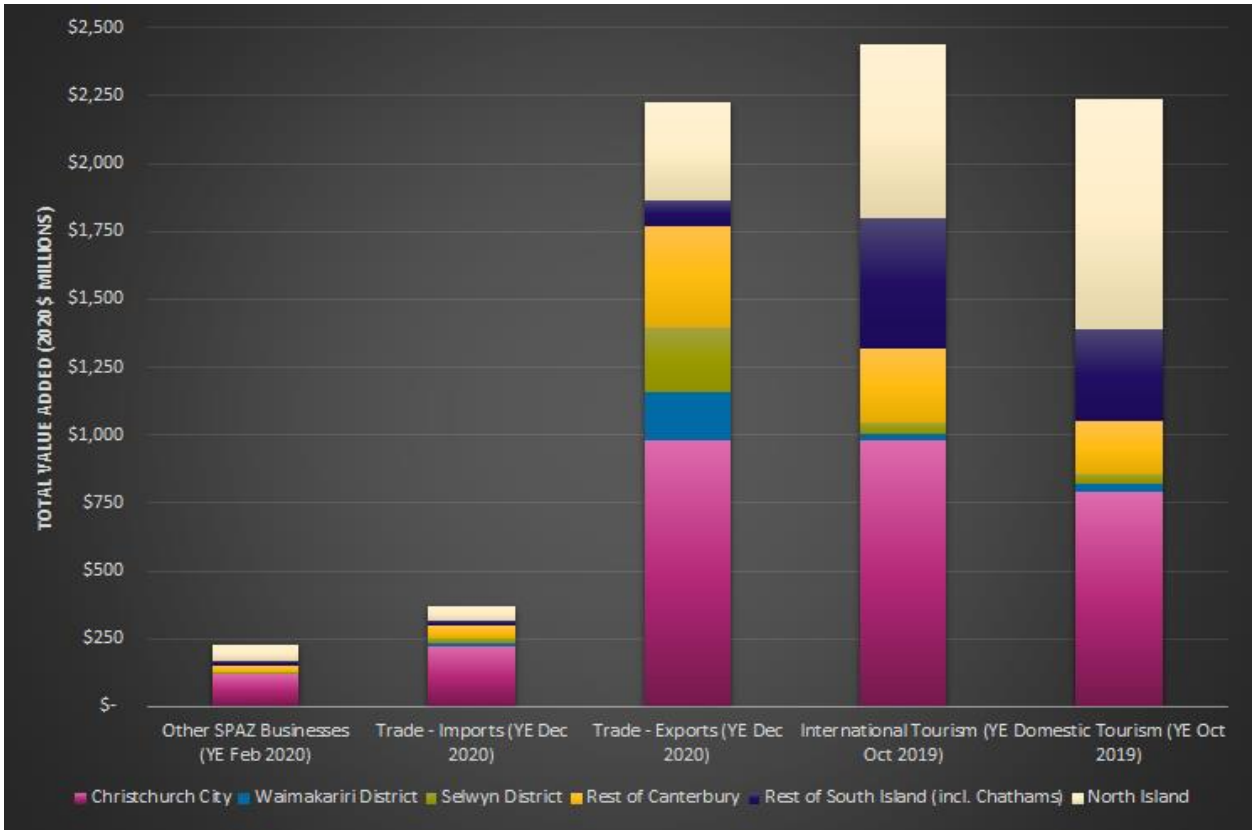


Figure 4-3 - Economic Contribution of Airport Facilitated Businesses Activity by Location 2019/2020

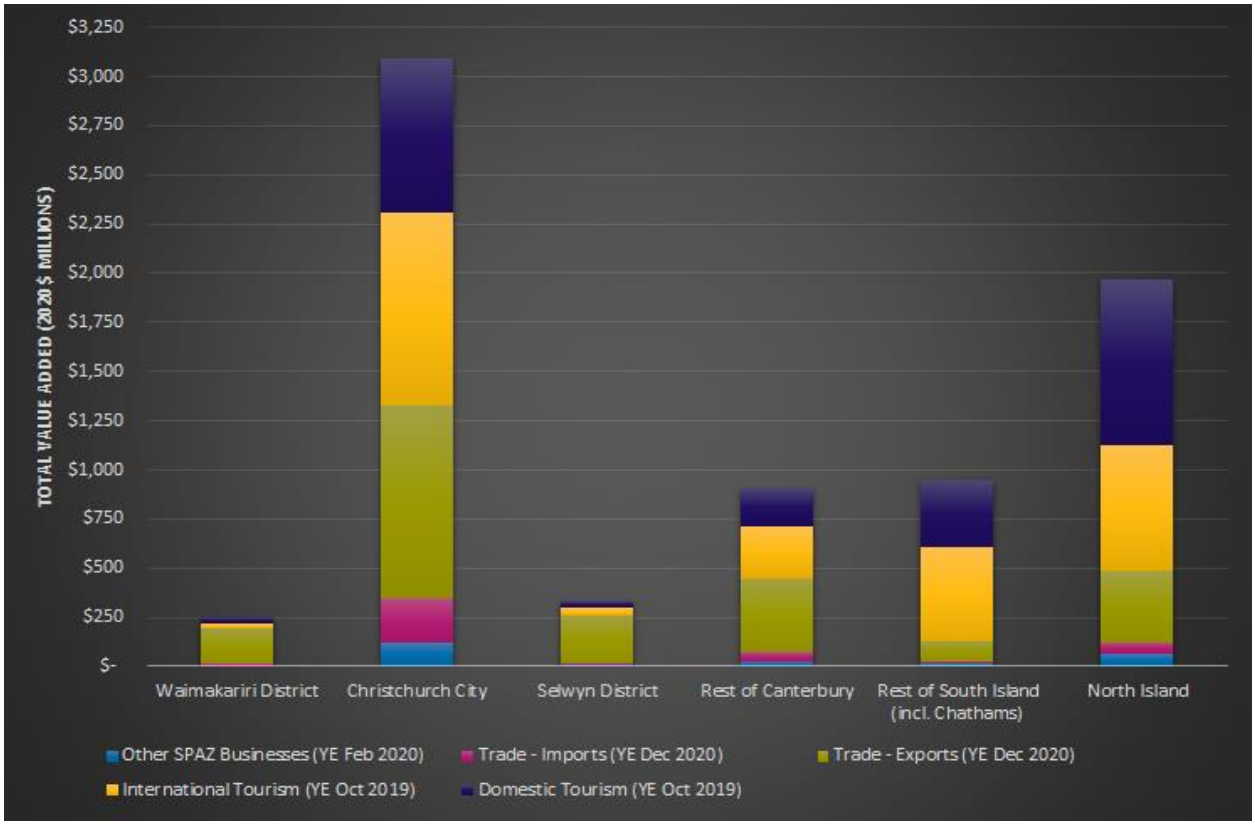


Figure 4-3 highlights the localised economic benefit of having an international airport. When value added across all supply chains of business activity facilitated by the Airport is 'put on the ground', 41% of that economic contribution is felt within Christchurch City. Districts north and south of Christchurch (Waimakariri and Selwyn) make up 3% and 4% respectively of the total national value added (mainly associated with exports). The Rest of Canterbury receives 12% of the economic contribution, bringing the Canterbury Region share of the total to 61%. A further 13% of total facilitated value added is felt within the Rest of the South Island, and 26% is felt in the North Island.

5 Summary & Conclusions

This section combines the EIA results from Section 3 (economic contribution directly attributable to the Airport) and Section 4 (economic contribution facilitated by the Airport). It briefly discusses the impact that Covid-19 has had on the Airport's economic contribution (for those components of activity in the SPAZ able to be modelled across time using employment data). Brief closing comments on the economic significance of the Christchurch Airport are included.

5.1 Overall Summary of Economic Contribution

The total economic contribution to the Canterbury Region from all business activity in the SPAZ (inclusive of CIAL) that is directly related in some way to the operation or presence of the Christchurch Airport is $_{2020}$717 million of value added and 6,560 jobs (in addition to those employed directly by those businesses) (YE February 2020). Those same businesses contribute $_{2020}$1.13 billion of value added and just over 8,900 additional jobs to the New Zealand economy. In total, this business activity makes up only a small share (11-14%) of the total economic contribution once facilitated effects are accounted for (Table 5-1).

Table 5-1 - Summary of EIA Results – Canterbury Region and Total New Zealand

Year End as Stated	Valued Added ($_{2020}$$ million) Total	Employment ($_{2020}$MECs) * Total	Valued Added ($_{2020}$$ million) %	Employment ($_{2020}$MECs) * %
	Canterbury Region			
Core Airport Operations	$ 440	4,013	8%	7%
Other SPAZ Airport Related/Linking/Assoc.	$ 277	2,547	5%	4%
Total Direct Contribution (YE Feb 2020)	**$ 717**	**6,560**	**14%**	**11%**
Other SPAZ Businesses (YE Feb 2020)	$ 153	1,349	3%	2%
Trade - Imports (YE Dec 2020)	$ 300	2,891	6%	5%
Trade - Exports (YE Dec 2020)	$ 1,767	18,198	33%	30%
International Tourism (YE Oct 2019)	$ 1,317	18,141	25%	30%
Domestic Tourism (YE Oct 2019)	$ 1,050	14,036	20%	23%
Total Facilitated Contribution	**$ 4,586**	**54,615**	**86%**	**89%**
Total Direct & Facilitated	**$ 5,303**	**61,174**	**100%**	**100%**
	New Zealand			
Core Airport Operations	$ 687	5,377	8%	6%
Other SPAZ Airport Related/Linking/Assoc.	$ 440	3,529	5%	4%
Total Direct Contribution (YE Feb 2020)	**$ 1,127**	**8,906**	**13%**	**10%**
Other SPAZ Businesses (YE Feb 2020)	$ 227	1,773	3%	2%
Trade - Imports (YE Dec 2020)	$ 373	3,320	4%	4%
Trade - Exports (YE Dec 2020)	$ 2,227	20,978	26%	24%
International Tourism (YE Oct 2019)	$ 2,441	29,004	28%	33%
Domestic Tourism (YE Oct 2019)	$ 2,235	24,508	26%	28%
Total Facilitated Contribution	**$ 7,503**	**79,582**	**87%**	**90%**
Total Direct & Facilitated	**$ 8,630**	**88,488**	**100%**	**100%**

Source: CIAL, StatisticsNZ, MBIE MRTEs, Market Economics Ltd. Christchurch Airport EIA Model 2023.

** Based on Modified Employment Count or MEC: Employee Count including working proprietors.*

Once the facilitated economic effect of other SPAZ businesses benefiting from the Airport environs is added, as well as international trade effects and tourism effects associated with travellers passing through Christchurch Airport, the total valued added contribution to the regional economy rises to a significant $_{2020}$5.30 billion and employment sustained grows to approximately 61,170 jobs (in addition to those employed directly in the SPAZ). This equates to 20% of all jobs in Canterbury Region in 2020 sustained in some way by Christchurch Airport.

Nationally, the directly attributable and facilitated contribution of the Christchurch Airport rises to $_{2020}$8.63 billion, and employment rises to approximately 88,490 jobs (YE February 2020) (Table 5-1). The facilitated effect accounts for 87% of the total national value added, and 90% of the total employment effect. Facilitating tourism and export activity are, by far, the Airport's greatest contribution to the economy.

The vacant land remaining in the SPAZ signals that with every new activity that is established in the zone in the future, the greater the economic contribution of the SPAZ will be, and depending on the type of business established, the greater the direct or facilitated economic contribution of the Christchurch Airport will be. That is, M.E expects the economic contribution of the Airport (and wider SPAZ) will be greater in the future than assessed in this current study.

5.1.1 Covid-19 Impacts on Economic Contribution

The EIA modelling clearly demonstrates the economic significance of Christchurch Airport – based on a recent 'peak year' of employment and performance.[32] What the modelling has also helped demonstrate is how employment and value added sustained by the Airport can drop when air travel (passengers and freight) is constrained.

Covid-19 has had an unprecedented effect on the Airport (and related) sector, and those effects are still being felt. Figure 5-1 shows the total value added results for Canterbury Region for all Airport related and facilitated business activity located in the SPAZ for the period 2019-2022 (i.e., it excludes the facilitated contribution of international trade and tourism beyond the SPAZ).

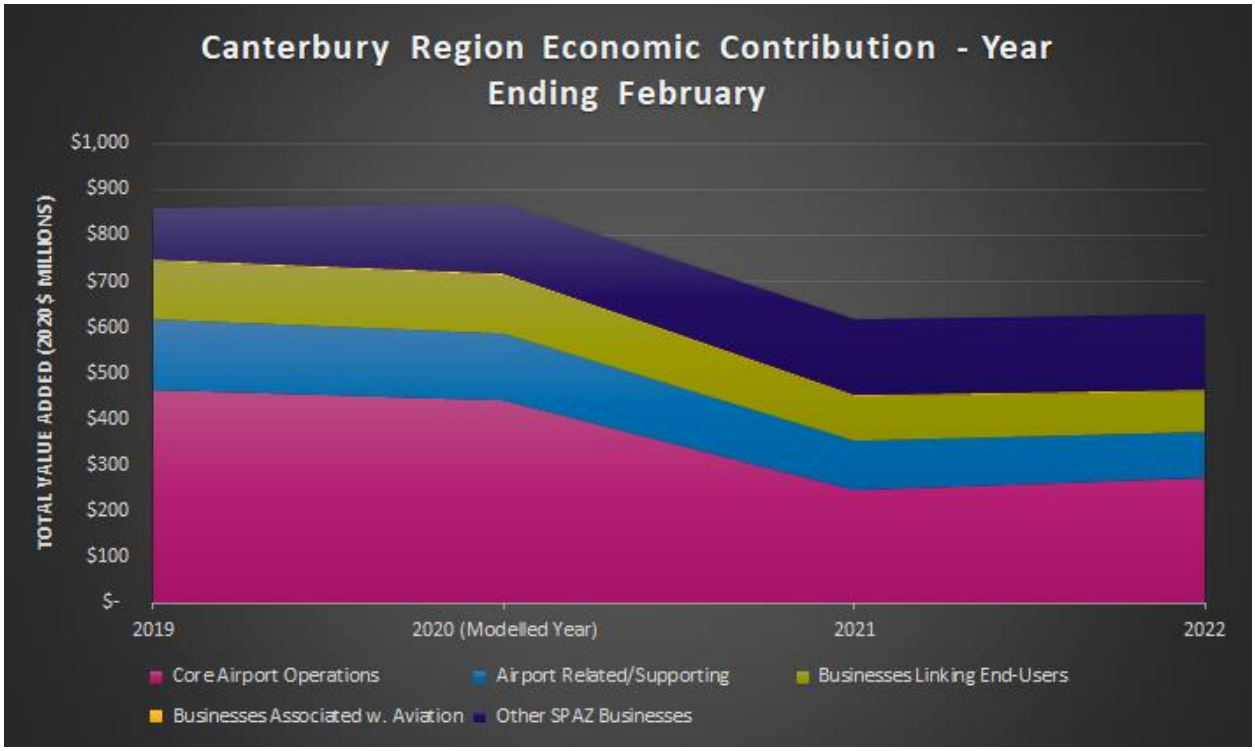
The results discussed above in Sections 3 and 4.1 were for the year 2020 (YE February). Those results were very similar to the preceding 2019 year. However, core airport operations (particularly airlines) were significantly reduced because of Covid-19. This analysis shows that when flights (and freight and passengers on those flights) are reduced, then this has a flow-on effect for Airport related/supporting businesses in the SPAZ, as well as businesses linking the Airport with end-users in the SPAZ, and activities associated with aviation based in the SPAZ. In other words, the whole upstream and downstream supply chain is impacted.

As all of those business sectors contracted (with substantial reductions in employment), so too did their spending across their supply chains – leading to a significant drop in economic activity right across Canterbury Region in the year ending February 2021 (-29%). The Airport's economic contribution to Canterbury Region in the year ending February 2022 was only marginally better, and still 72% of the contribution in 2020. In fact, the only activity in the SPAZ that helped grow valued added in Canterbury Region during the Covid-19 period was the other businesses benefiting from the Airport environs.

[32] Noting that the international air freight (trade) facilitated contribution was not based on a peak year and was conservative.

Data for February 2023 is expected to show some further recovery in Airport related and facilitated value added and employment in Canterbury (and total New Zealand), but that data is not yet available. The results of the EIA are anticipated to remain relevant until such time as Airport performance and SPAZ employment exceeds past peak levels.

Figure 5-1 - Value Added Contribution to the Canterbury Region 2019-2022 of Total SPAZ Business Activity by Relationship to the Airport



5.2 Conclusions

Airports and the activities directly related to and facilitated by them, have extensive value chains meaning that any change, positive or negative, in the system is bound to have a sizable impact on contributions to value added and employment. This latest EIA modelling demonstrates that Christchurch Airport makes a significant contribution to the Canterbury and national economy. It is a nationally significant infrastructure asset.

By delivering high quality and efficient air-services and a functional and attractive business environment within the SPAZ, Christchurch Airport can enhance the growth potential of the Region's economy (and beyond). This means that ensuring that the Airport is appropriately recognised in strategic planning decisions will be critically important going forward. In particular, managing incompatible land uses in the operational area of the Airport will be critical because:

- The Airport's economic contribution is significant and far larger than simply the contribution of CIAL which owns and runs it;

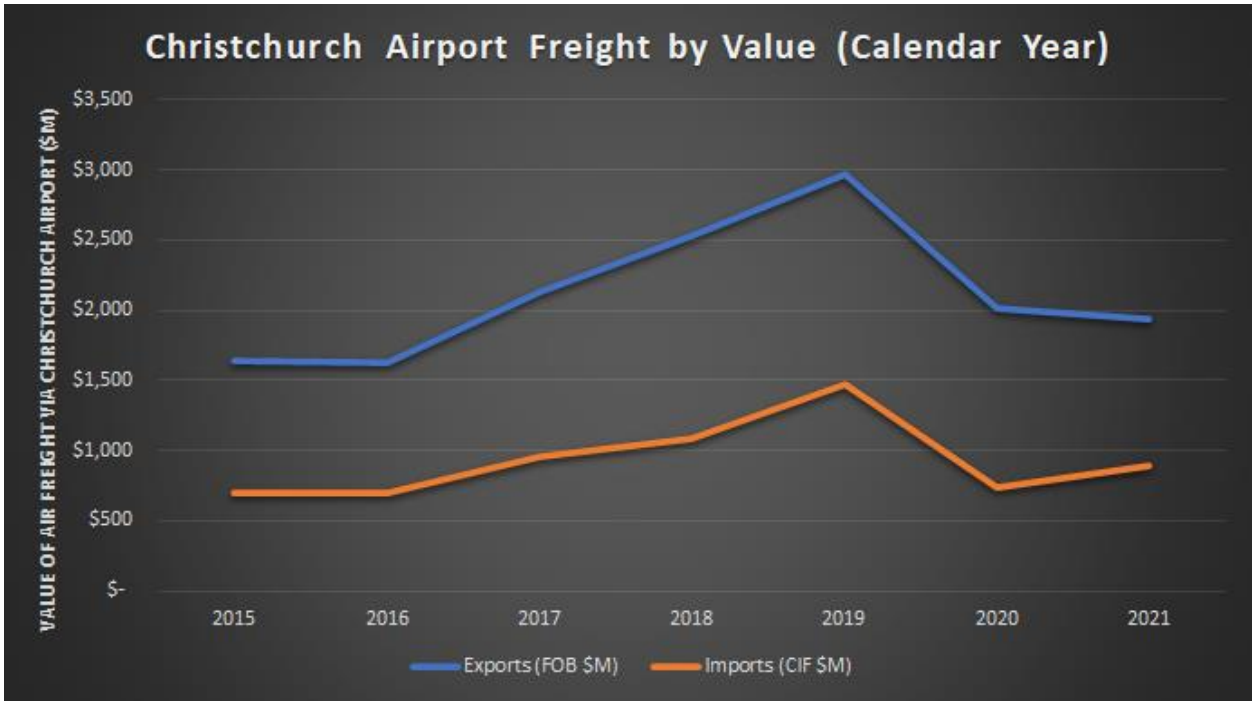
- The presence of the Airport plays a key role in attracting inward investment in Canterbury across a range of sectors;
- The Airport provides a critical service linking Canterbury Region with business opportunities in other regions;
- Efficient airport services enhance economic competitiveness by reducing transaction costs for companies involved in international trade; and
- The Christchurch Airport plays a critical role in facilitating tourism activity. It acts as a gateway to the wider Canterbury Region.

Appendix A – Approach & Assumptions for Imports/Exports

This appendix provides further detail on M.E's approach to estimating the facilitated effect of Christchurch Airport for international trade. It should be read in conjunction with section 4.2.

Data Sources

The data for imports and exports for Christchurch Airport was taken from Stats NZ data of value of imports[33] and exports[34] for cargo by port which are reported by commodity using the Harmonised System classification at the two-digit level (HS2). The year of the data used was 2020 calendar year data for both imports and exports. While we know that this was a Covid-19 impacted year (as shown in the graph below), and therefore under-represents the maximum facilitated trade effect of the Airport in recent years, 2020 was chosen due to the MRIO model having a base year of 2020 – avoiding the need for further inflation/deflation in the model for this component of economic contribution. This approach also ensures our results are conservative.



The MRIO model covers the New Zealand economy across six regions and 109 industries. To allow the import and export data to be used within this framework, M.E created an approximate concordance between the 99 HS2 commodities to the 109 industry sectors, as well as assumptions that linked those imported and exported goods with businesses on the ground. These steps are discussed further below.

[33] Stats NZ: Imports for Overseas Cargo (cif NZ$): New Zealand Port by Country of Origin, Commodity (HS2) and Period

[34] Stats NZ: Exports for Overseas Cargo (fob NZ$): New Zealand Port by Country of Destination, Commodity (HS2) and Period

Industrial Allocation

The 109 industry sectors in the MRIO table are a grouping of industries using the ANZSIC system. For exports, an existing concordance of Harmonised System commodities to ANZSIC was used, which then allowed us to aggregate commodities (via ANZSICs) to the 109 industry sectors. However, this concordance was only available at the more detailed ten-digit level for the Harmonised System classification. Furthermore, freight data for exports at the ten-digit level (HS10) is only available at the national level, covering all of New Zealand's export commodities and ports. Further assumptions were needed to link this existing concordance with our HS2 level export data associated with Christchurch Airport.

A key issue is that when HS10 commodities are aggregated up to HS2 level commodities, they span multiple 109 industry sectors. That is, there is not a one-to-one relationship. A matrix was derived from the concorded national freight data which shows the proportion of value of each HS2 commodity which is distributed across each 109 industry sector. These proportions are then applied to the value of Christchurch Airport's exports in each HS2 commodity to instead give the indicative value by 109 industry sector. The underlying assumption of this approach is that the commodities exported at Christchurch Airport are similar to the national profile when aggregated to HS2 level. This may or may not be the case, but in the absence of HS10 level data specifically for Christchurch Airport, this approach is considered sufficient for the purposes of the report.

For imports, a different method of industrial allocation was used. The HS to ANZSIC method can be applied to classify the outputs of industries and the subsequent flows of end products. This method would not consider allocating commodities to industries which use them in production as imports are inputs to an industries production. Furthermore, a significant proportion of imports are items which are used for final consumption by the end consumer and are not used as an intermediate input to production by New Zealand businesses. It is the latter that generates value added in the economy and that is of interest for this EIA.

Within the National Accounts input-output tables published by Stats NZ[35] is the table which quantifies the value and therefore proportion of imported goods going into industries (as intermediate inputs to production across the 109 sectors) and going to categories of final demand such as households and central government. The imported goods in the national accounts are classified according to different types of goods and services. However, as that classification of imported goods did not match the HS2 commodities imported via Christchurch Airport, an approximate concordance was created by M.E between HS2 commodities and the National Accounts goods and services classification. This allowed us to derive a national distribution of imports going into industry sectors and final demand sectors but with an HS2 base.

From here the proportion of each HS2 commodity per 109 sector was applied to give the industry sector distribution of Christchurch Airport's imports. Estimated imports freighted via Christchurch Airport going to final demand sectors were discarded from the model.

We note that within the HS2 airport commodities data is a classification of 'confidential commodities' which comprises non-disclosed imported or exported items. Rather than exclude the value of these goods from the concordances/matrices discussed above, these were allocated across the 109 industries pro-rata the

[35] Stats NZ: National accounts input-output tables: Year ended March 2020. Our MRIO tables for this EIA concord with these tables at the national level.

average distribution of known commodities. As the nature of these is unknown it was assumed that the average proportions for all commodities would be the best fit, but this assumption is acknowledged as a limitation of the approach.

Regional Allocation

A key point when using the freight data is that it only shows the point of entry for imported goods and the point of exit for exported goods (i.e., via Christchurch Airport). The economic region in which the goods originate or are used in production or consumed cannot be determined from this data. To make up for the gap in information in the freight data, the value of imports and exports by 109 industry sectors is regionally allocated. This was done using data contained within the base input-output table of the MRIO model where the value of imports and exports are shown for each industry and economic region.

An assumption was made to allocate all imports and exports transported via Christchurch Airport to the Canterbury Region only. This may under-represent the actual import/export catchment of the Airport within the South Island as some imports and exports may be associated with businesses located beyond Canterbury (i.e., in the Rest of South Island). We know for example that Queenstown Airport does not have a material freight role, but the freight role of Dunedin and Invercargill airports is unknown. Similarly, we do not know whether businesses in the top of the South Island choose to transport goods to/from Wellington Airport or south to Christchurch Airport.

Within the Canterbury Region, the allocation was across the four economic regions of Christchurch City, Waimakariri District, Selwyn District, and the rest of Canterbury Region. As the freight data had already been allocated by industry (discussed above), this was used to determine the proportion of each region's share of the imports/exports from each industry. This also assumes that the regional profile of Christchurch Airport's freight matches imports and exports of the Canterbury region as a whole. This spatial allocation within Canterbury Region was done separately for imports and exports using the relevant distributions by industry in the MRIO table.

While there are potential limitations in this spatial allocation assumption and approach, the total value of goods allocated to industries is fixed. Even if more of that value had been apportioned to industries located in the Rest of the South Island, the main difference is in the geography of the up-stream supply chains and therefore where value added and employment contributions are felt on the ground. The current approach is likely to give greater weight to economic contributions within Canterbury Region. It is estimated that any changes to this assumption would have only a minor impact on final results.

Inputs and Outputs of the Final Model

Once the value of goods imported and exported were allocated by industry and region, this was run through the MRIO model to quantify the economic contribution in terms of the value added and employment which imports and exports sustain across the economy. Importantly, we do not estimate the economic contribution of whole industry sectors that engage in international trade, only the share of that industry sectors' gross inputs or outputs that equate to the value of goods imported or exported via the Airport.

The results themselves should be viewed with care as they rely on several assumptions. They represent the economic activity which the imports and exports facilitate in the economy which is not generated by the transport of freight itself. Furthermore, the contributions described in this section relate only to the value

of exports and imports that are generated by their leaving or entering New Zealand and does not consider inter-regional (domestic) freight within New Zealand.

Appendix B – Approach & Assumptions for Tourism Contribution

This appendix provides further detail on M.E's approach to estimating the facilitated effect of Christchurch Airport for international and domestic tourism activity. It should be read in conjunction with section 4.3.

Tourism spending data was taken from the MRTE published by MBIE. MRTE are an estimate of total regional tourism spend including cash and online spending and excluding Goods and Services Tax (GST). The MRTE give an estimate of tourist spending patterns within New Zealand. The year chosen from the data used was for the year ending in October 2019. The MRTE data was split between international tourist spending (total from all countries) and domestic tourist spending. Domestic tourists are classified as travelling more than 40km outside their usual place of residence, as such domestic tourist spending was derived for non-Canterbury residents and Canterbury residents who use the Airport to visit other areas of New Zealand, primarily the North Island. The spending data of the three tourist classifications provided by the MRTEs was then aggregated to the six regions of the EIA model.

The next step in the modelling was to determine how much of tourist spending was attributable to Christchurch Airport. However, a significant information gap had to be bridged as the MRTE data is not linked to the transportation of tourists and their flows of movement. For this, assumptions were made regarding how tourists used the airport within their movements. This was informed by domestic and international passenger counts from Christchurch Airport and ports as a whole. For example, 14% of international tourists enter or exit the country via Christchurch Airport, yet their movement across the regions before/after their arrival/departure through the airport is not accurately known, nor if they use the airport for a domestic flight. As such, the figure of 14% was used a guide whereby, the airport should be attributed with around this level of national tourist spending. The regional distribution of tourist spending within each of the EIA model's regions that was attributed to Christchurch Airport was allocated based on the proportions shown in the table below.

Regional Allocation of MRTE Tourist Spending Attributed to Christchurch Airport (M.E)

Region	Proportion of 2019 Spend attributed to CIAL		
	International Visitors	Canterbury Residents (will include day visits more than 40km within Canterbury)	Non-Canterbury Residents
Christchurch City	85%	0%	65%
Selwyn District	85%	0%	65%
Waimakariri District	85%	0%	65%
Rest of Canterbury Region	50%	0%	50%
Rest of South Island	14%	25%	5%
North Island	2%	50%	0%

For Canterbury residents, any tourism related spend within the Region was assumed to be car-based travel. We have a assumed a modest share of spend by Canterbury residents in the rest of the South Island is associated with outgoing domestic flights (i.e., to Queenstown, Dunedin, Invercargill, and regional airports like Wanaka, Chatham Islands, Blenheim, Nelson, etc). Given the added distance to travel to the North

Island (the alternative being the Picton Ferry crossing by car), we have assumed 50% of Canterbury Resident spend in the North Island is associated with outbound domestic flights.

Conversely, for non-Canterbury Residents (which will be dominated by the North Island Population), we have assumed that approximately 65% of spend occurring in central Canterbury is associated within inbound domestic flights. A higher share was not adopted in light of Rest of South Island (although excluded Chatham Islands) residents may have a high propensity for car-based travel to these destinations. The assumptions reflect the weighted average of these two groups. The assumption decreases for spend occurring in the rest of Canterbury Region on the basis that it is incrementally closer to other domestic airports. Similarly, only a very minor share of non-Canterbury resident spend in the Rest of the South Island is estimated as this will relate to relatively short trips (by road) for residents within that area, or, for North Island residents, they may be likely to catch direct flights to the airports in that region (rather than come via Christchurch Airport). Some allowance for road trips from Christchurch Airport has been made in the 5% assumption.

For international tourist spend, the assumptions follow a similar process of consideration. The aggregate results of spend were cross checked to equate to approximately 14% of international visitor spend nationally (aligning with 14% share of international passenger arrivals by foreigners) – and assuming that all international visitors have a similar spending profile, irrespective of where they enter the country.

From the MRTE spending data, spending is grouped by activity. The analysis used categories across:

- Accommodation services,
- Cultural, recreation, and gambling services,
- Food and beverage serving services,
- Other passenger transport,
- Other tourism products,
- Retail sales - alcohol, food, and beverages,
- Retail sales - fuel and other automotive products, and
- Retail sales – other.

Each of the MRTE's spending categories can be identified with sub-sectors of the ANZSIC industry classification at the six-digit level. The ANZSIC 2006 industry classifications are used to ascertain the proportion of tourist activity within each of 109 industries of the model. While it is not accurately known how much of the spending of each of the MTRE categories is attributed to a sector of the ANZSIC 06, we assume that the proportion of tourist spending for each of the sectors is attributed to its size. This was done using BD employment data at the national, where the proportion of employment within an industry of the 109 which was within the MTRE categories. This created a matrix for the allocation of each category's spending into each of the relevant 109 industries for the EIA model. As the matrix aggregates data at the

national level, it assumes that proportions of the spending to the 109 industries for each spending category is the same for each economic region within the model.

Once the regional and industrial allocation was made for tourist spending linked to Christchurch Airport, a portion of the tourist spending was removed which was closely linked to the Airport and located in the SPAZ, and previously counted within the assessment of the Airport and supporting activity. This deduction was done for spending specifically within Christchurch City. The proportion linked with the SPAZ was derived using the proportion of employment of the ANZSIC 06 industries within the SPAZ relative to wider Christchurch. For example, the accommodation sector in the SPAZ contained around 4% of Christchurch's employment in the sector. This meant that 4% of the MRTE spending in Christchurch on accommodation was removed to avoid double counting across the report.

This approach assumes that the location of tourist spending is spread evenly across the relevant industries in Christchurch, however, the concentration of these industries within the SPAZ influences the degree to which airport linked spending is removed. The assumption was used as MRTE data cannot be identified below Christchurch as a whole and the earlier analysis of the Airport and SPAZ is conducted for the 109 industries which is above the finer sub-sectors (ANZSIC 06) which are identified from the MRTE.

Several limitations in this approach exist as it relies on a wide range of assumptions from the MRTE data itself, through to the methods used to attribute the tourist spending to the Airport and how it is allocated to the regions and industries used in the model. However, given the limited range of tourism datasets now available at the sub-national level, the approach adopted by M.E is considered sufficiently appropriate for the purposes of estimating facilitated tourism effects.