

Review of international and domestic freight trends through Christchurch International Airport



Final Report

submitted by

Richard Paling Consulting

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1 Introduction

Christchurch International Airport (the Airport / Christchurch Airport) is the second largest international airfreight gateway in New Zealand and the only one providing direct links to overseas destinations for those wishing to ship goods by air to or from the South Island. While the volumes of goods handled are small, the total value of these (at almost \$3 billion in 2021) makes the Airport the second largest South Island import gateway after the port of Lyttelton and the third largest South Island export gateway after Lyttelton and Port Chalmers.

A number of studies have indicated the value of international airfreight services to the domestic economy. For example, a study in the UK¹ estimated that these services contributed up to about 9 per cent of regional gross value added. Christchurch Airport similarly has an important role in encouraging and supporting economic development in the South Island.

International airfreight through Christchurch Airport has two major focusses:-

- The provision of a facility for export of a range of time sensitive premium agricultural products from South Island producers to a range of international markets, especially in Australia, China, South East Asia and the US, for which the transit times by alternative modes would prevent or severely limit the sale of these products. These products include fresh and live fish, horticultural products such as cherries and other stone fruits and fresh and chilled meat.
- The movements of high value manufactured goods supporting local industries both for exports and imports of time-critical materials examples of which include Hamilton Jet engines and parts and also the movements of goods to consumers from overseas suppliers.

Up to 2019 this role had been growing, with the share by value of Christchurch Airport in total South Island trade reaching 16 per cent for exports and 19 per cent for imports. The advent of COVID-19 and the reduction in services through the Airport has, however, halted or reversed this trend. This report looks at the extent of these changes before looking further into the role that the flows of freight through Christchurch Airport may play in supporting economic activity in Canterbury and the South Island as a whole in the future.

In addition to serving international trade, Christchurch is an important staging point for e-commerce, other courier movements and mail within New Zealand, acting as a distribution centre for items delivered to South Island destinations and also as a consolidation point for those moving to North Island destinations. A very large proportion of this inter-island traffic passes through Christchurch Airport and the report also considers the importance of accommodating this traffic.

The structure of this report is as follows:-

- Section 2 examines the general growth of air traffic through Christchurch Airport up to 2019.
- Section 3 focuses on the airfreight position in 2019, as it demonstrates the most recent data unaffected by the Covid-19 pandemic.

¹ Steer (2018) Assessment of the value of air freight services to the UK economy

- Section 4 looks at the changes over the period between 2019 and 2021.
- Section 5 considers predicted future trends
- Section 6 considers the role of Christchurch Airport in the increases in international air-freight demand anticipated in the future.
- Section 7 considers domestic airfreight issues
- The main findings are summarised in Section 8.

There are two dimensions of airfreight which this report considers particularly in relation to international movements –

- the volume of goods transported, which is related to the capacity available; and
- the value of the goods transported, which reflects their impacts on the economy of the areas served by Christchurch Airport.

2 Growth in the period before 2019

2.1 Changes up to 2019

Up to the end of 2019, the total value of international trade carried by airfreight both in terms of the total value of the goods transported and its share of total South Island trade had been increasing strongly, as can be seen in Figure 2.1 and Figure 2.2.

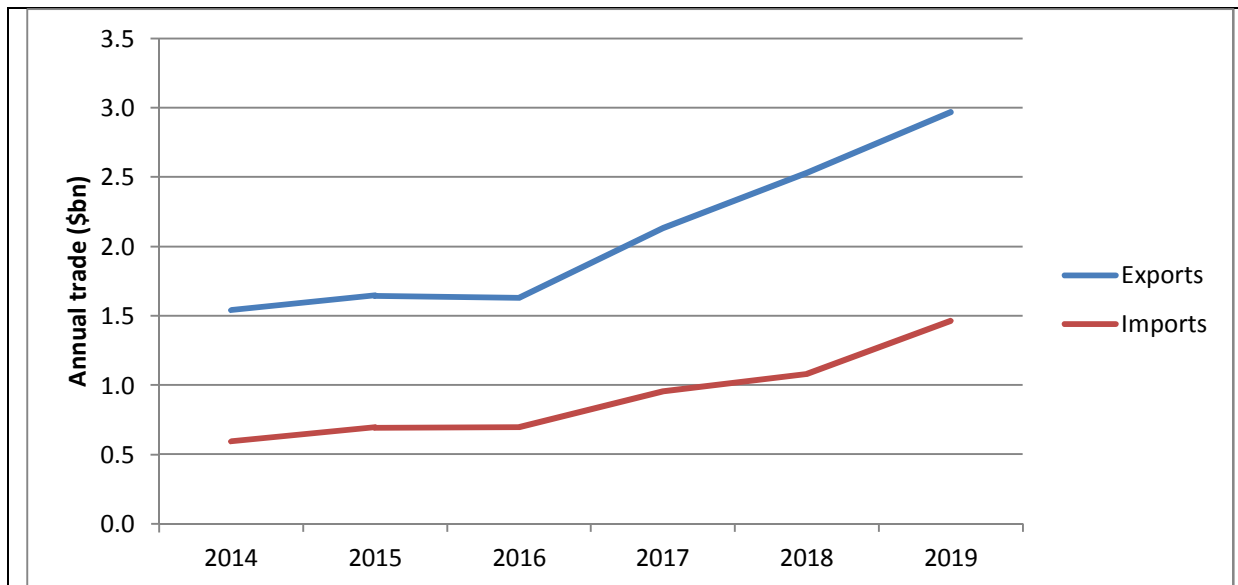


Figure 2.1
Growth in the value of international trade through Christchurch International Airport 2014-2019 (\$bn)

Source : Statistics New Zealand

The values of both airfreight exports and imports had been growing strongly from 2014 to 2019:

- imports increased by almost 150 per cent, increasing from \$0.6bn to \$1.5bn.
- exports also almost doubled over the same period, growing from \$1.5bn to almost \$3bn.

With this rapid growth in the value of airfreight, its share of the total value of international trade from the South Island ports and airports also increased sharply rising from about 10 per cent of the total in 2014 to 16 to 18 per cent in 2019. This is displayed in Figure 2.2.

It is also noticeable that the shares of both imports and exports grew along a similar path, possibly reflecting the growth of air freight capacity primarily provided by passenger services through the Airport.

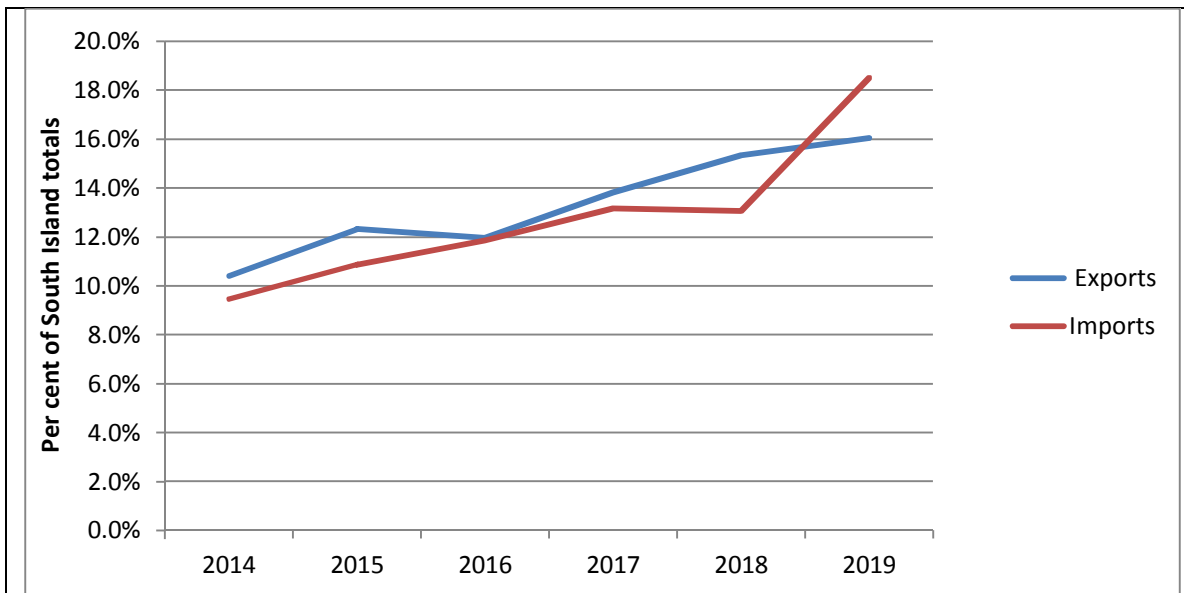


Figure 2.2
Growth in the value of foreign trade through Christchurch International Airport as a share of the total for the SI as a whole (per cent)

Source : Statistics New Zealand

As well as considering the value of airfreight, which contributes significantly to the local economy, the volumes carried are also important in relation to the capacity available for international movements. Changes in the tonnages of international airfreight into and out of Christchurch Airport are set out in Figure 2.3. It should be noted that these are very small in relation to the volumes transported by sea, amounting to about 0.2 per cent of South Island imports and exports. This demonstrates the high values per tonne for airfreight movements.

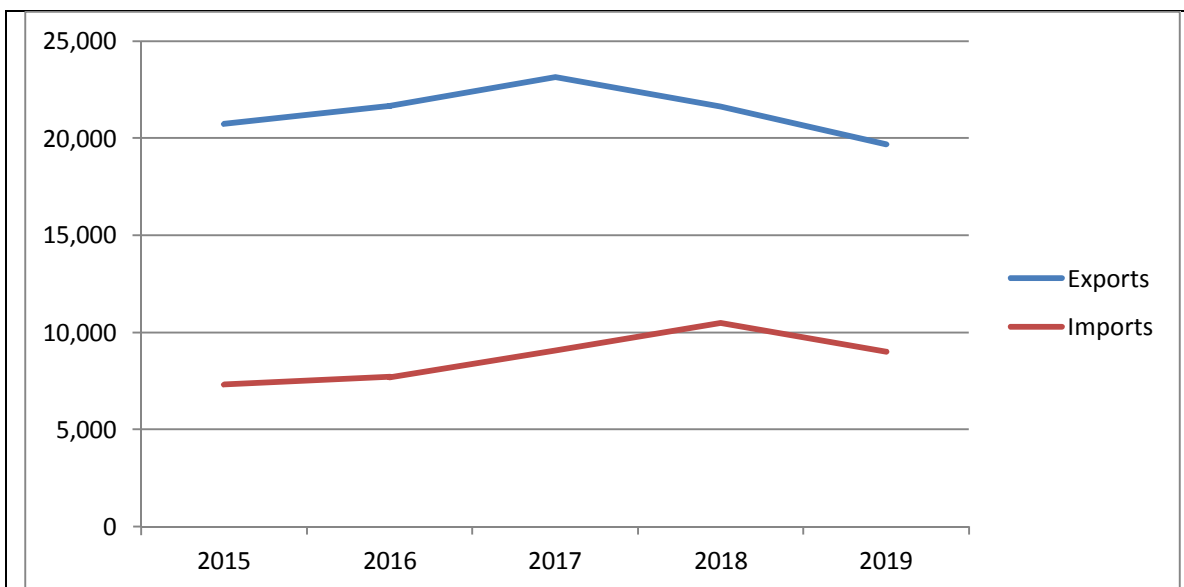


Figure 2.3
International airfreight movements through Christchurch International Airport by volume 2014-2019

Source : Statistics New Zealand

After growing for much of the period from 2015, volumes of both imports and exports declined slightly in 2019. This in combination with the increases in value set out in Figure 2.1 indicates a switch to the carriage of higher value commodities.

2.2 Overall assessment

The key findings from the consideration of airfreight through Christchurch Airport over the period up to 2019 include:-

- Traffic through the Airport in 2019 was dominated by exports both in value and volume terms;
- In value terms both exports and imports had been growing strongly over the period, increasing by 100 per cent and 150 per cent respectively;
- The value of airfreight through Christchurch Airport was also growing as a proportion of total South Island trade;
- Volumes of exports and imports had remained broadly stable with increases in total value reflecting a switch to higher value commodities.

3 International airfreight movements in 2019

3.1 Introduction

2019 represents the last normal year before the Covid pandemic struck and is therefore the most recent position from which to consider future trends. This section first considers the totality of airfreight movements in terms of imports and exports in 2019. It then goes on to look at the breakdown of these flows both in terms of the commodities handled and also the overseas markets served.

3.2 The general position in 2019

In 2019 the value of international trade through Christchurch Airport amounted to about \$4.4bn, representing about 17 per cent of the total international trade of the South Island. Of this, imports accounted for about \$1.47bn or 19 per cent of the total imports for the South Island. Exports, which were almost twice as large as imports, amounted to \$2.97bn or 16 per cent of the total exports for the South Island. The split between the value of imports and exports in 2019 is highlighted in Figure 3.1

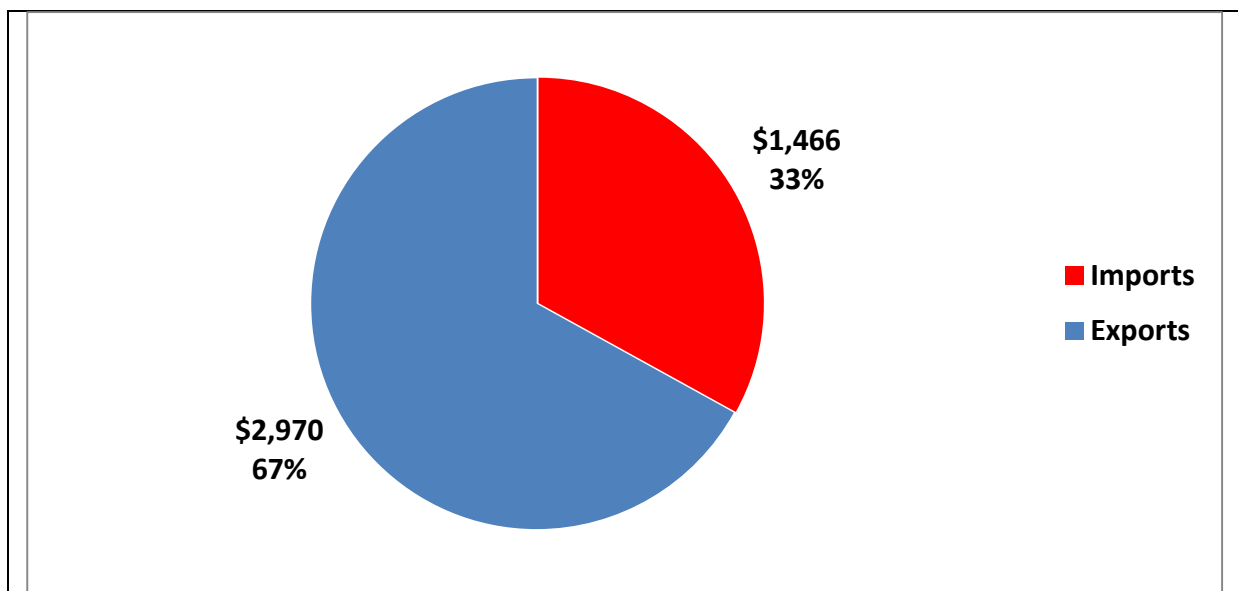


Figure 3.1
Imports and exports through Christchurch airport in 2019 by value (\$m)

In volume terms exports were again much larger than imports, at about 20,000 tonnes compared to imports of about 9,000 tonnes, although because of the nature of air freight, both represented only a very small share of the volume of total international freight to or from the South Island. The split between imports and exports by volume for 2019 is set out in Figure 3.2

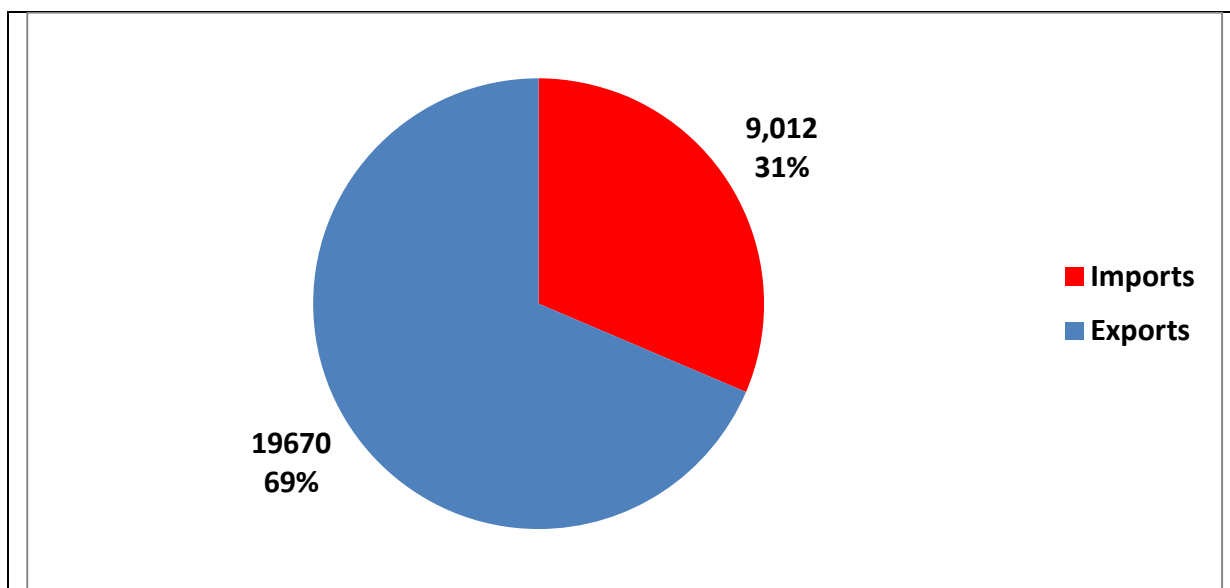


Figure 3.2
Imports and exports through Christchurch airport in 2019 by volume (tonnes)

The dominance of exports to some extent reflects the nature of the South Island economy as a whole with a strong focus on the production of goods for overseas markets, especially agricultural commodities.

The relatively high shares of airfreight in the total value of international trade highlights its importance in supporting economic activity, getting time-sensitive high value goods to overseas markets and bringing in supplies for local industries and consumers. The provision of airfreight services to and from Christchurch airport also simplifies South Island supply chains by allowing direct international export and import. This may reduce the amount of handling between supplier and customer, compared to what would be required if airfreight had to be routed through alternative locations.

3.3 Trade by commodity in 2019

Looking in more detail at the patterns of air freight trade, the breakdown by commodity in volume terms in 2019 is set out in Table 3.1 and summarised in Figure 3.3 and Figure 3.4.

Table 3.1				
Total trade through Christchurch airport 2019 (tonnes)				
Commodity group	Exports		Imports	
	Total (tonnes)	Per cent	Total (tonnes)	Per cent
Bulk and chemicals	648	3.3%	1002	11.1%
Dairy	1044	5.3%	48	0.5%
Fish	6387	32.5%	20	0.2%
Horticulture	2000	10.2%	351	3.9%
Live animals	151	0.8%	6	0.1%
Manufactured goods	2421	12.3%	3531	39.2%
Meat	2830	14.4%	29	0.3%
Metal products	302	1.5%	460	5.1%
Pharmaceuticals	174	0.9%	47	0.5%
Precious metals	6	0.0%	6	0.1%
Processed food	2232	11.4%	1239	13.7%
Stones and ceramics	240	1.2%	227	2.5%
Textiles	748	3.8%	1334	14.8%
Wood prods	187	1.0%	276	3.1%
Transport equipment	292	1.5%	435	4.8%
Grand Total	19662	100.0%	9011	100.0%

Source : Data supplied by Statistics New Zealand

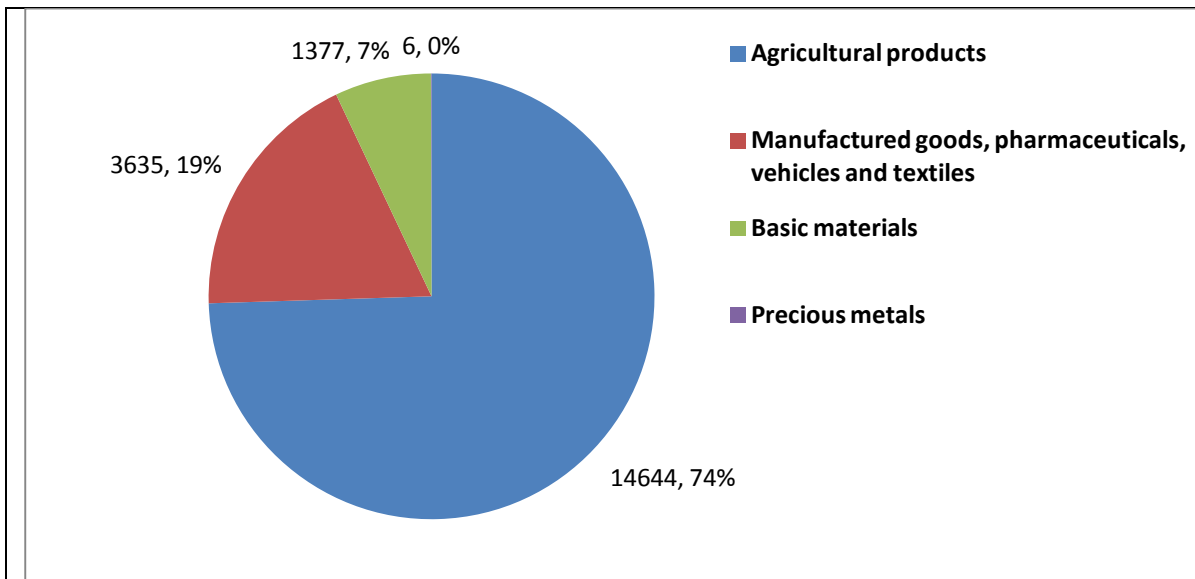


Figure 3.3
Airfreight exports through Christchurch airport by broad commodity group and volume 2019 (tonnes and per cent of total)

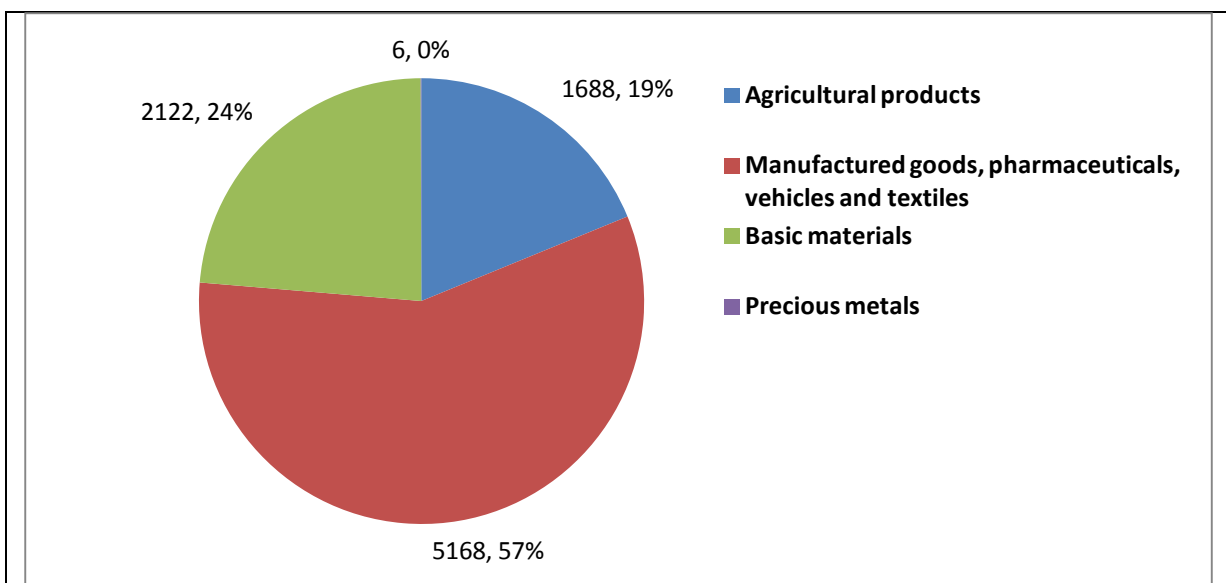


Figure 3.4
Airfreight imports through Christchurch airport by broad commodity group and volume 2019 (tonnes and per cent of total)

Export tonnage is dominated by agricultural products, especially fish, meat, processed food, horticultural items and dairy which together accounted for about three quarters of the exports through the airport in 2019. Manufactured goods including textiles, vehicles and pharmaceuticals account for a further 20 per cent of the total. For imports, there is a greater focus on manufactured goods and textiles which account for over half the total volume, with agricultural products accounting for just 20 per cent.

This pattern reflects the economic structure of the South Island with a heavy dependence on agricultural products for export and also a substantial manufacturing industry with strong overseas links. With its location to the centre of the South Island and at the junction of road and rail links to the north, south and west, Christchurch also acts as the major distribution centre for the South Island as a whole supporting businesses and consumers in general. This is evidenced by the presence of a number of South Island distribution centres. These are both for retail chains including Progressive, Foodstuffs, The Warehouse, Noel Leeming and Kathmandu in the city and also companies selling to businesses and similar agencies, such as DHL (distributing critically important healthcare products from a site close to the airport), USL biomedical services, OfficeMax, Century Yuasa Batteries, NZ Safety Blackwoods and Primepac.

In value terms the position was rather different as can be seen in Table 3.2.

Commodity group	Exports		Imports	
	Total (\$m)	Per cent	Total (\$m)	Per cent
Dairy products	18	0.6%	2	0.2%
Fish	151	5.1%	0	0.0%
Horticultural products	39	1.3%	2	0.1%
Live animals	8	0.3%	0	0.0%
Meat	62	2.1%	2	0.1%
Processed food	67	2.3%	23	1.6%
Wood products	4	0.1%	3	0.2%
Bulk and chemicals	50	1.7%	36	2.6%
Manufactured goods	2354	79.3%	1169	82.8%
Metal products	7	0.2%	14	1.0%
Pharmaceuticals	26	0.9%	8	0.6%
Precious metals	37	1.3%	4	0.3%
Stones and ceramics	4	0.1%	4	0.3%
Textiles	53	1.8%	75	5.3%
Transport equipment	88	3.0%	69	4.9%
Grand Total	2969	100.0%	1412	100.0%

Source : Data supplied by Statistics New Zealand

The details in Table 3.2 highlight the importance in value terms of manufactured goods in the movements of both imports and exports through Christchurch airport, with manufactured goods accounting for about 80 per cent of the total values for both imports and exports in 2019. Agricultural products which accounted for a high proportion of the volume of exports only comprise about 12 per cent of the total value of exports and 9 per cent of imports.

3.4 Trade by origin or destination

The pattern of trade by origin or destination is set out in volume terms in Table 3.3.

Country group	Exports		Imports	
	Total (tonnes)	Per cent	Total (tonnes)	Per cent
Australia	6115	31.1%	1987	22.0%
China	3574	18.2%	2382	26.4%
Vietnam	380	1.9%	134	1.5%
Taiwan	788	4.0%	106	1.2%
Japan	637	3.2%	157	1.7%
Other SE Asia	2043	10.4%	427	4.7%
US	2661	13.5%	877	9.7%
Canada	114	0.6%	79	0.9%
EU	1947	9.9%	2000	22.2%
GB	965	4.9%	296	3.3%
ME+C Asia	232	1.2%	70	0.8%
Other	206	1.0%	495	5.5%
Grand Total	19662	100.0%	9011	100.0%

Source : Data supplied by Statistics New Zealand

In terms of the destinations and origins for international airfreight by volume through the Airport, Australia is the most important destination for exports followed by China, and the US. For imports China is the most important source representing 26 per cent of the market followed closely by Australia and the EU with similar shares of 22 per cent.

The pattern of trade by value is set out in Table 3.4.

Country/ region	Exports		Imports	
	Total (\$m)	Per cent	Total (\$m)	Per cent
Australia	655	22.1%	80	5.7%
China	431	14.5%	105	7.4%
Vietnam	716	24.1%	13	0.9%
Taiwan	25	0.8%	18	1.2%
Japan	27	0.9%	79	5.6%
Other SE Asia	146	4.9%	37	2.6%
US	751	25.3%	649	45.9%
Canada	8	0.3%	25	1.8%
EU	113	3.8%	302	21.4%
GB	44	1.5%	57	4.0%
ME+C Asia	31	1.0%	7	0.5%
Other	22	0.7%	39	2.8%
Total	2969	100.0%	1412	100.0%

Unlike the position for volumes, exports by value are dominated by trade with the US and Vietnam which together account for about half the total. Other important export markets are Australia (22 per cent) and China (15 per cent).

Imports by value are spread between a wider set of origins but are again dominated by flows from the US (46 per cent) the EU and GB (25 per cent).

3.5 Flight patterns in 2018 and 2019

The pattern of airfreight is to some extent dictated by the availability of suitable capacity, which in turn depends on the services provided. For the most part in 2019 potential freight capacity was provided in the belly hold of passenger aircraft. The pattern of international passenger flights in 2019 and also 2018 is set out in Table 3.5. This covers the flights outbound from Christchurch but the pattern of inbound flights is effectively the same.

Destination	Year	
	2018	2019
Brisbane	1102	1105
Melbourne	1423	1377
Sydney	1675	1618
OOL	297	296
Perth	36	25
Total Australia	4533	4421
Hong Kong	40	49
Guangzhou	234	235
Singapore	395	405
Total China and SE Asia	669	689
Rarotonga	16	
Suva	1	
Nandi	194	195
Total Pacific Islands	211	195
Total all destinations	5413	5305

This was supplemented by a weekday freight only service to Sydney as set out in Table 3.6.

Year	Sydney	Total
2018	260	260
2019	261	261

This weekday freight-only service operated on a loop with services Sydney-Auckland-Christchurch-Sydney. For this flight the traffic from Christchurch would have had to share the capacity in the plane with the traffic between Auckland and Sydney.

The number of flights with freight capacity declined slightly in 2019 compared with the previous year. This may be a factor in the small reduction in import and export flows noted above in Section 2.1.

3.6 Overall assessment

The key features for the airfreight movements through Christchurch in 2019 include:-

- Exports are much larger than imports both in terms of volume and value. These are therefore more likely to be constrained by the absolute volume of airfreight capacity that may be available. The smaller volumes of imports are less likely to be affected by the lack of total capacity.
- In volume terms,
 - Agricultural products represent about three quarters of the total airfreight export movements. Many of these products are time-sensitive, perishable items for which the timing of services may be critical if these products are to be able to access markets in receiving countries.

- Imports have a much higher proportion of textiles and other manufactured goods for which specific regular timing issues may be less critical. However, because of the wide range of origins for this traffic and often less predictable timing, a wider range of airfreight routes and services would be important to facilitate these flows and to support the wide range of firms operating distribution hubs in Christchurch serving both retail and business customers.
- Export traffic is focussed on Australia, China and South East Asia which accounts for about 70 per cent of the total. The balance is split more or less equally between European destinations and the US and Canada combined.
- For imports China is the most important source making up over a quarter of the total, with Australia and Europe having similar shares of 20-25 per cent.
- In terms of value
 - Exports and imports are dominated by manufactured goods, which account for about 80 per cent of the total. This highlights the importance of these movements to local businesses and to other consumers.
 - The key markets for exports are China and South East Asia with just under half the total market and Australia and the US with about 20-25 per cent each. For imports the market is dominated by movements from the US and Canada (just under half) and Europe (about 25 per cent).
- Direct airfreight capacity from Christchurch Airport is mainly with Australia and China and South East Asia, providing onward connections to other destinations. There are also direct flights from Christchurch to the Pacific islands but because of the small size of these islands, they do not appear to attract much freight.

4 Impact of Covid-19: Changes to airfreight in 2020 and 2021

4.1 Introduction

With the onset of Covid-19 and the associated restrictions and lockdowns affecting economic activity and trade, there were substantial changes in the patterns of airfreight activity through Christchurch Airport. In part these reflected the changes in flight patterns as passenger flows fell sharply, and in part the changes in the underlying patterns of economic activity that resulted from the constraints that ensued in 2020 and 2021 and which reduced to some extent the demand for air freight.

While this section considers both exports and imports, the detailed analysis is confined to the key export flows which represent the majority of the airfreight traffic and the area where the main issues and capacity constraints are likely to arise.

4.2 Changes in flight patterns and freight availability

With the onset of the pandemic there was a substantial downturn in the numbers of international flights serving Christchurch Airport providing for the movement of airfreight. This is set out in Table 4.1 and Figure 4.1.

Calendar year	Passenger aircraft	Freighters
2019	5295	261
2020	1340	290
2021	719	535

Source: Data supplied by CIAL

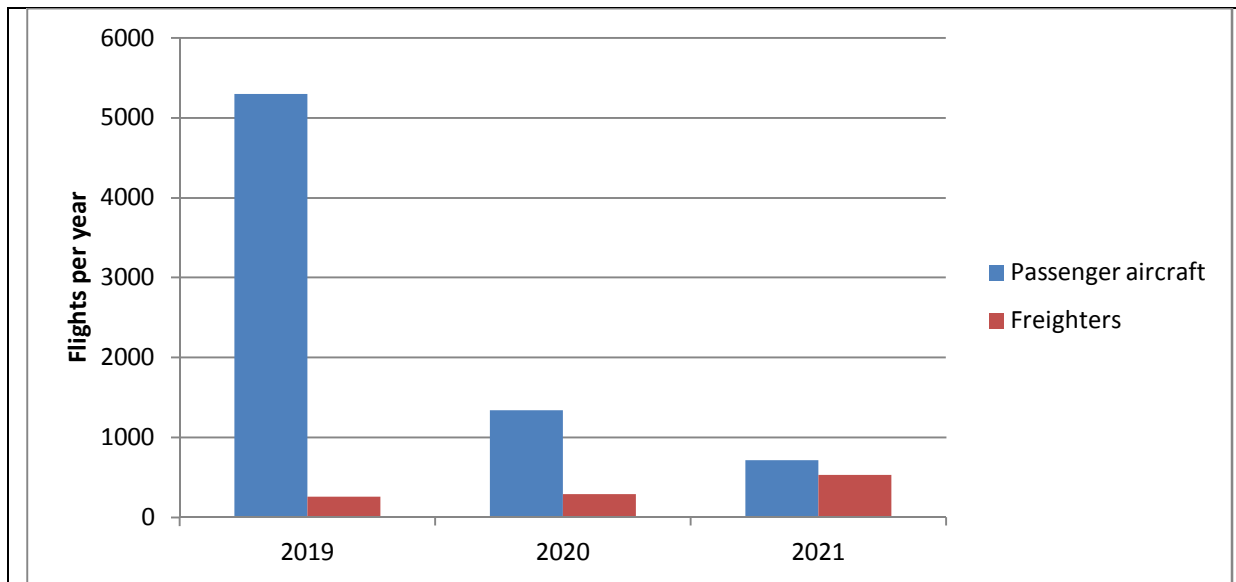


Figure 4.1
Total international flights from Christchurch International Airport 2019-2021 (flights per year)

From a total of over 5,000 international passenger flights departing Christchurch in 2019, the numbers fell by about 75 per cent in 2020 and by a further 11 per cent in 2021. Overall, the frequency of services to many of the key international destinations fell sharply. These reductions make airfreight less flexible, with connections being constrained to particular days via limited passenger services or freight-only aircraft.

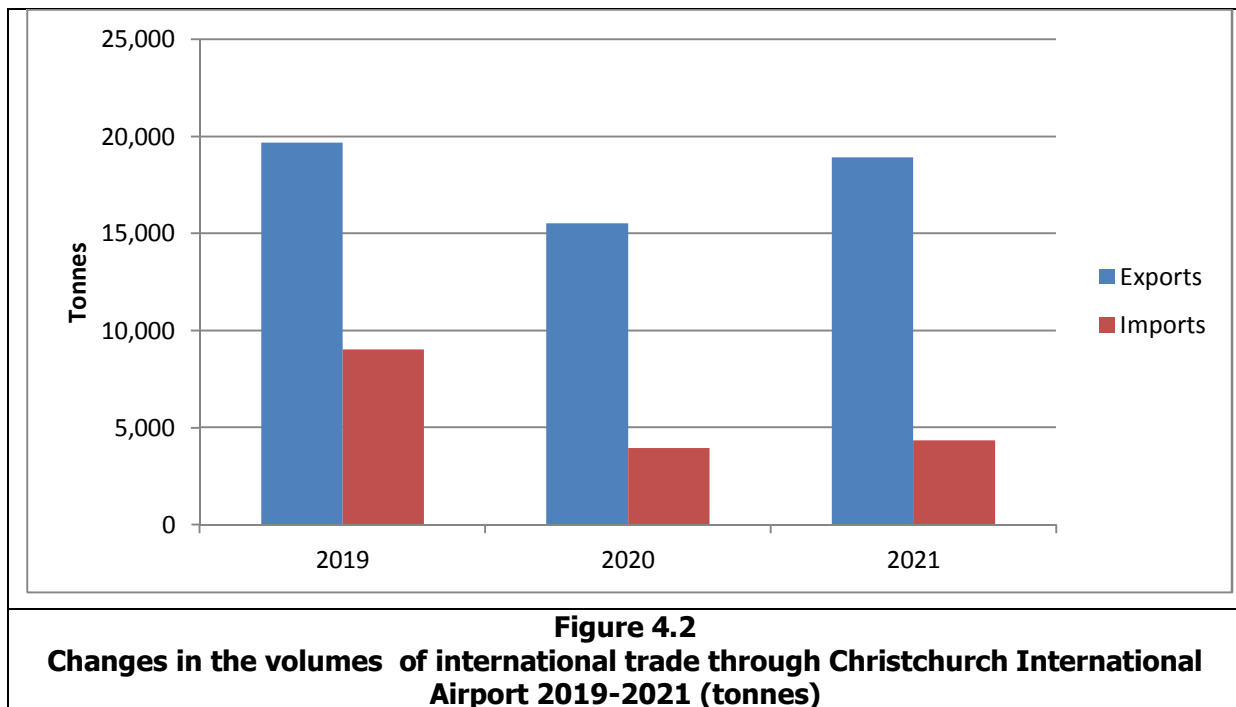
To some extent the decline in the numbers of passenger aircraft offering freight capacity was balanced by increased freight capacity per aircraft as the numbers of passengers per flight declined or fell to zero. It was also balanced by increases in the numbers of freight-only aircraft, helped in part by the subsidy offered by the New Zealand government through the MIAC scheme and its predecessors. The pattern of services by destination also changed significantly as can be seen in Table 4.2

Destination airport	Passenger aircraft			Freight only aircraft		
	2019	2020	2021	2019	2020	2021
BNE	1105	261	179			
MEL	1377	368	167		7	31
SYD	1618	353	155	261	262	216
PER	25					
OOL	296	69	33			
Total Australia	4421	1051	534	261	269	247
CAN	235	41			2	77
PVG						42
HKG	49	34			3	8
SIN	405	185	186		1	
TPE					2	8
Total China and South East Asia	689	260	186	0	8	135
NAN	195	28				
TBU			1			
Pacific Islands	195	28	1	0	0	0
LAX					13	148
HNL						5
Total N America	0	0	0	0	13	153
Grand Total	5305	1339	721	261	290	535

While the number of destinations served directly has remained broadly the same, with the support offered by the New Zealand government enabling additional airfreight capacity directly from Christchurch to destinations including Los Angeles, Guangzhou and Shanghai, the overall frequency of services to many of the key destinations fell sharply. As an example the number of flights (passengers and freight) to the major market of Australia declined from almost 4,700 in 2019 to 780 in 2021. There were similar reductions in the flights serving the gateways to South East Asia and China. The effect of these reductions in the frequency of flights would be to make airfreight less flexible, with connections being constrained to particular days via limited passenger services or freight-only aircraft. This compares with the more comprehensive potential coverage supplied in earlier years by higher frequency passenger services. The number of freight-only flights per year has been largely maintained for Australian destinations and has increased significantly for other destinations. Increases in capacity per aircraft offered by freight-only services have largely offset reductions in the frequency of passenger flights. The supported service to Los Angeles has provided a new direct connection to North America.

4.3 Changes in airfreight volumes and values

Concomitant with the reductions in the numbers of flights, the values and volumes of exports and imports fell compared to the higher levels of trade in the period up to 2019. The changes to the volumes of international air freight are set out in Figure 4.32



While the volume of exports declined by about 20 per cent in 2020 compared to 2019 levels, it then increased in 2021 to almost 95 per cent of its pre-Covid level. This suggests that, in aggregate, the efforts to maintain outbound airfreight capacity through the MIAC scheme for the key routes had been reasonably successful. For imports there was a decline in volumes of about 55 per cent in 2020 compared to 2019 levels, but these volumes then increased slightly in 2021. This probably, in part, represented a reduction in the demand for goods from overseas as the New Zealand economy responded to the effects of Covid, with major sectors of the economy going into lockdown and total imports by all modes declined. However, this reduction also partly reflected the diminution in the range and frequency of services provided. This is particularly important for the more irregular movements of manufactured and retail goods which represent a high proportion of the volume of imported goods (and a high proportion of the values of exports).

Although the volumes of exports in 2021 were similar to those in 2019, it was a different picture for the values of goods exported and this is set out in Figure 4.3.

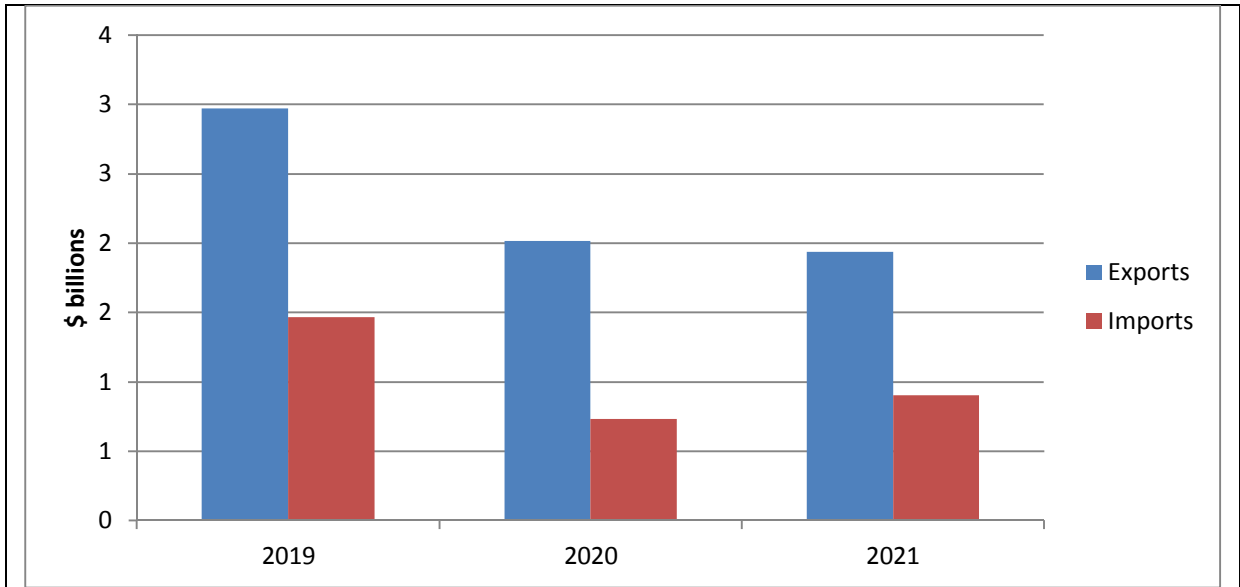


Figure 4.3
Changes in the value of international trade through Christchurch International Airport 2019-2021 (\$ billions)

The value of exports dropped by about a third from just under \$3bn in 2019 to about \$2bn in 2020 after which the total value stabilised in 2021. In contrast while the value of imports declined by about a half to 2020, broadly in line with the changes in the volume of airfreight traffic, they recovered slightly in 2021, again broadly in line with the changes in the volume.

The different patterns of change to the volumes and values of exports suggest significant changes in the unit values of the commodities exported by air. For imports the value pattern broadly repeats the changes in total value suggesting, in aggregate, at least more consistent prices for the commodities traded.

4.4 Air freight exports

4.4.1 Exports by area

The values of export airfreight by area are set out in Table 4.3

Table 4.3						
Changes in the destinations of export airfreight through Christchurch International Airport 2019-2021						
Country grouping	Value (\$m FOB)			Volume (tonnes)		
	2019	2021	Change 2019-2021	2019	2021	Change 2019-2021
Australia	655	637	-3%	6115	4481	-27%
China	431	207	-52%	3574	5457	53%
Vietnam	716	98	-86%	380	432	14%
Taiwan	25	20	-22%	788	886	12%
Japan	27	15	-46%	637	705	11%
Other SE Asia	146	141	-4%	2043	1358	-33%
US	751	552	-26%	2661	2654	0%
Canada	8	2	-80%	114	5	-95%
EU	113	104	-8%	1947	1641	-16%
GB	44	56	26%	965	867	-10%
Middle East & Central Asia	31	82	167%	232	161	-31%
Other	22	19	-14%	206	174	-16%
Total	2969	1933	-35%	19662	18821	-4%

In value terms, all major destination countries have recorded a drop in airfreight exports from Christchurch although for Australia the decline was only very small at about 3 per cent. Of the other major longer haul markets, the US fell by 26 per cent, China fell by 52 per cent and Vietnam by a very large 86 per cent.

However these changes are in contrast to the volumes of freight exported with that to China increasing by over 50 per cent to become the largest export destination by volume and that to Vietnam increasing by 14 per cent despite the substantial reduction in value. Declines in volumes for the major markets were confined to Australia, Other South East Asia, and Europe. The difference in the changes in values and volumes suggest a change in the mix or average price of the types of goods being exported by airfreight. This is discussed in the next section.

4.4.2 Exports by commodity

Exports by commodity in 2019 and 2021 are set out in Table 4.4.

	Volumes (tonnes)			Values (\$m)			Value per tonne (\$)	
	2019	2021	2021/ 2019	2019	2021	2021/2019	2019	2021
Bulk and chemicals	648	389	-40%	50	45	-11%	77009	114541
Dairy	1044	682	-35%	18	10	-46%	17416	14505
Fish	6387	8223	29%	151	187	24%	23611	22700
Horticulture	2000	1949	-3%	39	33	-16%	19620	16899
Live animals	151	97	-36%	8	3	-57%	51303	34501
Manufactured goods	2421	1777	-27%	2354	1349	-43%	972379	759488
Meat	2830	3309	17%	62	68	10%	21870	20634
Metal products	302	237	-22%	7	6	-14%	22404	24639
Pharmaceuticals	174	169	-3%	26	27	4%	150958	161299
Precious metals	6	2	-70%	37	31	-15%	6316892	18129669
Processed food	2232	1008	-55%	67	51	-25%	30165	50281
Stones and ceramics	240	137	-43%	4	2	-48%	17427	15852
Textiles	748	457	-39%	53	31	-42%	71404	67749
Transport equipment	187	260	39%	4	87	1858%	23706	334622
Wood prods	292	128	-56%	88	3	-97%	299827	23155
Total	19662	18821	-4%	2969	1933	-35%	150999	102712

While in general the exports for each of the identified commodity groups declined between 2019 and 2021, there were significant increases for fish and meat and, because of these, total agricultural exports increased over that period. The main decreases were in manufactured goods where the volume fell by over 25 per cent, and textiles which declined by about 40 per cent. In volume terms the balance between agricultural and other exports shifted significantly, with the agricultural share increasing from 74 per cent to 81 per cent of the total.

In value terms, while there were general decreases, the totals for fish and meat increased giving an overall increase in the value of agricultural exports from \$345m to \$352m. Because of the reduction in the value of exports generally, this resulted in the share for agricultural products increasing from about 12 per cent of total airfreight exports to 18 per cent.

Overall while the volumes and values of exports declined between 2019 and 2021, the totals for the time- and timing- sensitive agricultural products as a whole increased with a consequent growth in their overall share of total exports.

4.5 Key findings

The key findings from the analysis of the changes in airfreight patterns through Christchurch Airport between 2019 and 2021 are:-

- The patterns of airfreight movements show considerable change over the period after 2019. Both the volumes and values of airfreight imports and exports declined in 2020 in the face of very substantial reductions in the numbers and ranges of air services operated and changes in the patterns of demand following the pandemic.
- The bounce back in the export volumes in 2021 suggests that the recent measures to enhance the volume of air freight capacity through Christchurch have been largely successful and have allowed the key agricultural commodities to maintain and even increase their exports to key markets in volume terms.
- Compared to the position in 2019 the reduction in the range of services provided through the Airport in terms of routes and frequencies appears to have limited the ability for both exporters and importers of high value manufactured goods to take advantage of the time savings achievable with air freight with declines in both the volumes and values of these commodities. This decline has occurred despite the growth of the regional economy and highlights the importance of a wide range of air services capable of carrying freight to support this part of the airfreight market.

5 Looking to the future

5.1 Introduction

In looking to the role that Christchurch Airport might provide in supporting airfreight services to and from the Canterbury region and the South Island in general, it is likely that this will have two main components:-

- Supporting agricultural production in the region by providing enhanced access for premium products to the key markets in Australia, Asia, the US and Europe;
- Providing for the rapid movement of manufactured and other inputs for industries in New Zealand and overseas and also providing facilities for the movement of consumer goods for consumers in New Zealand.

In volume terms the first component is very important with high volumes of agricultural products looking to access premium markets around the world where the timing of services and speed of delivery are critical. In value terms it is the second component that dominates where access to and from a wide range of origins and destinations is the important factor.

5.2 Recent growth patterns

The analysis of the patterns of flow through Christchurch Airport above has highlighted the importance in value terms of the movements of manufactured goods through the Airport. The observed relationship between the values of the flows of international freight traffic through the Port of Lyttelton and through Christchurch Airport for manufactured goods and for total traffic is set out for movements of exports in Figure 5.1.

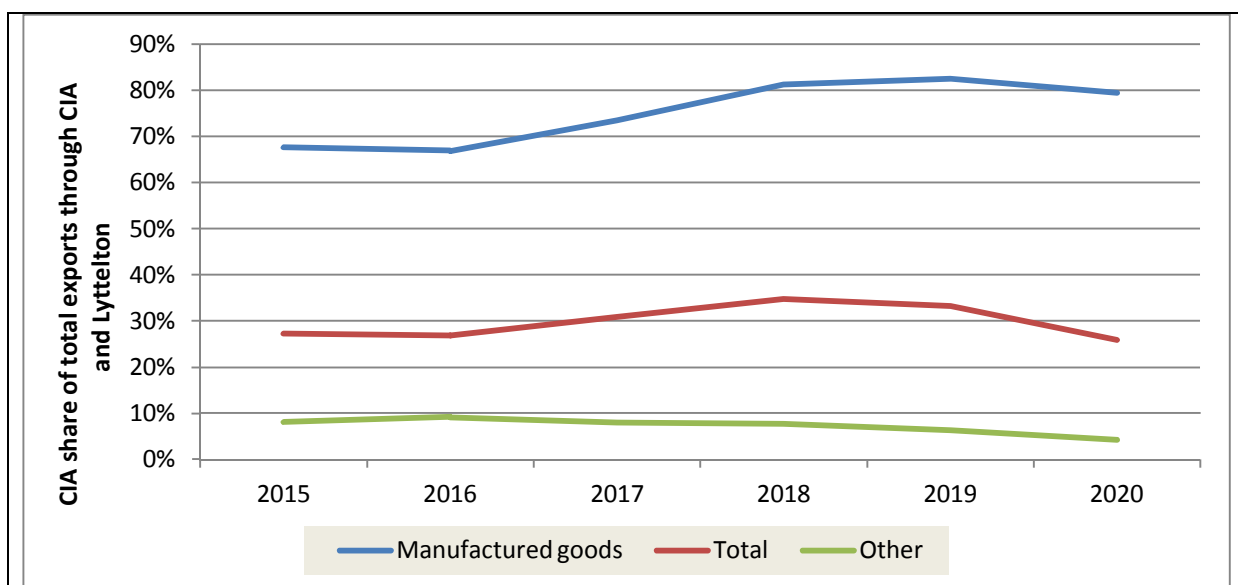


Figure 5.1
Share of Christchurch International Airport in the total value of exports through Christchurch International Airport and Lyttelton Port combined (per cent of total)

For exports of manufactured goods, the airfreight services through Christchurch Airport provide the main direct access to international markets. The Airport's share of the total value of exported manufactured goods for the Airport and Lyttelton Port combined was substantial, at between 70 and 80 per cent of the direct exports from the region, and was steadily increasing up to 2020.

The position for imports is set out in Figure 5.2.

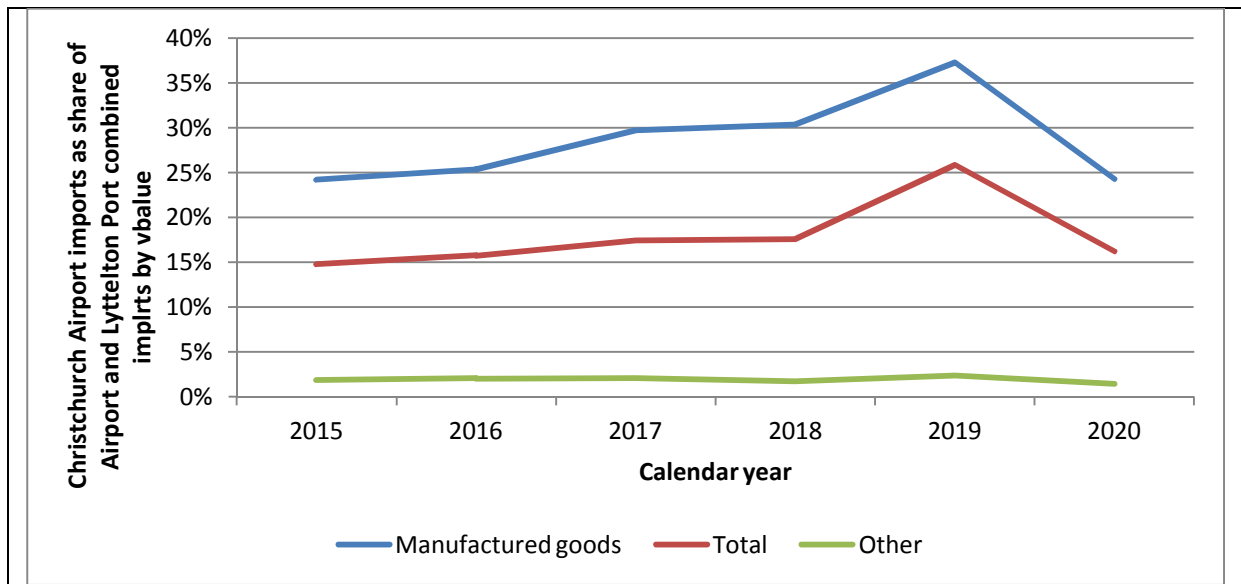


Figure 5.2
Share of Christchurch International Airport in the total value of imports through Christchurch Airport and Lyttelton Port combined (per cent of total)

A similar position to that observed for exports arises with the share again increasing over the period from 2014, although for these movements, the Airport’s share of freight in the combined total for the Port and Airport is lower at 25-35 per cent.

5.3 Forecast growth in international freight activity for the Christchurch area

The 2018 National Freight Demand Study (NFDS)² provides a detailed snapshot of freight movements across New Zealand in 2018 for the main domestic modes. This, combined with the MOT Freight Futures Model which was developed from this, provide forecasts of the growth of freight for a range of commodities, including forecasts for international freight flows through the Port of Lyttelton. Because of the purpose of the NFDS, and the subsequent model development which was focussed on the potential demands on the domestic transport network in New Zealand, this work has not taken into explicit account the relatively small volumes of airfreight in tonnage terms. However the modelling does provide forecasts of the volumes of traffic by broad commodity type through the Port of Lyttelton, which as explained above is likely to be linked with increased demands for international airfreight to and from Christchurch Airport.

The forecasts of growth from the model are set out in Table 5.1

² <https://www.transport.govt.nz/assets/Uploads/Report/NFDS3-Final-Report-Oct2019-Rev1.pdf>

Table 5.1					
MOT Freight Futures model forecasts for international trade through Lyttelton					
(m tonnes pa)					
	2018	2032	2042	2052	Growth 2018-2052
Exports through Lyttelton					
Total trade	3.19	3.40	1.98	2.08	-35%
<i>Meat</i>	<i>0.13</i>	<i>0.13</i>	<i>0.13</i>	<i>0.13</i>	<i>0%</i>
Manufactured and retail goods	0.30	0.36	0.39	0.42	39%
<i>Horticulture</i>	<i>0.11</i>	<i>0.13</i>	<i>0.14</i>	<i>0.15</i>	<i>31%</i>
Imports through Lyttelton					
Total trade	2.40	3.32	3.88	4.32	80%
<i>Meat</i>	<i>0.01</i>	<i>0.01</i>	<i>0.01</i>	<i>0.01</i>	<i>0%</i>
Manufactured and retail goods	0.73	1.38	1.74	2.06	182%
<i>Horticulture</i>	<i>0.02</i>	<i>0.02</i>	<i>0.03</i>	<i>0.03</i>	<i>31%</i>

Source: MoT Freight Futures Model with consultant analysis

These numbers indicate a very substantial growth in the forecast movements of manufactured and retail goods through the port of Lyttelton, reflecting the growing demands generated by industries and consumers in the area. Following the trends experienced in recent years and discussed earlier in this section, this will almost certainly be accompanied by an increased demand for airfreight through Christchurch Airport. Horticulture, which is also an important component of the total airfreight market, is also forecast to grow substantially in volume terms.

As well as gaining from the growth of overseas markets in general, airfreight provides opportunities for the increasing movements of value-added elements within particular commodities. The breakdown of traffic by commodity in Section 4 has for example indicated the growing importance of airfreight exports of high value meat products. In 2021 these had a typical value for products exported by air of \$21,000 per tonne compared to the values exported by sea of about \$6,000 per tonne. Similarly, horticultural exports by air have an average value per tonne that is more than 12 times the average value for those exported by sea with airfreight offering direct delivery for high value perishable items to overseas markets especially Australia China and other South East Asian countries. The continuing growth in the value of airfreight in the period up to 2019 reinforces these findings.

6 The future role of Christchurch International Airport in servicing increased international airfreight demand

The analysis above indicates that there is likely to be growing demand for airfreight as the regional and South Island economies continue to grow following the diminution of the effects of COVID-19 pandemic and also as the use of air becomes increasingly attractive for the transport of the growing share of premium agricultural products. The latter will often require flight timings that allow the products, in many cases fresh or chilled, to be brought to markets in the destination countries at a time that meets the patterns of consumer demand. An example of this is the current service to Guangzhou for which the flights depart from Christchurch in the late evening and arrive in Guangzhou early in the morning in time for the goods to reach markets later the same day when they are still in prime condition. Limitations on the timings of the flights could have adverse impacts on this traffic.

While at present the supply of airfreight capacity through Christchurch appears to be broadly in line with the longer term trends in demand, especially for exports, this reflects the current support provided by the New Zealand government. This government support is likely to be withdrawn as passenger services offering freight capacity are reintroduced. If the anticipated levels of demand for the airfreight of agricultural products are to be met, these new passenger focussed services will need to provide both the freight capacity and timing of services that this trade requires. Any constraints on these services providing airfreight capacity could affect the sector adversely.

In addition to meeting the more specific demands of the agricultural sector, air freight also needs to meet the broader demands for the movement of manufactured goods both exported from and imported to New Zealand. These products are typically of high value, which reflects their importance to manufacturing and retail activities, and make up a large part of the inward and outward airfreight market. While absolute capacity and the specific timing of services is probably not such an issue for these movements, services to and from a range of overseas locations at a variety of times would be important. Again it is likely that this capacity would be mainly provided on passenger aircraft ideally serving directly or indirectly a wide range of destinations at reasonable frequencies.

The experience of Auckland airport, where a wider range of services is provided and where traffic is largely back up to pre-Covid trends, highlights the potential for services out of Christchurch to recapture former airfreight markets if appropriate services and frequencies are offered.

The position for Auckland is set out in Figure 6.1 and Figure 6.2. For volumes, and more particularly values, airfreight through Auckland airport has largely rebounded from the dips associated with the depths of the Covid pandemic as the level and range of services has gradually increased.

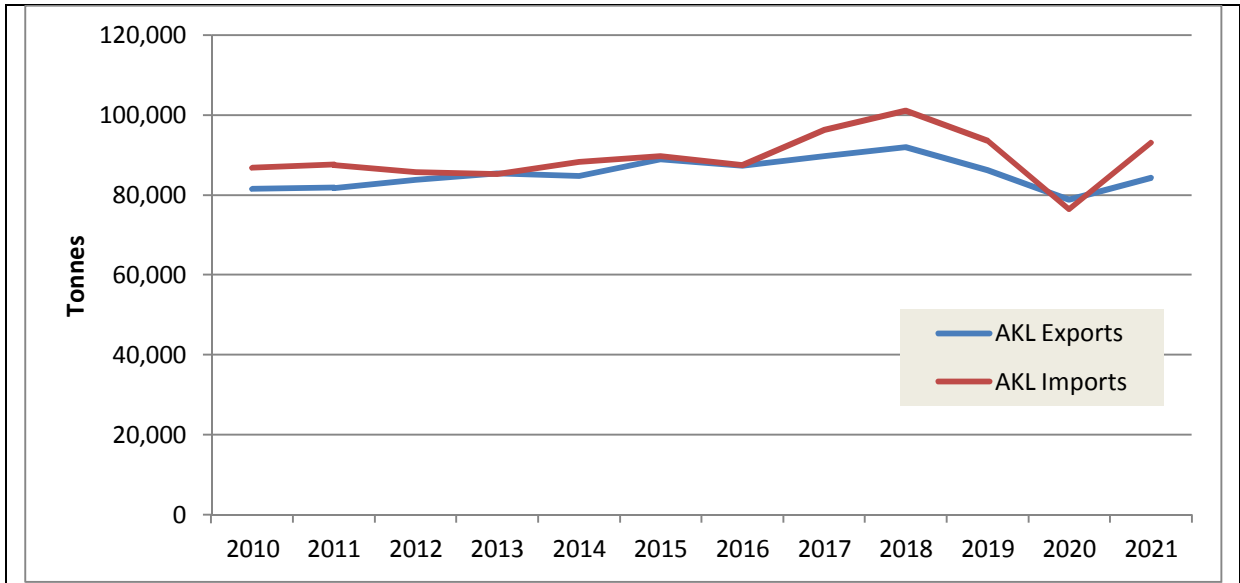


Figure 6.1
Total volumes of airfreight exports and imports through Auckland International Airport (tonnes)

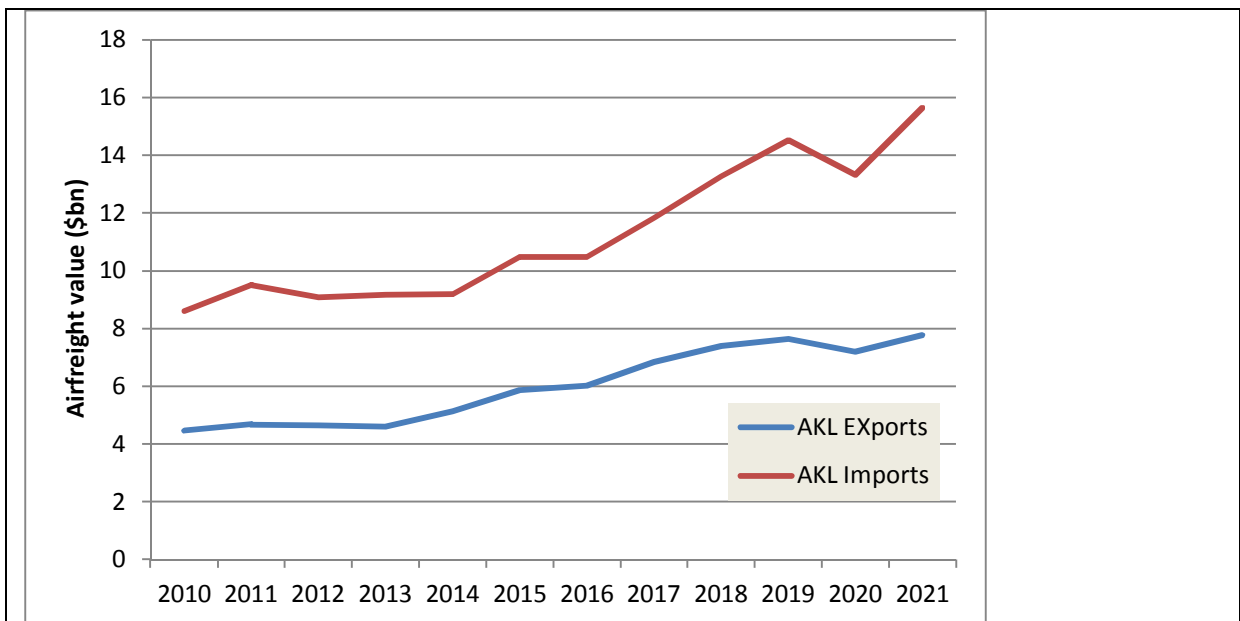
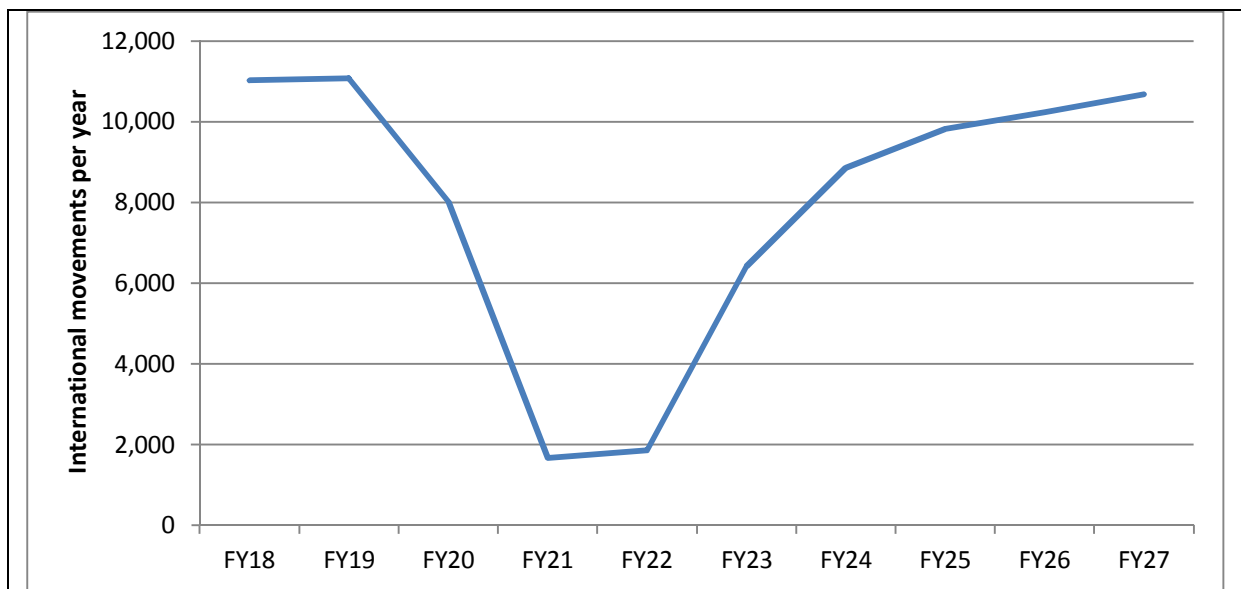


Figure 6.2
Total values of airfreight exports and imports through Auckland International Airport (\$bn)

Passenger aircraft freight capacity would be likely to replace the existing freight-only services through Christchurch and more generally in New Zealand as the MIAC scheme is wound down. CIAL have made forecasts of the possible growth in international aircraft movements as passenger demands start to increase through the airport and these are set out in Table 6.1 and Figure 6.3.

Table 6.1 International aircraft movements through Christchurch International Airport (observed and forecast)					
Year	Aircraft type				Total Movements
	Passenger - Narrowbody	Passenger - Widebody	Freight - Narrowbody	Freight - Widebody	
FY18	8,524	2,244	5	240	11,013
FY19	8,672	2,136	0	263	11,071
FY20	6,042	1,683	20	264	8,009
FY21	587	324	93	667	1,671
FY22	767	430	0	662	1,859
FY23	4,998	1,143	0	270	6,411
FY24	6,926	1,656	0	270	8,852
FY25	7,644	1,908	0	270	9,821
FY26	7,977	1,991	0	270	10,238
FY27	8,332	2,080	0	270	10,682

Source: CIAL



**Figure 6.3
International aircraft movements through Christchurch International Airport
2018-2027
(observed to FY21 and forecasted to 2027)**

These forecasts suggest that, by 2027, the numbers of international flights could have recovered to the levels experienced before the pandemic. However, given the position of Christchurch Airport generally as a service taker for these new passenger services, it is important that as few constraints as possible are imposed, in order to attract this level of services to a range of destinations.

Achieving these CIAL forecasts, incorporating reasonable route coverage at sufficient frequencies, would facilitate the growing demands for airfreight to and from the area. This would allow the local and wider economy to receive the full benefits by the later part of the decade, and provide the basis for the forecast continuing growth over the longer term.

7 Domestic freight issues

7.1 Introduction

Christchurch is an important staging point for e-commerce, other courier movements and mail within New Zealand, acting as a distribution centre for items delivered to South Island destinations and also as a consolidation point for those moving to North Island destinations. A very large proportion of this inter-island traffic passes through Christchurch Airport and, because of the timing required to meet customers' demands, much travels at night allowing collection of the goods at the end of the working day and delivery in the major centres the next morning. The relatively high fees charged to customers for these overnight services with expedited transit costing considerably more than slower services³ potentially indicate the value that is attached to prompt delivery.

This section looks at the way in which this traffic has been growing in recent years and possible pointers for future growth, and then goes on to look at the way in which services to meet these demands have been developed.

7.2 Growth of e-commerce in the retail sector in New Zealand

A feature of recent years has been the rapid growth of e-commerce in the retail industry in New Zealand, with increasing volumes being delivered directly to customers. This is documented on a regular basis by NZ Post⁴. While this growth has been accentuated by the COVID pandemic, expansion was strong in the years before COVID increasing from \$3.6bn in 2017 to \$4.7bn in 2019, a growth of 30 per cent in just two years. With the onset of COVID, growth in 2020 was particularly large with the value of online retail purchasers expanding by a further 25 per cent. To some extent this reflected increases in the average value of the items purchased but the number of transactions also increased by 17 per cent. The average value per transaction in 2020 was about \$110.

While there was lower growth in online expenditure in 2021 it was still increasing at an estimated 4-5 per cent per year, despite the relaxation of restrictions and the opening of more shops for direct sales.

This growth in expenditure is summarised in Figure 7.1.

³ As an example the cost of a Size 2 NZ Post Box sent from Auckland to Christchurch would cost \$17.00 for 3-day delivery but \$31.20 (more than 80 per cent more) for an overnight delivery

⁴ NZ Post The Full Download for 2019, 2020 and 2021



Even with this growth the proportion of on-line expenditure as a proportion of total retail expenditure in New Zealand is relatively low at about 11 per cent of total retail sales, compared to over 20 per cent in economies like the US and UK. This would suggest that there remains considerable scope for expansion in the share of e-commerce in New Zealand to bring it closer in line with trends in other comparable countries. As well as online expenditure taking a greater share of the existing domestic retail market, it is likely that the total domestic retail market itself (and therefore the net volume of e-commerce expenditure) will grow over the future.

7.3 Future e-commerce

Forecasts are available for the total future domestic movements of manufactured and retail goods combined. However the share of e-commerce in this is not readily available, since typically it only represents a small share of the volumes moved (although in value terms it is more important). Christchurch is an important hub for this trade with the development of a range of multi-user facilities to support it.⁵

The MoT Freight Futures model⁶ provides forecasts for the movements of manufactured and retail goods combined but does not distinguish between them. This model indicates that for the manufactured and retail goods sector as whole (which would include e-commerce) there are likely to be substantial increases in the total flows into and out of the lower South Island regions accessed via Christchurch (Canterbury, West Coast, Otago and Southland regions). These forecasts are set out in Table 7.1.

⁵ An example of this would be the facilities operated on behalf of a range of clients by Online Distribution Services from locations across the city.

⁶ <https://www.transport.govt.nz/statistics-and-insights/transport-outlook/updated-future-state-model-results/>

**Table 7.1
Forecasts of flows of manufactured and retail products by all modes from the MoT Freight Futures model (m tonnes pa)**

	To Lower South Island				
From:-	2018	2032	2042	2052	Total growth 2018-52
Upper North Island (1)	1.66	2.04	2.24	2.41	45%
Lower North Island (2)	0.12	0.14	0.15	0.15	33%
Total	1.77	2.18	2.38	2.56	44%
	From Lower South Island				
To:-	2018	2032	2042	2052	Total growth 2018-52
Upper North Island	1.00	1.20	1.30	1.39	39%
Lower North Island	0.14	0.17	0.18	0.19	32%
Total	1.14	1.36	1.48	1.58	38%

Source: MoT Freight Futures model updated by consultants

Notes (1) Upper North Island includes Northland, Auckland and Waikato

(2) Lower North Island includes Wellington and Manawatu/Whanganui

The figures in Table 7.1 indicate that total volumes of manufactured and retail goods transported into and out of the Lower South Island are expected to increase substantially over the period to 2052.

The growing size of total movements of manufactured and retailed goods, combined with the increased share of this market likely to be taken by online sales, suggests that future growth in e-commerce is likely to be sustained and substantial.

7.4 Pattern of air services

To meet a major part of the domestic e-commerce market into and out of the South Island, domestic freight movements of mail and courier parcels are operated by Parcelair. This supports the activities of the two major New Zealand parcel and package delivery companies, New Zealand Post and Freightways, and represents the consolidation of earlier separate operations using a number of different aircraft types.

This service provides flights operating through the night between Auckland, Palmerston North and Christchurch. The pattern of these flights for a typical day in March 2022 is set out in Table 7.2 and shows a total of 8 arrivals into and 8 departures from Christchurch Airport. Flights with arrivals or departures between 2300 and 0600 are highlighted.

Depart/ Arrive	Aircraft type	Date	Scheduled arrival/ departure time	Destination/Origin
D	73F	7/03/2022	1730	Auckland
D	73F	7/03/2022	2010	Auckland
A	73F	7/03/2022	2030	Auckland
D	73F	7/03/2022	2115	Palmerston North
A	73F	7/03/2022	2150	Auckland
D	73F	7/03/2022	2235	Auckland
A	73F	7/03/2022	2305	Auckland
A	73F	7/03/2022	2345	Palmerston North
A	73F	8/03/2022	0005	Auckland
D	73F	8/03/2022	0005	Auckland
D	73F	8/03/2022	0055	Palmerston North
D	73F	8/03/2022	0125	Auckland
A	73F	8/03/2022	0200	Auckland
D	73F	8/03/2022	0240	Auckland
A	73F	8/03/2022	0330	Palmerston North
A	73F	8/03/2022	0810	Auckland

Because of the volumes of the goods carried and the need for these to be sorted before onward despatch, these flights are spread over a wide period throughout the night. This timing of the flights also meets the main demands from customers, allowing goods despatched towards or at the end of the working day to be transported overnight and to be available for delivery the next morning. This reduces the costs of stockholding and contributes to efficient supply chains, minimising any losses of production for organisations dependent on receiving critical parts via air freight (particularly at short notice). By minimising despatch and delivery times, this supports the requirements of business and personal customers.

The substantial number of flights and the premiums that customers are prepared to pay for more rapid delivery indicates the high value of this level of service to firms and consumers across New Zealand.

7.5 Overall assessment

The key findings from the review of the domestic e-commerce market passing through Christchurch Airport include:-

- The demand for e-commerce in New Zealand is growing, and this growth is likely to continue into the future as total markets expand and the share of e-commerce in these grows;
- Christchurch Airport is a key gateway for these movements to and from much of the South Island;
- Because of the nature of these movements, there is a demand for flights throughout the night, allowing goods to be despatched at the end of one working day and delivered early the next, providing an efficient supply chain for business and personal customers.

8 Summary of findings

Christchurch Airport plays an important role in the movement of international airfreight and also in the movement of domestic airfreight including Post and courier movements into and out of the South Island. Both of these movements are important to the economy of the South Island and efficient airfreight services also give benefits to consumers who have rapid access to goods from around the world and from other parts of New Zealand. These demands are likely to grow in the future as conditions recover from the challenges of 2020 and 2021.

For international air freight, a key provider of capacity will be in the range and frequency of passenger services as these return to Christchurch to meet growing demands. However given the position of Christchurch Airport as a service taker for these new operations it is important that as few constraints as possible are placed on these services, if the full benefits to the local and wider economy from air freight are to be achieved. This may involve flights arriving and departing within night-time hours. A wide range of services to a range of destinations would support the outbound and inward movement of high value manufactured goods important to local businesses and also movements of international e-commerce for New Zealand consumers. Careful timing of flights would also provide suitable avenues for the export of time sensitive agricultural products allowing goods to reach markets at appropriate timings, so allowing the best returns to be achieved for local exporters. It is anticipated that flight numbers could return to pre-Covid levels by the later part of the current decade, but again it is important that as few constraints as possible are imposed if these forecasts are to be achieved.

Services through the night would also support domestic airfreight movements linking Auckland and the upper North Island with Christchurch the key distribution centre for the South Island. These would support the efficient movement of goods, with items despatched at the end of the working day being available in businesses and consumers at the beginning of the following working day.

For both international and domestic airfreight movements the ability to work with as few constraints as possible through the night is important. This would help ensure that the maximum benefits are obtained from the movement of airfreight and its support for local industries and consumers.