

National Freight Demand Study 2017/18



Final Report

Richard Paling Consulting
Murray King & Francis Small Consultancy
EROAD Limited

September 2019

Richard Paling Consulting

Table of Contents

Executive Summary

Introduction.....	i
Approach to the analysis.....	i
Growth of the overall freight task since 2012.....	i
The scale of the freight task in 2017/18	ii
The freight task in detail.....	iii
Changes from 2012.....	vi
Forecast growth	viii

Main Report

1	Introduction	1
2	Scope of the work	1
3	General growth patterns between 2012 and 2017/18	3
3.1	Introduction	3
3.2	Total movements by mode.....	3
3.3	Imports and exports	3
3.4	Overall assessment.....	4
4	Commodity estimates for 2017/18.....	5
4.1	Introduction	5
4.2	Milk.....	5
4.2.1	Current production	5
4.2.2	Recent changes in production	6
4.2.3	Estimated movement patterns.....	8
4.3	Manufactured dairy products.....	10
4.3.1	Introduction	10
4.3.2	International trade in dairy products.....	10
4.3.3	Changes in export patterns	10
4.3.4	Overall movement patterns.....	12
4.4	Logs.....	14
4.4.1	Introduction	14
4.4.2	Recent changes in the movement of logs.....	14
4.4.3	Distribution of logs harvested by region.....	15
4.4.4	Use of logs for domestic production.....	16
4.4.5	Exports of logs	17
4.4.6	Movement patterns for logs	19
4.5	Manufactured timber products.....	21
4.5.1	Introduction	21
4.5.2	Domestic production of timber products	21
4.5.3	Exports of manufactured timber products	21

4.5.4	Imports of manufactured timber products.....	22
4.5.5	Movement patterns for manufactured timber products	22
4.6	Meat and meat products	24
4.7	Livestock Movements.....	27
4.7.1	Introduction	27
4.7.2	Regional patterns of movement and slaughter	27
4.7.3	Total movements.....	27
4.8	Wool.....	30
4.9	Fish	33
4.10	Horticulture	36
4.10.1	Introduction	36
4.11	Other agriculture	40
4.11.1	Introduction	40
4.12	Petroleum	43
4.13	Coal	45
4.14	Aggregates.....	48
4.14.1	Introduction	48
4.15	Limestone, Cement and Fertiliser.....	52
4.15.1	Introduction	52
4.16	Iron and Steel	55
4.17	Concrete	57
4.18	Other minerals	59
4.19	Waste.....	61
4.20	Other manufactured and retail goods	64
4.20.1	Introduction	64
4.20.2	Manufacturing	64
5	Overall freight patterns and modal shares.....	70
5.1	Introduction	70
5.2	Assessment of movements by mode.....	71
6	Changes from 2012.....	76
7	Future forecasts.....	79
7.1	Introduction	79
7.2	Liquid Milk.....	79
7.3	Manufactured dairy products.....	81
7.4	Logs.....	81
7.5	Meat and Meat By-products.....	85
7.6	Livestock.....	87
7.7	Fish and wool.....	87
7.8	Horticulture	87

NATIONAL FREIGHT DEMAND STUDY 2017/18

7.9	Other agriculture (including grain).....	89
7.10	Overall Assessment.....	89

National Freight Demand Study 2017/18

Executive Summary

Introduction

The movement of freight has a vital role in the economy of New Zealand moving goods between producers and consumers and supporting the flows of international trade with exports for world markets and imports to support New Zealand industries and consumers. Understanding the patterns of trade is important to be able to plan effectively for the sector and to help ensure that it plays its role as efficiently as possible.

However the data from the 2014 revision of the NFDS is now over six years old and much about the New Zealand economy and the freight transport industry has changed. This includes significant growth in population, GDP, and specific industries, changes in supply chains and distribution patterns, changes in carrier service offerings, and changes in the mix of specific products and commodities produced and consumed.

In order to help understand the impact of these changes the Ministry of Transport commissioned a team comprising Richard Paling Consulting and Murray King Francis Small Consulting, supported by EROAD Limited to undertake this update, drawing on the experience gained in the two previous versions of the NFDS in 2008 and 2014. It is intended that the detailed outputs from the study will form one of the inputs to the Ministry's Freight Model and they have therefore been configured to meet the requirements for this.

Approach to the analysis

In general we have followed a similar approach to that undertaken in the two previous National Freight Demand Studies although time and budget constraints meant that it was not possible to repeat the same level of detail. In a number of instances, the previous forecasts were simply updated rather than created from scratch. We did however take the opportunity to use sources of data that were not available in previous studies, particularly information on the patterns of road movements supplied by EROAD Limited for this study. This allowed a better appreciation of these patterns, especially the shorter distance movements which are hard to identify by alternative means.

Growth of the overall freight task since 2012

The published figures on the growth of the overall freight task since 2012 are summarised in Table 1.

Table 1				
Total changes in freight movements by mode 2012-2017/18 (bn tonne-kms)				
Mode	2017/18	2012	Growth	Source
Rail	3.47	4.19	-17 % (1)	KiwiRail
Coastal shipping	4.04	3.61	12%%	Consultants estimates
Road transport	25.11	21.71	16%	MoT
Total	32.62	29.51	10.5%	

Notes (1) The decline in rail reflects the impact of the Kaikoura earthquake and the reduction in coal traffic in 2017/18.

NATIONAL FREIGHT DEMAND STUDY 2017/18

EXECUTIVE SUMMARY

These figures are not entirely consistent since the road totals include in some instances the weights of the containers in which the goods are carried and would also include the movement of staff and equipment. Both are generally excluded from the rail and coastal shipping numbers. However on the assumption that the effect of these is similar in both years, the published total freight movements in tonne-km terms are estimated to have grown by about 10-11 per cent over the period between the two NFDS analyses. Road transport has grown particularly strongly offset in part by the decline in rail.¹

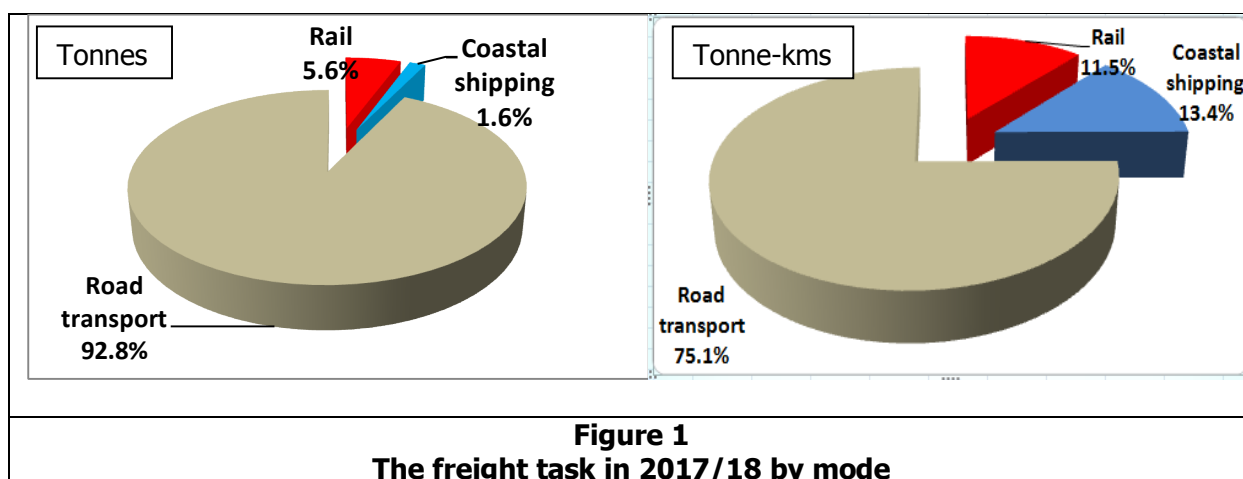
International trade in tonnage terms has grown more strongly with exports increasing by 35 per cent and imports by 27 per cent, highlighting the increasing importance of international markets and suppliers.

The scale of the freight task in 2017/18

The total scale of the estimated freight task in 2017/18 is set out in Table 2

Table 2				
The freight task in 2017/18				
Mode	Tonnes		Tonne-kms	
	Million tonnes	Per cent of total	Billion tonne-kms	Per cent of total
Rail	15.6	5.6%	3.5	11.5%
Coastal shipping	4.6	1.6%	4.0	13.4%
Road transport	258.5	92.8%	22.6	75.1%
Total	278.7	100.0%	30.1	100.0%

Road is the dominant mode in terms of both tonnes and tonne-kms. In tonnage terms, it accounts for 93 per cent of the total tonnes moved, but in tonne-km terms the share is much lower at 75 per cent reflecting the greater average distances for goods transported by rail or coastal shipping. This is illustrated in Figure 1



¹ It should be noted that the previous 2014 NFDS was based on the then current estimate of road freight tonne-kms which is below that set out in Table 1.

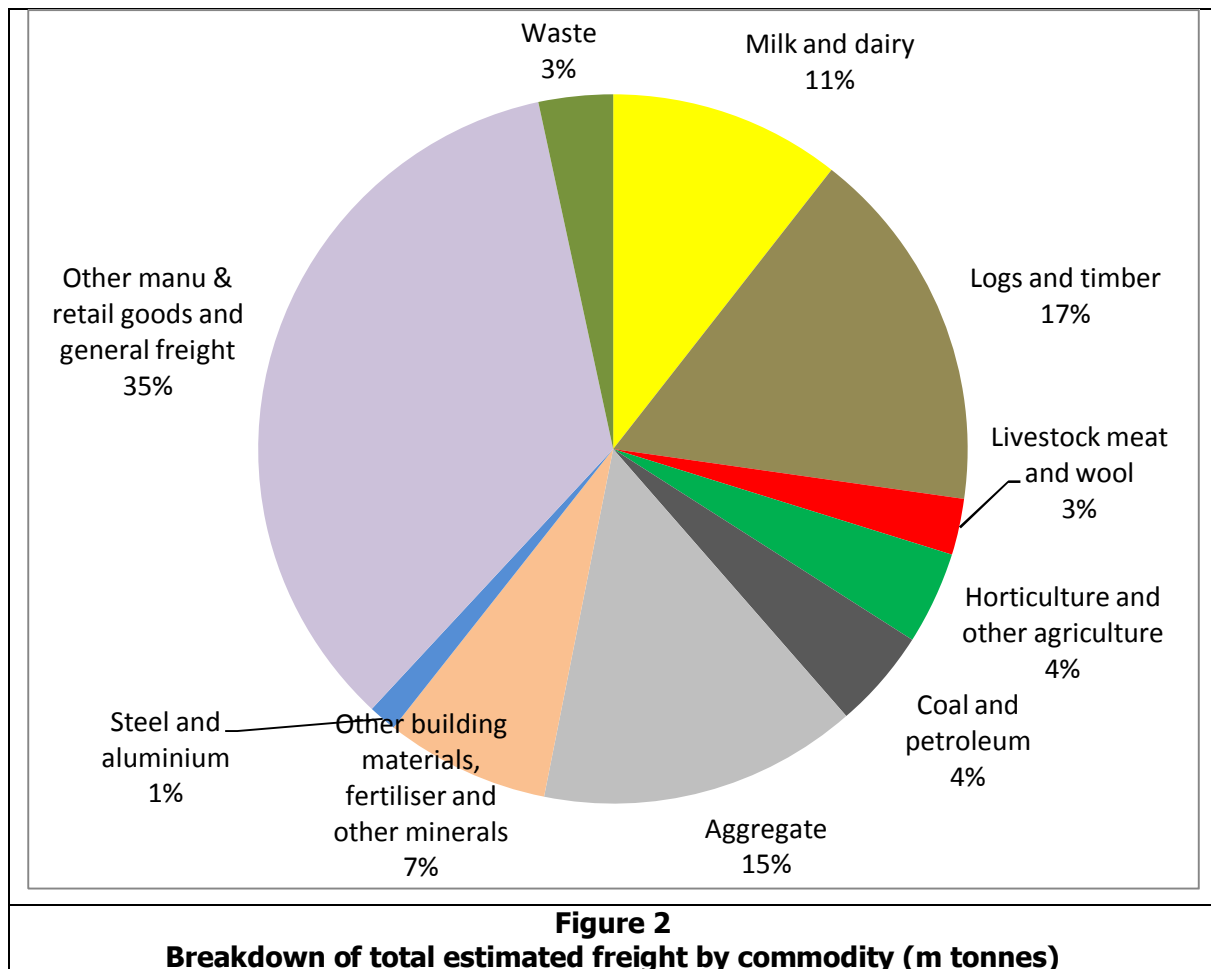
NATIONAL FREIGHT DEMAND STUDY 2017/18 EXECUTIVE SUMMARY

The figures for rail have been particularly affected by the Kaikoura earthquake which has reduced the volumes travelling between the North Island and the main centres in the South Island. The position has also been affected by the reduction in coal exports carried by rail from the West Coast to Lyttelton since 2012.

The freight task in detail

The key commodities have been aggregated into broad groups and the details of the movements of these for 2017/18 are set out in Table 3 and Figure 2.

Table 3 Summary of freight movements by broad commodity 2017/18 (m tonnes)		
Commodity group	Total movements (m tonnes)	Per cent of total
Milk and dairy	29.4	11%
Logs and timber	46.5	17%
Livestock meat and wool	7.2	3%
Horticulture and other agriculture	11.8	4%
Coal and petroleum	12.6	5%
Aggregate	40.5	15%
Other building materials, fertiliser and other minerals	21.0	8%
Steel and aluminium	3.6	1%
Other manufactured and retail goods and general freight	96.7	35%
Waste	9.4	3%
Total	278.7	100%



The patterns of movements for the total freight task are set out in Table 4.

NATIONAL FREIGHT DEMAND STUDY 2017/18
EXECUTIVE SUMMARY

Table 4
Total movements by all modes in 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	11.9	1.7	0.1	0.8	0.0	0.2	0.1	0.0	0.3	0.3	0.0	0.7	0.3	0.2	16.6
	Auckland	1.2	61.8	4.3	2.2	0.2	0.6	0.7	1.7	1.4	0.4	0.1	1.1	0.4	0.2	76.3
	Waikato	0.1	3.5	24.2	7.3	0.0	0.1	0.4	0.1	0.1	0.0	0.0	0.1	0.0	0.0	36.0
	Bay of Plenty	0.1	2.9	2.7	18.9	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.3	0.0	0.0	25.4
	Gisborne	0.0	0.1	0.1	0.1	4.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	5.0
	Hawke's Bay	0.0	0.4	0.1	0.4	0.2	7.5	0.1	0.6	0.1	0.0	0.0	0.1	0.0	0.0	9.4
	Taranaki	0.1	0.3	0.2	0.4	0.0	0.2	5.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	7.4
	Manawatu-Wanganui	0.0	0.5	0.1	0.2	0.0	1.6	1.7	7.2	2.1	0.0	0.0	0.1	0.0	0.0	13.5
	Wellington	0.0	1.0	0.1	0.0	0.0	0.1	0.0	1.1	8.8	0.0	0.0	0.1	0.0	0.0	11.2
	TNM	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	8.2	0.1	0.5	0.0	0.0	9.3
	West Coast	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.7	0.0	0.0	3.1
	Canterbury	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.9	0.7	39.2	1.1	0.4	43.6
	Otago	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	7.7	1.3	9.9
	Southland	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.9	9.7	12.1
	Total	13.5	73.5	32.0	30.6	4.9	10.7	8.5	11.5	13.1	9.9	2.2	44.9	11.5	11.9	278.7

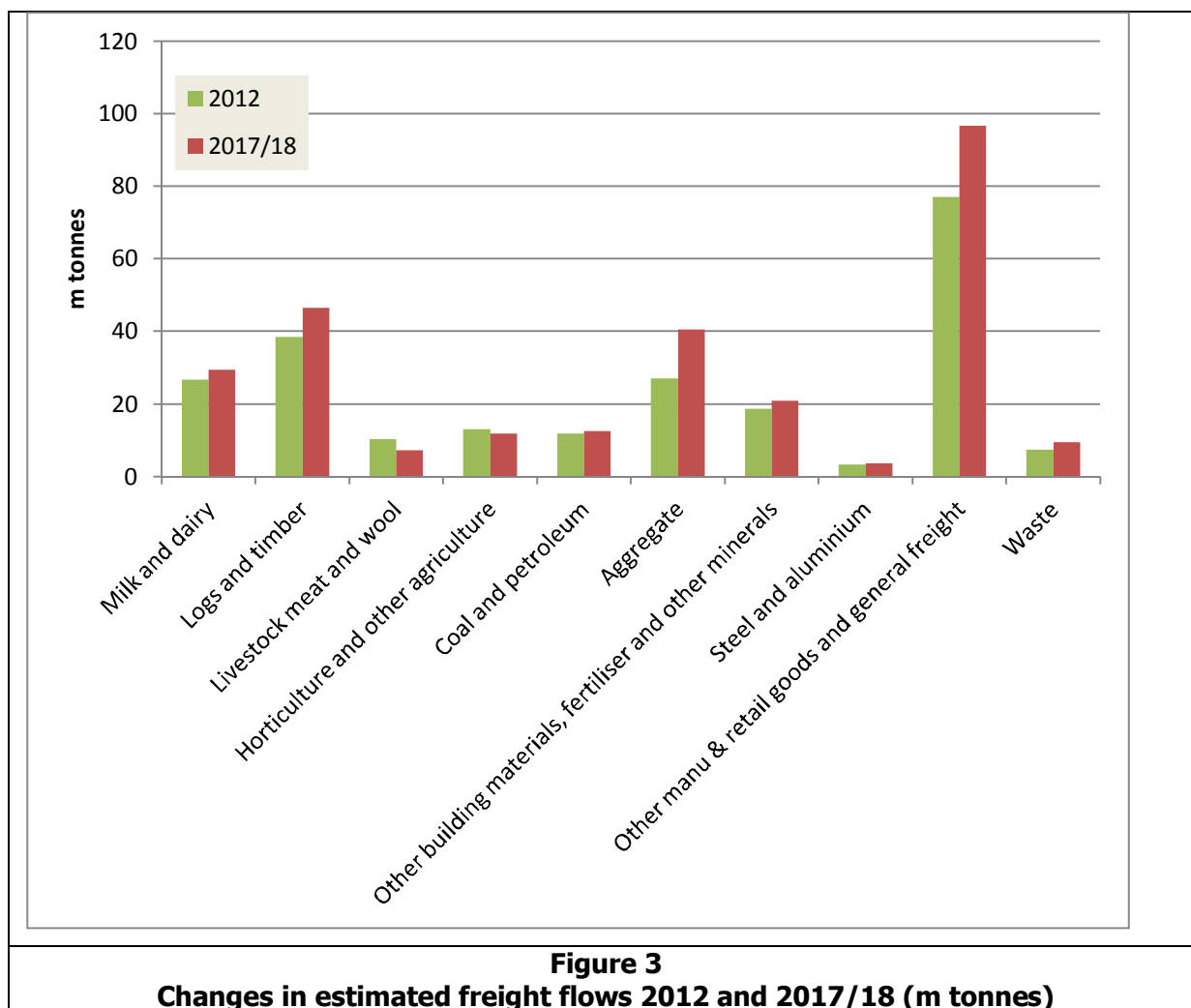
NATIONAL FREIGHT DEMAND STUDY 2017/18

EXECUTIVE SUMMARY

Changes from 2012

The changes in the estimates compared with 2012 are set out in Table 5 and summarised in Figure 3.

Table 5			
Changes in estimated freight flows 2012-2017/18 (m tonnes)			
Commodity	2017/18	2012	Growth 2012-2017/18
Liquid milk	22.8	21.1	8%
Manufactured dairy	6.6	5.7	17%
Logs	36.5	29.3	25%
Timber products	10.0	9.2	8%
Waste	9.4	7.4	28%
Wool	0.3	0.3	-21%
Fish	0.4	1.1	-62%
Livestock	5.6	8.5	-34%
Meat and meat by-products	1.3	1.4	-6%
Horticulture	5.9	5.4	9%
Other agriculture	5.5	6.5	-16%
Coal	3.5	3.7	-7%
Petroleum	9.1	8.2	12%
Limestone, cement, fertiliser	10.2	11.0	-17%
Concrete	9.8	7.0	41%
Aggregate	40.5	27.0	50%
Steel and aluminium	3.6	3.3	8%
Other minerals	1.0	0.7	48%
Manufacturing, retailing and general freight	96.7	77.0	26%
Total	278.7	236.2	18%



Substantial growth in the estimated totals has been recorded for logs, aggregate and manufactured and retail goods. For logs this represents the growth in the volumes harvested but for aggregates and manufactured goods the difference between 2012 and 2017/18 represents a combination of changes in production and improved methods of estimating the totals, in part using sources of data that were not available for earlier studies. In the case of manufacturing and retail goods this also reflects changes in the methods of distribution with more complex supply chains.

For commodity groups where there have been decreases, these in general reflect underlying declines in the volumes produced. However for livestock the reductions in the totals estimated reflect a better understanding of the output from NAIT, which in 2012 was in an early stage of development.

In general with the exception of logs, the volumes of agricultural products have not increased substantially between 2012 and 2017/18 reflecting the slowing down of the growth of milk production and the continued decline of meat production in volume terms. The growth in the volumes of concrete and aggregates reflect the expansion of the construction industry with growth in investment in infrastructure and commercial and residential buildings. The growth in manufactured and retail goods reflects the continuing growth of these sectors in part evidenced by the high rate of growth of imports which form an essential component of this.

Forecast growth

Growth over the future has been forecast for a limited number of supply driven commodities where output is restricted by limitations on production or supply rather than constraints on the demand for these products. These reflect agricultural products where typically New Zealand is a supplier to large international markets or to the inputs related to these.

In general output in tonnage terms appears to have reached a plateau for a number of agricultural products especially milk and dairy products and meat and meat products and in general for these products we have forecast either generally stable volumes over the future.

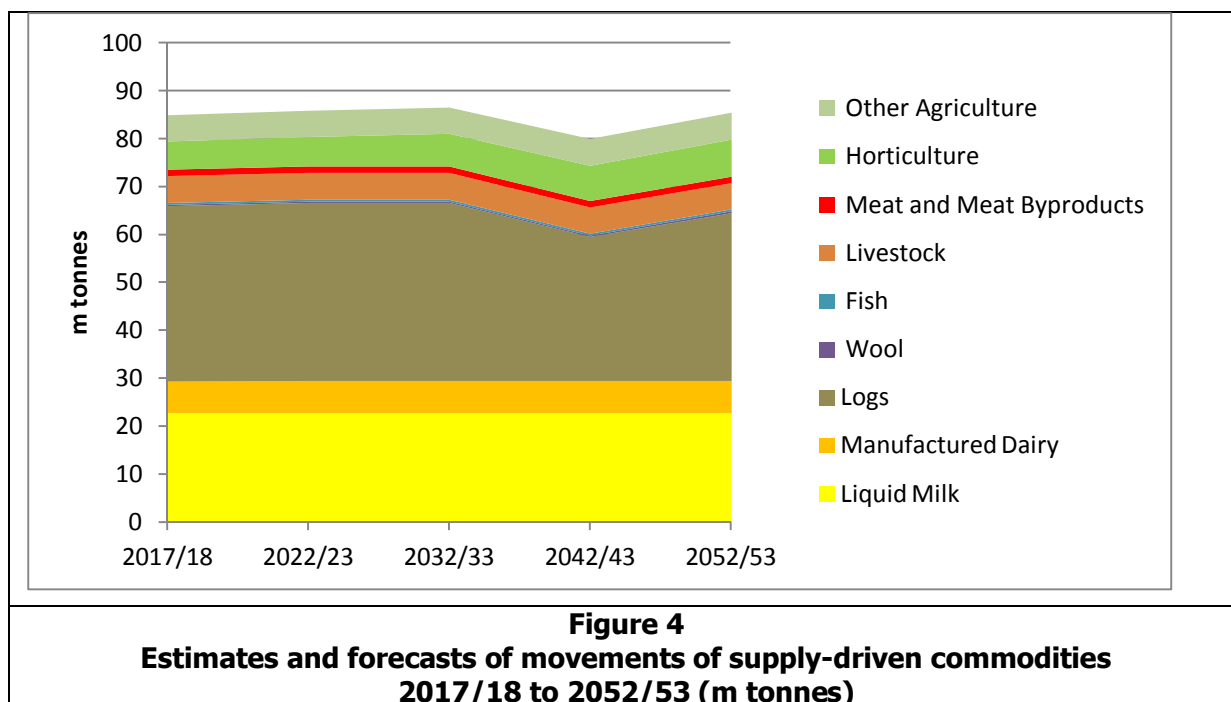
The main exceptions to these are forestry and horticulture. For forestry, production is forecast to fluctuate over time in part reflecting in part the volumes of trees available to be harvested and in part constraints on the infrastructure for their harvesting, right through the supply chain from felling the trees through their handling within New Zealand to their export. While we have forecast the longer term position at mainly 10 year intervals it is recognised that fluctuations in price and demand on foreign markets may lead to more substantial year to year variations.

For horticulture, while there has been a concentration in increasing the value of the crops produced, we have forecast growth in volume terms over the future, reflecting both strong increases in export demand and more modest increases in demands from the New Zealand domestic market.

The outcomes for the commodities for which we have undertaken forecasts is summarised in Table 6 and set out in more detail in Table 7 and Figure 4

Table 6 Summary of future forecasts	
Commodity	Forecast
Milk	Generally stable over future but with limited growth to 2022/23
Dairy products	Generally stable over future but with limited growth to 2022/23
Logs	Stable over immediate future but declines and subsequent growth over the period to 2052/2
Wool	No growth forecast
Fish	No growth forecast
Livestock.	No growth forecast
Meat and meat y-products	No growth forecast
Horticulture	Growth over period to 2052/53
Other agriculture	No growth forecast

Table 7 Estimates and forecasts of flows of supply-driven commodities (m tonnes)					
Commodity	2017/18	2022/23	2032/33	2042/43	2052/53
Liquid Milk	22.8	22.9	22.9	22.9	22.9
Manufactured Dairy	6.6	6.7	6.7	6.7	6.7
Logs	36.5	37.0	37.0	29.9	35.0
Wool	0.3	0.3	0.3	0.3	0.3
Fish	0.4	0.4	0.4	0.4	0.4
Livestock	5.6	5.6	5.6	5.6	5.6
Meat and Meat Byproducts	1.3	1.3	1.3	1.3	1.3
Horticulture	5.9	6.2	6.8	7.3	7.7
Other Agriculture	5.5	5.5	5.5	5.5	5.5
Total supply driven commodities	84.9	85.8	86.5	79.9	85.4



Overall assessment

The key findings from the 2017/18 National Freight Demand Study include:-

- The volume of freight being moved in New Zealand in 2017/18 is estimated to amount to about 280m tonnes
- This represents an increase of about 18 per cent compared to the position in 2012
- This is dominated by the movements of agricultural and other bulk commodities which account for about two-thirds of the total tonnages moved
- Road transport is the major mode carrying about 93 per cent of the total tonnes carried and 75 per cent of the tonne-kms.
- Forecasts have been made for the limited number of supply-driven agricultural commodities, including logs and milk and dairy products. These suggest that the volumes of these products will remain broadly constant over the future with some increases in horticultural products and fluctuations in the volumes of logs reflecting different planting regimes in the past.

1 Introduction

The National Freight Demand Study (NFDS) forms an important role in understanding current and future freight patterns in New Zealand and as such it is used to support planning for the movement of freight by a number of agencies in the country. However the last version was based on data for 2012 and as result the basis is becoming increasingly outdated. In addition possible new sources of information have become available which may assist in the understanding of freight patterns, particularly for road transport. As a result in May 2019, the Ministry of Transport commissioned an update to the earlier work to take account of the changes that have taken place since the previous report was commissioned and if possible to take advantage of the additional sources of information that are becoming available. A team comprising of Richard Paling and Murray King assisted by EROAD Limited was subsequently commissioned to undertake the update.

It is intended that the detailed outputs from the study will form one of the inputs to the Ministry's Freight Model and they have therefore been configured to meet the requirements for this. In particular this has required some aggregation of the commodity groups for which estimates and forecasts have been made reducing these from 29 to 19. In addition the form of the model requires the separation of import and export flows and the explicit identification of the domestic freight movement patterns which are associated with these. The details are set out in the spreadsheet which has been provided to the Ministry of Transport in association with this report.

2 Scope of the work

The work required and the outputs to be produced fall into three main areas:-

- The definition of the base year inter-regional freight patterns for each of the commodity groups defined
- The assessment of the modal split for these for the base year, taking into account movements by road, rail and coastal shipping. Although some domestic freight traffic is carried by air or by pipeline, these movements were outside the scope of the study. Movements by air are small and information on the patterns and scale of these is generally regarded as confidential. The movements of product by pipeline between the refinery at Marsden Point and the terminal at Wiri and ironsand to the Glenbrook steel mill, do not really impinge on the land transport and so following the approach taken in the earlier NFDS work, these have also been excluded from the analysis.
- Forecasts out to 2052 for a limited number of supply driven commodities.

The work requires estimates of current year flows to be undertaken for 19 commodities. The commodities for which base year (2017/18) estimates were required comprised:-

- Liquid Milk
- Manufactured Dairy
- Logs
- Processed Timber
- Meat and Meat By-Products
- Livestock
- Horticulture
- Wool
- Other Agriculture
- Fish
- Coal

- Petroleum
- Aggregate
- Limestone-Cement- Fertiliser
- Concrete
- Steel and Aluminium
- Manufactured Goods-Retail Goods-NES
- Waste
- Other Minerals

Because of the way in which the Freight Model works, separate forecasts are only required for the supply driven commodities. These are where the flows are typically based on production capacity and constraints and where goods are sold on world markets for which New Zealand production only represents a small proportion of the total demand. These comprise:-

- Liquid Milk
- Manufactured Dairy
- Logs
- Meat and Meat By-Products
- Livestock
- Horticulture
- Wool
- Other Agriculture
- Fish

For the other commodities, the levels of consumption and associated freight flows are based primarily on the domestic demands for these and the availability of these commodities is assumed not to be constrained by production capacity.

3 General growth patterns between 2012 and 2017/18

3.1 Introduction

While the growth of the freight movements associated with each of the commodities identified in Section 2 is set out later in this report, a number of measures are available to provide an indication of the overall growth of freight movements between 2012, the base year for the previous NFDS estimates and the current analysis period of 2017/18. These include:-

- Estimated total movements by mode
- International traffic through NZ ports

3.2 Total movements by mode

The total estimated movements by mode in 2012 and 2017/18 are set out in Table 3.1.

Table 3.1				
Total changes in freight movements by mode 2012-2017/18 (bn tonne-kms)				
Mode	2017/18	2012	Growth	Source
Rail	3.47	4.19	-17 % (1)	KiwiRail
Coastal shipping	4.04	3.61	12%%	Consultants estimates
Road transport	25.11	21.71	16%	MoT
Total	32.62	29.51	10.5%	

Notes (1) The decline in rail reflects the impact of the Kaikoura earthquake and the reduction in coal traffic in 2017/18. Since this date the volumes carried by rail have recovered and in calendar year 2018 reached almost 3.9bn tonne-kms

These figures are not entirely consistent since the road totals include in some instances the weights of the containers in which the goods are carried and would also include the movement of staff and equipment. However on the assumption that the effect of these is similar in both years, the published total freight movements in tonne-km terms are estimated to have grown by about 10-11 per cent over the period between the two NFDS analyses. Road transport has grown particularly strongly offset in part by the decline in rail.

3.3 Imports and exports

An important driver of domestic freight movements is international trade. Changes in imports and exports over the period from 2012 to 2017/18 are set out in Table 3.2.

Table 3.2			
Changes in international cargo movements (m tonnes)			
	2012	2017/18	Growth 2012-2017/18
Exports			
Wood products	18.10	24.77	36.8%
Confidential products (probably mainly coal and petroleum)	3.55	6.04	70.3%
Other products	9.59	11.41	18.9%
Total	31.24	42.22	35.1%
Imports			
Total	19.14	24.29	26.9%
Total foreign cargo movements			
Total	50.39	66.51	32.0%

Source: Based on data supplied by Statistics NZ

In contrast to domestic freight movements, International trade has grown strongly over the period increasing by just over 30 per cent, with exports growing more rapidly than imports. An important part of this has been the growth of wood and wood products driven especially by the growth in export logs.

There has also been growth in the numbers of international containers handled at New Zealand ports and this is set out in Figure 3.1

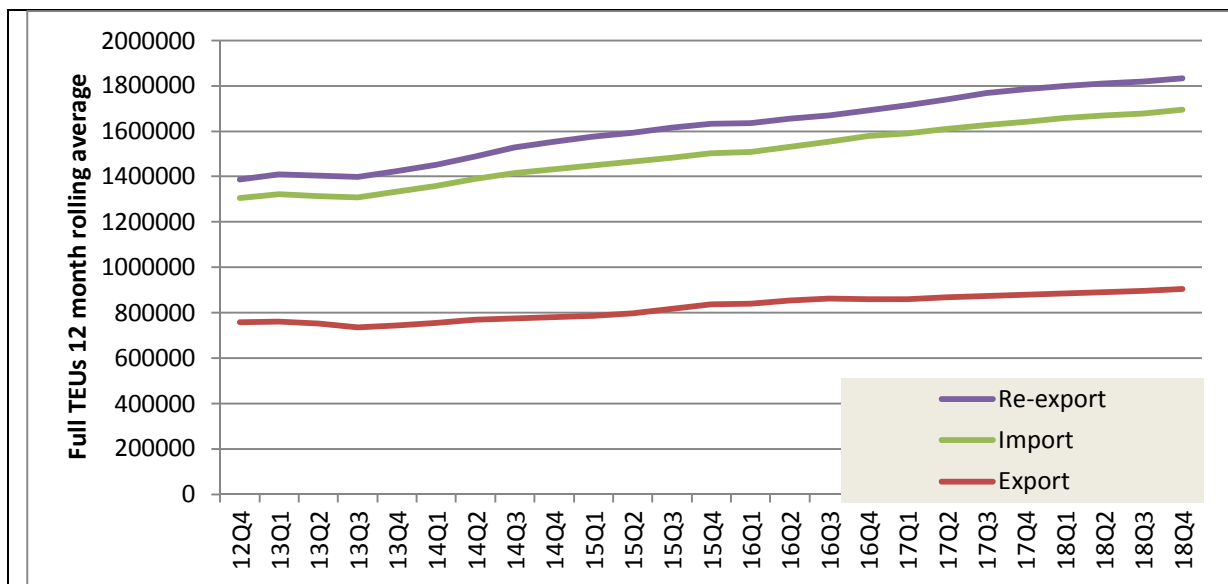


Figure 3.1
Growth in international container traffic through NZ ports 2012-2018

Source : Freight Information Gathering System, Ministry of Transport.

Over the period from the end of 2012 to 2018 Q2 the number of full TEUs² handled through NZ ports has increased by about 30 per cent with exports growing by about 18 per cent and imports growing rather faster by 42 per cent. This indicates a growing penetration of the import market by containers but a reduced share for exports, reflecting the growth of exports of primary products, especially logs.

3.4 Overall assessment

Over the period from the last NFDS covering the position in 2012, growth in international trade both in total and in terms of container movements has been very substantial with both growing by about 30 per cent. In part this has reflected the growth of primary products such as logs and in part the growth of containerised traffic particularly for imports.

The movement of freight within New Zealand has however grown more slowly increasing by about 10-11 per cent over the period, somewhat below the growth in GDP, estimated at about 19 per cent. This probably reflects the increasing value for tonne of the goods transported and also the shift in activity away from primary production and manufacturing to service based activities for which the freight requirements are relatively low.

This then sets the background against which the positions for the individual commodities have been assessed.

² Twenty-foot equivalent unit.

4 Commodity estimates for 2017/18

4.1 Introduction

In general the approach to calculating the total patterns of movement for each commodity comprises:-

- Identification of the production or import of the commodity in each region. This information may be available directly or if this is not available it may need to be estimated, taking into account the way in which estimates for larger areas might be disaggregated.
- Identification of the region in which the product is consumed or is exported. Again this may either be available directly or be estimated taking into account likely consumption patterns
- Identification of the movement patterns which link the sources of the commodity and the areas in which it is consumed. Various approaches are used for this.

The analysis brings together a number of sources of published and unpublished data supported by discussions with a number of the key players in the sector.

4.2 Milk

4.2.1 Current production

Liquid milk production in New Zealand in 2017/18 amounted to just over 20.7 bn litres (21.3 m tonnes) and this represents a major contribution to the freight task.

The distribution of production by region is set out in Table 4.1

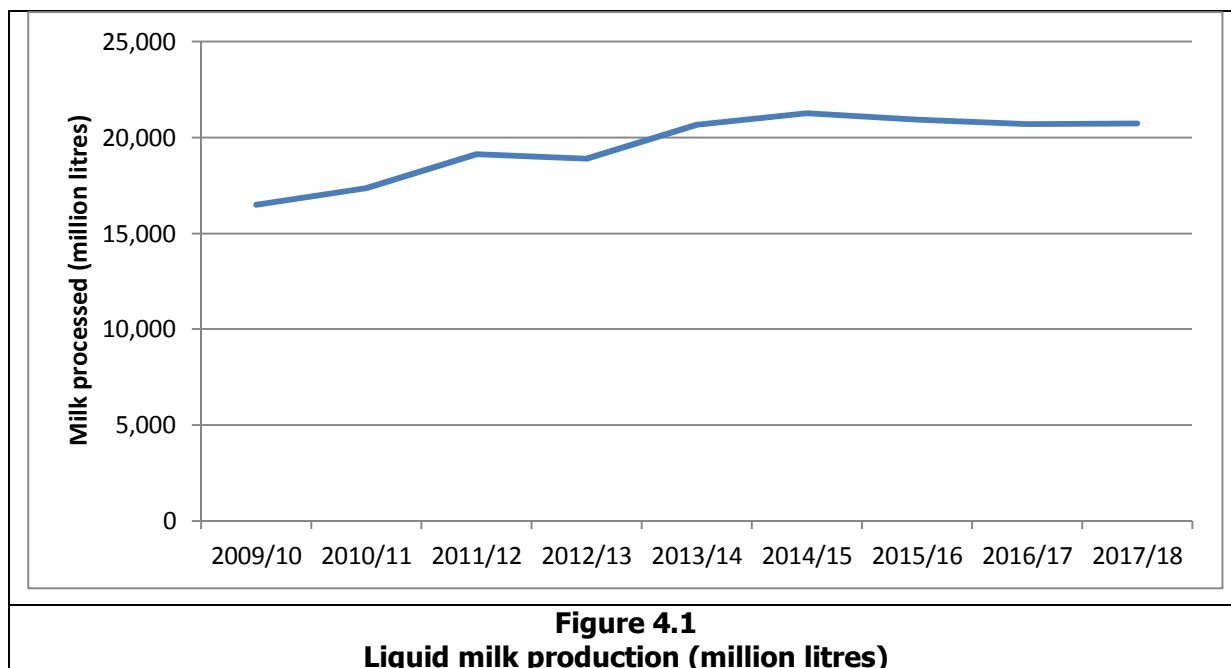
Table 4.1 Milk production by region 2017/18		
Region	Total milk production (bn litres)	Per cent of total
Northland	1.00	4.8%
Auckland	0.41	2.0%
Waikato	5.28	25.5%
Bay of Plenty	1.36	6.6%
Gisborne	0.02	0.1%
Hawke's Bay	0.19	0.9%
Taranaki	1.83	8.8%
Manawatu-Wanganui	1.29	6.2%
Wellington	0.28	1.3%
<i>Total North Island</i>	11.65	56.2%
TNM	0.28	1.4%
West Coast	0.54	2.6%
Canterbury	4.43	21.4%
Otago	1.18	5.7%
Southland	2.65	12.8%
<i>Total South Island</i>	9.08	43.8%
Total	20.72	100.0%

Note : TMN = Tasman/Marlborough/Nelson

The major milk producing regions are Waikato with 26 per cent of the total and Canterbury with 21 per cent. Overall the North Island accounts for just over half the total production with the South Island accounting for about 44 per cent.

4.2.2 Recent changes in production

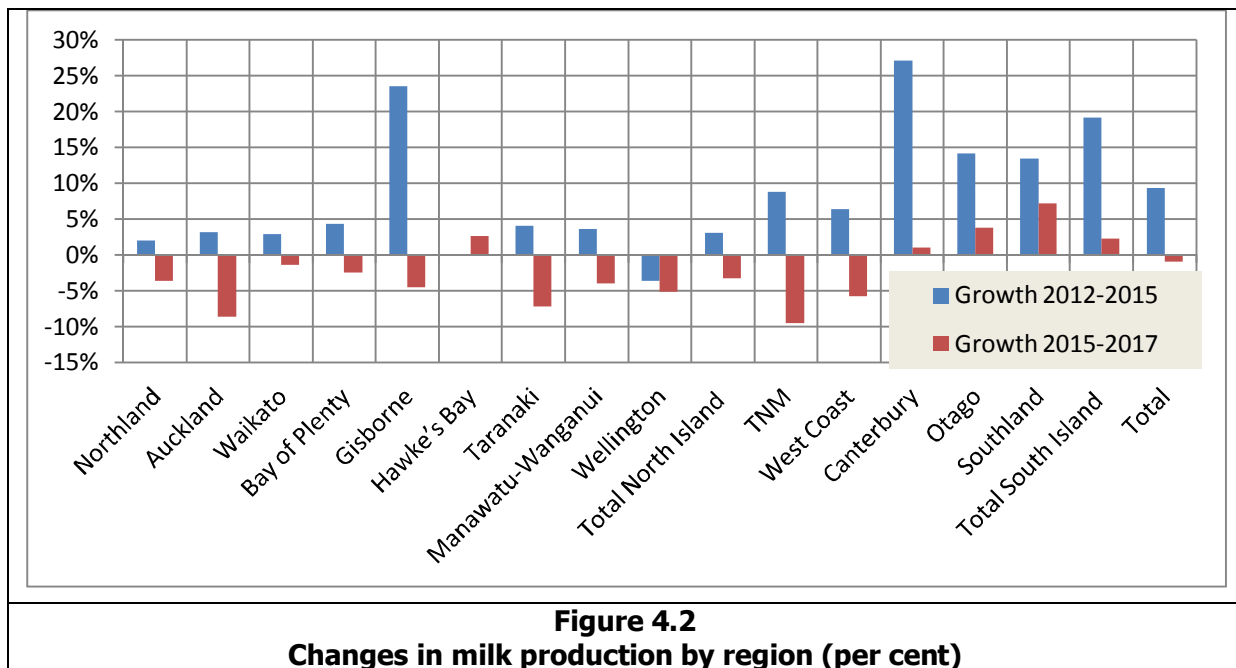
The level of milk produced in New Zealand over recent years is set out in Figure 4.1.



While there has been some growth from 2012, this has largely been in the years immediately following, and since 2013/14 the volumes produced have remained broadly constant. There has been some change in the patterns of production with a decline in the North Island largely offset by growth albeit slowing in the South Island. This is set out in Table 4.2 and Figure 4.2.

NATIONAL FREIGHT DEMAND STUDY 2017/18
MAIN REPORT

Table 4.2					
Milk production by region over recent years					
Region	Milk production (m litres)			Growth (per cent)	
	2011/12	2015/16	2017/18	2011/12-2015/16	2015/16-2017/18
Northland	1,014	1,034	997	2%	-4%
Auckland	430	444	406	3%	-9%
Waikato	5,203	5,353	5,275	3%	-1%
Bay of Plenty	1,339	1,396	1,362	4%	-3%
Gisborne	16	19	19	24%	-5%
Hawke's Bay	189	189	194	0%	3%
Taranaki	1,890	1,968	1,826	4%	-7%
Manawatu-Wanganui	1,299	1,346	1,292	4%	-4%
Wellington	301	290	275	-4%	-5%
<i>Total North Island</i>	<i>11,681</i>	<i>12,040</i>	<i>11,646</i>	<i>3%</i>	<i>-3%</i>
TNM	287	312	283	9%	-10%
West Coast	539	574	540	6%	-6%
Canterbury	3,446	4,381	4,427	27%	1%
Otago	995	1,135	1,178	14%	4%
Southland	2,181	2,473	2,651	13%	7%
<i>Total South Island</i>	<i>7,448</i>	<i>8,874</i>	<i>9,078</i>	<i>19%</i>	<i>2%</i>
Total	19,129	20,914	20,724	9.3%	-0.9%



Milk is a low value product and typically travels to a nearby dairy factory for processing. There are however some movements of liquid milk between processing plants to make the best use of the capacity available, particularly at the ends of the season when flows are reduced.

4.2.3 Estimated movement patterns

The estimated patterns of movement of liquid milk in 2017/18 are set out in Table 4.3.

Table 4.3
Total movements of liquid milk 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	1.03	0.07	0.03	-	-	-	-	-	-	-	-	-	-	-	1.12
	Auckland	0.14	0.07	0.21	-	-	-	-	-	-	-	-	-	-	-	0.42
	Waikato	-	0.03	5.88	-	-	-	0.03	-	-	-	-	-	-	-	5.94
	Bay of Plenty	-	-	0.20	1.25	-	-	-	-	-	-	-	-	-	-	1.45
	Gisborne	-	-	-	-	-	-	-	0.02	-	-	-	-	-	-	0.02
	Hawke's Bay	-	-	-	-	-	-	-	0.20	-	-	-	-	-	-	0.20
	Taranaki	-	-	-	-	-	-	2.19	0.05	-	-	-	-	-	-	2.24
	Manawatu-Wanganui	-	-	-	-	-	-	1.23	0.27	-	-	-	-	-	-	1.50
	Wellington	-	-	-	-	-	-	-	0.28	-	-	-	-	-	-	0.28
	TNM	-	-	-	-	-	-	-	-	-	0.16	-	0.14	-	-	0.29
	West Coast	-	-	-	-	-	-	-	-	-	-	0.56	-	-	-	0.56
	Canterbury	-	-	-	-	-	-	0.00	-	-	-	0.13	4.66	-	0.00	4.79
	Otago	-	-	-	-	-	-	-	-	-	-	-	-	0.33	0.28	0.61
	Southland	-	-	-	-	-	-	-	-	-	-	-	-	0.63	2.74	3.37
	Total	1.17	0.17	6.32	1.25	-	-	3.45	0.83	-	0.16	0.69	4.79	0.96	3.02	22.80

4.3 Manufactured dairy products

4.3.1 Introduction

As was noted in the earlier NFDSs, manufactured dairy products represent one of New Zealand major exports accounting for 25 per cent of the value of total merchandise exports. The volumes moved are also substantial at about 5-6 million tonnes although in line with the stabilisation of liquid milk production these have only grown slowly over the period since 2012.

4.3.2 International trade in dairy products

Exports of New Zealand dairy products are set out in Table 4.4. It should be noted that these figures represent the locations where the goods are loaded onto vessels for export and not the final port from which they sail overseas. The Customs data which is based on the final port of clearance has therefore been adjusted.

Table 4.4 Exports of dairy products 2017/18 (m tonnes)		
Port	Total tonnage (adjusted for coastal movements)	Per cent of total
Auckland Airport	0.00	0.1%
Auckland Seaport	0.05	1.5%
Christchurch Airport	0.00	0.0%
Christchurch Seaport (Lyttelton)	0.46	14.8%
Dunedin Seaport	0.45	14.5%
Invercargill Seaport (Bluff)	0.07	2.4%
Napier	0.01	0.3%
Nelson	0.03	0.9%
New Plymouth	0.00	0.0%
Tauranga Seaport	1.58	51.4%
Timaru	0.36	11.8%
Wellington Seaport	0.07	2.2%
Whangarei	0.00	0.0%
Total	3.05	100.0%

Source: Based on data supplied by Statistics NZ

On the North Island, almost all the exports go through Tauranga, which accounts for more than 50 per cent of the national total. On the South Island exports are split more widely across a number of ports, particularly Lyttelton and Dunedin which have similar shares of 15 per cent of the national total.

4.3.3 Changes in export patterns

The total volumes exported have only increased slightly since 2012, but this conceals some significant changes in the volumes for individual ports. This is set out in Table 4.5 and Figure 4.3.

Port	Exports in 2012	Exports in 2017/18	Change to 2017/18 (m tonnes)
Auckland Airport	0.01	0.00	0.00
Auckland Seaport	0.10	0.05	-0.05
Christchurch Airport	0.00	0.00	0.00
Christchurch Seaport (Lyttelton)	0.60	0.46	-0.14
Dunedin Seaport	0.40	0.45	0.05
Invercargill Seaport (Bluff)	0.04	0.07	0.04
Napier	0.18	0.01	-0.17
Nelson	0.01	0.03	0.02
New Plymouth	0.01	0.00	-0.01
Tauranga Seaport	1.32	1.58	0.26
Timaru	0.06	0.36	0.31
Wellington Seaport	0.04	0.07	0.03
Whangarei	0.01	0.00	-0.01
Total	2.77	3.07	0.30

Source: Based on data supplied by Statistics NZ

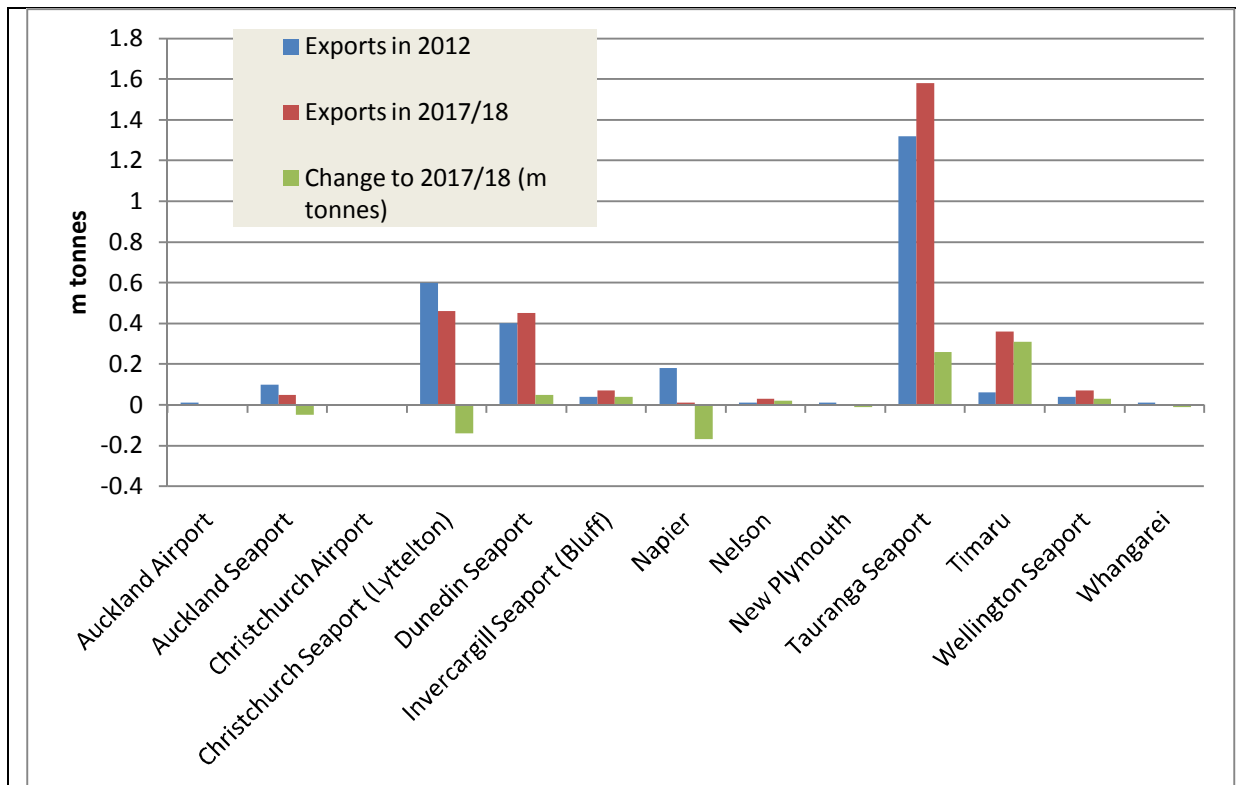


Figure 4.3
Changes in exports of dairy products by port 2012-2017/18 (m tonnes)

The most notable changes over the period have been the declines in dairy traffic through Auckland, Napier and Lyttelton. In the North Island, this traffic has mainly transferred to Tauranga. In the South Island the reductions in Lyttelton have been balanced by increases at a number of ports including Timaru, and to a lesser extent Dunedin and Invercargill. To a large extent these changes reflect changes in the shipping patterns of Maersk and Fonterra with an increased focus on Tauranga and the Tauranga owned port of Timaru.

4.3.4 Overall movement patterns

The overall patterns of movement of dairy products reflecting the changes in the patterns of milk production, intermediate storage between the processing plant and the port and changing export routes are set out in Table 4.6.

Table 4.6
Total movements of manufactured dairy products 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	0.04	0.14	0.00	0.03	-	-	0.00	0.00	-	-	-	0.00	-	-	0.22
	Auckland	0.00	0.27	0.02	0.03	-	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	-	0.33
	Waikato	0.00	0.10	0.47	1.17	-	0.00	0.03	0.00	0.00	0.00	-	0.01	0.00	0.00	1.78
	Bay of Plenty	0.00	0.03	0.02	0.12	-	0.00	0.01	0.00	0.00	-	-	0.00	0.00	-	0.19
	Gisborne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hawke's Bay	-	-	-	0.00	-	0.00	-	0.00	0.00	-	-	-	-	-	0.01
	Taranaki	0.00	0.08	0.10	0.21	-	0.13	0.10	0.08	0.02	0.00	-	0.00	0.00	0.00	0.73
	Manawatu-Wanganui	-	0.07	0.00	0.06	-	0.04	0.02	0.01	0.06	-	-	0.00	0.00	-	0.27
	Wellington	-	-	-	0.00	-	-	-	0.00	0.00	-	-	-	-	-	0.00
	TNM	-	0.00	-	-	-	-	-	-	-	0.03	-	-	-	-	0.03
	West Coast	-	-	-	-	-	-	-	-	-	-	-	0.08	-	-	0.08
	Canterbury	-	0.01	0.01	0.00	-	0.00	0.00	0.00	-	0.00	0.01	1.89	0.02	0.01	1.97
	Otago	-	0.00	0.00	-	-	-	0.00	0.00	-	-	-	0.01	0.27	0.02	0.30
	Southland	-	0.00	0.00	-	-	-	0.00	0.00	-	-	-	0.01	0.62	0.10	0.74
	Total	0.05	0.70	0.62	1.63	-	0.18	0.17	0.10	0.08	0.04	0.01	2.01	0.91	0.14	6.64

4.4 Logs

4.4.1 Introduction

The movement of logs forms an important component of the movement of freight within New Zealand and is also a significant contributor to exports especially in volume terms. Logs are produced in all regions in New Zealand and are exported in significant quantities through almost all New Zealand seaports, the exception being Auckland.

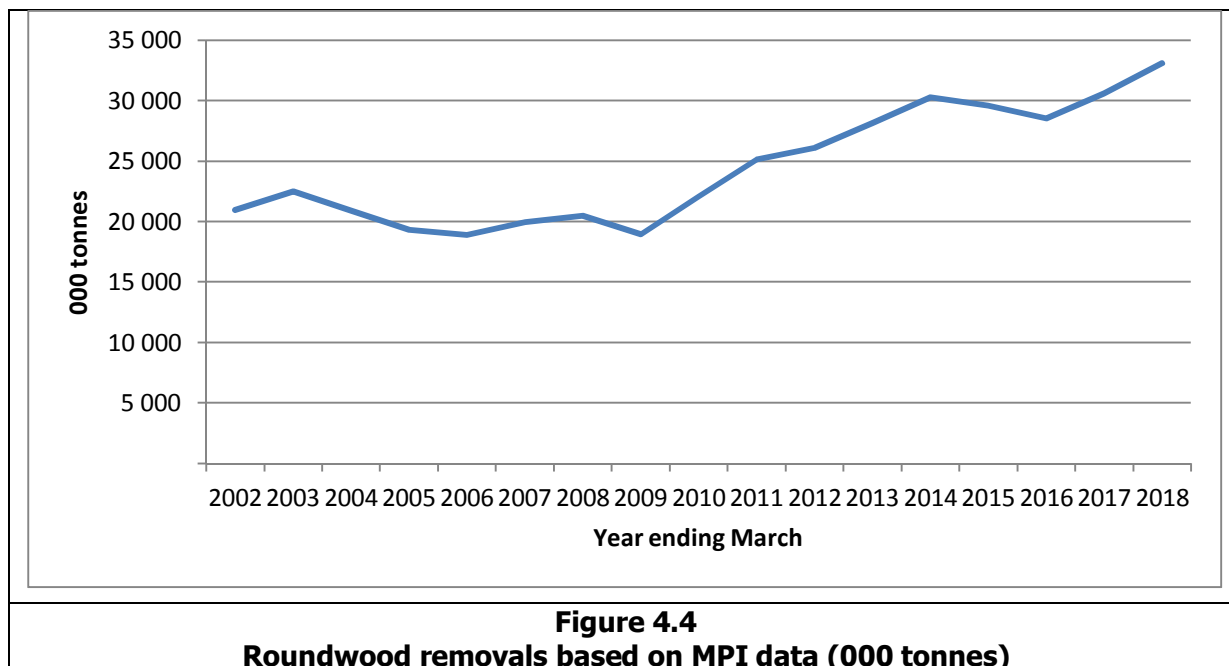
There are three main sources of information on the volumes of logs harvested:

- Estimates of roundwood removals and use produced by Ministry of Primary Industries (MPI) and the NZ Forest Owners Association
- the Agricultural Production Survey produced by Statistics New Zealand
- Further information on the volumes of logs exported by port is available from Customs data.

These three sources of information are not entirely consistent but have been combined in developing the overall patterns for the movements of logs

4.4.2 Recent changes in the movement of logs

The volume of logs harvested has grown substantially since 2012, and the growth is set out in Figure 4.4.



Source MPI

Since 2012 the volume of logs has increased from 26m tonnes to 33 m tonnes, an increase of 27 per cent.

The logs harvested can either be exported in an unprocessed form or used to make a range of processed products including sawn timber, panels and manufactured timber products or as pulp and paper. The split between the volume of logs exported directly and those used for domestic processing is set out in Figure 4.5

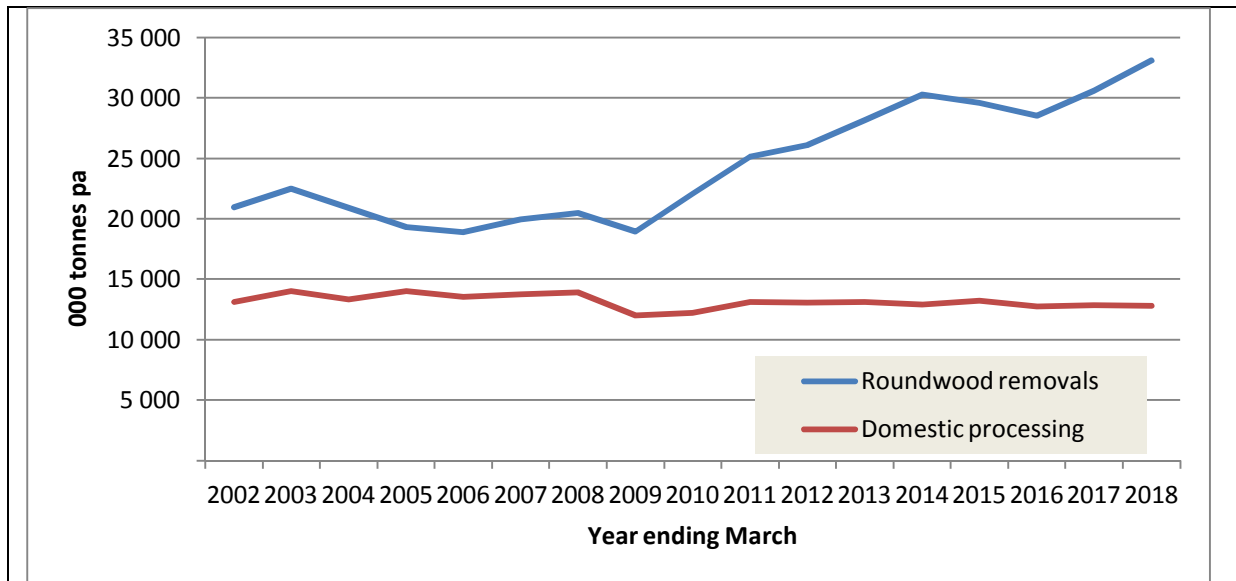


Figure 4.5
Estimates of total log harvests and their use for domestic processing

Since 2012 almost all of the growth in the logs harvested has been for logs for export and the volumes used for processing have remained broadly constant.

4.4.3 Distribution of logs harvested by region

Information is available from MPI on the estimated volumes of logs harvested but this is by Wood Supply Areas. These stretch across regional boundaries and so to estimate the volumes at a regional level these have been disaggregated where appropriate using the regional totals derived from the Agricultural Production Surveys conducted by Statistics NZ. The estimated harvest by region which results is set out in Table 4.7.

Region	Total logs harvested	Per cent of total
Northland	3.95	12%
Auckland	0.53	2%
Waikato	6.78	20%
Bay of Plenty	4.20	13%
Gisborne	3.09	9%
Hawke's Bay	2.86	9%
Taranaki	0.55	2%
Manawatu	2.14	6%
Wellington	1.03	3%
TNM	3.32	10%
West Coast	0.17	1%
Canterbury	1.58	5%
Otago	1.83	6%
Southland	1.06	3%
Total	33.10	100%

Source : Consultants estimates based on MPI and Statistics NZ data

The main log producing areas are Waikato, Bay of Plenty, Northland and TMN (Tasman/Marlborough/Nelson) accounting for almost half of the national production.

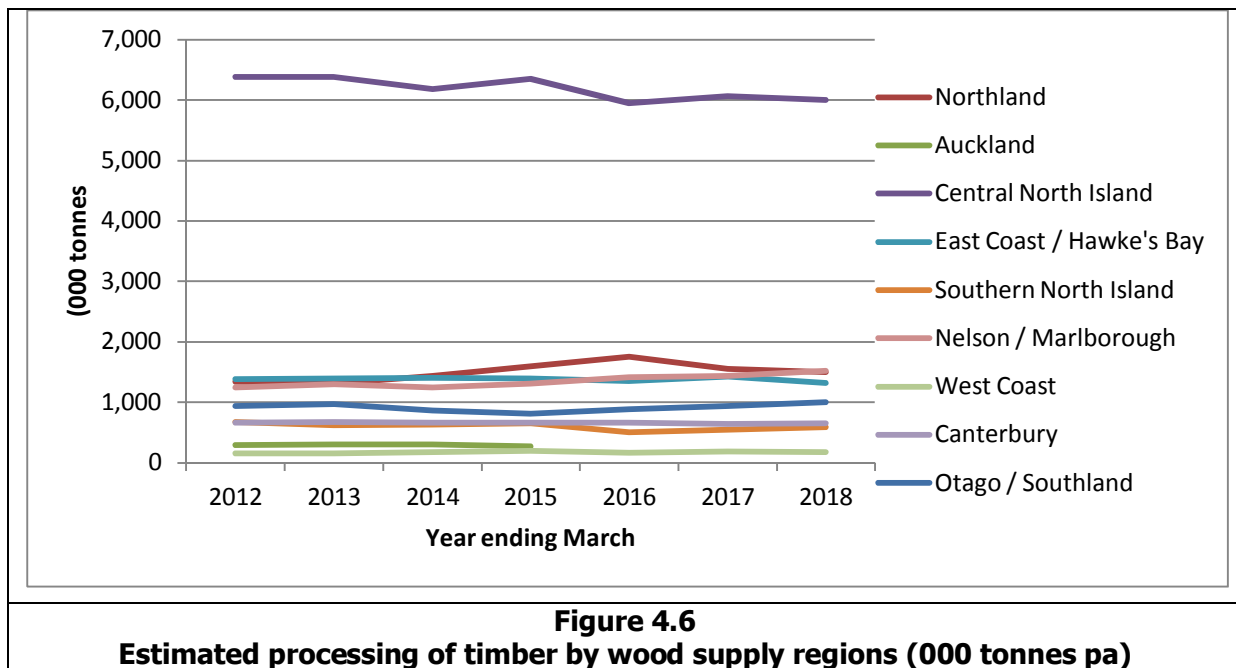
4.4.4 Use of logs for domestic production

The use of logs for domestic production has remained broadly constant between 2012 and 2017/18 as can be seen in Table 4.8.

Table 4.8			
Change in use of logs for domestic production 2012 to 2018 (000 cu m)			
Wood supply regions	Year ending March		
	2012	2018	Change 2012-2018 (per cent)
Northland	1 340	1 501	12%
Auckland	290	40	-86%
Central North Island	6 380	6 003	-6%
East Coast / Hawke's Bay	1 390	1 325	-5%
Southern North Island	680	594	-13%
Total North Island	10 080	9 463	-6%
Nelson / Marlborough	1 250	1 520	22%
West Coast	160	175	9%
Canterbury	660	652	-1%
Otago / Southland	940	1 004	7%
Total South Island	3 010	3 350	11%
Total New Zealand⁶	13 088	12 813	-2%

Source MPI

The pattern over the period is also set out in Figure 4.6 Figure 4.6.



This highlights the limited growth over the period affecting all the Wood Supply Regions. In part this reflects limited demand and in part the challenges faced with attempting to get resource consents for new development, which makes the establishment of new facilities very difficult.

4.4.5 Exports of logs

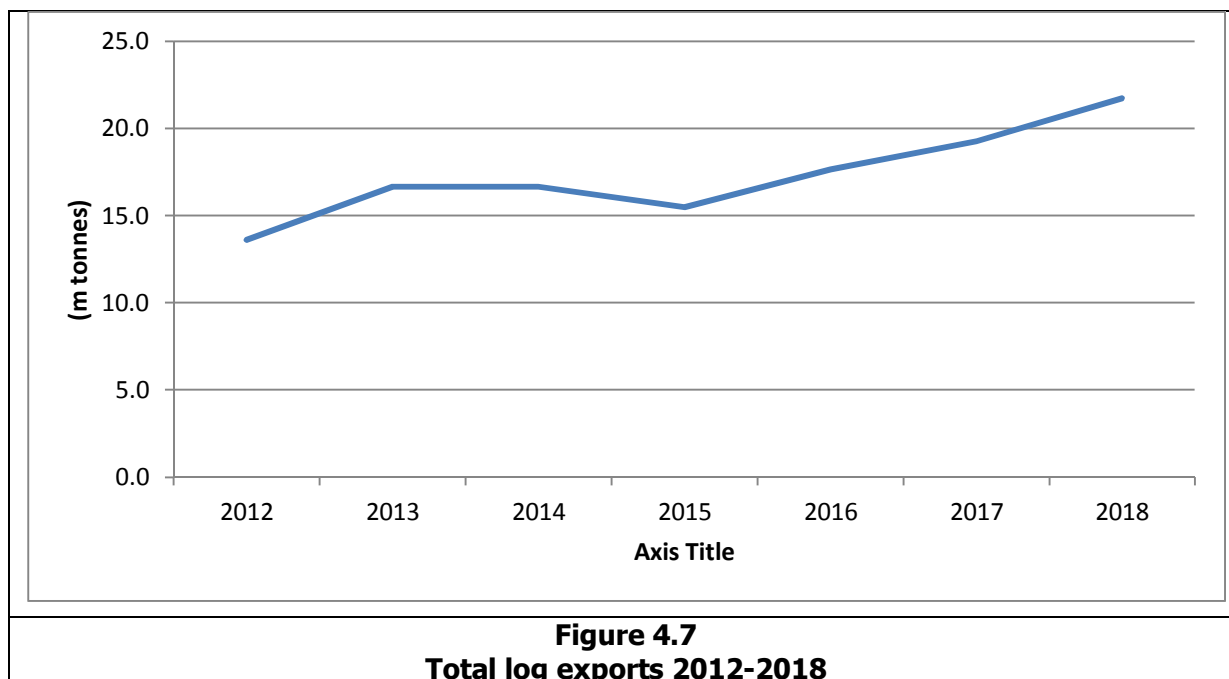
Information on the volumes of logs exported by seaport is available from Customs data supplied by Statistics NZ. The volumes for 2017/18 are set out in Table 4.9.

Table 4.9		
Volumes of logs exported by port 2017/18 (000 tonnes)		
Port	Volumes exported (000 tonnes)	Per cent of total
Auckland Seaport	40	0.2%
Christchurch Seaport (Lyttelton)	397	1.9%
Dunedin Seaport	1,048	5.1%
Gisborne	2,974	14.4%
Invercargill Seaport (Bluff)	641	3.1%
Napier	1,922	9.3%
Nelson	1,257	6.1%
New Plymouth	674	3.3%
Picton	672	3.3%
Tauranga Seaport	6,403	31.1%
Timaru	492	2.4%
Wellington Seaport	1,314	6.4%
Whangarei	2,761	13.4%
Total	20,594	100.0%

Source: Based on data supplied by Statistics NZ

While logs are exported through all New Zealand seaports, the main ports are Tauranga, Gisborne and Whangarei, which between them account for almost 60 per cent of the total.

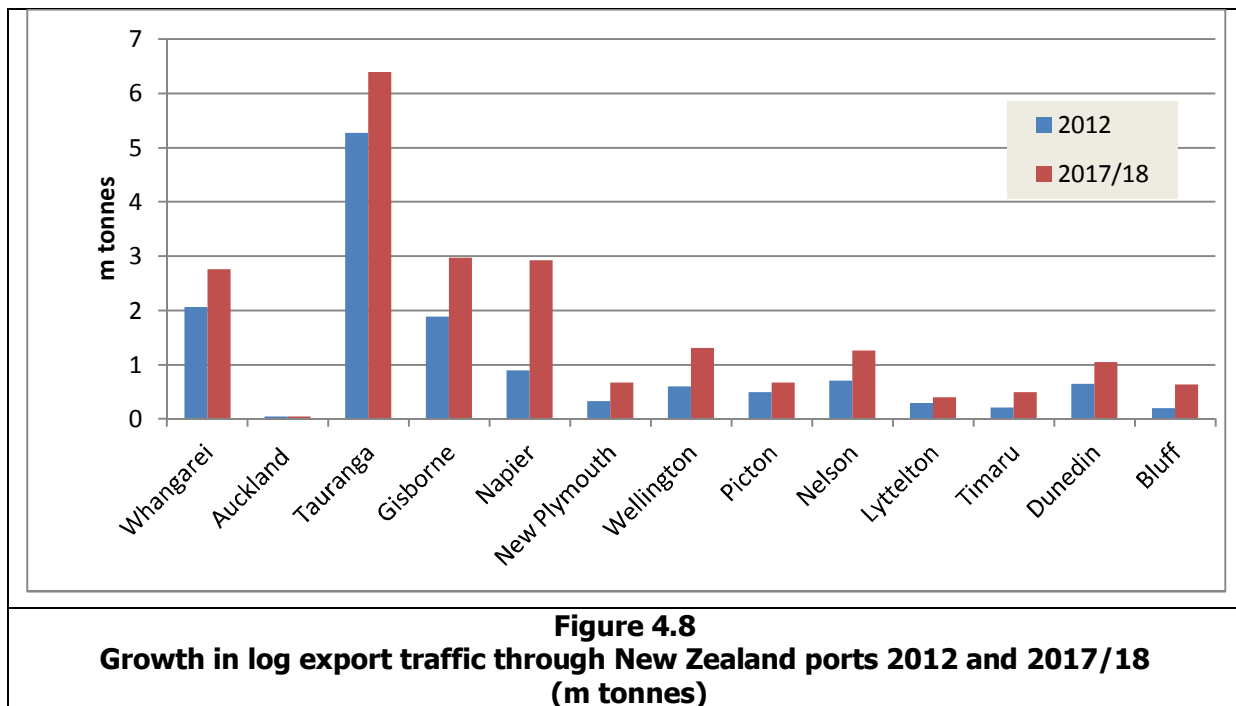
With the growth of the log harvest and little increase in the domestic consumption of the logs, export traffic has been growing strongly. The growth of total log exports is set out in Figure 4.7 and the growth for individual ports in Table 4.10 and Figure 4.8.



Source: Based on data supplied by Statistics NZ

Table 4.10 Growth of log export traffic by port 2012-2018 (m tonnes)			
Export port	2012	2018	Growth
Whangarei	2.06	2.76	34%
Auckland	0.04	0.04	3%
Tauranga	5.27	6.40	21%
Gisborne	1.88	2.97	58%
Napier	0.89	2.92	228%
New Plymouth	0.33	0.67	103%
Wellington	0.60	1.31	118%
Picton	0.49	0.67	37%
Nelson	0.70	1.26	80%
Lyttelton	0.29	0.40	38%
Timaru	0.21	0.49	133%
Dunedin	0.65	1.05	62%
Bluff	0.20	0.64	220%
Total	13.61	20.59	51%

Source: Based on data supplied by Statistics NZ



4.4.6 Movement patterns for logs

In general because of their low value, logs tend to travel to the nearest port or production point. Reflecting this, the estimated patterns of log movements for 2017/18 are set out in Table 4.11. These take into account the patterns of movement derived from the analysis of the movements by rail obtained from KiwiRail and the patterns of road movements derived from data provided by EROAD Limited as part of this study. The totals also reflect the double handling of logs which are transported in part by road and in part by rail and also the movement of intermediate goods such as sawdust and wood chip used in the making of manufactured timber products.

Table 4.11
Total movements of logs 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	4.17	-	-	0.14	-	-	-	-	-	-	-	-	-	-	4.31
	Auckland	-	0.12	0.04	0.41	-	-	-	-	-	-	-	0.00	-	-	0.58
	Waikato	-	-	3.84	4.10	-	-	-	-	-	-	-	0.00	-	-	7.94
	Bay of Plenty	-	-	0.04	5.72	-	-	-	-	-	-	-	-	-	-	5.76
	Gisborne	-	-	-	-	3.01	0.10	-	-	-	-	-	-	-	-	3.11
	Hawke's Bay	-	-	-	-	0.13	2.01	-	-	0.00	-	-	-	-	-	2.14
	Taranaki	-	-	0.03	-	-	-	0.54	-	-	-	-	-	-	-	0.56
	Manawatu-Wanganui	-	-	0.00	-	-	0.82	0.20	0.88	0.70	-	-	-	-	-	2.60
	Wellington	-	-	-	-	-	0.00	-	0.08	1.31	-	-	-	-	-	1.39
	TNM	-	-	-	-	-	-	-	-	-	3.49	-	-	-	-	3.49
	West Coast	-	-	-	-	-	-	-	-	-	-	0.15	0.08	-	0.00	0.23
	Canterbury	-	-	-	-	-	-	-	-	-	-	-	1.21	0.02	-	1.23
	Otago	-	-	-	-	-	-	-	-	-	-	-	-	1.34	0.67	2.01
	Southland	-	-	-	-	-	-	-	-	-	-	-	-	-	1.17	1.17
	Total	4.17	0.12	3.95	10.37	3.14	2.94	0.74	0.96	2.01	3.49	0.15	1.29	1.35	1.84	36.52

4.5 Manufactured timber products

4.5.1 Introduction

Manufactured timber products include:-

- Sawn timber
- Panels and veneered products
- Pulp and paper

These are used both for domestic consumption and are also exported overseas. In addition there are significant imports of these products, to supplement domestic production.

4.5.2 Domestic production of timber products

As discussed in the previous section, the domestic production of timber products has remained virtually constant since 2012 and the volumes by product are set out in Table 4.12.

Table 4.12									
Production of timber products (million tonnes)									
Year ending March	Sawn Timber	Veneer	Plywood	Laminated veneer lumber	Particle -board	Fibre-board	Pulp	Paper	Total
2012	3.89	0.71	0.16	0.20	0.16	0.72	0.98	0.86	7.68
2013	4.02	0.65	0.14	0.20	0.17	0.73	0.99	0.82	7.72
2014	3.94	0.65	0.14	0.21	0.15	0.70	1.04	0.73	7.56
2015	4.01	0.64	0.14	0.20	0.16	0.69	0.97	0.73	7.54
2016	4.14	0.63	0.14	0.20	0.23	0.73	0.81	0.74	7.62
2017	4.31	0.50	0.11	0.22	0.15	0.77	0.99	0.68	7.73
2018	4.46	0.48	0.12	0.27	0.16	0.78	1.00	0.68	7.95

Source Economic Data and Analysis, Ministry for Primary Industries.

4.5.3 Exports of manufactured timber products

Considerable volumes of timber products are exported and this is set out in Table 4.13. It should be noted that these take into account the coastal movement of traffic before export and as a result, the totals for individual ports do not match the Statistics NZ Customs data. The main differences are for Lyttelton, Dunedin, and Nelson for which the totals have been adjusted upwards to reflect these coastal movements and for Auckland and Tauranga for which the totals have been adjusted downwards.

Table 4.13 Exports of manufactured timber products 2017/18 (m tonnes)		
Export port	Total tonnages (m)	Per cent of total
Whangarei	0.11	3.1%
Auckland	0.24	6.7%
Tauranga	1.59	44.4%
Gisborne	0.01	0.3%
Napier	0.75	20.9%
Wellington	0.04	1.1%
Nelson	0.29	8.1%
Christchurch	0.27	7.5%
Timaru	0.00	0.0%
Dunedin	0.23	6.4%
Bluff	0.05	1.4%
Total	3.58	100.0%

Source: Based on data supplied by Statistics NZ

4.5.4 Imports of manufactured timber products

The imports of manufactured timber products are much smaller and are set out in Table 4.14.

Table 4.14 Imports of manufactured timber products 2017/18 (m tonnes)		
	Total tonnages (m)	Per cent of total
Whangarei	0.00	0.0%
Auckland	0.27	34.2%
Tauranga	0.34	43.0%
Napier	0.04	5.1%
Wellington	0.01	1.3%
Christchurch	0.08	10.1%
Timaru	0.00	0.0%
Dunedin	0.01	1.3%
Bluff	0.00	0.0%
Total	0.79	100.0%

Source: Based on data supplied by Statistics NZ

Import traffic is dominated by the ports of Tauranga and Auckland, in part serving the large construction market in Auckland and in part serving the timber related industries in the Bay of Plenty and Waikato.

4.5.5 Movement patterns for manufactured timber products

Movement patterns for manufactured timber in 2018 have been based on the patterns developed in the 2012 NFDS adjusted for the changes in production, the patterns of imports and exports and information from KiwiRail and EROAD Limited. The estimated pattern that results for 2017/18 is set out in Table 4.15.

Table 4.15
Total movements of manufactured timber products 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	0.36	0.36	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78
	Auckland	0.04	0.32	0.06	0.01	0.01	0.01	0.02	0.03	0.07	0.00	0.00	0.16	0.00	0.00	0.73
	Waikato	0.01	0.39	0.33	0.58	0.00	0.03	0.01	0.03	0.03	0.00	0.00	0.01	0.00	0.00	1.42
	Bay of Plenty	0.00	0.96	0.16	1.36	0.00	0.03	0.01	0.01	0.03	0.00	0.00	0.02	0.01	0.00	2.59
	Gisborne	0.00	0.00	0.00	0.09	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
	Hawke's Bay	0.00	0.00	0.02	0.20	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72
	Taranaki	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
	Manawatu-Wanganui	0.00	0.02	0.02	0.00	0.00	0.30	0.00	0.11	0.15	0.00	0.00	0.00	0.00	0.00	0.60
	Wellington	0.00	0.01	0.02	0.00	0.00	0.00	0.01	0.04	0.46	0.00	0.00	0.00	0.00	0.00	0.54
	TNM	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.66	0.00	0.24	0.00	0.00	0.95
	West Coast	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.00	0.00	0.13
	Canterbury	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.63	0.06	0.02	0.77
	Otago	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.11	0.01	0.19
	Southland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.14	0.37
	Total	0.41	2.08	0.65	2.27	0.05	0.88	0.10	0.22	0.78	0.69	0.05	1.20	0.40	0.17	9.95

4.6 Meat and meat products

Total meat production in New Zealand in 2017/18 amounted to about 1.2 m tonnes and the estimated breakdown of the total by region³ is set out in Table 4.16 and Figure 4.9.

Table 4.16 Estimated production of meat and meat products 2017/18 (m tonnes)		
Region	Estimated production (m tonnes)	Per cent of total
Northland	0.04	3.6%
Auckland	0.06	5.0%
Waikato	0.16	13.1%
Bay of Plenty	0.04	3.0%
Gisborne	0.01	1.0%
Hawke's Bay	0.12	10.1%
Taranaki	0.09	7.8%
Manawatu-Wanganui	0.15	12.5%
Wellington	0.04	3.6%
TMN	0.03	2.4%
West Coast	0.02	1.6%
Canterbury	0.20	16.9%
Otago	0.11	8.9%
Southland	0.12	10.5%
Total	1.19	100.0%

Source : Consultants estimates based on Statistics NZ data

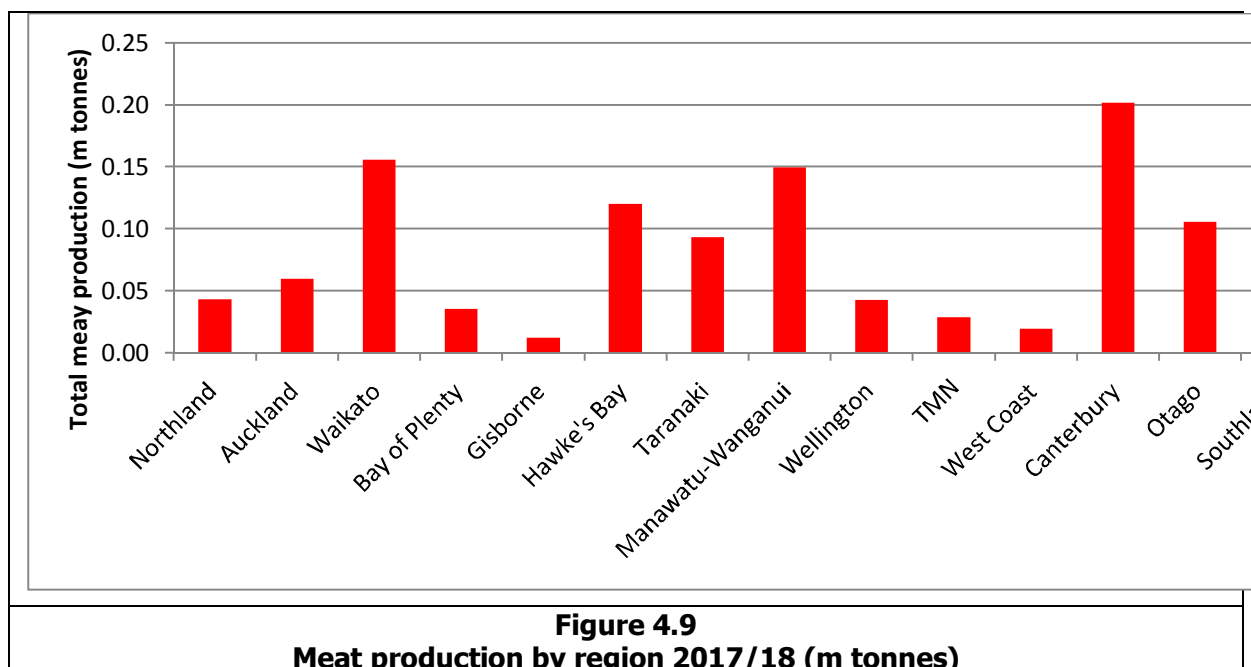


Figure 4.9
Meat production by region 2017/18 (m tonnes)

³ For confidentiality reasons, the estimates of meat production by Statistics NZ include groupings of region. The totals by region within these groups have been estimated on the basis of employment in meat processing.

NATIONAL FREIGHT DEMAND STUDY 2017/18 MAIN REPORT

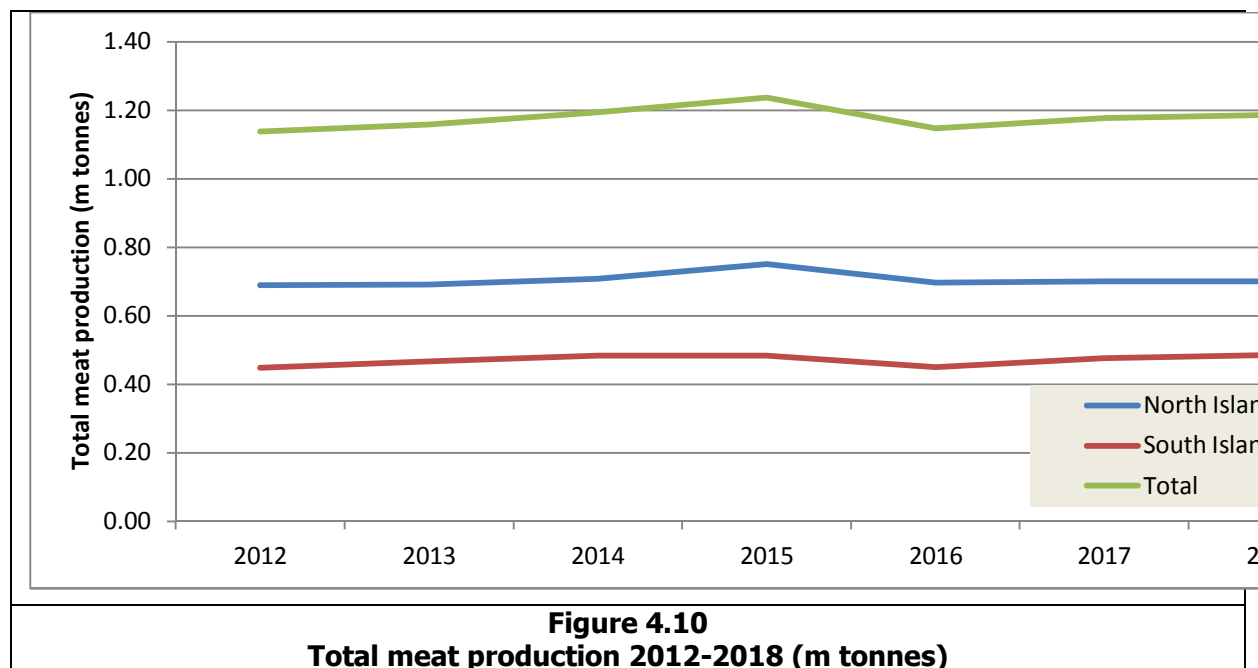
The meat produced is primarily exported and the breakdown of exports by port is set out in Table 4.17. There are also limited imports of meat products which are also included in the table. In the figures in the table allowance has been made for the coastal shipping of export traffic before its final departure from New Zealand.

Table 4.17		
Exports and imports of meat and meat products 2017/18 (000 tonnes)		
Port	Exports	Imports
Auckland Airport	7.5	0.4
Auckland Seaport	68.5	21.0
Christchurch Airport	2.7	0.0
Christchurch Seaport (Lyttelton)	114.1	10.2
Dunedin Seaport	215.7	1.2
Invercargill Seaport (Bluff)	20.8	
Napier	178.1	7.4
Nelson	16.4	0.0
Tauranga Seaport	204.7	15.9
Timaru	31.9	0.0
Wellington Seaport	77.0	7.4
Total	937.5	63.5

Source: Based on data supplied by Statistics NZ

In total almost 80 per cent of meat produced is exported.

The production of meat and meat products has remained broadly stable over the period from 2012 to 2017/18 as can be seen in Figure 4.10



Source : Statistics NZ

The patterns of the movement of meat products which result are set out in Table 4.18

Table 4.18
Total movements of meat and meat products 2017/18

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	0.01	0.03	-	-	-	-	-	-	-	-	-	-	-	-	0.04
	Auckland	-	0.08	-	-	-	-	-	0.00	0.00	-	-	-	-	-	0.08
	Waikato	-	0.07	0.03	0.05	-	-	-	-	-	-	-	-	-	-	0.16
	Bay of Plenty	-	0.00	-	0.05	-	0.00	-	0.00	0.00	-	-	-	-	-	0.05
	Gisborne	-	-	-	-	0.00	0.01	-	-	-	-	-	-	-	-	0.01
	Hawke's Bay	-	0.00	-	0.00	-	0.13	0.00	0.00	0.01	-	-	-	-	-	0.14
	Taranaki	-	0.00	-	0.08	-	0.00	0.01	0.00	0.02	-	-	-	-	-	0.12
	Manawatu-Wanganui	-	0.00	-	0.09	-	0.05	0.00	0.01	0.04	-	-	-	-	-	0.19
	Wellington	-	0.00	-	0.00	-	0.00	0.00	0.00	0.05	-	-	-	-	-	0.05
	TNM	-	-	-	0.00	-	0.00	-	-	-	0.03	-	0.00	-	-	0.03
	West Coast	-	-	-	-	-	-	-	-	-	-	0.00	0.02	0.00	-	0.02
	Canterbury	-	-	-	-	-	-	-	-	-	-	-	0.18	0.03	-	0.21
	Otago	-	-	-	-	-	-	-	-	-	-	-	0.00	0.11	0.00	0.11
	Southland	-	-	-	-	-	-	-	-	-	-	-	0.00	0.10	0.03	0.12
	Total	0.01	0.19	0.03	0.28	0.00	0.19	0.01	0.02	0.12	0.03	0.00	0.21	0.23	0.03	1.34

4.7 Livestock Movements

4.7.1 Introduction

The movement of farm animals continues to be an important part of the transport task. Estimates are based on the numbers of livestock from Statistics New Zealand, and the movement data for cattle and deer from the National Animal Identification and Tracing Scheme ("NAIT"), as published in the Freight Information Gathering System (FIGS) on the Ministry of Transport's website.

In 2012 NAIT was very new, and a number of adjustments were made to reflect this, in terms of animals registered with NAIT compared with the Statistics Department figures, and in terms of the take up of reporting movements. By 2017 the system had been in force for a number of years, and the adjustments needed were fewer. No adjustment was made for the numbers registered, as it matched reasonably well with the Statistics number.

However, there was a considerable difference between the movements reported for the nine months ended March 2019 and the same period a year earlier, especially in dairy cattle, which was likely to be due to the emphasis on compliance during the *mycoplasma bovis* outbreak. The figures were thus adjusted for that change. Nevertheless the total reported movement was only 5.6 million tonnes, over 30% fewer than the 2012 level. It is probable that this difference was a result of statistical issues, although there was reputed some reluctance to transport cattle during the outbreak, as well as the impact of herd culling.

4.7.2 Regional patterns of movement and slaughter

The stock numbers by region are set out in Table 4.19. They are from the 2017 agricultural census, as at 30 June 2017

Table 4.19					
Livestock numbers (principal types) as at 30 June 2017					
Region	Dairy cattle	Beef cattle	Lambs	Other Sheep	Deer
Northland	379,401	382,957	277,385	328,033	4,913
Auckland	132,323	111,948	204,082	253,074	11,284
Waikato	1,871,594	488,033	1,366,392	1,478,921	62,714
Bay of Plenty	325,175	104,751	292,155	281,535	32,645
Gisborne	9,407	247,238	1,199,627	1,412,045	11,859
Hawke's Bay	87,675	421,163	2,103,190	2,794,237	51,713
Taranaki	590,846	117,954	402,167	497,505	3,999
Manawatu/Wanganui	463,057	567,856	4,536,168	5,061,676	54,965
Wellington	96,804	134,924	1,264,507	1,512,079	10,637
TNM	94,354	94,972	562,157	750,143	16,425
West Coast	156,204	27,422	37,087	40,384	28,340
Canterbury	1,308,058	467,550	3,475,402	4,473,916	238,633
Otago	333,850	262,823	4,198,596	4,586,781	115,730
Southland	681,011	175,201	4,164,046	3,987,294	192,480
Total	6,529,759	3,604,792	24,082,96	27,457,623	836,337

Excludes horses, pigs, goats, alpacas/llamas and other minor types. Excludes Chatham Is. Source: Statistics NZ

4.7.3 Total movements

Slaughter patterns by region were supplied by MPI, and so for sheep (not covered by NAIT) an estimate of the movement to slaughter could be derived, as well as the proportion slaughtered. The remainder are harder to estimate. In 2012 a simple estimate of the number of trips in the animal's lifetime could be made. In 2017, saleyard data was available, from which we could derive an estimate of non-slaughtered sheep.

Dairy cows move multiple times in their lifetime, as set out in the 2012 study. This (and their individual weight) makes their movement the biggest contributor to the freight task. As well, the national flock of sheep has been in steep decline, so that they put relatively little demand on the transport system. In 2017 deer were added; they too do not appear to be transported much. The assumptions about live weight per head are those set out in FIGS, and are those used for the 2012 study

Table 4.20			
Animals (number and tonnes) transported 2017-18			
	head	tonnes	Per cent
Dairy	5,525,461	2,762,731	49.6
Other cattle	3,288,006	1,644,003	29.5
Sheep	25,931,819	11,221,43	20.2
Deer	343,526	36,242	0.7
Total	35,088,812	5,565,119	100

In 2012, cattle amounted to 81% of the cattle and sheep total (deer were not included). The proportion for 2017-18 is essentially the same at 80%. No breakdown into dairy and other cattle was available in 2012.

In 2012 there was minimal international trade (12,817 tonnes) in livestock. The pattern in 2017 was similar, but with even less trade. 4,874 tonnes were exported through Napier and 2,713 tonnes through Timaru (all cattle), along with 61 tonnes through Auckland and 1,478 tonnes through airports, mostly horses.

Most movements for cattle remain within a region; 68%, with half that in Waikato and Canterbury. These regions are also important sources or destinations for longer distance flows. 70% of sheep were assessed to move intra-regionally, although the data is less firm than that for cattle.

As for 2012, all transport of animals is by road.

The movement of dairy cattle is expected to remain static in the future. While the forecast for milk is for slight growth, this is likely to be a per-head growth rather than the numbers of animals (and therefore their transport) increasing. The same is likely for cattle. Earlier forecasts of growth were largely based on the increase in land available for dairying as a result of irrigation. We believe this to have reached its peak, coupled with likely increased pressure on high intensity farming.

There are now few sheep, and they have declined since 2012 at a strong rate. We are unable to comment on whether that has bottomed out, so have forecast nil growth. See Figure 4.11(in wool, below)

The regional pattern is shown in Table 4.21. Overall an estimated 5.57m tonnes were moved in 2017-18, compared with the assessed total for 2012 (8.49 m tonnes). Much of the change is likely to be methodological as discussed above.

Table 4.21
Total movements of livestock 2017/18 (m tonnes)

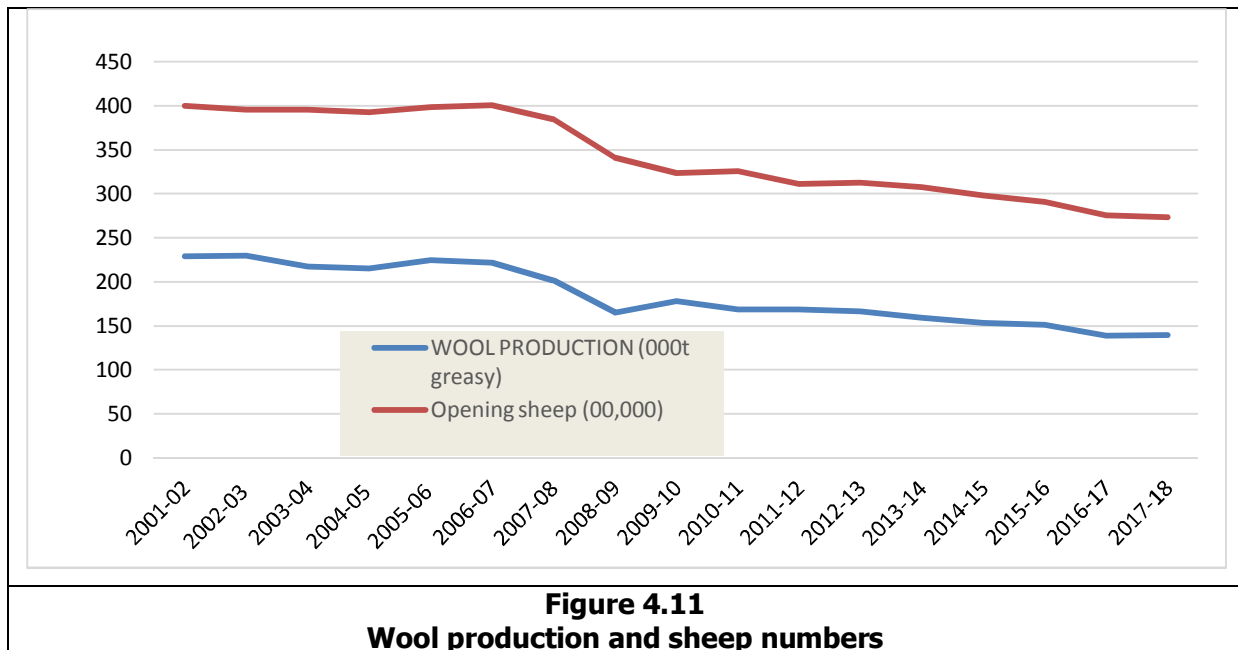
		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	0.22	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.32
	Auckland	0.02	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
	Waikato	0.01	0.07	0.79	0.03	0.00	0.03	0.05	0.03	0.00	0.00	0.00	0.01	0.00	0.00	1.03
	Bay of Plenty	0.00	0.01	0.08	0.10	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.22
	Gisborne	0.00	0.00	0.02	0.01	0.05	0.04	0.00	0.01	0.00	0.00	-	0.00	-	0.00	0.13
	Hawke's Bay	0.00	0.00	0.03	0.00	0.00	0.23	0.02	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.33
	Taranaki	0.00	0.00	0.01	0.00	0.00	0.01	0.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.29
	Manawatu-Wanganui	0.00	0.01	0.04	0.00	0.00	0.08	0.07	0.43	0.04	0.00	0.00	0.01	0.00	0.00	0.69
	Wellington	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.15
	TNM	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00	0.02	0.05	0.01	0.02	0.00	0.00	0.10
	West Coast	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.01	0.04	0.02	0.00	0.00	0.07
	Canterbury	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.04	0.03	0.94	0.03	0.03	1.10
	Otago	0.00	0.00	0.00	-	-	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.22	0.06	0.37
	Southland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.06	0.43	0.55
	Total	0.26	0.29	1.07	0.14	0.07	0.45	0.37	0.62	0.14	0.11	0.08	1.12	0.31	0.52	5.57

4.8 Wool

In 2017-18 the total wool clip was 139,800t (greasy) (Beef and Lamb NZ). Wool production has declined sharply since 2012, continuing the trend of previous years, in line with the decline in sheep numbers. The productivity advances that have allowed the number of lambs born to decline by only 8% in the face of a 55% decline in sheep numbers do not apply to wool. The change in the number of sheep and wool production is set out in Table 4.22 and Figure 4.11.

Table 4.22			
Sheep numbers and wool production			
Year	Sheep at opening of period - (000 head)	Wool production (000t greasy)	Tonnes/head
2001-02	40,033	228.9	0.0057
2002-03	39,572	229.6	0.0058
2003-04	39,552	217.7	0.0055
2004-05	39,271	215.5	0.0055
2005-06	39,880	224.5	0.0056
2006-07	40,098	221.9	0.0055
2007-08	38,460	201.3	0.0052
2008-09	34,088	164.8	0.0048
2009-10	32,384	177.9	0.0055
2010-11	32,563	168.5	0.0052
2011-12	31,132	168.3	0.0054
2012-13	31,263	166.7	0.0053
2013-14	30,787	159.2	0.0052
2014-15	29,803	153.4	0.0051
2015-16	29,121	151.4	0.0052
2016-17	27,584	138.6	0.0050
2017-18	27,369	139.8	0.0051

Source: Farm Facts 2018: Beef and Lamb NZ



The transport of wool remains only a small part of the transport task. The same pattern of movement as for 2012 was assumed, with wool being transported from farms to the scouring centres in Hawke's Bay (for North Island originated wool) and Canterbury (for SI). Regional production is strongest in Hawke's Bay, Manawatu/ Wanganui, Canterbury, Otago, and Southland. The output of each region was assessed in relation to sheep numbers, by multiplying the total production by each region's share of sheep (excluding the Chathams).

Table 4.23	
Regional Wool Production (tonnes)	
Region	Wool Production
Northland	1670
Auckland	1289
Waikato	7530
Bay of Plenty	1433
Gisborne	7189
Hawke's Bay	14227
Taranaki	2533
Manawatu - Wanganui	25771
Wellington	7699
TNM	3819
West Coast	206
Canterbury	22779
Otago	23354
Southland	20301
Total	139800

Based on sheep numbers, from Agricultural Census and Farm Facts

Almost all wool is exported through Napier (56,706t) and Lyttelton (48,595) with a lesser amount from Timaru (5859t). These figures have been adjusted for tranships, so they represent the port the wool was loaded. Internal consumption is assumed to be minor, principally for spinning for the carpet industry, on similar patterns to those in 2012.

As in 2012, nearly all moves are by road, with only 37,400 tonnes by rail (mainly within Canterbury)

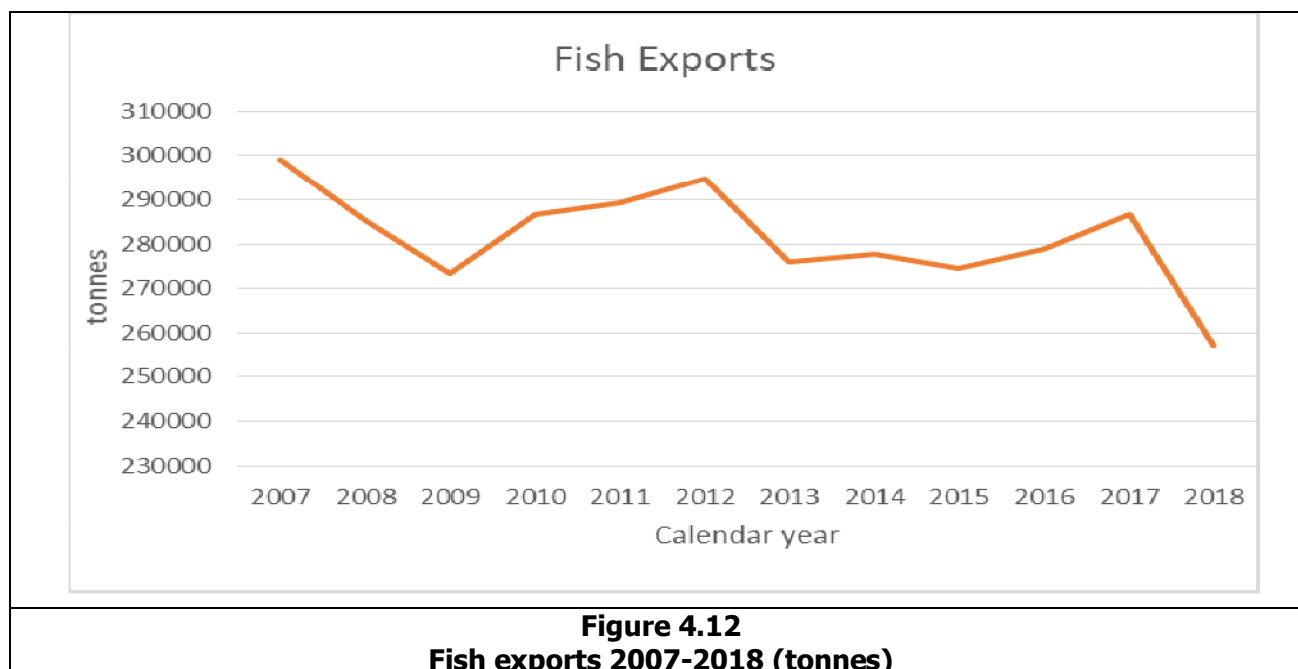
The regional pattern of movements is set out in Table 4.24. Total movements were assessed at 0.28 m tonnes compared with 0.23m tonnes in 2012. As production has reduced, the change is likely to reflect methodological differences.

Table 4.24
Total movements of wool 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	0.00
	Auckland	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	0.00
	Waikato	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	0.01
	Bay of Plenty	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	0.00
	Gisborne	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	0.01
	Hawke's Bay	-	-	-	-	-	0.07	-	0.00	0.01	-	-	-	-	-	0.08
	Taranaki	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	0.00
	Manawatu-Wanganui	-	0.00	-	-	-	0.03	-	-	-	-	-	-	-	-	0.03
	Wellington	-	0.01	-	-	-	0.01	-	-	0.00	-	-	-	-	-	0.02
	TNM	-	-	-	-	-	-	-	-	-	-	-	0.00	-	-	0.00
	West Coast	-	-	-	-	-	-	-	-	-	-	-	0.00	-	-	0.00
	Canterbury	-	-	-	-	-	-	-	-	-	-	-	0.08	-	-	0.08
	Otago	-	-	-	-	-	-	-	-	-	-	-	0.02	0.00	-	0.03
	Southland	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	0.02
	Total	-	0.01	-	-	-	0.13	-	0.00	0.01	-	-	0.13	0.00	-	0.28

4.9 Fish

Most fish is exported. The volumes exported have been relatively constant over many years which is unsurprising given the quota management regime for the industry. The pattern of fish exports over recent years is set out in Figure 4.12



However although the total exported has remained broadly stable, the volumes handled at particular ports have varied considerably, with Nelson now having a greater volume and share. In both years the numbers have been adjusted for tranships.

Port	Tonnes 2012	Tonnes 2017-18
Auckland	6512	5149
Tauranga	59909	25909
New Plymouth	921	0
Napier	1193	429
Wellington	1443	0
Nelson	75994	101003
Lyttelton	57983	52054
Timaru	11705	28212
Port Chalmers	53837	29719
Bluff	3824	2477
Air	21499	22274
Total	294820	267226

There is little published information on exactly where the fish is landed, and we have used the 2012 pattern for the origins of each port's fish.

Fish continues to be mainly transported by road. All fresh fish is and only 10,500 tonnes of the frozen fish is carried by rail (in the South Island). Much is exported directly from processing plants on the respective wharfs.

The regional pattern of movement is set out in Table 4.26. Movement is assessed at 0.41 m tonnes, compared with 0.72m tonnes in 2012.

Table 4.26
Total movements of fish 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	-	0.00	-	-	-	-	-	-	-	-	-	-	-	-	0.00
	Auckland	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	0.01
	Waikato	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	0.01
	Bay of Plenty	-	-	-	0.02	-	-	-	-	-	-	-	-	-	-	0.02
	Gisborne	-	-	-	0.00	-	0.00	-	-	-	-	-	-	-	-	0.00
	Hawke's Bay	-	-	-	0.00	-	0.00	-	-	-	-	-	-	-	-	0.00
	Taranaki	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	0.00
	Manawatu-Wanganui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Wellington	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	0.00
	TNM	-	-	-	-	-	-	-	-	-	0.13	-	-	-	-	0.13
	West Coast	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	0.01
	Canterbury	-	-	-	-	-	-	-	-	-	-	-	0.14	-	-	0.14
	Otago	-	-	-	-	-	-	-	-	-	-	-	-	0.04	-	0.04
	Southland	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.03
	Total	-	0.02	-	0.03	-	0.01	-	-	-	0.14	-	0.14	0.04	0.03	0.41

4.10 Horticulture

4.10.1 Introduction

Horticulture plays an important role in the New Zealand economy with exports of 1.4m tonnes (4 per cent of the total) or \$3.7bn by value (6 per cent of the total) in 2017/18. Both volumes and values of exports have grown substantially since 2012, export volumes by 20 per cent and export values by 80 per cent. However overall production has grown much more slowly with the estimated total domestic output growing from about 2.65m tonnes in 2012 to 2.75m tonnes in 2017/18, an increase of just 3 per cent.

Production of horticultural products in New Zealand in 2018 in volume terms is split more or less equally between fruit and vegetables. The key crops are summarised in Table 4.27.

Table 4.27		
Key horticultural products 2017/18 (000 tonnes)		
Commodity	Total production (000 tonnes)	Per cent of total
Kiwifruit	497	18.0%
Wine grapes	396	14.4%
Apples	384	13.9%
Avocados	45	1.6%
Other fruit	79	2.9%
Total fruit	1401	50.8%
Potatoes	480	17.4%
Onions	237	8.6%
Carrots	204	7.4%
Squash and Pumpkins	115	4.2%
Other vegetables	322	11.7%
Total vegetables	1,358	49.2%
Total fruit plus vegetables	2,759	100.0%

Source : Statistics NZ agricultural production survey

The dominant products are kiwifruit, wine grapes, and apples for fruit and potatoes, onions and carrots for vegetables.

The estimated production by region is set out in Table 4.28.

Table 4.28 Production of horticultural products by region 2017		
Region	000 tonnes	Per cent of total
Northland	71	2.6%
Auckland	323	11.7%
Waikato	197	7.2%
Bay of Plenty	421	15.3%
Gisborne	150	5.5%
Hawke's Bay	454	16.5%
Taranaki	2	0.1%
Manawatu	122	4.4%
Wellington	18	0.7%
TNM	463	16.8%
West Coast	0	0.0%
Canterbury	436	15.9%
Otago	59	2.1%
Southland	34	1.2%
Total	2,750	100.0%

Source : Statistics New Zealand

Note : Because of the ways in which the numbers are presented the totals by product are slightly different to the totals by region.

In addition to the exports of horticultural products, some products are imported either to fill gaps in the seasons when local production is not available or for crops, particularly bananas, which are not available locally.

The total exports and imports of horticultural products by port in 2017/18 are set out in Table 4.29.

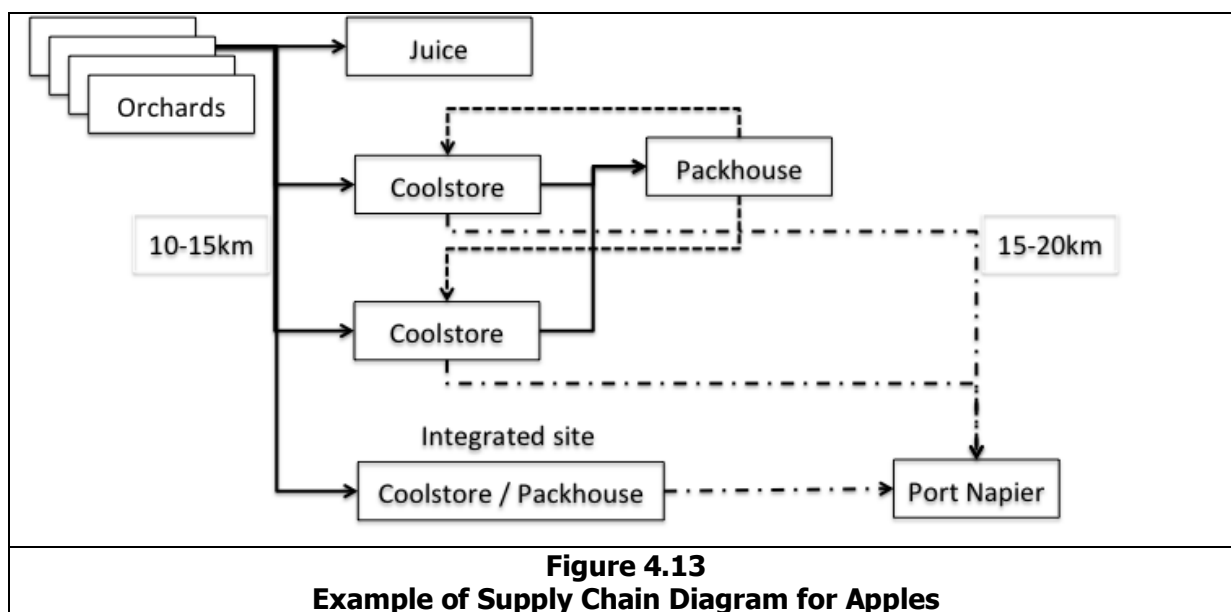
Table 4.29 Exports and imports of horticultural produce 2017/18 (tonnes)		
Port	Exports	Imports
Auckland Airport	0.017	0.010
Auckland Seaport	0.134	0.187
Christchurch Airport	0.003	0.000
Christchurch Seaport (Lyttelton)	0.069	0.020
Dunedin Seaport	0.020	0.001
Gisborne	0.018	0.000
Invercargill Seaport (Bluff)	0.003	0.014
Napier	0.364	0.000
Nelson	0.085	0.000
Tauranga Seaport	0.656	0.022
Timaru	0.019	0.000
Wellington Seaport	0.005	0.000
Whangarei	0.007	0.001
Grand Total	1.400	0.257

Source: Based on data supplied by Statistics NZ

The reported export traffic is dominated by flows through Tauranga (mainly kiwifruit) and Napier (apples). In the statistics however some of the exports from Nelson (mainly apples) are moved on coastal services before leaving the country at Tauranga and so are recorded in the Tauranga statistics.

Imports which are relatively small are dominated by movements through Auckland, the largest market and also the key centre for distribution across the country.

Within New Zealand, the movements of horticultural products can be complex as can be seen in Figure 4.13.



Based on the patterns of movements estimated for 2012 and the changes in the patterns of production and demand the pattern of movements estimated for 2017/18 is set out in Table 4.30

Table 4.30
Total movements of horticultural products 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	South-land	Total
Origin	Northland	0.07	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
	Auckland	0.03	0.81	0.06	0.06	0.02	0.00	0.00	0.01	0.01	0.05	0.00	0.01	0.00	0.00	1.06
	Waikato	0.00	0.17	0.15	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
	Bay of Plenty	0.00	0.03	0.00	0.89	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.95
	Gisborne	0.00	0.07	0.01	0.01	0.16	0.04	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.34
	Hawke's Bay	0.00	0.05	0.01	0.04	0.00	0.70	0.00	0.08	0.00	0.00	0.00	0.02	0.00	0.00	0.90
	Taranaki	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Manawatu-Wanganui	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.24
	Wellington	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.05
	TNM	0.00	0.14	0.00	0.07	0.00	0.02	0.00	0.01	0.00	0.41	0.00	0.05	0.00	0.00	0.71
	West Coast	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Canterbury	0.00	0.02	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.81	0.01	0.00	0.86
	Otago	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14	0.00	0.17
	Southland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.05
	Total	0.11	1.35	0.22	1.17	0.18	0.80	0.00	0.41	0.04	0.46	0.00	0.97	0.15	0.03	5.87

4.11 Other agriculture

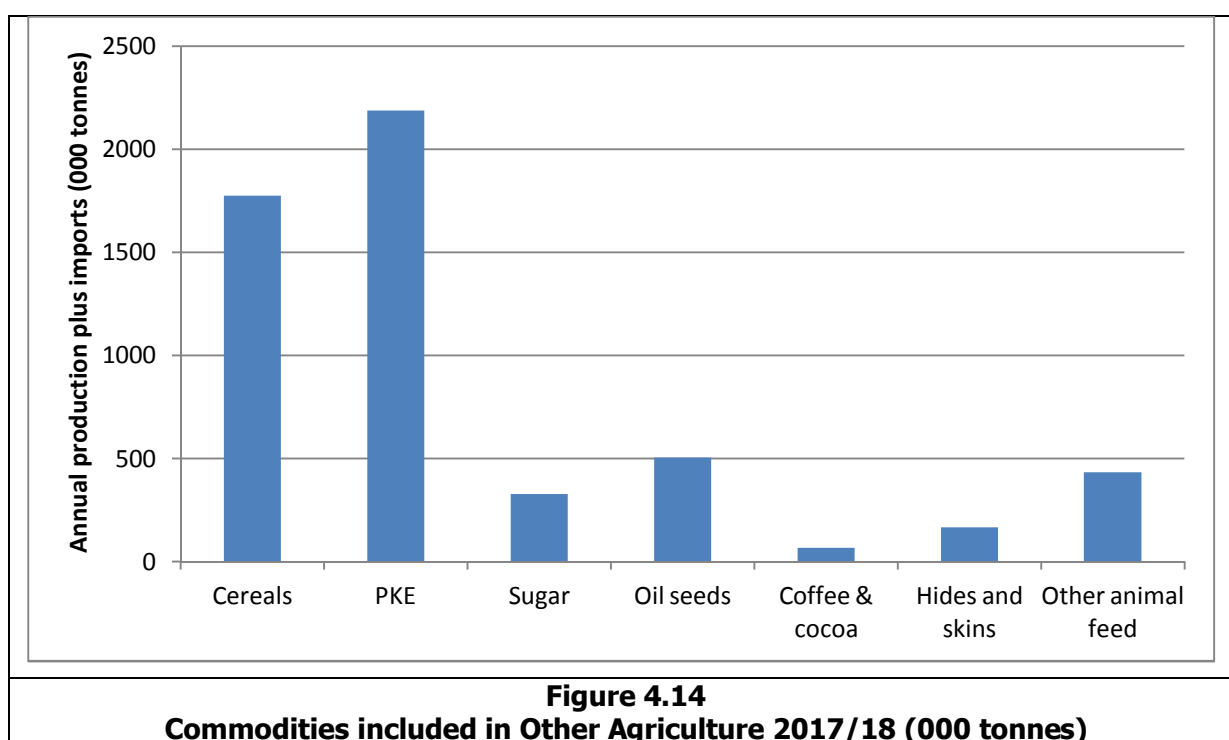
4.11.1 Introduction

Other agriculture combines a range of commodities including:-

- Cereals (wheat, barley, maize)
- Palm kernel expeller (PKE)
- Sugar
- Vegetable oils
- Hides and skins
- Other

To a large extent these are linked to the volumes of livestock with PKE and a large proportion of cereals being used as feeds and hides and skins being a by-product of the meat industry.

The total volumes of each of these, combining imports and domestic production, are set out in Figure 4.14.



A feature of Other Agriculture is the substantial volume of imported PKE which has increased from about 1.4 m tonnes in 2012 to 2.1 m tonnes in 2017/18. The future use of this product is uncertain in part because of the adverse impacts its use has on the quality of the milk produced⁴ and is controversial because of the methods used to clear forests for palm oil production. As a result there is pressure to reduce the volumes used and this is taken into account in the forecasts for this commodity set out in Section 6.

The pattern of imports and exports of other agricultural products is set out in Table 4.31

⁴ See <https://www.ruralnewsgroup.co.nz/dairy-news/dairy-agribusiness/farming-into-the-future-with-pke>

Table 4.31		
Imports and exports of other agricultural products (000 tonnes)		
Commodity	Imports	Exports
Cereals	782	
PKE	2186	
Sugar	327	
Oil seeds and vegetable oils	154	349
Coffee & cocoa	66	
Hides and skins		165
Other products	273	
Total	3788	514

Source: Based on data supplied by Statistics NZ

The demand for the different products has been estimated either on the basis of dairy livestock numbers or on population.

The pattern of demand which results is set out in Table 4.32.

Table 4.32
Total movements of other agricultural products 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	0.17	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17
	Auckland	0.14	0.40	0.02	0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.00	0.03	0.01	0.00	0.66
	Waikato	-	-	0.06	-	-	-	-	-	-	-	-	-	-	-	0.06
	Bay of Plenty	-	0.13	1.15	0.45	0.01	0.01	0.00	0.00	0.00	-	-	0.00	-	-	1.76
	Gisborne	-	-	-	-	0.03	-	-	-	-	-	-	-	-	-	0.03
	Hawke's Bay	-	-	-	-	0.00	0.20	-	0.00	-	-	-	-	-	-	0.20
	Taranaki	-	0.00	-	0.00	-	0.04	0.39	0.22	-	-	-	-	-	-	0.65
	Manawatu-Wanganui	-	0.00	-	0.00	-	0.00	-	0.05	0.01	-	-	0.00	-	-	0.06
	Wellington	-	-	-	-	-	0.00	-	0.02	0.14	-	-	-	-	-	0.16
	TNM	-	-	0.00	0.00	-	0.00	-	0.00	0.00	0.01	-	-	-	-	0.01
	West Coast	-	-	-	-	-	-	-	-	-	-	0.00	0.00	-	-	0.00
	Canterbury	-	0.00	0.00	0.00	-	0.00	0.00	0.03	-	0.07	0.06	1.01	0.08	-	1.26
	Otago	-	-	-	-	-	-	-	-	-	-	-	0.00	0.11	0.02	0.13
	Southland	-	0.00	0.00	-	-	0.00	-	-	0.00	-	-	0.00	0.07	0.29	0.36
	Total	0.31	0.53	1.23	0.46	0.04	0.25	0.40	0.33	0.18	0.08	0.07	1.03	0.26	0.32	5.50

4.12 Petroleum

Petroleum is supplied around the country from the Marsden Point refinery, and through product imports.. Some 5.1 m tonnes of crude are imported and refined at Marsden Point along supplemented with 0.35m tonnes of refined product and 0.1m tonnes of crude oil from New Plymouth. About equal quantities are transported by pipeline to Auckland and by ship to the rest of the country.

Information on the distribution from Marsden Point is published by the Freight Information Gathering System (FIGS). Imports are shown in the international trade statistics obtained from Statistics NZ. The combined volumes are set out in Table 4.33.

Table 4.33			
Coastal petroleum flows from Marsden Point and imports (tonnes)			
Destination region	From Marsden Point	Imports of finished products	Total
Northland	0.002	0.346	0.348
Auckland (excl pipeline)	0.180	0.038	0.219
Bay of Plenty	0.519	0.607	1.125
Hawke's Bay	0.190	0.004	0.195
Taranaki	0.047	0.010	0.058
Wellington	0.212	0.969	1.181
TNM	0.229	0.001	0.230
Canterbury	0.411	0.830	1.241
Otago	0.272	0.001	0.273
Southland	0.182	0.000	0.183
Total	2.244	2.807	5.051

For 2017-18, it has generally been assumed that the product moved through a port is used in the adjacent region or region. Where there is more than one such region, it has been allocated on the basis of population. However, we have also taken account of the larger out of region movements revealed in the 2012 study, especially in the case of Auckland, Waikato, and the Bay of Plenty; and Otago-Southland. In that year we had access to exact flows and stock transfers.

Secondary distribution on land is by road. Rail does not carry petroleum products (except some gas, which is not part of this commodity)

Overall volumes moved in 2017-18 at 9.14m tonnes are 12 per cent more than in 2012 (8.14m tonnes). The total pattern of movements is set out in Table 4.34.

.

Table 4.34
Total movements of petroleum 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canter-bury	Otago	South-land	Total
Origin	Northland	0.35	0.18	-	0.52	-	0.19	0.05	-	0.21	0.23	-	0.41	0.27	0.18	2.59
	Auckland	-	1.61	0.35	-	-	-	-	-	-	-	-	-	-	-	1.96
	Waikato	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bay of Plenty	-	0.19	0.25	0.69	0.02	-	-	-	-	-	-	-	-	-	1.15
	Gisborne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hawke's Bay	-	-	-	-	0.02	0.15	-	-	-	-	-	-	-	-	0.17
	Taranaki	0.10	-	-	-	-	-	0.06	-	-	-	-	-	-	-	0.16
	Manawatu-Wanganui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Wellington	-	-	-	-	-	-	-	0.38	0.80	-	-	-	-	-	1.18
	TNM	-	-	-	-	-	-	-	-	-	0.23	-	-	-	-	0.23
	West Coast	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canter-bury	-	-	-	-	-	-	-	-	-	-	0.06	1.18	-	-	1.24
	Otago	-	-	-	-	-	-	-	-	-	-	-	-	0.27	-	0.27
	Southland	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.15	0.18
	Total	0.45	1.98	0.59	1.21	0.04	0.34	0.10	0.38	1.02	0.46	0.06	1.59	0.58	0.33	9.14

4.13 Coal

Coal is mined in the Waikato, the West Coast, and Southland, along with smaller amounts in Otago and Canterbury. It is imported and exported. Imports are used in steel and cement making, power generation. Local coal is also used for steel and power, along with process heat (for meat and dairy) and general commercial heating. The heat uses are principally in the South Island where there is no natural gas. Most coal is bituminous (1.35 m tonnes in 2018) and sub-bituminous (1.58 m tonnes), with a lesser amount of lignite. The proportions have not changed significantly since 2012. All mining is now opencast.

The principal source of information is NZ Petroleum and Minerals, supplemented with some rail data and industry knowledge. The availability of coal is set out in Table 4.35.

Table 4.35 Coal available for use in New Zealand 2017-18 (m tonnes)	
Coal mined	3.11
Less exports	1.26
Plus imports	0.48
less stock change	-0.01
Total available for use in NZ	2.35

Source: NZ P and M

Figures of coal production by region, sourced from Ministry of Business Innovation and Employment (MBIE), show a slightly different picture. They are for calendar 2018.

Table 4.36 Regional coal production (000 tonnes) (2018)	
Region	Tonnes produced (000s)
Waikato	982.3
West Coast	1504.6
Canterbury	141.1
Otago	38.0
Southland	571.3
Total	3,237.3

Source :MBIE

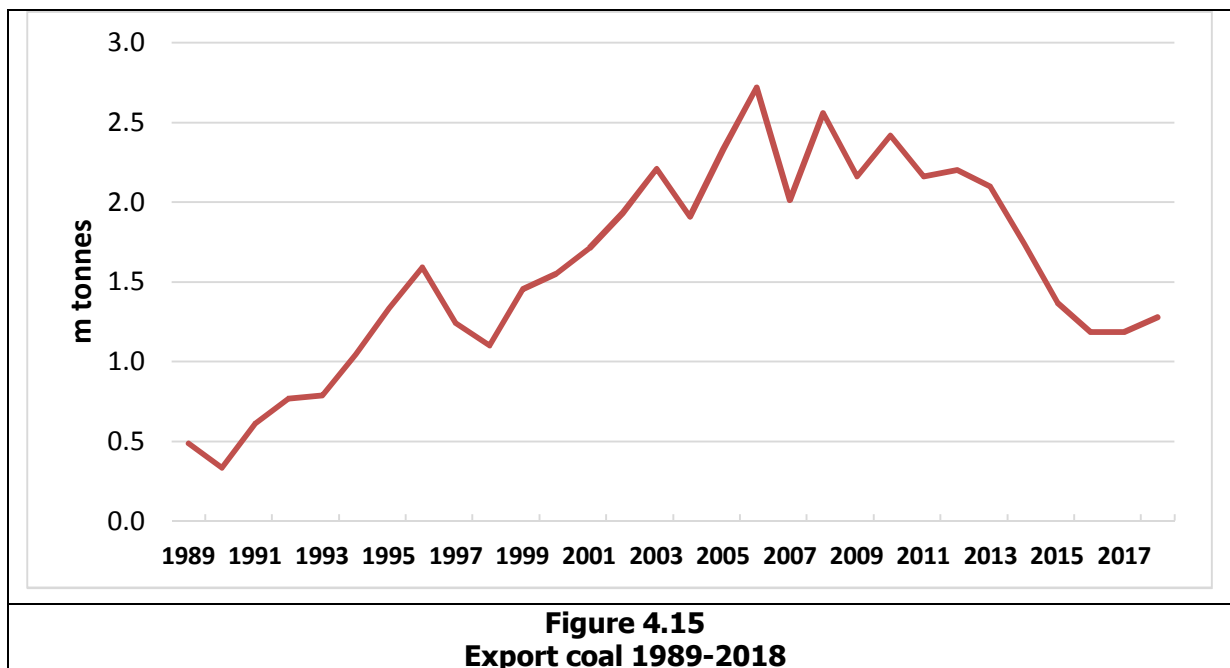
The uses of coal are set out in Table 4.37. Industrial plants are the biggest user, followed by electricity generation, including co-generation.

Table 4.37 Uses of coal in New Zealand 2017-18 (000 tonnes)	
Transformation	1,295.8
Electricity generation	342.7
Cogeneration	353.0
Other transformation	548.6
Production losses and own use	51.5
Consumption	1,135.1
Agriculture/forestry/fishing	137.1
Industrial	929.1
Commercial	52.7
Residential	15.4

Source :MBIE

Exports have reduced in recent years, in part at least reflecting difficulties with the operations of Solid Energy and Pike River, but the volumes are now slowly growing again. In calendar 2018 1.278m tonnes were exported, an increase of 8% on 2017.

Given the quality of much of the coal and its use in steel making, activated carbon and other non-thermal uses, it would be reasonable to forecast a return to 2 m tonnes within 10 years. The following graph shows the trend.



The export flow from Ngakawau (and some other places) on the West Coast to Lyttelton (1.26m tonnes) is hauled by rail. Rail is also used for flows to a meat works in North Otago and a dairy plant in south Canterbury, along with movement from Huntly to Glenbrook for part of the steel making coal.

In 2017-18 no coal was imported for power generation, but since then it has been imported, and transported from Mt Maunganui to Rotowaro (Huntly) initially by road and latterly by rail. Other process and commercial heat applications are transported by truck, as are some imports into Northland and Auckland. Overall, rail carried 1.85m tonnes, about 54 % of the total coal moved.

Overall volumes and patterns are given in Table 4.38. They total 3.44m tonnes, a reduction of 32 per cent from 2012 (5.05m tonnes). This is mainly due to a reduction of over 1m tonnes of export coal.

Table 4.38
Total movements of coal 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canter-bury	Otago	South-land	Total
Origin	Northland	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08
	Auckland	-	0.41	-	-	-	-	-	-	-	-	-	-	-	-	0.41
	Waikato	0.01	0.45	0.37	-	-	-	-	-	-	-	-	-	-	-	0.84
	Bay of Plenty	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	0.02
	Gisborne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hawke's Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Taranaki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Manawatu-Wanganui	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Wellington	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TNM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	West Coast	-	-	-	-	-	-	-	-	-	-	0.01	1.34	0.01	-	1.36
	Canter-bury	-	-	-	-	-	-	-	-	-	-	-	0.12	-	-	0.12
	Otago	-	-	-	-	-	-	-	-	-	-	-	0.01	0.04	-	0.05
	Southland	-	-	-	-	-	-	-	-	-	-	-	0.09	-	0.51	0.60
	Total	0.09	0.86	0.39	-	-	-	-	-	-	-	0.01	1.56	0.05	0.51	3.46

4.14 Aggregates

4.14.1 Introduction

Aggregates remain New Zealand's most mined mineral. In 2012 6 tonnes per head was produced but by 2018 the estimated amount was 8 tonnes. Reported production is erratic, as it depends on the response rate to a survey administered by NZ Petroleum and Minerals (P&M), part of MBIE. For about half the quarries, those on Crown licences, response to a survey is compulsory. However for the other half it is voluntary. For 2018 the voluntary response was 82.8%. In 2012 it was only 70%.

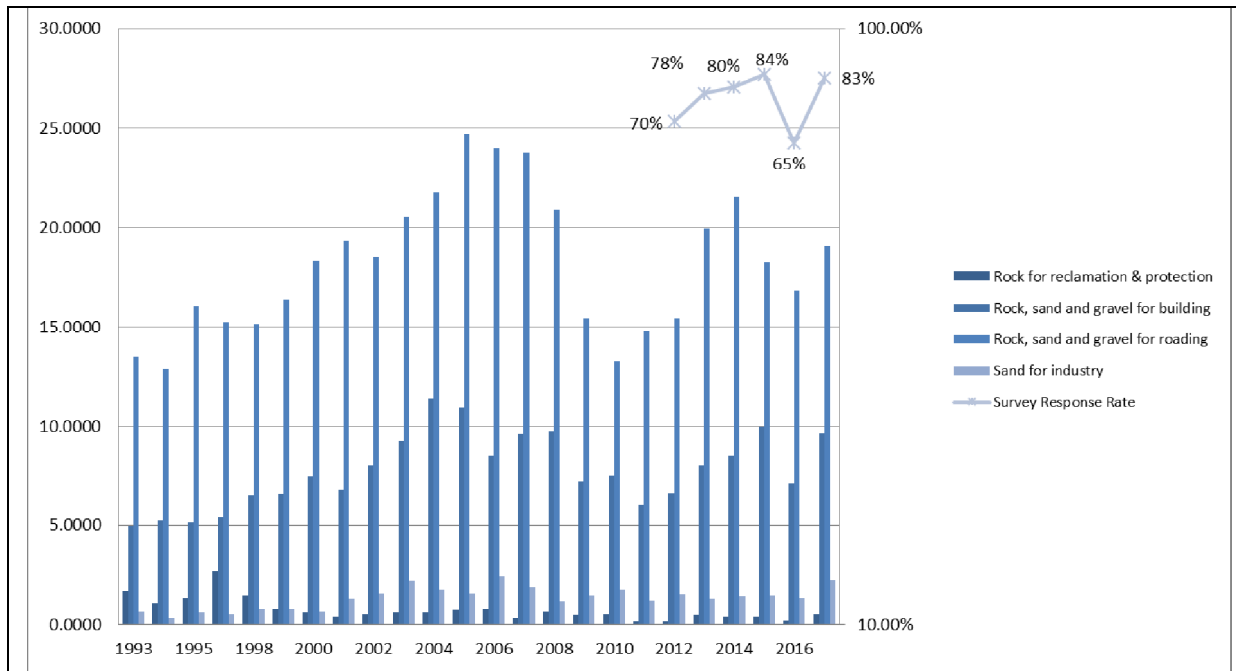


Figure 4.16
Aggregate production 1993-2017

Source: www.nzpam.govt.nz

P&M report on four categories of aggregate; rock for reclamation and protection; rock, sand and gravel for building; rock, sand and gravel for roading; rock, sand, gravel and clay for fill, and sand for industry. For some regions the data has been withheld for confidentiality reasons, and the amounts have been estimated based on concrete production or roading expenditure.

The 2017 breakdown of production as reported is as follows:

Table 4.39	
Reported aggregate production 2017	
Type of aggregate	Total reported production (tonnes)
Reclamation and protection	524,014
Building	9,670,545
Roading	19,075,788
Fill	5,116,821
Industrial sand	2,262,094
Total	36,649,262

The regional production pattern is as follows;

Table 4.40						
Estimated Aggregate production by type and region (000 tonnes)						
Region	Reclamation	Building	Roading	Fill	Sand	Total
Northland	62	458	906	22*	19*	1466
Auckland	22	2337	5049	1042	526	8975
Waikato	148	2093	3442	1357	714	7754
Bay of Plenty	34	201	1117	63	46*	1461
Gisborne	9*	18	412	0	0	439
Hawke's Bay	0	187*	384	179	120	871
Taranaki	6*	171	183	15*	55*	431
Manawatu/Wanganui	46*	676	738	455	9*	1924
Wellington	0	270	739	291	232	1533
TNM	112	219*	587*	99	19*	1036
West Coast	6*	20*	84*	4*	0	114
Canterbury	48	2260	3866	1496	457	8127
Otago	12	625	1169	48	56*	1910
Southland	19	136	398	46	9*	608
Total	524	9671	19076	5117	2262	36649

Source: www.pandm.govt.nz. Consultant's estimates of withheld items are marked with an *. These were derived by using regional shares of population (reclamation and fill), concrete (building), roading expenditure (roading), and previous years' data (sand). Slag (estimated at 190,000 tonnes) is added to these numbers)

Concrete data is reported below in Section 4.14. Roding expenditure was obtained from the NZ Transport Agency (NZTA) and expenditure categories unlikely to involve aggregate (eg design, planning, and land) were removed.

The regional breakdown of roading expenditure is set out in Table 4.41.

Table 4.41		
Distribution of roading expenditure by region 2017/18		
Region	Total roading expenditure (\$m)	Per cent of total
Northland	146.3	4.7
Auckland	657.3	21.1
Waikato	491.1	15.8
Bay of Plenty	198.8	6.4
Gisborne	32.3	1.0
Hawke's Bay	74.8	2.4
Taranaki	63.9	2.1
Manawatu/Wanganui	124.6	4.0
Wellington	163.1	5.2
TNM	112.3	3.6
West Coast	40.3	1.3
Canterbury	833.6	26.8
Otago	121.0	3.9
Southland	53.9	1.7
Total	3,113.5	100.0

Source: NZTA

Most aggregate is consumed in the region it is produced in. It costs about the same to transport the material 30km as it does to produce it, and the same transport costs are added for every 30km beyond that. Nevertheless there is some cross-border trade from quarries near the borders, and into deficit areas. In particular we estimate that Auckland consumes more than it produces, and that most of this is sourced from the Waikato. We have estimated the volume based on the shares of ready mix concrete per region, and the roading expenditure.

There is a shortage of high quality roading aggregates in some areas, and the pattern in the future may include more interregional flows. However, there is some pressure on NZTA to reduce its specifications slightly to enable more to be sourced locally.

The largest flows are in and into Auckland (11.2m tonnes), Canterbury (8.8m tonnes) and Waikato (6.1m tonnes). Other important moves are within Northland, Manawatu/Wanganui, Wellington, and Otago. Nearly all moves are by truck. Rail carries a small proportion of the output in the form of railway ballast but this is also delivered to rail loading sites by truck.

The overall position for 2017-18 is set out in Table 4.42. In 2017/18 it was estimated that 40.5m tonnes were moved, compared with 26.99m tonnes in 2012, an increase of 50%. This increase is largely due to a better response to the voluntary part of the P and M survey, 83% compared to 70% in 2012. In addition the numbers for 2017-18 have been scaled up by 10% to estimate the position at 100% response.

Table 4.42
Total movements of aggregate 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canter-bury	Otago	South-land	Total
Origin	Northland	1.55	0.06	-	-	-	-	-	-	-	-	-	-	-	-	1.61
	Auckland	-	9.98	0.10	-	-	-	-	-	-	-	-	-	-	-	10.08
	Waikato	-	1.15	6.01	1.11	-	-	0.26	-	-	-	-	-	-	-	8.53
	Bay of Plenty	-	-	-	1.61	-	-	-	-	-	-	-	-	-	-	1.61
	Gisborne	-	-	-	-	0.48	-	-	-	-	-	-	-	-	-	0.48
	Hawke's Bay	-	-	-	-	-	0.96	-	-	-	-	-	-	-	-	0.96
	Taranaki	-	-	-	-	-	-	0.47	-	-	-	-	-	-	-	0.47
	Manawatu-Wanganui	-	-	-	-	-	0.02	0.06	1.88	0.15	-	-	-	-	-	2.12
	Wellington	-	-	-	-	-	-	-	-	1.69	-	-	-	-	-	1.69
	TNM	-	-	-	-	-	-	-	-	-	1.05	0.09	-	-	-	1.14
	West Coast	-	-	-	-	-	-	-	-	-	-	0.13	-	-	-	0.13
	Canter-bury	-	-	-	-	-	-	-	-	-	0.09	0.18	8.67	-	-	8.94
	Otago	-	-	-	-	-	-	-	-	-	-	-	0.11	1.93	0.06	2.10
	Southland	-	-	-	-	-	-	-	-	-	-	-	-	-	0.67	0.67
	Total	1.55	11.20	6.11	2.72	0.48	0.98	0.79	1.88	1.83	1.14	0.40	8.78	1.93	0.73	40.52

4.15 Limestone, Cement and Fertiliser

4.15.1 Introduction

These commodities have been combined to protect confidentiality. In terms of transport, they have a degree on commonality as bulk powder commodities.

Limestone production data is sourced from P&M, as for aggregate, supplemented by rail data. Total production is nearly 3.5m t (including an estimate of the limestone used for cement making).

Cement supply is sourced from comments by a Golden Bay Cement executive reported in *Inside Resources*, and by an estimate of Holcim imports based on shipping movements. These imports are suppressed in the Statistics NZ data. The total market is about 1.5m tonnes, with about two-thirds supplied by Golden Bay Cement and about one-third by Holcim. A further producer imports clinker into Mt Maunganui and crushes it there, but the scale is modest compared with the main players. 133,000t is imported into Mt Maunganui.

For convenience, gypsum imports are included, even though only some of the volume is a cement additive. The rest is used for wallboard manufacture in Auckland and Christchurch.

Fertiliser production data is sourced from the two producing companies, Balance and Ravensdown, with raw materials and imported manufacture fertiliser volumes taken from the Statistics trade data. Total production (nitrogenous and phosphatic) is over 1.1m tonnes, and manufactured imports 1.5m tonnes. Raw materials total 0.9m tonnes.

The limestone is used for industry and for agriculture. In both cases it is normally hauled short distances from a quarry to plant or farm and is largely recorded as intraregional flows. Some is hauled further afield, and where this is identifiable it is recorded in the origin-destination matrix.

Cement is hauled long distances by coastal ship. Both companies now use larger coastal vessels than they did in 2012. From Golden Bay's works at Portland, Whangarei, the MV *Aotearoa Chief* hauls cement to Auckland, Tauranga, Napier, Wellington, Picton, and New Plymouth. For other places in the South Island about 200,000 t is hauled by coastal container ship in ISO tank containers called "ISOveyors". Road is used for further distribution. Holcim lands its 0.5m tonnes of imports at Auckland and Timaru. From Auckland distribution is by road. From Timaru the MV *Buffalo* hauls cement to Lyttelton, Bluff, Dunedin, Nelson, Wellington, and Napier, from where it is further distributed by road.

The regional usage of cement was estimated by using the ready-mix concrete data as the allocator, and the flows then worked out from the two manufacturers.

Fertiliser usage data is available from the Agricultural Census, as shown in the following table. The total of the manufactured and imported product was allocated to regions by general guidance provided by the manufactures, and related to the pattern of use in this table.

Table 4.43				
Fertiliser use in New Zealand (000 tonnes)				
Region	Ammonium based	Superphosphate	Potassium and others	Total
Northland	40.0	47.0	25.1	112.1
Auckland	14.0	14.2	9.4	37.6
Waikato	171.3	128.1	102.2	401.7
Bay of Plenty	35.3	26.8	28.3	90.4
Gisborne	10.7	32.5	10.9	54.1
Hawke's Bay	26.1	42.9	20.2	89.2
Taranaki	55.3	42.0	27.9	125.1
Manawatu/Wanganui	60.6	105.3	36.3	202.2
Wellington	20.4	26.7	6.3	53.4
TNM	12.5	14.3	13.5	40.2
West Coast	29.7	15.4	12.2	57.3
Canterbury	231.8	130.5	60.3	422.6
Otago	58.5	75.2	27.0	160.8
Southland	108.7	116.5	49.2	274.3
Total	874.8	817.4	428.7	2,120.9

Source: Agricultural Production Census 2017, Statistics NZ. Excludes Chatham Is.

Very little of these commodities are hauled by rail. The principal rail flow is limestone from the Waikato to the Glenbrook steel mill.

The total volumes of limestone, cement, and fertiliser moved are shown in Table 4.44. These total 10.16m t, compared with 11.02m t for 2012.

NATIONAL FREIGHT DEMAND STUDY 2017/18
MAIN REPORT

Table 4.44
Total movements of limestone, cement and fertiliser 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	South-land	Total
Origin	Northland	1.60	0.47	-	0.10	-	0.03	0.02	-	0.10	0.03	-	0.23	-	-	2.58
	Auckland	0.03	0.72	0.16	0.03	-	-	-	-	-	-	-	-	-	-	0.94
	Waikato	-	0.06	0.88	-	-	-	0.03	-	-	-	-	-	-	-	0.97
	Bay of Plenty	0.08	0.03	0.36	0.60	0.02	0.02	0.01	0.07	0.02	-	-	-	-	-	1.20
	Gisborne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hawke's Bay	0.00	0.00	0.01	0.02	0.06	0.40	0.04	0.12	0.04	-	-	-	-	-	0.69
	Taranaki	0.02	0.01	0.10	0.02	0.00	0.01	0.12	0.06	0.01	0.02	0.02	-	-	-	0.38
	Manawatu-Wanganui	-	-	-	-	-	-	-	0.08	0.03	-	-	-	-	-	0.11
	Wellington	-	-	-	-	-	-	0.01	0.05	0.12	-	-	-	-	-	0.18
	TNM	-	-	-	-	-	-	-	-	-	0.14	-	-	-	-	0.14
	West Coast	-	-	-	-	-	-	-	-	-	-	0.07	-	-	-	0.07
	Canterbury	-	-	-	-	-	0.02	-	-	0.08	0.01	0.08	1.37	0.09	0.02	1.68
	Otago	-	-	-	-	-	-	-	-	-	-	-	-	0.35	0.17	0.52
	Southland	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.56	0.71
	Total	1.72	1.29	1.51	0.77	0.08	0.48	0.22	0.38	0.39	0.20	0.16	1.61	0.58	0.76	10.16

4.16 Iron and Steel

Steel is produced by Pacific Steel at Otahuhu and Bluescope Steel at Glenbrook. Pacific Steel is now owned by Bluescope, and there are important flows of billet steel by rail from Glenbrook to Pacific Steel for further processing. The output of the plants is distributed across the country by road and rail. Pacific Steel produces reinforcing steel, and NZ Steel finished products like roofing.

Guidance on the split of destinations between Auckland, the rest of the North Island, and the South Island was given by the manufacturers. The distribution between regions within the North and South Island was assessed on the basis of concrete production, as it had a direct relationship with reinforcing, and an indirect one with NZ Steel's output. NZ Steel also exports products via Mt Maunganui, which is shown in the trade statistics (and confirmed by rail data and the manufacturer).

Aluminium is produced at Tiwai Point in Southland. It is difficult to find information on production, but most of it is exported directly from Bluff, and is shown in the trade statistics. Further amounts are exported from Port Chalmers, and also transported to the North Island by rail for further domestic processing. Imports of raw materials are also shown in the trade statistics.

Exports of scrap steel and aluminium are also included in this commodity. These are set out in Table 4.45

Table 4.45			
Scrap Exports 2017-18 (000 tonnes)			
Region	Steel	Aluminium	Total
Northland	0.0	0.0	0.0
Auckland	258.4	12.9	271.3
Waikato	0.0	0.0	0.0
Bay of Plenty	138.1	24.4	162.5
Gisborne	0.0	0.0	0.0
Hawke's Bay	12.0	0.3	12.3
Taranaki	12.5	0.0	12.5
Manawatu/Wanganui	0.0	0.0	0.0
Wellington	64.6	6.7	71.3
TNM	4.9	0.1	5.1
West Coast	0.0	0.0	0.0
Canterbury	107.0	7.0	114.0
Otago	12.3	0.7	13.1
Southland	6.4	0.4	6.8
Total	616.1	52.6	668.7

Overall movements are shown in Table 4.46. They total 3.59m tonnes, an increase of 8% on 2012 (3.33m tonnes).

Table 4.46
Total movements of steel and aluminium 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	South-land	Total
Origin	Northland	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01
	Auckland	0.01	1.22	0.02	0.17	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.05	0.02	0.01	1.55
	Waikato	-	0.00	-	-	-	-	-	-	-	-	-	0.00	-	0.00	0.00
	Bay of Plenty	-	0.01	-	0.52	-	-	-	-	-	-	-	-	-	-	0.52
	Gisborne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hawke's Bay	-	-	-	-	-	0.04	-	0.00	-	-	-	-	-	-	0.04
	Taranaki	-	-	-	-	-	-	0.01	0.00	-	-	-	-	-	-	0.01
	Manawatu-Wanganui	-	-	-	-	-	0.00	0.00	-	0.00	-	-	-	-	-	0.00
	Wellington	-	-	-	-	-	-	-	-	0.09	-	-	0.00	-	-	0.09
	TNM	-	0.00	0.00	-	-	-	0.00	-	-	0.01	-	-	-	0.00	0.01
	West Coast	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Canterbury	-	0.00	0.00	-	-	-	0.00	-	-	-	-	0.23	0.00	0.00	0.23
	Otago	-	-	-	-	-	-	-	-	-	-	-	0.00	0.04	0.00	0.04
	Southland	-	0.00	0.01	-	-	-	0.00	-	-	-	-	0.01	0.01	1.05	1.08
	Total	0.01	1.23	0.03	0.69	0.00	0.04	0.02	0.01	0.11	0.02	0.00	0.29	0.07	1.06	3.59

4.17 Concrete

A significant tonnage of concrete moves a very short distance from sites throughout the country. As noted in 2012, the product has a short shelf life and cannot tolerate the time taken up by longer hauls. As a result all concrete is moved within a region.

The production is recorded by Statistics NZ. Some regions are grouped by them, and they have been separated on the basis of population.

Table 4.47	
Regional production of ready-mix concrete 2017-18 (million tonnes)	
Region	Production
Northland	0.39
Auckland	3.43
Waikato	1.08
Bay of Plenty	0.70
Gisborne	0.07
Hawke's Bay	0.22
Taranaki	0.16
Manawatu /Wanganui	0.33
Wellington	0.71
TNM	0.34
West Coast	0.07
Canterbury	1.64
Otago	0.47
Southland	0.20
Total	9.82

The overall regional position is set out in Table 4.48. In 2017-18 some 9.82m tonnes of concrete were produced and transported, an increase of 40% over the 2012 total of 6.96m tonnes .

Table 4.48
Total movements of concrete 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	South-land	Total
Origin	Northland	0.39	-	-	-	-	-	-	-	-	-	-	-	-	-	0.39
	Auckland	-	3.43	-	-	-	-	-	-	-	-	-	-	-	-	3.43
	Waikato	-	-	1.08	-	-	-	-	-	-	-	-	-	-	-	1.08
	Bay of Plenty	-	-	-	0.70	-	-	-	-	-	-	-	-	-	-	0.70
	Gisborne	-	-	-	-	0.07	-	-	-	-	-	-	-	-	-	0.07
	Hawke's Bay	-	-	-	-	-	0.22	-	-	-	-	-	-	-	-	0.22
	Taranaki	-	-	-	-	-	-	0.16	-	-	-	-	-	-	-	0.16
	Manawatu-Wanganui	-	-	-	-	-	-	-	0.33	-	-	-	-	-	-	0.33
	Wellington	-	-	-	-	-	-	-	-	0.71	-	-	-	-	-	0.71
	TNM	-	-	-	-	-	-	-	-	-	0.34	-	-	-	-	0.34
	West Coast	-	-	-	-	-	-	-	-	-	-	0.07	-	-	-	0.07
	Canterbury	-	-	-	-	-	-	-	-	-	-	-	1.64	-	-	1.64
	Otago	-	-	-	-	-	-	-	-	-	-	-	-	0.47	-	0.47
	Southland	-	-	-	-	-	-	-	-	-	-	-	-	-	0.20	0.20
	Total	0.39	3.43	1.08	0.70	0.07	0.22	0.16	0.33	0.71	0.34	0.07	1.64	0.47	0.20	9.82

4.18 Other minerals

This covers a range of relatively minor flows of specialist minerals, but includes salt. Other minerals included come from the list published by P&M, although much is withheld and has to be estimated. Included in the category are china clay, zeolite, clay, bentonite, serpentine, decorative stone and pebbles. Their origins are given by P&M, supplemented by estimates, and the destinations generally estimated based on 2012 patterns or population. A flow of gold slurry from the West Coast to Otago, included in 2012, has ceased.

Table 4.49	
Estimated volumes of Other minerals (000 tonnes)	
Mineral	Volume (000 tonnes)
China Clay, mined and processed	78
Decorative pebbles	140
Building Stone	162
Salt	155
Clay for bricks and ceramics; bentonite	55
Silica sand	53
Serpentine	54
Zeolite and perlite	170
Pumice	92
Total	959

Source: P&M and consultant's estimates

Nearly all is moved by road, except for the processed china clay (from Northland to Auckland and Bay of Plenty) and some salt from Lake Grassmere. Unfortunately because of the Kaikoura earthquake the movement by rail was disrupted in 2017-18, and quantities in the data are unrepresentative of a normal year.

This category could also include water, but this has not been assessed. Very little is exported at present, although major export moves are likely in future.

The total tonnage moved for this commodity group was 0.96m, a rise of nearly 50% over 2012.

NATIONAL FREIGHT DEMAND STUDY 2017/18
MAIN REPORT

Table 4.50
Total movements of other minerals 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	South-land	Total
Origin	Northland	0.07	0.01	-	0.01	-	-	-	-	-	-	-	-	-	-	0.09
	Auckland	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	0.01
	Waikato	0.01	0.18	0.13	0.03	-	0.00	0.02	-	0.00	-	-	0.00	0.00	-	0.39
	Bay of Plenty	0.00	0.05	0.03	0.10	0.00	0.02	0.01	0.01	-	-	-	-	-	-	0.23
	Gisborne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hawke's Bay	-	-	-	-	-	0.00	-	-	-	-	-	-	-	-	0.00
	Taranaki	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	0.01
	Manawatu-Wanganui	-	0.01	-	-	-	-	-	0.03	-	-	-	-	-	-	0.04
	Wellington	-	-	-	-	-	-	-	-	0.00	-	-	-	-	-	0.00
	TNM	-	-	-	-	-	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.05
	West Coast	-	0.01	-	-	-	-	-	-	0.01	-	-	0.01	-	-	0.02
	Canterbury	-	-	-	-	-	-	-	-	-	-	-	0.13	-	-	0.13
	Otago	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	-	0.01
	Southland	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00
	Total	0.08	0.27	0.16	0.14	0.00	0.03	0.04	0.04	0.01	0.01	0.00	0.16	0.02	0.01	0.97

4.19 Waste

As was the case for 2012, there are three major streams of waste. Household and similar waste dumped in licensed landfills is about 3.5m tonnes. This is very readily allocated to regions because there is a levy per tonne on this waste, and the Ministry for the Environment (MfE) collects these statistics. In addition there remains some unlicensed landfill (0.6m tonnes). The second major stream is recycling, which is estimated from an MfE calculation of tonnes/head. Scrap steel and aluminium are counted under building materials. The third major stream is cleanfill. This is widespread but hard to estimate, and we have adopted the same estimate as in 2012, of 1tonne/head.

Table 4.51					
Regional production of waste (000 tonnes)					
Region	Levied waste	Non levied	Recycling	Cleanfill	Total
Northland	112		19	177	308
Auckland	1,600	180	182	1677	3639
Waikato	163		50	464	677
Bay of Plenty	249	90	33	303	675
Gisborne	36		5	49	90
Hawke's Bay	99		18	165	282
Taranaki	41	25	13	119	198
Manawatu/ Wanganui	170	20	26	242	458
Wellington	284	130	56	518	988
TNM	143	50	16	150	359
West Coast	9		4	33	46
Canterbury	363	70	67	618	1118
Otago	152		25	227	404
Southland	61		11	99	171
Total	3,482	565	525	4840	9412

Source: MfE (levied, recycling); Stantec (non-levied); consultant's estimates. Waste levy adjusted to account for interregional movements into Waikato landfills

Much waste is handled within the region it is produced in, and is thus relatively short haul. All goes by road. There are however notable exceptions: the Hampton Downs landfill and the Tirohia one are both in Waikato but draw their waste for further afield, Hampton Downs from Auckland, and Tirohia from the Bay of Plenty and Gisborne. A further large landfill, at Bonny Glen near Marton, is about to receive waste from Taranaki, but none so moved in 2017-18. Recycled waste is assumed to be processed or exported through Auckland and Christchurch.

The movement pattern is set out in Table 4.52. The amount moved was 9.41m tonnes, an increase of 28 per cent over 2012 (7.37m tonnes).

Table 4.52
Total movements of waste 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	0.29	0.02	-	-	-	-	-	-	-	-	-	-	-	-	0.31
	Auckland	-	2.93	0.71	-	-	-	-	-	-	-	-	-	-	-	3.64
	Waikato	-	0.05	0.63	-	-	-	-	-	-	-	-	-	-	-	0.68
	Bay of Plenty	-	0.03	0.22	0.42	-	-	-	-	-	-	-	-	-	-	0.67
	Gisborne	-	0.01	0.04	-	0.05	-	-	-	-	-	-	-	-	-	0.09
	Hawke's Bay	-	0.02	-	-	-	0.26	-	-	-	-	-	-	-	-	0.28
	Taranaki	-	0.01	-	-	-	-	0.19	-	-	-	-	-	-	-	0.20
	Manawatu-Wanganui	-	0.03	-	-	-	-	-	0.43	-	-	-	-	-	-	0.46
	Wellington	-	0.06	-	-	-	-	-	-	0.93	-	-	-	-	-	0.99
	TNM	-	-	-	-	-	-	-	-	-	0.34	-	0.02	-	-	0.36
	West Coast	-	-	-	-	-	-	-	-	-	-	0.04	0.00	-	-	0.05
	Canterbury	-	-	-	-	-	-	-	-	-	-	-	1.12	-	-	1.12
	Otago	-	-	-	-	-	-	-	-	-	-	-	0.03	0.38	-	0.40
	Southland	-	-	-	-	-	-	-	-	-	-	-	0.01	-	0.16	0.17
	Total	0.29	3.15	1.59	0.42	0.05	0.26	0.19	0.43	0.93	0.34	0.04	1.17	0.38	0.16	9.41

4.20 Other manufactured and retail goods

4.20.1 Introduction

Retail and manufactured goods form one of the key freight demands but represent an area where there is relatively little information directly available on the volumes or patterns associated with this commodity group. In the previous NFDS this commodity group was broken down into a number of sub categories but for the current update the output has been combined into a single category to match the requirements of the MoT Freight Model. In developing the estimates we have also made use of data from KiwiRail and data provided by EROAD Limited to establish the scale and patterns of movements overall and those moved by rail.

4.20.2 Manufacturing

The scale of manufacturing in New Zealand has been based on the estimates of the values of the output of the manufacturing sector as recorded by Statistics NZ broken down by the different types of manufacturing. A summary of the growth since 2012 of the value of manufacturing output at constant prices (excluding meat, dairy and wood products which are considered separately) is set out in Figure 4.17.

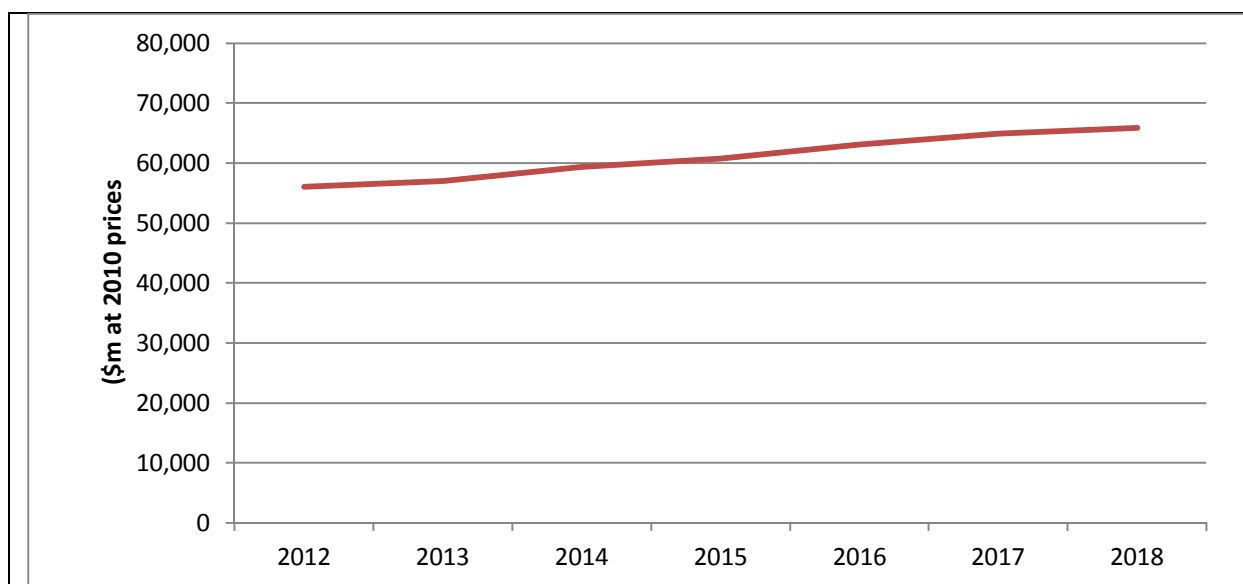


Figure 4.17
Value of manufacturing output at constant 2010 prices (\$m)

Over the period since 2012 the value of the output of the sector at constant prices has increased by about 18 per cent broadly in line with GDP growth of about 19 per cent.

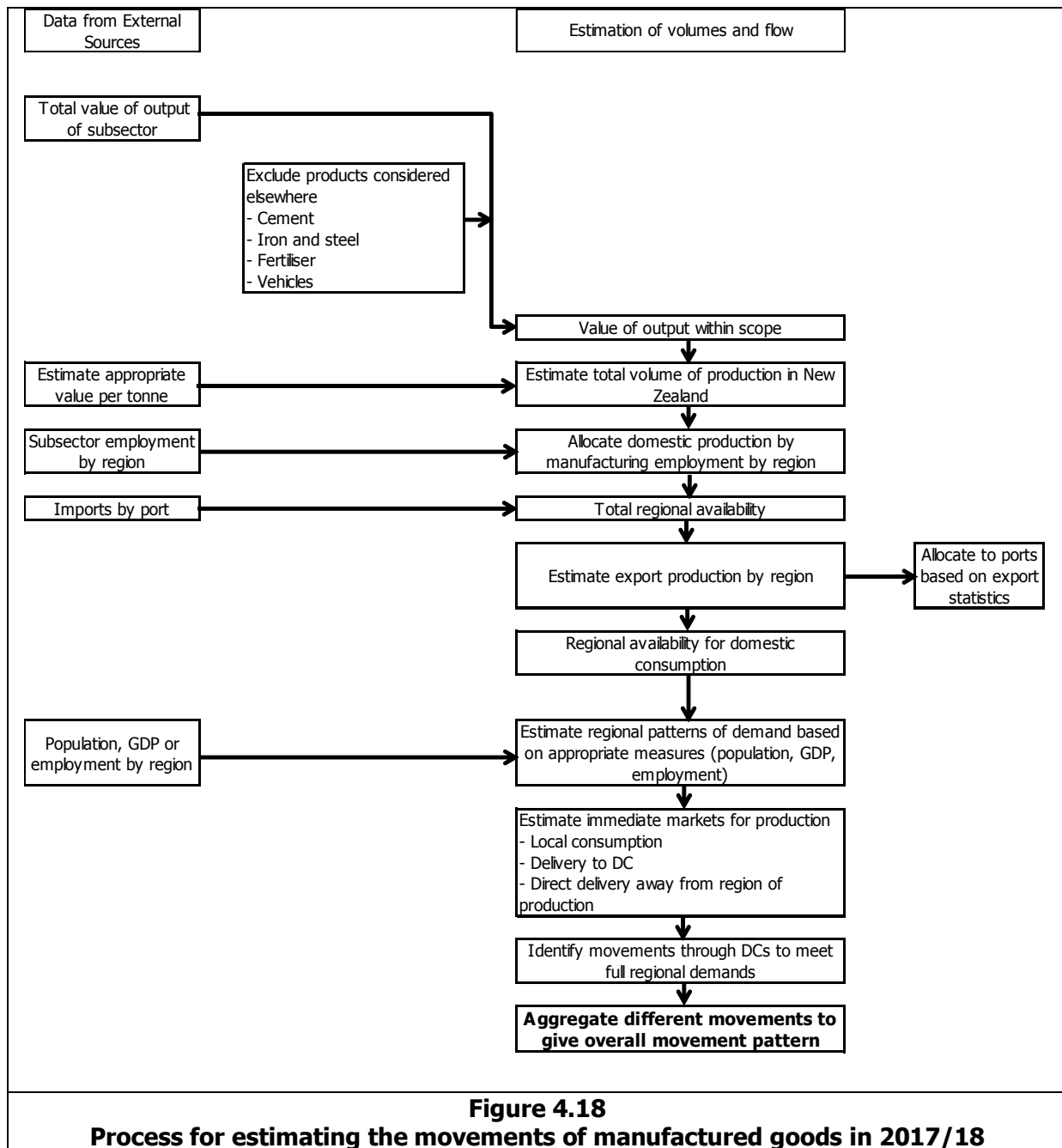
Within the total for 2018 the breakdown by manufacturing subsector is set out in Table 4.53.

Table 4.53
Growth of manufacturing output by sector 2012-2017/18

Manufacturing sector	Value of output in 2017/18 at 2010 prices	Per cent of total	Growth of output from 2012 at 2010 prices
Food products	14,800	22.5%	10%
Textile, leather, clothing, and footwear manufacturing	2,100	3.2%	4%
Printing	1,500	2.3%	-6%
Chemicals	20,500	31.2%	33%
Non-metallic mineral product manufacturing	3,300	5.1%	31%
Metal product manufacturing	10,100	15.4%	9%
Transport equipment, machinery, and equipment manufacturing	11,500	17.5%	16%
Furniture and other manufacturing	1,800	2.7%	18%
All manufacturing excluding meat, dairy and wood products	65,600	100%	

The approach to estimating the freight movements associated with the manufacturing sector builds on the approach developed for the previous NFDS and uses the growth in output and the observed imports and exports for 2017/18 to adjust the earlier overall totals.

The patterns of movement were then derived using the framework developed for the earlier study. This is set out in Figure 4.18.



For retail movements information is available on the level of retail spending by region and this is set out in Table 4.54. These were combined with updated information on imports and exports to assess the overall patterns of movement.

NATIONAL FREIGHT DEMAND STUDY 2017/18
MAIN REPORT

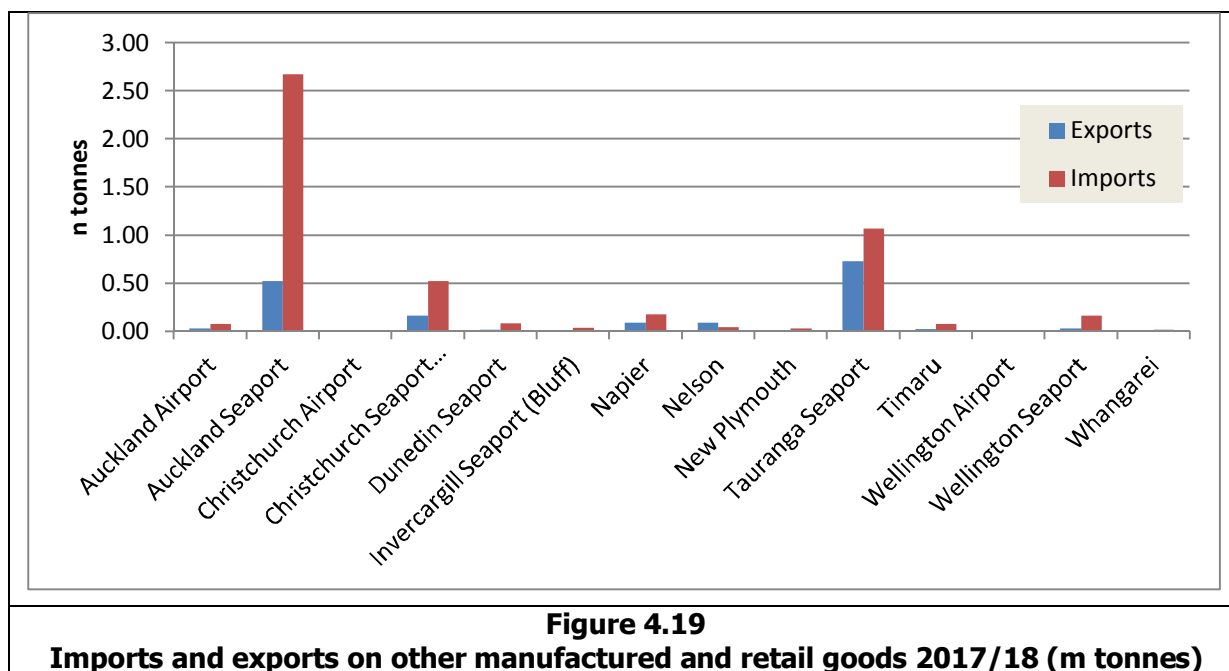
Table 4.54 Retail expenditure by region 2017/18 (\$m)	
Region	Retail expenditure
Northland	2,791
Auckland	34,024
Waikato	8,287
Bay of Plenty	5,747
Gisborne	683
Hawke's Bay	2,821
Taranaki	1,847
Manawatu-Wanganui	4,043
Wellington	8,926
TMN	2,883
West Coast	631
Canterbury	12,114
Otago	5,166
Southland	1,852
Total	91,816

Source : Statistics New Zealand

The total volumes of exports and imports in 2017/18 of manufactured and retail goods are set out in Table 4.55 and Figure 4.19.

Table 4.55 Exports and imports of other manufactured and retail goods 2017/18 (m tonnes)		
Port	Exports	Imports
Auckland Airport	0.03	0.08
Auckland Seaport	0.52	2.67
Christchurch Airport	0.00	0.01
Christchurch Seaport (Lyttelton)	0.17	0.52
Dunedin Seaport	0.01	0.08
Invercargill Seaport (Bluff)	0.00	0.03
Napier	0.09	0.18
Nelson	0.09	0.04
New Plymouth	0.00	0.03
Tauranga Seaport	0.73	1.06
Timaru	0.03	0.07
Wellington Airport	0.00	0.00
Wellington Seaport	0.03	0.16
Whangarei	0.00	0.01
Total	1.70	5.69

Source: Based on data supplied by Statistics NZ



These were combined with the manufactured goods data and where appropriate, the totals were adjusted to use information from data provided by EROAD Limited as part of this study, especially in the estimation of short distance intra-regional trips, rail data from KiwiRail and coastal shipping data.

The patterns of movement that result are set out in Table 4.56.

Table 4.56
Total movements of other manufactured and retail products 2017/18 (m tonnes)

		Destination														
		North-land	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	South-land	Total
Origin	Northland	0.49	0.26	0.01	0.00	0.00	0.00	0.00	0.00	0.01	-	0.00	0.04	-	0.00	0.80
	Auckland	0.77	33.71	2.55	1.50	0.20	0.54	0.61	1.62	1.24	0.34	0.07	0.88	0.39	0.23	44.66
	Waikato	0.01	0.81	1.42	0.19	0.00	0.01	0.01	0.03	0.04	0.00	0.00	0.09	0.00	0.00	2.62
	Bay of Plenty	0.02	1.37	0.15	2.62	0.01	0.03	0.02	0.09	0.06	0.01	0.00	0.23	0.03	0.00	4.65
	Gisborne	0.00	0.03	0.00	0.03	0.09	0.00	0.00	0.00	0.00	-	-	0.01	-	-	0.17
	Hawke's Bay	0.01	0.34	0.02	0.09	0.00	0.92	0.01	0.11	0.05	0.01	-	0.06	0.00	0.00	1.62
	Taranaki	0.00	0.23	0.01	0.06	0.00	0.00	0.47	0.01	0.01	0.00	-	0.03	0.00	0.00	0.83
	Manawatu-Wanganui	0.00	0.40	0.03	0.08	0.02	0.23	0.07	1.83	0.88	0.00	-	0.04	0.00	0.00	3.59
	Wellington	0.01	0.87	0.04	0.03	0.00	0.09	0.01	0.15	1.60	0.00	-	0.07	0.00	0.00	2.88
	TNM	0.00	0.10	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.39	-	0.05	-	-	0.58
	West Coast	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.07	0.00	0.00	0.18
	Canterbury	0.01	0.73	0.02	0.08	0.00	0.02	0.01	0.06	0.08	0.68	0.13	9.49	0.75	0.34	12.41
	Otago	0.00	0.14	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.29	0.91	0.04	1.43
	Southland	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.20	0.01	0.52	0.88
	Total	1.32	39.13	4.26	4.71	0.34	1.86	1.23	3.90	3.99	1.47	0.30	11.55	2.11	1.14	77.30

5 Overall freight patterns and modal shares

5.1 Introduction

Using the results of the analysis of the individual commodities described in the previous section we have developed total identified matrices which have been estimated in terms of both tonnes and in terms of tonne-kms. These are summarised in Table 5.1

Table 5.1	
Estimates of total tonnes and tonne-kms in 2017/18 based on identified commodities	
Total Tonnes (m)	251
Total tonne-kms (bn)	29.2

The identified total tonne-km movement has been compared to the total estimated freight tonne-kms by mode, combining data from the Ministry of Transport, KiwiRail and our estimates of the coastal shipping freight task. These figures are set out in Table 5.2. The published road transport estimate included in the table would include not only the weight of the goods but in some instances particularly for the movements of unitised cargoes, the weight of the equipment in which the goods are transported. It would also include the weight of any staff or plant transported. This would therefore overestimate the weight of the commodities carried. We have therefore adjusted the road transport estimate by about 10 per cent to reflect this factor giving a total figure for the movement by road of 22.6bn tonne km and a total overall of 30.1bn tonne-kms.

Table 5.2		
Initial top down estimates of total tonne-kms 2017/18		
Mode	Estimated tonne-kms (bn)	Source
Rail	3.5	KiwiRail
Coastal	4.0	Consultants estimates
Road transport As published	25.11	MoT
Adjusted	22.60	Revised to allow for freight container weights and also movements of non-freight items
Total with adjusted road transport total	30.1	

Comparing this revised total with the total estimated for the individual commodities gives a shortfall of about 1.0 bn tonne-kms equivalent to about 3 per cent of the total identified.

By developing a total commodity matrix and then deducting the amounts transported by rail and by coastal shipping it is then possible to derive a road freight matrix for the identified commodities. The rail and coastal shipping matrices can be considered to be reasonably reliable. As a consequence, the adjustment required to bring the total estimated on the basis of the individual commodities to match the overall control total of 30.1 bn tonne-kms as set out above will therefore need to be applied to the amounts transported by road. Because road transport accounts for the majority of freight tonne-kms the relative adjustment to the road tonne-km matrix will be only small, of the order of 4 per cent, increasing this from 21.7 billion tonne-kms to the 22.6 billion tonne-kms set out above.

To adjust the road matrix the assumption has been made that the traffic flows most likely to be missing from the analysis of the individual commodities are shorter distance movements which arise as part of the more complex supply chains. An example of these would be the movement of goods from a manufacturers distribution centre to one operated by a third party before delivery to the distribution centre of the retailer or the movement of goods to or from a rail head. These movements which we have denoted as "General Freight" would typically occur within a region. As a result we have increased the intra-regional totals to give a road vehicle matrix in tonne-km terms the total of which matches to the overall control set out above.

The position which results in terms of the tonnes moved is summarised in Table 5.3. Figure 5.1 displays the percentage split of freight traffic by mode in terms of tonnes and also of tonne-kms.

Table 5.3		
Final estimate of tonnes moved by mode in 2017/18 – all commodities		
Mode	million tonnes	Per cent of total
Rail	15.6	5.6%
Coastal Shipping	4.6	1.6%
Road transport	258.5	92.8%
Total	278.7	

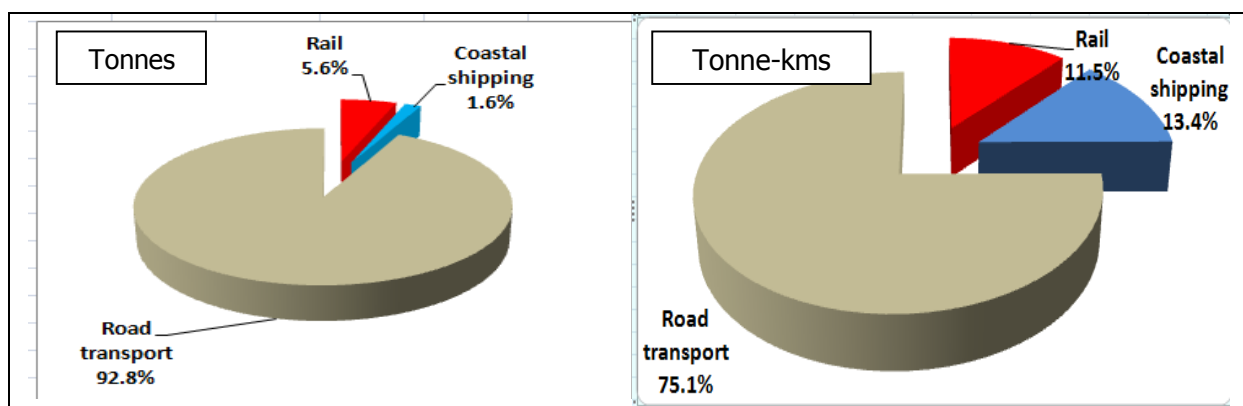


Figure 5.1
The freight task in 2017/18 by mode for tonnes and tonne-kms

When comparing the results with those derived for the previous NFDS it should be noted that with the changes in the Road User Charge system, the approach used to calculate road tonne-kms has changed and the earlier figures subsequently been revised upwards. As an example of this, the previous NFDS was based on an estimate of road tonne-kms for 2012 of 18.5 bn, but with the changes in the method of calculation this has subsequently been revised to 22.0 bn tonne-kms. Some of the apparent growth between 2012 and the current NFDS is therefore due to this change in the base used to estimate the total figures.

5.2 Assessment of movements by mode

The estimated tonnages moved by each mode are set out in Table -Table 5.5.

NATIONAL FREIGHT DEMAND STUDY 2017/18
MAIN REPORT

Table
Total movements by rail in 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	Auckland	0.0	0.9	0.0	1.6	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0	3.2
	Waikato	0.0	0.5	0.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
	Bay of Plenty	0.0	1.4	0.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7
	Gisborne	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hawke's Bay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
	Taranaki	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
	Manawatu-Wanganui	0.0	0.1	0.0	0.1	0.0	0.5	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	1.0
	Wellington	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.4
	TNM	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	West Coast	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	1.4
	Canterbury	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.2	0.1	1.1
	Otago	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.5
	Southland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.1	0.9
	Total	0.0	3.3	0.4	5.9	0.0	0.7	0.2	0.3	0.8	0.1	0.0	2.5	1.2	0.2	15.6

NATIONAL FREIGHT DEMAND STUDY 2017/18
MAIN REPORT

Table 5.4
Total movements by coastal shipping in 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	0.0	0.6	0.0	0.6	0.0	0.2	0.1	0.0	0.3	0.3	0.0	0.4	0.3	0.2	2.9
	Auckland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.7
	Waikato	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Bay of Plenty	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3
	Gisborne	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hawke's Bay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Taranaki	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	Manawatu-Wanganui	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Wellington	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TNM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	West Coast	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Canterbury	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.5
	Otago	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Southland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.1	0.7	0.0	0.7	0.0	0.3	0.1	0.0	0.4	0.4	0.0	1.3	0.4	0.2	4.6

NATIONAL FREIGHT DEMAND STUDY 2017/18
MAIN REPORT

Table 5.5
Total movements by road in 2017/18 (m tonnes)

		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	11.9	1.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	13.5
	Auckland	1.2	60.8	4.3	0.6	0.2	0.5	0.6	1.4	1.2	0.3	0.1	0.4	0.4	0.2	72.4
	Waikato	0.1	3.0	24.0	5.7	0.0	0.1	0.4	0.1	0.1	0.0	0.0	0.1	0.0	0.0	33.5
	Bay of Plenty	0.1	1.5	2.6	16.7	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	21.5
	Gisborne	0.0	0.1	0.1	0.1	4.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	5.0
	Hawke's Bay	0.0	0.4	0.1	0.4	0.2	7.3	0.0	0.5	0.1	0.0	0.0	0.1	0.0	0.0	9.1
	Taranaki	0.0	0.3	0.2	0.2	0.0	0.2	5.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	6.9
	Manawatu-Wanganui	0.0	0.5	0.1	0.2	0.0	1.1	1.6	7.2	1.8	0.0	0.0	0.0	0.0	0.0	12.5
	Wellington	0.0	0.9	0.1	0.0	0.0	0.1	0.0	1.0	8.5	0.0	0.0	0.1	0.0	0.0	10.7
	TNM	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	8.2	0.1	0.5	0.0	0.0	9.2
	West Coast	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.3	0.0	0.0	1.7
	Canterbury	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.9	0.7	38.3	0.9	0.3	42.0
	Otago	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	7.4	1.3	9.4
	Southland	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	9.6	11.2
	Total	13.4	69.5	31.6	24.0	4.9	9.7	8.3	11.2	11.9	9.5	2.2	41.1	9.9	11.5	258.5

NATIONAL FREIGHT DEMAND STUDY 2017/18
MAIN REPORT

Table 5.6
Total movements by all modes in 2017/18 (m tonnes)

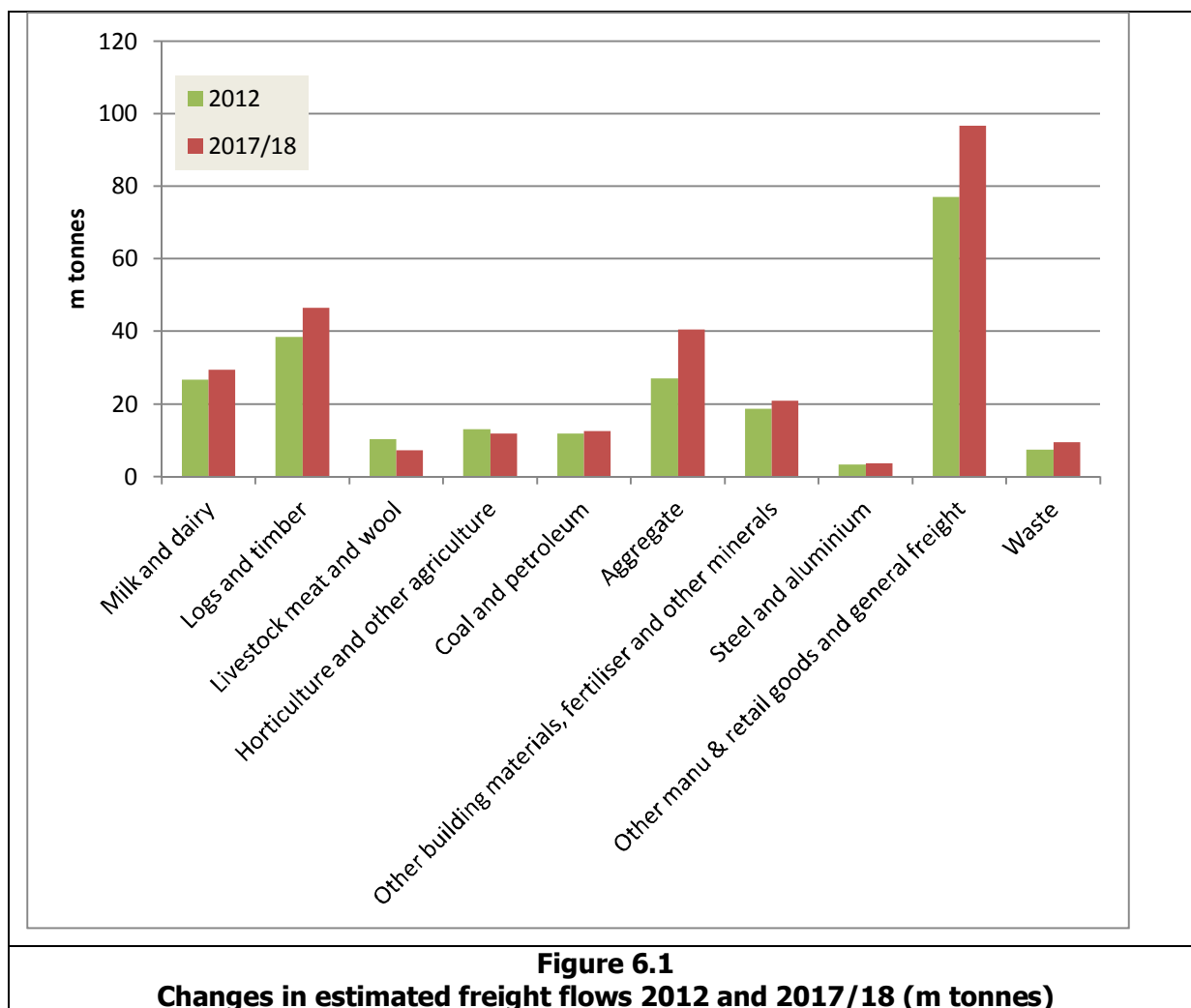
		Destination														
		Northland	Auckland	Waikato	Bay of Plenty	Gisborne	Hawke's Bay	Taranaki	Manawatu-Wanganui	Wellington	TNM	West Coast	Canterbury	Otago	Southland	Total
Origin	Northland	11.9	1.7	0.1	0.8	0.0	0.2	0.1	0.0	0.3	0.3	0.0	0.7	0.3	0.2	16.6
	Auckland	1.2	61.8	4.3	2.2	0.2	0.6	0.7	1.7	1.4	0.4	0.1	1.1	0.4	0.2	76.3
	Waikato	0.1	3.5	24.2	7.3	0.0	0.1	0.4	0.1	0.1	0.0	0.0	0.1	0.0	0.0	36.0
	Bay of Plenty	0.1	2.9	2.7	18.9	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.3	0.0	0.0	25.4
	Gisborne	0.0	0.1	0.1	0.1	4.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	5.0
	Hawke's Bay	0.0	0.4	0.1	0.4	0.2	7.5	0.1	0.6	0.1	0.0	0.0	0.1	0.0	0.0	9.4
	Taranaki	0.1	0.3	0.2	0.4	0.0	0.2	5.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	7.4
	Manawatu-Wanganui	0.0	0.5	0.1	0.2	0.0	1.6	1.7	7.2	2.1	0.0	0.0	0.1	0.0	0.0	13.5
	Wellington	0.0	1.0	0.1	0.0	0.0	0.1	0.0	1.1	8.8	0.0	0.0	0.1	0.0	0.0	11.2
	TNM	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	8.2	0.1	0.5	0.0	0.0	9.3
	West Coast	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.7	0.0	0.0	3.1
	Canterbury	0.0	0.7	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.9	0.7	39.2	1.1	0.4	43.6
	Otago	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	7.7	1.3	9.9
	Southland	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.9	9.7	12.1
	Total	13.5	73.5	32.0	30.6	4.9	10.7	8.5	11.5	13.1	9.9	2.2	44.9	11.5	11.9	278.7

6 Changes from 2012

The flows estimated for 2017/18 have been compared with those estimated for 2012 in the previous NFDS and these are set out in Table 6.1 and summarised in Figure 6.1.

Reference source not found.

Table 6.1			
Changes in estimated freight flows 2012-2017/18 (m tonnes)			
Commodity	2017/18	2012	Growth 2012-2017/18
Liquid milk	22.8	21.1	8%
Manufactured dairy	6.6	5.7	17%
Logs	36.5	29.3	25%
Timber products	10.0	9.2	8%
Waste	9.4	7.4	28%
Wool	0.3	0.3	-21%
Fish	0.4	1.1	-62%
Livestock	5.6	8.5	-34%
Meat and meat by-products	1.3	1.4	-6%
Horticulture	5.9	5.4	9%
Other agriculture	5.5	6.5	-16%
Coal	3.5	3.7	-7%
Petroleum	9.1	8.2	12%
Limestone, cement, fertiliser	10.2	11.0	-17%
Concrete	9.8	7.0	41%
Aggregate	40.5	27.0	50%
Steel and aluminium	3.6	3.3	8%
Other minerals	1.0	0.7	48%
Manufacturing, retailing and general freight	96.7	77.0	26%
Total	278.7	236.2	18%



The changes in the estimated flows between the two periods reflect three main components:-

- Changes in the volumes produced
- Changes in the methods used to move the goods along the supply chain
- Better understanding of the steps in the supply chain with the availability of new data.

The largest increases recorded are for manufactured, retail and general goods, aggregate and logs. For logs, the volumes harvested have grown strongly, for aggregates there has been an increase in production but there is also better understanding of the volumes actually produced which has also increased the total estimated. The strong growth in aggregate is supported by the increases in ready mix concrete production.

The growth in manufacturing, retail and general freight reflects all three types of changes with an increase in the underlying volumes of goods handled, particularly supported by the increases in imports, changes in the methods of distribution with more complex supply chains and a better understanding of the freight patterns using data that was not available for earlier studies. A generally better understanding of freight patterns is also reflected in the revision of the estimates of freight tonne-kms for 2012 by the Ministry of Transport in their freight vindicators.

Apart from these commodities, the changes in the volumes transported have typically been small.

Within the primary agricultural sector, with the exception of logs, flows in 2017/18 are similar to or below those estimated for 2012. In general this reflects:-

- moderate growth in the production of milk which appears to have reached a plateau towards the end of the period up to 2017/18
- a continuing declining production of meat products
- moderate growth in volume terms for the horticultural sector although accompanied by strong growth in exports
- a continuing decline in the volumes of wool and fish

For livestock the decline probably reflects a better understanding of the movement patterns coupled with a generally static underlying demand, reflecting the position for milk and meat.

For coal the decline reflects both a sharp reduction in exports and some decline in domestic use.

For other commodities the changes reflect small changes in underlying demand coupled with better understanding of the supply chains.

7 Future forecasts

7.1 Introduction

Forecasts of future demand have been made for the supply driven commodities in the NFDS namely:-

- Liquid Milk
- Manufactured dairy products
- Logs (but only in terms of regional supply)
- Wool
- Fish
- Livestock
- Meat and meat products
- Horticulture
- Other agriculture

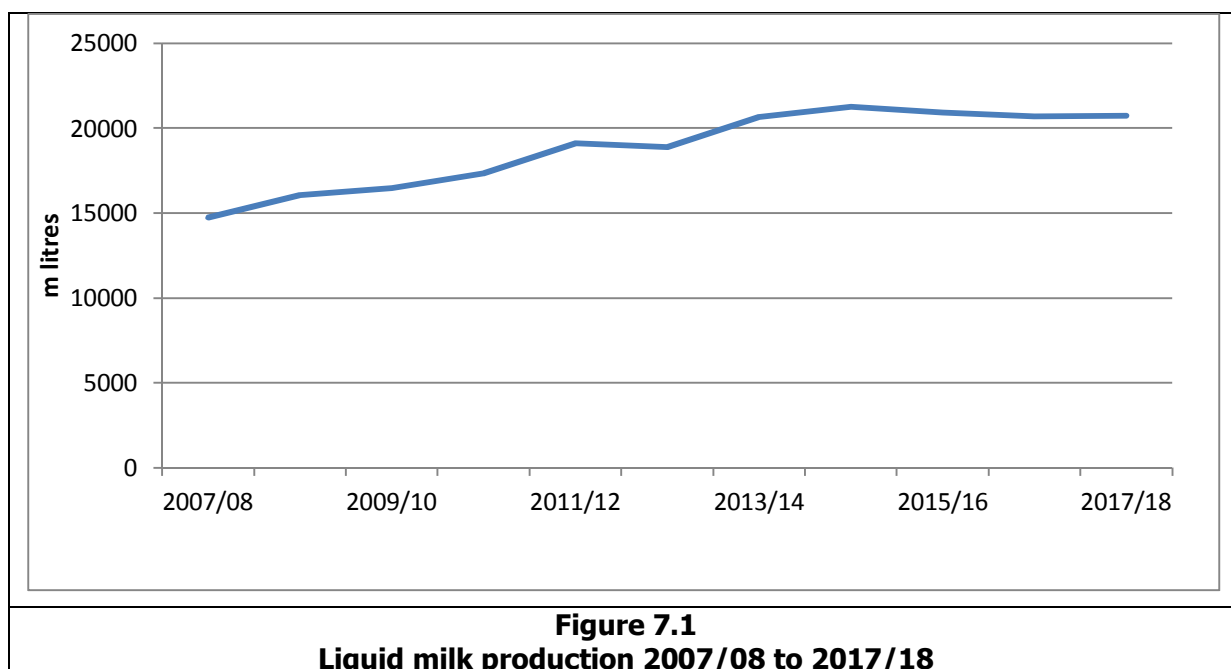
These forecasts have been made for 2022/23, 2032/33, 2042/43, 2052/53. It needs to be recognised that there are considerable uncertainties in these forecasts especially where they are underpinned by exports to overseas markets where demands may be volatile. This may be particularly the case for dairy products and logs where recent experience has highlighted the potential for fluctuations in demand which may implications across the freight sector.

There are considerable inter-relationships between these forecasts with milk and meat production being drivers for other commodities in particular manufactured dairy products, wool, livestock and other agriculture (which includes a commodities used for animal feed).

It should be noted that no forecasts have been made for demand-driven commodities. These are produced directly by the Freight Outlook Model reflecting growth in a number of economic variables including population, regional GDP and world GDP.

7.2 Liquid Milk

The volumes of milk produced over recent years are set out in Figure 7.1.



Although there has been some growth compared to the position in 2011/12, almost all this increase occurred in the first two years of the period and subsequent volumes have been fairly stable with little or no growth recorded since 2013. This position is largely mirrored at a regional level and details of this are set out in Table 7.1.

Table 7.1					
Milk production by region over recent years					
Region	Milk production (m litres)			Growth (per cent)	
	2011/12	2015/16	2017/18	2011/12-2015/16	2015/16-2017/18
Northland	1014.4	1034.4	997.3	2.0%	-3.6%
Auckland	430.1	443.8	405.5	3.2%	-8.6%
Waikato	5202.5	5352.7	5275.4	2.9%	-1.4%
Bay of Plenty	1338.6	1396.4	1361.6	4.3%	-2.5%
Gisborne	15.7	19.4	18.5	23.5%	-4.5%
Hawke's Bay	189.4	189.4	194.3	0.0%	2.6%
Taranaki	1890	1968.1	1825.8	4.1%	-7.2%
Manawatu-Wanganui	1298.8	1345.7	1291.6	3.6%	-4.0%
Wellington	301.1	290.3	275.4	-3.6%	-5.1%
<i>Total North Island</i>	<i>11680.6</i>	<i>12040.2</i>	<i>11645.6</i>	<i>3.1%</i>	<i>-3.3%</i>
TNM	287	312.3	282.5	8.8%	-9.5%
West Coast	538.8	573.5	540.1	6.4%	-5.8%
Canterbury	3445.9	4380.7	4426.7	27.1%	1.0%
Otago	994.9	1134.8	1177.7	14.1%	3.8%
Southland	2181.4	2472.6	2650.9	13.4%	7.2%
<i>Total South Island</i>	<i>7448</i>	<i>8873.9</i>	<i>9078.0</i>	<i>19.1%</i>	<i>2.3%</i>
Total	19,128.60	20914.1	20723.5	9.3%	-0.9%

Source: Consultants estimates based on Livestock Improvement Coordination data in Dairy Statistics NZ

For almost all the country, production has fallen or remained flat since 2015/16. The only exception to this has been in the south of the South Island. There, growth in Otago appears to be tailing off with only Southland recording sustained rates of growth, although with the stricter environmental controls proposed with the Southland Water and Land Plan and general constraints on the industry these are again expected to decline.

The national position reflects a rather unstable dairy price coupled with pressures to minimise the environmental impact of the industry. Discussions with members of the industry have suggested that this trend is likely to continue with farmers to some extent concentrating on producing higher value outputs while keeping the volumes of milk either constant or possibly declining.

For the future we have taken the view that that milk production across the country as a whole will remain broadly stable, which would be coupled with a move towards higher value products. This would represent a continuation of existing trends and would reflect the growing environmental pressure against increased production. Over the period to 2022/23 this would be achieved with small increases in the South Island but at a declining level being offset by small reductions in output further north. Beyond 2022/23 we have forecast that output by region would remain constant.

In more detail for the period up to 2022/23, for Otago and Southland we are predicting a continuation of current growth but reducing towards the end of the period. For Otago this would give 2022/23 flows about 5 per cent higher than at present. For Southland where growth over the short term is likely to be stronger, we have estimated an increase of about 12 per cent up to 2022/23. For Canterbury we have assumed that flows in 2022/23 would be at their present levels. These increases would be offset by declines elsewhere with output declining by about 1 per cent to 2022/23. Beyond this date, the flows for all regions are assumed to remain stable.

This would give the forecast levels of production set out in Table 7.2.

Table 7.2					
Forecast milk production by region (m litres)					
Region	Milk production (m litres)				
	2017/18	2022/23	2032/33	2042/43	2052/53
Northland	997	1000	1000	1000	1000
Auckland	406	400	400	400	400
Waikato	5275	5150	5150	5150	5150
Bay of Plenty	1362	1350	1350	1350	1350
Gisborne	19	0	0	0	0
Hawke's Bay	194	200	200	200	200
Taranaki	1826	1800	1800	1800	1800
Manawatu-Wanganui	1292	1250	1250	1250	1250
Wellington	275	250	250	250	250
<i>Total North Island</i>	11646	11400	11400	11400	11400
TNM	282	300	300	300	300
West Coast	540	550	550	550	550
Canterbury	4427	4450	4450	4450	4450
Otago	1178	1250	1250	1250	1250
Southland	2651	2900	2900	2900	2900
<i>Total South Island</i>	9078	9400	9400	9400	9400
Total	20724	20800	20800	20800	20800

7.3 Manufactured dairy products

The forecasts of movements of manufactured dairy products follow much the same pattern as for liquid milk, with some growth over the short-term to 2022 but then stable over the longer term

7.4 Logs

In developing the forecasts of the logs likely to be harvested in the future, we have reviewed the predictions of log production made regularly by MPI in the Wood Availability Forecasts. These are produced for each of the Wood Supply Regions and the last round of these was published in 2015. The forecasts look at the potential availability of logs based on the ages of the forests in each region and then consider alternative harvesting strategies. For this, the forests are divided into two broad ownership groups:-

- the forests controlled by the large plantation owners who have fairly well defined harvesting strategies aiming to generate a broadly level supply of logs and
- the forests owned by smaller plantation owners whose future harvesting strategies are not well defined and who may take the opportunity to bring forward the harvesting of logs before their optimum age when conditions are considered favourable or alternatively delay harvesting when short-term conditions may be deemed to be less favourable.

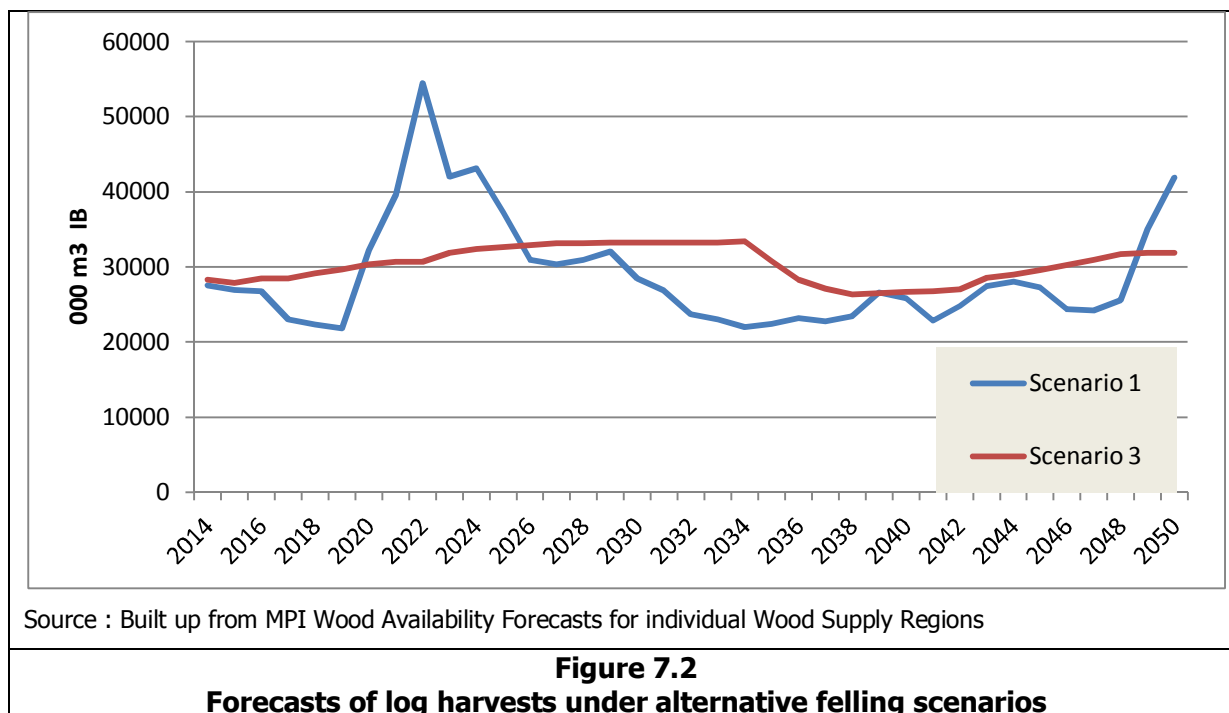
In the Wood Availability Forecasts, four scenarios are presented for radiata pine based upon different harvest assumptions. Scenarios 1 and 3 have been selected in this analysis to illustrate the impacts of the basic alternative felling scenarios:-

- Scenario 1 is when the smaller forest owners are assumed to harvest their forests when these reach an optimum age which results in volatile harvests over time reflecting the years when the forests were planted
- Scenario 2-4 are when the total volumes harvested are based on the assumption of more stable patterns over time reflecting possible constraints on the felling and transport of the logs.

For our analysis we have considered Scenario 1 as the unconstrained option and Scenario 3 as representing a more constrained case. Scenario 3 was used as the basis of forecasting for the previous NFDS.

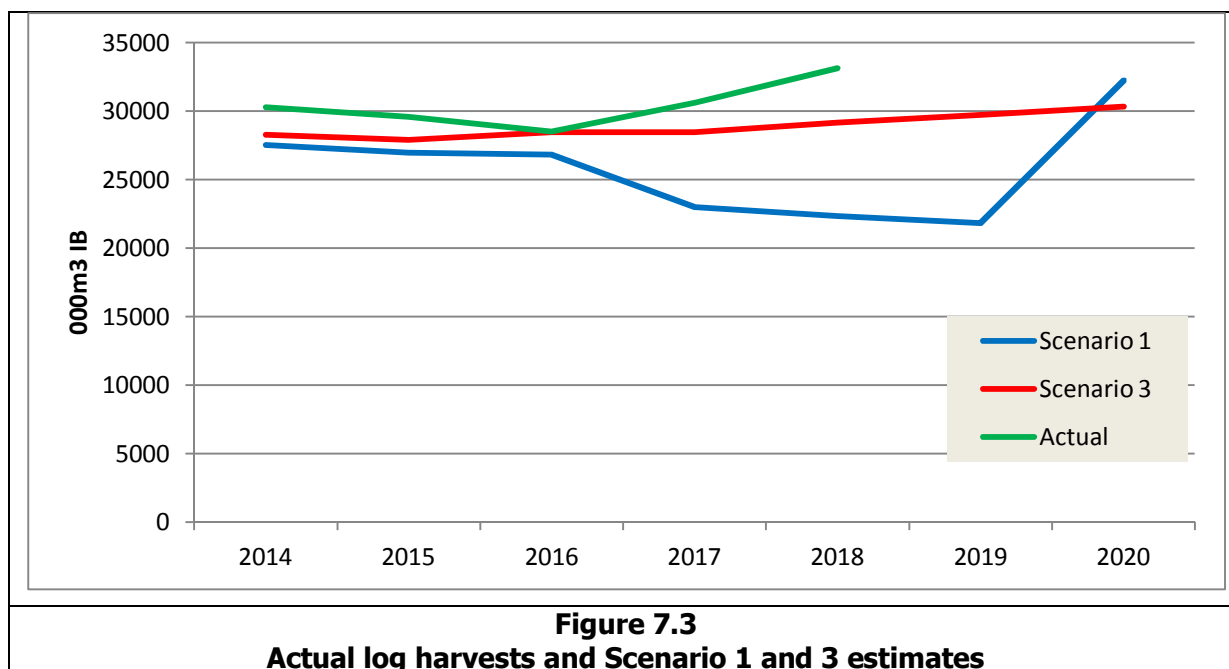
In both cases the harvests by the large scale owners are assumed to be the same with a broadly stable path over time.

The two scenarios give different forecasts for the future as can be seen in Figure 7.2.



The figure highlights the more volatile supply position for Scenario 1 compared to the more stable position for Scenario 3 even though this latter displays a significant drop in production in the mid 2030's.

However because of favourable pricing and transport conditions in recent years, the volumes actually harvested have been substantially above the forecasts even for the more optimistic Scenario 3. This can be seen in Figure 7.3.

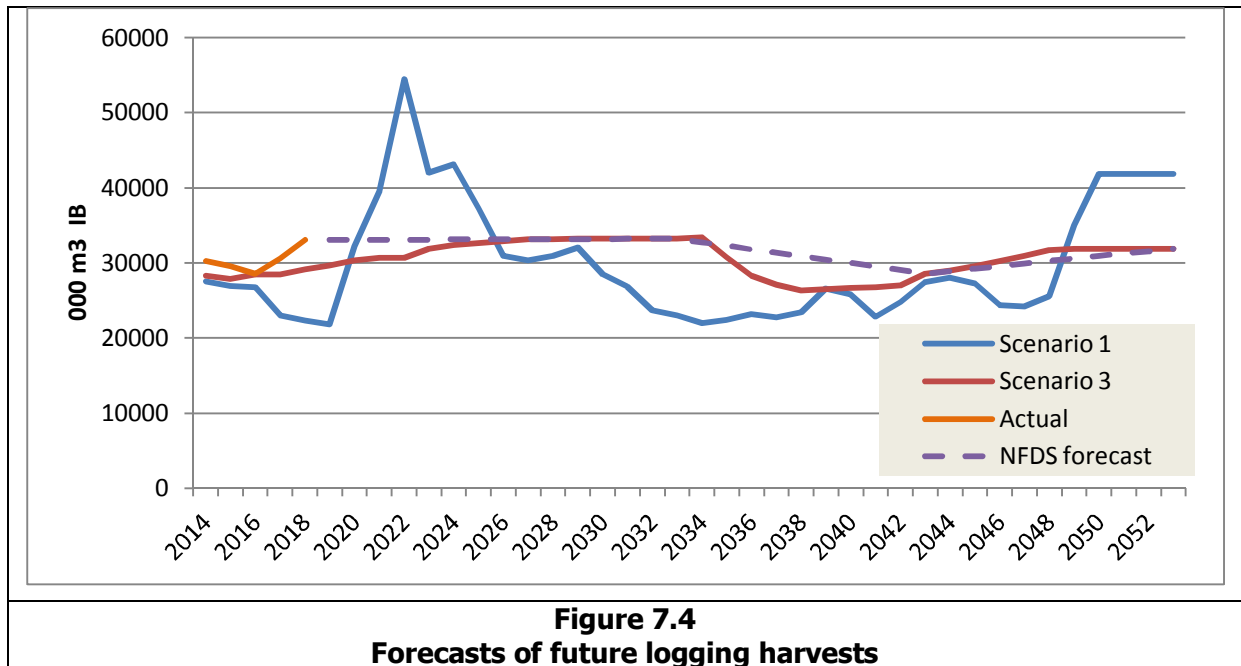


There is therefore an issue as to the extent to which this rapid growth is likely to continue and the level of harvesting which is likely to be achieved especially over the short term.

Discussions with industry stakeholders have suggested that although volumes have increased rapidly over recent years, there are a growing number of limitations on the scale of the logging industry including both the capacity to fell the trees, the availability of domestic transport and infrastructure capacity constraints. As a result, the current levels of output may represent a position at or near the maximum volumes that can be harvested particularly over the short term.

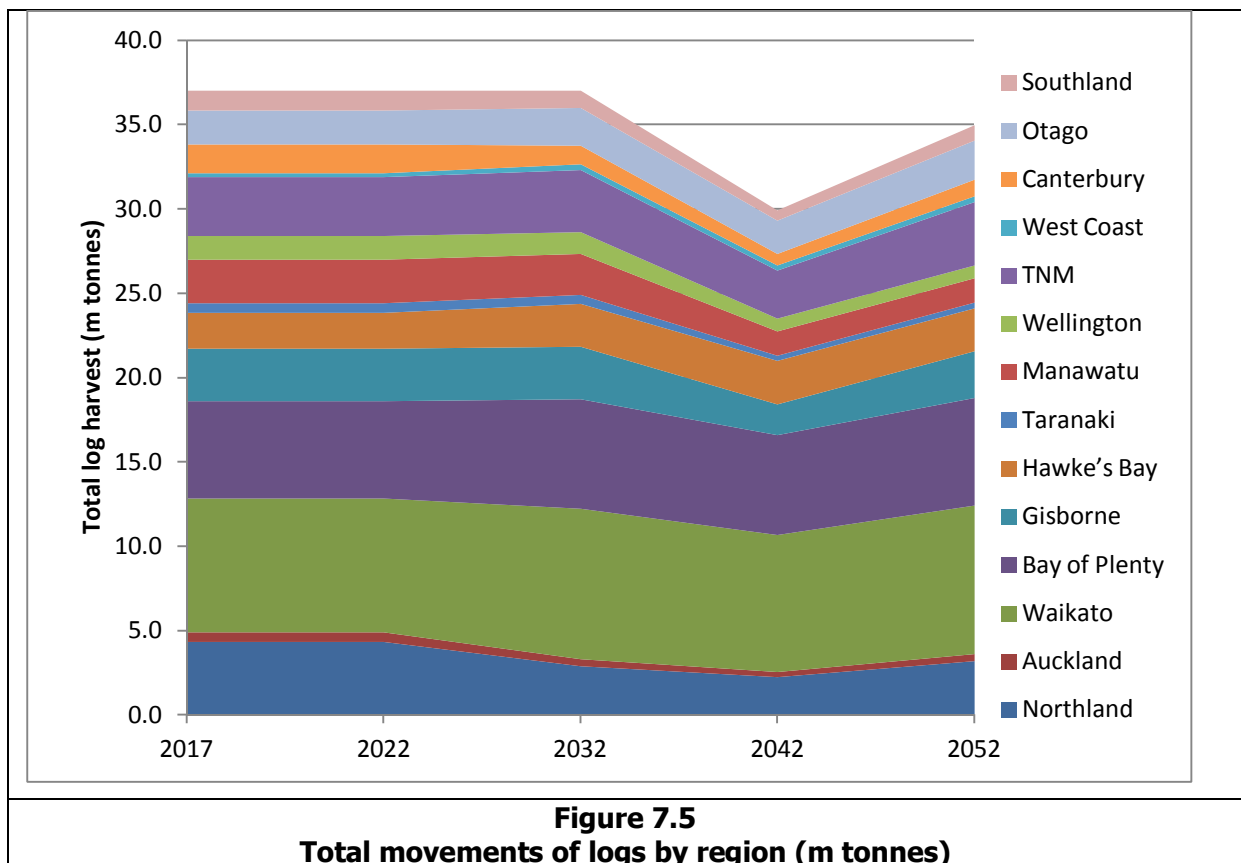
For our forecasts we have therefore assumed that the current harvesting levels are broadly maintained to 2022/23. This would give a level similar to the Scenario 3 forecast for that year. For 2032/33 we have assumed a forecast in line with that for Scenario 3. This reflects the high potential availability of logs in the mid 2020's (identified with Scenario 1) being harvested in a managed fashion taking into account the capacity likely to be available to the industry. For 2042/3 we have also assumed a forecast in line with Scenario 3, although for this year the two Scenarios produce similar forecasts. For 2052/3 we have also assumed a forecast in line with that for Scenario 3, although there is the potential for this to be higher reflecting the current level of tree planting.

The NFDS forecasts that result compared to the current levels of harvesting and the forecasts for Scenarios 1 and 3 are set out in Figure 7.4.



While we have shown the growth between the forecast years as straight lines, we recognise that there is the potential for these to fluctuate on a year by year basis.

Using the approach to the total national forecasting set out above, forecasts have also been made of the movements of logs at a regional level and these are set out in Figure 7.5. These totals reflect the movements of residues and chips used in the manufacture of board and pulp and paper and also double handling associated with the movement by rail.



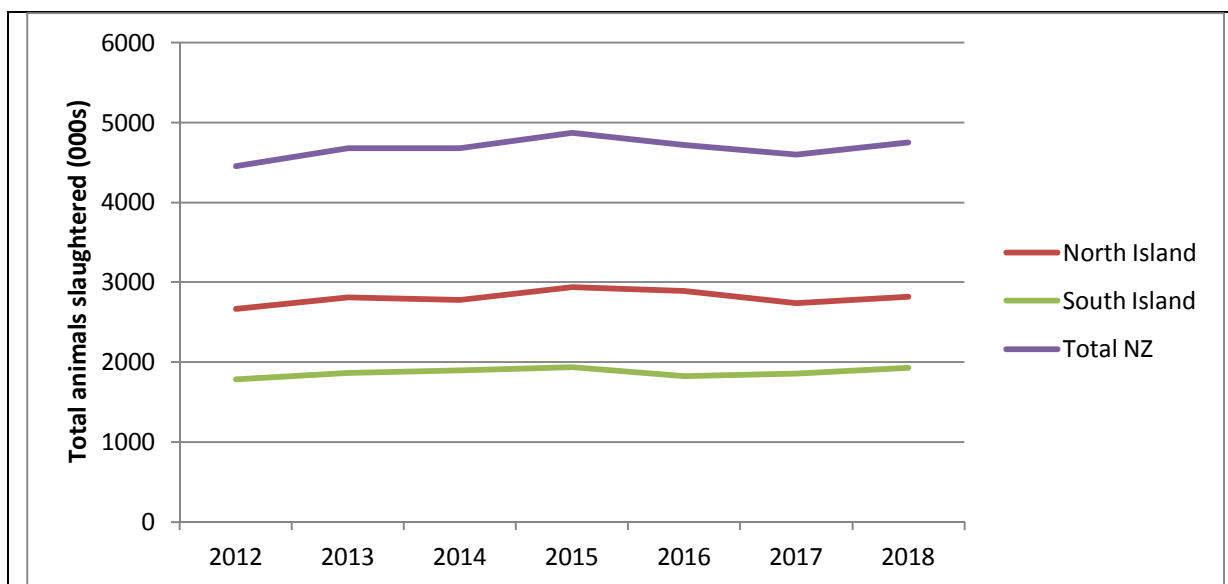
With these forecasts the total volumes moved remain broadly unchanged from present day totals up to 2032/33, before declining in 2042/3, reflecting the reduction in the numbers of trees planted in recent years. There is subsequently forecast to be growth to 2052/53, reflecting the possible impacts of the Governments "One Billion Trees" objective.

The forecast flows of logs that result including an allowance for the doubling handling of logs handled by rail and the movements of residues and chips required for domestic production are set out in Table 7.3.

Table 7.3					
Logging traffic by region (m tonnes pa)					
Region	2017/18	2022/23	2032/33	2042/43	2052/53
Northland	4.3	4.3	2.9	2.2	3.2
Auckland	0.6	0.6	0.4	0.3	0.4
Waikato	7.9	7.9	8.9	8.1	8.8
Bay of Plenty	5.8	5.8	6.5	5.9	6.4
Gisborne	3.1	3.1	3.1	1.8	2.8
Hawke's Bay	2.1	2.1	2.6	2.6	2.6
Taranaki	0.6	0.6	0.5	0.3	0.3
Manawatu	2.6	2.6	2.4	1.4	1.4
Wellington	1.4	1.4	1.3	0.8	0.8
TNM	3.5	3.5	3.7	2.9	3.8
West Coast	0.2	0.2	0.3	0.3	0.3
Canterbury	1.7	1.7	1.1	0.7	1.0
Otago	2.0	2.0	2.2	2.0	2.3
Southland	1.2	1.2	1.0	0.6	0.9
Total	37.0	37.0	37.0	29.9	35.0

7.5 Meat and Meat By-products

The production of meat and meat products in volume terms has remained broadly stable over recent years and the volumes slaughtered are set out in Figure 7.6.



Source : Statistics NZ

Figure 7.6
Total animals slaughtered 2012-2018

While these show some fluctuation from year to year, the general trend is for volumes to remain broadly stable.

This is repeated in the patterns of export flows, the major market for the meat industry and the position over recent years is set out in Figure 7.7.

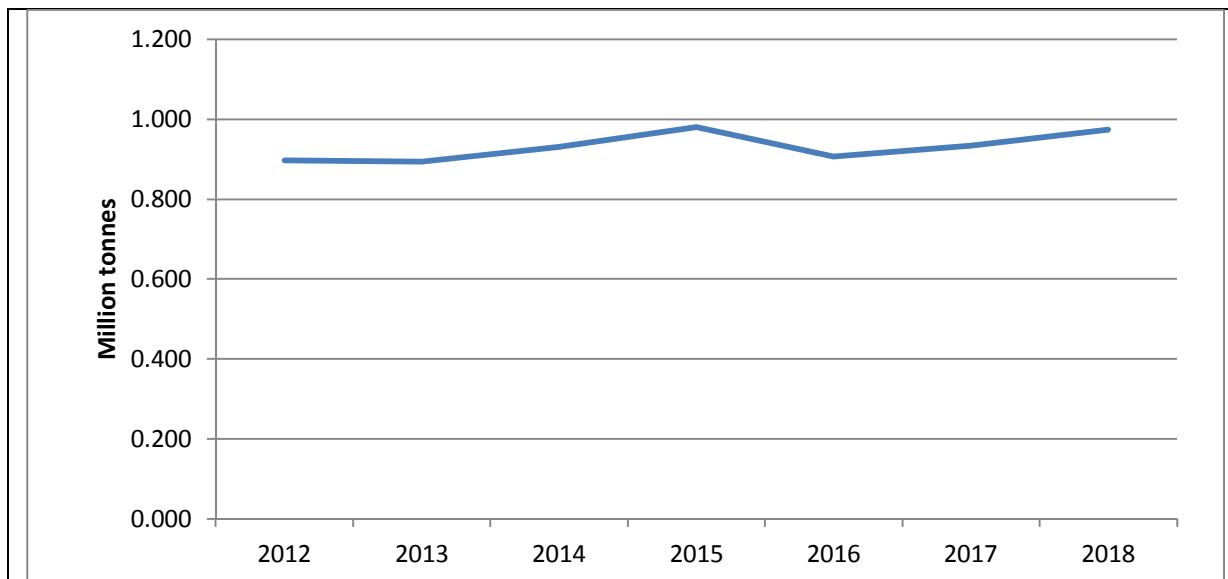


Figure 7.7
Total exports of meat and meat products (m tonnes)

Again while there have been fluctuations from years to year the overall totals have been broadly stable. As in the case of dairying, the industry is attempting to develop higher value products, particularly with a greater emphasis on the export of chilled meat products rather than the more traditional frozen products, so export earnings would improve while the overall volumes remain broadly unchanged.

For the future therefore it has been assumed that the levels of production and export remain broadly stable.

7.6 Livestock

In line with the forecasts of stability in meat and dairy, the forecast for livestock is also for no growth.

7.7 Fish and wool

No significant growth is expected for the movement of fish and wool in future years

7.8 Horticulture

The growth in horticultural output for the period from 2012 to 2017/18 is set out in Table 7.4

Table 7.4			
Changes in horticultural production by region 2012-2017/18 (000 tonnes)			
Region	Production in 2012	Production in 2017/18	Growth
Northland	68	71	4.6%
Auckland	265	323	22.0%
Waikato	244	197	-19.3%
Bay of Plenty	341	421	23.5%
Gisborne	156	150	-3.9%
Hawke's Bay	494	454	-8.2%
Taranaki	2	2	6.2%
Manawatu	148	122	-17.6%
Wellington	11	18	64.0%
TNM	411	463	12.7%
West Coast	0	0	
Canterbury	451	436	-3.3%
Otago	51	59	14.8%
Southland	23	34	46.8%
Total	2665	2750	3.2%

Overall horticultural production volumes in 2017/18 are slightly higher than those estimated for 2012, although there have been some changes in the patterns of regional production. To some extent these are reflected in the changes in export volumes which are set out in Table 7.5.

Table 7.5			
Changes in the exports of horticultural products 2012-2017/18 (m tonnes)			
	2012	2017/18	Change
Auckland Airport	0.02	0.02	0.00
Auckland Seaport	0.11	0.13	0.03
Christchurch Airport	0.00	0.00	0.00
Christchurch Seaport (Lyttelton)	0.08	0.07	-0.02
Dunedin Seaport	0.02	0.02	0.00
Gisborne	0.03	0.02	-0.02
Invercargill Seaport (Bluff)	0.00	0.00	0.00
Napier	0.26	0.36	0.10
Nelson	0.04	0.08	0.05
Tauranga Seaport	0.63	0.66	0.03
Timaru	0.00	0.02	0.02
Wellington Seaport	0.01	0.01	0.00
Whangarei	0.01	0.01	0.00
Total	1.21	1.40	0.19

Exports have increased by about 15 per cent over the period somewhat faster than the increase in production and indeed the total volume of exports has increased faster than the volume of production. To some extent the possible shortfall in availability to the domestic market has been met by increased imports although the growth has been relatively small and probably represents products that are different to those produced locally. The position that appears to result is that in recent years in volume terms overall production and exports have been fairly flat, although this has been accompanied by more substantial increases in the value of exports with new crop varieties.

However in contrast to the limited growth in production experienced over recent years, the most recent SOPI report⁵ suggests that more substantial growth may be expected for export markets with kiwifruit and apples expected to grow by 20 per cent in volume terms over the period to 2023. For our forecasts we have assumed that this growth in export volumes will be sustained over the future although at a diminishing rate. Given the rapid development of other fruit crops such as avocados we have assumed that the this high rate of growth for apples and kiwifruit will also apply to other types of fruit, but that exports of vegetable products will remain broadly constant over time.

Production for the domestic market is assumed to grow in line population.

Putting these forecasts together gives the following total movements of horticultural products (including movements along the supply chain as follows:-

Table 7.6	
Estimates and forecasts of movements of horticultural products (m tonnes)	
Year	Estimated/forecast movements (m tonnes)
2017/18	5.70 (Estimated)
2022/23	6.14
2032/33	6.79
2042/43	7.34
2052/53	7.76

⁵ Situation and Outlook for Primary Industries June 2019 MPI

7.9 Other agriculture (including grain)

Much of other agriculture is driven by the requirements of the cattle herd in New Zealand, with PKE and a large proportion of the cereals production being used for feedstock. Our forecasts for this sector have suggested that there will be little growth in the overall size of the herd, impacting on the demand for the different types of feedstock. In addition, the use of PKE is likely to reduce, reflecting environmental concerns and also the impact that the use of this has on the nature of the milk produced. To some extent reductions in PKE may be met by the increased use of grain, although given the significant share currently imported it is likely that much of this increased demand will be met from overseas sources, and the levels of imports of animal foods overall may not change significantly.

Other components of other agriculture include sugar, where again there will be pressure to limit its use because of growing concerns about obesity in New Zealand.

Overall therefore we forecast that the volumes of Other Agricultural products will remain much the same as at present, although again with the potential for year to year fluctuations.

7.10 Overall Assessment

For the majority of primary commodities for which we have produced forecasts, the potential for growth is limited and in many cases we are predicting broadly stable or even declining flows over time. The general position is summarised in Table 7.7 with a more detailed assessment in Table 7.8 and Figure 7.8

Table 7.7 Summary of future forecasts	
Commodity	Forecast
Milk	Generally stable over future but with limited growth to 2022/23
Dairy products	Generally stable over future but with limited growth to 2022/23
Logs	Stable over immediate future but declines and subsequent growth over the period to 2052/2
Wool	No growth forecast
Fish	No growth forecast
Livestock.	No growth forecast
Meat and meat y-products	No growth forecast
Horticulture	Growth over period to 2052/53
Other agriculture	No growth forecast

Table 7.8 Estimates and forecasts of flows of supply-driven commodities (m tonnes)					
Commodity	2017/18	2022/23	2032/33	2042/43	2052/53
Liquid Milk	22.8	22.9	22.9	22.9	22.9
Manufactured Dairy	6.6	6.7	6.7	6.7	6.7
Logs	36.5	37.0	37.0	29.9	35.0
Wool	0.3	0.3	0.3	0.3	0.3
Fish	0.4	0.4	0.4	0.4	0.4
Livestock	5.6	5.6	5.6	5.6	5.6
Meat and Meat Byproducts	1.3	1.3	1.3	1.3	1.3
Horticulture	5.9	6.2	6.8	7.3	7.7
Other Agriculture	5.5	5.5	5.5	5.5	5.5
Total supply driven commodities	84.9	85.8	86.5	79.9	85.4

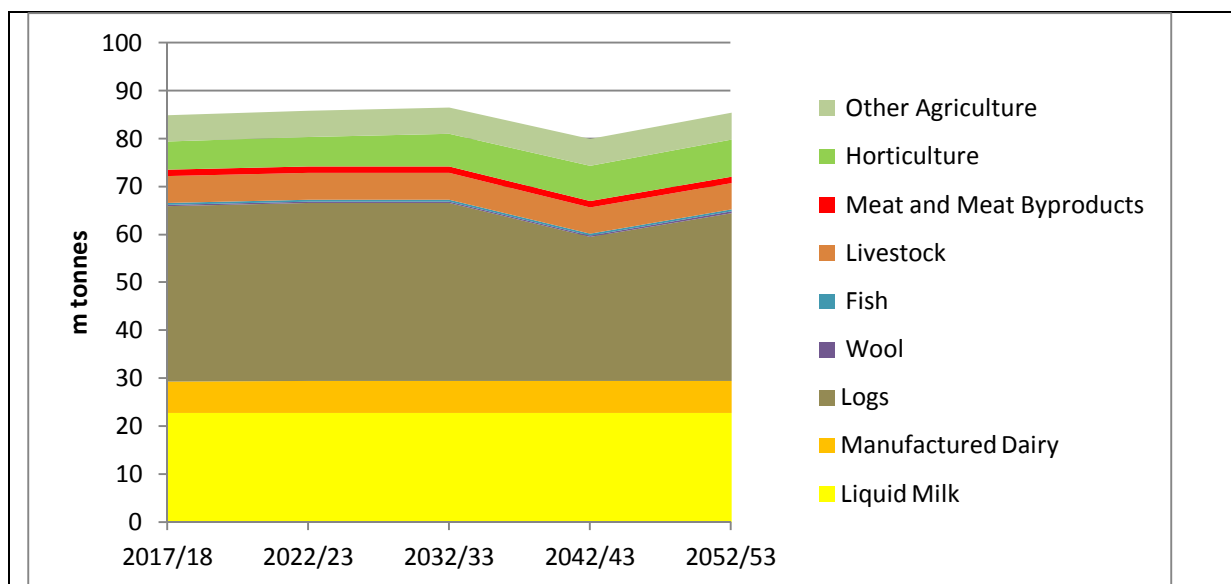


Figure 7.8
Estimates and forecasts of movements of supply-driven commodities
2017/18 to 2052/53 (m tonnes)

In general this reflects both recent trends and also perceptions as to how the sectors might grow in the future. The major uncertainty probably lies with the movement of logs which has grown quickly over recent years but more recently appears to be affected by the constraints in harvesting and in the transport of goods and also most recently in the demand from the largest customer China. While we have forecast that current movement levels will be maintained, reflecting the potential outputs from forests planted in the 1990s, there is the potential for significant variations in this on a year to year and even longer basis.

The heavy dependence of other primary products on export markets in China also increases the uncertainty surrounding the forecasts, since there are a number of contradictory pressures occurring and it is difficult to determine the net outcome, especially in any particular year.

The future for most of the primary product exports in New Zealand appears to lie in increasing the value added associated with these rather than increasing the volume of production. This is a factor which is occurring across a number of sectors possibly most notably in the horticulture sector where a combination of technological development of products and advanced ways of marketing has led to considerable increases in the average value of many of the products exported. Interestingly this appears to be combined with limited growth for the domestic market for which production in recent years in volume terms appears at best to have remained broadly flat.