

# **National Freight Demands Study**

**September 2008**

## **Executive summary**

## **The importance of the freight sector**

The movement of freight plays a vital role in sustaining and supporting economic development and contributes to the high quality of life experienced by New Zealanders. The freight sector is an essential component of export industries, linking areas of production to the ports where goods are sent overseas and its costs form a component of the overall costs of supplying world markets. An efficient freight industry can provide cost-effective forms of transport improving the overall competitiveness of New Zealand exports.

The freight sector also supports a wide range of domestic activities including:

- linking suppliers of raw materials with the industries that use or process their goods
- transporting semi-finished components within the manufacturing sector
- distributing finished products to consumers, including deliveries to the full range of retail outlets
- supporting household activities through for example the transport of waste, household deliveries and removal services.

The movement of freight touches almost all sectors of the economy and household activities and a loss of efficiency for the freight sector can have widespread impacts. In addition the freight sector is a significant consumer of energy resources, accounting for about 43 percent of the energy consumed by the transport sector and a similar proportion of greenhouse gas emissions. In support of its sustainability objectives, the government has set targets for the freight sector seeking to increase the modal shares for rail and coastal shipping in order to reduce the freight sector's energy use and emissions.

The information available on the overall patterns of movements and activities of the freight sector is however very limited. This constrains the efficient use of resources by those providing infrastructure and services and also restricts the government's ability to plan for and manage the sector.

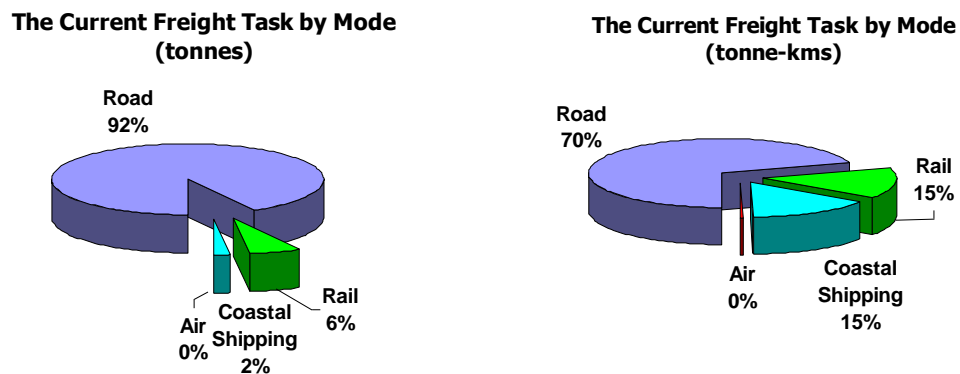
The government recognises the importance of the freight sector and the desire to improve its efficiency and achieve significant changes in modal shares. The National Freight Demand Study was therefore commissioned in early 2008 by the Ministry of Transport (MoT), the Ministry of Economic Development (MED) and Land Transport New Zealand (now the NZ Transport Agency) to look at the current operations of the sector and its future development. The study was undertaken to overcome the limited amount of data on the sector and provide a sound basis for future policies.

This work is set out in the main report of this study.

This study combined interviews and surveys of many of the key participants within the sector with a detailed review of published and unpublished information.

## The total current freight task

The current freight task in terms of tonnes and tonne-kms is summarised in Figure 1.



Source NFDS

**Figure 1**  
**The Current Freight Task by Mode**

Activity in the sector is dominated by the movement of goods by road, although when the length of haul is taken into account in the tonne-km figures on the right, the role of rail and coastal shipping is enhanced with these having a higher share of longer distance movements.

## Approach to the study

In order to examine the freight task in detail, 17 key commodities were identified and separate investigations were undertaken for each of these.

The approach used for the examination of the identified commodities was based on discussions with and collection of information from with a large number of key participants within the freight sector. The information gained from these discussions and interviews was combined with analyses of available statistical material to build up a comprehensive picture of the activities undertaken within the sector.

The steps involved for each commodity were to:

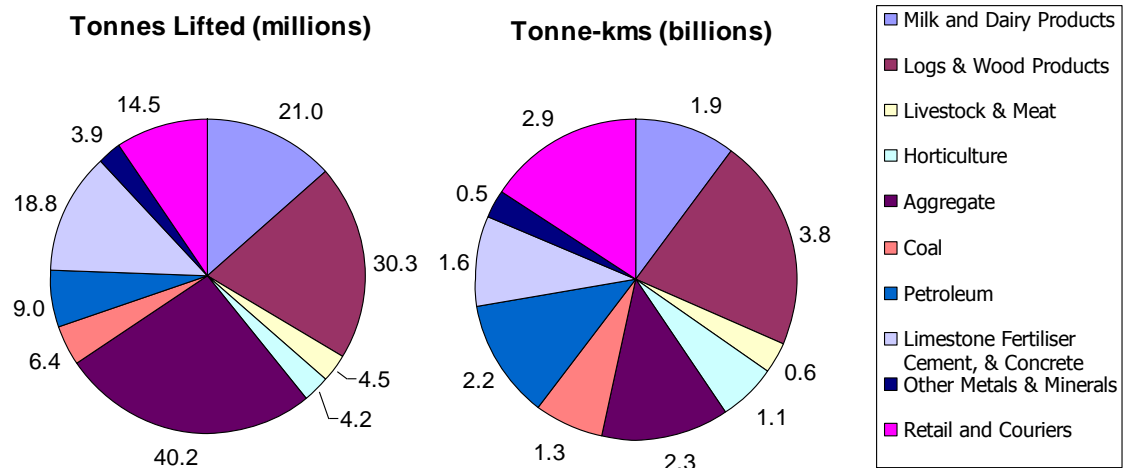
- identify the total size of the market and if possible the regional distribution of activities
- determine the linkages between the areas where goods are produced or imported and those where they are consumed or exported.

The movements for each commodity were then combined and compared with the outline information on total estimated freight flows. An adjustment factor was then determined for movements as a whole and used to estimate total flows by road. These were compared with observed traffic counts to confirm the robustness of the overall findings from the study as well as the detailed analyses. It is estimated that the detailed analyses cover about two-thirds of the total activity within the freight sector.

## The freight task in detail

The individual commodity flows are set out in Table E1 and summarised in Figure E2.

<b>Table E1</b>		
<b>Movements for selected commodity groups</b>		
Selected commodity group	Tonnes lifted (millions)	Tonne-kms transported (billions)
Milk & dairy products	21.0	1.9
Logs & wood products	30.3	3.8
Livestock & meat	4.5	0.6
Horticulture	4.2	1.1
Aggregate	40.2	2.3
Coal	6.4	1.3
Petroleum	9.0	2.2
Limestone, fertiliser, cement & concrete	18.8	1.6
Other metals & minerals	3.9	0.5
Retail & couriers	14.5	2.9
<b>Total</b>	<b>152.7</b>	<b>18.0</b>



**Figure E2**  
**Movements of Key Commodities 2006/07**

Total movements in terms of tonnages are dominated by aggregates, logs and wood products and by dairy products, which combined are estimated to account for about 60 percent of the total movements identified.

While the tonne-km summary shows broadly similar patterns to that for the tonnes lifted, the share of aggregates is much smaller, reflecting the shorter distances travelled for this low value product. The share for retail and couriers is much higher reflecting their nationwide distribution patterns.

The patterns of movements for the selected commodities are set out in Table E2.

	Northland/ Auckland	Waikato/Bay of Plenty	Gisborne/ Hawke's Bay	Taranaki/ Manawatu- Wanganui/ Wellington	Tasman/ Nelson/ Marlborough/ West Coast	Canterbury	Otago/ Southland	Total
Northland/Auckland	33.3	3.5	0.5	1.6	0.4	0.9	0.7	<b>40.7</b>
Waikato/Bay of Plenty	7.1	32.6	0.8	1.5	0.0	0.1	0.0	<b>42.2</b>
Gisborne/Hawke's Bay	0.2	0.3	7.0	0.9	0.0	0.0	0.0	<b>8.4</b>
Taranaki/Manawatu- Wanganui/Wellington	0.3	0.7	0.4	17.4	0.0	0.2	0.0	<b>19.1</b>
Tasman/Nelson/ Marlborough/West Coast	0.2	0.0	0.0	0.3	8.1	3.7	0.2	<b>12.4</b>
Canterbury	0.2	0.2	0.0	0.5	0.5	15.0	1.1	<b>17.5</b>
Otago/Southland	0.0	0.0	0.0	0.0	0.0	0.8	11.6	<b>12.5</b>
<b>Total</b>	<b>41.3</b>	<b>37.2</b>	<b>8.7</b>	<b>22.2</b>	<b>9.0</b>	<b>20.6</b>	<b>13.6</b>	<b>152.7</b>

The flows are dominated by the shorter distance movements within the areas identified, although there are significant volumes of longer distance traffic.

### **Movements by mode**

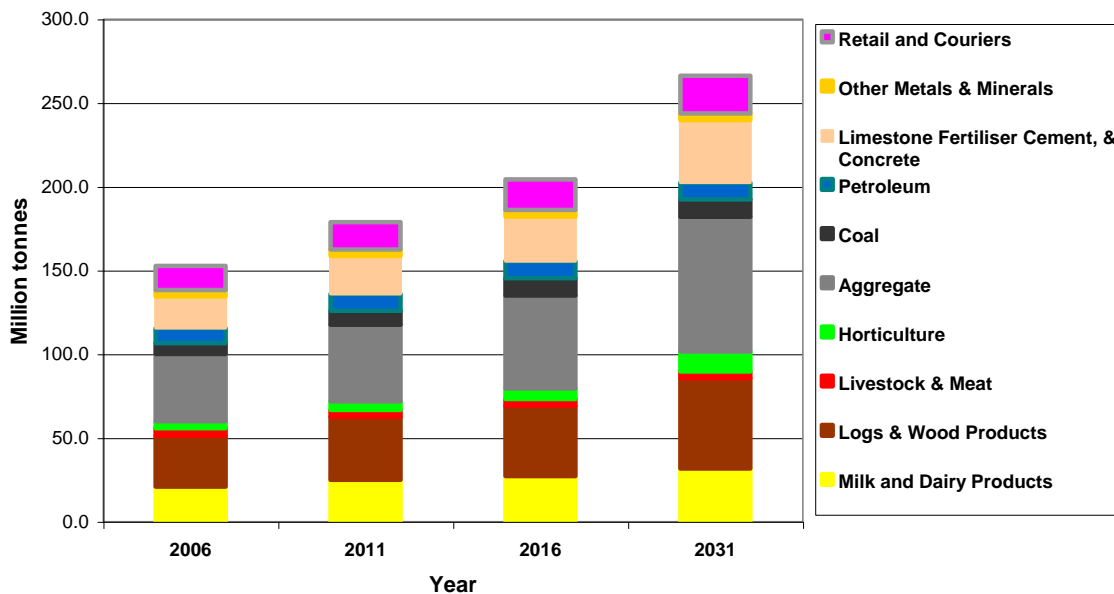
Three main modes are involved in the movement of goods within New Zealand, road, rail and coastal shipping. The estimated shares for each of these for selected commodities set out in Table E3.

Commodity	Total volume (000 tonnes)	Share by mode (%)		
		Road	Rail	Coastal shipping
Liquid milk	17,145	96%	4%	
Dairy products	3,816	59%	41%	
Logs and chips	21,600	94%	6%	
Manufactured timber products	8,750	97%	3%	
Livestock (all by road)	3,624	100%		
Meat	889	57%	43%	
Horticultural products	4,192	93%	7%	
Aggregate	40,188	99%		1%
Coal	6,399	36%	64%	
Petroleum products	9,020	75%		25%
Aluminium and steel	1,853	80%	20%	
Limestone, fertiliser, cement and other minerals	12,187	88%	2%	10%
Concrete (all by road)	8,949	100%		

Modal shares vary significantly by commodity, with rail having a relatively high share of coal, dairy products and meat. Coastal shipping carries significant volumes of petroleum and cement.

## Forecasts for the future

For each of the commodities identified forecasts have been made of future volumes and flows, based on national projections, industry views and the consultant's own analysis. These are summarised in Figure E3.



**Figure E3**  
**Growth in Total Commodities Identified in Terms of Tonnes Lifted**  
**2006/07 to 2031**

Over the period from 2006/07 to 2031 the freight task for the commodities identified is expected to increase by about 70-75 percent in terms of tonnes lifted and in terms of tonne-kms transported. This figure of growth to 2031 can be compared with alternative estimates of growth in tonne-kms of about 70 percent between 2005 and 2020 based on work undertaken by TERNZ and forecasts of growth of up to 100 percent by 2040 based on work undertaken internally by the MOT, and lies broadly between the two.

The freight task is therefore expected to continue to have strong growth, both in response to increases in outputs of basic commodities for which trip lengths are likely to be short and of more sophisticated products which are typically transported longer distances.

## Growth by mode and by region

### Introduction

The forecast growth of the freight task will offer expanded markets for those transporting the goods. Forecasts by mode have been made. These take into account general growth trends for particular commodities identified in the course of the study and some specific opportunities to increase the modal shares of rail and to a lesser extent coastal shipping in commodity movements in which these modes already participate. These do not include the effects of interventions by the government specifically aimed at changing modal shares, although the effects of the Emissions Trading Scheme have been considered. These effects are however likely to be only very limited.

## Forecast growth by rail

The forecast growth in rail freight movements is set out in Table E4.

Product group	2006-07	2031	Growth to 2031
Dairy products inc milk	2.20	4.08	85%
Meat	0.48	0.54	13%
Logs and woodchips	1.29	3.24	151%
Timber, wood products and pulp and paper	1.41	1.75	24%
Horticultural products	0.13	0.42	223%
Other agricultural products	0.17	0.18	6%
Coal	4.07	5.50	35%
Aluminium and steel	0.36	0.36	0%
Chemicals, fertiliser and minerals	0.21	1.38	557%
Food, other manufactured products or not elsewhere specified	3.29	5.61	71%
<b>Total</b>	<b>13.59</b>	<b>23.06</b>	<b>70%</b>

These forecasts would imply that the modal share of rail would remain broadly constant, with the 70 percent increase in rail tonnage being slightly below the overall increase forecast of a growth of about 75 percent. Nevertheless it would represent a very substantial increase on present day flows, representing an annual average increase of about two percent, compared to the current position of broadly constant flows.

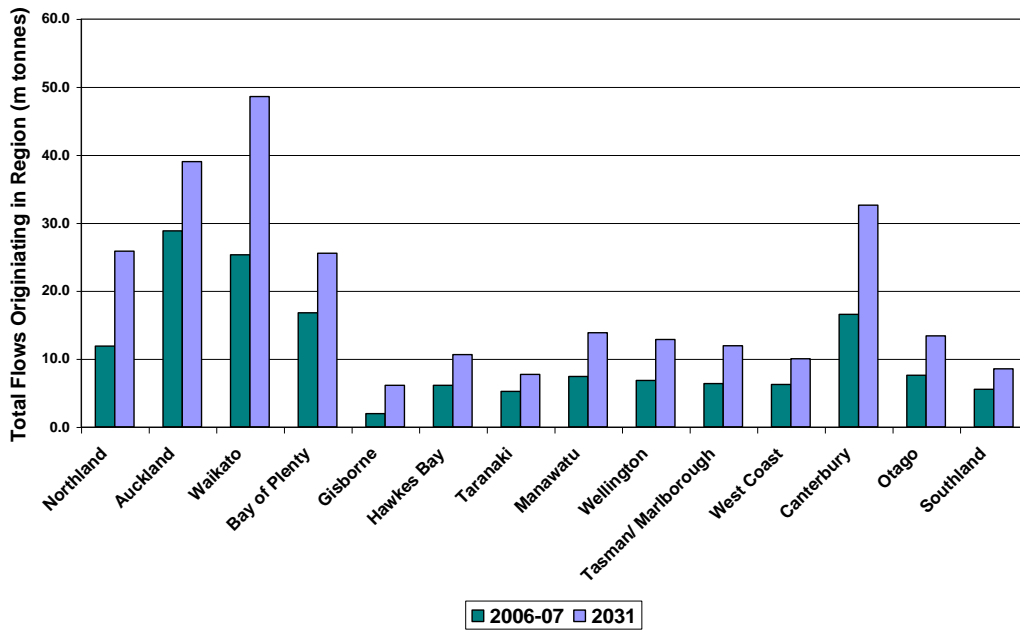
## Forecast growth by coastal shipping

For coastal shipping, the movement of petroleum is likely to grow with the expansion of the refinery at Marsden Point and the movement of cement will be reduced as product is distributed by land within the South Island. For the rest of the commodities handled, which we have classified as general cargo, we have tentatively forecast that this might increase at the same rate as for manufactured goods. Overall this would therefore give forecasts for 2031 of about 8.5-9.0 million tonnes, broadly double those of 2006-07, but again in line with or slightly ahead of the growth of the sector as a whole.

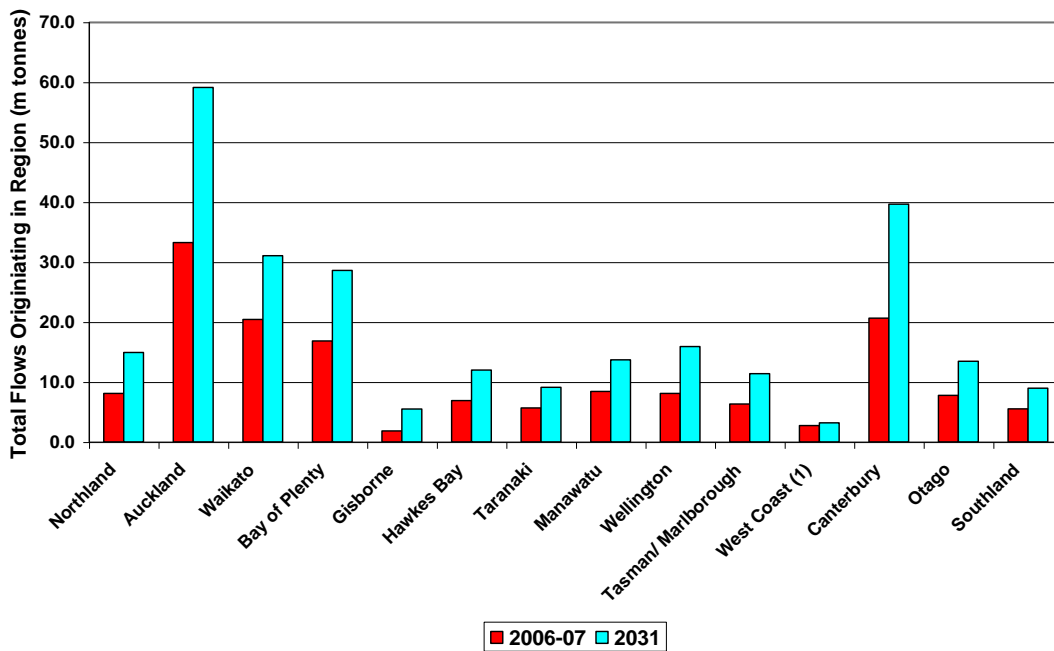
Again this represents a considerable increase from current levels. Our understanding is that coastal shipping movements have been generally constant over recent years.

## Growth by region

The growth of traffic by region for movements originating and terminating in the regions is set out in Figures E4 and E5. In both cases, the figures include movements wholly within the regions.



**Figure E4**  
**Forecast Growth in Freight Traffic Generated in Regions (million tonnes)**  
**2006-07 to 2031**  
**Identified Commodities Only**



**Figure E5**  
**Forecast Growth in Freight Traffic Attracted to Regions (million tonnes)**  
**2006-07 to 2031**  
**Identified Commodities Only**

For the traffic generated by regions, substantial growth is forecast for Waikato and Canterbury regions, reflecting growth in the forestry or dairy industries and in the case of Waikato in the volume of aggregates being produced to serve the needs of the region itself and the neighbouring Auckland region.

For goods attracted to the regions the highest growth is predicted for Auckland, in part reflecting the movement of primary products from Northland and Waikato. The Canterbury region is also forecast to have substantial growth, reflecting the growth of the dairy industry and to a lesser extent of coal traffic from the West Coast.

### **Following on from this freight study**

To make the best use of the data summarised above and presented in the Main Report, it is recommended that the government institutes a programme of regular data collection covering the three main modes used for the transport of freight. This would provide information on emerging trends and would enhance the value of the data already collected, improving its usefulness to those who operate within the freight sector, to the government in its management of the sector and its achievement of sustainability goals and to those who provide the infrastructure and related services necessary to support an efficient freight industry.

### **Acknowledgements**

The successful undertaking of this study has been greatly assisted by the support and advice received from many participants in the freight sector in New Zealand, who have given their time and resources to assist us. These include the operators of transport services by road, rail, and coastal shipping, manufacturers and producers, employers associations and chambers of commerce, port companies and government departments. We would like to acknowledge the contribution these have made to this work and trust that they find it of use in the development of an efficient and sustainable sector able to meet the evolving needs of New Zealand.