Transport's proportion of total costs for New Zealand businesses

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- the steering group members: Sandy Fong (Chair), Marinus LaRooij, Joanne Leung and Nik Vorster
- Steve Meyrick and Professor Lew Evans for peer reviewing the project
- the organisations and people who participated in the interviews and shared their invaluable insights and perspectives.

Abbreviations and acronyms

DC	distribution centre
FIN	Foodstuffs Inbound
GDP	gross domestic product
HPMV	high-productivity motor vehicle
LCV	light commercial vehicle
NZTA	New Zealand Transport Agency
RUC	road user charges

Contents

Executive summary

An efficient transport system is crucial for the New Zealand economy. It facilitates businesses delivering goods to consumers, retail stores and to ports for export, and maintaining their competitiveness. An improvement in the efficiency of the transport system could deliver productivity benefits to the economy as a whole by reducing the cost of transporting goods, services and labour across New Zealand and to international markets.

The purpose of this study was to quantify the proportion of business costs that were attributable to transport in a number of case studies, as the basis for identifying and evaluating the opportunities for reducing those costs. Importantly, some of the findings from these case studies could be more widely applicable to other industries in New Zealand. NERA Economic Consulting, in collaboration with Pinnacle Research and Policy, conducted this research in 2011–12 as one of the economic productivity topics within the NZ Transport Agency's (NZTA) research investment framework.

Three industries were selected as case studies for this project – the logging, flower and grocery industries. They were selected because transport and the associated costs were considered to be important inputs for them. The case studies were selected to cover a range of operating conditions, types of goods and segments of the supply chain, to allow any wider implications for New Zealand businesses to be considered as part of the study.

The study involved a number of in-depth face-to-face interviews with businesses to understand their use of transport, its costs, and any opportunities to reduce transport costs. In addition a data template was developed to collect detailed cost data from the industries. Information from interviews and the data template were used to develop the findings for the study.

Logging industry case study

The logging industry includes the felling of trees and subsequent transport of logs to mills, processing plants, and ports for export. Most logs are transported by third-party transport providers using heavy vehicles. The logging sector was found to have the highest transport costs as a proportion of business costs out of all three industries investigated, ranging between 25% and 30% of business costs and 15% and 25% of revenue. This is significantly higher than previous estimates of the average transport cost for business of 8.8% of total input costs (page 20 of a 2003 Infometrics report, *Generating growth: infrastructure*).

Logs are heavy and indivisible goods that have relatively low value-to-weight ratio. Logs are typically transported locally to mills or ports, and typically by overweight, over-dimension vehicles.

Our study found that transport operations in the logging industry are mostly efficient. The extensive use of third-party contractors ensures that logging companies do not need to invest in managing and operating their own fleet. Most logging companies aim to maintain competitiveness among transport providers by having relatively short contracts of around 2 to 3 years, with a number of transport providers at any one time. To reduce road maintenance costs borne by logging companies, logging companies ensure transport providers make use of central tyre inflation (ie a system that controls the air pressure of each tyre). Rail and vehicle backloading are also used where economically feasible.

We found there could be opportunities to reduce transport costs in the logging industry by:

- addressing impediments for greater use of high-productivity motor vehicles (HPMVs)

- reducing the delays at the port caused by congestion and lack of log storage capacity.

Logging companies identified during interviews that the cost of meeting tighter axle tolerance levels for HPMVs generally outweighs the benefits of using HPMVs, due to the irregularity of log weights and sizes. This could be addressed by reducing load tolerances for HPMVs to bring them in line with general access vehicle requirements, or by developing cost-effective solutions to allow logging companies to adequately manage HPMV load tolerances. In addition, many of the routes that are currently used by logging companies cannot be used by HPMVs. It was recognised that the NZTA, in conjunction with councils and the logging industry, had expended considerable effort on identifying the strategic HPMV routes requiring pavement upgrades and bridge strengthening. That said, it was clear that there was concern about the future programming and funding of this work.

A primary source of transport delays in the logging industry arise from port congestion (resulting in delays in log truck unloading) and log-storage constraints, resulting in logs needing to be stored after harvesting and prior to transport to port. This was identified as a potentially increasingly important issue, as most of the anticipated growth in log production over the next few years is expected to be for export. Port congestion and storage constraints could be reduced by implementing mechanisms to manage unloading delays at ports and examining opportunities to reduce the constraints on their log-storage facilities.

Preliminary estimates suggest the benefits of greater use of HPMVs, combined with reductions in port congestion delays, could be as large as $30 million and $40 million each year.

Grocery case study

The grocery industry involves the manufacture and supply of food, beverages and various other household products. The focus of our case study was the two major New Zealand supermarket chains - Foodstuffs and Progressive Enterprises. Most grocery goods are transported by road, although there is some use of rail and coastal shipping for delivery to distribution centres (DCs) and for transfers between DCs. The transport costs vary significantly within the industry, with transport costs as a proportion of both revenue and operating costs ranging from 1–12%. This range is in line with earlier estimates of the average proportion of transport costs of 8.8% of total input costs.

The grocery industry receives a wide variety of products, ranging from packaged goods that have longer shelf life, to perishable goods such as fruit and bread. The wide variety means that supermarkets can receive up to 10 different trucks delivering stock each day. Suppliers usually deliver stocks to retail stores via DCs or directly, with perishable goods, including milk, bread, and poultry, typically delivered directly to retail store to maintain quality of the products.

Transport operations within the grocery industry are believed by industry to be mostly efficient. There is significant use of backloading for trucks travelling between DCs, retail shops and suppliers. Rail and coastal shipping are also used as low-cost alternatives to road where economically feasible for particular goods. There is also a small but growing use of a 'primary freight' system, where Progressive/Foodstuffs itself arranges the transport of supplier's product. This can improve scheduling, reduce vehicle movements and fuel consumption for Progressive/Foodstuffs, but can have a negative impact on suppliers, particularly importers of grocery products, as it requires additional sorting of goods.

Opportunities to reduce costs in the grocery industry could arise by improving coordination and utilisation of vehicles. For example, we heard that the prevailing 'just-in-time' strategy could have a negative impact on suppliers due to the additional warehousing costs incurred by producers. A reduction in transport costs

might therefore be achieved by ensuring these additional costs were transparent and so were taken into account in logistical decisions. In addition, the greater use of HPMVs could deliver benefits for certain goods in the grocery industry, including the bread industry.

Flower case study

The flower industry includes the growing of flowers and subsequent selling to wholesalers and retailers for delivery to end customers, or transport to air/sea ports for export. The sector is fragmented, with almost 1000 commercial flower growers and numerous wholesalers and retailers. Flowers are mainly delivered by light commercial vehicles (small trucks and courier vans) with the transport requirements met by third-party transport providers and own-fleet vehicles. There was insufficient information to derive the proportion of business costs that were transport costs for the flower industry. That said, for the businesses where some (albeit limited) data was received, transport costs were a relatively small proportion of business costs and revenue compared with the results from the logging and grocery data.

Flowers can be described as a high-value, time-sensitive and fragile good that requires care when transported. The perishable and time-sensitive nature means that flowers need to be delivered to retail shops on close to a daily basis. Retail flower stores typically operate in urban environments and require multiple deliveries to customers per day. The findings for the flower industry can be applied to similar retail industries, including meat retailing, smaller grocery stores, cafes and restaurants, as well as non-grocery retail shores (eg, apparel, appliances, electronics, etc).

In general, our study identified limited opportunities to reduce transport costs in the flower industry. This is likely a reflection both on the characteristics of the industry and the low proportion of transport costs. There is also limited scope to use low-cost transport modes, including rail and shipping, due to the perishable nature of the goods. Our study also highlighted the importance of reducing the impact of road congestion as a contributor to transport costs.

Overall conclusion

Overall, we found that transport operations for the case study industries investigated were mostly efficient, with businesses seeking to reduce transport costs by whatever means within their control. Vehicle backloading and low-cost alternative modes were being used where feasible. That said, we identified a number of policy opportunities to reduce costs for New Zealand businesses, including:

- increasing the use of high-productivity motor vehicles (HPMVs) by continuing to upgrade strategic routes and examining the trade-off between axle tolerance level and the practicalities of industries
- examining the reasons for the shortage of skilled drivers and considering policy options of how to address this
- analysing policy measures to manage road congestion.

Abstract

An efficient transport system is crucial for the New Zealand economy. It facilitates businesses delivering goods to consumers, retail stores and ports for export, and maintaining business competitiveness. The objective of this research was to understand the importance of transport costs as a proportion of total business costs, and examine the opportunities to reduce these costs for New Zealand businesses.

We selected three industries as case studies – the logging, flower and grocery industries – covering different operating conditions and types of goods.

Through interviews and the collection of cost data from businesses in each case study industry, we estimated the transport costs as a proportion of its operating costs and revenue. Transport costs as a proportion of revenue ranged from 15–25% for the logging industry, and 1–12% for the grocery industry. There was insufficient information for the flower industry to estimate transport costs as a proportion of revenue.

We found that most businesses were seeking transport cost savings wherever possible, especially where those costs were within their direct control. However, smaller businesses where transport costs were bundled within delivered goods prices had limited opportunities to manage those costs.

Finally, we identified for further consideration a number of transport policy opportunities that might reduce transport costs for New Zealand businesses.

1 Introduction

Transport is critical to the production of goods and services in any economy, as it facilitates the interactions of businesses and consumers and ultimately provides the means by which economic prosperity flourishes. Transport underpins economic growth and productivity within an economy by enabling goods, services and labour to be transported in a cost-effective way across New Zealand, as well as to international markets.

New Zealand's products, markets, geography and location result in transport costs that are often perceived to be high relative to other countries. For example, in the World Bank Logistics Performance Index, around two-thirds of respondents reported that road and rail transport costs in New Zealand are 'high' or 'very high'. Further, more respondents in New Zealand think road and rail transport costs were high, compared with the UK and the US.[1] In the government's 2025 Taskforce discussions, high transport costs were also identified as an area where New Zealand does not perform well when compared with other countries.[2]

NERA Economic Consulting, in collaboration with Pinnacle Research and Policy (hereafter the 'project team'), were funded by the NZ Transport Agency (NZTA) to conduct research on behalf of the transport sector into the proportion of the total costs for New Zealand businesses that are attributable to transport. The research was undertaken in the period 2011–12.

1.1 Purpose and objectives of the research

The purpose of this study is was to quantify the proportion of business costs that were attributable to transport in a number of case study industries, as the basis for identifying and evaluating the opportunities for reducing those costs.

The detailed objectives of the research were to:

- identify transport's proportion of the total costs for a number of case study New Zealand industries
- identify measures for reducing domestic land transport costs in New Zealand for these case study industries
- provide New Zealand transport decision makers with guidance as to how they might facilitate the adoption and/or implementation of these measures by businesses through policy, regulation, etc.

The focus on industries rather than goods means that the transport cost figures are not comparable between industries because they represent potentially different segments of the supply chain of different goods. However, by focusing on selected case study industries, general insights have been gained on the wider opportunities for reducing transport costs for businesses in New Zealand. That said, there are likely to be particular opportunities specific to every industry, given the characteristics of any particular supply chain and so transport needs.

1 See http://info.worldbank.org/etools/tradesurvey/mode2c-result.asp?showgraph=163&countryID=6&countryID=56&countryID=87&countryID=125&countryID=126&backurl=mode2c.asp

2 See www.2025taskforce.govt.nz/pdfs/fr2t-tsy-ic-sep09.pdf

1.2 Steering group

This research project was guided by the involvement of an external steering group, consisting of individuals from a number of agencies, specifically:

- Sandy Fong, Principal Advisor, NZTA (Chair)
- Marinus LaRooij, NZTA
- Joanne Leung, NZ Ministry of Transport
- Nik Vorster, Auckland Transport.

Throughout this research project we had a number of steering group meetings to obtain feedback, comments and discussion on the research outputs. The project team would like to thank the members of the steering group for their time and helpful comments made throughout this project.

1.3 Report structure

This report is structured as follows:

- Section 2 outlines the research methodology for this project.
- Section 3 discusses the logging industry case study and findings.
- Section 4 outlines the grocery industry case study and findings.
- Section 5 describes the flower industry case study and findings.
- Section 6 summarises the conclusions of the report.
- Section 7 shows the references used in this report and appendix A lists the organisations that were interviewed.

2 Methodology

Obtaining a robust measure of transport costs to business is a complex task, requiring a deep understanding of the transport requirements along a supply chain, and the allocation of transport costs to the various businesses involved in that supply chain. For commodities or goods (ie freight), this includes the transport of raw materials, the transport of inputs to production, and the transport of final goods (and services) to consumers. With respect to services (ie business travel), this includes the transport of people to locations where they can conduct business transactions. Ultimately all of the costs associated with these final and intermediate transport stages along a supply chain are borne by the businesses involved in each stage of the supply chain, before being passed through to customers within final goods or service prices.

Our approach to understanding transport costs for businesses involved:

- identifying a number of case study industries for investigation
- conducting interviews with selected businesses in each case study industry, and relevant industry associations
- collecting data from interviewed businesses on transport costs.

The data collection and interviews allowed us to gain insights on the transport costs relevant to the case study industries, and allowed us to explore the barriers to, and opportunities for, reducing those costs. Our approach allowed us to gain insights into the possible actions and/or interventions that might be required by transport decision makers, transport users and providers in order to achieve the cost-reduction potential.

The following section sets out some of the important definitions and theoretical issues that were involved in this study, followed by a discussion of the approach taken to the selection of case studies and to interviewing and data collection.

2.1 Understanding transport costs to business

Estimating the proportion of transport costs incurred by business requires some consideration of the delineation of those costs between the businesses along a supply chain. This involves considering:

- those businesses along the supply chain that are responsible for, and so control, the incurrence of transport costs
- those businesses along the supply chain that are charged directly and separately for transport-related costs.

For example, the transport of grain by the grower to the grain silo is incurred by the grower, while in contrast, milk transported from farm gate to a factory is incurred by the milk manufacturer (rather than the dairy farmer). In these circumstances the dairy farmer would have lower costs of transport compared with the grain grower, simply as a consequence of the incidence of transport costs along the supply chain.

While the allocation of costs amongst businesses is relatively unimportant for a high-level examination of the total transport costs to business, it does become important when considering where the opportunities

for reducing transport costs arise, based on the party along the supply chain that is responsible for those costs. Our approach focused on those costs that are directly incurred by a business within the case study industry. This means all transport-related costs that are readily identifiable by the business, and not otherwise bundled within the price of a purchased good or service.

Importantly, our approach allowed us to present estimates of the proportion of costs to business, which aligned with that proportion of costs that a business is capable of controlling in some way (eg by changing business systems, or using substitutes that incur lower transport costs). This approach allowed us to readily identify the opportunities for cost reductions through business changes but excluded indirect transport costs that were not readily identifiable by a business.

The exclusion of indirect costs made transport costs less comparable across industries and firms, as the proportion of indirect transport costs could differ substantially. The comparability of the cost figures across industries was further hindered by the limited responses received to the data requests. Case studies were selected to give diversity in industry and operation conditions. However these case studies covered different segments of the supply chain for different goods, making the cost figures less comparable across industry.

In addition, there were a number of different categories of transport costs incurred by business at each stage of the supply chain, for which there were different opportunities for cost efficiencies; namely:

- the transport of goods as an input to production
- the transport of goods to customers (whether wholesalers, retailers or final good customers).

Business-related postal and courier communications costs were not examined as part of this study and may be worth considering in future research.

For each of these categories of transport costs, there were different opportunities for, and barriers to, transport cost reductions, reflecting:

- the scope for reasonable substitutes for the category of transport (eg rail for road-based transport)
- the physical and economic characteristics of the good being transported
- the nature of the supply chain
- the implications for other business costs of changes to the transport supply chain.

An important component of this study was to develop an understanding of the proportion of transport cost by transport cost category (where possible). From this analysis of cost categories and opportunities, an assessment of those opportunities with the most potential (ie likely to deliver the 'biggest bang for your buck') were identified, allowing consideration to be given as to the extent of barriers to the achievement of these transport cost savings.

Another important consideration was the definition of the proportion of transport costs – ie on what basis would transport costs be calculated? The various options included:

- sales revenue
- value added (the difference between the sale revenue and intermediate consumption)
- profit

- production costs.

A high-level summary of the strengths and weaknesses for each approach is provided in table 2.1.

Table 2.1 Metrics for calculating the proportion of transport costs for business

Metric	Strengths	Weaknesses
Sales revenue	Easy to obtain and allows for comparison between industries	Does not provide an indication of the relative importance of transport as an input cost to the business
Value added/profit	Allows for an assessment of the importance of transport cost savings for industry profitability	More difficult to estimate for specific businesses (particularly for value added)
Production costs	Allows for an assessment of the importance of transport cost savings for industry total costs	More difficult to estimate for specific businesses

Europe and North America tend to use sales revenue as the denominator in an equation like this, as these are easy to obtain. We also used production costs, as this allowed us to examine transport costs as a proportion of business costs for the different industries.

2.2 Selection of case study industries

The first step of the project involved identifying the industries that were to become the principal focus for the study. To assist with this decision, we undertook a high-level assessment of the key New Zealand industries to identify those industries where:

- transport costs are a high proportion of total input costs
- transport costs are a high proportion of the total industry value added
- transport costs are a high proportion of the gross industry output.

These three metrics were used because they were readily available and so calculable for all industries in New Zealand. [3] That said, the data involved the use of aggregate input–output information developed by Statistics NZ and so the transport costs data only included transport costs incurred by an industry from a third-party transport provider. As a consequence, it did not adequately represent the transport costs that were incurred directly within the industry through the operation of its own transport fleet.

However, given the practical difficulties of identifying industry internal transport costs (and indeed that was one of the objectives of this study), the input–output data was considered sufficient for the purposes of identifying those industries where transport costs are relatively high.

Tables 2.2, 2.3 and 2.4 set out the top 10 industries where freight costs are the highest proportion of the:

- total input costs of the industry
- industry value added

3 Data from Supply and Use tables from Statistics NZ for the year ended March 2007.

- gross industry output.

The total freight costs of the top 10 industries in table 2.2 represent 28% of the total freight expenditure by all New Zealand industries. Hence, we are confident that these 10 industries represent the key industries where freight is a significant cost of the industry.

Table 2.2 Ranking of industries by freight cost as a proportion of total costs

Industry	Freight costs	Total costs	Freight costs/ total costs
Forestry and forestry services	$339	$1571	22%
Food, drink and tobacco wholesaling	$427	$2592	16%
Personal and household goods wholesaling	$379	$2355	16%
Builders supplies wholesaling	$133	$1089	12%
Supermarkets, grocery stores and furniture, houseware appliances and recreational goods retailing	$225	$2319	10%
Machinery and equipment wholesaling	$142	$1486	10%
Non-metallic mineral product manufacturing	$139	$1503	9%
Plastic product manufacturing	$143	$1577	9%
Fertiliser, petroleum and other industrial chemical manufacturing	$126	$1416	9%
Other personal and household goods retailing	$127	$1498	8%

Table 2.3 Ranking of industries by freight cost as a proportion of industry value added

Industry	Freight costs	Total costs	Freight costs/ value added
Forestry and forestry services	$339	$746	45%
Food, drink and tobacco wholesaling	$427	$1492	29%
Unprocessed primary product wholesaling	$108	$584	18%
Plastic product manufacturing	$143	$807	18%
Petroleum, metal and chemical wholesaling	$274	$1585	17%
Meat and dairy manufacturing	$658	$3905	17%
Personal and household goods wholesaling	$379	$2260	17%
Pulp paper and paper board manufacturing	$63	$427	15%
Fertiliser, petroleum and other industrial chemical manufacturing	$126	$894	14%
Non-metallic mineral product manufacturing	$139	$999	14%

Table 2.4 Ranking of industries by freight cost as a proportion of industry gross output

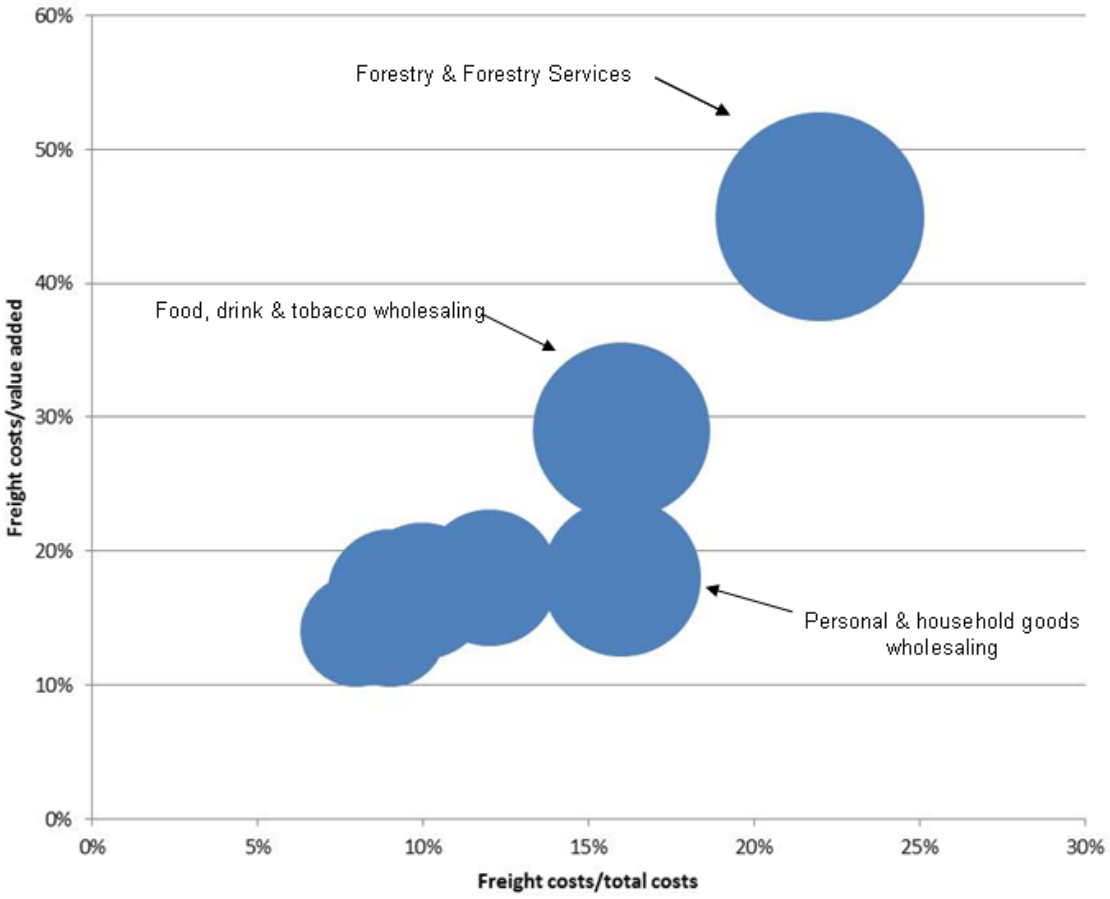
Industry	Freight costs	Total costs	Freight costs/ gross output
Forestry and forestry services	$339	$2350	14%
Food, drink and tobacco wholesaling	$427	$4156	10%
Personal and household goods wholesaling	$379	$4655	8%
Plastic product manufacturing	$143	$2400	6%
Builders supplies wholesaling	$133	$2326	6%
Non-metallic mineral product manufacturing	$139	$2526	6%
Fertiliser, petroleum and other industrial chemical manufacturing	$126	$2331	5%
Unprocessed primary product wholesaling	$108	$2127	5%
Mining and quarrying	$88	$2162	4%
Supermarkets, grocery stores and furniture, houseware appliances and recreational goods retailing	$225	$5556	4%

The tables highlight that:

- forestry and forestry services have a significantly higher freight cost across all of the metrics compared against the other industries
- food, drink and tobacco wholesaling is the next-highest freight cost industry, possibly reflecting the diversity of products involved and the need to transport those products from the major urban centres (particularly Auckland and Christchurch) to all parts of New Zealand
- supermarkets, grocery stores, etc, have a high freight cost as a proportion of total costs (ranked 5th), but not when compared on an industry value added or gross output basis
- meat and dairy manufacturing have a high freight cost as a proportion of value added, but not as a proportion of total cost or gross output.

The analysis suggested that those industries where freight costs are a high proportion of total costs are also typically those industries where freight costs are a high proportion of industry value added – see figure 2.1. This highlights that freight costs are important for the overall competitiveness and profitability of those industries.

Figure 2.1 Relationship between freight costs as a proportion of value added, total costs and gross output



This analysis identified those industries where transport is a relatively important component of the industry's cost structure. However, in selecting the case study industries we also took into account those industries where we believed there was an *a priori* expectation that opportunities to reduce costs in the industry might exist. These opportunities might be due to a number of circumstances, including:

- opportunities for improving access by higher-mass or over-dimension heavy vehicles servicing the industry
- addressing transport infrastructure bottlenecks
- improvements in supply chain coordination
- facilitating the introduction of new technologies that could reduce transport costs.

In selecting these industries we were also mindful of the wider implications that might be drawn from these case study industries for other similar businesses. Specifically:

- the logging industry case study allowed us to consider transport costs for industries that transport bulk, low-value commodities for both domestic processing and export

- the food and beverage industry case study allowed us to consider transport costs for industries that involve both bulk and retail distribution across both the North and South islands, and associated daily delivery of perishable goods
- the flower industry case study allowed us to consider transport costs for agricultural industries along a complete supply chain including producer, wholesale market and retail distribution and sales.

These industries were considered to be representative of the daily transport needs and challenges facing a large proportion of New Zealand businesses.

Based on this analysis and discussions with the steering group, we chose the following case study industries for the study:

- the logging industry, because of the relatively high transport costs in the logging industry and mass/dimension limits and other heavy-vehicle regulatory factors that could influence transport costs
- the grocery industry, because of the range of vehicle types used (eg rigid, articulated and refrigerated), wide distribution of goods to multiple locations, and consideration of supermarket locations
- the flower industry, because it involves the transport of fragile, perishable and time-sensitive goods, allows for the examination of urban transport issues, and involves light commercial vehicles (LCVs), couriers and non-motorised modes.

Table 2.5 Ranking of industries by freight cost as a proportion of industry value added

Sector	Transport costs	Location	Mode	Key features of interest
Logging	High	Rural and urban	Road and rail	• Transport costs are relatively high • Mass/dimension limits and other heavy-vehicle regulatory factors could influence transport costs
Grocery	High	Outer city/rural to urban	Road	• Wide distribution of goods to multiple locations within New Zealand • Involves a range of vehicle types (eg rigid, articulated and refrigerated) • Consider (at least at a high level) supermarket location selection
Flower	Unknown	Predominantly urban	Road, couriers and non-motorised modes	• Involves LCVs, couriers and non-motorised modes • Allows for the examination of urban transport issues • Involves the transport of fragile, perishable and time-sensitive goods

The meat and/or dairy manufacturing industries were not considered as part of this study because these sectors have been the subject of other recent work considering transport-related costs. [4]

4 For the red meat sector, the relevant report is Deloitte (2011) *Red meat sector strategy report*. The dairy sector pricing information was released in September 2011 – the *Farmgate milk price manual* and the *Farmgate milk price statement 2011* are available for download at www.fonterra.com.

2.3 Approach to information collection

Having selected the case study industries, we developed a cost data template, interview protocols and an industry engagement strategy to collect information to inform our analysis of the transport costs for each case study industry.

2.3.1 Selective survey of costs

A cost data template was developed to allow us to obtain information from the interviewed businesses on transport-related costs as a proportion of total operating costs, business value added and total revenue. A breakdown of the information received through both the cost data template, and directly provided during interviews, is set out in table 2.6. The data template is reproduced in appendix B.

Table 2.6 Responses to the data collection

Case study industry	No. of interviews (excl. industry associations)	No. of data responses	% response
Logging	3	2	67%
Grocery	7	4	57%
Flower	4	3	75%

The response rate to the data survey was relatively low, reflecting concerns about the commercial nature of the requested information. However, businesses also provided cost information during the interviews, which was included in the response rate information above. Together, this information was considered sufficient to allow some conclusions to be drawn on the proportion of costs that were attributable to transport for some of the industries investigated.

The data template included only direct transport costs incurred by the respondent and did not include indirect transport costs where businesses only paid the final product price. This could have biased the transport cost results downwards, as indirect transport costs were not included. To reduce this bias, we aimed to represent the transport costs of businesses that had more direct control of their total transport task (ie had fewer indirect transport costs).

2.3.2 Approach to interviews

For each case study industry we conducted face-to-face interviews with representatives of relevant industry associations and freight/business owners. The topics discussed included:

- an overview of the relevant industry supply chain, to obtain an understanding of the role of transport in the industry, and the incurrence of transport-related costs along the supply chain
- the key characteristics of the industry, including the degree of vertical/horizontal integration, and management and ownership of transport operations
- the opportunities for, and barriers to, reducing transport costs for the business/industry.

A breakdown of the interviews by type of organisation interviewed is set out in table 2.7.

Table 2.7 Breakdown of the interviews, by type of organisation and industry

Case study industry	Categories
Logging	• Industry association x 1 • Logging companies x2
Food and beverage	• Supermarkets x2 • Bread suppliers x2 • Other suppliers x3 • Industry association x2
Flower	• Wholesalers x1 • Growers x1 • Wholesaler and auctioneer x1 • Grower, wholesaler and retailer x1

Appendix A provides a list of the associations and businesses interviewed as part of the study.

2.3.3 Related issues

The focus of this study was on the transport costs for businesses and opportunities to reduce these costs. However, during the course of interviews with businesses for this project, broader matters relating to logistics that had little or no direct impact on transport costs were also discussed. Where we believed there were important policy conclusions, we have also discussed these matters in the report.

3 Case study 1: Logging industry

This chapter focuses on the transport costs incurred by the logging industry. We start with a brief overview of the logging industry in New Zealand, followed by a discussion of the role of transport in the industry, sources of transport delays, and estimates of the range of transport costs for the industry. We conclude with a discussion of the opportunities that were identified to reduce transport costs for the industry.

3.1 Context: Logging in New Zealand

3.1.1 Value and contribution to the economy

The forestry and logging industry is an important industry for the New Zealand economy, representing around 2.8% of gross domestic product (GDP), and is the third-largest export earner, at $3.9 billion in 2010 (Forest Owners Association n.d., p3). The top three forestry products by export value in 2010 were logs ($1076 million), sawn timber ($736 million) and chemical pulp ($465 million). The importance of the forestry and logging industry is expected to grow as export revenue from this sector is forecast to increase to $6.1 billion by 2015, fuelled by strong growth in demand by China (Ministry of Agriculture and Forestry 2011, p43). This is 90% more than 2008's $3.2 billion (ibid).

The forestry and logging industry is a major employer in New Zealand, employing more than 6000 employees directly, and a total of 16,800 including first stage processing, in 2009 (Forest Owners Association n.d., p6). Forests in New Zealand also play a critical role in meeting New Zealand's climate change objectives and achieving greenhouse gas abatement targets. For this reason it was the first sector to enter the Emissions Trading Scheme (Ministry of Agriculture and Forestry 2011, p3).

3.1.2 Structure of the sector

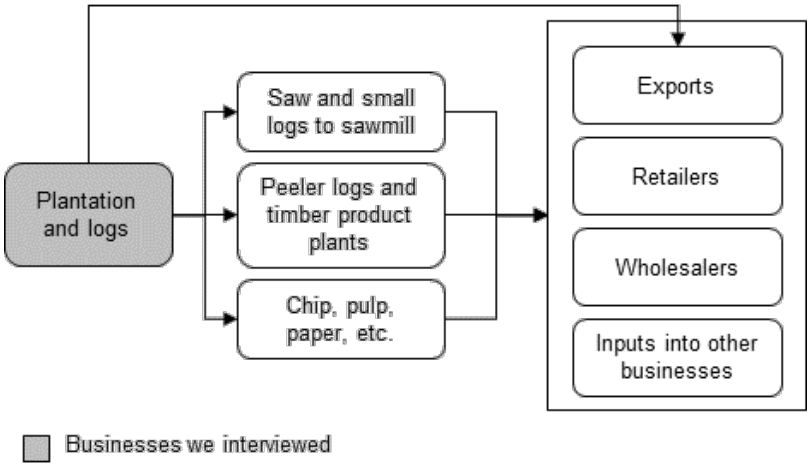
The logging sector includes the felling of trees and subsequent transport of logs to mills or processing plants for sawing or chipping, or the transport of raw logs for export. In New Zealand, forestry ownership is dominated by the private sector, with the top 15 forest owners collectively owning about 1 million hectares of forest (or 56% of the plantation forest estate), and the top three owners owning about 620,000 hectares (or 34% of plantation forest estate) in 2008 (Ministry of Agriculture and Forestry 2009, pp45, 46). The main uses of logs include:

- logs directly exported (42%)
- sawlogs and peelers (36%)
- pulp (15%)
- other uses such as chip exports, pole and reconstituted panels (7%) (Forest Owners Association n.d., pp16, 17).

A proportion of the logs processed domestically are also subsequently exported overseas. According to the Ministry of Agriculture and Forestry (2011b, p40), more than 80% of New Zealand's forestry exports go to seven countries: China, Australia, Japan, Korea, the US, Indonesia and India. The largest destination is China, with exports of over $1.2 billion.

A high-level summary of the forestry and logging industry is provided in figure 3.1.

Figure 3.1 High-level summary of the forestry industry



The low-value/high-weight characteristic of logs means that transport costs can be a significant input cost for the forestry and logging industry. Indeed, the transport costs of logs can account for 20–25% of final production costs (Ministry of Agriculture and Forestry 2009, p29). Our analysis of input–output data for New Zealand suggested that the forestry and logging industry has one of the highest transport costs in New Zealand, with transport costs representing 14% of gross output, 22% of total inputs, and 45% of total industry value added. The significance of transport costs is expected to increase, as wood will likely be sourced from plantation forests in smaller lots that are located further away from key infrastructure (Ministry of Agriculture and Forestry 2009, piii).

The transport of logs typically occurs in remote areas, where there may be a lack of good-quality roads or infrastructure. The heavy and indivisible nature of logs means that overweight and over-dimension vehicles are usually used to transport logs. For this reason, the logging sector was expected to be a primary beneficiary from recent changes in heavy productivity motor vehicle regulations in New Zealand, which allowed increases in heavy-vehicle weights and changes in vehicle configuration. (The transport challenges and issues faced by the forestry and logging industries may also be relevant to other sectors that carry bulk freight in remote areas.)

The focus of our study was on the logging segment of the industry; ie the felling of trees, processing (removal of branches, etc) and subsequent transport of logs to mills for further processing or to ports for export.

The main forests used for tree felling are located in the North Island, which represents approximately 70% of the available plantation forest hectares (Forest Owners Association n.d., p7). The principal North Island plantation forests are located in the central North Island (30.1%), followed by Northland (11.2%) and southern North Island (9.6%). Mills are located near the forestry plantations, with logs for export typically being taken to the nearest port (eg East Coast logs are shipped from the Port of Gisborne). That said, logs from the central North Island (34% of total New Zealand log exports) are shipped to Tauranga, and another six local ports ship the remaining North Island export logs (approximately 33% of total log exports) (Richard Paling Consulting et al 2008, p30).

The remaining 30% of plantation forest is in the South Island, principally near Otago (11.9%), Nelson (9.7%) and Canterbury (6.2%). A small proportion of tree felling occurs on the West Coast of the South Island. Local ports are used to export these logs, which represent 29% of total log exports.

Therefore logging transport is relatively 'localised', in the sense that the majority of transport largely occurs within regions, rather than being the very long-haul or inter-island transport that is characteristic of some of the other industries we considered in this study.

In general, logging businesses use contracted third-party transport providers to meet logging transport requirements. This approach reflects a belief that the capital investment required to own and operate a dedicated fleet of vehicles is not justified, given the likely returns from such an investment. Indeed maintaining the competitiveness of third-party providers was identified as an important consideration for logging companies to ensure that transport costs remained low, while a performance system was seen as being an important balance to achieve lower costs while maintaining appropriate safety standards.

To maintain competitiveness, logging companies' contract with log transport providers to provide logging transport services for relatively short periods (common time frames for the businesses we spoke to were between two and three years, although some had an option to renew). The contracted transport providers were typically smaller businesses (an owner-driver, or business with two or three heavy vehicles) that specialised in log transport. While one logging company indicated that they only used a single transport provider (who in turn contracted individual operators as the need arose), the others made use of a number of providers to manage risk and ensure competitive tension.

Logging transport providers generally charge logging companies on a $/tonne-km or $/tonne basis, where the latter is usually a schedule with $/tonne prices increasing as the kilometres increase. Contracts often include a separate fuel component, with monthly or quarterly fuel price adjustments, provision for road user charges (RUC) adjustments, and an annual adjustment for price based on transport cost indices published by the Road Transport Forum. This means that the logging company bears the risks of fuel price and RUC changes, which are beyond the direct control of the transport provider.

Logging companies do not separately on-charge the transport cost component to their customers (ie domestic mills, or when logs are exported). Rather, they set an all-inclusive price for logs, which also recovers their transport costs.

Logging companies encourage third-party transport providers to maintain their safety standards. One of the companies interviewed mentioned that they monitor transport providers to ensure that safety standards are met, but only at a high level and for specific contractors, rather than as ongoing monitoring. Transport providers are typically monitored for:

- hours of work for drivers
- load security (to minimise bark flying off, or logs slipping out of trucks).

Logging companies also indicated that vehicle configuration is important and they hire third parties accordingly. In this way, logging companies can have some influence over the safety of the overall log transport task. In general, rollovers are a significant safety concern in the logging industry (although they have fallen by 75% since 2001, when a safety accord was signed between industry stakeholders).[5]

5 See www.nzfoa.org.nz/file-libraries-a-resources/cat_view/25-agreements-and-accords.

In addition, log transport vehicles affect the private forestry road maintenance costs borne by logging companies. As a consequence, most logging companies encourage transport operators to have (and use) central tyre inflation (ie a system that controls the air pressure of each tyre), to keep the cost of road maintenance down. Most New Zealand logging trucks have central tyre inflation, as it reduces vehicle and tyre maintenance costs and improves traction, thus providing productivity improvements.

Most logs in New Zealand are transported by road, although some logs are transported by rail, typically from the central North Island to the Port of Tauranga, and from the upper North Island to central North Island mills. In some cases, this involves very large trucks (up to 100 tonnes) being used on private roads to transport logs from forests to rail heads in the central North Island. There is little use of coastal shipping in the logging industry, although there is some barging of logs out of forests in the Marlborough Sound, because of their inaccessibility.

3.2 Transport costs

Only two out of three of the businesses we approached for data responded to our request. However, we believe we received sufficient information to give an overview of the logging industry's transport costs, given the excellent quality of the data (with one firm providing several years of data), similar transport arrangements across the logging sector (ie the common use of third-party providers), the lack of indirect transport costs, additional information received during interviews, and the similarity of the responses received.

The information provided highlighted the importance of transport costs as a proportion of total business costs. Transport costs are typically one of the largest costs in the logging sector, ranging between approximately 25% and 30% of operating costs, and 15% and 25% of revenue. This is significantly higher than earlier estimates of the average transport cost being 8.8% of total input of businesses in New Zealand (Infometrics 2003, p20) and is consistent with existing literature on transport costs for this sector (Ministry of Agriculture and Forestry 2009, p29).

In terms of the ratio of transport costs by destination, approximately 70% are incurred for local transport (ie from plantation to mill), with the remaining 30% associated with transport of raw logs to ports, for export.

3.3 Transport cost drivers

Our analysis of the costs of transport for the logging industry confirmed the importance of transport as an input to the final cost of production for forestry products. Transport costs in the logging industry are driven mostly by:

- the specialised nature of the transport involved, whereby specialised trucks are required to transport logs – this limits the potential for trucks to be used to transport other products, which might otherwise improve vehicle utilisation and reduce transport costs
- log length, with longer logs being more cost effective to transport because less time is required for loading than for shorter logs
- the location of milling and export facilities relative to forestry plantations
- the condition of public roads in forestry areas, affecting accessibility by heavy log trucks

- changes in fuel prices.

Most of these transport cost drivers are outside of the direct control of logging companies (eg fuel prices and public road maintenance conditions), and so the logging companies have focused on achieving transport cost savings mostly through competitive pressures on third-party providers, to minimise truck and transport labour costs. While log length is also within the control of logging companies, in practice New Zealand logs tend to be shorter, and some domestic and export clients prefer shorter logs, which means that the higher prices paid for shorter logs are mostly outweighed by the higher transport costs.

The condition of public roads was identified by a number of logging companies as having a significant influence on industry transport costs. Poor-quality public roads:

- directly increase truck maintenance and running costs, through increased road roughness and breakages
- limit access by heavy log trucks to some roads, necessitating the use of alternative routes with greater travel times, giving rise to greater costs – in the most severe cases, this can result in some plantations not being accessible to logging trucks.

These problems were identified as being of specific concern for areas with forests that were coming due for harvest in the near future. As a consequence, heavy-vehicle access is an important factor for logging companies when selecting new forests.

Finally, we heard that local councils often place restrictions on the routes and times of day that logging vehicles can travel, due to concerns about noise. This was identified as contributing to logging industry transport costs.

3.4 Sources of transport delays

Delays along the transport supply chain have the potential to increase transport costs for logging companies. The principal sources of transport delays arise from:

- port congestion, resulting in delays in unloading log trucks
- log-storage constraints at ports, resulting in logs needing to be stored after harvesting and prior to transport to port.

The coordination of harvesting and truck loading and unloading at mills was considered to be generally fairly efficient by the logging companies interviewed. Practices regarding harvesting and local transport to the mill seek to minimise the length of time between a tree being felled, processed and delivered. The ideal time for this process is two to three days.

The frequency of ships means that storage of logs at the port will be necessary on some occasions. For export logs that require storage because of port storage constraints, there are risks for the logging company that the wood will dry out or be affected by a fungal disease. While strictly speaking this is not a transport cost, it results in the value of the log decreasing as it becomes suitable for only lower-value uses.

Log harvesting levels will be increasing over the next few years, and since there is no new on-shore processing capacity being developed, much of the increased output is expected to be exported. This was

identified by the logging companies as likely to place greater pressure on the facilities at local ports, with potential transport cost implications.

3.5 Opportunities to reduce transport costs

This study found that transport costs for the logging industry could be reduced by:

- improving the efficiency of use of the existing transport fleet servicing the industry
- greater use of high-productivity motor vehicles
- addressing delays along the supply chain, particularly at points of intersection between parties along the supply chain
- considering alternative modes of transport.

In the next section we examine the opportunities to reduce transport costs within each of these three areas.

3.5.1 Improving the efficiency of the use of the existing log transport fleet

Improving the efficiency of the use of the log transport fleet requires consideration of the opportunities to improve backloading of existing vehicles. In practice this is very difficult in the logging industry, because the remoteness of the log transport task and the specialist nature of the vehicles limit backloading opportunities.

That said, log truck utilisation can be improved by creating circuits to minimise the time spent with an empty truck. One example of a circuit might be a truck that unloads logs from one forest at a mill, then takes logs from a forest adjacent to the mill, and unloads at a second mill or port on the return journey to the first forest.

Logging companies indicated that wherever possible they work together to develop these circuits, to minimise transport costs.

Some trucks are dual purpose (ie have the ability to convert their trailer, so they can take logs in to the mill and timber or wood chips out, or they can take machinery into the forest and logs out, allowing more backloading to be achieved. While it has not been explored by the industry to date, it was seen as feasible for such trucks to be used to carry products such as steel or pipes. This would increase vehicle utilisation rates and could reduce transport costs across sectors.

That said, the study participants indicated that the industry standard is for approximately 55% truck utilisation, with a range of 50–60%, suggesting that there are likely to be limited opportunities for further improvements in utilisation to reduce transport costs for the logging industry.

3.5.2 Greater use of high-productivity motor vehicles

On 1 May 2010, the land transport rules were amended to allow permits to be issued for a new class of vehicle; ie high-productivity motor vehicles (HPMVs). A vehicle with an HPMV permit is allowed to carry loads over 44 tonnes on specified HPMV routes. HPMV permits also allow increases in vehicle length – eg 22m for logging trucks.

Prior to the introduction of the HPMV regulations, there was an agreed exemption for logging industry vehicles to permit 22m trucks, as this permitted the load heights to be reduced with great safety improvements achieved. This length now has to be specially permitted for, imposing an extra cost on the sector. There was a suggestion that the 22m exemption should be reinstated.

Logging companies we spoke to noted that HPMVs have potential, but most of the routes that logging companies want to travel on are not currently specified as HPMV routes because of pavement or bridge strength limitations. While the companies recognised that these funding and programming issues are being worked through by the NZTA, they expressed frustration over the delays.

They noted that the biggest remaining issue regarding HPMVs is the enforcement of rules, and when the rules are broken, 'the punishment does not fit the crime'. The companies said axle tolerances are considerably tighter for HPMVs than for normal trucks, and this means that if the truck is slightly outside the tolerance then it is in breach of the permit, resulting in a very large penalty (plus the costs of the compulsory offload and organising another truck to take the load). The tighter axle tolerance levels require greater precision in the weights loaded onto logging vehicles. However, because of the irregularity of log weights and sizes, and the additional transport costs that would be incurred to manage these load tolerances, logging companies indicated that the benefits of using HPMVs, even when routes are available, might not outweigh the additional costs. This was identified as being a large impediment to improved transport cost efficiency for the industry.

In addition, our interviews highlighted a concern in the industry regarding the cut-off point for HPMVs in terms of RUCs under the new RUC system to be introduced from 1 August 2012. The concern is that if 44 tonnes is the cut-off point between a standard truck and a HPMV (ie if carting more than 44 tonnes, the operator would need an HPMV permit), then this would add significant costs to the industry as it would require logging trucks to reduce their payload, thus reducing productivity and leading to more trucks on the road.

3.5.3 Addressing sources of delay

Addressing the principal sources of delay (ie port congestion and the availability of log storage at ports) would have the effect of reducing existing transport costs, and logistics/inventory costs overall, particularly for the growing log export market. Possible approaches to addressing these sources of delay include:

- implementing mechanisms to better ration port unloading capacity, to minimise unloading wait times, particularly during peak periods
- expanding port access and/or unloading facilities to minimise unloading wait times
- examining the feasibility of expanding log storage in those ports with limited capacity (eg Lyttelton, Wellington, Tauranga and New Plymouth).

Another possible approach could be to increase the frequency of ships that pick up logs from the ports. This would lessen the pressure placed on port storage facilities, but it might not be economically feasible, given the additional shipping costs this would incur.

We were unable to evaluate the size of this opportunity as part of this study. That said, a 10% reduction in export log transport costs would represent a benefit of approximately $22 million to the industry each year.[6]

We also noted that log exports tend to be clustered at particular ports, particularly the Port of Tauranga. Delays and/or storage constraints at ports might therefore be addressed by export logs being more dispersed across the ports. Indeed, one of the businesses mentioned that a potential future consequence of growing export would be for ports that receive few or no logs at present to see large increases in volumes because of the diverse location of plantation forests. However, the benefits from any reduction in delays, or access to ports, due to a wider dispersion of logs, could be offset by the transport costs from transporting logs to ports other than the closest one. In any case, the optimal choice of port for export logs is likely to be something that is best determined by market forces.

3.5.4 Potential for mode substitution

Most logs are transported by road, with some limited rail transport from the central North Island to Tauranga, and from the upper North Island to mills in the central North Island.

For example, Hancock has a rail head at Kinleith and Kawerau to transport export logs directly to the Port of Tauranga – distances of approximately 100 kilometres and 90 kilometres respectively. This is a cost-effective approach compared with road, given the distances involved and the potential delays with road transport into Tauranga, because rail allows logs to be unloaded directly at the port.

Another example of the use of rail is for the transport of logs from Northland to the Kinleith Mill. We were advised that approximately 10 rail wagons are used each day, with each wagon holding approximately 25 tonnes of logs. This is a cost-effective approach, given the distance involved and the likely road time delays (particularly near Auckland) if road was used to transport a similar number of logs. Road transport for the same transport task would require approximately nine truck movements a day.

While rail could be a cost-effective solution for transporting logs over longer distances, there is limited opportunity to make greater use of rail because for the majority of the log transport task, road transport is the only available option.

3.6 Summary of conclusions

The information collected as part of this study indicated that transport costs, as a proportion of total business costs for the logging industry, were between 15% and 25%. This meant that transport was a critically important input for the logging industry. The industry had actively pursued several options directly available to it to reduce costs, including:

- contracting transport services to use competitive pressures to reduce transport costs, and using re-tendering of these contracts and monitoring of contract transport services to maintain those pressures
- establishing transport circuits to increase opportunities for backloading where feasible, given the location of harvesting and mills/ports

6 Estimated based on assumed transport costs as a percentage of revenue for forestry products in 2010.

- making use of rail for longer distances, where practically and economically feasible under existing arrangements.

As a consequence, we found there were currently only limited additional opportunities to reduce transport costs that were directly within the control of the logging industry. Potential opportunities included exploring cross-sectoral sharing of transport vehicles, as discussed in section 3.5.1.

There were opportunities to reduce costs for the logging industry in areas currently *outside* their control, namely by:

- addressing impediments for greater use of HPMVs, through:
  - increased axle loading tolerances for HPMVs, to bring them in line with general access vehicle requirements, or developing cost-effective solutions that would allow logging companies to adequately manage HPMV load tolerances
  - fast-tracking of the funding and programming processes to speed up the pavement upgrades and bridge strengthening along significant log truck routes, to facilitate greater use of HPMVs
  - logging companies part-funding road upgrades, to facilitate greater use of HPMVs in a fair and equitable manner
- reducing port congestion and improving port log storage, through:
  - mechanisms to manage unloading delays at ports
  - expansion of log storage facilities at those ports experiencing growing log export demand.

Finally, greater use of HPMVs was seen as having the potential to improve the productivity of log transport by at least 10% (ie moving from the use of 44-tonne trucks to 50-tonne trucks). Assuming this would be possible for, say, 20% of all current log truck movements, then this could potentially increase productivity of the fleet, reduce pressure on truck drivers, and save the industry approximately $15–20 million each year. When combined with reductions in port-congestion delays, the total opportunity might be as large as $30–40 million each year.

That said, these figures should be treated as indicative, given that we did not investigate in detail the likelihood that HPMVs could be used more, or that port delays are a significant problem. We would therefore recommend further investigating the size of the benefit opportunity from addressing these matters.

4 Case study 2: Grocery industry

Our second case study focused on the grocery industry. While there are numerous small independent grocery outlets (including dairies) throughout the country, our case study focused on the two major supermarket chains, Foodstuffs and Progressive Enterprises, and the transport supply chain from grocery supplier to the supermarket. While we considered the grocery industry in general terms, as a subset of the grocery case study, we also looked in particular at transport for the daily fresh bread segment of the grocery industry.

We start with a brief overview of the grocery industry in New Zealand, followed by a discussion of the role of transport in the industry and the extent of transport costs in the industry. We then discuss the drivers of these transport costs, including sources of transport delays. We conclude with a discussion of the opportunities to reduce transport costs for the grocery industry, followed by our closer analysis of the bread segment of the grocery industry.

4.1 Context: Grocery in New Zealand

4.1.1 Value and contribution to the economy

The grocery industry involves the production, manufacture and supply of food, beverages and various other household grocery products, such as pet food, cleaning products, health and beauty products, etc. The supermarket and grocery sector is a major industry in New Zealand, contributing $5.6 billion to GDP.[7] In addition, food and beverage manufacturing in New Zealand involves close to 2000 companies, employing almost 80,000 people, accounting for 54% of total exports, with a total revenue of approximately $38 billion (Coriolis 2012, p34). At the retail end, the two main supermarket chains (Foodstuffs and Progressive Enterprises) operate 886 stores and employ more than 48,000 people across New Zealand.[8]

4.1.2 Structure of the sector

The grocery industry comprises suppliers of food and beverage products and other general grocery items, large distribution centres for the consolidation of suppliers' products, and retailers, including the major supermarket chains and smaller grocery outlets. There is also significant diversity in the size of the companies involved, from large companies with billion-dollar turnover, such as Fonterra, to smaller producers and companies offering niche grocery products.

The retail grocery sector of the industry is dominated by two major supermarket chains, namely:

- Foodstuffs, which owns and operates under the Pak'n Save, New World and Four Square supermarket brands

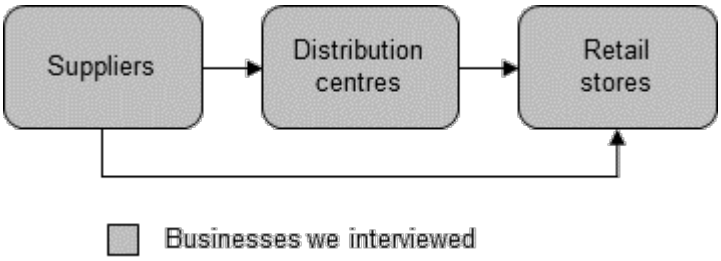
7 This figure is for the category supermarkets, grocery stores and furniture, houseware appliances and recreational goods retailing. Data from NZ Statistics Supply and Use tables.

8 Based on information available on the Foodstuffs and Progressive Enterprise websites, accessed on 09 May 2012.

- Progressive Enterprises (hereafter called Progressive), which owns and operates under the Countdown brand.

Foodstuffs operates through three regional supermarket-owned cooperatives: Foodstuffs (Auckland) Limited, Foodstuffs (Wellington) Co-operative Society Limited, and Foodstuffs South Island Limited.[9] Together, Foodstuffs and Progressive represent about 88% of sales in the supermarket sector (Richard Paling Consulting et al 2008, p93). In addition, there are a number of smaller independent grocery outlets and convenience stores. A high-level summary of the goods and grocery industry is provided in figure 4.1.

Figure 4.1 High-level summary of the grocery industry



The transport task for the food and grocery sector can be complex, particularly regarding delivery to retailer shops. Multiple methods of delivering products have been adopted even within the same firm, including:

- delivery to retailers via distribution centres (DCs) owned by the retailer
- delivery to retailers via DCs owned by a third party
- direct delivery to retailers from producers, manufacturers and importers (Richard Paling Consulting et al 2008, p92).

This complexity means that transport costs can be a significant operating cost for both supermarkets and suppliers. Indeed, our input–output data analysis suggested that the proportion of the transport costs for grocery retailers represents 4% of gross output, 10% of total inputs, and 7% of total industry value added.[10] For food, beverage and tobacco wholesalers, the transport costs can represent 10% of gross output, 16% of total inputs, and 29% of total industry value added.

The transport challenges and issues identified in the grocery sector may be relevant to other retailer sectors such as department stores and other major retail chains. The transport task in the food and grocery sector typically involves the distribution of goods to multiple locations within New Zealand. There is also a variety of products to be delivered, from perishable goods including milk, cheese and fruit, to packaged goods including biscuits and drink. The differences in location and types of goods mean that a variety of different vehicle types are needed. Consideration on where to locate distribution centres is also relevant to minimising transport costs.

9 Our interview was conducted with a representative of the Wellington cooperative, which covers the lower North Island, as far north as Wairoa, Ohakune, Waitara and New Plymouth. Each of the Foodstuffs companies operates independently in terms of transport demand from sources into locally based distribution centres.

10 This was based on our analysis of input–output data. However, the group also includes retailing of furniture, houseware appliances and recreational goods.

4.2 Transport use

There are two main transport methods used to deliver goods from grocery suppliers to supermarkets:

- delivery via a supermarket distribution centre (DC)
- direct delivery from the supplier to the supermarket.

Both Progressive and Foodstuffs operate a combination of the two delivery mechanisms. For both businesses, the majority of products are delivered by suppliers into the DC. Progressive has DCs for general groceries in Auckland, Palmerston North and Christchurch, and the DC for Foodstuffs (Wellington) is located in Palmerston North. It is estimated that approximately 80% of the country's grocery supplies are sourced from the Auckland area, so the majority of Progressive's supplier-to-DC deliveries come into its Auckland DC. While some products are delivered directly from suppliers into supermarkets, these are mostly perishable products, such as eggs, milk, bread and poultry, for which the longer supply chain via the DC is likely to compromise quality.

For the majority of deliveries into DCs (and all direct-to-supermarket deliveries), the supplier contracts a third-party transport provider and incurs the resulting freight charges. While suppliers do not separately on-charge this freight cost to Progressive/Foodstuffs, they charge a wholesale price for their grocery product that seeks to recover that cost. Suppliers that manufacture in New Zealand generally deliver out of their manufacturing site. Importing suppliers may operate their own DC, where imports are delivered and aggregated before then being supplied to supermarkets. There are several examples of multiple importers using a single warehouse as a DC, which is generally owned by the freight transport operators, who coordinate their transport requirements from the DC to the supermarket DC, or direct-to-store (DSD) delivery.

However, there is a small (but growing) proportion of deliveries into DCs that are managed using a 'primary freight' system. In these cases, Progressive/Foodstuffs themselves arrange the transport of the supplier's product, including pick-up from the supplier's manufacturing/distribution site. In the case of Progressive, this is done through Progressive contracting a third-party transport provider. Foodstuffs' primary freight business, Foodstuffs Inbound (FIN), uses both its own transport fleet (Foodstuffs (Wellington)'s subsidiary, AF Logistics) and contracts third-party transport providers, if necessary, to supplement the operations of AF Logistics. While Progressive/FIN incurs the transport costs from its primary freight business, it on-charges these costs directly to suppliers.

The primary freight model allows the supermarket business to take some control over the transport component of supplier-to-DC deliveries, while at the same time the model is seen as being attractive to suppliers, as the risk and responsibility for transport lies with the supermarket business, rather than the supplier. Foodstuffs noted that other benefits from the FIN model include a reduction in the number of vehicle movements at the DCs and supermarkets and in the volume of trucks on the road, increases in fuel efficiency from route planning, and improved frequency of delivery and shelf availability.[11]

On the other hand, some suppliers, particularly those that import manufactured products, identified a disadvantage of the primary freight model as increasing the complexity of the handling and transport tasks, wherein some products have to be packaged and loaded for Progressive and FIN trucks to their DCs and DSD, while other products are packaged and loaded on their transport operators' vehicles. This can

11 See http://suppliers.foodstuffs.co.nz/foodstuffs-inbound/benefits.aspx

reduce the advantages of scale to the supplier, which come from managing both of these transport tasks itself.

Progressive/Foodstuffs also use rail and coastal shipping to some extent, mostly to transport products between DCs, or from supplier to DC. The choice of these transport modes depends on factors such as the perishability of the product, whether or not refrigeration is required, if it is economically feasible under current arrangements to use these modes, and the timeliness of the transport mode – see section 4.6 for further discussion of the potential for mode substitution. Grocery products are also imported by Progressive/Foodstuffs and transported to the DC by road, which can lead to some natural backload opportunities, as we discuss later in this report.

The final leg of the supply chain is delivery of grocery products in the DC to supermarkets. This is generally done by road, using third-party transport providers, and the costs are borne by Progressive/Foodstuffs (but ultimately passed through to final retail consumers in the retail price of the products). Including DSD delivery from producers and manufacturers, individual supermarkets generally can have multiple truck movements (at least 10) per day, each with different grocery products, requiring careful scheduling of deliveries. Foodstuffs also allows local New World stores significant flexibility to manage local transport/logistics decisions, which adds additional complexity to its overall transport task.

4.3 Transport costs

Four out of the seven businesses we interviewed responded to our request for specific transport cost-related data. Together with the information gathered during the interviews, we gathered sufficient information to create an overview of transport costs in the industry. Where possible we tried to include businesses that had significant control over the transport task, thus reducing the proportion of indirect costs.

Overall transport costs ranged from 1–12% of both revenue and operating costs, depending on the nature of the goods and the segment of the supply chain (ie supplier to DC, supplier to retail store, or DC to retail store). Transport costs for suppliers typically ranged from 1–3% for non-perishable goods, significantly lower than for perishable goods (reflecting the frequency of delivery required for them). In general, transport costs were also higher for goods delivered from DC to supermarkets, ranging between 5% and 10%.[12]

4.4 Transport cost drivers

Our analysis of transport costs in the grocery industry found that the main drivers of cost were:

- requirements for timeliness, due to both issues of perishability and the 'just-in-time' nature of the industry
- the wide dispersion of supermarkets across the country and their urban location
- a shortage of skilled drivers.

12 The 5–10% range was applied for confidentiality reasons, and because of insufficient disaggregation of the data provided from respondents.

We consider each of these factors in more detail below.

4.4.1 Timeliness

The grocery industry is characterised by a number of highly perishable products, such as milk and dairy products, bread (which we consider in more detail below), fresh produce, meat and poultry, and fish. The short shelf-life of these products, and the requirement that the delivery time from supplier to supermarket shelf is as short as possible, often constrains the use of alternative transport mechanisms and can add significant cost. Perishable products are generally ruled out from using the alternative (and potentially lower-cost) transport modes of rail and coastal shipping, as the scheduling and journey times of these services mean they are often unable to deliver goods to the supermarket in a timely manner. This constrains perishable products' transportation by road, often using refrigerated vehicles, which can add further cost.

The additional time required for shipping perishable products across Cook Strait generally makes this an unsuitable transport method for these products. The alternative would be transport by air freight (which is generally substantially more expensive than alternative modes), or segmenting the manufacture, storage and transport of the products separately for the North and South Islands. This is usually what occurs in New Zealand, but it imposes its own costs by limiting the economies of scale that may be achieved through a single large manufacturing site. Bread manufacturers Goodman Fielder and George Weston Foods have processing sites in both the North and South Islands. Only a limited range of specialty fresh bread products are transported between the North and South Islands, as it is not practical (in terms of freshness requirements) or economic to do this.

The perishability of many grocery products also drives the need for these products to be delivered directly from the supplier to the supermarket, rather than via a DC, as a means of reducing the additional transport and handling time. While the DC model may yield some additional transport costs relative to the direct-to-supermarket model, as it imposes additional handling costs and potentially some vehicle backtracking, there would be offsetting costs arising from product consolidation and economies of scale. It is not clear which of these factors would dominate, and indeed those that we spoke to in the industry were divided on whether the DC or direct-to-supermarket model was more efficient.

Transport costs, for both perishable and non-perishable grocery products, are also driven by the just-in-time nature of the industry. The strategy underlying just-in-time is that inventory holdings at supermarkets are reduced, and products are ordered as and when they are needed. For the supermarket, this reduces the costs associated with inventory and operating a warehouse, and indeed many supermarkets are now designed with very little in the way of inventory facilities. However, from a transport perspective this can impose additional costs, as it results in the transport of multiple smaller orders and also increases handling costs. From the grocery supplier's perspective, production runs may not be sufficiently flexible to provide small volumes on a regular basis. Rather, the supplier can only produce a single large volume of product in a given production run, but rather than distributing that to supermarkets immediately, the supplier must incur additional inventory-holding costs, due to the need to distribute small volumes of its product on a regular basis.

4.4.2 Supermarket locations

As noted earlier, Foodstuffs and Progressive operate 886 supermarkets between them, and these are widely dispersed across the country. This dispersion means that road transport is the only practical delivery mode for delivery from the DC to supermarkets, since the rail and coastal shipping networks

cannot service such a dispersed range of locations. While delivery to multiple dispersed locations does allow efficiencies to be achieved through consolidation of loads and multiple deliveries, there are also some instances where it is only possible for a single truck to serve a single store, with only a partial load.

The urban location of supermarkets is also a cost driver. For many supermarkets, trucks need to comply with local council bylaws, such as those that impose noise curfews and those that prevent large trucks driving through town centres. This might mean that deliveries can only be made at a certain time, or trucks can only approach from a certain direction. This may lead to a reduction in vehicle and driver utilisation and impose additional costs on transport operators. There might also be unintended consequences, such as the potential for noise curfews to undermine attempts by supermarkets to reduce congestion in urban areas by arranging deliveries and product restocking at night.

4.4.3 Skilled drivers

One driver of costs that we encountered in discussions with grocery industry participants is a shortage of skilled drivers; this issue was also mentioned by the logging businesses and is likely to be an issue across all industries that rely significantly on road transport. With truck drivers in New Zealand believing that there is limited career path, and the low wages relative to what they can receive overseas (particularly in Australia), the pool of skilled drivers in New Zealand has been declining in recent years. This can have implications for transport costs, such as the following:

- If vehicles are being driven inappropriately by less-skilled drivers, it can result in excessive fuel consumption or truck damage.
- Because there are fewer drivers, it can be difficult to find substitute drivers when necessary. For example, truck drivers are restricted in the number of hours they can drive, to reduce the risk of fatigue. When delays mean a driver reaches the limit of their driver hours and must have a compulsory rest period, it can be difficult to find a replacement driver, leading to delayed delivery and increased costs.

Another possible explanation for the shortage of skilled drivers experienced by the grocery businesses could be the market structure of the transport industry and the outsourcing of the transport task to third-party providers. It is possible that this shortage could be caused by competition for skilled drivers amongst the third-party providers. However, further research would be needed to confirm this and determine the cause of the shortage of skilled drivers.

4.5 Sources of transport delays

The main source of delay for the grocery industry arises from congestion, which is of particular concern in this industry, given the significant transport volumes to supermarkets in the main centres (particularly Auckland, Wellington and Christchurch) and from suppliers to DCs along the main arterial routes. Sources of congestion include not only high traffic volumes, but also road works and road closures. It can also arise at the DC or supermarket, if transport operators arrive at a similar time (although scheduling of arrival times tends to mitigate this issue) or there are delays in unloading trucks. The cost of congestion is largely borne by the transport operators themselves, but this is likely to be passed through to suppliers and/or supermarkets through higher transport charges, reflecting increased fuel use and vehicle maintenance as well as lower labour and capital productivity. However, supermarkets can also be affected to the extent that delays prevent the restocking of shelves, which can result in sales being lost to

competitors not affected by the same delays. While congestion can be managed to some extent by scheduling deliveries (and thus shelf restocking) to occur at night, constraints such as noise curfews can limit the ability for this to be achieved (as mentioned above).

4.6 Opportunities to reduce transport costs

A common opinion expressed by those who we interviewed in the grocery industry was that opportunities for efficiencies in transport costs have been analysed in detail by industry participants, and there are few further opportunities for reducing transport costs. In this section we discuss two sources of transport efficiencies that appear to be well covered in the grocery industry (ie improving the efficiency of the existing fleet, and the potential for mode substitution), before considering two areas where further investigation into transport cost efficiencies might be warranted.

One opportunity that we have not discussed in further detail in this section, but which follows directly from the analysis above, is for there to be further research into the shortage of skilled drivers, and industry investment in training skilled truck drivers. As indicated earlier, improving the pool of skilled drivers would reduce transport costs through more efficient driving and the ability to substitute drivers to mitigate the impact of delays.

We also do not discuss the use of HPMVs as a means of reducing transport costs in the grocery industry. While HPMVs are used to some extent on long-haul routes from supplier to DC, or from DC to DC, they are not practical for servicing supermarkets in urban areas. Many of the issues regarding the use of HPMVs that were raised by grocery industry participants have already been discussed in the logging case study.

4.6.1 Improving efficiency of the use of the existing grocery transport fleet

Improving the efficiency of grocery transport through the backloading of vehicles is something that appears to be done very well in the grocery industry. We were provided with one estimate that approximately 80% of its trucks travelling north to Auckland (after having delivered from suppliers in Auckland to DCs and supermarkets in the south) are backloaded for at least part of the trip. Opportunities for backloading in this industry could include the following:

- Supermarkets could return empty pallets, milk crates, bread trays, etc, to the DC or supplier that they originated from, with trucks making deliveries of grocery products to supermarkets loaded with these items for the return leg.
- The supplier-to-DC model, coupled with the wide dispersion of supermarkets, could create opportunities for backloading, with trucks delivering suppliers' products into the DC, and on their return leg delivering products from the DC to supermarkets, or vice versa. There are also opportunities for circuits, with trucks delivering products from the DC to multiple supermarkets before returning to the supplier.
- Opportunities for backloading imports could be found, with trucks delivering goods from a DC to supermarkets in a region where imports are landed, and returning to the DC with the truck reloaded with the imported products (or vice versa).

4.6.2 Potential for mode substitution

While transport by road is generally the only feasible option for delivery from DCs to supermarkets, it appears that rail and coastal shipping are well used in the grocery industry for deliveries from supplier-to-DC or for transfers between DCs. Rail and coastal shipping generally offer lower freight rates relative to transport by road. There is also more control over unloading the products after they arrive at the DC, as a shipping container can be unloaded when it suits, whereas a truck and its driver require immediate attention. Transport by rail and coastal shipping also allows larger weights to be shifted relative to road, where weight limits apply.

The key to using rail and coastal shipping is achieving critical mass, to ensure that full container loads can be sent, and to ensure that the lower freight rates offset the additional handling costs (and, often, the requirement to transport the product by road for some portion of its journey) of rail and coastal shipping. Progressive and Foodstuffs, as well as many large suppliers, appear to have the scale necessary to achieve these high volumes. Rail and coastal shipping are also unlikely to be suitable for perishable products – as noted above, the scheduling and journey times of these services are often insufficient to deliver perishable goods to the supermarket in a timely manner.

4.6.3 Managing congestion

One of the major sources of delay in the grocery industry relates to traffic congestion. This reflects limitations on the use of after-hours deliveries and the greater use of direct supplier delivery, leading to increased numbers of truck movements, contributing to congestion. It also results in transport delays and so imposes costs directly on the grocery retailers.

A number of mechanisms could be used to reduce the transport costs caused by increasing urban congestion, including:

- increased delivery time flexibility to allow evening and/or night-time delivery and shelf restocking
- government policy measures that could reduce congestion, possibly including congestion charging on cars and trucks.

Improved flexibility would allow grocery businesses to schedule deliveries in a manner that minimises the costs of transport delays. Over time, this would be expected to reduce the overall transport costs and by implication, improve the efficiency of the grocery sector as described above.

A government policy measure that reduces road congestion could also reduce transport costs for businesses. For example, congestion charging, which can take many forms, could charge road users on a time-of-day basis as a means of reducing morning and evening traffic peaks, or charge for the use of particular routes with high traffic volumes.

4.6.4 The use of pallets or slip sheets

One significant factor affecting transport costs in the grocery industry that was mentioned in our discussions with industry stakeholders was the use of wooden pallets. Grocery products are generally transported around the country in boxes loaded onto wooden pallets, with (New Zealand) standard dimensions of 1200mm x 1000mm and a weight of approximately 25kg. Some proportion of transport costs incurred therefore involves transporting the weight of the pallet – we were told that as much as 20%

of transport costs could be attributed to the cost of transporting the pallets, although we were not able to independently verify this figure.

An alternative to pallets could be the use of a slip sheet – a thin plastic sheet, of similar dimensions to a pallet, but made of high-density plastic or fibreboard material. Because slip sheets are much lighter than pallets, the cost of transporting the sheet itself is much lower than that of transporting a wooden pallet. Moreover, the use of slip sheets might allow larger payloads of products to be transported, as removing the weight of wooden pallets would allow more goods to be carried within road transport weight limits. This could lead to cost reductions by improving utilisation of vehicle space and freeing up transport resources. We understand that slip sheets are often used by overseas suppliers to transport products imported into New Zealand, but they are not used to a significant extent for domestic transport within New Zealand.

On the other hand, there are additional costs associated with handling goods carried on slip sheets. They require investment in specialised forklifts, or attachments to existing forklifts. Most warehouses are currently designed for pallets, and further capital investment would be required to modify pallet racks so that they can support slip sheets. We were also advised that slip sheets require a more skilled forklift operator, and loading and unloading them can be more time-intensive than pallets. Slip sheets are also more appropriate for loads containing uniform box sizes – where there are multiple different box sizes on a single load then the use of slip sheets is not feasible.

It is not clear, without further investigation, whether the benefits of transport cost savings from slip sheets would outweigh higher capital costs and the other disadvantages noted above. However, to the extent that economic signals in this area are appropriate, there is likely to be a form of market test that will determine whether, over time, slip sheets are ultimately more cost effective than pallets. Indeed, in this regard we were advised that the use of slip sheets in New Zealand is growing. To some extent, grocery industry businesses that are involved in both inbound and outbound transport are likely to face counteracting incentives: as a receiver of inbound goods, businesses are likely to prefer pallets, as they reduce handling costs and do not require additional investment in warehousing, forklifts or staff training; but as a provider of outbound goods, businesses might prefer slip sheets, due to the transport cost savings.

4.7 Findings from the bread industry

4.7.1 Structure of the sector and transport use

Our discussions with the grocery industry indicated that the nature of the supply chain, transport costs, and issues such as those discussed above, are similar across many grocery items, including high-value/low-value items, heavy/light items, general non-perishable household items, and frozen items. However, there are some distinguishing features for perishable items, such as fruit and vegetables, meat and poultry, bread, and milk. We have touched on some of these issues above, but as a more detailed look into transport issues for perishable goods, we focused on the 'daily fresh' grocery segment, specifically bread (milk is the other daily fresh item, but we did not consider it in this report).

The bread and bakery sector represents 8.3% of household food expenditure (or 1.6% of total household consumer spending)[13] and $132 million in export earnings.[14] According to the FMCG (Fast Moving Consumer Goods) website[15] over 80% of New Zealand bread and bakery products are exported to Australia. The loaf bread category alone has a turnover of $372 million.

The bread industry is dominated by two companies, George Weston Foods, whose key brands include Tip Top and Burgen, and Goodman Fielder, whose brands include Quality Bakers and Nature's Fresh. Goodman Fielder is the number one supplier in the bread category, with a market share of 47% (ibid). While there are a number of other smaller bread bakers in the industry, they typically supply relatively limited geographic areas, or more specialty bread products. Our study of the bread industry focused on George Weston Foods and Goodman Fielder, as the two major national suppliers of bread products.

Both George Weston Foods and Goodman Fielder have numerous large baking plants throughout the country. Bread is baked daily at these plants, with most bread being sold through supermarkets, although sales also occur in dairies, service stations, convenience stores and bakeries. The shelf life for bread products varies – some standard bread loaves stay fresh for only 18 hours before they start to deteriorate, while others might be fresh for up to five days (Commerce Commission 2007, paras 74–75). Other bread products, such as muffin splits, have a shelf life of 12–14 days. For reasons of freshness, the lead time from when standard bread loaves are baked and ready to deliver to when they are at the retail store is typically 12–24 hours. Supermarkets tend to restock their shelves after 24 hours of bread being on display, hence the need for daily delivery of fresh bread (ibid, para 76).

Bread is delivered to retail stores by road, using third-party transport providers (some of which are large trucking companies, but others are small owner-drivers). As with other grocery products, the transport costs are borne by the bread manufacturer, although the price charged to retail stores is sufficient to recover these costs. Bread to supermarkets is typically delivered directly from the plant to the supermarket, bypassing the supermarkets' distribution centres. This avoids double handling, thereby reducing costs, and also ensures more timely delivery, given the need to maintain freshness.

Bread deliveries to smaller retail outlets (eg dairies, service stations, etc) rely on 'distribution partners', that is, owner-operators who function as salespeople (taking orders for bread from the outlet) and delivery services. In large urban areas, the bread is picked up directly from the plant and delivered to multiple retail outlets and supermarkets. In smaller areas, the manufacturer adopts a 'hub and spoke' delivery model. This usually uses third-party transport providers to deliver a large volume of goods from the plant to a small depot (which may be a warehouse or, in more remote areas, a shipping container), where the volume is disaggregated and delivered by multiple trucks into retail outlets and supermarkets in smaller towns.

Typically, only specialty bread that has a longer shelf life (eg 12–14 days) travels between the North and South Islands. Given the perishability of the product, the time lag involved in delivering across Cook Strait is too long to maintain freshness. Rather, bread manufacturers have multiple plants in the North and South Islands, and tend to transport bread within relatively narrow geographic areas depending on plant location.

13 Aggregate expenditure on bread, cakes and biscuits, and pastry-cook products from Statistics New Zealand (2011a) *Food price index review: 2011* and *Consumers price index review: 2011*.

14 Information from Statistics New Zealand Infoshare database.

15 www.fmcg.co.nz/features/category-reports/84-bread

4.7.2 Transport costs, cost drivers and sources of delay in the bread industry

We only interviewed two companies in the bread industry, and for confidentiality reasons, we have not presented any data on transport costs. Nonetheless, we noted in general terms that transport costs tend to be relatively high in this industry, and are, on average, greater (as a proportion of operating costs and revenue) than average transport costs for general grocery items. A large proportion of transport costs come from delivery from depots to retail stores, which is likely due to the relatively fragmented nature of this transport and the smaller volumes being transported.

A key cost driver in the bread industry is the perishability of the product and the need to ensure freshness. We have already discussed some of the implications of this for the grocery sector in general, such as:

- the need to develop a more regional delivery model to ensure timeliness of delivery – industry participants we spoke with said transport is a key factor in the decision of where to locate bakery plants
- bread products generally being delivered directly into supermarkets, rather than via their DCs, as a means of reducing the time from plant to supermarket shelf.

For similar reasons, neither rail nor coastal shipping is used in the bread industry. The frequency of the scheduling, as well as the total delivery time (including additional handling, and the need for some road transportation), prevent this from being an effective mechanism to deliver fresh bread to retail stores.

Sources of delay in the bread industry include:

- traffic congestion, mostly in the Auckland region
- weather-related delays, particularly during winter in the central North Island and South Island
- manufacturing delays, such as those arising from production outages or breakdowns

On long-haul deliveries, the above delays can lead to drivers exceeding the limit of the number of hours they can drive without a rest, and needing to deliver bread via two trips, with an adequate rest time in between them.

These delays can be a significant issue in the bread industry – with retailers requiring daily delivery of fresh bread, late deliveries can undermine the relationship between bread manufacturer and retailer, while also potentially leading to the retailer losing customers to competitors. Therefore, there are benefits to operating multiple plants and transporting on a regional basis, as delays related to weather and driver hours are more likely to occur over longer distances.

4.7.3 Opportunities to reduce transport costs in the bread industry

Our analysis of the bread industry found that transport is a key issue in the industry, and serious attempts are made within the industry to reduce transport costs as much as possible. Often this occurs at a relatively micro level within the industry – eg detailed analysis often goes into determining the optimal location of plants, both from a transport cost perspective and a timing-to-market perspective.

There are also attempts in the industry to improve vehicle utilisation by backloading trucks returning from dropping bread at retail stores. Bread is transported to retail stores in bread crates, which are stacked directly into trucks. Once full crates have been delivered, the trucks can be backloaded with empty crates

as well as any unsold stale products. It is easier to achieve substantial backloading in large urban areas, where the volume of returnable crates is higher; while backloading also occurs in smaller towns, there is only a limited number of crates to be collected on the return journey.

One opportunity identified as a means of reducing transport costs in the bread industry was the use of HPMVs for long-haul distribution of bread. With the additional volumes that could be loaded on to HPMVs, there would be potential for substantial cost savings. In one example, it was estimated that two HPMV trucks could be used for every three standard trucks that were currently used. Many of the issues identified earlier regarding the use of HPMVs in the logging industry were also raised here, such as the need to upgrade roads. Despite this, we understand that the use of HPMVs is being seriously considered in the bread industry.

4.8 Summary and conclusions

The data we collected as part of this study indicated that transport costs as a proportion of revenue in the grocery industry were approximately 1–12%. This was not as substantial as the extent of transport costs identified for the logging industry. Nonetheless, this did not appear to have prevented businesses in this industry from dedicating resources to seeking transport cost efficiencies where they might be available. Indeed, the industry has sought to achieve lower transport costs through:

- the use of a primary freight model, as a means of improving scheduling, reducing vehicle movements and achieving fuel cost savings (although this may impose some additional costs on suppliers, particularly importers, as noted earlier)
- significant use of backloading for trucks travelling between suppliers, DCs, ports and supermarkets
- the use of rail and coastal shipping for transport to DCs, where this is economically feasible for the particular type of product.

The opportunities to reduce costs in the grocery industry would arise mostly from the extent that improvements in coordination and utilisation of vehicles could be achieved.

5 Case study 3: Flower industry

For our third case study we considered the flower industry. While we initially intended to focus only on transport costs and issues for retail florists, we ended up covering the entire flower supply chain, from flower growers through to wholesalers and auctions, retail florists, and ultimately the end consumer.

We start with an overview of the flower industry in New Zealand, followed by a discussion of the industry supply chain and the extent of transport costs in the industry. We then discuss the main drivers of these transport costs, including sources of transport delays. We conclude by outlining some possible opportunities for reducing transport costs in the flower industry.

5.1 Context: Flowers in New Zealand

5.1.1 Value and contribution to the economy

New Zealand's climate and general environment provides excellent conditions for producing high-quality flowers. According to New Zealand Institute for Plant & Food Research (2010), there are almost 1000 commercial flower growers in New Zealand, producing cut flowers and foliage with an estimated wholesale value of $270 million in wholesale value, of which $235m is sold domestically. The remaining $35m is exported, with New Zealand by far the largest exporter of cut flowers and foliage products in the Oceania region (McGregor et al 2008). New Zealand flower exports include cut flowers, native greens, foliage, and bulbs. Orchids are the most common export, representing close to 60% of flower exports by value. From our discussions with industry participants, we estimated that approximately 80% of New Zealand's flower and foliage[16] production is based in Auckland, which supplies the Auckland market as well as other parts of the country. Growers are also distributed elsewhere throughout New Zealand, and many also supply all parts of New Zealand (including Auckland).

5.1.2 Structure of sector

The flower industry includes the growing of flowers, seeds and bulbs and subsequent selling to wholesalers and retailers for delivery to end customers, or transport to air/sea ports for export. Flowers are grown either in outdoor gardens or indoor greenhouses. Upfront investment for land and machinery can be high, particularly for flowers grown in greenhouses. In addition, labour costs can also be high, depending on the method of harvest used.

The flower industry in New Zealand is highly fragmented, with almost 1000 commercial flower growers, numerous wholesalers and retailers, and eight main exporters that handle around 95% of flower exports (New Zealand Institute for Plant & Food Research 2010).

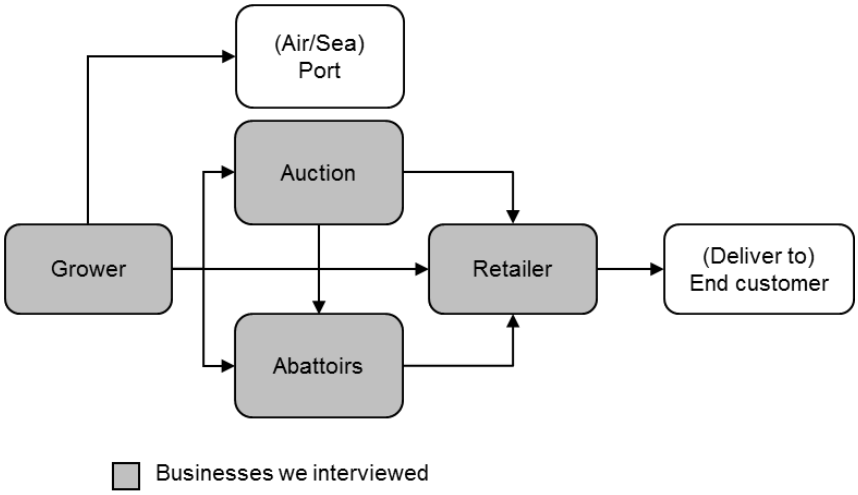
Growers range from large companies to small hobbyists. Once grown and harvested, cut flowers are sold by growers either at an auction or direct to a wholesaler or exporter. There are two major flower auction firms in New Zealand – FloraMax and United Flower Growers – with many smaller auction firms across the country. While flowers sold at auction can be purchased by retail florists, there are only limited

16 In the remainder of this report we refer only to flowers, but this should be taken to include both flowers and foliage.

circumstances in which flower growers sell flowers directly to retailers, as the quantities sold to any single retailer are too small to achieve supply cost efficiencies.

Flowers bought by wholesalers are resold to retailers, who then sell the flowers to the end consumer. There is significant diversity at the retail end, with flowers sold at major supermarket chains and other grocery outlets (eg dairies), major florist chains and by numerous small florists. Figure 5.1 provides a high-level summary of the flower industry supply chain.

Figure 5.1 High-level summary of the flower industry



The flower industry is characterised by some important features that make it an interesting industry to study in terms of transport-related issues. In particular:

- Flowers are fragile, which means that care needs to be taken when transporting them, to avoid compromising their quality.
- The delivery of perishable fresh cut flowers is time-sensitive. People in the flower industry told us that (approximately) 24 hours was the optimal time from when flowers are removed from water and boxed up at the grower/auction/wholesaler to when they can be returned to water at the retailer. This can create logistical transport-scheduling problems, such as with Sunday delivery, as we discuss later.
- Large fluctuations in demand occur in the industry, with peaks occurring at St Valentine's Day, Mother's Day and Christmas. There are also seasonal/regional upswings, with much higher production occurring in Auckland in winter than elsewhere, due to climate differences.
- The industry is highly fragmented, with large numbers of players at each stage of the supply chain: growers, wholesalers, transport operators, and retailers.
- Retail florists operate in an urban environment, and this can create issues associated with parking availability, urban congestion and delay.

5.2 Transport use

Once grown and harvested, cut flowers are sold by growers either at an auction or direct to a wholesaler. Of the companies we interviewed, Moffatts also sold flowers direct to retailers, although we were advised that most flower growers tend not to sell flowers directly to retailers.

For flowers sold via auction, if the grower is located sufficiently close to the auction house, they will transport the flowers to the auction house using their own transport. This is typically a grower-owned vehicle, such as a small truck or van, although there are some cases where a grower contracts out this transport service to a third-party transport operator, usually a courier-based freight company. Growers place the cut flowers in buckets of water, which are then loaded onto trolleys and transported to the auction house. Growers bear the cost of this transport themselves – that is, they do not on-charge this transport cost to the auction house or auction bidders. Rather, growers hope that this transport cost can be recovered via the market price determined at auction.

Growers might also sell flowers at auctions outside of their region. For example, while there are two major auction houses in Auckland, some Auckland growers also sell flowers at auctions run in Wellington, Taranaki and Manawatu. Transport outside of the region in this case is by way of third-party (road) transport operators. Cut flowers transported in this way are usually packaged in boxes, although there are instances where flowers are transported in buckets (on trolleys) between regions. Growers either deliver the flowers to the trucking company, or in some cases the trucking company picks up the flowers from the grower. The trucking company then delivers the flowers to the relevant auction house, charging the grower the freight costs of doing so (who, again, does not on-charge but hopes to recover these costs via the auction price).

Growers who sell direct to a wholesaler also use contract trucking companies to deliver flowers to the wholesaler. In some cases growers bear this cost themselves, but in others the growers on-charge the cost of freight to the wholesaler. Where freight is on-charged, it can vary as to whether the freight component is separately specified, or it is included in the price. Cut flowers sold to wholesalers are also packaged in boxes.

Once at auction, flowers are sold to either wholesalers or retailers (sometimes via flower marketers and commission buyers). Both wholesalers and retailers use their own vehicles (eg a truck or van) to transport the flowers from the auction to their wholesale or retail outlet. Wholesalers take orders from retail florists, and transport flowers in boxes from their wholesale outlet to the retailer using third-party transport operators, with the freight costs incurred by the wholesalers and on-charged to the florists. The freight charges negotiated with third-party transport operators often include a separate fuel surcharge component.

For intra-island transport, boxes of flowers are typically transported to the transport provider's regional hub using the provider's own delivery (courier) vans, and then transported long-haul by truck to another regional hub located close to the retail florist, before again being transported by courier van from the hub to the florist.

Many flowers are also transported between the North and South Islands. Inter-island transport can be by road and ferry over Cook Strait, but the two-day delivery time makes this only suitable for less perishable products. The majority of flowers transported to the South Island go by air freight, in the belly-holds of passenger aircrafts. One estimate we were given was that approximately 70–80% of flowers transported from the North Island to the South Island are by air. Likewise, transport from the South Island to the North Island is often by air freight, although road freight might be used to supply to bulk customers (such as a wholesaler).

The retail segment of the flower industry is very fragmented, with a large number of small florists (although there are some large florist chains), and supermarkets also purchase significant flower volumes. Florists receive multiple deliveries every day of flowers purchased from wholesalers, which are generally transported to the florist by courier drivers (from a regional hub, as explained above), but in some cases

might also be delivered directly by the wholesaler. Florists also purchase flowers at auctions, and as noted above, generally transport these from the auction to their retail store using their own vehicle.

Deliveries from florists to final consumers can use a range of transport methods, although typically a florist has regular scheduled courier pick-ups throughout the day, where they try to dispatch multiple orders. In between regular courier pick-ups, florists might also use urgent couriers, or deliver by foot to nearby destinations (eg flowers delivered to offices in CBDs). Some florists also use their own vehicles for delivery to final consumers. Transport costs charged to florists are on-charged to the end-consumer, typically specified as a separate transport component on the invoice.

5.3 Transport costs

We only received a limited response from the flower industry to our request for data, and for those who did respond, the quality of data was relatively poor. There was insufficient information to derive the percentage of transport costs for the flower industry. That said, the limited data obtained from businesses indicated that transport costs as a proportion of business costs and revenue in the flower industry is possibly lower than in the logging and grocery industries.

While the majority of flowers are delivered by road, some flowers are transported using air freight between the islands, which can add significantly to transport costs. In general, transport costs are split 50:50 between road and air modes, despite much lower volumes being delivered using air freight.

5.4 Transport cost drivers

The main factors affecting transport costs in the flower industry are:

- the perishability of the product, and the implications of this for the timeliness of delivery
- the costs imposed by Cook Strait in transporting flowers between the islands
- the use of non-dedicated third-party transport providers.

We discuss each of these key cost drivers in the sections below.

5.4.1 Perishability

Flowers are a highly perishable product, with the implication that the delivery time frame is very tight. As noted earlier, (approximately) 24 hours is the optimal time from when flowers are removed from water and boxed up at the grower/auction/wholesaler to when they should be returned to water at the retailer. When there are multiple stages along the supply chain (eg from grower, to auction, to wholesaler, to retailer), this can add additional processing costs, as at each stage in the chain the flower is typically re-cut and refreshed in water.

The perishability of flowers means that it is difficult to transport flowers long distances using anything other than air freight. The time frame for transport by road, rail or coastal shipping is too long to transport most types of flowers between the islands while maintaining quality. This leads to substantially higher transport costs due to the cost of air freight. Industry data suggests that approximately three times as much is spent on air freight per unit as on transport by road.

The perishability of flowers means that it is difficult for retail florists to obtain fresh flowers in their stores on Monday mornings, as third-party transport operators do not typically pick up or deliver on Sundays – particularly an issue for lower North Island and all South Island retailers requiring flowers from upper North Island growers or wholesalers. For example, to obtain fresh flowers for Monday morning, a retailer needs to purchase the flowers on Friday, with delivery occurring on Friday and Saturday to ensure the flowers are available in-store on Monday morning – ie consumers may well be purchasing flowers that are three days old, which can compromise quality.

Similar problems can occur with delivery around public holidays, such as Easter and Christmas. With third-party transport operators not providing deliveries on certain public holidays, florists need to order their flowers in advance, but doing this can reduce the quality of the flowers that are available immediately after the public holiday period. Industry participants we spoke to all identified this as a key factor affecting transport costs in the flower industry.

5.4.2 Cook Strait

Another key factor that increased transport costs in the flower industry was the need to cross Cook Strait to reach North or South Island markets. We understand that growers of certain types of flowers tend to cluster together, according to factors such as soil type and climate that best suit the flowers grown (but see our discussion below regarding some South Island growers). However, since florists (and ultimately, the end consumer) demand a range of different flower types, there is a need to transport flowers to all parts of the country. For example, a rose grower in Christchurch is unlikely to find sufficient demand for their products in the South Island alone, so will also need to transport roses to the North Island.

However, to send flowers between the islands by road requires the grower/wholesaler to incur both the cost of the trucking operator's freight charge, and an additional charge for the Cook Strait ferry crossing. The alternative is transport by air freight, which as noted earlier can incur a high cost. Either way, transport between the islands is a significant cost factor, especially when compared with the relatively low costs for local growers to transport to their local markets. One estimate we were provided with was that the (wholesale) price of gerberas in Auckland is approximately three times greater for gerberas grown in Christchurch than for those grown in Auckland.

As well as limiting the ability of growers and wholesalers to expand into markets across Cook Strait, the transport costs imposed by Cook Strait can also lead to perverse incentives for industry participants. South Island growers tend to grow flowers that are not necessarily suited to the South Island climate, but are more likely to be in demand in the South Island market. These growers are constrained from growing more climate-suitable flowers, as although there would be greater demand for these flowers in the North Island, the Cook Strait transport costs make it uneconomic to send them there.

5.4.3 Non-dedicated transport operations

The vast majority of transport in the flower industry, across all stages of the supply chain, use third-party transport operators. These operators are generally not dedicated flower transporters – they also transport a range of other products such as groceries and other general consumer items, although there are a few dedicated courier vans operating in Auckland.

Those we spoke to in the flower industry suggested that the use of third-party/courier companies can have the following implications:

- It can increase the chances of flower products being damaged. Third-party transport operators tend to 'top stow' boxes of flowers, stacking them on top of other heavier items to reduce the chances of damage. However, loose boxes are sometimes squashed, or move around, which can damage certain flowers. Sometimes a driver stands a box on its end (rather than lying it flat) in order to fit it into a load, causing considerable damage to the flowers. We heard differing views amongst industry participants on how significant this issue was – some considered that damaged product only happened on the odd occasion, while others said they suffered substantially from flower damage.
- There is potential for flower quality to be compromised, as flowers are not usually transported on refrigerated trucks (although there are some instances where flowers are transported on chilled produce trucks). Conversely, transport on chilled trucks can damage flowers if the temperature fluctuates or is too cold. While it does appear that the industry manages this potential problem (eg by transporting a lot of product overnight, when heat is less of an issue), it could nonetheless improve efficiencies if flowers could be transported at a steady chilled temperature. For example, it might allow a slightly longer delivery lead time, without compromising quality, potentially solving issues around delivery on Sundays and public holidays.
- Transport operators tend to arrange their pick-up and drop-off schedules around the range of products that they carry, but often this does not coincide with the requirements of the flower industry. For example, operators often arrive to pick up from auctions before the flowers are boxed and ready to be transported. Likewise, operators might deliver flowers to an auction after the auction has already started, due to the need to meet delivery deadlines for other products also being transported, meaning that the grower can miss the opportunity to sell at that particular auction time. There is also the potential for timing problems, such as boxes of flowers remaining at the depots of transport operators for long periods while they consolidate other freight.

We noted that despite raising these concerns, those we spoke to indicated that these problems only tend to happen on isolated occasions, and they can be actively managed by those in the flower industry by ensuring competitive tension amongst transport operators. Moreover, speaking to the transport operators was outside the scope of this study, so they did not have a chance to clarify their view on any of the above issues.

5.5 Sources of transport delays

As with the grocery industry, which also operates in an urban environment, the main source of delay for the flower industry arises from congestion. This occurs mostly for delivery to retail florists and end consumers in the main centres, particularly Auckland. Those we spoke to suggested that congestion is not a significant issue for the long-haul transport of flowers, although, as with the grocery industry, the cost of congestion is likely to be borne by the transport operators, who will pass this through to growers/ wholesalers/retailers in their freight charges. The cost of congestion from long-haul transportation may therefore not be visible to those in the flower industry.

A related issue for retail florists is the lack of parking and loading zones, particularly in the major cities, as this can turn potential customers away or limit the number and/or timeliness of deliveries.

Delays in the supply chain can also occur around big events, such as Valentines' Day, due to the substantial increase in volumes transported around these times and the resulting potential for mistakes. This might include missed pick-ups, sending flowers to the wrong destination, breakdowns, delivering the wrong number of boxes, etc.

5.6 Opportunities to reduce transport costs

Those we spoke with in the flower industry indicated that the opportunities for improved transport efficiencies in the industry were limited. The industry uses third-party transport operators and looks to ensure there is competitive tension between these operators (eg by regularly swapping between operators to obtain better service and/or price). The limited opportunity to use mechanisms such as backloading or alternative transport modes to reduce costs, and the small volumes being delivered, also contribute to the use of third-party operators. This may partly reflect our finding that transport costs are only a small proportion of operating costs and sales revenue for this industry, but it also reflects the characteristics of the industry.

For example, backloading is not used to any significant extent because the flow of flowers tends only to be one-way eg grower to auction/wholesaler, or wholesaler to retailer. Flowers also tend to be transported in boxes, so there is little need for trucks to be backloaded with the empty boxes. While backloading occurs when flowers are transported in buckets and trolleys (with the return of empty buckets/trolleys), this generally applies to the transport of flowers from the grower to the auction house or wholesaler, rather than to transporting flowers over long distances.

Likewise, substitution to rail or coastal shipping is unlikely to be an effective option for the flower industry, as the speed of these services and the irregular scheduling (relative to road transport) is not sufficient to meet the tight timelines required to deliver flowers while maintaining quality. The requirement for road transport to and from the train/ship also adds time, plus additional handling costs. None of those we spoke to in the industry identified any current use of rail or coastal shipping for the transport of flowers, and neither was it considered to be an economically feasible option for transport.

One way that transport costs in the flower industry could be reduced would be through dedicated transport services for flowers. As noted above, currently the transport of flowers over both long and (in most cases) short distances is consolidated with the transport of other products. This can lead to concerns over timeliness and quality, as transport operators make decisions in a way that reflects the entire range of products that they carry. A dedicated flower transport service would resolve many of these concerns, as pick-up and delivery of flowers would be scheduled to the appropriate time, and flowers would be transported in a way that mitigates damage and improves efficiencies (eg using refrigerated freight, as noted above). It could also resolve issues such as the lack of deliveries on Sunday and public holidays, as the dedicated freight service would find it cost effective to operate on these days. However, the small volumes delivered could make it difficult to operate a dedicated service. Indeed, one of the businesses indicated that a dedicated operator used to exist but went out of business.

However, the lack of scale in the New Zealand flower industry is likely to make a dedicated freight option uneconomic. If transport providers were to focus solely on delivering flowers, they would have insufficient volumes to cover fixed transport costs. Indeed, the current model where third-party transport operators cover a wide range of products likely allows these operators to achieve economies of scale, reducing average costs across the greater range of volume, and potentially passing through these cost savings to transport uses.

As a final area where transport costs might be reduced in the flower industry, we noted that one of the key sources of delay identified above was from congestion. As with the grocery industry, the introduction of policies that lower congestion could reduce the transport costs of the flower industry. A possible option would be to implement direct congestion charging to road users; however, more work would be required to determine if the benefits of such a policy would be likely to exceed the costs.

5.7 Summary and conclusions

Our analysis of the flower industry suggested that the key drivers of transport costs in this industry were:

- the perishability of the product, and therefore the need to have flowers delivered to retailers in a timely manner
- the need for growers and wholesalers to serve markets in both the North and South Islands
- the absence of any transport operators that provided a dedicated flower transport service.

These were issues that were difficult for industry participants to overcome, and there were unlikely to be solutions through central or local government policy intervention. Indeed, the perishability of flowers is a fundamental feature of the product in question, the additional cost of crossing Cook Strait is largely unavoidable, and as discussed above, the scale of the flower industry in New Zealand makes a dedicated transport service uneconomic.

Other possible ways in which transport costs could be reduced, such as backloading and modal substitution, which as we have seen for logging and groceries have potential in other industries, were also unsuitable for the flower industry. The main way that the industry was trying to reduce transport costs was to ensure there were significant competitive pressures between contracted transport operators.

The information we collected also indicated that transport costs were a relatively small proportion of operating costs and revenue in the flower industry. To some extent, this could diminish the incentive for industry players to seek ways to reduce their transport costs, as doing so would not materially impact their profitability – some of those we interviewed said that reviewing transport costs and the nature of their supply chain was of a very low priority for their business.

For these reasons, we concluded that there was very limited scope for reducing transport costs in the flower industry. The only area that could be explored further, which we discussed in more detail for the grocery industry, would be introducing policies that could reduce congestion in urban areas, such as congestion pricing.

6 Discussion and conclusions

This study provided an opportunity to examine the relative importance of transport costs as an input to the logging, grocery (including bread) and flower industries. However, while these industries were the focus of this study, there were a number of common themes that were relevant for transport costs for all businesses in New Zealand.

This chapter discusses these more general themes and the associated opportunities for reducing transport costs for New Zealand businesses.

6.1 Overview

The case studies were selected to provide wider insights on transport costs for New Zealand businesses.

The grocery, daily bread and flower industries were characterised by:

- supply chains requiring close coordination between producers, wholesalers and retailers
- many, sometimes small, retail outlets across both the North and South Islands of New Zealand, and within urban centres
- the use of third parties and/or couriers for many transport-related tasks
- products with differing transport requirements (eg perishable and non-perishable goods).

These characteristics would also apply to a range of other retail industries, such as meat retailing, smaller grocery stores, cafes and restaurants, as well as non-grocery retail stores (eg apparel, appliances, electronics, etc).

The logging industry was characterised by:

- periodic harvesting of raw products that were transported to local mills for processing or directly to ports for export
- third-party provision of log transport services
- the specialised nature of logging trucks
- the need to access remote locations to transport products to markets.

These characteristics would also apply to other forms of primary production, including grains, dairy, wool and livestock.

The opportunities to reduce transport costs for New Zealand businesses engaged in primary production and/or retailing can be grouped into two principal categories, namely:

- opportunities for New Zealand businesses themselves to directly reduce transport costs through improved vehicle utilisation
- opportunities to improve the transport policy environment to reduce transport costs for all New Zealand businesses.

The remainder of this chapter discusses the opportunities to reduce transport costs within these two categories in greater detail.

6.2 Opportunities to directly reduce transport costs for New Zealand businesses

A common theme across the industries that we investigated was that the importance of transport costs to businesses meant that they sought to reduce costs by whatever means they believed was directly within their control. In practice this meant that:

- there was widespread use of transport contracting to reduce transport costs, where this was practically feasible
- third-party transport was part of the effort to reduce transport costs, with third parties having strong incentives to make use of spare capacity by offering services across multiple industries
- efforts were being made to minimise empty running, through route design and/or backloading within an industry, wherever possible (eg circuits for logging vehicles, backloading empty crates in the bread industry).

However, there were a number of impediments to improving vehicle utilisation to reduce transport costs for these industries, such as:

- limited power by many businesses within the industries examined to influence transport prices
- information asymmetries on transport cost drivers, and so limited incentive to change practices and improve coordination where any additional transport costs were not directly borne by the business.

The first impediment arises because many smaller businesses are transport price takers, given the amount of transport required, and so prefer to receive bundled prices for goods received. This reduces administrative costs and so allows the business to focus on its primary role, the retailing of goods to end customers. One example was a business in the flower industry that, if given an invoice for (say) $50 of product and $10 of freight cost, it would raise the issue with the supplier, but if given an invoice for $60 it would have no concerns whatsoever.

There seemed to be little opportunity for businesses to examine how improved coordination along a supply chain could reduce these costs. For example, coordination of the times for receipt of goods could allow suppliers to improve routes and vehicle utilisation, and minimise unloading delays. In the absence of knowledge of the transport cost component within the bundled price, any changes in coordination that could reduce these prices would be received by the transport provider and not the business. To some extent these could be passed on, as transport markets seem reasonably competitive. But even so, the lack of clear visibility of the opportunity for efficiencies to be achieved, and how those efficiencies might be passed on through lower prices, limits the incentives for businesses to seek out these opportunities.

Finally, the logging industry was likely to have less opportunity to achieve direct cost savings, given the specialised nature of the transport requirements. That said, there could be lessons from other harvesting industries where trucks are used for only a part of the year in the industry and are otherwise used for other transport tasks for the remainder of the year (eg carting grain). As identified in our discussions with logging companies, there might therefore be opportunities to use logging trucks for other transport tasks outside of the logging industry, with minor vehicle modifications.

In summary, we believe that there would be likely benefits of reducing transport costs for New Zealand businesses by:

- seeking out opportunities to improve coordination along the supply chain
- investigating opportunities to improve vehicle utilisation by making greater use of vehicles across industries.

6.3 Transport policy opportunities to reduce costs for New Zealand businesses

Our discussions with industry representatives highlighted a number of potential opportunities to reduce costs for New Zealand businesses. We did not have the opportunity, as part of this study, to examine whether or not these opportunities were likely to be net beneficial (ie whether the benefits would outweigh the costs).

6.3.1 Increasing the use of high-productivity motor vehicles

High-productivity motor vehicles (HPMVs) have the potential to improve the productivity of the transport sector by increasing the capacity of heavy vehicles travelling on designated HPMV routes. In the industries that we considered, the potential opportunity to make greater use of HPMVs was acknowledged, but a number of impediments to their use were identified, including:

- the limited routes where HPMVs can operate
- tolerance levels for HPMVs being tighter than for general-access vehicles.

Investment in HPMV routes would require consideration of the relative costs and benefits of any pavement and bridge strengthening required. While it was recognised that considerable effort has already been expended by the NZTA, in conjunction with councils and the logging industry, on identifying the strategic HPMV routes requiring pavement upgrades and bridge strengthening, it was clear that there was concern about the future programming and funding of this work.

In addition, the trade-off between the risks associated with HPMV tolerance levels and the practicalities of industries making use of HPMV vehicles could be examined further.

6.3.2 Availability of skilled drivers

In a number of interviews, participants identified the lack of availability of skilled drivers as an ongoing concern. Anecdotally, the perceived limited career path in New Zealand and higher wages for drivers in other countries (eg Australia) has resulted in the pool of skilled drivers declining in recent years, with flow-on impacts on driver and transport costs. A reduced pool of drivers, combined with fatigue laws restricting the number of hours that drivers can drive, means that the ordinary labour market processes of providing overtime to manage labour shortages cannot apply.

This shortage could be the result of the market structure of the industry, where third-party providers offer competitive salaries to drivers who are skilled and qualified.

Additional research on the cause of the shortage and how it might be addressed could be considered further.

6.3.3 Managing congestion

The final policy opportunity relates to the impacts of transport decisions on the wider community through increased road congestion. The contribution of business to road congestion reflects supply chains that do not seek to minimise the total transport costs, including third-party congestion effects. Improving transport decision making to take into account these effects would therefore be one approach to reducing transport costs in general to New Zealand businesses.

Where transport costs are borne outside of the industry (eg as a consequence of congestion impacting on third parties) there are limited incentives to reduce those costs by transport operators and businesses. An example of this has been a shift in the grocery industry to just-in-time supplier delivery of goods to retail stores, as compared with coordinated delivery to distribution centres and then on-delivery to grocery stores. This change has:

- reduced the direct transport costs borne by the grocery industry for the delivery of goods from distribution centres to retail stores
- reduced inventory costs for grocery retailers
- given rise to potentially increased transport costs
- increased the number of truck movements in and around retail stores
- probably contributed to increased urban congestion.

A further example involves council restrictions on travel by heavy vehicles after hours, due to community noise concerns. These restrictions limit opportunities for businesses to schedule deliveries after standard business hours and thereby improve vehicle utilisation, reduce transport delays and ultimately reduce transport costs. That is not to say that the increased noise does not impose costs on third parties (ie communities). This is an area that warrants further investigation.

We therefore believe that there would be likely benefits in reducing transport costs for New Zealand businesses through reducing congestion, particularly in urban areas.

6.4 Summary of key findings

This study provided an opportunity to investigate the proportion of total business costs that were attributable to transport in New Zealand and to consider the opportunities for reducing those costs. Across the case study industries, we found that transport costs represented:

- 15–25% of total revenue and 25–30% of total costs for businesses in the logging industry
- 1–12% of both total revenue and costs for businesses in the grocery industry.

Insufficient information was provided from the flower industry to estimate the proportion of business costs that were related to transport.

Our key findings on the opportunities to reduce these costs for New Zealand businesses are set out in table 6.1 below.

Table 6.1 Summary of key findings from the study

Industry	Findings
Logging	• Increased transport and handling costs for the logging industry are likely as export log growth places increasing pressure on existing log-storage facilities at ports. • Opportunities to reduce direct transport costs are limited. • Some opportunities might exist to improve utilisation of logging vehicles by modifying vehicles so they can provide services to other industries.
Grocery	• The shift to greater reliance on just-in-time delivery directly from suppliers to grocery retailers is likely to be contributing to urban congestion and so increasing transport costs for the sector (offset by lower inventory and other costs). • The use of rail is increasing, particularly for non-perishable goods, and further opportunities are available. • Improving the coordination and utilisation of vehicles (particularly for the daily bread-delivery sector) could result in lower transport costs.
Flower	• The industry is efficient in its use of third-party transport operators, and given the small volumes of product transported (relative to other sectors) there is limited opportunity for transport costs to be actively managed.
All industries	• Improved coordination along the supply chain could provide opportunities for businesses to seek out cost savings where feasible. • Consideration should be given to impediments to the greater use of HPMVs, including considering the appropriateness of current weight tolerances and processes for the programming and funding of HPMV route extensions. • Consideration should be given to addressing the shortage of skilled drivers. • Consideration should be given to mechanisms (including pricing) to ensure that transport decisions take into account costs imposed on the wider community.

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Appendix A List of organisations interviewed

The organisations listed in the table below were interviewed as part of this project.

Logging	Grocery	Flower
NZ Forest Owners Association	NZ Food and Grocery Council	Fresh Cut
Pan Pac	Progressive Enterprises	United Flower Growers
Hancock	Foodstuffs (Wellington)	Bokay Flowers
Rayioner	Bell Tea	Moffatts
	Nestle New Zealand	
	Mars New Zealand	
	Goodman Fielder	
	George Weston Foods	

Appendix B Data collection template

Transport's proportion of total costs for New Zealand businesses:
Data collection template - general accounting data

Date: 24 April 2012

All data collected will remain strictly confidential and will only be used for the purpose of this particular project. Companies interviewed will not be identified in the data analysis, and data will only be presented in average form so that no individual responses can be determined

Where your company has multiple lines of business, please only provide data that relates to the grocery retailing segment of your business

Financial reporting year		**Comments/assumptions**
We prefer data from your most recent financial reporting year. Please enter the financial reporting year from which the data in the questions below is taken.		
Financial reporting year-end (DD/MM/YYYY)		
Revenue		
For the financial year, please provide your total revenue and a breakdown of your total revenue. Some possible categories are suggested below - you may add, delete or modify these as best suits your company and its accounting system.		
Total revenue ($)		
Broken down as follows:		
Gross revenue from retail sales ($)		
Other revenue (please specify in yellow comment box) ($)		
Operating and Administration Expenses		
For the financial year, please provide your total operating and administration expenses and a breakdown of these expenses. Some possible categories are suggested below - you may add, delete or modify these as best suits your company and its accounting system.		
Total operating and administration expenses ($)		
Broken down as follows:		
Cost of production and sale		
Cost of goods sold ($)		
Labour costs ($)		
Domestic transport costs ($)		
International transport costs ($)		
Sales and marketing costs ($)		
Storage/warehousing costs ($)		
Other (please specify in the yellow comment box) ($)		
General and administration expenses		
Finance/accounting/legal/professional ($)		
Rental/lease payments or mortgage payments/utilities/rates (excluding storage/warehousing costs noted above) ($)		
Other general and administration expenses (e.g., R&D, insurance, ACC levies, fringe benefits taxes) ($)		
Other (please specify in the yellow comment box) ($)		

Data collection template - specific transport cost data

Date: 24 April 2012

All data collected will remain strictly confidential and will only be used for the purpose of this particular project. Companies interviewed will not be identified in the data analysis, and data will only be presented in average form so that no individual responses can be determined

Where your company has multiple lines of business, please only provide data that relates to the grocery retailing segment of your business

We are interested in how transport costs are split between: (1) costs for transport from suppliers into the distribution centre; and (2) costs for transport from the distribution centre (and/or directly from suppliers) into the retail store. Each question below includes two headings above the green shaded cells to capture this split ("Into DC" and "Into Retail Store" respectively)

The following questions relate to your company's transport costs. When calculating those transport costs please include:

- All costs related to transporting raw materials and other inputs between domestic locations (including NZ ports), by road, rail, domestic shipping and domestic air freight
- All costs related to transporting outputs between domestic locations (including NZ ports), by road, rail, domestic shipping and domestic air freight
- All costs charged to you by a third party provider of a vehicle fleet (including couriers) or a third party transport operator
- Any costs related to employee travel (personal vehicle usage, airfares, taxi fares, etc)
- Any postal or courier transport costs

But please exclude:
- Any costs related to shipping from/to overseas markets
- Any costs related to storage or warehousing

Financial reporting year

			Comments/assumptions
Financial reporting year-end (DD/MM/YYYY)	1/0/1900	1/0/1900	

Transport costs by mode

*For the financial year, please provide your domestic transport **costs** by transport mode (road, rail, domestic shipping and domestic air).*

	Into DC	Into retail store	Comments/assumptions
Domestic transport costs by road ($)			
Domestic transport costs by rail ($)			
Domestic transport costs by domestic shipping ($)			
Domestic transport costs by domestic air ($)			

Transport volumes by mode

*For the financial year, please provide your domestic transport **volumes** by transport mode (road, rail, domestic shipping and domestic air.*

Please specify in the yellow comment boxes the units you have used for volumes (e.g., tonnes, kms, tonne-kms, cartons, containers, pallets, etc)

	Into DC	Into retail store	Comments/assumptions
Domestic transport volumes by road			
Domestic transport volumes by rail			
Domestic transport volumes by domestic shipping			
Domestic transport volumes by domestic air			

Transport costs by department (for transport costs into retail store only)

For the financial year, please provide a breakdown of your total domestic transport costs, transport volumes, and total revenue for the following departments.

	Into retail store only			
	Transport costs	Transport volumes	Total revenue	Comments/assumptions
Meat				
Delicatessan				
Seafood				
Bakery				
Fresh fruit and vegetables				
Beer and wine				
Frozen goods				
Dairy products				
Dry groceries				
Health and beauty products				
General merchandise				
Other (not specified above)				