

# **Best practice in freight transport operations**

Report No. R08/59

ISBN 078 1 86027 866 0

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**ISBN 978-1-86937-866-0**

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July 2008





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## *Executive Summary*

Regional government is showing good leadership in developing best practice freight systems. This is evidenced by freight route, hub and delivery planning that is well documented and is in place and working. Government issued freight related strategy and objectives indicate that across New Zealand more emphasis and planning needs to be put into transport sustainability. Research shows that practical ways to achieve that are through reducing energy use by optimising modal choice, and intermodal freight movement. These are in line with the New Zealand Transport Strategy's overarching aspirations of economic transformation and achieving environmental sustainability. This reports identifies area particularly in the areas of freight movement between modes and more specifically including rail and coastal shipping strategies into best practice development throughout the region.

The clear identification and communication of freight routes through urban areas is necessary and achievable, and meets governments transport objectives particularly for safety and accessibility. Canterbury has done this well. Freight hubs are emerging in the literature as a best practice option for coordinating the efficient movement of regional and urban freight. While Christchurch has areas designated as freight hub zones, and some freight hubs are operated within individual companies, further investigation is recommended into a wider adoption by the region, with aligned policy and connections to other regions. This work would examine suitable ownership and operation of urban freight villages and public logistics terminals.

Linking with the identification of freight routes and hubs is the recommendation that best practice be widened to consider the benefits of intermodal freight terminals. Intermodal terminals can serve as a cost efficient link between coastal shipping, rail and road operations. Overseas experience shows the potential for a large growth in freight using such facilities. Pickup and delivery operations are likely to remain truck based as there is no practical alternative whereas for interregional work best practice and national strategy indicators are that more freight will move other than by road. This report recommends this as a key area for best practice development.

Urban freight pickup and delivery best practice requires accessibility to business and controls on loading and unloading zones. Canterbury does well in this regard and this is evidenced by the recently released freight accessibility guide. For new distribution centres a more proactive approach is recommended to ensure newly establishing business at least make planning provision for future rail links in their design and layout.

Efficient use of resources is identified as of importance to best practice as growing concern mounts over fuel cost and availability. Canterbury's freight strategy and industry practices are well focused to meet currently understood demands of freight system efficiency, however future best practice planning will need to include a stronger emphasis on risk management planning to cope with possible disruptions to reliability of transport systems in times of shortages and price increase scenarios.

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## 1 Introduction

The quest maximising the benefits and mitigating the costs of operation a supply chain drives the search for better ways of operating throughout the freight transport system. The adoption of best practices requires leadership – primarily from the Government – to ensure maximum return for New Zealand as a society. Regional and local government can then confidently operationalise the vision and goals via policy and procedure and measure performance.

The solutions that add most value are identified as 'best practice'. Seeking out best practices transcends efficiency and addresses issues of sustainability in striving to attain the 'greater good' for all freight industry stakeholders. Best practice activities therefore must be transparent, ethical and subject to public scrutiny and fulfil both the letter and intention of the law. The step from compliance to best practice can be taken voluntarily by business. Seeking accreditation for a company's management systems, or environmental systems are examples of initiatives that provide a base for best practice systems to develop. Freight transportation is a key but often overlooked area for transport policy with the complexities of the freight market not well understood. (Bolland, 2005).

The adoption of best practice systems and processes is voluntary; however leadership and direction from industry overview bodies can make the task simpler, more effective and increase the rate of adoption. Many businesses are caught up in day to day activities and tasks which make it difficult for them to find the time and energy to review their systems and performance, identify areas for improvement and invest the time and energy required to adopt best practice, even if that commitment will give them a long term advantage. Government policy enables regional planning and representative organisations to assist their members understand and embrace changes that improve their operations. At the point where freight moves on the network, businesses provide employees with process and performance standards for route choice, safety and driver behaviour.

The social, political, economic and environmental frameworks in which businesses operate sets the parameters and expectations of what is understood as best practice. The growing recognition of the impact of economic externalities, most topically environmental concerns that contribute to global warming, and road safety, invites the industry to examine best practice in terms other than just freight delivery efficiency. Should authorities and operators embrace such issues voluntarily?

### 1.1 Objectives of report

The objectives of this report are to:

- Identify the key factors contributing to best practice and develop simple assessment criteria
- Compare the current Canterbury freight industry to benchmark definitions and examples
- Rank Canterbury's commercial industry performance against a core set of best practice indicators
- Highlight how best practice measures might evolve in light of alternative visions of the future of Canterbury

## 1.2 Methodology

Best commercial transport practices have been identified by way of a literature review of papers relating to New Zealand and international studies of best practice in the freight operation and logistics fields. Reviews of recent reports on freight movements summarised in recent reports about transport are reported. Canterbury, along with observed current freight movement methods and processes have been analysed.

## 1.3 Scope of report

The scope of this report covers the systems, activities and processes that contribute to the regional commercial freight movement regime. It does not address best practice at a first line operator level such as an operator rating programme for truck drivers. However, best practice process that includes fuel efficiency, road safety and emissions are included where freight company and driver actions are direct contributors to regional commercial freight best practice systems. Likewise government initiatives for fuel type and modal choice are also considered within the report.

## 1.4 The freight industry in New Zealand

This section outlines, in very broad terms the nature of the freight industry and issues that it faces. It summarises the main factors that define freight operations within the wider New Zealand context, before focusing on the Canterbury region in the main body of the report.

### 1.4.1 Industry characteristics

At present, 84% of New Zealand's internal freight is carried by road. The remainder is by rail and coastal shipping. There were 100,002 heavy vehicles on the road in 2005 (Mackie, Baas et al. 2006) this includes goods vehicles and passenger transport buses and coaches. About a 25% of those vehicles are combination vehicles (truck-trailers, B-trains and tractor-semitrailers) and they travelled 40% of total distance travelled by all heavy vehicles. Combination vehicles travel between 50,000 and 500,000 kms per year and work in the hire and reward sector carrying 75% of the total payload transported by road. The industry is characterised by relatively few national network operators, and many small regional operators, most of whom operate small fleets of less than five vehicles. There is a perception that most trucks are in small fleets, and it is true that about 80% of transport operators have up to three vehicles. However this group only operates 30% of all vehicles with the largest 2% of operators responsible for 32% of all vehicles. In numerical terms, there are 88 enterprises that employ more than 50 employees, with 38 enterprises with 100 or more employees which accounts for nearly a third of all road freight transport employees.

More freight could be transported by rail, however there are a number of practical reasons such as short distance, inter urban movement and freight movements between source and destination not serviced by rail. The latter group contains milk collection, livestock and produce for the rural sector. A study by Mackie, Baas et al. (2006) showed that at best rail could increase its modal share from 13% to 20% on a tonnage basis. A modal shift of that amount still represents a tripling of rail freight volumes by 2020, based on current predictions of the freight transport task.

The operation of the freight industry is determined by legislation, resource location, geography and patterns of settlement and is very diverse. Road transport currently dominates the mode of logistics development that centralises production and distribution

on a few sites, and promises 'overnight delivery' to most destinations within each island, or two day when delivery is inter-island.

In 2005 Land Transport New Zealand published research that investigated freight within New Zealand. (Bolland 2005).The report sought to identify inter regional freight movements by type and by mode. A summary of those findings is included below, and this information will be used later in the report when assessing what best practices are. The findings report the relationship between tonnes and distance for each mode and that information is summarised in the following table.

	<b>% Tonnes Carried</b>	<b>% Tonne/Kms</b>	<b>Nature of trip</b>
<b>Road</b>	83	67	Average trip 144kms, with one third greater than 200kms
<b>Rail</b>	13	18	Average trip of 250kms, including short hauls
<b>Coastal Ship</b>	4	15	Long distance.

**Table 1: Relationship between tonnes and distance (Adapted from Bolland 2005)**

The ratios between tonnes carried and tonne/kms indicate that road has the shortest haul, and consistent with that, Bolland reports that two thirds of all road movements are of less than 200kms.

Of all tonnage, half of all road and rail freight is reported to move within the Auckland, Waikato and Bay of Plenty regions. By contrast Canterbury is the region with the largest area with a 10% share of freight tonnage movements. Bolland identifies road movements from Christchurch source to Christchurch destination as the second greatest road tonnage corridor after freight movements across Auckland. He attributes this to coal movement and Christchurch's role as an important distribution centre. Rail shipments of coal from the West Coast to Christchurch are identified as a significant movement, second only in rail tonnage movement of forestry production within the Bay of Plenty to the port of Tauranga. 55% of all imported freight enters NZ via Marsden point as oil and via Auckland for general commodities. Christchurch is the third largest port after Tauranga (11.5%) with 8% of tonnage, with Timaru receiving two percent of all imports. Lyttelton is the third largest export port with 12% of export tonnage, behind Tauranga (31%) and New Plymouth (13%), with Timaru exporting 1.5%.

#### **1.4.2 Industry framework**

Commercial freight movements take place within a social, economic and technical context – a framework that includes stakeholders, infrastructure, political and economic interests. Within this extremely broad and complex framework freight system operators and controllers can choose a model of operation as long as it is lawful. Deregulation of the industry in 1983 removed restrictions on road transport distances, and allowed open competition between all modes. Further restrictions were removed in when coastal shipping was opened up by the removal of cabotage.

## 1.5 National freight issues

Of concern at a national level is the projected doubling of freight movements by 2020. Research identifies that an increase in heavy vehicle kilometres travelled is closely linked with GDP growth, with every percentage growth in GDP resulting in 1.4% growth in kilometres travelled. (Mackie, Baas, & Manz 2006). Little is known about the behaviour of kilometre growth where there is 0% GDP growth or negative GDP growth.

### 1.5.1 Rail revisited

The recent purchase of the rail operation by the government opens up the opportunity to assist with identifying how freight best practice could be developed to address some of the issues that frustrate Worrall below. The dispute between ONTRACK and Toll over rail funding have hindered investment and frustrated companies like Mainfreight who would make better use rail for national distribution. For example, Mainfreight's new Auckland facility has rail loading and unloading facilities integrated into its loading docks and could accept rakes of wagons straight from the Ports of Auckland. Should the service be available, rail would also be used for overnight freight to Hamilton, taking over twenty truck and trailers off SH1 (Pers Comm Don Braid 2007). Mr Braid also expressed frustration over the unreliability of overnight rail into Palmerston North. Rail's lack of a clear future is a major stumbling block nationally to best practice national systems. A rail link is needed to the inland port of Wiri that will help lower the costs of moving cargo through the congested urban network.

Historically there have been regular overnight rail and shipping freight services in operation, the structure of which could be revisited and applied to the Canterbury region. Richard Doell, of Mainfreight recalls that the Canterbury region had an overnight rail service between Christchurch and Wellington which operated successfully for many years. It ceased to be viable when shorter transit times by truck created competition. Pacifica Shipping also changed from an overnight shipping service to three trips per week between Lyttelton and Wellington as a result of increased road competition. Doell recalls that "customer's demands for an overnight service drove the demand for a road service increasing truck volumes and also increasing the risks as is evident by the number of accidents on SH1 between Christchurch and Picton". This highlights the aspect of safety as a factor to be considered in best practice.

Doell also draws attention to general freight short haul freight services that operated between Auckland and Hamilton and from Christchurch to Ashburton and Timaru in a time where there was a 64km restriction on road movements. Christchurch is greater than 250 kms from Wellington and Dunedin which may recreate competitive rail opportunities should costs currently external to business be factored in, or should fuel economy become more pressing than just in time delivery. Such considerations need to be built into the rich picture of freight movement by those responsible for infrastructure.

Transport & Logistics Magazine 13 March 2008 again stressed that a buyback of rail requires a long term vision with sufficient funding being allocated to the job. Worrall noted that the network is starved of funding and has been 'for decades'. He notes that maintaining 4000kms of track on less than \$50M is like running the national road network on 10% of current funding. He also notes that no new locomotives have been purchased for 30 years and what we have are obsolete and worn out. He notes that Ireland, with a similar population is prepared to spend \$9 billion on a network slightly smaller than that of New Zealand.

At a national political level Jeanette Fitzsimons notes the vicious circle where the system is so run down the service is poor and so is underused; because the system is under used, there isn't the revenue to pay for upgrades. She considers New Zealand's performance with rail is in sharp contrast to most other OECD countries that are pouring money into rail infrastructure for both efficiency and sustainability reasons. Internationally, the United Kingdom the Institute of Mechanical Engineers is urging government to change policies on transport pricing energy and town planning to include a major shift to using rail transport over road to help cut greenhouse gas emissions. Studying and reviewing the reasons for and application to the New Zealand situation are in itself best practice.

### **1.5.2 Coastal shipping**

Petroleum, cement, coal and gas are the main bulk products transported by coastal shipping. General freight services are provided by Pacifica Shipping and Strait Shipping who are in direct competition with international shipping lines. Intense price competition from overseas ships and a preference for road for time sensitive freight make survival an issue for coastal shipping. The government has identified coastal shipping as possibly playing a bigger part of the solution for freight transport as is happening in Europe. Shipping is seen as effective in addressing climate change and congestion issues, and being suited to island nations such as Japan and New Zealand. Issues such as cost structure and subsidisation are likely to be addressed as part of the 'Sea Change' initiative.

With regard to port infrastructure Worrall (2008) is of the opinion that a 'lack of forward planning is starting to bite'. He says that for the last twenty years there has been no co-ordinated centralised planning for infrastructure especially when it comes to ports. There are few long term solutions on the drawing board as assets like the Ports of Auckland reach their capacity. Worrall refers by way of example that the option of developing Marsden Point as it is a currently under used deep water port lacks a high capacity rail link to Auckland and beyond. Criticisms such as those levelled by Worrall at both rail and shipping investment and planning clearly support the closer examination of modes for freight movement other than road.

## **1.6 Summary**

Road is the dominant freight mode in New Zealand with three quarters of all freight tonnage travelling on combination vehicles that travel 40% of all freight kilometres. For practical reasons much freight cannot move on rail, however even with the current systems there is scope to increase freight on this mode. Across town and interurban freight have no practical option apart from trucks, while rail is better suited to longer trips, and coastal shipping for bulk movement over even larger distances.

Chapter 2 defines best practice, benchmarking and the use of performance indicators to measure the value of best practice.

Chapter 3 identifies national and regional policy and strategies that freight best practice supports.

Chapter 4 reviews the relevance of best practices identified in the literature review in terms of national, regional and business strategies.

Chapter 5 best practices that are relevant to Canterbury regional freight flows.

Chapter 6 summarises best practice performance in the region and recommends actions that could enhance best practice.

## 2 Best practice defined

The NZTS description of the role of 'responsiveness' ably summarises the interrelationship required for best practices to emerge from informed policy that is relevant and effective.

*"The diverse needs of urban and rural communities need to be recognised. Those who use transport, and those who are affected by it, will need to be encouraged to participate in transport policy development. Transport policy will need to foster the government's goals for partnership between the Crown and Māori; between central government and local government; and between government and citizens and communities, including business."*

The nature of best practice becomes a little clear when it is understood as a highly interactive and aspirant pursuit of a 'greater good'. It is this meaning that differentiates it from benchmarking and measurement against key performance indicators.

This section defines and describes best practice processes and behaviours of relevance to the freight industry in general. The concept of best practice is defined and set in context with related concepts of compliance and best industry practice. We then explore the high level drivers and motivation to strive for best practice by operators, regulators and policy makers, and how changes in practice come about. We conclude with an example of how this has been carried out in a New Zealand setting.

### 2.1 Description and definition

Best practice can be defined in its simplest form as a way or method of accomplishing a business function or process that is considered to be superior to all other known methods. A business' primary goal is to be profitable and so it is reasonable to expect only the adoption of practices that enhance profitability, or at least business continuity.

Identifying the stakeholders - parties who work with, share resources and are affected by transport - helps identify the perceptions and impacts transport has, and the system types that can have best practice objectives built into them. The following table summarises the range of activities any agreed basis of best practice must have. The table attempts to identify the primary driver of best practice for that entity. All drivers and safety in particular will be important to all stakeholders. For example, if best practices as perceived by freight carriers do not at least maintain profitability, then they are unlikely to be voluntarily adopted. If profitability is maintained, then the incentive is there to further address best practice safety, sustainability and other drivers that make for a better community.

	<b>As perceived by:</b>	<b>Primarily in terms of:</b>	<b>Best practice systems</b>
1	Sender/Receiver	Delivery	Operational and quality assurance
2	Freight Carrier	Profit	Company Management
3	General road users	Conformance	Road rules
4	Community	Safety	Community Health
5	Business Protagonists	Efficiency	Compliance rules
6	Local Government	Congestion	City Plan
7	Regional Government	Accessibility	Regional Plan
8	Central Government	Sustainability	International Protocols/Agreement
9	Central Government	Gross domestic product	Sector strategy/Trade rules
10	Mankind	Survival of the planet	International Protocols/Agreement

**Table 2: Stakeholders and best practice**

Any commercial freight movement has, to some extent, an impact on all the above stakeholders with the most tangible terms of engagement being related to on road behaviour, noise and congestion.

Those practices will include safety, sustainability and operator efficiency. Processes that meet a definition of superior method resulting in profit are likely to deliver the desired result in the most efficient way.

## 2.2 Benefits of best practice

The benefit of striving for best practice is that a thorough understanding of the systems, methods, processes or activity that are most effective at delivering a particular outcome yield advantage for a business.

## 2.3 Best practice context

To identify what is most relevant to best practice it is important to be clear about the tangible outcomes that need to be identified. For the NZ freight transport industry the outcomes at the highest level are defined in the NZTS. At a national level this means interpretation of and making operational the broad goals for efficiency, safety and accessibility. A best practice freight system will have the following characteristics:

- Customer focused
- Flexible, forward looking and responsive to change
- A highly connected network with connections between modes and regions
- Served by strategic intermodal hubs that have efficient transport links in and out
- Largely invisible – in that the freight function is carried out effectively and efficiently, but is largely inconspicuous
- Incurs minimal social cost
- Has minimal impact on the environment

The relevance of this to best practice is as a further practical connection between with the ideology of what is accepted as good management practice, the aspirant goals of the government and a business's profit imperative.

## 2.4 Importance of best practice

Striving to meet best practice offers to combine good management systems with worthy social and economic goals. As well as having a focus on such an outcome systems that are under control operate at a higher efficiency level. (Odum 1976) For freight best practice, increased efficiency benefits can assist freight government and industry meet their particular objectives in a cost effective way. Best practice fuel efficiency is an example where a broad range of objectives for reduced emissions, and increased profitability can be simultaneously met. As such it would be classified as a high priority.

Best practices stand a good chance of being achieved when an agency with a higher level of planning and control can 'feedback' a requirement to actors within its sphere of influence, by giving clear direction that guides the behaviour of the next level of activity. This seems to be particularly applicable when considering best practice for including freight movement matters in planning and development processes within the region or the country as a whole.

## 2.5 Best practice need to be appropriate to the current situation

Bolland reports that two thirds of all trips are less than 200kms. From this metric it is reasonable to assume the reasons for the trip lengths are economic and practical. A report prepared for the Auckland Regional Council (ARC 2005) reports that with the current business practices and infrastructure there is little opportunity for freight to move away from road, and rail and coastal shipping do not operate between many freight source and destinations.

Projections of double the freight under a 'business as usual' scenario, and little knowledge what freight demand would be with little or negative GDP paints an unclear picture of what best practice initiatives would be appropriate. In his address to the Road Transport Forum in 2007, Brent Layton of the New Zealand Institute of Economic Research spoke of risk to freight transport of climate change legislation and the unintended consequences of which could harm the economic viability of transport. Legislation that is ill informed or results in unintended consequences has the ability to harm best practice development. Best practice needs to begin with an ideology that is consistent with consensus on long term goals, as David Skilling, the outgoing chief executive of The New Zealand Institute made in a recent interview. (Listener 21 June 2008) He said "there is not point saying we're going to do X, Y and Z if 60% of the country thinks it's a terrible idea". He says the country needs more clarity around what is wants to achieve, with the resultant consequences and actions that would require. While he was aiming his comments at economic issues he recognises the need to begin with "What do we want as a country? How aggressively do we respond to these things? Or are we comfortable just muddling through?" (Listener, 21 June 2008, p25). Clarity of best practice at a regional level requires answers to the above questions and leadership to achieve them. At a regional level there are still huge obstacles in the way of 'world class infrastructure'.

By way of example, there are the big freight challenges faced in the Auckland region where 'disjointed planning still dogs Auckland'. Richard Worrall, editor of T&L magazine sees Auckland as lacking a proper coordinated approach to planning and implementing new infrastructure projects and so more congestion is inevitable. He also notes a 'lack of joined up and co-ordinated multi agency planning' with the Western corridor route. He says that logically it should be a multi mode transport corridor to help future proof

movement along the corridor from further rises in global oil prices. To cope with the uncertainties of the future he sees the need for road and rail connections to the main trunk line and airport area. He notes that heavy investment in roads is not necessary a good idea if petrol was to reach \$3 a litre or more. All of this highlights a need for one agency to plan the region's transport infrastructure covering Transit NZ, Auckland Regional Council, ARTA and ONTRACK.

The issues raised above indicate areas where best practice can be applied to freight issues. They are where congestion affects delivery times, infrastructure enhances efficiency, and where main hubs are accessible intermodal and well connected. Initiatives supporting modal competition and compatibility also feature in visions of a future where energy scarcity and cost are increasing risks. A need for leadership overarches all areas of practical best practice initiatives, supported by consistent and aligned policy.

Projections of road freight growth for New Zealand, and a number of other OECD nations are that the freight task will double by 2020. The issue raises concerns about congestion around ports and freight hubs, the supply of qualified drivers, and the level of green house gas emission from an enlarged fleet.

## **2.6 Best practice and external costs**

A central question that needs to be asked when deciding the relevance and practicality of implementing best practices is: should best practice cover externalities? Put another way, can the freight system be expected to incur costs that put a value on externalities, but for which there is not profit reward.

Of particular interest to transport are issues to do with burning fossil fuel. Many of the costs of fossil fuel powered transport – including health, safety, building and maintaining roads, polluting the air and water and CO<sub>2</sub> emissions - are currently not direct transport costs. At a private business level there is little encouragement for transport operators to address issues that would effectively add cost but give no perceived direct financial benefit. A voluntary embracing of cost adding measures would most likely put them out of business. However, there are a range of environmental and sustainable actions that could build towards a better model of best practice. It is practical to address a number of externalities when planning and upgrading facilities where they offer a 'no regrets' improvement to the business. For example, Mainfreight Auckland's new depot has a number of sustainable features built in to its operation. All rainwater is collected for use in truck washing, and yard run off is treated in a rain garden.

Examples of best practice of this nature would be that in a company's quality plan the following type of issues are addressed.

	Measure	Consideration
Vehicle purchase	Fuel efficiency	Fuel efficiency per tonne for the work to be done.  A realistic consideration of the whole of life cycle and cost of running the vehicle
Vehicle type	Fuel/tonne	Review of current operational patterns  Options for collective or cooperative transport
Depot location	Km/delivery	Optimisation of delivery kms.
Vehicle purchase	Fuel type	Alternative, or mix of sustainable fuel
Vehicle purchase	Emission rating	Consider as a primary factor with more weighing than purchase price.  A realistic consideration of the whole of life cycle and cost of running the vehicle
Business performance	L/100km	Measurement of the fuel efficiency per tonne delivered
Site management	Sustainability	Rain water collection, runoff water treatment  Solar water heating

**Table 3: No regrets best practice steps**

## 2.7 Development of urban commercial transport best practice

Urban freight best practice is a relatively new field of study for transport operations. Australian urban logistics has been on the regulatory back-burner to long distance articulated trucking, long distance freight and rail, even buses for 20 years (Hassall 2006). Urban logistics has gained some momentum internationally with think tanks and programs such as City Logistics, INRETS, IMPACTS and BESTUFS. Best Urban Freight Strategies (BESTUFS) is a European Commissions network group who intend to use template surveys of these data collections (but aren't collecting the data as yet). When analysing Australian urban commercial freight systems the Raptour Group propose the following measures (Hassall, 2006) that define transport operations and help understand what commercial freight systems best practice might be.

## 2.8 Inputs to best practice

### 2.8.1 Benchmarking

Benchmarking can be defined as a process of searching out and studying the best practices that produce superior performance, and comparing it to an entities own performance. Many organisations benchmark the performance of their processes, such as accident prevention against other organisations in the same market. This application as functional benchmarking can be applied to freight transport performance between regions both internal and external of New Zealand. Benchmarking could be described as

a form of match racing, where performance against rivals is the focus, and not performance against a set of principles or standards.

### **2.8.2 Performance measures**

Best practice commercial freight systems benefit from the analysis of freight movements from existing data sources to gain an understanding of the nature of freight and the collection of new information to build an enhanced understanding to inform decisions on how to manage freight.

New Zealand, however, collects very little information about freight movements, with no primary data being regularly collected by source, destination and commodity type. Estimates have been made about inter regional freight movements (Bollard et al) and the MoT is currently undertaking an empirical survey of freight movement carried out. None of the reports done in the past 10 years could be considered statistically reliable. Hassall reports that, in Australia, only eight metrics of the 32 (25%) are measured at a national or state based surveys. A future six can be calculated from that data, but the majority are not measured in any shape or form.

A sound understanding of the nature of freight at a local level can greatly assist the decision making process, backed up with evidence, and not just being intuitive. (DfT, undated). The first stage is to make best use of existing information and data sources, with the second stage being the collection of new information to enhance the level of understanding.

Making use of existing data includes (DfT, undated):

- Classified traffic counts
- Journey time data
- Accident statistics and associated reports
- Data on goods moved through key locations (e.g. rail freight terminals, ports and airports)
- Complaints or feedback from residents and businesses
- Feedback from freight quality partnership (or equivalent)
- Freight industry and other publications

### **2.8.3 Transport targets**

Transport targets will impact on commercial transport and are listed in column one of the following table. A future impact on commercial transport best practice can be anticipated. In broad summary terms (these ideas are developed later in this document) meeting the targets could mean changes as summarised in the column headed best practice implications below.

<b>Greenhouse gas reduction actions/fuel security</b>	<b>Best Practice Implications</b>
<b>Managing demand for travel</b>	Controls on where and when freight travels
<b>Shifting to more efficient and lower impact means of transport</b>	Encouragement to use certain modes of transport for certain types of freight.
<b>Improving the fuel efficiency of the vehicle fleet</b>	Emissions standards, fuel usage
<b>Developing and adopting future fuels</b>	Specialist transport using specialist power sources. (electricity, compressed air, solar)
<b>Ensuring the security of short-term oil supplies and a diverse supply of transport fuels</b>	Multimodal transport options,

**Table 4: GHG and fuel security implications for best practice**

The UK freight best practice group developed a survey that uses Key Performance Indicators. (Beaumont, 2004) To ensure the indicators are useful they must be:

- Relevant to operators
- Understood by those compiling the data
- Able to measure energy use
- Easily scalable from individual vehicle to a sector analysis
- Related to data already collected by operator to measure their effectiveness

The work of the Freight best practice group lead to five KPI's to measure vehicle operation. They are:

- Vehicle fill (Utilisation)
- Empty running
- Time utilisation
- Deviations from schedule
- Fuel efficiency

While Freight Best Practice group's KPI's are focused at the operator level, they are useful in understanding the role and focus of the operator within the wider commercial best practice system.

Utilisation can be measured by weight, by cube and by deck length and can be expressed as the number of items (i.e. pallets) that could be placed on the deck. The Freight Best Practice survey of pallet distribution did not record volume as it was not considered a controlling factor (Beaumont 2004). Utilisation can be measured by a combination of weight and measure using a formula that considers the practical use of the vehicle. Weight and volume are proportionally combined and used to express a percentage of the target proportional tonnage and cubic capacity expected of that type of trip. Empty running indicates the marketing strategy and level of networking and

cooperation within the regime. Time utilisation indicates what a vehicle is doing at any one time and is categorised as:

- Running on the road
- Driver rest period
- Loading or unloading
- Preloaded and waiting for departure
- Delayed and inactive whilst loaded
- Being maintained or repaired
- Empty

A deviation from schedule indicates delays and lost time that can result for a number of reasons such as:

- Lack of driver
- Delays in loading at depot
- Delays at collection point
- Traffic congestion
- Vehicle breakdown
- Route dislocation

Fuel efficiency is a useful measure in terms of litres per kilometre and day to day, as an indication of driver training and awareness of resource use. Fuel efficiency on its own does not tell us anything about utilisation.

#### 2.8.4 Fleet best practice

In a British publication, the UK the Department for Transport have released a Freight Best Practice guide to Efficient Public Sector Fleet Operations. In this document an operational checklist is offered to assist managers with the development of fleet best practice. It is reproduced in part below:

Operational Checklist	Tick (✓)
Have you ever undertaken a review of your fleet operations, or a risk assessment to identify areas for potential improvement?	
Do you have a fuel management programme in place? (Know average l/100 kms, most fuel efficient driver?)	
Do you know if outsourcing some of your operations would save you money?	
Do you purchase vehicles based on life-cycle running costs? (Also known as whole life costing?)	
Have you looked recently at whether new technology and telematics systems could help to improve your operations?	
Do you use KPI's to measure vehicle operations or maintenance costs (e.g. \$/km, direct maintenance costs per vehicle) to measure the effectiveness of your operations?	
Do you know how your costs compare with those of other organisations that have similar operations?	

**Table 5: Operational checklist (From DfT, 2005)**

The quality management systems mandatory review step features as a way to reduce risk and make improvements, and to keep in step with advantages gained from technology. Energy efficiency is addressed via fuel usage and identifying and focusing on

strengths is addressed by the consideration of outsourcing. Sustainability and whole of life costing invite the operator to assess costs on more than weekly or quarterly basis. Measurement as an essential tool for improvement and benchmarking with similar organisations are also considered essential elements of best practice.

## **2.9 Best practice for sector activities**

Hassall reports that in Australia there is a lack of knowledge of both urban and rural transport tasks. He identifies twenty specific classes, and notes that all but four have quite specific attributes. The literature search revealed little about specific sector best practice as could be applied in a general way. Hassall reports that in Australia there is a lack of knowledge of the entire 'ancillary sector' and also the operations of specific specialist vehicle type (Hassall 2006). The relevance as proposed by the Canterbury commercial freight transport operation is summarised in the column "relevance to Canterbury" more detail of the high relevance sectors is given in the following chapter of this report.

A consideration for the Canterbury region is that while a number of specialist sectors may exist, the overall number may be too small to have any specific impact. In identifying an application to Canterbury, the degree of relevance is measured by the impact on hubs, ports and key transport routes/times.

No	Operational Sector	Specialist Vehicles	Relevance to Canterbury
1	Petroleum/Chemicals	Yes	Medium
2	Other tankers	Yes	High; dairy tankers
3	Quarry/earth/mining	Yes	Low
4	Over dimensional	Yes	Medium; accessibility
5	Car carrier	Yes	Low
6	Volumetric parcels	Yes	Low
7	Steel	Yes	Low
8	Grain	Yes	Medium
9	Building Materials	Yes	Medium; HVs in urban environments
10	Logging	Yes	Medium
11	Waste	Yes	High; ongoing and growth industry
12	Container/wharf	Yes	High; congestion
13	Agricultural other	No	
14	Taxis trucks	Yes	Low
15	Refrigerated operations	Yes	Low
16	General freight other	No	Yes; Loading zones and tail lifters
17	Concrete	Yes	Low
18	Mini skips	Yes	Low
19	Furniture	Yes	Low
20	Horse movements	Yes	Low
21	Retail	No	
22	Livestock	Yes	Medium
23	Courier	No	High
24	Security collections	Yes	Low

**Table 6: Commodity Specific Vehicle Technology (adapted from Hassall)**

## 2.10 Future best practice scenarios

Fuel price and fuel availability have a strong likelihood of featuring in future freight scenarios and how new best practice activities may emerge as a result. Future best practice work is likely to be driven by increased pressure on efficient use of fossil fuel resources.

Economic growth and standards of living in New Zealand for the last thirty years has been made possible by access to cheap fossil fuel. Such times of consistent economic performance, such as the last five years, support standard economic models with constant growth rates providing a sense of security. Projections of continuing growth rates, anticipate growth in freight transport. An example of this is a projection made by Transport Engineering Research NZ (TERNZ) showing the doubling of commercial transport requirements by 2020 (Mackie et al., 2006). Of particular interest to transport generally is the almost total reliance on oil to power surface transport in New Zealand.

The implications of high price and constrained supply of energy will impact on our social and economic system and alter the parameters defining 'best practice'. Currently operational best practice pays little attention to externalities – non accountable factors. Future best practice may well include a far greater focus of modal choice, sustainability and efficient resource usage. The general tenor of future freight systems focus is already embedded in the regional policy statement indicating a direction that promotes modes with low adverse environmental effects, and the reduction of the need to travel. (Regional Policy Statement p6)

One scenario relevant to assessing best practice performance measure is that total primary energy supply flowing into New Zealand's economy reduces, causing decrease in GDP. Less consumer spending would reduce commercial transport needs. Little is understood about the relationship between negative GDP growth and transport demand but it is projected to decrease demand. Less energy for motoring, caused by fuel shortages and this may lead to 'carless' days, and long queues and rationing at petrol stations. This phenomenon could be termed 'demand suffocation', being a situation where inelastic demand cannot be met at any price, with no alternative available within the timeframe of the trip. This phenomenon would be a new threat to economic development.

Addressing the implications of supply suffocation while there is a growing demand for oil is important when trying to understand what would constitute best practice in a fast changing commercial world. Encouraging debate and scenario planning around the above bullet points would inform the debate on what should constitute best practice for freight transport.

## 2.11 Summary - so, what is best practice?

We have established that best practice is a higher level management activity built on a base of regulatory compliance, performance benchmarking and measurement. Upon that base an organisation will have core procedures similar to those found in most quality management systems. Those procedures would cover planning, checking a corrective action, along, with regular review and audit. The result is that a business function or process is considered superior to all other known methods. Best practice is therefore essentially an outcome of effective systems. An organisation that achieves this could be said to be operating at best industry practice.

We have identified industry strategies for freight communication, planning, technology, operations and management as well as key performance indicators that address vehicle and time utilisation, fuel efficiency, empty running and schedule management. Best practice also needs to deal with possible risks to freight systems caused by fuel price and shortage. Evaluation by way of risk management scenarios would assist with weighting all best practice initiatives, especially those that reduce energy intensity in freight systems.

The future direction of freight systems development has been shown to develop from policy and comes from high level controls in the form of government goals, and the vision of an integrated, safe, responsive and sustainable transport system. Sandwiched between the operators and the goal setters lies agencies such as ECan. To the operators there is a responsibility of assisting them realise best industry practice. To the policy makers a plea for clarity and funding for infrastructure and legislation that can bring about the greater good, or best practice.

### 3 Freight strategies

A clear idea about which best practice actions should be focused on by the freight industry can be gained from national and regional freight strategies. This chapter identifies what those priorities are.

#### 3.1 National strategies

##### 3.1.1 New Zealand Transport Strategy

The New Zealand Transport Strategy (NZTS) was released in December 2002 and is aimed at moving New Zealand towards sustainability (MOT 2002). The vision of the NZTS states that:

*By 2010 New Zealand will have an affordable, integrated, safe, responsive, and sustainable transport system.*

The strategy has five objectives:

- Assisting economic development
- Assisting safety and personal security
- Improving access and mobility
- Protecting and promoting public health
- Ensuring environmental sustainability.

Increasingly, different ministries and government agencies are working together on transport related policy developments especially in the environmental sustainability area. In the last decade, environmental impacts of road transport – noxious emissions to air, pollution of water run-off and noise – have become an issue of increasing public concern. Policy development in this area is increasing, but will need to continue at a high level. There is also a need for a strategic approach to the uptake of more sustainable vehicle technologies and energy sources.

The NZTS has two overarching aspirations. They are the transformation of the economy and achieving environmental sustainability. Reference is made to higher level policy to help identify and prioritise best practice actions that are likely to be funded, successful and integrate with nationwide freight movement. The framework for transport is that there must be sustainability, integration, safety and responsiveness in all our transport systems. To become more environmentally sustainable in the face of climate change issues the Government has set targets to be met by 2040. They are, to halve per capita domestic greenhouse gas emissions from 2007 levels, and for New Zealand to become one of the first countries in the world to widely deploy electric vehicles (MOT 2002). Those targets assist with identifying where freight systems might have to change to meet the challenge of moving from open targets to best practice operation, especially in areas sensitive to climate change issues.

A key strategic issue raised by the MoT is the level of effectiveness of primarily legislation and enforcement based approaches to safety and security. For many years legislative and enforcement measures were successful in changing individual, organisational and community behaviour, but are less effective now as the transport environment becomes more complex society's expectations increase and business

practices change. It is also very difficult to meet further energy efficiency and environmental sustainability goals through an enforcement-based regime. A best practice focus will broaden the scope and magnitude of the potential benefits to government and will allow the objectives of the NZTS to be achieved more easily.

The government is encouraging the transport of products by rail and through this strategy is indicating that it will be more proactive in assisting sustainable economic development in the regions. The NZTS includes facilitation of key transport issues in partnership with local government and business, strategic investment, as evidenced by the recent buy back of rail, and exploring alternatives to roading as a signal of the intention to use rail and coastal shipping for long haul freight movements.

### **3.1.2 New Zealand Energy Strategy**

The draft *Energy Strategy* was released in December 2006 by Ministry of Economic Development. It has been prepared as a whole-of-government initiative led by the Ministry of Economic Development.

The strategy notes that oil imports cost \$4.4billion dollars in 2005, and transport as a whole accounts for approximately 86% of oil consumed. With the increasing demand for transport, a key focus for the strategy is to reduce New Zealand's dependency on imported oil through greater use of renewable fuels, more efficient fuel use and fuel savings in the transport sector.

The strategy's objectives include the need to continue to meet the demand for transport services while reducing emissions and increasing resilience to higher or more volatile fuel prices.

The strategy notes that vehicle fuel efficiency can be improved by vehicle technology, how the vehicle is driven and how productively the vehicle is utilised. The strategy also notes that the amount of freight that can be switched from road to rail is limited by time, route and other specific requirements. However, in the long term, land-use decisions, including where to site industry and services, could benefit rail transport.

The NZ energy strategy recognises that the transport sector "presents a major energy challenge" and sets out actions to complement emissions pricing and improve security. The almost total dependence of the freight industry on fossil fuel energy will subject all stakeholders in freight transport systems to scrutiny regarding their use of energy, including justification of the methods and modes employed.

### **3.1.3 Sea Change Draft Strategy**

The New Zealand Government released a draft policy document 'Sea Change' in October 2007 driven by a concern that coastal shipping is not taking a growing share of the freight market because it is slow, inconvenient, and usually part of a higher cost supply chain. Other areas of concern are the unequal cost structures and subsidisation of other services. The document notes that the twenty first century has different imperatives and it makes sense to have shipping integrated into the mix, with the aspiration that imports and exports go by sea and coastal feeder services would be logical for inter regional freight. The policy highlights that

*'Sea Change' is a signal of the government's strong commitment to coastal shipping and of its belief that coastal shipping has an essential role to play in:*

- *creating more efficient and competitive supply chains*
- *creating an integrated transport system offering greater capacity and greater choice*
- *creating a sustainable nation.*

The strategy is driven by a perception that there are issues that affect all New Zealanders. Transport is a very prominent for fossil fuel and can be clearly seen as a significant source of greenhouse gas emissions and environmental sustainability This is particularly important given that the government has announced a goal of a 50% reduction of per capita emissions by 2040. A change to sea, where ships can be seen as relatively energy efficient in moving freight is a clear way the government can see a contribution being made to climate change goals. Traffic congestion is seen as a reason to move freight off roads. Changes in global shipping, with ship size increasing and port stops decreasing. This will change patterns of freight movement to ports. If not addressed this could mean more freight kilometres on roads as freight tries to move to ports and more cost to exporters and ultimately the general public.

This document more clearly states the themes within the National Freight strategy and highlights growing concerns for environmental sustainability, reduction of congestion, energy efficiency and changes to global shipping movements. It also signals the transport development, that would include best practice initiatives should not be focused solely on road as the current dominant mode, but should encompass and prepare for a wider modal mix.

#### **3.1.4 New Zealand Rail Strategy**

The National Rail Strategy to 2015 launched by the Government in May 2005, communicates a number of strategic directions in order to achieve the overall transport objectives in the NZTS.

Its focus is on increasing the amount of freight and passengers using rail with priorities that include:

- Improving safety
- Upgrading the network
- Improving rail's contribution to regional economic development
- Optimising the use of rail within the wider transport network, and
- Improving access to rail for users.

The recent purchase of the rail by government makes ownership another lever available to policy makers regarding transport, sustainability, congestion, safety and energy efficiency issues. The importance best practice to regional government is that future of rail as an option is likely to become more central to transport planning.

#### **3.1.5 Draft National Energy Efficiency and Conservation Strategy**

This draft strategy was released in 2006. It presents sector based action plans that would support the energy efficiency, energy conservation and renewable energy objectives set out in the draft *New Zealand Energy Strategy*. The strategy notes that freight transport has increased its energy use by 38% from 1996 and 2005, the largest increase by sector. Actions relevant to this study include:

- Education on the impact of vehicle purchase decisions and driving habits

- Procurement decisions based on best value over whole of life
- Developing measures to ensure vehicles maintain their fuel economy
- Developing a fleet operators commitment program, with a focus on fuel efficient driving practices and driver training
- Assessing opportunities to increase weight limits

From international experience, a mix of both mandatory interventions supported by information campaigns and voluntary schemes is required to achieve effective energy efficiency and conservation gains.

### **3.1.6 New Zealand Injury Prevention Strategy**

This strategy was released in 2003 and has a stated vision of 'a safe New Zealand, becoming injury free'. Transport was one of the identified as one of the six national injury prevention priority areas. The strategy notes that attitudes towards safety and behavioural factors are critical and highlights the importance of measures such as reducing speed, and behavioural factors are critical and highlights the importance of measures such as reducing speed, not drink driving, and wearing restraints to prevent injuries on the road.

## **3.2 Canterbury Regional Land Transport Strategy**

### **3.2.1 Overview**

The Canterbury Regional Land Transport Strategy (RLTS) represents the aspirations of the region in relation to what it wants its transportation infrastructure to achieve and deliver.

Freight issues are dealt with in two main areas – the Canterbury Transport Implementation Plan (TRIP) and the Canterbury Freight Action Plan. Both of these documents support the RLTS.

### **3.2.2 Freight issues in TRIP**

Freight is identified within TRIP as one of the growth drivers within the region. Other drivers identified that have a significant freight or heavy vehicle component are business growth, the international airport, ports and one operation in particular being Fonterra's Clondeboye dairy factory site.

TRIP notes that few rail related projects are proposed as a consequence of uncertainty around rail funding and identifies it as a national issue. Rail focus is therefore on bulk freight including developing the use of rail for freight through inland ports. (TRIP, p10). Increased capacity for coal cartage is noted, along with a project in the National Rail Strategy to build a Clondeboye branch line.

Freight issues and influences in TRIP are summarised as:

- Long term protection of freight corridors
- Heavy traffic on SH1 passing through towns
- More heavy traffic trips to service farms and forestry
- Increased long haul freight
- Opportunities to increase use of rail or coastal shipping
- Additional heavy vehicles on farms (especially with increased dairying)
- Changing land use impacting on current key transport routes

### 3.2.3 Canterbury Freight Action Plan

The Canterbury Freight Action Plan has been developed for the Regional Land Transport Strategy (RLTS) as a need for a strategy with a specific freight focus that recognised explicitly the importance of freight transport to the economic health of the region (Plan p1). Consultation in 2002/3 identified a set of issues, and a framework for specific actions. The relevance of the freight action plan is in the leadership and accountability it has in achieving freight best practice, while both advocating for freight interests and actively promoting a means for regional development.

### 3.3 Other regions - How do they perform?

The coordinating influence of the New Zealand Transport Strategy is evident as a driver of a number of regional land transport strategies, and in the case of Auckland, and Canterbury, with further development into a freight strategy. Most regions acknowledge the need for better freight information, and the inclusion of freight systems planning, but little is published in the form of results of this type of work. The biggest variation is seen in the focus put on the inclusion of a rail strategy in some regional documents.

While there is no freight strategy as such mentioned on the Environment Bay of Plenty (EBOP) website, there is a rail freight strategy document called the "Bay of Plenty Rail Strategy" and dated August 2007. The strategy has been developed to 'advance a vision for rail in the Bay of Plenty region and focus attention on the rail sector to better understand how to move forward in the new rail environment which has emerged with the Crown taking ownership of the rail network in 2004'. (BOP Rail Strategy, p1) The strategy notes the importance of rail to the BOP with a third of Toll's rail traffic, and the most densely used rail lines. Freight's significant role in the region, with a focus on the Port of Tauranga, makes the rail strategy important, especially with the NZTS strategy focus on developing rail freight. The document is seen as a proactive way of providing ONTRACK with information concerning the desired direction of rail in the region, as the National Rail Strategy requires ONTRACK to prepare a ten year Rail Network development plan covering the retention or disposal of unused rail corridors. The strategy anticipates an increasing level of investment, with key drivers being the growing pressure on the roading network, a greater appreciation of the advantages of rail for the haulage of bulk freight and passenger transport, and greater awareness of the potential sustainability gains from increased use of rail. The strategy document acknowledges uncertainty surrounding the funding of rail, but sees advantages in having a living document that tracks the opportunities, vision, actions and funding approach being worked through with the rail participants in the region and in particular with ONTRACK and Toll.

There is no specific reference to a freight strategy on the Hawkes Bay Regional Authority website, nor in the Nelson Regional Land Transport Strategy 2001-2006 (NRLTS). Relevant transport issues covered are mainly about the protection of existing freight corridors, and for Nelson the document identifies specific growth in the number of trips for both forestry and aquaculture which 'will be monitored' (NRLST, p 22)

The recent release of both the National Rail Strategy to 2015 and the current development of a national coastal shipping strategy are set to provide further high level guidance to regions. With all three strategies in place a degree of integration is anticipated, an example of which is Environment Bay of Plenty's Bay of Plenty Rail

Strategy designed to provide the best freight (and passenger) transport system for that region in the future.

### 3.3.1 Auckland

Auckland City’s freight strategy contains details of the work required to fulfil its vision, which is given as:

*“Auckland City is the gateway for the majority of the goods and produce entering and leaving New Zealand. Auckland City promotes and supports freight and commercial transport initiatives that are good for local, national and international business. Auckland City will work to achieve this in a way that maximises the safe and efficient movement of goods, whilst minimising adverse impacts on the environment and community”*

The following table summarises the performance measures identified by Auckland City that are required to meet the objectives of their freight strategy.

Strategy	Performance Measures
For community and industry communication:	<p>Regularity with which freight forum, consisting of members of the transport industry and other key stakeholders meet, with three times a year being the target</p> <p>Number of complaints received by Auckland City regarding freight issues, with the target being a decreasing trend</p> <p>Number of enforcement notices received by freight vehicles on Auckland city’s roads with the target being a decreasing trend.</p>
Freight Network Planning:	<p>Number of freight related accidents on the road network, with target being a decreasing trend</p> <p>Reliability of freight journey times, with the trend being that reliability increases.</p>
For Transport operations and technology	<p>An increased knowledge of freight movements, with the target being an annual freight travel pattern report</p> <p>A regional freight strategy.</p>
Local area freight management	<p>Reduction of freight vehicles using local roads as through traffic</p> <p>Increased level of service on alternative arterial routes; the target being improved reliability in journey times on alternative routes.</p>
Freight Operations	<p>Reliability of freight journey times</p> <p>Freight vehicle accident levels</p>

	Maintenance on routes with high freight vehicle flows.
City and development planning	Compliance with district plan loading and servicing specifications  Development of freight routes through intensified growth areas.
Monitoring	Monitored increase in usage of main arterial routes  Less use of through traffic on traffic sensitive roads  Decreasing level of complaints received regarding freight vehicles.

**Table 7: Auckland City - Freight performance measures**

We can now focus on freight best practice leadership by matching up government goals with those most able to influence by cross referencing stakeholder influence as identified in Table 2 with Governments underpinning principles for the vision that New Zealand will have an affordable, integrated, safe, responsive, and sustainable transport system.

To determine how best practice for freight movements can be understood, the underpinning concepts of the national transport vision are merged with stakeholders interests. From Table 2 we see the principles become of interest to stakeholders at a community level onwards. That interest is then passed on in the form of regulation and compliance issues to transport companies and the businesses they work for at a day to day level.

	<b>Integration</b>	<b>Safety</b>	<b>Responsive</b>	<b>Sustainable</b>
<b>Community</b>	Cooperation and collaboration	Individual responsibility	Diverse needs	Social well being
<b>Business Protagonists</b>	Cost effectiveness	Business responsibility	Participate in policy development	Economic well being
<b>Local government</b>	Accessibility	Robust framework	Partnership with stakeholder	Environmental well being, resilience flexibility
<b>Regional government</b>	Infrastructure	Robust framework	Partnership	Environmental well being, resilience flexibility
<b>Central government</b>	Efficient use of public investment	Robust framework	Partnership	National framework. Definition and pricing of externalities
<b>Mankind</b>	Resource use	Survival	Involvement	International treaties

**Table 8: Interests of stakeholders**

### 3.4 Summary

Government strategy creates a clear picture of issues that must be addressed in the development of an affordable, integrated, safe, responsive and sustainable transport system. The strongest directional theme is the revival of interest in alternative modes to road transport for freight. The driving force behind that is the growing pressure on the roading network especially in the Auckland, Tauranga, Hamilton triangle. Also developing is a greater appreciation of the advantages of rail for bulk freight, and for sea freight.

It can be summarised as:

1. Sustainability; mainly in the form of greenhouse gas emissions, as a health issue, and also to meet New Zealand's international obligations.
2. Integration of modes achieved by exploring and preparing for alternative freight mode usage, namely rail and coastal shipping for some types of freight.
3. Safety both for those who work in the industry and those who share the transport networks.
4. Responsiveness, where there are modal choices available in situations of natural disasters, energy crises and changes to international supply lines.

The challenge to regional government and the freight industry is to incorporate the intent of relevant strategy into efficient operational systems aided by good management. As transport systems often have source and destinations in different regions, communication and alignment of strategy between regions becomes equally important.

## **4 Freight best practices reviewed**

This section identifies and reviews the relevance of best practices identified by the literature review in terms of national regional and business strategies for freight systems. Regional geography, primary production and freight flows are taken into consideration when appraising the best practice experiences of other for relevance to Canterbury.

### **4.1 Operational best practice**

Operational best practice, or best industry practice may in fact have a motivation for results that is closer to benchmarking, where gains in efficiency and productivity are compared with other operators within the same industry group or market.

Notwithstanding, it is still a very strong learning tool that allows businesses to gain in efficiency and productivity.

As discussed in the chapter above there are different views and ideologies that influence the definition of best practice. Themes of efficiency, accessibility, safety and sustainability along with ideologies such as total quality management practices are clearly present in the expectations of best practice. However, current business models tend to measure success against an economic model only, where external costs are not directly considered and measured in terms of company profit. The result is that some more ideologically driven best practices are subverted in favour of more pragmatic industry best practice activities focused around a general requirement to deliver goods at a profit in full, on time and in specification (i.e. not damaged). Businesses should not be penalised for this, nor expected to do something for nothing. Many businesses take their wider role as corporate citizen seriously, voluntarily reducing waste, pollution and actively supporting sustainability initiatives.

Freight businesses operate within communities where local regional and national government can influence and assist the emergence of best practice. Consultation, planning and policy can be applied to cover operational procedures, communication, planning and management activities. This sphere of influence is spelled out in Auckland City's freight strategy (Auckland City, undated), and summarised below.

Activity	Covering
Community and industry communication	A freight forum of industry operators and other key stakeholders who develop and implement the region's freight strategy.
Freight Network planning	The identification, development and securing of freight corridors for the movement of goods and services.
Transport operations and technology	Advocating for the development and application of technology that improves the environment and the costs and effectiveness of the transport industry. The outcomes of this will be the reduced air and noise pollution and improving efficiency and costs.
Local area freight management	Management of arterial routes to minimise freight being carried on residential roads as through roads.
Freight operations	If freight movements are managed well, then this should lead to improvement of the day to day operation of the road network including road safety, loading facilities, the transport of dangerous goods and improved maintenance levels.
City and development planning	To ensure that the effects of freight movement are considered and the requirements of freight are taken into account in regulatory planning, development planning, traffic management and new road schemes.
Monitoring	Adequate monitoring programmes to assess progress and performance of the freight strategy.

**Table 9: Summary of Auckland City Freight Strategy**

The activities described above are a development and interpretation of the NZ Transport Strategy, where the ideology begins to shape a practical and operational framework.

## 4.2 Freight routes and networks

Freight network planning, and particularly the identification, development and securing of freight corridors are key best practices identified in the literature, and in urban freight strategy document. Clearly identified and practically useful freight routes provide other direct benefits to freight and public users. Goods freight flow, especially for freight passing through the region, is separated from local traffic modes and so reduces congestion and greatly increases safety. The clear identification and ease of use of

designated routes sends positive signals to the wider freight community and assists the process of intensifying production in suitable zones.

It is often quite easy to identify freight routes without going to great lengths. In these cases the most significant task is to gain endorsement for a management regime that ensures that the route continues to operate in a way that is supportive to operators (Austroads 2007).

A report entitled 'ARC Freight Data Acquisition Study' (ARC 2005b) found gathering useful data difficult and a lack of current information was available when taking a 'scientific' approach to identifying the main routes freight vehicles followed.

#### **4.2.1 Freight route identification process**

Regional authorities have a strong co-ordinating role to play in consideration of the suitability of routes across a region, and provides 'long terms strategic guidance for signage and agreed routing within the freight industry' (DfT, undated). Incorporation of truck routes into road signage assists the driver navigate to their destination and avoids wasting time. Freight-specific driver maps have been produced by many UK authorities to show the best routes for freight traffic to access key destinations, and show areas restricted by height or weight (DfT, undated). Information boards can be used to facilitate effective way finding for goods vehicles.

### **4.3 Freight hubs**

Freight hubs in the form of Urban Freight Villages or Public Logistics Terminal are gaining recognition as best freight practice in many places. Hassall reports on 'radical urban logistics strategies' that have been trialled in Japan, Germany, Monaco, Switzerland and Greece called Public Logistics Terminals (PLT). Some are very successful, others less so. A public logistics terminal is a third party terminal, depot and/or distribution centre placed in a planned area of a major city or port. It may be multimodal, near an airport, rail terminal or sea port. It has the planning right to operate into the future without rezoning restrictions. It can be a breakdown point for interstate incoming traffic or urban consolidation for outgoing freight cargo. It has enormous possibilities as an inter-modal entity. It may offer short term storage to incoming and outgoing freight, cold storage, and local transport services contracted through the terminal.

This concept occurs already in NZ largely by default. In the 1970's many cities developed a common user facility. In Christchurch A1 Carriers operated out of premises in Sandyford St and this was a cooperative owned by Suburban and Rural Canterbury Carriers where they exchanged freight. The future of this type of operation was diminished with the growth of New Zealand wide forwarders who operate depots e.g. Mainfreight/Toll/PBT etc - it is now at these locations that regional operators deliver and uplift freight. Linehaul Freighters is another example of this, as is Five Star in Auckland, although they only interchange road freight. In the 1970's through to the Mid 80's Mogal Transport was owned by 190 carriers throughout NZ so that as a cooperative it was a forerunner of the PLT concept.

Internationally PLT are built at locations with minimal freight intrusiveness and in some cases on 'green field' sites. This is a major developing issue as residents object to heavy vehicles passing their properties, and it is likely that there will be heavier restrictions as already implemented in many European cities.

A Japanese independent and non aligned terminal has been an attractor to usage from small and medium companies using transport and other logistic services. This may mean a consortium of independent owners or even a governmental operator may be one of the key elements of the success of a PLT. The owner may need to be a new independent government carrier/operator if a consortium of independent operators could not be made to work successfully.

The terminal operator could be an incumbent operator, a consortium partner, governmental carrier or even customers organising their own transport operator to perform pickup and drop offs whether incoming or outgoing. The advantages of a common carrier is that significant benefits arise from higher capacity consolidation, especially from allowing small and medium customers to purchase services from a common carrier. The concept of a common carrier is not embraced and yet it is a method whereby the high urban freight growth rates can be eased.

Hassall notes that the concept might not work where there are two major rival retailers, but where there are 200 small manufacturers the option might work well. The PLT would also work well for long distance operator to have quick turnarounds. Having a terminal on the town outskirts make for a definite endpoint for a trip. 'More than one terminal, (but less than many)' is given as a general guideline for how a city should provide infrastructure. International experiments make a compelling case for the Public Logistic Terminal concept to be further examined. Further best practice study of the development of such terminals should be considered by watching international developments.

#### **4.4 Intermodal freight**

For intermodal freight networks to be efficient, the short haul pickup and delivery between terminals are an important part of the intermodal freight chains and a big factor in terms of cost, time and reliability. Kreutzberger et al note that recent sustainability research clarifies that pre or post haulage (PPH) is a crucial part of the environmental performance and cost (Kreutzberger, Konnings, & Aronson, 2005). They note, however, that there is little research devoted to this transport area, with the work that has been done identifying opportunities to improve PPH services though changes in legal, logistical, organisational, communicational and technological conditions. These studies conclude that how well a PPH is organised strongly influences its cost performance. When planned properly by either concentrating all traffic in one carrier or centralising the planning of PPH, up to 30% reductions of costs were achieved.

The European Commission has published research that will enhance door-to-door services based on intermodal transport. Driven by an increasing demand for alternatives to road transport, intermodal options are a response to policy on sustainable mobility and a desired shift to less energy consuming transport modes. A key point in this research is that improving intermodal connections is critical since road transport is likely to remain the first choice for the first and last leg of most freight journeys. Currently intermodal transport represents around 3% of goods transport, with the potential to reach 30% on some important corridors. The transport research programme focuses on promising technologies and strategies, by focusing on problems that arise with the quality of transport networks and the quality of terminal/transfer points. The four main areas under study are:

- Removing barriers and reducing costs

- Exploiting information and communication
- Facilitating information and communication
- Introducing new concepts for city distribution

## 4.5 Accessibility for deliveries

At a practical level, accessibility in the form of adequate turning radii in commercial areas and a purpose built multi lane freight networks roads connecting strategic hubs and regional corridors are examples of best practice, where what is provided is in addition to what is required merely to comply with mandatory standards. Understanding the requirements for direct truck delivery into commercial zones, and the enforcement of unloading zones are simple and effective ways to ensure freight efficiency.

## 4.6 Resource efficiency

### 4.6.1 Fuel supply and cost

Research investigating future fuel shortages and the associated risks to urban forms and transport systems, suggests that transport planners have historically assumed that fuel supply is unlimited (Dantas, Krumdieck, & Page, 2006). While the report focuses primarily on passenger transport it also applies to freight transport. Growth and intensification of socio-economic activities have altered freight distribution systems create additional and complex travel patterns, with substantial reliance on fossil fuel. For example, it is reported (Yates pers comm.) that there are a number of a basic freight lines distributed from Auckland to as far away as Invercargill on a two day delivery basis, without any other warehousing between the source and delivery. This has greatly intensified energy and management input required to provide the rapid, time-bound service which is often underutilised as the scheduled service runs whether there is a full truck load or not.

The lack of inclusion of future energy risks in major planning initiatives is in keeping with most transport models and methods that rarely consider energy as an integral part of the transport and activity system, let alone constraint on development. (Dantas et al 2007). The key point made is that "energy is not currently considered in risk analysis or reliability assessment of transport systems, disregarding any potential shortage and/or price increase scenarios. While this may be a source of debate, it should not be ignored in planning activities". (Dantas et al 2007, p11)

An implication for road transport energy use and best practice is the effect that price rises over the past two years have had on cost structures. Fuel is now a larger percentage of direct costs than road user charges (RUC). While price rises of this magnitude are considered not to have much impact on the demand for freight services, it could influence fleet replacement decisions. RUC charges tend to reduce with the number of axles, with the weight of the additional axles reducing payload. With fuel now costing more, payload and fuel economy are likely to be more influential factors in truck choice. Full loading and energy efficient modal choice could favour alternatives to 'just in time' and direct delivery.

While there is a chance that oil will continue to be available at reasonable prices over the medium to long term, the evidence that is available would tend to suggest that it is more likely that oil prices will continue to increase and supply will be constrained. This may occur within a short period of time. The risks of high fuel prices and constrained supply require immediate widespread discussion and planning to prepare for a vastly different

transport infrastructural usage. The debate could have a practical dimension in defining best practice elements. The risk of waiting until there is 'demand suffocation' before beginning to consider alternatives will compound the situation of a lack of transport services and reduced revenue streams to fund new services.

General conclusions that can be drawn from the above are a need to:

- Promote efficiency of the vehicle fleet
- Bring the oil cost and supply debate into the public arena
- Plan and think about alternative methods for freight collection and delivery, where efficiency is paramount
- Focus new infrastructure spending into public and commercial transport systems, and away from expenditure that supports private vehicle growth.
- Consider alternatives to hydrocarbon fuel such as electricity for commuter and commercial rail freight trunk routes

## **5 Best practices of relevance to Canterbury**

This section describes and quantifies the main freight flows and freight infrastructure in the Canterbury province. It begins with a description of what is known to date, and from an assessment and discussion of that information identifies the main volumes, flows and characteristics of freight movement in Canterbury. Trends in freight movement and the nature and capability of the infrastructure are also described to create a picture of Canterbury freight flows.

Regional freight strategies vary on the emphasis placed on rail usage. ECan documentation is light on even discussing ways rail could be incorporated. The reason given that 'it is not our area of control' should not preclude the development of a strategy of how rail can be better utilised to meet the regions' goals. The same national conditions apply to all regions, and yet the level of planning and detail regarding rail is far higher in both Bay of Plenty and Otago – both major freight nodes with similar roles and pressures as Canterbury.

The TRIP package development and prioritisation process satisfies best practice standards of regional planning. It addresses the specific requirements of different parts of the region with a package of measures. Freight transport is a factor in conflicts between local traffic and through traffic on SH1 and on the rail line. Freight issue relating to dairying feature, the growth of tourism, freight (especially dairy related) vehicles on rural roads and route security identify best practice priority areas. Rail activities are not included in the plan due to the uncertainty of rail funding. Again, there is scope to at least describe a desirable future, or set of futures for rail usage to promote discussion and thinking about alternatives.

For the Greater Christchurch area, corridors between major freight nodes and the need for a high level of access to the central city region are key issues for best practice application. National routes through urban areas create opportunities for best operational practice and road surface management. The TRIP is a comprehensive plan with actions well integrated with national and regional transport related documents.

## 5.1 Community and industry communication

Regional coordination of transport activities is achieved through the Regional Land Transport Strategy (RLTS) managed by the Canterbury Regional Land Transport Committee (RLTC), in particular the Technical Officers Group (TOG). A coordinated approach is achieved through the TRIP, and within that plan, freight transport matters are identified and prioritised throughout the region. The main objectives of the Plan are to:

- Provide an implementation framework
- Create a regional picture of transport and land use
- Develop advocacy and planning tools
- Assist with input into regional funding allocation discussions
- Provide information and content for the RLTS

The TRIP follows a documented process with workshops used to develop the Plan which included a high level of consultation to identify strategic issues, transport trends, economic drivers and prioritisation (TRIP, 2007). Once strategic issues and activities were identified in a draft TRIP more detailed localised issues and investigations were carried out as required.

The Canterbury Freight Working Group has already identified and addressed many of the issues raised. The group has been proactive in establishing the following best practice systems throughout the region.

- An active freight forum of industry, regional government and other key stakeholders meets regularly
- Canterbury has an active and effective freight strategy
- Freight hubs are clearly identified and communicated
- Freight routes are clearly identified
- Monitoring systems are in place for freight flows and accident data

The workshops identified megatrends including a number that would impact freight best practice such as climate change, carbon neutrality, fuel supply and cost, globalisation (TRIP, p9). In terms of the level of influence within the control of the Canterbury region global economic influences and fuel supply/cost are relatively low in the successful achievement of the plan.

A guide for prioritising freight best practice issues can also be taken from the Canterbury Regional Policy Statement (RPS). Key directions for transport are:

- Protection of existing transport infrastructure and corridors as required for future growth
- Promote transport modes with low adverse environmental effects
- Promote changes that promote the safety, efficiency and cost-effectiveness of the transport infrastructure and reduces the need to travel.
- Encourage settlement patterns that make efficient use of the regional transport network

The Canterbury Freight Working Group, with its wide industry representation provides a effective community and industry communication mechanism for this.

## 5.2 Freight routes

### 5.2.1 Identification of freight routes

The Canterbury Freight Working Group has already done this, with freight routes clearly identified. The routes identified are logical and direct, with links between ports and freight zones. The Freight Action plan recognises and has actions in place to define and protect the operation of and access to the strategic network.

### 5.2.2 Freight en route

The LTNZ Report 330 reviews long haul freight in New Zealand and notes that the ports of Lyttelton and Timaru are the main export ports for Canterbury and also the West Coast. Also about half of Marlborough's export freight leaves from Canterbury ports. Imports tend also to not travel great distances between regions as the majority of goods tend to be delivered directly to the port of final destination, as most regions in New Zealand are serviced by some form of port.

Their analysis of the State Highway network concludes that there is the ability to meet increasing freight demand in the near future. The South Island network has no significant problems because of lesser growth in traffic, tonnages and population. The report notes that areas of the South Island are experiencing conversion from pastoral to dairy farming, with resulting additional tonnages and a higher frequency of heavy vehicle visits to farms. Access to key ports is considered adequate at present.

The state of the rail network is addressed by the report identifying a number of key issues that need to be faced, including the construction of a railhead to Clandeboye. Increasing freight volumes are anticipated with demand growing from coal, forestry and dairy. The increased use of containers internationally also makes rail a more attractive option for the future.

## 5.3 Freight hubs

Identifying freight hubs and ensuring these are located in industrial areas on the perimeter of the city with good access to the State Highway network works in tandem with the identification of freight routes. Reducing freight movement through urban areas supports best practice goals of improved safety, accessibility and pollution. Hubs linked to highways and ports by freight routes separates the freight movement away from schools, recreational areas and dormitory suburbs. The enhanced community safety profile greatly reduces the risk of harm. Partial mode separation improves accessibility through for freight operators and businesses. There is an overall reduction in noise pollution, or at least a concentration along known corridors and in zoned industrial areas, and is of benefit to the community in general. In return, freight routes and hubs that have a degree of separation from residential and recreational areas enable freight activity at night and during the weekend without restriction.

Clearly identified hubs reduce the number 44 tonne heavy vehicles in urban areas. The Freight Working Group has identified and promoted freight hubs and so again scores well in providing a best practice lead to infrastructural development. The optimisation of delivery kilometres is also achieved by the hubs being on freight routes. The importance of protecting key freight hubs is clearly identified in the Freight Action Plan.

Freight hub and freight route identification and protection are the foundations of an effective and efficient urban freight system, and Canterbury should be justifiably proud of its success in this area.

## 5.4 Intermodal freight

Canterbury freight hubs are positioned on, or near rail and on or near routes to ports. This is largely as a result of the moves in the 1970s to develop intermodal freight that have left a legacy of rail, road and port linked infrastructure. Both government strategy, and likely future best practice indicate that intermodal freight terminals may again become central to freight movement. We have also seen a commitment to this type of development in the Otago and Bay of Plenty regional plan.

**Recommendation:** The development of intermodal freight movement needs to be part of a bigger movement towards national freight efficiency. Best practice at this time would be to increase communication and debate over a number of regions who may share the benefits of intermodality. Canterbury could be more active in at least exploring this. Further work could also be done into how to increase shipping by improving intermodal freight exchanges – specifically to reduce the cost of handling.

## 5.5 Distribution

Historically commodity chains have been localised, but recently commodity chains have become global because of developments in telecommunications, electronic data interchange (EDI), increased freight mobility and efficient distribution networks. Each commodity chain differs which means that freight transportation providers are constantly changing to meet demands and become more customised (Rodrigue Comtois & Slack, 2006). The coal commodity chain, like dairy product movement, operates only partially within the Canterbury region, putting most considerations of best practice in the hands of the providers of infrastructure and freight corridors. The nature of commodity chains impacts on regional distribution patterns as point of entry, delivery timings and vehicle dimensions requires appropriate infrastructure to accommodate it.

### 5.5.1 Food distribution

Most food and fast moving consumer goods (FMCG) are now distributed from national warehouses on a just in time, or overnight basis. Vehicles are committed to regular long distance schedules with deliveries being made directly off the line haul vehicle, and not by smaller pick up and delivery vehicles. This requires accessibility for 44t vehicles of 20m length. In addition to this, there has been a large increase in courier type deliveries, making multiple deliveries of small quantities of goods throughout the day.

### 5.5.2 Urban pickup and deliveries of line haul freight

With distribution for the Canterbury region and the South Island being centred in Christchurch, there is extensive pickup and delivery activity from distribution centres. Pickups are often palletised and made directly onto the 44t line haul unit that is to make the delivery journey to Nelson, Dunedin, the West Coast and all destinations in between. Large distribution centres such as Foodstuffs would, in an ideal world, receive direct delivery by line haul vehicles are the optimum however with the Book In system adopted

by the distribution centres this often means freight is required to be unloaded at a depot for subsequent redelivery. Recent rising fuel prices has already created some collaboration on freight delivery, and international experiences show that combined, or regionalised delivery of goods, even in a competitive environment, saves on resources and costs.

Corridors between transport yards and distribution centres need to meet freight corridor specifications for ease of turning, lane width and mode separation from cyclists and pedestrians.

**Recommendations:**

- Facilitate discussions between major warehouses and interregional transport companies on the development of best practice delivery systems. The outcome should be focused on the lowest overall cost to the system, with due regard being given to the value of initiatives that reduce congestion, emissions and increase delivery efficiency.
- Assist operators to deliver efficiently by enforcement of delivery zones, site accessibility and 'clearways'.
- Ensure that any new storage and retail infrastructure adequately allows for delivery vehicles.

### 5.5.3 Container and wharf cartage

Container use for imports and exports continues to grow requiring pickup and delivery access to most importing and exporting businesses. Containerisation means there needs to be a high level of accessibility to most industrial areas of the region for 44t 20m vehicles. Turning and manoeuvring can damage road surfaces and the method used to load and unload containers requires double parking at times. Furniture removal firms also use containers, meaning occasional trips into residential areas that at times require extensive backing on roads where turning is not possible.

## 5.6 Accessibility

Canterbury Freight Action group have identified the need for improvements for freight vehicles to commercial and retail establishments. The production of a practical guide to docking facilities is one example of this. Canterbury has done very well here ensuring that the combination of freight hubs, identified routes and standards for freight docks enable a good flow of freight movement.

## 5.7 Dairy industry

### 5.7.1 Milk collection

Milk collection operates 24 hours a day using the State Highway for line haul, and rural roads for farm pickup. The majority of milk from the Canterbury region is processed at Clandeboye, as is a large percentage of milk from the Nelson, and Marlborough region. The installation of the evaporator at Culverden by Fonterra has reduced vehicle numbers considerably in transporting milk back to Clandeboye.

The conversion from pastoral to dairying creates tanker traffic but it has also had an impact in the reduction of stock, bulk and general freight vehicles with the change of land use. The increasing intensity of dairying means there are a lot of tankers on State Highways and rural roads, with common sightings of four or five travelling almost in convoy.

Milk pickup procedure and infrastructure (in the form of wide farm entrance ways and off road turning circles) is well established and while tanker numbers are increasing they represent a small percentage of road users.

Fonterra rails milk from Oringi in Hawkes Bay and Longburn in the Manawatu daily to Hawera using up to eight trains at the peak of the season. While volumes are smaller in the South Island, distances are larger, and the opportunity to rail bulk milk from Marlborough and North Canterbury to Clandeboye would seem better practice.

**Recommendations:** A key recommendation is that affected South Island regional councils include a specific strategy for milk cartage. This could be achieved by setting up a task force to study North Island milk train operation and to open communication and joint consultation with dairy processors regarding their medium term collection strategies. While South Island volumes and distances may not have supported investment in this sort of infrastructure in the past, rising oil prices, increased road safety and emissions reduction may favour such a move. There may be an opportunity to work with central government regarding policy incentives to reduce line haul milk cartage. As Fonterra operates across a number of regions, a joint regional councils project approach is recommended.

Regional councils could work together with producers to define a common 'best practice' standard covering:

- Linehaul milk cartage over long distance
- Rail accessibility to production sites
- other bulk liquid cartage by rail such as grape juice between Canterbury and Marlborough

### 5.7.2 Dairy products for export

Dairy is growing in Canterbury as it is throughout the South Island, with two new production plants recently commissioned in the region. Both plants are located beside SH1 and the rail line, with neither plants appearing to have included rail connections in their start up design. Of particular significance is the lack of rail access to Fonterra's Clandeboye plant. Cost and convenience are likely to be the reasons road transport has been favoured in the past, especially for palletised product. However with a change to most product now exported by container, public ownership of rail and rising fuel costs there is opportunity to progress a number of government and best practice strategies for dairy exports. The industry itself is proactive in this area with Fonterra developing a large intermodal distribution facility in Te Rapa, Hamilton for dairy products for export from the Waikato region. Containerised traffic is consolidated here for export by rail through the ports of either Tauranga or Auckland.

Railing finished product from Clandeboye to export ports in Canterbury or Otago would satisfy a number of best practice goals for such products, and using rail for the type of work for which it is suited.

**Recommendations:** South Island regional council task force to study Te Rapa intermodal storage operation to ascertain future application within the South Island. As with milk collection, volumes and distances may not have supported investment in this sort of infrastructure in the past but rising oil prices, increased road safety and emissions reduction may favour such a move.

As Fonterra operates across a number of regions, a joint regional council project approach is recommended.

Regional councils could work together with producers to define a common 'best practice' standard for

- Linehaul milk cartage over long distance
- rail accessibility to production sites
- other bulk liquid cartage by rail such as grape juice between Canterbury and Marlborough

## 5.8 Coal

### 5.8.1 Coal to Port Lyttelton

Coal mined on the West Coast is railed to Port Lyttelton and shipped to various international destinations. The coal commodity chain operates only partially within the Canterbury region, putting most considerations of best practice in the hands of the providers of infrastructure and freight corridors.

Coal cartage is included in Canterbury's best practice considerations as its movement and storage and handling affect the economy of the region. Coal is also railed, mostly from the West Coast to Temuka, before being finally delivered to Clandeboye by road.

Historically commodity chains have been localised, but recently commodity chains have become global because of developments in telecommunications, electronic data interchange (EDI), increased freight mobility and efficient distribution networks. Each commodity chain differs which means that freight transportation providers are constantly changing to meet demands and become more customised (Rodrigue Comtois & Slack, 2006). The coal commodity chain, like dairy product movement, operates only partially within the Canterbury region, putting most considerations of best practice in the hands of the providers of infrastructure and freight corridors.

## 5.9 Emerging best practice

Emerging best practices are likely to be responses to pollution (noise and air), congestion around ports, shared intermodal hubs, alternative fuels for some tasks, and regional business development. Best practice in managing these emerging issues is likely to:

- Stimulate sector wide discussion on a range of possible futures through scenario planning and trend projection. Create the ability to interpret trends and take 'no regrets' steps towards future best practice
- Lead to further research on the type and nature of transport hubs, and identify strategic locations for them. Be prepared to consider investing in some form of public freight hub concept.
- Consider a wider risk assessment than just a 'business as usual' case when determining what aspect of best commercial freight transport should be considered best practice.
- Increased regional production and shorter supply lines will require a different approach to transport management.
- Maintain open and transparent systems so communities understand where commercial freight is likely to flow.

## 6 Conclusions

Government strategy for communities and those who use transport encourages participation in policy development. The aim of best practice is to identify and use of superior methods to meet agreed goals. Canterbury's Freight Action Plan already includes a range of best practice initiatives which have been put into action.

Canterbury is succeeding well in many areas of freight best practice. Canterbury's best practices freight performance is shown to be better than in other regions. This position is underpinned by Christchurch as a city having what is considered to be a superior transport network and urban design layout compared with other large cities in New Zealand.

While well positioned to integrate freight movement with rail and coastal shipping, road transport remains dominant, not least because freight moving in and around a metropolitan area does not have access to rail or shipping. Coal, the largest flow of inter-regional freight bound for the port already uses the rail network. There is nothing inherent in regional policy or practice that has hindered other freight using rail. The reasons for the current mix are driven by current resource pricing and economics, being factors beyond the influence of regional best practice.

Community and industry communication is well coordinated with the Freight Working Group having identified and addressed many best practice issues. The existence of the committee is positive in itself, as an active forum that can promote and protect transport interests, and also monitor the safety, community and environmental impacts the industry has.

Freight routes are well identified and developed with current congestion levels generally below a level of concern. The movement of freight to the port from other regions causes no major issue, with coal being the main commodity involved, and its movement by rail being best practice for that commodity.

Freight hubs are identified as general industrial areas on the perimeter of the city and are serviced by good access connections to state highways and ports. The importance of protecting the operation of key freight hubs is clearly identified in the Freight Action Plan. Canterbury should be justifiably proud of the work done in this area.

Previous experiences with intermodal freight in the 1970s mean that concepts and general locations of freight hubs are in place. For strategy and energy reasons it is likely that intermodal freight hubs will again become infrastructure for moving freight. Best practice at this stage would be to build into future freight planning infrastructure that would enable intermodal freight movement.

Freight distribution, as a subset of national and international supply chains and commodity chains has seen an increase in large warehouse complexes, mainly served by road. Overnight, and 'just in time' deliveries have increased the number of possible direct deliveries of 44t vehicles. Best practice in this area falls short, and efficient freight delivery thus effected. It is recommended that further investigation is carried out to identify best practices in delivery into urban areas.

The growth in the dairy industry affects a number of regions, where milk is picked up from farms, with milk north of Ashburton and as far away as at least Blenheim being line hauled considerable distances. It is recommended that South Island regional authorities collaborate in developing a best practices dairy transport strategy. This of course would require the involvement of industry members, but would help regions better coordinate a range of activities from infrastructure provision to improved road safety.

The biggest opportunity for future best practice improvement is to research and development a better understanding of the features and benefits of intermodal freight movement options that could improve the urban environment. The lead taken by the Bay of Plenty regional council in creating a rail strategy shows that even in an uncertain policy environment much can be gained by articulating the current importance and future potential that rail can offer.

The challenge to regional government and the freight industry is to incorporate the intent of relevant strategy into efficient operational systems aided by good management. As transport systems often have source and destinations in different regions, communication and alignment of strategy between regions becomes equally important.

The Canterbury region is meeting that challenge, and the commissioning of this report in itself is evidence of best practice monitoring and review of its performance against a fast changing environment.

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