



# **ENVIRONMENT CANTERBURY**

## **Potential for Increased Use of Rail and Coastal Shipping for Freight in Canterbury**

### **Final Report Executive Summary**

**submitted by**

**Richard Paling Consulting**

in association with

**IPC & Associates**

**June 2009**

## Table of Contents

<b>E1 Background</b> .....	<b>i</b>
<b>E2 Current Freight Patterns <a href="http://www.hsbcpremier.co.nz">www.hsbcpremier.co.nz</a></b> .....	<b>i</b>
<b>E3 Future Freight Patterns</b> .....	<b>iv</b>
<b>E4 Freight Modal Choice</b> .....	<b>v</b>
<b>E5 The Potential to Switch to Alternative Modes</b> .....	<b>vi</b>
<b>E6 Overall Assessment and the Regional Role</b> .....	<b>x</b>

### TABLES

Table E.1 Potential for Increased Modal Shares for Rail and Coastal Shipping for Key Commodities	viii
--	------

### FIGURES

Figure E.1 Internal Freight Movements within the Canterbury Region for Selected Key Commodities 2006-07 (million tonnes)	ii
Figure E.2 Freight Movements to and from Canterbury by Corridor for Identified Commodities 2006-07 (million tonnes)	ii
Figure E.3 Modal Splits in Key Corridors to and from Canterbury 2006-07 (Rail and Coastal Shipping as percentages of Total Tonnages)	iii
Figure E.4 Forecast Changes in Modal Splits in Key Corridors to and from Canterbury 2006-07 (Rail and Coastal Shipping as percentages of total tonnages)	iv
Figure E.5 Summary of Possible Specified Options for Modal Transfer or Change	ix

## EXECUTIVE SUMMARY

### E1 Background

The movement of freight plays a vital role in a modern economy, supporting economic development and contributes to the high quality of life experienced by New Zealanders. In the current economic downturn this role has probably been enhanced. Substantial volumes of freight are moved within, to and from and through the Canterbury Region amounting to about 36 million tonnes per year, equivalent to about 70-75 tonnes per resident.

However although the movement of freight gives clear benefits, it can impact adversely on the communities through which it is transported and it can also generate considerable emissions of greenhouse gases, especially if transported by road. In order to mitigate some of these adverse impacts, Environment Canterbury in its RLTS "supports opportunities for efficient transport of freight by alternatives to road" (Policy 5.1.7).

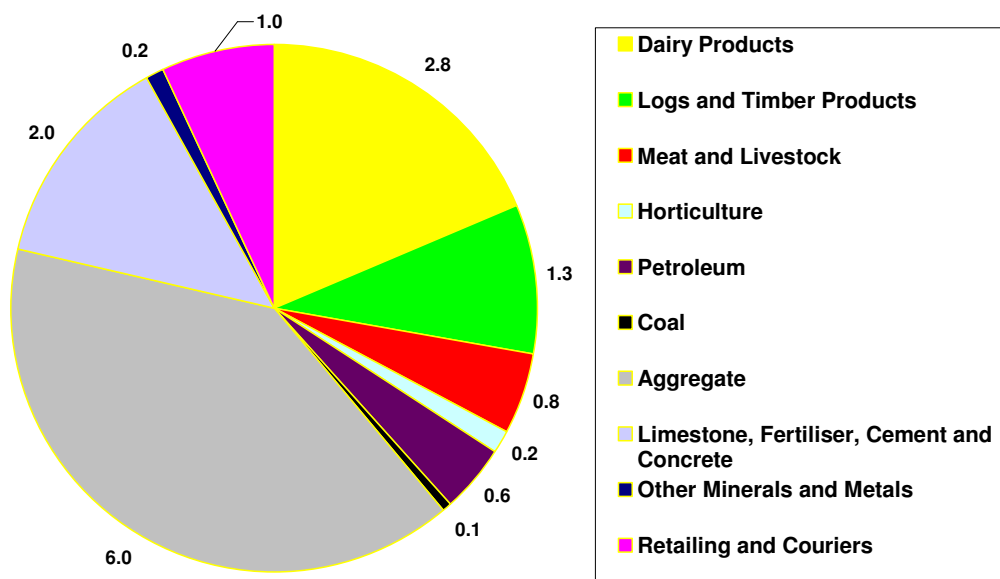
The key characteristics which underlie the movement of freight in the Canterbury region include:-

- The production within the Region of a wide range of primary products for local, national and international markets
- The location within the region and in Christchurch in particular of a wide range of manufacturing activities again serving local, national and international markets
- The role of Christchurch as a distribution centre serving the South Island
- The ports of Lyttelton and Timaru
- The location of Christchurch at the crossroads of the main north-south and east west routes in the South Island

### E2 Current Freight Patterns

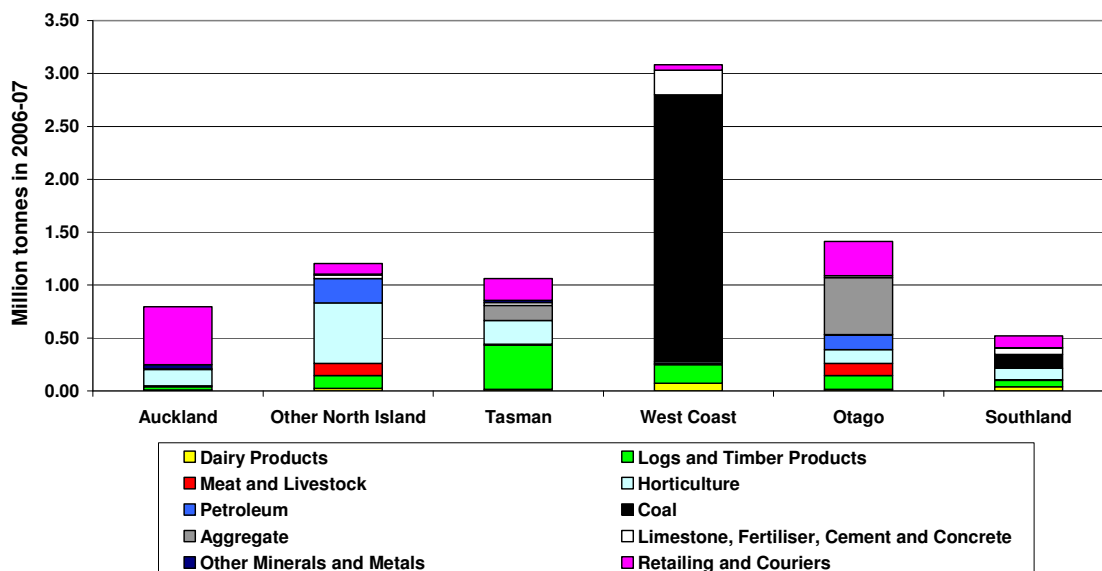
Internal movements within the Canterbury Region are dominated by the movement of basic commodities, primarily liquid milk and dairy products, logs and timber products and aggregates and other building materials and the breakdown is summarised in Figure E.1.

Potential for Increased Use of Rail and Coastal Shipping for Freight in Canterbury



**Figure E.1**  
Internal Freight Movements within the Canterbury Region for Selected Key Commodities 2006-07 (million tonnes)

There are also substantial movements to and from the Region and these are summarised in Figure E.2.



**Figure E.2**  
Freight Movements to and from Canterbury by Corridor for Identified Commodities 2006-07 (million tonnes)

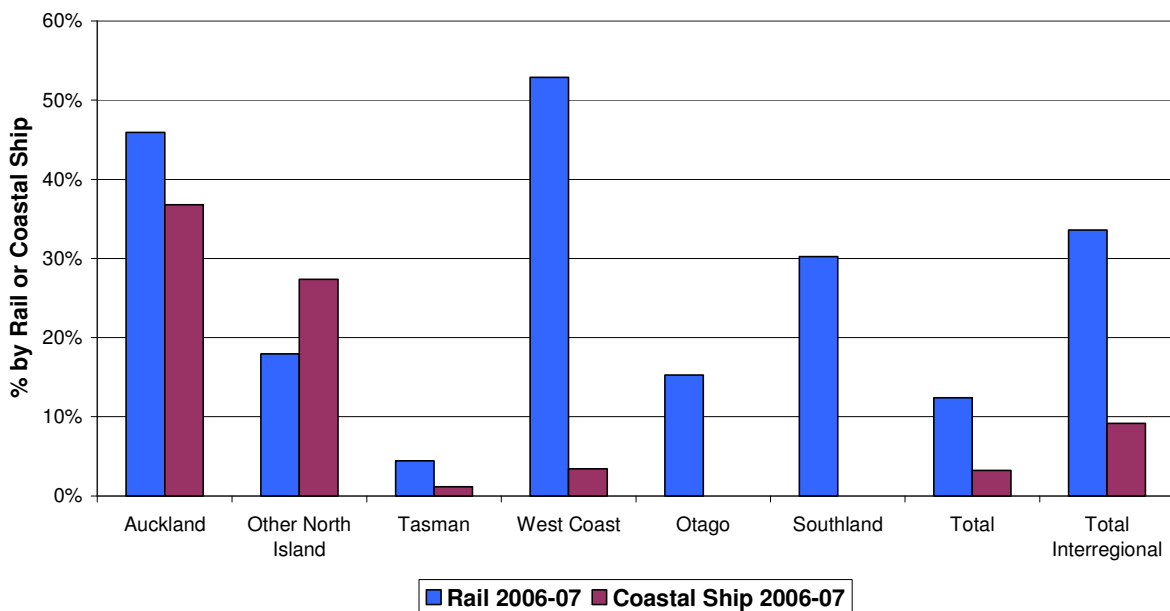
## Potential for Increased Use of Rail and Coastal Shipping for Freight in Canterbury

The totals are dominated by movements of coal from the West Coast and there are also substantial movements to and from the rest of the South Island emphasising the role of Christchurch as a regional distribution centre. In addition there is also a sizeable degree of interaction with Auckland, primarily for retail goods, and for the North Island as whole Canterbury receives more goods than it send out. This has implications for the transport system and results in a high volume of empty running northbound.

The participation of rail in internal movements within the region is small, at about 2 per cent of the overall total or about 0.3 million tonnes per year, but for the longer inter-regional movements, the rail share and the volumes carried are much higher. Rail carries almost all the coal traffic of almost 2.4 million tonnes and substantial volumes of food and other manufactured goods, and carries almost a third of inter-regional traffic. Excluding coal traffic the flows on rail are fairly closely balanced inbound and outbound.

Coastal shipping also plays a role in inter-regional freight flows. Excluding cement and petroleum products which are transported by sea in bulk into the region to meet the whole of the regions demands, the National Freight Demand Study (NFDS) estimated that about 0.7 million tones were moved by sea or about 6 per cent of inter-regional flows<sup>1</sup>. Again these flows are imbalanced with the main movement southbound.

The modal shares vary by corridor and this is set out in Figure E.3. These include cement and petroleum flows from the West Coast and Northland.



**Figure E.3**  
**Modal Splits in Key Corridors to and from Canterbury 2006-07**  
**(Rail and Coastal Shipping as percentages of Total Tonnes)**

For movements to and from Auckland, where the market is fairly large, the distance is long and a range of coastal shipping services is operated, the shares of the modes other than road are relatively high. A similar although not so marked position exists for movements to and from the rest of the North Island although the coastal shipping figures are influenced by the substantial movements of cement and petroleum from Northland. Within the South Island the rail share is particularly high for movements to and from the West Coast but is also fairly high for Southland, again reflecting the distance over which freight moves.

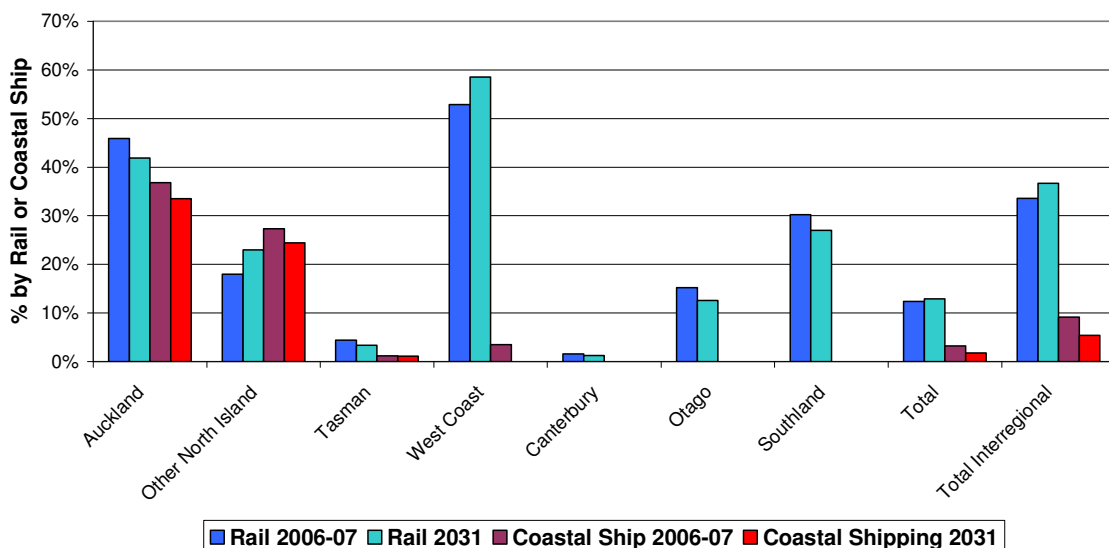
<sup>1</sup> These figures are being reviewed as part of the Rockpoint Coastal Shipping Study but the indications are that they are unlikely to change significantly

### E3 Future Freight Patterns

Forecasts of future freight demands and patterns were made as part of the NFDS. The freight task in Canterbury was predicted to more than double over the 25 years to 2031 compared with a figure of about 75-80 per cent nationally. The expected growth in Canterbury driven by substantial increases in the freight associated with milk and dairy products, coals and aggregates and other building materials.

Much of the growth relates to movements either within Canterbury or between Canterbury and the neighbouring regions in the South Island. The growth in longer distance movements was predicted to be more modest, in part reflecting changes in distribution patterns with more direct movements through regional ports replacing movements through Auckland or Tauranga to the north.

The changing freight patterns would also result in changes in modal shares and these are set out in Figure E.4. These assume a business as usual approach to the allocation of traffic between modes and exclude specific interventions to support particular modes. They therefore form the baseline against which any such proposals can be assessed.



**Figure E.4**  
**Forecast Changes in Modal Splits in Key Corridors to and from Canterbury 2006-07**  
**(Rail and Coastal Shipping as percentages of total tonnages)**

In general in the absence of any specific interventions, the modal shares are expected to remain broadly unchanged over time with a small increase in the rail share, primarily driven by increased coal traffic from the West Coast and a decline in the coastal shipping share, in part reflecting the assumed relocation of the Holcim cement factory to Weston.

Although the modal shares do not change markedly, the growth in the freight task overall means that the volumes handled particularly by rail are forecast to increase substantially. Achieving even these increases may prove challenging in the light of modest growth over recent years, although in general these challenges are probably more related to the general operation of the system than specific infrastructural constraints.

The main infrastructural issue for rail is the Otira Tunnel on the Midland Line where the steep gradients and the resulting need for substantial separation of trains imposes some potential capacity constraints. However there are proposals which would increase this capacity if required at relatively modest cost. Elsewhere infrastructural constraints are not regarded as significant and substantial increases in volumes could easily be handled, with only minor works required. With the recently announced purchases of locomotives and wagons, current rolling stock constraints are likely to ease, although with the forecast growth in traffic the position would need to be kept under review.

While there are some potential infrastructure issues at Lyttelton with the potential growth of traffic through the port, work is ongoing on proposals to address these.

Overall the forecasts also indicate that a major shift away from road will not happen by itself, but will require specific interventions to make this happen.

## **E4 Freight Modal Choice**

A key element in developing proposals to attempt to shift freight from roads to other modes understands the factors which enter into freight modal choice. As part of the work, a number of interviews were undertaken with firms either located in Canterbury or with interests in the area. The key findings from these interviews in relation to the ways in which freight modes are selected include:-

- Many of the firms interviewed had a distribution model which included a major storage and distribution centre in Auckland and a second centre in Christchurch which normally served the South Island as a whole. Movements between these distribution centres included a regularly weekly service replenishing general stock levels and more frequent and ad hoc movements to meet more immediate demands
- The key factors in the choice of freight mode are typically reliability, cost, transit time and frequency of service. The weightings attached to these vary from commodity to commodity, between different types of product handled by single firms and influence to a different degree the choice of mode for regular shipments and more ad hoc movements.
- In terms of the modes available road typically offers a service which is expensive, but which provides a high quality of service in terms of transit times, reliability and frequency. Rail is less expensive but is regarded as less reliable and slower. Coastal shipping is the slowest and cheapest and also typically offers low frequency of service.
- Within coastal shipping there appears to be two separate markets, one provided by the domestic operators, Pacifica and Straits Shipping, which is regarded as reliable but relatively expensive and that provided by the international shipping operators which is regarded as cheaper but less reliable.
- For many manufactured goods, the costs of transport even by the more expensive transport typically accounts for 5 per cent of the total cost to the customer, and in such cases reliability and speed of delivery to be able to meet the customers requirements and prevent the sale going elsewhere has a high weighting. This weighting has probably been accentuated with the economic downturn.
- Conversely for basic commodities often sold on world markets the costs of transport can be significant, and minimising transport costs is very important.

- In many instances shippers aim to minimise their carbon footprints, although the extent to which they are prepared to accept increases in costs, which would either have to be passed on to their customers or would reduce their own profitability is very limited

## **E5 The Potential to Switch to Alternative Modes**

The potential for switching freight from road to other modes or for reducing the freight task transported by road has been considered in the light of:-

- Specific identified proposals for which at least some planning has been undertaken
- More general proposals and emerging issues
- Potential for specific commodities

### *Specific Identified Proposals*

The specific proposals identified include

- **A rail connection from Temuka to Clandeboye.** This has been considered for some time, but because of the high cost and volatility of current transport flows, there appears to be limited enthusiasm for progressing this actively at the present time. The viability of the connection may be affected by proposals to permit the increased use of heavy road vehicles with a gross vehicle weight of up to about 50 tonnes on specific routes, which could allow the more efficient movement of both inbound and outbound commodities between the Clandeboye dairy factory and Temuka. In addition currently most of the output of the dairy factory travels via the port of Timaru, just 30 kms from the dairy plant, and the overall benefits from transferring this traffic to rail if it required the construction of the new rail link are probably small. Moving exports to a destination other than Timaru could raise sustainability issues, even if transported by rail.
- **Development of milk trains** Fonterra have proposals to develop a series of milk trains serving the Clandeboye dairy factory from the north of the region. This would use ISO tanks which could be transferred to road for the final part of their journey.
- **Relocation of the Holcim Cement Plant to Weston** Holcim are proposing to relocate their cement plant current located near Westport to Weston. While this would be located in Otago, it is proposed that the product would be almost entirely moved from the plant by rail to Timaru from where it would be distributed by coastal shipping.
- **Movement of fuel to the West Coast** KiwiRail are developing proposals to use the spare capacity they have on movements to the West Coast to move petroleum products from Canterbury to the West Coast using ISO tanks. While it is intended that initially this would be for major industrial users, the potential exists to extend this to serve a wider market if terminal facilities were developed at a location on the West Coast.

### *More general proposals and emerging issues*

- **The purchase by the Government of the national rail network.** This is widely regarded as a measure which by clarifying ownership issues gives the

potential for the rail network to develop long term relationships and attract additional traffic. There are however a number of concerns which remain and which may limit any expansion.

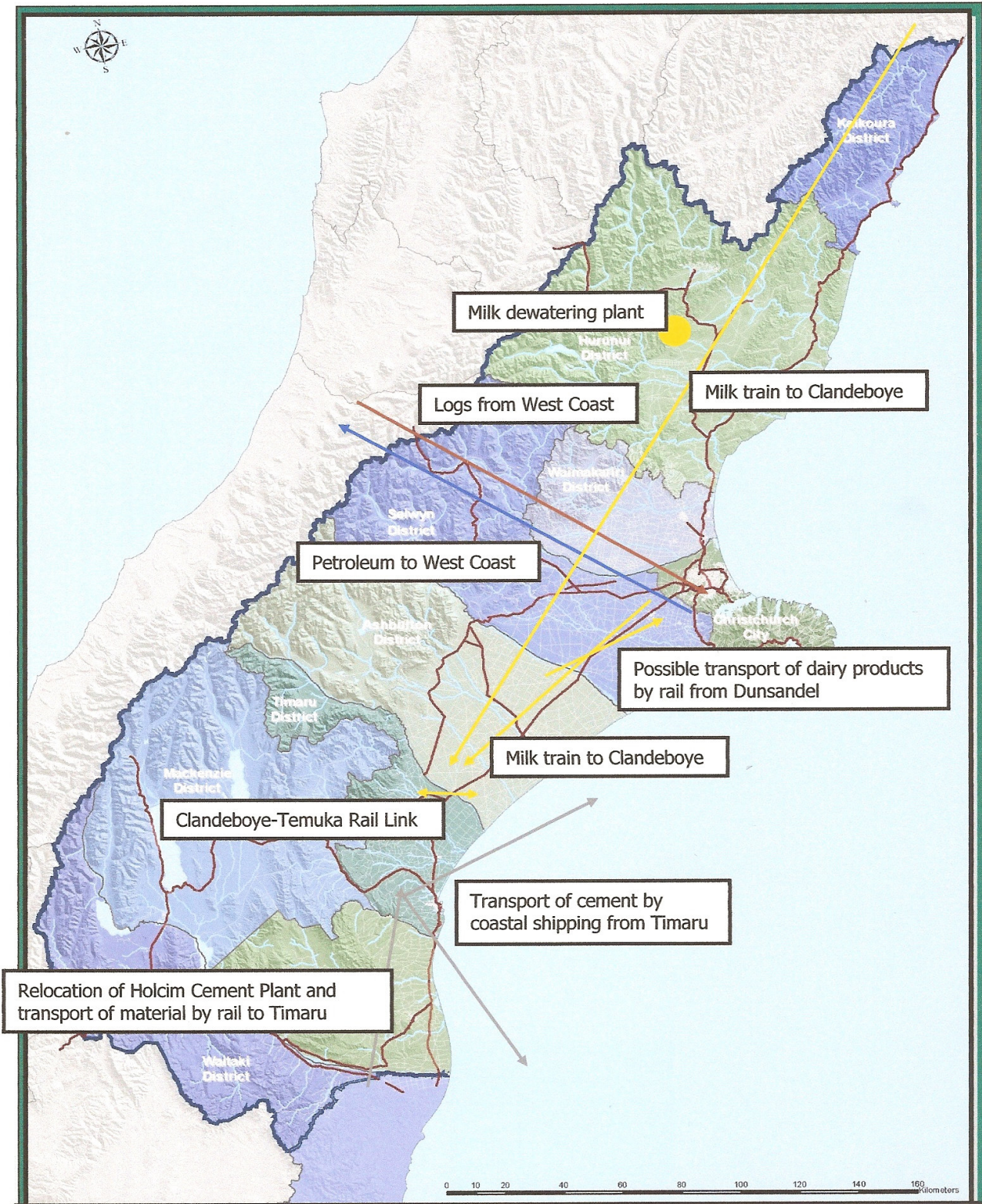
- **Introduction of heavier vehicle weights** Following on from the trial of the impact of relaxing the constraints on the movements of heavy vehicles with a gross vehicle weight of up to about 50 tonnes, it seems likely that changes will be made to allow these to operate on specific routes. The proposals and the way in which a future permitting system would operate have not yet been finalised, but it appears likely that the movement of heavier vehicles would be permitted for specific operators on specific routes, which would have to be agreed with the appropriate Road Controlling Authority or Authorities. While in some instances, such as movements from Temuka to Clandeboye, this may support the use of modes other than road, it is likely that elsewhere two main impacts would be felt:-
  - A reduction in short-distance movements of heavy basic products which are mainly if not entirely carried by road and where the increased vehicle loadings would allow the number of vehicle movements to be reduced.
  - 
  - A possible increase in longer distance movements where the improved competitiveness of road would allow it to attract freight away from rail or coastal shipping. However the extent to which this might happen may be small, because of the nature of much of the longer distance traffic and the difference in cost between road and other modes.
- **The future of the Cook Strait Ferries** The issue of the replacement of one of the Cook Strait ferries and whether this should have the facility to accommodate rail traffic will need to be considered over the next few years. The inclusion of a rail facility is considered to have significant cost implications but its exclusion would effectively sever the rail networks on the North and South Islands. While it would have potentially significant impacts on the modal split for longer distance traffic between Canterbury and the North Island, it may provide an opportunity for the development of more frequent coastal shipping services and allow them to overcome one of their main current perceived shortcomings in the eyes of customers, the limited frequency of service offered.
- **Development of coastal shipping in response to recent Government initiatives** There may be some development of coastal shipping in response to recent Government initiatives, although the political pressure for change appears to have diminished. Some changes in coastal shipping patterns have been made and others are proposed, although the viability of these is uncertain.
- **Changes in international shipping patterns** It is possible that international shipping lines will seek to reduce the numbers of port calls that they make and consequently increase the demand for movement along the coast to replace their existing services. While these developments are still being considered and the outcome is still uncertain it is possible that shippers will move to a two port call scenario, calling at one port in the North Island and one in the South. In this scenario there will be an increased requirement to transport freight to the chosen port of call rather than the port currently used. This may be met either by the increased use of road or rail transport or it may give opportunities for the development of enhanced coastal shipping services.

*Potential for specific commodities*

- The potential for the increase in modal shares of rail or coastal shipping for a number of the key commodities carried in and to and from the Canterbury region has also been assessed and the key findings are set out in Table E.1. This takes into account issues discussed above.

<b>Table E.1 Potential for Increased Modal Shares for Rail and Coastal Shipping for Key Commodities</b>	
<b>Commodity</b>	<b>Potential for Diversion to Rail or Coastal Shipping</b>
Coal	Almost entirely transported by rail and potential for further diversion is limited
Liquid Milk	Proposals for milk trains. Movement of liquid milk by road also affected by introduction of dewatering facilities in Tuamarina and the Amuri Valley
Dairy Products	Some potential for movement of dairy products by rail between Dunsandel and Christchurch Possible changes associated with output of Clandeboye dairy factory if export port moves from Timaru. Options would include issue of possible construction of a rail link to Temuka or use of larger road vehicles to allow transfer of heavy containers by road between Clandeboye and Temuka facilitating increased use of rail for longer distance moves.
Cement	Impact of possible relocation of cement plant from Westport to Weston and subsequent use of rail between Weston and Timaru
Aggregates	No major opportunities for transfer because of low value of product and limited distance transported
Logs and timber	Main sources in Canterbury either not well located in relation to rail lines or are located close to export ports. May be potential for increasing volumes carried from West Coast if rail capacity can be made available
Petroleum Products	Potential for use of rail to serve West Coast
Meat and meat products	Rail share is high and potential for major further diversion limited
General cargo	Rail and coastal shipping have reasonably high shares in key movements so potential for further diversion may be limited given nature of flows and current user requirements for frequent, flexible and rapid services.

Possible changes in key commodity movements are set out in Figure E.5



**Figure E.5**  
**Summary of Possible Specified Options for Modal Transfer or Change**

## **E6 Overall Assessment and the Regional Role**

While the opportunities for major changes in modal shares are probably limited, the projected growth in the freight task as a whole means that even retaining modal shares broadly in line with current levels will result in significant increases in the volumes handled by rail and coastal shipping. For rail, accommodating these increased traffic levels will require the provision of additional capacity in terms of infrastructure, particularly for expanded intermodal terminals, some additional rail track capacity and possibly the reinstatement or construction of private sidings, and in terms of additional rail rolling stock. For coastal shipping there may need to be investment in port inter-modal terminals and also the provision of additional coastal capacity.

A key role for the Region is to facilitate many of these actions by bringing the various interested parties together. Where investment or other action is required by the Government for example in the possible upgrading of the Otira Tunnel, or in the framework within which coastal shipping operates, the Regional Council would have an advocacy role, supporting the other parties involved. The Region also has a role in identifying possible sites for inter-modal terminals and seeking to establish a planning regime which protects both their future development and the use of the road and possibly rail connections which serve these for intensive operation by freight vehicles.