Introduction

- Demand for Freight transport in NZ (tonne-kilometres)

- 92% of total volume of freight movements are made by road

Sources: TERNZ, NFDS and Ministry of Transport
NZ Freight patterns

- Changes in the **shape of products** being transported and **logistics patterns** of firm
- **67%** of NZ manufactures outsourced logistics services*
  - The common outsourced services: Outbound transportation(79%), Warehousing(53%), and Shipment consolidation(48%)

Sources: *Zhang (2009)

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Background: Mode Choice literatures

- Mode Choice Perceptions 1970s~ 1990s (Murphy et al. 1995)
Background: NZ Studies

- Freight Mode Choice Studies in NZ
  - the National Freight Demand Study (NFDS: Richard Paling Consulting, 2008)
  - Coastal Shipping and Modal Freight Choice (Rockpoint, 2009)
  - the Gisborne to Napier Coastal Shipping Study (Warwick Walbran Consulting, 2010)

Study Questions

- What is the use of road transport fleet and the nature of the relationships with carriers?
- What service attributes do shippers use to select transport mode(s) and which attributes are most and least important?
- What are the shipper’s perceptions of rail and sea shipping?
- What are the differences in the total logistics cost between business types?
Research Method

- RP(Revealed Preference) Survey
- Web-based questionnaires
- Survey sample sources: New Zealand Stock Exchange (NZX), Industry association/groups, and councils
- Invitation sent to 1900 NZ based companies from June ~ September 2011

Questionnaires

- Physical factors
  - Company Information
  - Product Information
  - Inbound & Outbound O/D
  - Supply Chain & Logistics facilities

- Behavior factors
  - Transport mode use
  - Mode choice service factors
  - Mode preference
  - Intermodal preference
Sampling & Data Collection

- Total 176 firms completed
  - 4 business types
- 9 Industry(product) groups

Survey Sample: Number of employees

- Percentage of SMEs (small and medium-sized enterprises)
Mode Share: by Business Types

Wholesale/Retails
Manufactures
Primary

Road
Sea
Rail
Air

Mode Share: by Product Groups

Animal Non-animal FMCG Chemical Plastics Textiles Machinery Wood Metal

Air
Rail
Sea
Road
What is the use of road transportation fleet?

What is the nature of the relationships with carriers?

Road Transport

Structure of trucking industry

Non-perishable durable product

- Wood
- Plastic
- Chemical
- Owned fleet 45%
- Glass & base-metal
- Leather, footwear & Textiles
- Machinery & mechanical equipments

Contracted Carrier 55%

- Vegetables & non-animal
- Perishable food product
- Animal

- United States
- Canada

by the American Trucking Association (2006)


0 20 40 60 80 100

Percentage (%)
What transport mode(s) characteristics do you consider most important?

Mode Choice:
Service Factors & Preference

- Timeliness (e.g., transit time, reliability of service)
- Transport cost
- Suitability (e.g., suitability for shipment size, commodity to be carried)
- Customer service (e.g., firm contact, after sale service)
- Availability/accessibility (e.g., availability of equipment/mode at origin or destination point(s))
- Restitution (e.g., processing of loss and damage)
What are the most important constraints that discourage you from using RAIL/SEA to carry your products?

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Percentage (Sea)</th>
<th>Percentage (Rail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door-to-door service</td>
<td>10.6</td>
<td>17.5</td>
</tr>
<tr>
<td>Road transfer</td>
<td>9.2</td>
<td>9.2</td>
</tr>
<tr>
<td>Transport time</td>
<td>9.2</td>
<td>9.2</td>
</tr>
<tr>
<td>Transport cost</td>
<td>9.2</td>
<td>9.2</td>
</tr>
<tr>
<td>Minimum loading size</td>
<td>15.4</td>
<td>24.2</td>
</tr>
<tr>
<td>Service frequency</td>
<td>17.3</td>
<td>24.2</td>
</tr>
<tr>
<td>Accessibility</td>
<td>38.5</td>
<td>38.5</td>
</tr>
</tbody>
</table>

Mode shift: Constraints to Rail & Sea
What are the differences in the logistics costs between business types?

Logistics Cost

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation &amp; cargo handling</td>
<td>21.2</td>
</tr>
<tr>
<td>Warehousing</td>
<td>17.1</td>
</tr>
<tr>
<td>Inventory carrying cost</td>
<td>21.2</td>
</tr>
<tr>
<td>Logistics administration</td>
<td>8.7</td>
</tr>
<tr>
<td>All other logistics costs</td>
<td>21.1</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td></td>
</tr>
</tbody>
</table>

(Wholesale/Retailer: Manufacturer)
Conclusions

- NZ shippers strongly prefer **road transport**
- NZ shippers rely heavily on **contracted carriers**
- There is increased emphasis on **timeliness** and **cost** as mode choice factors
- NZ shippers have negative perceptions about transporting goods by both rail and sea in terms of **poor accessibility** and **transport time**.
- Wholesalers/retailers spent more on **warehousing costs**, while manufacturers spent more on **transportation costs**.

Q & A

Hyun-chan.kim@pg.canterbury.ac.nz