MULTIMODAL TRANSPORT CORRIDORS IN SOUTH EAST ASIA:
A CASE STUDY APPROACH

Thesis Submitted in Candidature for the Degree of Philosophiae Doctor of the
University of Wales

by

Ruth Banomyong

Logistics & Operations Management Section, Cardiff Business School
Cardiff University

November 2000
DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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This thesis is the result of my own investigation, except where otherwise stated.

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ABSTRACT

The objective of this research is to assess multimodal transport corridors in South East Asia with a particular emphasis on Lao PDR, the only land-locked country in the region. The research focuses on theoretical and practical perspectives of multimodal transport competitiveness with a view to understand international freight transport practices, and the appraisal and management of multimodal transport corridors available to Lao PDR when trading internationally. This is investigated through the use of four research questions: How is international freight transport conducted in South East Asia, especially with regard to movement to and from Lao PDR? What are the factors that affect the selection of modes and routes within and around Lao PDR? Which multimodal transport corridor is the most competitive for Lao PDR international trade? Who can best manage these multimodal transport corridors?

To answer the research questions, a sample of Lao traders and logistics operators were selected. Field study was also conducted in order to understand the physical and institutional environment of freight movement within South East Asia. Data relating to the research objective was collected via a questionnaire survey and from in-depth unstructured interviews.

The findings revealed that road transport was the dominant mode of transport in Lao PDR. “Speed”, “reliability” and “cost” are some of the most important factors affecting the selection of transport modes to, from and within Lao PDR. The most competitive multimodal transport corridor is shown to be a road-rail-sea combination via Port Klang in Malaysia and it is demonstrated that the efficient management of multimodal transport corridors is best done by forwarders.

This research presents a general methodology for the identification of the most competitive multimodal transport corridor while proposing a logistics decision-making model for routeing and mode selection.
ACKNOWLEDGEMENTS

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<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>AETR</td>
<td>European Agreement Concerning the Work of Crews of Vehicle Engaged in International Road Transport</td>
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<td>AFFA</td>
<td>ASEAN Federation of Forwarders Association</td>
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<td>AFTA</td>
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<td>AGC</td>
<td>European Agreement on Main International Traffic Arteries</td>
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<td>European Agreement on Main Inland Waterways of International Importance</td>
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<td>AGR</td>
<td>European Agreement on Main International Railway Lines</td>
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<td>AGT</td>
<td>European Agreement on Important International Combined Transport Lines and Related Installations</td>
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<td>AIDA</td>
<td>Analysis of Interconnected Decision Areas</td>
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<td>Agreement on Minimum Requirements for the Issue and Validity of Driving Permits</td>
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<td>APEC</td>
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<td>American President Line</td>
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<td>ASEAN</td>
<td>Association of South East Asian Nation</td>
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<td>ASYCUDA</td>
<td>Automatic System for Customs Data</td>
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<td>CBM</td>
<td>Cubic-metres</td>
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<td>CEN</td>
<td>European Committee for standardisation</td>
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<td>ECE</td>
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<td>EDI</td>
<td>Electronic Data Interchange</td>
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<td>Economic and Social Commission for Asia and the Pacific</td>
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<td>ETA</td>
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<td>FALPRO</td>
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<td>FIATA</td>
<td>Federation Internationale des Associations de Transitaires et Assimilées</td>
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<td>FMFF</td>
<td>Federation of Malaysian Freight Forwarder</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>FOB</td>
<td>Free On Board</td>
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<td>GATS</td>
<td>General Agreement on Trade in Services</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GMS</td>
<td>Greater Mekong Sub-region</td>
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<td>GNP</td>
<td>Gross National Product</td>
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<td>H/BL</td>
<td>House Bill of Lading</td>
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<td>HMSO</td>
<td>Her Majesty’s Stationary Office</td>
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<td>ICC</td>
<td>International Chamber of Commerce</td>
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<td>ICD</td>
<td>Inland Clearance Depot</td>
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<td>IMF</td>
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<td>Multimodal Transport Document</td>
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<tr>
<td>NYK</td>
<td>Nippon Yusen Kaisha Line</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>PAT</td>
<td>Port Authority of Thailand</td>
</tr>
<tr>
<td>PDR</td>
<td>peoples’ Democratic Republic</td>
</tr>
<tr>
<td>PMLOA</td>
<td>Pan-malaysian Lorry Owners Association</td>
</tr>
<tr>
<td>PSA</td>
<td>Port of Singapore Authority</td>
</tr>
<tr>
<td>PTP</td>
<td>Port of Tanjung Pelepas</td>
</tr>
<tr>
<td>RCL</td>
<td>Regional Container Line</td>
</tr>
<tr>
<td>RORO</td>
<td>Roll-on/Roll-off</td>
</tr>
<tr>
<td>RRC</td>
<td>Royal Railways of Cambodia</td>
</tr>
<tr>
<td>SCM</td>
<td>Supply Chain Management</td>
</tr>
<tr>
<td>SEA</td>
<td>South East Asia</td>
</tr>
<tr>
<td>SFFA</td>
<td>Singapore Freight Forwarder Association</td>
</tr>
<tr>
<td>SMT</td>
<td>Societe Mixte de Transport</td>
</tr>
<tr>
<td>SRT</td>
<td>State Railway of Thailand</td>
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<tr>
<td>TAR</td>
<td>Trans-Asia Railway project</td>
</tr>
<tr>
<td>TDRI</td>
<td>Thailand Development Research Institute</td>
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<tr>
<td>TEU</td>
<td>Twenty Foot Equivalent Unit</td>
</tr>
<tr>
<td>THC</td>
<td>Terminal Handling Charge</td>
</tr>
<tr>
<td>TIFFA</td>
<td>Thai International Freight Forwarders Association</td>
</tr>
<tr>
<td>TIR</td>
<td>Transport International Routier</td>
</tr>
<tr>
<td>TL</td>
<td>Transit Lao</td>
</tr>
<tr>
<td>TQM</td>
<td>Total Quality Management</td>
</tr>
<tr>
<td>UCP</td>
<td>Uniform Commercial Practices</td>
</tr>
<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
<tr>
<td>UNIDROIT</td>
<td>International Institute for the Unification of Private Law</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>USSR</td>
<td>Union of Soviet Socialist Republics</td>
</tr>
<tr>
<td>VAN</td>
<td>Value Added Network</td>
</tr>
<tr>
<td>VICT</td>
<td>Vietnam International Container Terminal</td>
</tr>
<tr>
<td>VIFFAS</td>
<td>Vietnam International Freight Forwarders Association</td>
</tr>
<tr>
<td>WCO</td>
<td>World Customs Organisation</td>
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<tr>
<td>WTO</td>
<td>World Trade Organisation</td>
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</tbody>
</table>
CHAPTER 1: INTRODUCTION

1.1 RESEARCH BACKGROUND

The developing economies of South East Asia were badly hit by the regional financial and economic crisis that started in 1997. This Asian economic crisis was a major setback to the regional development progress. Fortunately, sign of a healthy return to growth is, in large part, due to the robust and increasingly competitive Asian export industries.

According to Mooy (1999), the development of transport and communication technologies has revolutionised production and distribution processes, and has created the “global” market. He stressed that it is within this competitive environment that shippers and consignees require efficient transport services that can get their goods at the right place, at the right time, and at the right price. Another issue that has been presented in his statement relates to the importance of strengthening regional linkages among neighbouring countries in South East Asia in order to facilitate trade and transport.

The improvement of South East Asia’s transport sector can provide the foundation for further growth. However, for many countries in the region, inadequate transport infrastructure and high service cost have constrained economic development. Adequate transport and communications facilities are also considered major determinants of trade performance and of the costs and profitability of trading internationally (ESCAP, 1996a). Efficient multimodal transport corridors could play an important role in increasing the region’s trade competitiveness.

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1 www.adb.org
Multimodal transport is used to describe carriage where one operator assumes liability for the carriage of goods by a route involving a number of different modes of transport, e.g. most commonly road and sea, road and rail, or road and air. Multimodal transport is generally known in the USA as “intermodal transport”, and in Europe it has also often been referred to as “combined transport”, although this terminology appears to have been displaced to some extent by the term “multimodal transport”.

Multimodal transport corridors in South East Asia can be considered as a long chain of individual segments linking traders within the region to traders worldwide. For the majority of cargo with origins or destinations in South East Asia, only a portion of the chain is subject to direct regulation or control by governments in the region (ESCAP, 1995a).

A limited number of studies have been conducted on transport corridors in the region (Leinbach & Chia, 1989; ESCAP, 1993 & 1994a; ADB, 1998). The main purpose of these studies was to identify the main non-physical impediments as well as to promote cross-border trade facilitation. One of the major limitations of these studies was the fact that they did not assess alternative scenarios for corridor selections. The other limitations were that none of these studies explored freight cost structure, transit time and reliability of multimodal transport corridors in the region within an international supply chain context.

Some authors (Boerne, 1990; Beresford & Dubey, 1990; Levander, 1992; Christopher, 1998; Beresford, 1999a) have modelled freight cost structure and transit time of European or North American multimodal transport corridors. Very little equivalent work has been carried out in South East Asia, which is why there is a need for research to be conducted on multimodal transport corridors in South East Asia. This research, therefore, presents new data and empirical insights into the selection of modal choices and route choices along multimodal transport corridors in South East Asia while proposing a conceptual model for logistics decision-making for routeing and mode selection.
1.2 AIM OF THE RESEARCH

The main objective of this research is to assess the various multimodal transport corridors currently being utilised, or that may be utilised, by traders in South East Asia. The research will focus on shippers and consignees in Lao PDR, the only landlocked country in South East Asia, when trading internationally. The specific objectives of the study can be briefly described as follows:

1. To appraise transport infrastructure in South East Asia;
2. To understand the regulatory framework that is in place in South East Asia with regard to transport and trade facilitation;
3. To comprehend transport usage in Lao PDR;
4. To examine the factors affecting modal choice in Lao PDR;
5. To explore and quantify the various multimodal transport corridors that are available to shippers and consignees in Lao PDR when trading internationally;
6. To assess the reliability of these multimodal transport corridors;
7. To determine how and by whom should these multimodal transport corridors be managed;
8. To propose a conceptual model for logistics decision-making.
1.3 RESEARCH HYPOTHESES

The purpose of this study is to explore three main hypotheses:

1. The selection of particular transport modes or combination of transport modes for freight transport to, from and within Lao PDR is constrained by a number of factors that are related to transport infrastructure, the nature of the product being transported, the transport decision-maker, the transport service offered and the prevailing commercial environment.

2. The most frequently utilised multimodal transport corridor for Lao PDR international trade may not be the most efficient or reliable, or even the cheapest or the most competitive.

3. The management of multimodal transport corridors in the South East Asian region is best performed by freight forwarders.

1.4 DATA COLLECTION

There were many difficulties involved in the search for relevant data with regard to freight transport in South East Asia. These difficulties include out-of-date data, incomplete data sets, ambiguous data values and complete lack of data in some cases. The political situation in some of the countries involved in the study also created many barriers to data collection, as many governmental agencies were reluctant to disclose their operating procedures and practices. Governmental agencies such as Customs, port authorities, Ministries of Transport, Finance and Construction formulate and shape national as well as regional trade, transit and transport policies.

Data collected from private enterprises were also quite difficult to obtain, as many of the data required for this research are considered commercially sensitive. These private enterprises consisted of freight forwarders, transport operators, shippers (wood and garment), importers (foodstuff), etc. Access to data had to be negotiated
on every level. A list of people met or interviewed for this study is provided in Appendix A.

1.5 RESEARCH METHODOLOGY

A case-study methodology was used for this research. According to Yin (1994), a case-study methodology is deemed ideal for a situation where little is previously known, and the purpose of the research is to gain an understanding of the phenomenon being studied. Through this methodology the author was, thus, able to develop a better understanding of how transport mode selection was made as well their implication on multimodal transport corridors in South East Asia.

A “triangulation” research technique was formulated and applied by combining a number of research methods. The research utilised a questionnaire survey with unstructured interviews and transport modelling to examine the question of international freight transport practices to and from Lao PDR and multimodal transport corridors in South East Asia. The first stage of the research involved an empirical investigation into transport usage and the factors affecting the selection of transport mode. This was conducted through the use of questionnaire surveys. The second stage of the research involved in-depth unstructured personal interviews to collect data for the transport modelling aspect needed to explore and assess multimodal transport corridors in South East Asia.

1.6 STRUCTURE OF THE THESIS

The structure of the thesis can be separated into three parts (see Figure 1.1). The first part is the background of the research, which is presented in Chapters 2, 3 and 4. The second part, Chapter 5, concerns the research strategy and methods used in the study. The third part discusses the results of empirical findings (Chapter 6, 7 and 8) and conclusions (Chapter 9). The contents of each chapter are presented below:

- Chapter 1 begins with a general background related to the research. Then the aim of the study, the research hypotheses, data collection, research methodology and
the structure of the thesis are presented. The chapter concludes with the possible contribution of the research.

- Chapter 2 introduces the concept of multimodal transport. It begins with a definition of multimodal transport and explains transport terminology. The requirements for an efficient multimodal transport system are then examined for both the “hardware” and “software” aspects. Finally, logistics and supply chain management definitions are presented.

- Chapter 3 reviews the literature relating to transport corridors; multimodal transport competitiveness; modal choice selection, and logistics and transport modelling. The purpose of this review is to provide a perspective on previous publications and studies that have been conducted as well as to illustrate relevant research areas.

- Chapter 4 presents an understanding of the region that will be assessed in the research. Firstly, global trends in trade and logistics are explored in order to examine their numerous implications. Secondly, South East Asia is presented with a brief overview of the countries involved in the study. Thirdly, regional trade patterns and transport policies are examined in relation to cross-border and transit trade. Lastly, South East Asia’s transport infrastructure is described along with its institutional framework.

- Chapter 5 proposes a framework for research methodology in transport and logistics studies, with a particular emphasis on case-study research strategy. “Triangulation” is then discussed and used as a research technique for this study. This chapter concludes with the different research methods used in the study.

- Chapter 6 presents the findings related to international freight transport practices and attitudes towards the selection of transport modes in Lao PDR. These findings are derived from an analysis of transport usage and attitudes towards transport modes in Lao PDR. Finally, external constraints to Lao PDR international freight transport are identified and discussed.
• Chapter 7 discusses the management of multimodal transport corridors in South East Asia. Freight forwarders are presented as the most capable entities to manage multimodal transport corridors within supply chains with a brief description of the freight forwarding industry in the region. A logistics decision-making model is proposed for routing and mode selection done by regional freight forwarders.

• Chapter 8 evaluates alternative multimodal transport corridors that are available to traders in Lao PDR for export to and import from Europe and within South East Asia. A multimodal transport cost-model will illustrate the case study and helps identify the most competitive supply chain.

• Chapter 9 concludes the thesis with a summary of the research and a discussion drawn from the study’s main findings. In addition, this chapter presents the limitations and applicability of the research. Finally, chapter 9 closes with suggestions for future research.
Figure 1.1: Structure of the thesis

**Introduction**
(Chapter 1)

**Research background**
- Multimodal transport: its evolution & application
  (Chapter 2)
- Literature Review
  (Chapter 3)
- Globalisation of trade and transport in South East Asia
  (Chapter 4)

**Methodology**
- Research Strategy & Methods
  (Chapter 5)

**Findings**
- International freight transport practices and attitudes towards the selection of transport modes in Lao PDR
  (Chapter 6)
- Managing multimodal transport corridors in South East Asia
  (Chapter 7)
- Modelling multimodal transport corridors: the case of land-locked Laotian traders
  (Chapter 8)

**Conclusions**
(Chapter 9)

*Source: The Author*
1.7 CONTRIBUTION OF THE RESEARCH

The research aims to provide an understanding of transport usage and choices in transport modes in a less-developed and land-locked country, such as Lao PDR, as well as identifying the strengths and weaknesses of multimodal transport corridors utilised by Lao traders when trading internationally. The freight forwarder is also proposed as the most capable entity for the efficient management of multimodal transport corridors with the help of a logistics decision-making routeing selection model.

It is hoped that this research will be of significance to academics, traders and policy makers in areas such as trade, transit, transport and logistics because the study will probably provide an insight into the impact of an efficiently managed multimodal transport corridor with regard to trade competitiveness. Such information can:

1. Be of assistance to shippers and consignees when choosing a particular mode, or a combination of modes, of transport or a freight forwarder for export and/or import routeing;
2. Help forwarders and logistics operators to identify the most competitive multimodal transport corridors with the logistics decision-making model;
3. Show segments and links where national and regional policy makers can improve regional multimodal transport corridors. This can be done by eliminating infrastructure and institutional impediments.