UNIVERSITY OF GHANA

ADDRESSING OPERATIONAL CHALLENGES OF MULTIMODAL TRANSPORT SYSTEM IN GHANA

BY

PAUL KWADWO YEBOAH ASUAMAH
(10360037)

A DISSERTATION SUBMITTED TO UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MA PORTS AND SHIPPING ADMINISTRATION DEGREE

JULY 2011
DECLARATION

I, PAUL KWADWO YEBOAH ASUAMAH, hereby declare that apart from the references to other people's work which have been duly acknowledged, this project work is of the result of my own original investigation and that no part of it has been presented for another degree in this university or elsewhere.

Student:

[Signature]

PAUL KWADWO YEBOAH ASUAMAH

Date 17/5/2012

Supervisors:

[Signature]

DR. KWADWO KWABIA

Date 21/05/2012

[Signature]

MRS. FELICITY ANKOMAH-SEY

Date 17/5/2012
DEDICATION

To the young people of Africa who share in my vision of a better future. Keep the faith.
ACKNOWLEDGEMENT

I wish to acknowledge the encouragement and guidance of my supervisors, Mrs. Felicity Ankomah-Sey and Dr. K. Kwobia. I am also deeply grateful for their invaluable support and inspirational exchange of ideas.

Finally, I would like to express my gratitude to my good friends Obed Minkah, Alexander Koduah, Matilda Wiafe-Yeboah and my parents for their constant support throughout the entire research journey.
# TABLE OF CONTENTS

*Declaration* .................................................................................................................. i  
*Dedication* ......................................................................................................................... ii  
*Acknowledgements* .......................................................................................................... iii  
*Table of Contents* ............................................................................................................ iv  
*Abstract* ............................................................................................................................ viii  

## CHAPTER ONE
### INTRODUCTION TO THE STUDY
1.1 Background to the study .............................................................................................. 1  
1.2 Problem Statement ...................................................................................................... 7  
1.3 Objectives .................................................................................................................... 8  
1.4 Research Questions ..................................................................................................... 8  
1.5 Significance of the Study ............................................................................................. 8  
1.6 Scope of Study ............................................................................................................ 9  
1.7 Limitations .................................................................................................................. 10  
1.7 Organization of the study ........................................................................................... 10  

## CHAPTER TWO
### REVIEW OF RELATED LITERATURE
2.0 Introduction .................................................................................................................. 12  
2.1 Overview of Multimodal Transportation ................................................................... 12  
2.2 Definitions ................................................................................................................... 15  
2.3 Models or Forms of Multimodal Transport ............................................................... 18  
 
2.3.1 Land-sea-land ...................................................................................................... 19  
2.3.2 Land-air-land ...................................................................................................... 19  
2.3.3 Sea-air-sea ......................................................................................................... 20  
2.3.4 Land-inland ways-sea ....................................................................................... 20  
2.3.5 Mini-bridge ........................................................................................................ 20  
2.3.6 Land bridge ......................................................................................................... 21  
2.3.7 Ro-Ro .................................................................................................................. 21  
2.3.8 L.A.S.H .............................................................................................................. 21  

iv
4.2.4 Respondents Understanding of Multimodal Transport ........................................... 52
4.2.5 Role in Multimodal Operations ................................................................................. 53
4.2.6 Nature of Goods Shipped through Multimodal Transport ....................................... 56
4.2.7 Challenges of Multimodal transport ......................................................................... 57

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction .................................................................................................................. 60
5.1 Summary of Findings .................................................................................................. 60
5.2 Conclusions ................................................................................................................ 62
5.3 Recommendations .................................................................................................... 64
5.4 Limitations .................................................................................................................. 65
5.5 Suggestions for Future Studies .................................................................................. 65

References ....................................................................................................................... 66
Appendix 1 ....................................................................................................................... 71
LIST OF FIGURES

Figure 2.1 Components of Multimodal Transport 18
Figure 2.2 Segmented Transport vs Multimodal Transport 29
Figure 4.1 Distributions of Respondents by Multimodal Operator Role 53
Figure 4.2 Nature of Multimodal Goods 57
Figure 4.3 Challenges of Multimodal Transport in Ghana 58

LIST OF TABLES

Table 2.1 Freight Containers 14
Table 2.2 Key Elements in Containerization and Multimodal Transport 15
Table 2.3 Average Costs Involved in the Movement of Goods 23
Table 2.4 List of typical Transport Considerations 28
Table 2.5 Customs procedures 36
Table 2.6 Infrastructure required to handle containers 39
Table 3.1 Distribution of sample size 45
Table 4.1 Distribution of Respondents by Organization 49
Table 4.2 Distribution of Respondents by Positions Of Responsibility 50
Table 4.3 Distribution of Respondents by Years of Experience 51
Table 4.4 Distribution of Respondents (Principals) 54
Table 4.5 Distribution of Respondents (Agent) 54
Table 4.6 Impact of the Challenges 57
ABSTRACT

Over the past two decades the world has witnessed considerable developments in the maritime industry. The massive growth in containerization which introduced the modern concept of Multimodal Transport has shifted the cargo delivery system from "port-to-port" to "door-to-door". National borders are increasingly disappearing and trade barriers are dismantling. Ghana's ability to plug on the international trade and become a maritime hub depends on the efficiency of Multimodal Transport operations in the country. The research focuses on the nature of Multimodal Transport operations in Ghana, the challenges and potent ways of curbing the situation. With a total sample of 150 comprising of freight forwarders, truckers, shipping lines and shippers, findings indicated that even though the term multimodal is common among all stakeholders, the practice in Ghana is not consistent with internationally accepted definition of multimodal transport. The unfavorable trade pattern, lack of infrastructure, lengthy border procedures and documentation and lack of appropriate legal regime all contributed to the challenges that hinder the smooth operation of multimodal transport in the country.
CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Shipping is the life blood of the global economy. Without shipping, the intercontinental trade, the bulk transport of raw materials, and the import and export of food and manufactured goods would simply not be possible — “half the world would starve and the other half would freeze” (FEJER, 2010). The international shipping industry is responsible for the carriage of 90% of the world’s trade totaling an average of 8 billion tons annually (UNCTACD, 2009). The operation of merchant ships generates an estimated annual income of $380 billion in freight rates alone. In January 2010, there were 102,194 commercial ships in service, with a combined tonnage of 1,276,137 thousand deadweight (dwt) trading internationally, transporting every kind of cargo. The world fleet is registered in over 150 nations and manned by over a million seafarers (excluding shore operators and related networks) virtually from every nationality (IMO, 2011). The prospects of the industry’s further growth continue to be strong because of the growing efficiency of shipping as a mode of transport and increased economic liberalization.

According to UNCTAD (2010), over the last three decades, world trade has grown more than twice as fast as world gross domestic product (GDP). This is partly due to the change in foreign trade structure of developing countries as a result of diversification policies. These countries now increasingly export manufactured semi-finished and finished goods. While in 1981 only 22% of exports from low income developing countries were manufactured goods, this share had increased to 80% by 2001 (UNCTAD, 2002). During the 1990s, the trade growth coincided with even faster growth in expenditure on international transport. While exports increased by about
75%, real expenditure on international transport more than doubled (ibid). Furthermore, the proportion of overall logistics expenditure spent on transport has increased in recent years, whereas that of warehousing decreased significantly (UCTAD, 2005). The primary reason for this is greater demand for Just-In-Time (JIT) deliveries. These days, manufacturers no longer carry excess inventory.

The changes in trade pattern also required changes in the type and quality of transport, logistics services and infrastructure. This has increased the share of air transportation, as well as more frequent, more secure and more reliable door-to-door transport services. As the global supply chain moves from a push model (build-to-stock) to pull model (build-to-demand) there was the need for efficient transport system that can deliver when orders are made on JIT basis. This augmented the relevance of multimodal transport.

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. An example of such a system is the transportation of goods via road, sea and rail with one operator responsible for organizing and overseeing the various modes. Globalization and technology have brought about revolutionary changes in the transport industry and perhaps the most tremendous change in the maritime industry is containerization (Galley, 2010). The growth of containerization has resulted in changes in transport patterns and practices. Goods are increasingly carried from door-to-door, using two or more modes of transport. A typical example of multimodal transportation include containers loaded in continental Europe travel by train to Rotterdam, then ship on a vessel to Tema, then delivered inland in Burkina by truck all under a single contract.
Containerization was first introduced in international trade in the 1960s. In many developing countries however, containerization was initially not considered suitable for their particular situation because it required high capital investment and reduced the demand for labour (Alderton, 2005).

Today, it is generally recognized that the technologies used in one part of a global network cannot be different from those used in another. The choice of technology has to take into account the total system's cost and in order to connect to a network, users and providers have no choice but to adapt to prevailing standards and technologies.

Indeed, "you can resist an invading army, but you cannot resist an idea whose time has come" (Hugo, 1865).

There is no single universally accepted definition for multimodal transport but for the purpose of this work the most widely accepted definition given by the 1980 Multimodal Transport Convention will be used. The MT Convention (1980) defines international multimodal transport as the carriage of goods by at least two different modes of transport on the basis of multimodal transport contract from a place in one country at which the goods are taken in charge by the multimodal transport operator to a place designated for delivery situated in a different country.

The emergence of JIT strategy requiring dedicated and integrated schedules within manufacturers, warehouse and distribution arrangements as against continuous changes in shippers demand, multimodal transport service has become the new order in global trade and international transport. Companies which offer multimodal transportation or act as multimodal transport operators (MTO) are mostly shipping lines, large logistics companies or freight
forwarding firms who specialize in such traffic, as it obviously requires diligent organization to ensure that the chain of transport events works smoothly (Donner, 2008).

With globalization and constantly changing market demands, the freight forwarders traditional middle man role has evolved, and continues to do so, into one where he has become a key component in the supply chain mechanism. His role now incorporated value-added services that are crucial to his customers and vital to his own survival in the international trade arena. He must manage the service provided to customers by identifying more cost effective and efficiently from one of taking and acting on instructions to one of partnership with customers, creating and implementing strategies to meet international market demands (Sim et al, 2008)

When the freight forwarder contracts as a principal, he assumes the role of multimodal transport operator or MTO. As MTO, his choices in routing, rates, carriers and a larger profit margin are increased. However, so are his responsibilities and liabilities. He assumes all liability from the time he takes delivery of the goods until the goods are delivered to the consignee named in the transport document. He becomes liable for loss of or damage to the goods provided the shipper can prove that the loss or damage occurred while the goods were indeed in his care.

Currently most major container shipping lines have taken control over their own inland transport and distribution. For example, Maersk Line, a major shipping line has now open a logistics division in Ghana known as DAMCO responsible for clearing and inland transport and distribution on door-to-door basis. SDV, another major logistics company operating door-to-door services in many African countries including Ghana, is also part of the major shipping group CMA CGM. Traditional operators now strive to win or keep their market share through
multimodal strategies. Ports and terminals compete and market their hinterland links and multimodal oriented services to attract business.

The advantages of multimodal transport cannot be overemphasized. Multimodal transport has improved the transit times, reliability, interchangeability, professional management, efficiency and quality of services. Efficient multimodal transportation systems could play an important role in increasing not only the region, but a country's trade competitiveness.

The benefit for those who make use of multimodal transportation is that they have one document only for the whole operation and that the operator is legally responsible for a satisfactory overall performance by his own staff and by the agents or branches that he is employing.

Despite the numerous advantages provided by multimodal transport, many developing countries still do not fully benefit (UNCTAD, 2003). Owing to the high risk associated with land leg transport and the absence of an appropriate legal framework in relation to such transportation, international carriers often do not offer one contract to cover the entire transport operation from origin to destination with the carrier taking responsibility throughout. Other major obstacles to multimodal transport in many developing countries include physical inspections of cargo by customs or other authorities which require additional unstuffing and stuffing of containers in the port or at the border crossing. Imbalances in containerized trade, poor road infrastructure, lengthy border procedures, inadequate customs treatment of the cargo, and the insecurity involved in moving cargo overland all add to the costs and risk associated with the land leg of multimodal transport.

The challenges enumerated above may not be far from the situation in Ghana although some have been partially resolved. For example, with introduction of scanners and container tracking
systems, the physical inspection of containers is no more a major challenge for the multimodal transport system in Ghana since all unitized cargo can be scan by the Inspections Companies using X- Ray scanners in less than a minute. The 40-foot container takes 55 seconds while the 20-foot takes 30 seconds without customs physically examining the content of the container (GSL, 2010). Customs only physically examined when there is discrepancy between what is declared on the importers documents and the image seen on the scanner. However lengthy custom procedures and processes continue to persist.

Regardless of the fact that Ghana has an effective Electronic Data Interchange (EDI) known as the GCNet (Ghana Community Network) which links all the major stakeholders in custom clearing and security related issues, clearing procedures are still flawed with so many paper works which causes delays at the port and various borders.

Ghana does not fully benefit from use of the rail transport as other countries like Cote D’voire do, as most of the international trade Cargo is transported inland by road. However most of the roads have suffered serious deterioration that requires urgent attraction (Martey, 2011)

All the named challenges facing multimodal transport in developing countries can be grouped under five broad areas namely, Infrastructure and Equipment, Information Technologies, Safety and Security, Administrative Processes and finally Legal Framework including policy coherence.

As noted earlier, the challenges are not only peculiar to Ghana but to the larger African continent as a whole (UASC, 2008). Several papers have been written on operational regulations, freight cost structure and transit time of some advanced economies in Europe and North America on multimodal transport systems and operational challenges (Boerne, 1990; Beresford & Dubey, 1990; Levander, 1992; Christopher, 1998; Beresford, 1999a) and recently in many developing
countries across Asia and Latin America (Gujah, 2006). Very little equivalent work has been carried out in Ghana.

1.2 PROBLEM STATEMENT

As Ghana seeks to build its trading capabilities to increase its chances of becoming a maritime hub, there is the need to embrace the concept of multimodalism to facilitate trade.

Ghana's ability to be an effective hub will depend on its capability to plug on the regional and international trade network and this largely depends on how the country responds to global trade and market needs (Amanhyia, 2008).

With Multimodal transport being the new order in international trade and transport, it is needful to address all the bottlenecks that hamper the smooth operation of the system in Ghana. It appears much study have not been conducted to address these challenges especially in Ghana. The purpose of this study is therefore to address this gab.
1.3 OBJECTIVES

The main objective of the study is to shed light on measures needed to forestall the operational challenges of multimodal Transport with specific reference to Ghana.

The specific objectives are therefore

1. To give an overview of multimodal transport operation in Ghana.
2. Assess the challenges that hinder multimodal operations in Ghana.
3. Find out potent measures in eliminating these challenges.

1.4 RESEARCH QUESTIONS

The following research questions were used to guide the study

1. What is the nature of multimodal operations in Ghana?
2. What is the nature and magnitude of challenges confronting multimodal transport operations in Ghana?
3. What measures can be put in place to eliminate or reduce these challenges?

1.5 SIGNIFICANCE OF THE STUDY

The research is basically for academic purposes. It is in partial fulfillment of the requirement for the degree of Master of Arts in Ports and Shipping Administration. Secondly, the research would complement the efforts of others in future research, by adding to literature on multimodal transportation.
The study will suggest alternative solutions to reducing the challenges in multimodal transportation operations and therefore achieve the following:

- 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 routing;
- Help forwarders and logistics operators to identify the most effective and efficient multimodal transport operations.
- Show segments and links where national and regional policy makers can improve regional multimodal transport operations by formulating the right policies. This can be done by eliminating infrastructure and institutional impediments.

1.6 SCOPE OF STUDY

The study emphasizes on Multimodal transport operations in Ghana and focuses on the providers and direct beneficiaries of multimodal transport. Currently, Ghana has two major ports. Namely, the Tema Port which is about 30km east of Accra the capital city and Takoradi Port which is approximately 230km west of Accra. The port of Tema is the largest and younger of the two sea ports.

The port is part of the general logistics activity of transporting, storing and transforming cargo as it moves between the point of production and consumption. The port of Tema was selected as the study area because it handles 80% of the country’s import and export and about 90% of containerized cargo (GPHA 2010). The area also houses the offices of major stakeholders for the study. Using the port of Tema as the entry and exit point, the study extended to cover major stake
holders in the transportation of goods as it sought to find answers to the operational challenges of Multimodal Transport in Ghana.

The stakeholders who were involved in the study include Shipping Lines and Agents, Freight Forwarders, Haulage or Trucking companies and some major shippers (importers and exporters).

1.7 LIMITATIONS

The study sought to analyze just the challenges confronting multimodal operations in the Ghanaian transportation system. Other dimension like the impact of multimodal transportation on our national economy was not considered due to lack of time, money and other resources. The study was faced with time constraint.

Again, some respondents were unwilling to comment on some of the questions because they felt true reflection of the situation may reduce client confidence in the organization but upon further persuasion and the explanation that the findings are basically for academic purpose, some of these challenges were minimized.

1.8 ORGANIZATION OF THE STUDY

Chapter one introduced the study, defined the problem, and clarified the objectives of the study and limitations and how the research was organized. Chapter two reviewed related literature. This covered objective and analytical reviews of the theoretical framework within which the study was conducted as well as previous essays, commentaries and accepted publications on the
study subject. The study also relied on published material both in print and on accepted internet sites.

Chapter three described the methodology used in gathering data which was processed into information for the study and the hypothesis. It also covered the sources of primary and secondary data, population and sample size and constraints. A review of the study field was also conducted.

The fourth chapter entails data analysis presentation and discussion of key findings. The final chapter encapsulates conclusions, recommendations of the study and directions for future studies. It is followed by references and appendixes.
CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 INTRODUCTION

This chapter contains findings of the review of secondary sources of data relating to the research topic. Information for the literature review was obtained from relevant articles, textbooks, journals, speeches, web sites and other important sources of information. This chapter also contains the works that have been done by other researchers which were considered relevant for the subject of study. The following topics were reviewed for the study.

i. Overview of Multimodal Transportation

ii. Definitions

iii. Modes or Forms of Multimodal Transport Services

iv. Multimodal Transport Requirements

v. Multimodal Operations

vi. Summary

2.1 OVERVIEW OF MULTIMODAL TRANSPORTATION

According to Mooy (1999), the development of transport and communication technologies has revolutionized production and distribution processes, and has created the “global” market. 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.
Multimodal is essentially an international through-transport combination of various modes of transport such as ship, rail, truck, airplane, etc., primarily through the use of containers, by this means creating efficiency in international trade and transport (ibid).

The development of container traffic has made this possible, as containers can travel from end to end without being opened/unloaded/reloaded during the course of the journey. Containers will ensure the transport of unitized cargo from its origin to its final destination, with efficiency and least possible risk (UNCTAD, 1993). Multimodal transport is not only applicable to containerized cargo since some project transportation is done on multimodal basis. Project transportation in traditional freight forwarding terms is the shipment of a complete plant facility from several points of origin and several manufactures to a single site where the plant is to be built. Examples include moving power plant machinery from Shanghai (China) to Obuasi in the Ashanti Region of Ghana or the movement of 5000 tonnes of pre-fabricated housing from Malaysia to South Africa. Containers ultimately enabled multimodal transport to be applied to most types of general cargo by means of an international standardized transport unit. Only particularly large (out-of-gauge) and particularly heavy cargoes cannot be containerized. Pallets just like containers can also be carried by truck, train or rolling stock, airplane, ship, or on a barge. However, their relatively small size and lack of protective frame makes their multimodal handling labor intensive and prone to damage or theft. Containerization is basically the largest form of unitization. Containers are loaded with products at the shipper’s premises, sealed, and then carried over to the consignee’s premises intact, without the content being taken out or re-packed en route.

A standard container is a metallic box (steel or aluminium) with a double door at one end and in which general cargo can be safely loaded and transported. Most international container traffic is
carried in either 20 foot or 40 foot containers. Container dimensions are standardized and the maximum load is described in the table below.

*Table 2.1*

<table>
<thead>
<tr>
<th>Sea Freight Containers</th>
<th>20 foot container</th>
<th>40 foot container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity (m³)</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Internal dimensions L x W x H (meters)</td>
<td>5.89 x 2.32 x 2.23</td>
<td>12 x 2.32 x 2.43</td>
</tr>
<tr>
<td>Door W x H (meters)</td>
<td>2.30 x 2.14</td>
<td>2.30 x 2.23</td>
</tr>
<tr>
<td>Maximum load (tons)</td>
<td>18</td>
<td>30</td>
</tr>
</tbody>
</table>

Sea freight capacity, dimensions and load. There can be slight variations in these measurements depending on the maker.

Containerized shipments are either Less than a Container Load (LCL) or Full Container Load (FCL). LCL is a “Terminal to Terminal” concept. When a shipper does not have enough cargo to load a container to its full capacity, a forwarder running a “consolidated container service” may be contacted and allowed to add, that is using one container for several loads originating from various shippers. This is of greatest interest in the case of shipments to land-locked countries, as the use of containers practically eliminates the risks of loss, pilferage and delays in the port of unloading for transhipment over land. However, if reloading is required before the final destination, this method offers lower security, a higher risk of theft or damage during loading and offloading or exposure to adverse weather conditions. The stuffing of a container to safely secure the cargo to prevent movement and collisions inside the container is a specialized procedure that is normally carried out by professionals to reduce the risk of cargo damage.
FCL on the other hand is a “door to door” concept. Containers are sealed at origin and opened at the destination, offering high security and minimum handling. This is the essence of multimodal transport. But containerization is not synonymous with multimodal transport. Containerization only contributes to a higher efficiency in the development of multimodal transport operations (see Table 2.2). The focus, now, is more on the organization of the transport industry and the synchronization of the integrated logistical system (Hayuth, 1987). In order to achieve multimodal transport, intensive co-operation and co-ordination among transport modes are essential.

**TABLE 2.2**

<table>
<thead>
<tr>
<th>Containerisation</th>
<th>Multimodal Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unitisation</td>
<td>1. System concept</td>
</tr>
<tr>
<td>3. Cellular ships</td>
<td>3. Control over cargo</td>
</tr>
<tr>
<td>4. RoRo vessels</td>
<td>4. Mergers</td>
</tr>
<tr>
<td>5. Gantry cranes</td>
<td>5. Multimodal Transport Operators</td>
</tr>
<tr>
<td>7. Specialised terminals</td>
<td>7. Through rates and billing</td>
</tr>
<tr>
<td>8. Ship-to-shore productivity</td>
<td>8. Information system</td>
</tr>
<tr>
<td>9. Terminal back-up land</td>
<td>9. Logistics channels</td>
</tr>
<tr>
<td>10. Multi-rate structure</td>
<td>10. Deregulation</td>
</tr>
</tbody>
</table>

Source: Derived from Hayuth (1987)

**2.2 DEFINITIONS**

The term multimodal transport has been use interchangeably with other terms such as ‘Through Transport’, ‘Combined Transport’, Intermodal transport in different literatures. United Nations (UN) in their Multimodal Transport Handbook (1995) explains some of these terminologies as follows:
• Modes of Transport: The method of transport used for the movement of goods, e.g. by rail, road, sea or air.

• Means of Transport: The vehicle used for transport, e.g. ship, truck, or aircraft.

• Types of Means of Transport: The type of vehicle used in the transport process, e.g. wide-body, tank truck, passenger vessel, etc.

• Unimodal Transport: The transport by one mode of transport only, where each carrier issues his own transport document. For example, Bill of lading (B/L), airway bill, consignment note, etc.

• Combined Transport: The transportation of goods in one and the same loading unit or vehicle by a combination of road, rail, and inland waterway modes.

• Intermodal Transport: The transportation of goods by several modes of transport where one carrier organizes the whole transport from one point or port of origin via one or more interface points to a final port or point. Depending on how responsibility for the entire transport is shared, different types of documents are used. There are also different definitions for intermodal transport. Mahoney (1986), Hayuth (1987) and ECMT (European Conference of Ministers of Transport) all give different definitions for multimodal transport.

• Multimodal Transport: Where the carrier organizing the transport takes responsibility for the entire door-to-door transport and issues a multimodal transport document.

It should be noted that there is no universally accepted definition for multimodal transport since the 1980 Multimodal Transport Convention popularly known as MT Convention is still not in force. Definitions available are generally based on the background of the author and the context in which it is used.
According to Williamson (1990) multimodalism is the process of operating a door-to-door/warehouse-to-warehouse service for the shipper involving two or more forms of transport with the merchandise being conveyed in the same unitized form for the entire transit.

Donner (2008) acknowledges the fact there is no universally accepted definition for multimodal transport but believes multimodal transport should be used to describe the carriage where one operator assumes liability for the carriage of goods by a route involving a number of different modes of transport.

The widely accepted definition is the one given by the MT Convention (1980) which defines International Multimodal transport as the carriage of goods by at least two different modes of transport on the basis of multimodal transport contract from a place in one country at which the goods are taken in charge by the multimodal transport operator to a place designated for delivery situated in a different country.

From the definition above, four major features can be noticed. Namely, the carriage of goods by two or more modes, a single document of carriage also evidencing transfer of title from seller to buyer, one operator who is responsible for the entire carriage operation, although he may subcontract one or part of the deal to other parties especially when he himself is not a carrier and finally, the carriage of goods between two countries, (the two or more countries might also have different legal regime). It is the aim of this paper to find out if the practice in Ghana correlates to this definition of multimodal transport. From this definition, it will be needful to also define who a Multimodal Transport Operator (MTO) is.

A multimodal transport operator means any person who on his own behalf or through another person acting on his behalf concludes a multimodal transport contract as a principal, not as an
agent or on behalf of the consignor or the carriers participating in the multimodal transport operation, and who assumes the responsibility for the performance of the contract (MT Convention, 1980).

Multimodal transport is therefore a concept which places the responsibility for transport activities under one operator, who then manages and co-ordinates the total task from the shipper’s door to the consignee’s door (see Figure 2.1), ensuring the continuous movement of the goods along the best route, by the most efficient and, cost-effective means, to meet the shippers requirements of delivery. This means simplified documentation, and increasingly by electronic means such as electronic data interchange (EDI).

**Figure 2.1:**

*Figure 2.2: Components of a multimodal transport system*

| Source: Adapted from D’Este (1996) |

<table>
<thead>
<tr>
<th>Origini/Supplier</th>
<th>Destination /Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Base</td>
<td></td>
</tr>
<tr>
<td>Road/Rail</td>
<td>Depot</td>
</tr>
<tr>
<td>Terminal</td>
<td>Sea Truck/Leg</td>
</tr>
<tr>
<td>Cost &amp; Delivery</td>
<td></td>
</tr>
<tr>
<td>Pack Inland</td>
<td>Movement</td>
</tr>
<tr>
<td>Papers</td>
<td>Port to Port</td>
</tr>
<tr>
<td>Cost &amp; Delivery</td>
<td></td>
</tr>
<tr>
<td>Management &amp; Co-ordination</td>
<td></td>
</tr>
<tr>
<td>Packing Container Positioning</td>
<td>Inland Movement</td>
</tr>
<tr>
<td>Terminal Operations</td>
<td>Ship Stowage/Route Scheduling</td>
</tr>
<tr>
<td>Flow of Information</td>
<td>Booking Waybill Invoice Manifest Delivery Instructions Release of Cargo</td>
</tr>
<tr>
<td>Liability Network</td>
<td>Forwarder Road Rail Terminals Sea Forwarder</td>
</tr>
</tbody>
</table>

2.3 MODELS OR FORMS OF MULTIMODAL TRANSPORT

Currently, different types of multimodal transport operations involving different combinations are taking place, such as Land bridge via trailer/truck – road/sea/road; Land bridge via
2.3.1 Land-Sea-Land

This is where cargo is transported by land whether road or rail or both before it changes mode to the sea and then completes the journey by land to the consignee's warehouse. This system is also known as the sea bridge. An example of this form of the transport is as follows: An empty container is picked up from the line's container yard in Singapore and trucked to shipper's factory in Johore (Malaysia) for stuffing, thereafter the FCL is trucked to Singapore and transported by ocean vessel to New York (UNESCAP, 2005). There can be several additional links, for instance, if the container was carried by rail from, say, Kuala Lumpur to Singapore.

Where LCL cargo is concerned, the individual shipments would be delivered to the freight forwarder's Container Freight Station (CFS) or the shipping line's CFS and consolidated into a FCL which, in Chicago, is trucked to the CFS, where from it is picked-up by the consignee's truck.

2.3.2 Land-Air-Land

A combination of air carriage with truck transport is a frequent method of multimodal service in the land-air-land system. Undoubtedly, pick-up and delivery services by road transport are usually incidental to air transport. This road transportation is often effected with private or the carrier's own vehicles, and to and from their own facilities, but on occasion they do also use highway common carriers. In the advanced economies road transport is now being increasingly used, particularly in Europe and U.S.A., for trucking air freight over long distances, sometimes
across national boundaries, to connect with the main bases of airlines operating long haul services such as trans-Pacific, trans-Atlantic and inter-continental. But in most developing countries, the road transport is the dominant type because there is no linkage between the airport and the rail terminals.

2.3.3 Sea-Air-Sea

This combines the economy of sea transport and the speed of air transport and is becoming increasingly popular in several international trade routes like the Far East Europe route. The economics of this combination mode favors high value items like electronics, electrical goods, computers and photographic equipment as well as goods with high seasonal demand such as fashion wear and toys.

This multimodal operation is particularly applicable where the route to be covered combines large distances via land and water, and where transit time is important.

2.3.4 Land-Inland waterways-Sea

This combination mode is in common use when goods have to be moved by sea from one country to another and one or more inland modes of transport such as rail, road or inland waterways, have to be used for moving the goods from an inland centre to the seaport in the country of origin or from the seaport to an inland centre in the country of destination.

2.3.5 Mini-bridge

This involves the movement of containers, under a through bill of lading issued by an ocean carrier, by a vessel from a port in one country to a port in another country and then by rail to a second port city in the second country, terminating at the rail carrier's terminal in the second port.
city. The mini-bridge offers the consignor a through container rate inclusive of rail freight up to the final port city in the country of destination. The railways are paid a flat rate per container by the ocean carrier for the rail transit. This system is in operation on certain routes covering the trade between the United States and the Far East, United States / Europe, United States / Australia, etc.

2.3.6 Land Bridge

This system concerns itself with shipment of containers overland as a part of a sea-land or a sea-land-sea route. In this case also, the railways are paid a flat rate by the ocean carrier who issues the through bill of lading. This system is in operation for the movement of containers on certain important international routes such as: between Europe or the Middle East and the Far East via the Trans-Siberian land bridge; and between Europe and the Far East via the Atlantic and Pacific coasts of the U.S.A., continental U.S.A. being used as a land bridge.

2.3.7 Ro-Ro (Roll-on/Roll-off)

This mode combines different means of transportation (sea and road), and is used most often with new automobiles, which are shipped by sea and then simply driven off the vessel to the importer's warehouse. Heavy and over-dimensional cargo is also suitable for Ro-Ro transport.

2.3.8 L.A.S.H. (Lighter Abroad Ship)

LASH transport is the combination of deep sea and inland waterway transportation. An example is the route from Germany to the Mississippi Ports where the barges sail down the Rhine, Elbe or Weser in Germany, are loaded onto LASH container vessels in Rotterdam, Hamburg or Bremen;
are then carried across the Atlantic, only to be unloaded at a Mississippi delta port to sail upstream in the U.S. (UNESCAP, 2005)

It must be noted that LASH vessels are expensive, and furthermore it is necessary to check on the availability of the special handling facilities necessary in the ports of destination.

2.3.9 Piggyback

This is a system of unitized multimodal land transportation, a combination of transport by road and rail. It has become popular in Latin American and European countries because it combines the speed and reliability of rail on long hauls with the door-to-door flexibility of road transport for collection and delivery. The goods are packed in trailers and hauled by tractors to the railway station. At the station, the trailers are moved onto railway flat cars and the transport tractors, which stay behind, are then disconnected. At destination, tractors again haul the trailers to the warehouses of the consignee.

The system has undergone refinements and sophistication by the introduction of the so-called "trailer train" which uses the same trailer as a vehicle on the road and a rail vehicle on the rail. In other words, the trailer moves on its wheels as a truck on the road but the wheels can be retracted by an air suspension system and connected to a rail bogie for movement by rail. At the end of the rail journey, the conversion back to being road vehicle is effected for delivery of the goods to the customers.

2.3.10 Sea Train

This is another innovation in the multimodal transport system involving the use of rail and ocean transport. It was originally adopted in the U.S.A. It is similar to the roll-on, roll-off (Ro-Ro)
system except that in the place of the Ro-Ro vehicle a rail car is used so that geographically separated rail systems can be connected by the use of an ocean carrier. Typically these vessels are long and thin and consist of one main deck running the length of the ship. They are quicker at loading trains than general cargo vessels since the train’s carriages do not need to be detached from one another.

2.4 RELEVANCE OF MULTIMODAL TRANSPORT

The key to the operation of multimodalism is the non-vessel operating carrier (NVOC) or non-vessel operating common carrier (NVOCC). This may result in a FCL or LCL movement or trailer transit. In such a situation, carriers issue bills of lading for the carriage of goods on ships which they neither own nor operate. The carrier can be a freight forwarder issuing a ‘house’ bill of lading for a container or trailer movement.

Table 2.3: Average costs involved in the movements of goods

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Feeder trucking cost</td>
<td>14%</td>
</tr>
<tr>
<td>(2) Truck turn around time</td>
<td>8%</td>
</tr>
<tr>
<td>(3) Container handling cost from/to truck at port</td>
<td>5%</td>
</tr>
<tr>
<td>(4) Stacking/unstacking costs</td>
<td>10%</td>
</tr>
<tr>
<td>(5) Dwell time costs at inland and port terminals</td>
<td>8%</td>
</tr>
<tr>
<td>(6) Ship transport costs</td>
<td>34%</td>
</tr>
<tr>
<td>(7) Ship turn around time/costs</td>
<td>6%</td>
</tr>
<tr>
<td>(8) Container ship loading/unloading costs</td>
<td>15%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Note: These percentages will vary according to the distance involved, especially in the case of sea leg. Source: Derived from UNCTAD (1995)

As an example a freight forwarder offers groupage service using a nominated shipping line and infrastructure. The freight forwarder or MTO offers his tariff for the service but buys from the shipping line at a box rate. NVOCC allows shipping companies to concentrate on ship
management and the freight forwarder or MTO to use his expertise in marketing and cargo consolidation. This type of operation is particularly evident in the Far East, US, African and European (Williamson 1990). Overall there must be the availability of a good infrastructure to enable it to operate effectively.

The MTO is the only responsible party that is able to co-ordinate all modes of transport and organize multimodal transport. Shippers and consignees are not capable, nor do they have the time to determine the best route or the best price, as they do not have the MTO’s expertise in transport management. They also do not have the capability to determine, forecast and even to solve problems that might occur to their cargo during transit (see Table 2.4)

The factors below outline why shippers are in favour of multi-modalism.

a) The service is reliable, frequent and competitively priced. Goods arrive within a scheduled programme involving various transport modes and carriers operating in different countries.

b) In many companies it features as a global network either as a supply or retail chain. The former may comprises assembly or process plant serving a local market whilst the latter involves the retailer buying the product in an overseas market. The retailer may be a shop, manufacturer, consumers, etc.

c) Many companies operate their global schedules on the JIT basis requiring dedicated and integrated schedules within the shipper’s warehouse and distribution arrangements. Multi-modalism is ideal for this system. Many companies regard it as a distribution arm of their business with online computers access. This frequently involves an EDI system which strongly favours multi-modalism as a global distribution system.
d) The service is tailor-made to the trade or commodities it serves involving high-tech purpose built equipment. This provides adequate protection to the goods and arrival of the product in an excellent condition. The product may be refrigerated, fragile cargo or high-tech electrical goods.

e) It has a high profile which is a good marketing ploy in the promotion of a company’s business.

f) Companies are looking for offshore manufacturing and sourcing outlets for their components and bulk cargo needs. Countries with an established multi-modal global network are especially well placed in such a selection process.

g) The documentation requirements are minimal with the combined transport bill of lading involving one through rate and a common code of conditions.

h) More and more companies are focusing on international distribution as an important element of their international business. Such companies identify two profit centres: the manufacture/supply of the product and the channel of distribution from the supply point to the overseas destination.

i) Companies using the multi-modal network as a supply chain are very conscious of transit times and the capital tied up in transit. Quicker transit times bring the sourcing and assembly plants situated in different countries closer together, thus reducing the amount of capital tied up in transport which in turn reduces the company’s requirements for working capital, a critical factor with the multinational enterprise.

j) A key factor is the level of facilities provided by the NVOCC at the terminal warehouse. Many are high tech utilizing a bar code sorting system and have purpose-built facilities for specialist cargoes as found in distriparks and districentres.
2.5 MULTIMODAL TRANSPORT OPERATION

When a multimodal transport service is provided, the multimodal transport operator (MTO) will be liable from the point of origin to the point of destination (UNCTAD, 1995a). He will issue one transport document that will include invoice for freight charges, and also a guarantee for the transit time. From that point onwards, the MTO concludes a number of sub-contracts with individual carriers, road, rail, shipping lines, terminal operators, etc, on the MTO's own name, not that of the shipper or the consignee. Only the MTO is entitled to take delivery of the goods from each actual sub-carrier and pass them to the next sub-carrier. The MTO, in acting as a principal, is therefore responsible for the whole transport chain.

It is fundamental for the MTO to have the ability to design and provide effective transport arrangements. When goods are moving from the shipper to the consignee, it may take up to ten or twelve distinct transport links. At each transfer point, goods will then be unloaded and loaded, waiting or stored, weighted, checked or recorded, packed/reconsolidated. All of these transfers cost time and money, thus affecting the competitiveness of particular routes (Beresford & Savides, 1997; Beresford, 1999a).

The MTO will have to rely on transport system analysis for the design and planning of the multimodal transport operation. According to Manheim (1979), the field of transportation system analysis has the following characteristics:

• It is *multimodal*, covering all mode of transport.

• It is *multi-sectoral*, encompassing the problems and viewpoints of government, private industry, and the public.
• It is multi-problem, ranging from rules, regulations, and policies to customer service levels and financial and economic feasibility.

• It is multi-disciplinary, drawing on the theories and methods of engineering, economics, operations research, political science, psychology, other natural and social sciences, management and law.

This means that in the analysis of a transportation system, the total transportation system of a region must be viewed as a single multimodal system. The consideration of the transportation system cannot also be separated from consideration of the social, economic, and political system of a region.

Through transport systems analysis, the MTO will be able to use an integrated approach in operation, management and control of traffic, so that shorter delivery from origin to destination is made possible. The shorter delivery, and often more reliable delivery, will lower transit time of transport from origin to destination and will enable a greater control of costs, schedules and cargo safety. It is often due to the lack of co-ordination at the various intermodal transfers’ point that delay occurs.

Massive savings on the transport chain are therefore possible, by improving overall efficiency through proactive management techniques and better control over cargo flow. To be able to improve overall efficiency, the MTO must be able to plan a high level of utilization of transport links in conjunction with a continuity of cargo flow. Intralink storage must also be minimized (MacLeod, 1998).
Table 2.4: List of typical transport considerations

**a) Shippers**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Inland Transport complications</td>
<td></td>
</tr>
<tr>
<td>2) Transit time to terminal</td>
<td></td>
</tr>
<tr>
<td>3) Transit costs to terminal</td>
<td></td>
</tr>
<tr>
<td>4) Terminal charges</td>
<td></td>
</tr>
<tr>
<td>5) Frequency of service of main transport leg</td>
<td></td>
</tr>
<tr>
<td>6) Transit time of main transport leg</td>
<td></td>
</tr>
<tr>
<td>7) Costs of main transport leg</td>
<td></td>
</tr>
</tbody>
</table>

**b) Consignees**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Terminal charges</td>
<td></td>
</tr>
<tr>
<td>2) Delay in obtaining inward clearance</td>
<td></td>
</tr>
<tr>
<td>3) Costs of bonds, etc. at inward clearance point</td>
<td></td>
</tr>
<tr>
<td>4) Transit costs from terminal to destination</td>
<td></td>
</tr>
<tr>
<td>5) Transit time from terminal to final destination</td>
<td></td>
</tr>
<tr>
<td>6) Border delays</td>
<td></td>
</tr>
</tbody>
</table>

These two tables actually represent the minimum considerations that must be taken into account by both shippers and consignees, when exporting or importing. By using a MTO, both shippers and consignees do not have to worry about their cargo as that burden has shifted to the service provider. As the MTO offers a one-stop service, the MTO will consider what the best alternative is for its client and propose a tailor-made solution (see Figure 2.2). The value added in terms of the services provided by a MTO is significantly greater than that provided by the conventional carrier. The role of the MTO in the transportation of goods door-to-door will continue to increase because of the single carrier liability they undertake and the flexibility with which they function. They can, for example, vary the all-in freight rates according to the complexity of the service provided, taking into account the volume of business provided by their customers.
2.6 MULTIMODAL TRANSPORT REQUIREMENTS

The use of multimodal transport implies overall structural changes covering new trade and transport practices. Various measures are needed to implement multimodal transport, from the streamlining of commercial regulations to the development of transport infrastructure. The upgrade of three main elements is necessary for an efficient multimodal transport system. These elements are commercial practices, administrative requirements and transport infrastructure.
2.6.1 Commercial Practices

Because international trade is riskier than trade within a country they are often governed by contractual rights and obligations agreed between the parties expressly or by implication. Some of the risks that are usually taken care of by trade contracts are longer distances that result in less transparency in transactions, different currencies leading to exchange risks or money transfer limitations and different cultures and languages which might lead to misunderstanding and misinterpretation, as well as different legal frameworks that might result in weak legal position. Much of the risks associated with international trade can be divided between buyer and seller within the trade contract. The delivery of goods which usually sets in motion all the other risks and issues is agreed upon between seller and buyer and it is here that the risks are “shared”. The International Chamber of Commerce (ICC) has a series of pre-defined commercial terms known as International Commercial Terms or INCOTERMS that are intended primarily to clearly communicate the tasks, costs and risks associated with the transportation and delivery of goods. INCOTERMS are accepted by governments, legal authorities and practitioners worldwide for the interpretation of most commonly used terms in international trade.

The current edition INCOTERMS 2010 is divided into two main parts based on the method of delivery. The larger group of seven rules applies regardless of the method of transport, with the smaller group of four being applicable only to sales that solely involve transportation over water.

- **EXW - Ex Works (named place of delivery)**

  The seller makes the goods available at its premises. This term places the maximum obligation on the buyer and minimum obligations on the seller. The Ex Works term is often used when making an initial quotation for the sale of goods without any costs included. EXW means that a seller has the goods ready for collection at his premises (works, factory,
warehouse, plant) on the date agreed upon. The buyer pays all transportation costs and also bears the risks for bringing the goods to their final destination.

- **FCA – Free Carrier (named place of delivery)**
  The seller hands over the goods, cleared for export, into the disposal of the first carrier (named by the buyer) at the named place. The seller pays for carriage to the named point of delivery, and risk passes when the goods are handed over to the first carrier.

- **CPT - Carriage Paid To (named place of destination)**
  The seller pays for carriage. Risk transfers to buyer upon handing goods over to the first carrier.

- **CIP - Carriage and Insurance Paid To (named place of destination)**
  Seller pays for carriage and insurance to the named destination point, but risk passes when the goods are handed over to the first carrier.

- **DAT - Delivered at Terminal (named terminal at port or place of destination)**
  Seller pays for carriage to the terminal, except for costs related to import clearance, and assumes all risks up to the point that the goods are unloaded at the terminal.

- **DAP - Delivered at Place (named place of destination)**
  Seller pays for carriage to the named place, except for costs related to import clearance, and assumes all risks prior to the point that the goods are ready for unloading by the buyer.

- **DDP - Delivered Duty Paid (named place of destination)**
  Seller is responsible for delivering the goods to the named place in the country of the buyer, and pays all costs in bringing the goods to the destination including import duties and taxes. This term places the maximum obligations on the seller and minimum obligations on the buyer.
The four rules defined by INCOTERMS 2010 for international trade where transportation is entirely conducted by water are:

- **FAS – Free Alongside Ship (named port of shipment)**
  The seller must place the goods alongside the ship at the named port. The seller must clear the goods for export.

- **FOB – Free on Board (named port of shipment)**
  The seller must load themselves the goods on board the vessel nominated by the buyer. Cost and risk are divided when the goods are actually on board of the vessel.

- **CFR – Cost and Freight (named port of destination)**
  Seller must pay the costs and freight to bring the goods to the port of destination. However, risk is transferred to the buyer once the goods are loaded on the vessel (this rule is new!).

- **CIF – Cost, Insurance and Freight (named port of destination)**
  Exactly the same as CFR except that the seller must in addition procure and pay for the insurance.

These rules have proven to be of great help to the commercial world in providing clear explanations for roles and responsibilities for various important steps in the delivery which include freight arrangement, obligation to take out transport insurance, place of delivery, transfer of risk, distribution of costs (loading or off-loading etc.), arrange export or import clearance.

These terms also identify the one who will enter into contract with the MTO. The introduction of the 2010 version seeks to remove any ambiguity and uncertainty in regards to door-to-door transport and delivery. The correct terminology should therefore be clearly indicated in any international trade agreement.
2.6.2 Documentation

Bills of lading, air waybills, multimodal transport documents and so on are an integral part of any multimodal transport operation. The MTO and those persons embarking on some form of logistics exercise must understand the role performed by such documentation and their importance to any contract.

It should be noted that there is no international uniformity in documentary procedures for freight forwarding, and no consistency in the format and contents of the documents that are issued. The International Federation of Freight Forwarders Associations (FIATA) has taken steps to promote the use of uniform documents to improve professional standards globally. FIATA developed documents such as the FIATA Multimodal Transport Bill of Lading or FBL. The multimodal transport document, which, for all intents and purposes, is a B/L.

Despite FIATA’s efforts to standardize multimodal transport documentation, the use and acceptance of such documents is subject to national law or the prevailing commercial practice in each country.

In addition to the FBL, FIATA has developed several other documents for use by its members. These include:

- **Documents issued to the customer that is the shipper:**
  
  - FIATA FCR: Forwarder’s Certificate of Receipt
  - FIATA FCT: Forwarder’s Certificate of Transport
  - FBL: Negotiable FIATA Multimodal Transport Bill of Lading
  - FWR: FIATA Warehouse Receipt
  - House bill of lading or air waybill
2.6.3 Administrative Requirements

One of the major reasons for the introduction of multimodal transport is to facilitate trade. According to the United Nations Trade Facilitation Program (FALPRO) trade facilitation is done through the streamlining of the information flow mainly on three levels:

(i) Simplification: The reduction of the amount of information required by the various authorities to an absolute minimum. This has already been done in a number of developed countries and some developing countries. Simplification must be carried out, both of the procedures required and of the documents.

(ii) Normalization: The reduction of variants of formalities, procedures and documents both at the national and at the international levels (i.e., they must be identical in all ports of a country and must be aligned to similar procedures and documents in other countries). This mainly concerns, transport documents, INCOTERMS, payment conditions and trade documents.

(iii) Harmonization: The harmonization of statistics of streamlining of the transmission of data using EDI. Such change from paper documents to electronically transmitted information is difficult to carry out but will greatly facilitate trade. However, because of the many different systems in use, harmonization of such systems is required.
2.6.3.1 Customs

Customs is an important agency of every government. In many countries, Customs is a principal source of revenue for the government. In all countries Customs play a major role in enforcing laws at the nation’s borders. As world trade has grown, so too has the complexity and workload of Customs. According to Lane (1999), the mission of Customs is as follows:

- To ensure all goods entering and exiting the country do so in compliance with all laws including revenue.
- To facilitate the entry of all legitimate merchandise into the country.

The globalization of the world economy has placed increased pressure on the world’s Customs administrations. Merchants have demanded faster, more standardized and uniform service while governments require more revenues. At the same time Customs must produce trade statistics and enforce other agency laws (i.e., health, intellectual property, etc.) at the nation’s border.

Customs are faced with the prospect of balancing the requirement of facilitation with enforcement. Using a traditional approach to Customs practices and procedures is not suitable for trade facilitation. In the European Union and in other regional grouping (e.g. NAFTA), Customs have reduced their day-to-day work and the number of officers to concentrate mainly on intelligence gathering rather than high profile policing. Table 2.6 is a review of the traditional Customs operation still in service today contrasted with the more modern approach being put in place in many countries.

To implement multimodal transport, Customs are required to facilitate the container flows, through minimization of import or export documents and to permit the movement of cargo to and from ports.
under bond or in a sealed container. Customs procedures can be eased through the adherence to various Customs Conventions

These conventions are aimed at the facilitation of international trade and transport. Customs Conventions are designed to abolish unnecessary procedures at border crossings or to harmonize indispensable procedures. The following is an explanation of selected Customs Facilitation Conventions:

**Table 2.5: Customs procedures**

<table>
<thead>
<tr>
<th>Customs Procedure or Practice</th>
<th>Traditional Customs</th>
<th>Modern Customs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International Standards of the WCO</strong>&lt;sup&gt;18&lt;/sup&gt; and WTO&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Non conformance or only partial conformance</td>
<td>Full conformance with all international Customs standards for classification, value, and procedure</td>
</tr>
<tr>
<td><strong>Customs Automation</strong></td>
<td>No or only partial</td>
<td>Full automation</td>
</tr>
<tr>
<td><strong>Measures of Performance</strong></td>
<td>Limited output measures and process measures &amp; frequently the wrong measures</td>
<td>Full measures of compliance &amp; facilitation leading to improved performance</td>
</tr>
<tr>
<td><strong>Tariff System</strong></td>
<td>Complex &amp; high duty rates</td>
<td>Simplified &amp; reduced duties</td>
</tr>
<tr>
<td><strong>Revenue Collection</strong></td>
<td>Prior to entry of goods</td>
<td>Entry &amp; collection separate. Duties paid after entry</td>
</tr>
<tr>
<td><strong>Enforcement and compliance approach</strong></td>
<td>Characterised by manual inspections nearing 100% &amp; paper reviews</td>
<td>Minimal inspections &amp; paper documentation</td>
</tr>
<tr>
<td><strong>Information</strong></td>
<td>Provided at time of entry</td>
<td>Advance &amp; historical information prior to arrival of goods &amp; conveyance</td>
</tr>
<tr>
<td><strong>Personnel</strong></td>
<td>Poorly trained and low skilled</td>
<td>Highly trained &amp; professional</td>
</tr>
<tr>
<td><strong>Appeals of Customs decisions and transparency</strong></td>
<td>Limited &amp; unknown appeal process, limited publication notice of rules &amp; practices</td>
<td>Fully defined appeals process within &amp; beyond Customs, full transparency and co-operation with trade</td>
</tr>
</tbody>
</table>

**RESULTS:**

| | Low & unknown compliance, high cost for government & industry & poor facilitation | High & measured compliance, lower costs for government & industry, vastly improved facilitation & framework for continued improvement |
Customs Conventions on the Temporary Importation of Private and Commercial Road vehicle of 1954 established the principle of temporary importation of such vehicles under the cover of the “carnet de passage en douane”.

- **TIR Convention of 1975** permits the international carriage of goods by road from one Customs office of departure to a Customs office of arrival, through as many countries as necessary, without any intermediate frontier check of goods carried.

- **International Convention on the Harmonization of Frontier Control of Goods of 1982** aims at reducing the requirements for completing formalities.

- **Container Pool Convention of 1994** aims at the duty and tax-free admission of containers belonging to a Pool. Each contracting party’s assigns a certain number of its container into a Pool and allows an equal number of such Pool containers to travel within its territory without any restriction.

### 2.6.4 Transport Infrastructure

Where transport infrastructure is poor, the development of multimodal transport may not be easy. In order to be able to gain maximum benefit from multimodal transport, infrastructure that is capable of handling containers must be in place (see table 6). This minimum level of transport infrastructure must be in place, in order to benefit fully from multimodal transport. The exporter will benefit by being more competitive in reaching the foreign buyer at minimum costs, minimum time with goods delivered in good conditions. The importer will also benefit from multimodal transport, as goods he has ordered, will be delivered to his premises at minimum cost and in good conditions. Lack of the requisite infrastructure causes exporters and importers in Ghana to incur additional logistics cost. Example is in the area of cocoa export.

Cocoa is a major pillar of Ghana’s economy. The crop generates about One Billion Dollars in foreign exchange annually and is a major contributer of Government Revenue and GDP.
(COCOBOD 2011). About ninety percent of the cocoa produced in Ghana is exported. The crop grown in the forest belt of the country is purchased by Authorised Lincensed Buying Companies (LBC) from the farmers before taken over by the Warehouse and Port Operations (WPO) department of Cocoa Marketing Company (CMC) who warehouses the stock, organizes pre-shipment handling and undertakes loading of the vessel. Before 2002 the Ghana Railway Corporation was the major haulier of the county's cocoa from the CMC WPO's depots in hinterland (notably Kumasi Kaase Depot) to the major ports for export. A coachload was 20tons (480 bags) and more than 30 coaches were pulled together to the port for shipment. With the defunct of the Railway Corporation, the only available option now is road transport. The implementation of the Axle Load Controls has also resulted in a sharp increase in transport prices by haulage operators willing to compensate for the loss of tonnage they would have allowed to carry. The Cocoa production in Ghana reached an annual record of 1 million tonnes in 2011. This implies that with an average truckload of 37.5 tonnes, hauliers would have to make about 26,600 trips before the cocoa gets to the port cities for rewarehousing pending export. The average cost of a trip of cocoa from Kumasi to Tema and Takoradi is GHC 4,372.116 and GHC 5,223.66 respectively. Additional cost of between GHC 262 to GHC 337.5 is spent on transporting the same truckload to the port for export. Frequent thefts, wet beans, accidents which are associated with the road transport can all be reduced if there were effective multimodal structures in place.

Transport Infrastructure continues to be a challenge in the developing of an effective multimodal transport in Ghana. Even though plans are underway to improve the general transport infrastructure in the country, a lot more still needs to be done to facilitate smooth multimodal transport.
Meridian Port Services (MPS) a private Container Terminal Operator which currently handles 70% of export and import cargo at the Port of Tema has taken delivery of two additional mobile gantry cranes from the Port of Salala in Oman. The new GOTTWALD MHK 6407 cranes weigh 350 tonnes and have a lifting capacity of 100 tonnes on the hook and 50 tonnes on the spreader. The cranes have a twin lift spreaders that can enable it to load or discharge two TEUs concurrently to and from a container vessel. Each of these cranes is expected to make 15 to 25 moves per hour (GPHA 2010). MPS’s decision to acquire the new crane is to reduce time of operation on ships that call at the port, minimize anchorage waiting time and this is a step in the right direction as the overall productivity of the port will increase.

2.6.4.1 Inland transportation

Ghana can boast of an inland waterways, railways and highway. However, their deplorable state is cause for concern. The Ministry of Transport has disclosed that the current state of the
transport sector in the country is deplorable and needs an urgent rehabilitation system to save it from total collapse (Yaro, 2009).

Ghana has a total of 32,250 km of roads; 6,084 km concrete or bituminous surface, 26,166 km gravel, laterite, and improved earth surfaces but frequent accidents resulting from persistent port holes, poor vehicular maintenance and non-observation of road traffic regulations hinders smooth cargo flow (Brobbey 2009). To address the situation, roads in the capital have been subjected to rehabilitation works by the Ministry of Roads and Highways. The Ministry is focused on improving the nature of roads to make them motorable for users. This initiative even though laudable does not addresses the situation holistically.

Navigation on the Volta River has changed significantly since 1964 with the construction of the dam at Akosombo, about eighty kilometers upstream. The lake is navigable from Akosombo through Yeji in the middle of the country to Buipe. A twenty-four-meter pontoon was commissioned in 1989 to link the Afram Plains to the west of the lake with the lower Volta region to the east. Lake Volta provides 1,125 km of arterial and feeder waterways. Volta, Ankobra, and Tano Rivers provide 168 km of perennial navigation for launches and lighters. The Volta River Transport Company (VLTC) the main transport company on the Volta lake has a tanker barge with a capacity 1500m$^3$ (30,000 litre capacity) of liquid cargo equivalent of 48 tanker trucks. In addition, the company has 3 solid cargo flat-top barges (each with a carrying capacity of 730 tonnes)(VLTC 2010). The solid cargo barges have the ability of carrying Cement, Construction Materials/ Equipment, Shea nuts etc. These fully utilized will divert the bulk haulage from the roads and reduce Central Government’s fiscal burden for road maintenance, reduction of national forex expenditure on the importation of haulage vehicles and
spares as well as improve multimodal transport potentials of the lake. However, the presence of
tree stumps, un-chartered fairways affecting save navigation and poor Access roads pose
challenges that needs to be address to make the Inland waterways navigation more secured.

The Government of Ghana recognizing the need for the development and use of railway
infrastructure as a means of accelerating economic growth has signed a Six billion dollars contract
with China National Machinery Import and Export Corporation for the construction of a railway
infrastructure from Nsawam through Kumasi to Paga and from Tamale to Yendi. This project
when completed will improve the efficiency of Multimodal Operations in the country.

2.7 SUMMURY
The container revolution has facilitated the development of multimodal transport as an
international through-transport means with various modes of transport. Containers will ensure
the transport of unitized cargo from door-to-door with efficiency and least possible risk.

Confusion on transport terminology relating to multimodal transport is an area where
standardization may be necessary. Terms such as ‘through transport’, ‘combined transport’,
‘intermodal transport’ and ‘multimodal transport’ have very similar meanings’, that is the
transportation of goods by more than one mode of transport from door-to-door with a through
freight rate. In order to benefit from multimodal transport, shippers must acquire the services of
multimodal transport operators as only they have the knowhow to design efficient transportation
systems suited to shippers’ requirements.
Multimodal transport operators play a very important part in physically transporting the goods but other requirements are also needed for efficient multimodal transport systems. Commercial practices such as the selection of suitable INCOTERMS, banking procedures and documentation can help or hinder the development of multimodal transport. Shippers and consignees are dependent upon trade facilitation measures for the development of multimodal transport systems and seamless trade. Infrastructure that is capable of handling containers must also be in place in order to fully benefit from multimodal transport.

Multimodal transport decisions have an impact on the feasibility and reliability of supply chains. Shippers and consignees are more interested in supply chain performance than on the actual multimodal transport operations. They require efficient and reliable door-to-door service offered by transport/logistics service providers, who may be multimodal transport operators.
CHAPTER THREE

METHODODOLOGY AND PROFILE OF STUDY AREA

3.1 INTRODUCTION

Miles and Huberman (1984) stressed that, knowing what you want to find out leads inexorably to the question of how you will get that information. In this sense, one's choice of method used in a research is necessary to achieve the overall research objectives. Silverman (2000) also noted that the research methodology shapes which methods are used and how each method is used in every research. He defined methodology as a general approach to studying research topics.

This chapter discusses the research method used for this study. In brief, the chapter presents how the research was conducted, the instrument used, the procedures and statistical treatment utilized in analyzing the data gathered. The research method took the form of a preliminary survey, the selection of the sample size, the procedure used to collect the data and analysis of the data acquired.

3.2 RESEARCH DESIGN

The study is a descriptive survey. A descriptive study seeks to find answers to questions through assessing opinions or attitudes of individuals towards events of procedures (Cohen & Manon, 1995). According to Befring (1994) descriptive analysis compromise principles, methods, and techniques to present questionnaire, compile and construe empirical data.

The descriptive statistic authority also plays an important role in many different research disciplines. It helps when working with empirical data gathering and thereafter when the need is to get an overview of the material. The real information inside all the data can be uncovered and
the knowledge that is collected can be presented through the use of descriptive statistics (Britton & Garmo, 2002). The use of tables and diagrams are often related to and used when presenting descriptive statistics. The descriptive survey has been found appropriate in addressing operational challenges in multimodal transportation.

As this study aims at addressing operational challenges of multimodal transport, multi-purpose approach combining both qualitative and quantitative methods seemed to be pertinent. In order to cover a range of samples from shippers to shipping lines, both qualitative and quantitative were practically needed to access them all.

3.3 POPULATION

To be able to satisfactorily address all the research objectives, there is the need to obtain adequate and comprehensive data about the operations of multimodal transport in Ghana. However in a study of this nature, it is not possible to achieve 100% coverage of all the various sectors whose contribution could be of help to the research. It was therefore necessary to select a sample of the prospective stakeholders from the study area for detailed study.

The sample population therefore encompasses people who are directly involve in the multimodal transport operation either as a facilitator, a carrier or transport provider or a direct beneficiary of the transport system. These include freight forwarders, shipping lines, truckers and shippers, forming a total population of 800.

3.4 SAMPLE AND SAMPLING PROCEDURE

Sampling from any population is dependent on the information about that population, the purpose of the exercise, and the funds available (Silverman 2000). Ideally, one can take a complete enumeration of the population and from this framework draw a sample. However the
population of the major stakeholders is not evenly distributed. This makes drawing a sample for the study very difficult.

However, to obtain representatives sample of all the various production and service units from the frame of 800 stakeholders enumerated from the basic survey, the stakeholders were grouped into four categories or units based of two criteria: type or nature of organization and role in multimodal transport operation. The four groups or categories of organizations include shippers: comprising of mainly industrial importers and exporters. That is companies who core activity allows for frequent import of working materials or export of finish products. The second group is freight forwarders; the third comprises of all truckers or haulage companies since majority of goods carried inwards are by road. The last but not the least is the shipping lines. Stakeholders from the shipping lines are mainly from their commercial department because they are directly involve in cargo control, marketing, imports and exports. Using a multi stratified sampling technique; a sample was selected from each unit or category. A total sample size of 150 respondents was selected representing 18.8% of the total population.

<table>
<thead>
<tr>
<th>Participants</th>
<th>Sample population</th>
<th>Sample size (respondents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipping lines</td>
<td>185</td>
<td>37</td>
</tr>
<tr>
<td>Shippers</td>
<td>69</td>
<td>13</td>
</tr>
<tr>
<td>Freight Forwarders</td>
<td>454</td>
<td>81</td>
</tr>
<tr>
<td>Truckers</td>
<td>92</td>
<td>19</td>
</tr>
<tr>
<td>TOTAL</td>
<td>800</td>
<td>150</td>
</tr>
</tbody>
</table>

To give a reasonable and balanced number of observations for the study, 37 respondents were selected from the shipping companies representing 24.7% of the total sample size of the study. 19 respondents from the trucking companies representing 12.6% of the total sample size, 81
respondents from the freight forwarding companies forming 54% of the total sample size and 13 respondents from the shippers forming 8.7% of the total sample size were selected. Respondents were randomly selected from each unit or group, giving a sample size of 150. By this it was possible to cover almost all type of service units involve in the operation of multimodal transport.

3.5 RESEARCH INSTRUMENT

The structured questionnaire was used for data collection. A questionnaire was designed to elicit data from different stakeholders with different roles. The questionnaire was divided into two sections. The first section sought personal information on respondents. These instruments required respondents to state the type of organization they work in, their position within their organization or company and years of experience. This stage was aimed at getting a fair representation of the broad categories of people who were eligible to answer the questionnaire. However as Hoggart et al. (2002:203) quoting Glaser and Strauss (1967) and McCracken (1988) notes, “an appropriate objective for intensive methods is not to seek representative information, but to gain access to the cultural categories and assumptions according to which one culture construes the world”. To them this is important because it opens up insight on individual meaning and reasons for action.” The second part of the questionnaire sought responses on respondents understanding of multimodal transport and their involvement of multimodal operations and the third part sought responses on specific instruments about their observations and opinions regarding the challenges facing multimodal transportation in Ghana.

3.6 PRELIMINARY SURVEY

A preliminary survey is necessary not only as a first step in any scientific enquiry but indeed the only way to proceed with the application of suitable sampling technique for a detailed sample
survey. In this study, the preliminary survey was aimed at knowing whether the concept of multimodalism is an ongoing practice in Ghana. This was done through interviews and observations, primarily through the familiarization with general operations of cargo movement in the case of imports and exports.

Interview schedules focused on key stakeholders. Individuals from selected freight forwarding companies and shipping lines were initially conducted to get first hand description of their understanding of the multimodal transport. These include their opinions about the multimodal transport, challenges facing multimodal transport operations in Ghana, the perceived reasons as well as ways for addressing the challenges.

In addition, interview was also conducted to expand on and clarify certain points that may not be well understood by the questionnaire. Open-ended questions were used for the interview in order to obtain as much information as possible.

Besides, the interview or consultation and contact visits was to gather enough background information on the objective of the study and also to discuss issues that were not initially anticipated but emerged from the literature survey. This also helped to restructure the main questionnaire for the study.

3.7 DATA COLLECTION

Field visits were paid to all the selected organizations and the structured questionnaire was administered by the researcher with the help of two enumerators to elicit views from relevant stakeholders. The collection of the primary data was done during the normal business hours. This involved the administering close and open ended questionnaires. On the field, personal
observations of operational activities of the companies were also recorded and that was used as the basis for an informed judgment.

The researcher also took advantage of a seminar organized by the Ghana Institute of freight forwarders (GIFF) for shipping related groups to administer some of the questionnaires. This was very helpful because the seminar brought together not only freight forwarders but other stakeholders for the studies. A total of ten working days were used to collect the data.

3.8 DATA ANALYSIS

The method employed to generate relevant figures was Microsoft office excel. The interpretations on the survey and conclusions are descriptive. This means that greater reliance was placed on non-parametric analytic techniques. For the presentation, carefully selected broad discrete categories, percentages and cross tabulation were in the analysis.
CHAPTER FOUR
DATA PRESENTATION ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Introduction
This chapter was concerned with the analysis of the data collected from the two groups of respondents for the study. Tables and histograms were used to present the study.

4.2 Data Analysis

4.2.1. Questionnaire Item One: Please indicate which of the following most accurately describes your organization.

<table>
<thead>
<tr>
<th>Distribution Of Respondents By Organization</th>
<th>Frequency</th>
<th>Valid Percent (%)</th>
<th>Cumulative Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trucking/Haulage companies</td>
<td>19</td>
<td>12.6</td>
<td>12.6</td>
</tr>
<tr>
<td>Freight forwarder/clearing agent</td>
<td>81</td>
<td>54</td>
<td>66.6</td>
</tr>
<tr>
<td>Shipping lines and agencies</td>
<td>37</td>
<td>24.7</td>
<td>9.3</td>
</tr>
<tr>
<td>Shipper (Importer and Exporter)</td>
<td>13</td>
<td>8.7</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Field Survey, 2011

The data on table 4.1 above shows the distribution of respondents by the nature or type of organizations or companies they work for individually. This variable was considered relevant as it was seen by the researcher to be a major determinant to whether or not a respondent was directly involved or engaged in multimodal transportation. The results indicate that, out of the total of 150 respondents, eighty one 81 respondents, representing more than half 54% of the total
population were freight forwarders or clearing agents. Thirty seven 37 respondents, representing 24.7% were working for shipping lines or agencies. Shippers (importers and exporters) formed the least percentage of respondents at 8.7% whilst trucking/hauling companies were 12.6%. The respondents for the shippers were basically those who work in their shipping or logistics department and therefore liaise with forwarding agents to ensure smooth and timely shipment of imports and exports. They were considered relevant because they had the expertise with regards to the movement of cargo since most of the workers within such organizations concentrated on the core business of the organization and therefore had little or no knowledge about the subject matter.

4.2.2. Your current status in the organization

<table>
<thead>
<tr>
<th>Distribution Of Respondents By Positions Of Responsibility</th>
<th>Frequency</th>
<th>Valid Percent (%)</th>
<th>Cumulative Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management staff</td>
<td>31</td>
<td>20.7</td>
<td>20.7</td>
</tr>
<tr>
<td>Senior staff</td>
<td>73</td>
<td>48.7</td>
<td>69.4</td>
</tr>
<tr>
<td>Junior staff</td>
<td>34</td>
<td>22.7</td>
<td>92.1</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey, 2011

Data on Table 4.2 indicates the various levels of responsibilities held by respondents. Findings indicated that majority of respondents 69.4% were either management or senior staff who were assumed to have risen through the ranks of their companies and therefore were thoroughbred in multimodal operations and therefore were very competent to answer questions related to that
field. This in no way undermines the significant percentage 30.7% of juniors and other staff (mainly contract workers) who were seen to be the ones on the ground and therefore knowledgeable about everyday happenings. The researcher saw the need to blend both sets of knowledge base in order to help the credibility of the study.

4.2.3. How many years have you been working in this industry?

<table>
<thead>
<tr>
<th>Class Distribution of Student Respondents</th>
<th>Frequency</th>
<th>Valid Percent (%)</th>
<th>Cumulative Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 years</td>
<td>13</td>
<td>8.7</td>
<td>8.7</td>
</tr>
<tr>
<td>3 -5 years</td>
<td>54</td>
<td>36</td>
<td>44.7</td>
</tr>
<tr>
<td>6 -10 years</td>
<td>61</td>
<td>40.7</td>
<td>85.4</td>
</tr>
<tr>
<td>Above 10 years</td>
<td>22</td>
<td>14.6</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey, 2011

Respondents were asked how long they have been working in the transportation industry. This question was a proxy measure of their wealth of experience in the field of study. As shown in Figure 4.3 above, majority of respondents 76.6% had worked for periods ranging between three to ten years, whilst a significant percentage of respondents had worked in the industry for periods spanning more than ten years. Most of the respondents in this group had work under different sectors in the industry and were knowledgeable about the multimodal developments and operations in Ghana. Only 8.7% of respondents had worked for periods two years or less.
### Table 4.4 Respondents understanding of Multimodal Operations

<table>
<thead>
<tr>
<th>INSTRUMENT</th>
<th>RESPONSES</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FREQUENCY</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Have you heard of the term multimodal transport?</td>
<td>150/150</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Do you understand its operation?</td>
<td>149/150</td>
<td>99.3%</td>
<td>1/150</td>
</tr>
<tr>
<td>Do you operate multimodal or door to door transport service?</td>
<td>137/150</td>
<td>91.3%</td>
<td>13/150</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2011

Data on table 4.8 shows responses obtained for various instruments relating to respondents’ understanding of the subject matter of the research: multimodal transportation. The responses indicate that although 91.3% of total respondent population operates multimodal transport, a much larger percentage 99.3% answered that they do understand its operations but explanations reviewed that 95.3% 143 could explain that it is the transportation of goods by two or more modes organized by one entity. A very significant number 120 were able to explain that the one who organizes is solely liable in case of any damages to cargo. It was however encouraging realizing from the analysis of responses that 100% of respondents have heard of the term multimodal transport and might have some idea about it but do not fully understand it. This was a sign that respondents were knowledgeable and competent enough to contribute effectively to the research.
4.2.4. Do you normally act as the principal or an agent? If possible indicate the percentage.

*Figure 4.1 Distributions of Respondents by Multimodal Operator Role*

**Do you normally act as the principal or an agent?**

Source: Field Survey, 2011

In analyzing this instrument about the part the stakeholders usually played in any multimodal transportation operation, it was realised that most operators representing 86% of 137 usually played the role of agents rather than principals compared to just 14% of 137 who identified themselves as mainly principals. 17 respondents who answered that they acted as principals were those who worked in large shipping companies who had subsidiaries in the country and across the globe. This indicates that out of the 137 respondents who answered that question, only 1.5% who usually acted as principals were not shipping lines. Freight forwarders who are internationally recognised as the main architects of transport and therefore most likely to initiate and operate multimodal transport recorded only 2. The tracking companies and the shippers recorded 0 (zero) each. The distribution of respondents is presented in the table below.
A total of 118 respondents answered that they acted as agents to other principals in the multimodal transport in Ghana. All the trucking companies answered that they acted as agents in the multimodal transportation process because they are the ones who always complete the transport chain or start since there is no other form of transport that links the port of Tema from the hinterland. 79 of the freight forwarders answered that they also acted as agents because most of the transport arrangements were made outside the country and therefore they only help their foreign partners to complete their contract.

Table 4.4 Distribution of Respondents (Principal)

<table>
<thead>
<tr>
<th>Distribution Of Respondents (Principal)</th>
<th>Frequency</th>
<th>Valid Percent (%)</th>
<th>Cumulative Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trucking/Haulage companies</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Freight forwarder/clearing agent</td>
<td>2</td>
<td>10.5</td>
<td>10.5</td>
</tr>
<tr>
<td>Shipping lines and agencies</td>
<td>17</td>
<td>89.5</td>
<td>100</td>
</tr>
<tr>
<td>Shipper (Importer and Exporter)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Field Survey 2011

20 respondents from the shipping lines also said they usually acted as agents rather than principals. None of the shippers answered this question. This means that even though the shippers had confirmed that they
are beneficiaries of multimodal transport, they left the responsibility in the hands of the carriers and the freight forwarders. Their shipping or logistics department only liaise with the main operators to ensure timely shipment of their goods.

4.2.5 Which of the following trade agreements is normally used in the case of imports and exports?

The researcher gathered that, most shippers buy on CIF and export in FOB import as a normal practise. They said they do that at the request of their foreign trade patterners. In case of FOB export, the purchaser will have the right to name the shipper. He chooses the port of shipment. If some ports are defined in the contract, the buyer always choose the nearest port and the most convenient transport line. In such a case the exports are handled by MTOs outside the country who only appoint some of the Ghanaian freight forwaders to facilitate only the export from Ghana. Insurance arrangements are also made outside the shores of Ghana. On CIF import, the reversal is the case. Ghanaian traders purchase goods internationally with the freight and Insurance all added to the cost of the goods. The sellers in this case make all the transport arrangements. The local freight forwarders only do clearing at the port of destination in Ghana. The few traders who contact the major shipping lines request for a multimodal or ‘door-to-door’ service for their FOB import or EXworks, don’t get the full benefit of multimodal transport since the major carriers do not issue one document to cover the full transport chain even though the deliver the goods at the warehouse of the shipper. Freight forwarders and shipping lines, seeing the risk involved and due to a lack of adequate insurance cover, preferred to always act as agents rather than principals to minimize their risk levels. Shipping lines who act as principals issues different documents to cover different legs of the transport but market their door-to-door services as an additional package to attract customers and increase client confidence.
4.2.5. What is the nature of the goods shipped through multimodal transport? If possible indicate the percentage.

*Figure 4.2 Nature of Multimodal Goods*

**Nature of the Goods Shipped Through Multimodal Transport**

- Conventional goods (2%) - 1.30%
- Palletized goods (6%) - 4%
- Containerized Goods (142) - 94.70%

*Source: Field Survey, 2011*

Analysis of responses obtained for this instrument indicate that most goods (94.7%) are containerized when it has to go through multimodal transportation. This finding is consistent with earlier findings of researchers like Hayuth (1987) who stated that Containerization contributes to a higher efficiency in the development of multimodal transport operations and therefore is currently the preferred means of transporting goods.
4.2.7. What in your view are some of the challenges hindering multimodal transport operation in Ghana?

Figure 4.3 Challenges to Multimodal Transport in Ghana

<table>
<thead>
<tr>
<th>CHALLENGES TO MULTIMODAL TRANSPORTATION IN GHANA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ineffective and inadequate legal framework (87)</td>
</tr>
<tr>
<td>Poor port and related facilities (94)</td>
</tr>
<tr>
<td>Poor information technology (86)</td>
</tr>
<tr>
<td>Bureaucratic inefficiency and corruption (146)</td>
</tr>
<tr>
<td>Poor and inadequate transportation infrastructure (150)</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2011

4.2.7. To what extent do these enumerated challenges impact multimodal transport operations in Ghana?

Table 4.5 Nature of Multimodal Goods

<table>
<thead>
<tr>
<th>INSTRUMENT</th>
<th>DEGREE OF IMPACT RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO IMPACT</td>
</tr>
<tr>
<td>Poor and inadequate transportation infrastructure</td>
<td>0/134 (0%)</td>
</tr>
<tr>
<td>Bureaucratic inefficiency and unnecessary delays</td>
<td>0/134 (0%)</td>
</tr>
<tr>
<td>Poor Information Technology</td>
<td>30/134 (0%)</td>
</tr>
<tr>
<td>Security and Safety related issues</td>
<td>15/134 (0%)</td>
</tr>
<tr>
<td>Ineffective and inadequate legal framework</td>
<td>27/134 (0%)</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2011
Data on table 4.5 shows responses obtained to various instruments relating to the degree of impact of the stated challenges on multimodal transport operations in Ghana. The results indicate that, in all cases and for all challenges enumerated, majority of respondents saw between significant extents of impact to very large extents of impact. One hundred and fifty (N-150) respondents, representing 100% of total respondent population saw poor and inadequate transportation infrastructure as a major bane to effective multimodal operations in Ghana.

On a similar scale, over 97% of respondents saw Bureaucratic inefficiency and unnecessary delays resulting from cumbersome documentation and frequent unneeded checks at the port as an operational challenge to multimodal transportation that impacted negatively on the transportation industry in Ghana to a significant, large or very large extent. The customs has an effective EDI system but at every stage of clearance, physical paper documentation is needed to support electronic data. This opens room for unnecessary scrutiny by port and boarder officials. As way of addressing this problem, respondents suggested a total migration of clearing documentation to electronic data. Ninety four respondents, representing 62.7% of total population found Safety and Security issues notably road accidents and container theft at the port to a large or very large extent as an operational challenge to multimodal transportation in Ghana which affected the multimodal transportation and the transportation system in general to a significant, large or very large extent.

Again, 87 respondents, representing 58% of total respondent and 86 respondents, representing 57.3%, considered Ineffective and inadequate legal framework and Poor Information Technology respectively, as operational challenges to multimodal transportation in Ghana which affected the multimodal transportation and the transportation system in general to a significant, large or very large extent.
Poor and Inadequate Transportation Infrastructure, bureaucratic inefficiency and delays, Poor Information Technology are predictors of operational challenges in multimodal transportation confirms the findings by Okoli and Mbaika (2003) who indicated that in Sub-Saharan Africa, poor roads and physical infrastructure shipping slow and expensive. Furthermore, major public transport infrastructures are stressed by age, limited capacity and congestion (Dadzie, 1998).

Similarly, the observed significant relationship between bureaucratic inefficiency and delays and operational challenges in multimodal transportation in this study is consistent with the findings by Olsson (2004) who stated that transport infrastructure problems have been aggravated by unclear regulations, anticompetitive behavior, weak corporate governance, institutional shortcomings and corruption.

Furthermore, the observed significant relationship between Safety and Security Related Issues, Ineffective and Inadequate Legal Framework and Poor Information Technology and operational challenges in multimodal transportation concurs with the findings by Dinwoodie and Roe (2005) and Dadzie (1998), who argued that, the logistics and operational shortcomings could arise from the fact that many ports, terminals and rail services are offered by government bodies incurring financial losses which leads to insufficient investment in infrastructure. Slow progress in public-private initiatives plus lack of expertise and training for implementation of modern methods of operational and logistics management (Razzaque, 1997), have also been cited as causes to logistics problems. In addition, low creditworthiness, poor access to long-term funds due to weak capital market, political instability, lack of coordination and absence of an allocation system prevent efficient transportation network (Olsson, 2004).
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The purpose of this study is to give an overview of multimodal transport operation in Ghana, assess the challenges that hinder multimodal operations in Ghana and find out potent measures in eliminating these challenges. For the purpose of this study MT Convention (1980) definition for multimodal transport was used because Ghana is a party to that convention even though the convention is still not in force. Again Ghana has participated in many international conferences on multimodal transport of which the same definition was used. From that definition, the main factors to consider are the carriage of goods by two or more modes, a single document of carriage also evidencing transfer of title from seller to buyer, one operator who is responsible for the entire carriage operation, although he may subcontract one or part of the deal to other parties especially when he himself is not a carrier and finally, the carriage of goods between two countries. A sample size of hundred and fifty 150 respondents was used, all selected through purposive, random sampling and systematic sampling techniques to respond to questionnaire guide. The sample size was determined on the basis of four categories of respondents namely: trucking or haulage companies, freight forwarder or clearing agents, shipping lines and shippers (exporters and importers)

The data gathered confirmed the research questions and design. This chapter presents the summary of the study, states the conclusions it came to and outlines recommendations.

5.1 Summary of Findings

The research revealed that although only 91.3% of total respondent’s population said they operate multimodal transport, a much larger percentage (99.3%) said they understand its
operations even though the 95.3% who expatiated gave varied explanations which can be taken for multimodal transport or other similar terms like through transport or combined transport or even intermodal transport. 100% of the total respondents confirmed that they have heard the term before and had a fair idea of what it was. However the single document issued as a proof of contract and therefore evidencing single liability was missing from the explanations given. The researcher also observed that even those who answered that they usually acted as principals issued different documents to cover the different legs of transport rather than a single through document which can act as the B/L. It was also noticed that nature of trade made it difficult for the local operators to act as principals because of the type of trade agreement. Majority of the exports are on FOB while the imports are on CIF. Shippers agreed that it was a normal practice and more convenient. The freight forwarders lack the capital requirement to act as principals or MTOs. Goods being imported into the country need to be insured. By FOB imports Ghanaian merchants will use local insurance firms. At a premium of about 3%, billions of Dollars will be made available to the local insurance industry for national development even and this will boost to local industries. MTOs can even act as insurance brokers since they will be purchasing cargo insurance for clients on regular basis. In the case where there are no Ghanaian owned shipping lines, local MTOs can act as NVOCC and operate effectively because of their command over cargo. The FOB seller must abide by the delivery date as specified in the contract. Under CIF terms, the Ghanaian seller will determine the date of delivery properly so as to avoid paying the costs of storage, risks and increase the times of capital turnover. However the Ghanaian sellers increasingly sell on FOB and buy on CIF which has a ripple effect on the whole transport industry. This limits the abilities of the local service providers to function effectively.
The results also indicated that, in all cases and for all challenges enumerated, majority of respondents saw between significant extents of impact to very large extents of impact. These challenges included poor and inadequate transportation infrastructure, Bureaucratic inefficiency and delays, Safety and Security related issues, inadequate legal framework, Poor Information Technology. The researcher also discovered that most of the challenges were interdependent which confirms Mainhem (1979) notion that the consideration of a transportation system cannot be separated from consideration of the social, economic, and political system of a region.

5.2 Conclusions

The study concludes by examining the extent to which the findings address the research questions. The first research question sought to find out the nature of multimodal operations in Ghana. The operations in Ghana are not consistent with the general provisions in the MT Convention Article 1. The Ghanaian exporters and importers are limited when it comes to nominating transport for their trade because of the unfavorable trade agreements and this makes it difficult for potential MTO’s to emerge.

The second research question sought to find out the nature and magnitude of challenges confronting multimodal transport operations in Ghana.

The results indicates that, challenges hindering multimodal transport operations included poor and inadequate transportation infrastructure Bureaucratic inefficiency and delays, frequent accidents, container theft, arm robbery, inadequate legal framework and Poor Information Technology. Further analysis revealed that in all cases and for all challenges enumerated, majority of respondents saw between significant extents of impact to very large extents of impact. An appropriate legal framework for multimodal transport is virtually missing in the country’s
legal systems. There is no legal framework that reflects technological developments and current commercial practices. An outdated, complex and fragmented legal framework transaction costs, as it leads to costly litigation and increase insurance costs. This is confirms (UNTACD 2003) findings that owing to the high risk associated with land leg transport and the absence of an appropriate legal framework in relation to such transportation, international carriers often do not offer one contract to cover the entire transport operation from origin to destination with the carrier taking responsibility throughout.

In analyzing responses obtained for the third and final research question on what measures can be put in place to eliminate or reduce these challenges, respondents gave varied responses which were consistent with earlier findings by some other researchers. Razzaque (1997); Msimangira (1993); Islam, Dinwoodie and Roe (2005), recommended that, instead of viewing transportation infrastructure and port facilities development as the responsibility of the government, there is a need to recognize private sector participation. The government may plan a joint venture (Zubrod, Tasiaux and Beebe, 1996; Smyrlis, 2005) or enter into partnership (McCalla, Slack and Comtois, 2004) with local enterprises and/or foreign institutions to invest heavily in new transport infrastructure as well as modifying the existing logistics system.

Furthermore, a closer relationship between chain partners with long-term commitment would help to mitigate some challenges (Salin and Nayga, 2003). Razzaque (1997) emphasized the importance of education and training to Multimodal Operators by the academicians and researchers who have to undertake studies to obtain knowledge in determining the gap between the existing required transport systems. He also suggested that, cooperation between nations could be useful by sharing their experiences and expertise which could be beneficial to policy makers and the whole process of developing transport network.
In while country's productive capacities is an important factor in determining its export competitiveness, it remains undermined ineffective without having an efficient, operative, cost effective connection to global transport and logistics networks.

5.3 Recommendations

This research makes the following recommendations.

1. Government should explore avenues of partnership with the private sector to develop ports and transportation infrastructure in the country to enable effective multimodal operations.

2. The government should institute measures to empower the legislative and judiciary arms of government to enact laws and acts that will govern multimodal transport in Ghana in because there is the need for harmonization of the legal environment for multimodal transport to ensure a uniform liability regime that protects the interests of all concerned.

3. Stakeholders in the multimodal transportation industry should improve their IT knowledge by educating both management and their employees to be abreast with new IT systems in the industry. Management of stakeholder organization should seek to improve IT infrastructure in their places of work to enable efficient and effective multimodal transport operations.

4. Merchants should be educated on the correct use of delivery terms in trade contracts which will enable the nation derive maximum benefit from its international trade. It is therefore a major responsibility potential MTOs to educate their merchant clients. Also the maritime regulatory bodies need to take into account these issues when formulating trade policies.
5.4 Limitations
Several assumptions and limitations pertain to this study. The first limitation of this study is that the size of the sample was small and was limited to respondents in the geographical location of the study area.

The second limitation of this research is the fact that the collection of data took place at a particular point in time. There is no guarantee that the responses received would be indicative of responses solicited and given at another time. There is also a potential that other factors outside the control of the researcher (setting, time of day, recent conflicts, and fatigue of the participants) could influence the responses.

Suggestion for Future Studies

This study revealed that there are several areas that need to be looked into in the near future. The researcher therefore suggests to other researchers who will be interested in any of the building blocks/constituents in this study (multimodal transportation, transport infrastructure, legislative framework in multimodal industry, etc) to consider the following suggestions.

Currently, there is a lot of construction of new roads and old ones are being rehabilitated; in addition, there is advancement of plans to revamp and extend the rail coverage. Government has acquired funds to intervene in the railway line and other major highways that are currently non-operational to make them operational. It will be of great interest for future researchers to delve into how these initiatives will impact transport cost and reliability in multimodal transport operations. An in-depth future research study could be extended to include how the role or activities of intermediaries (transport companies, port authorities, and insurance companies) promote or hinder the achievement of reliability.
REFERENCES


7. BROBBEY (2009), *The Vehicle Owner and Driver; The Law and Conventions on Road Transport*, GNA news item, retrieved from www.ghanaweb.com on February 8, 2011


14. FEJER, Kim (2010); *decision makers*, Fairplay magazine, 29 April, page 33.


18. GSL (2010), *the port community*, Tema port news magazine, Vol5, Issue 1, January to March.


67


30. MARTEY, Emmanuel (2010), Making the West and Central Africa Supply Chain Globally Competitive, Shipping Review, Volume 12, Number 4 September to December


32. MILES and HUBERMAN (1984), Qualitative data Analysis, London, sage.


44. UNCTAD (2002), *UNCTAD/ICC Rules for Multimodal Transport Documents*, ICC publication no. 298


51. VLTC (2010): Corporate Profile; *Volta Lake Transport Company Limited, Shipping Review*, Volume 12, Number 2, April-June page 17.


APPENDIX A

QUESTIONNAIRE

This questionnaire has been designed as part of a study leading to the award of a Master of Arts Degree in Ports and Shipping Administration from the Regional Maritime University. The study seeks to find ways of addressing the operational challenges of Multimodal Transport in Ghana. Any information given would be treated confidential and it would be used for this purpose. Your anonymity is fully assured. (For the purpose of this work multimodal and door to door service are used interchangeably).

Contact 0244-247174

Date Questionnaire ID

PART I BACKGROUND INFORMATION

Please tick (/) or write your answer where appropriate.

1. Name of organization ________________________________

2. Please indicate which of the following most accurately describes your organization.
   i. Trucking/Haulage companies
   ii. Freight forwarder/clearing agent
   iii. Shipping lines and agencies
   iv. Shipper (Importer and Exporter)
   v. Other, please specify ________________________________

3. Your current status in the organization.
   i. Management staff
   ii. Senior staff
   iii. Junior staff
   iv. Other, please specify ________________________________
4. How many years have you been working in this industry?
   i. 0 – 2 years
   ii. 3 – 5 years
   iii. 6 – 9 years
   iv. 10 years and above

PART II

5. Have you heard of the term multimodal transport?
   Yes
   No

   If No move on to question 7

6. Do you understand its operation?
   Yes
   No

   Please explain .................................................................
   .................................................................
   .................................................................
   .................................................................
   .................................................................
   .................................................................

7. Do you operate multimodal or door to door transport service?
   Yes
   No

8. Do you normally act as the principal or an agent? If possible indicate the percentage.
   i. Principal ........... %
   ii. Agent .......... %

9. Which document(s) do you normally use for multimodal transport?
   ..............................................................................
   ..............................................................................
10. What is the nature of the goods shipped through multimodal transport? If possible indicate the percentage.

i. Containerized Goods
   
   Percentage: [ ] .....

ii. Break-bulk
   
   Percentage: [ ] .....

iii. Conventional goods (general cargo)
   
   Percentage: [ ] .....

iv. Palletized goods
   
   Percentage: [ ] .....

Other, please specify: 

11. Which of these trade agreements is normally used by your clients (traders) in the following cases?

<table>
<thead>
<tr>
<th>Case</th>
<th>EXPORT</th>
<th>IMPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. EXW (EX Works)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>ii. FCA (Free Carrier)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>iii. CIF (Cost Insurance Freight)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>iv. CFR (Cost and Freight)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>v. FOB (Free on Board)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>vi. DDU or DDP (Delivered Duty Unpaid or Paid)</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

Other, please specify: 

12. Briefly explain the reason for the choice of trade agreement?

13. What in your view are some of the challenges hindering multimodal transport operation in Ghana?


14. What are the causes of the challenges you have enumerated?

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

15. What measures can be put in place to enhance multimodal transport operation?

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

16. Any other comment

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................