VALUE ADDED LOGISTICS SERVICES AT PORTS: AN EVALUTION OF THE PORT OF IZMIR'S POTENTIAL IN TERMS OF SERVING VALUE ADDED SERVICES

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JANUARY 2007

VALUE ADDED LOGISTICS SERVICES AT PORTS: AN EVALUTION OF THE OF PORT OF IZMIR'S POTENTIAL IN TERMS OF SERVING VALUE ADDED SERVICES

A THESIS SUBMITTED TO

THE GRADUATE SCHOOL OF SOCIAL SCIENCES

OF

IZMIR UNIVERSITY OF ECONOMICS

BY

AYŞE NAZLI ATA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ART OF LOGISTICS MANAGEMENT

IN

THE GRADUATE SCHOOL OF SOCIAL SCIENCES

JANUARY 2007

Approval of the Graduate School of Social Sciences

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ABSTRACT

VALUE ADDED LOGISTICS SERVICES AT PORTS: AN EVALUTION OF THE PORT OF IZMIR'S POTENTIAL IN TERMS OF SERVING VALUE ADDED SERVICES

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January 2007, 140 pages

The main purpose of this thesis is to evaluate the potential of Port of Izmir in terms of the serving value added logistics services. The potential of the port is being evaluated by different factors. These are port infrastructure, land/land prices, labour, technology information, market factors, related industries, back-up city, institutional factors and connecting transportation system. The study also emphasizes the port's important role in the supply chain network while describing the changing role of the ports from serving traditional services to value added logistics services.

Keywords: Port, Value added, Value added logistics services, Distripark, Supply Chain

ÖZET

LİMANLARDA KATMA DEĞER LOJİSTİK FAALİYETLER: İZMİR LİMANININ KATMA DEĞER LOJİSTİK FAALİYETLER YÖNÜNDEN POTANSİYELİNİN İNCELENMESİ

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Tez Yöneticisi: Doç. Dr. Frank Bates

Ocak 2007, 140 sayfa

Bu çalışmanın amacı, İzmir Limanının katma değer lojistik servisler yönünden potansiyelini belirlemektir. Liman potansiyeli farklı faktörlerde değerlendirilmiştir. Bunlar; liman altyapısı, yerleşim yeri ve fiyatları, işgücü, teknoloji, market faktörleri, ilgili endüstriler, şehir arkası, kurumsal faktörler ve ulaşım ağlarına erişim şeklindedir. Bu çalışma limanların geleneksel servislerden katma değer lojistik servislere doğru değişen rolünü tarif ederken aynı zamanda limanların tedarik zinciri ağı içindeki önemli rolünü de vurgulamaktadır.

Anahtar kelimeler: Liman, Katma değer, Katma değer lojistik servisler, Distripark, Tedarik Zinciri

ACKNOWLEDGEMENTS

I express sincere appreciation to my supervisor Assoc. Prof. Dr. Frank Bates for his guidance and encouragement throughout the research. Thanks go to the Izmir Port Authorities Metin Özyılmaz, TCDD İzmir Port Management; Port Operations Manager, Hasan Çelebi, Terminal Department Chief, Celal Oral, Port Services Chief for their suggestions and their collaboration.

To my parents and my brother Servet, and my grandmothers I offer sincere thanks for their unshakable faith in me and encouragement.

Also, I would like to acknowledge and thank for my colleague Oktay Çoban for his recommendations and encouragement, Zübeyde who were always with me, Ayça Cezayirli and Mert Tezel for their friendship.

To My Family

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LIST OF ABBREVIATIONS

AH	Asian Highway
AFZ	Aegean Free Zone
AGC	European Agreement on Main International Railway Lines
AGR	Agreement on Main International Traffic Arteries
AGTC	European Agreement on Important International Combined Transport Lines and Related Installations
AFSCA	Asian Freight and Supply Chain Awards
ALTID	Asian Land Transport Infrastructure Development
BSEC	Black Sea Economic Cooperation
CU	Customs Union
CEU	Commission of European Union
CIS	Commonwealth Independent States
CSCMP	Council of Supply Chain Management Professionals
DHMI	General Directorate of State Airports Operations
Distripark	Distribution Park
E –commerce	Electronic Commerce
EU	European Union
EDI	Electronic Data Interchange
EEC	European Economic Community
ELCs	European Logistics Centers
FTZ	Free Trade Zone
GLS	General Logistics Services

IT	Information Technology
ICT	Information and Communication Technologies
IGA	Asian Highway Network
IAOIZ	Izmir Ataturk Organized Industrial Zone
JIT	Just In Time
KD	Keppel Distripark
LCIS	Logistics Chain Integration Services
OCDI	The Overseas Coastal Area Development Institute of Japan
PSA	Port of Singapore Authority
PETRAs	Pan-European Transport Corridors and Areas
QRM	Quick Response Manufacturing
Ro-Ro	Roll-Off
Sqm	suqare meters
TAR	Trans-Asian-Railway
TDİ	Turkish Maritime Organization
TEM	Trans European South-North Motorway Project
TENs	Trans-European Networks
TER	Trans- European Railway
TEUs	Twenty-Foot Equivalent Unit
THY	The Turkish Airlines Corporation
TMO	Turkish Grain Board
TCDD	Turkish State Railways
TPAO	Turkish Petroleum Corporation
TRACECA	Transport Corridor Europe Caucasus Asia

UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
UNESCAP	United Nations Economic and Social Commission for Asia and The Pacific
VAF	Value Added Facilities
VAL	Value-added activities or Logistics
WB	World Bank
3PLs	Third-Party Logistics Providers

INTRODUCTION

The globalization process has brought with it a number of driving forces that have caused, and are causing many changes within the world economy. The consequences of these forces are extending to all sectors of commercial and industrial activities, including the port environment. Maritime transport and ports are vital components of the logistics chains which link the Single Market to the world economy. As the world economies become more complicated, ports are acting like partners in assisting customers to compete for business share in the global market. However, technological changes in the shipping sector, increasing containerization of world trade and vessels sizes, change in production and distribution systems with globalization and demand of shippers for modern and efficient ports increased the pressure on port industry to become more competitive on a global basis.

Therefore; the traditional role of the ports as a link between the land and sea transportation has changed as the time progress. Ports are now important components of supply chain as a logistics centre, and can play a key role in the development of international logistics chains. Beyond the traditional port services, focusing on value added services may provide ports gaining competitive advantage.

CHAPTER 1

EMERGING ISSUES IN PORT ENVIRONMENT

1.1. Containerization of World Trade

The term "globalization" has been used to refer to the wide-ranging process of commercial, institutional and technological change that is taking place in the international economy (United Nations (UN), 1999). The development of globalization and of regional economic blocks has changed the way trade is carried out internationally; it has contributed to industries becoming more footloose in the quest for lower production and transport costs, and to the establishment of well-defined manufacturing and consumption points. There is a clear impact on the transport function, which has become an element of the logistics chain and which changed from an unimodal perspective to a multimodal/intermodal one. The shipping industry witnessed vessel specialization and increases in vessel size. Different types of ships capable of carrying specific cargoes such as crude oil, chemicals, gas, and dry bulks ply the oceans and the traditional general cargo freighters have been disappearing to be replaced by containerships. The advent of the container, allowing cargo consolidation, has permitted fast cargo handling rates and rapid ship turnaround in port. The size of containerships has increased steadily from around 400–750 TEUs in the mid-1960s to over 8,000+ TEUs today; there are even thoughts of a maximum size of 18,000 TEUs in the future (Paixao, Casaca, 2005, p.262-263).

This growth in size is justified from two different perspectives. First, the volume of waterborne trade has been increasing over the years, which justifies a

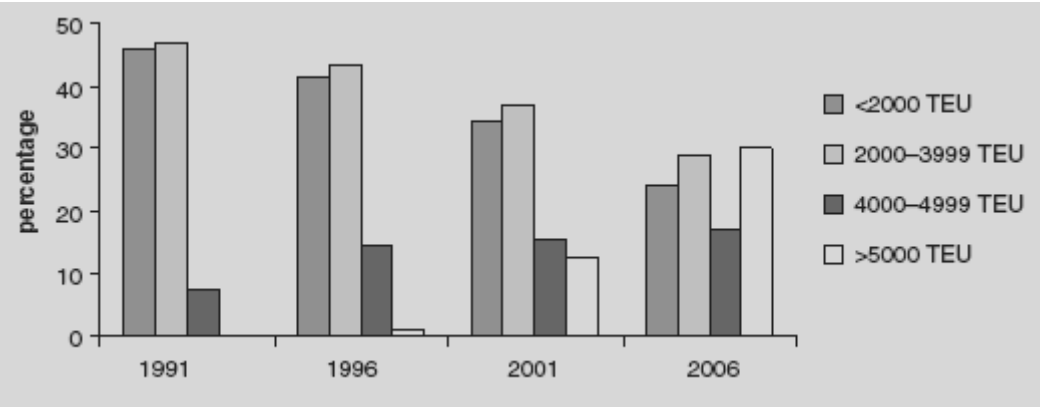
continuous demand for waterborne transport services. Second, general cargo (and to a lesser extent bulk cargo) is being transferred from its break-bulk form to a containerized one (Ryan, 1998; Bish, 2003). The growth of containerization has been such that, 90% of all liner freight is expected to be shipped in containers by 2010. At the same time every major container port is expected to double and possibly even triple its cargo throughput by 2020. If the current growth rate of 6%–7% per annum, as suggested by Ryan, is maintained, terminals all over the world will be handling about 700 million TEUS in 2020 (Corona et al, 2003; United Nations Conference on Trade and Development (United Nations Conference on Trade and Development(UNCTAD), 2003).

As the invention of containerization is considered, the container transportation that emerged after World War II is a convenient way for transporting goods because a variety of vehicles could transport them. Except for pine transportation, today's container has become the primary means for almost every transportation pattern (Chang, 2006).

Containers are easy to handle and store, offer protection against damage and theft, and allow interchange among various modes of transport. These features have encouraged the wide spread use of containers and facilitated multimodal transport operations. Furthermore, containerization has brought about greater efficiency in cargo handling in ports and inland freight stations through the use of specialized equipment, which has contributed to changing transport patterns and practices (UNCTAD, 2006, p.2).

More than 60 percent of world general cargo trade moved by sea is carried in containers. On trades between highly industrialized countries the percentage approaches over 80 percent (World Bank (WB), Module 2, 2001, p.21). This is a remarkable market penetration for a technology that dates only from the mid 1950s, when the first converted ship carrying 58 containers made its initial voyage between New York and Houston. Since then there has been a continual increase in both number and average size of containerships (WB, Module 2, 2001). While in 1965, world container throughput at ports was practically non-existent, it reached 303.1 million TEUs (twenty-foot equivalent unit) in 2003 (UNCTAD, Review of Maritime Transport, 2005, p. 75). In the beginning of 2005, the world fleet of cellular containerships consisted of 3,362 units with a capacity of 8.3 million TEU. The fleet will increase to 4,252 units with a capacity of 10.7 million TEU in 2008 (World Bank, Module 2, 2001). This figure is expected to reach 500 million TEUs by 2010 (Carana, 2003, p.6).

Figure 1: Development of Container Vessel Sizes as a Percentage of the Global Fleet



Source: World Bank, Module 2

Figure 1 illustrates the sizes of container vessels as a percentage by years. There has been an increase both number and average size of containerships.

The world container traffic by years is illustrated in Table 1. The container transportation reached approximately 360 million TEU in 2004 with the 14, 2 % increases when it compared with the throughput in 2003.

Table 1: World Container Transportation by Years

Years	Million TEU
1994	131.1
1995	145.1
1996	157.9
1997	176.0
1998	190.5
1999	210.0
2000	235.6
2001	247.4
2002	276.5
2003	314.9
2004	359.7

Source: The Drewry Annual Container Market Review and Forecast 2005 / 2006

1.2. Global Manufacturing and Distribution Processes

One of the main basic driving forces to change in the port industry emerges from the globalisation process and with it a structural shift from supply-driven to demand-driven economies. The supply-driven economy was based on the concept of economies of scale in production, through standardisation and on mass consumption of standard products. This approach was being scrutinized as productivity increases linked to economies of scale met their structural boundaries and as a growing individualism began to reflect on consumption patterns. The

outcome was a shift to a more demand-driven economic system, combined with collaborative networks on the supply side of the markets (Notteboom, Winkelmans, 2004, p. 16).

The emergence of global production systems, in which raw materials, components, and final products are sourced, manufactured, distributed, and shipped globally, has required a profound restructuring of the transportation industry, with shipping and port services being at the forefront of these changes and mutations. At the heart of these changes, the need to optimize transport chains, manage and integrate them within seamless production, distribution and trading systems becomes the new imperative. The impacts of modern developments in international logistics on the port industry have taken place (UNCTAD, 2004).

Global manufacturing and distribution processes bring together raw materials, parts and other semi-finished inputs from different parts of the world. Trade in components whose delivery is time-sensitive and which are essential to efficient production operations, accounts for around 30 per cent of global trade in manufactured goods. This trend is reinforced by the growing importance of intra-company trade, which accounts for approximately one third of this trade (UNCTAD, 2006, p.3). The broad geographic distribution of sourcing and production (back end) versus less broad geographic distribution of sales (customer end) is reflected onto trade patterns, supply chain management needs and shipping requirements (Notteboom, Winkelmans, 2004, p. 16).

Many factors such as standardization in production components, low transportation cost and the revolution of information and communication

technology make it possible for global companies to source raw materials and product components all over the world and to bring together and assemble raw materials, parts, and semi-finished products at a single or a few locations to reduce by a significant amount overall cost without any local interference to product quality. Thus, centralization of business structure for economies of scale is a useful strategy in enhancing global competitiveness. At the same time, cultural differences in the marketplace or the importance of response time demand global companies to customize or localize their products in accordance with local consumers' tastes. Decentralization of business structure or postponement of final assembly must, therefore, be considered, too (United Nations Economic and Social Commission for Asia and The Pacific (UNESCAP), 2005, p.46).

The new production processes require the implementation of supply chain management techniques to ensure timely receipt of inputs and delivery of finished products to the marketplace. The certain kinds of manufacturing processes should be considered in this context like Just in Time, Pull Strategy, Quick Response Manufacturing, Delayed Differentiation and Postponement etc. The just in time (JIT) production processes require that supply and demand be matched in near real-time to reduce inventory and storage costs and free up working capital and equipment (UNCTAD, 2006). Another production approach 'Pull Strategy' is also effective to reshape the companies' supply and distribution processes. Pull Strategy is a manufacturing strategy aimed at the end consumer of a product. The product is pulled through the channel by consumer demand initiated by promotional efforts, inventory stocking procedures, etc (http://www.marketingpower.com). Moreover, Quick Response Manufacturing (QRM) which is a companywide strategy to cut

lead times in all phases of manufacturing and office operations. Delayed differentiation or postponement is a concept in supply chain management where the manufacturing process starts by making a generic or family product that is later differentiated into a specific end-product. This is a widely used method, especially in industries with high demand uncertainty, and can be effectively used to address the final demand even if forecasts cannot be improved (http://en.wikipedia.org).

Many companies have experienced significant cost savings through integrating existing logistics places into a few integrated logistics centres, and some other companies have achieved success in penetration of specific markets by thorough localization strategies such as quick response times or different design and functions. In this way, ports have a great chance to play an important role as the centre of global logistics activities. However, because business structures of supply chain networks are decided wholly by a company's specific strategy, ports dreaming to become a hubs have been struggling to meet and provide the global standard in terms of hardware and software by investing for world class infrastructures and by experimenting with several policies (UNESCAP, 2005).

The demands of the marketplace have resulted in manufacturers increasingly entrusting the logistics functions of their supply chain operations to third-party logistics providers (3PLs). Outsourcing logistics has allowed the manufacturers to focus on their core business activities to benefit from the economies of scale of their 3PL partners and the broad range of services offered by specialized logistics services providers (UNCTAD, 2006).

Leading-edge companies are taking a broader view of the parts of their business they seek to control and manage. The re-engineering of supply chain processes (including customer order management, procurement, production planning, distribution, etc.) to enhance performance typically results in collaborative networks with logistics partners. Many companies have acknowledged that warehousing and transportation is not part of their core business and as a result these operations are outsourced to logistics service providers (Notteboom, Winkelmans, 2004). A recent study (Langley, Allen, Tyndall, 2002) indicates that in Europe 94% of companies have already outsourced part of their warehousing and transportation operations to logistics service providers.

1.3. Technological Advances and Infrastructure Modernization

Major technology changes are taking place in the ocean shipping sectors that affect requirements for port infrastructure and services. The most obvious is the increasing containerization of global trade, a trend that is widely expected to continue into the future. Containerization of seaborne trade is some 50 years old, and deep-sea containerization some 40 years old. Yet it has dramatically changed requirements for cargo handling and port facilities, raised the financial stakes of investing in these facilities, and radically affected manpower and labour skills required to handle cargo, creating serious labour redundancy issues and retraining needs in many ports. In addition, the ocean transport industry is employing increasingly sophisticated information technology (IT) to manage logistics; and ports, if they are to remain competitive, must be key players in future IT logistics networks (WB, Module 2, 2001).

The transport industry is being increasingly shaped by developments in the field of information and communication technologies (ICT). Transport and logistics services have been heavily influenced by the widespread use of electronic commerce (E commerce), which, in turn, has enabled the growth of this particular ICT area. E-commerce allows consumers to place orders on the Internet and enables trade transactions to be rapidly concluded. This results in frequent deliveries of small packages to many different destinations, thus compelling transport and distribution services providers to modify their operations, business strategies and practices (UNCTAD, 2006, p.2).

Maritime ports are getting busier, ships are getting larger, and the mix of cargo being transported is becoming more diverse. These increased demands for port infrastructure and services are also causing ports to run out of land, requiring them to dredge deeper harbours and waterways and to invest in expensive shipment-handling technology. As ships are being built larger and sailing greater distances and carriers are entering into more alliances, maritime arrivals at ports are increasingly bunched. Ports that are unable to adapt to these changing demands for port infrastructure and services will lose out to competitor ports for cargo throughput (Eriksen, 1998).

Nowadays, time-based competition is intensifying. Any delays to the ship and its cargo are costly to everyone in the supply chain. Information technology, especially Internet-based systems, is increasingly being employed in all transport services. As shippers become more attuned to sophisticated supply chain

management, ports will be faced with both opportunities and threats (http://www.unescap.org).

IT business applications in shipping can be grouped into three main segments.

Electronic documentation and transfer of data: EDI (Electronic Data Interchange), cargo-tracking, electronic documentation, etc.

E-commerce or e-business: On-line registering and chartering of ships, electronic procurement of supplies, on-line booking and e-payment systems, etc.

E-marketing: Also called dot.com business, and is gradually taking over EDI. Services may include tracing and tracking, 'virtual deal rooms' for document transaction and processing, on-line publishing, etc (UNCTAD, 2004, p.13).

IT reduces time for delivering cargo; provides more accurate transfer and recording of information; reduces manpower for port operation paperwork; offers advance information on ship, barge, truck, wagon, container, and cargo movements; and improves planning and coordination of berths, handling equipment, and storage facilities (WB, Module 2, 2001).

1.4. Carrier Alliances and Their Impact on Ports

Over the last few years we have seen changes in the service patterns of the liner shipping industry, changes that resulted from the introduction of larger vessels and carrier alliances (UNESCAP, 2002, p.10). Increase of world trade volume and introduction of larger container ships require quality services and productivity in the stevedoring industry, and have increased the importance of the role of the industry.

The privatization of port activities throughout the world has also increased the participation of global terminal operators, especially in container port operation.

Recently, global terminal operators have penetrated the global container stevedoring market more aggressively in order to increase their competitiveness through the establishment of global networks. Active horizontal integration of terminal operators has appeared in forms of mergers and acquisitions, investments for container terminal development in other countries through joint vestures with local companies, other global terminal operators or shipping lines (UNESCAP, 2005, p.38).

The consolidation of liner shipping companies was based first on strategic alliances and subsequently on mergers and acquisitions, which vastly increased the shipping company's size and market power (Francesetti, Foschi, 2001).

With many international shipping and logistics market players undertaking vertical and horizontal integration strategies, involving ports either directly or indirectly, the conventional taxonomy of port institutional players should be fundamentally reviewed. Strategies of vertical integration include ocean carriers and other multimodal providers (e.g. rail operators) engaging in terminal leasing and ownership. Shippers are also sometimes perceived as port owners, such as through dedicated oil or car terminals (UNCTAD, 2004). The increasing vertical specialization of world trade has had significant impact on the global logistics system of many manufacturers. It has added links to global supply chains and increased the transport intensity of production processes. Firms have been

increasingly concentrating on exploiting their core competencies and subcontracting out a number of noncore manufacturing and assembly activities to contractors. Tasks traditionally performed at the start or the ends of the production line are increasingly moving away from the main plant to be performed by manufacturing subcontractors or distribution centers. Preassembly and sequencing of parts for on-line production chains are activities increasingly outsourced to specialist logistics providers. Customization of products, which can range from labelling or repackaging of goods to reconfiguration of items, is one of the fastest growing areas of logistics outsourcing (WB, Module 2, 2001, p.36).

Horizontal integration strategies were less common in the past but have gained greater prominence in recent years, such as through port cooperation and mergers and, more particularly, the expansion of certain ports beyond their initial spatial bases. The impacts of such changes on the traditional perception of the port industry are dramatically significant in the sense that today's ports can be owned and managed by many types of institution (both within and outside international shipping and logistics markets), and that the long-established perception of ports as non-moveable assets may no longer hold so much validity (UNCTAD, 2004)

The container liner industry will continue to become more concentrated through carrier alliances. For ports, this means fewer and larger vessels and fewer customers. There are many factors that determine port choices. The liners will call only at ports that offer marketing advantages, such as the fastest container movement, superior service and the most sophisticated information system. Since information has become as important as cargo delivery itself in today's world of

transport, sophisticated information systems will be essential in supporting the new shipping alliances.

Carrier alliances will promote more effective utilization of port facilities to the extent that terminal sharing occurs among partners, particularly if one of the partners does not lease its own terminal. It could also lead to greater demand for larger terminals, especially if asset sharing spreads. Utilization of the overall transportation infrastructure of a port area will also improve when ship calls are more evenly scheduled throughout the week (UNESCAP, 2002).

1.5. Hub and Spoke Systems

Hub and spoke system firstly used in airline industry for minimising the transfer time at the hub port airport. A similar system has also developed in container shipping in order to generate economies of scale in operation and management, although the terminology used normally refers to 'hub ports' which generally serve long haul routes and which are provided (Gray, Kim, 2002, p.162).

In a hub and spoke system of containerized seaborne trade, cargo to a region is delivered first to a primary hub port and then transported to its final destination, whether by sea, rail, road or inland waterways. Similarly, exports from the region are collected in the primary hub, and then transported to final destination.

A hub port requires concentrating on the containers export, import and transshipment as well. There are mainly two types of hub ports (OCDI, 2000). The first type of hub ports mainly serves transshipment traffic and does not handle a

significant amount of export and import cargoes. The second type of hub ports both have local cargoes from/to its hinterland and also handle international transshipment traffic (Deveci, Oral, Kisi, Kalkan, 2004, p.84).

In last two decades, the hub and spoke system in liner service has been introduced as larger containerships have been adopted in major sea transport routes such as Europe-Far East-American West coast. The emergence of this new system has allowed load centres along the East-West shipping lanes. This hub-feeder system allows shipping lines to provide a global grid of east/west, north/south and regional services. The large ships on the east/west routes will call mainly at transhipment hubs where containers will be shifted to multi-layered feeder subsystem serving north/south, diagonal and regional routes (Notteboom, 2004).

Liner service network design depends on the balance of power between carriers and shippers (Notteboom, 2004). From the carrier's perspective economies of scale are a critical element in order to reduce costs, which can be achieved by operating larger ships and having fewer ports of call. However, from the shipper's perspective total freight rates, time and service quality, including frequency and flexibility, are more critical elements. There are clearly different views existing between carriers and shippers with respect to the hub and spoke system.

According to Notteboom (2004) liner service network design has tended to move from a pure cost-driven exercise to a more customer-oriented differentiation exercise, as the optimal network design is not only a function of carrier-specific operational factors, but more and more of shippers' needs (for transit time and other

service elements) and of shippers' willingness to pay for a better service. The hub and spoke system could be interesting from a pure liner network cost perspective. Hence, the more cost efficient the network becomes from a carrier's perspective, the less convenient that network could be for the shippers' needs in terms of frequency and flexibility. The multi-loop system of the alliances with smaller vessels bears less risk and could therefore turn out to be a cheaper option than running very large vessels on only a few loops. The higher the bargaining power of shippers, the more pressure for direct calls, which will shift the 'cargo follows ship' principle to the 'ship follows cargo' principle. In this regard, as liner service network design becomes a more customer-oriented differentiation exercise, there could be an increased tendency towards less transhipment and more direct port of calls. The networks operated by large vessels will continue to be based on end-to-end services. Hub and spoke systems are just a part of the overall scene (Notteboom, 2004).

1.6. Objective

The main objective of this thesis is to make an analysis of Port of Izmir in terms of the potential of serving value added services. This objective specifically includes analysing the Port of Izmir in terms of port infrastructure, land/land prices, labour, technology information, market factors, related industries, back- up city, institutional factors and connecting transport system. The study uses explorative research approach and benefits from primary, secondary data and interviews with experts.

CHAPTER 2

DRIVING FORCES OF MARITIME INDUSTRY IN TURKEY

2.1. Turkey's Geographical Advantage as a Bridge between East and West

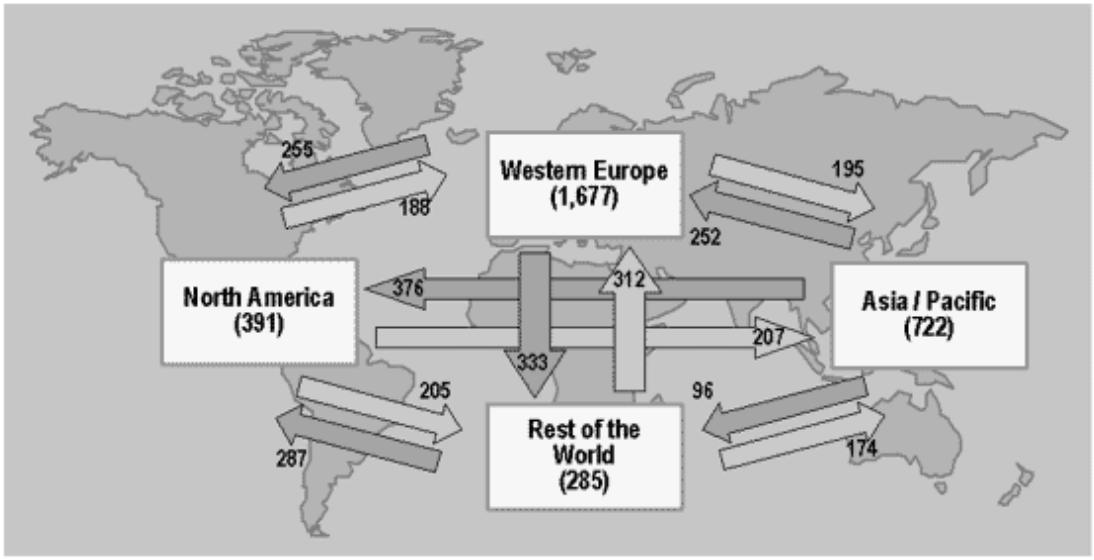
Throughout history Turkey has been a cradle of eastern and western civilizations, being a strategically important peninsula surrounded by the Black Sea to the North, Mediterranean to the South, and the Aegean to the West.

Turkey lies between Asia and Europe serving as a bridge geographically, culturally and economically. Its location on two continents plays a central part in Turkish history and gives the country's transportation and logistic sector a major advantage in serving the markets of Europe, the Middle East and North Africa (Bektaş, 2004). This is important not only for Turkey's foreign trade relations and economic development but also for regional and interregional economic cooperation. In the aftermath of the cold war, Turkey has moved from the periphery of Europe to the edge of a new political and economic reality called Eurasia. This region, broadly defined as including Central Asia, the Caucasus and the Black Sea countries, attracts increasing attention not only because it constitutes one of the world's most potentially important energy producing regions, but because it is also a crucial trade and transport corridor linking East and West (Aktas, Ulengin, 2005 p. 316-329). As it stated in the working paper of Commission of The European Communities, Turkey is situated at a regional crossroads of strategic importance for Europe: the Balkans, Caucasus, Central Asia, Middle East and Eastern Mediterranean; its territory is a transit route for land and air transport with Asia, and

for sea transport with Russia and the Ukraine. Its neighbours provide key energy supplies for Europe (Commission of The European Communities, 2004, p.6).

Turkey's geopolitical position as a link between the East and the West makes the transport sector crucial for the economic development of the region. Turkey is a major player both as a transit country and as an origin and destination of freight (see the Web Portal of Worldbank).

Figure 2: World Trade Flows (billion $US)



Source: (Based on data World Trade Organisation, 2001) Notteboom, 2004

Figure 2, illustrates the trade flows of the world. The last three decades have seen important modifications in international trading flows. The bulk of international trade occurs within economic blocs, especially the European Union and North America. Other significant flows are between Asia / Pacific and North America (especially the United States), between Europe and North America and between Europe and Asia / Pacific. For several reasons, such as geographical

proximity (Eastern Europe), energy (Middle East) and colonial (Africa), the European Union has significant trading linkages with the rest of the world. World trade shows a steady increase. Significant modifications have taken place in international trading flows. The triad regions (Asia, Europe and North America) remain by far the most important trading blocks. Mexico, China and East Asian Economies have increased their relative importance considerably. The USA remains the most important trading partner of the EU. China has overtaken Japan to become the most important Asian trading partner. The China effect is felt in most European economic sectors, in particular in the port and maritime industry. Significant trade imbalances (based on values) continue to exist with most leading trading partners (Notteboom, 2004).

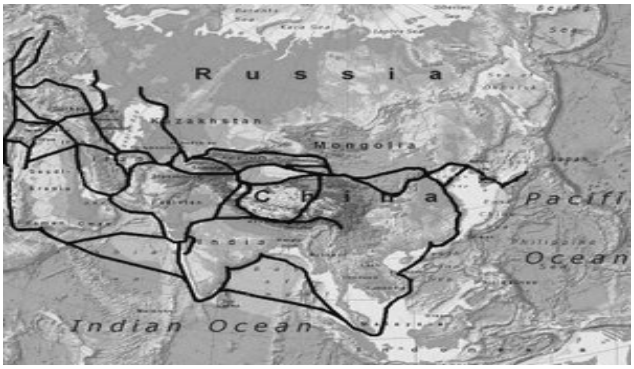
2.2. International Transportation Corridors That Turkey Involves

History of transportation in Anatolia reaches to B.C. 300. Anatolia, which is binding the Europe, Asia and Africa as a bridge, has played a very important role for centuries. The most important commerce roads have moved through Anatolia such as 'Spice Road' (Baki, 2004, p. 39).

The spice trade has been of major economic importance throughout human history. Spices, some of the most valuable items of trade in the ancient, were transported from India and Sri Lanka to the east coast of Africa, Arabia and Europe. Marco Polo's expedition to China was an attempt to open up a spice route with the East. Spices were the primary reason that Portuguese navigator Vasco Da Gama sailed to India. On the other hand, silk was as significant as spice that transported on a special route.

Silk Way Road, also called Silk Route**,** ancient trade route that, linking China with the West, carried goods and ideas between the two great civilizations of Rome and China**.** Silk came westward, while wools, gold, and silver went east (see the Web Portal of Encyclopaedia Britannica).

Figure 3: Silk Way Route



Source: Encylopaedia Britannica

As being one of the world's oldest and most historically important trade roads, it diverges into northern and southern routes. From Xian, China; the northern route pass through the Bulgar-Kypchak zone to Eastern Europe and the Crimean peninsula, and from there across the Black Sea, Marmara Sea and the Balkans to Venice; the southern route pass through Turkestan-Khorasan into Mesopotamia and Anatolia, and then through Southern Anatolia into the Mediterranean Sea or through Egypt and North Africa.

With the exploration of new commerce roads Silk Way lost its popularity and importance by time. After a long period, Silk Way Road has been increasing in importance again recently. United Nation's (UN) highway project that would cross through the whole Asia is inspired from the Silk Way Road (www.britannica.com)

As it was in the ancient times, Turkey is the intersection of international transportation corridors which increases its importance in global trade.

2.2.1. Asian Highway Network

It is a cooperative project among countries in Asia and the United Nations Economic and Social Commission for Asia and Pacific (UNESCAP). The Asian Highway network is a network of 141.000 kilometers of standardized roadways crisscrossing 32 Asian countries with linkages to Europe.

The Asian Highway project was initiated in 1959 with the aim of promoting the development of international road transport in the region. During the first phase of the project (1960-1970) considerable progress was achieved, however, progress slowed down when financial assistance was suspended in 1975 (see the Web Portal of UNESCAP).

In the late 1980s, the Asia-Pacific region as a whole emerged as a dynamic arena of economic growth. Demand increased for reliable and efficient road transport, which proved to be a versatile and cost-effective mode for moving large numbers of people and goods across borders.

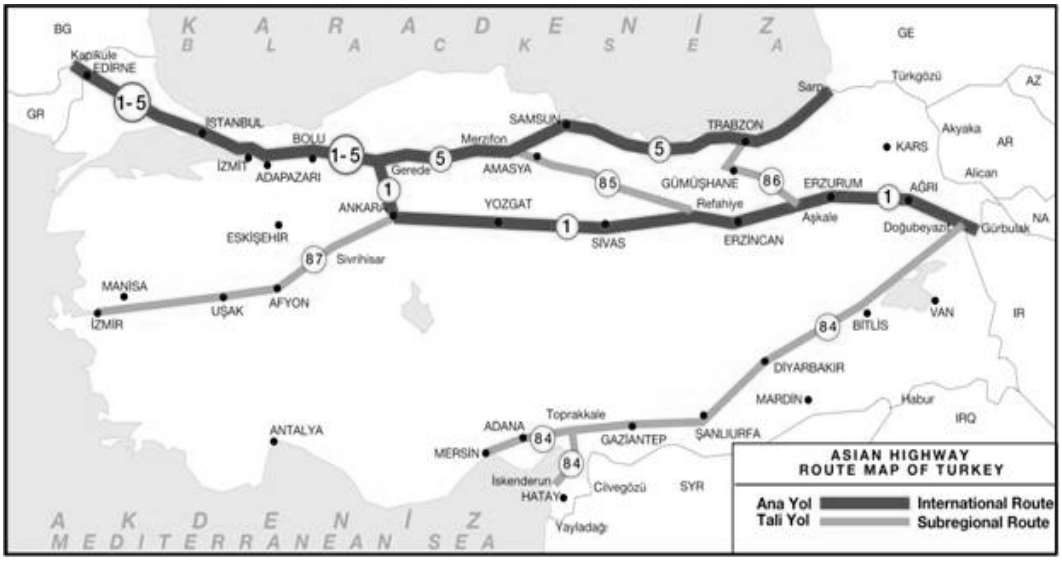
In 1992, UNESCAP endorsed the Asian Land Transport Infrastructure Development (ALTID) Project comprising of the Asian Highway and the Trans-Asian Railway network as well as facilitation of land transport. The Asian Highway project is one of the cornerstones of ALTID (Asian Highway Handbook, 2003, p.1).

The Intergovernmental Agreement on the Asian Highway Network was adopted on 18 November 2003 by an intergovernmental meeting held in Bangkok, was open for signature in April 2004 in Shanghai and entered into force on 4 July 2005. A total of US$ 26 billion has already been invested in the improvement and upgrading of the Asian Highway network (see the Web Portal of UNESCAP).

The Intergovernmental Agreement on the Asian Highway Network (IGA) includes Annex I, which identifies 55 AH routes among 32 member countries totalling approximately 140.000 km, and Annex II "Classification and Design Standards".

Route numbers begin with "AH", which stands for "Asian Highway", followed by one, two or three digits (Asian Highway Handbook, 2003, p.7).Route numbers 60–89 and 600–899 are allocated to North, Central and South-West Asia which includes Afghanistan, Armenia, Azerbaijan, Georgia, the Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan, Turkey, Turkmenistan and Uzbekistan (Asian Highway Handbook, 2003, p.8).

Figure 4: Asian Highway Route Map of Turkey



Source: Akcan, 2005, p.56

The Asian Highway routes link Turkey to Bulgaria, Georgia and the Islamic Republic of Iran and to Izmir, Icel, Iskendeun and Sarp seaports (Figure 4). Turkey is the land bridge between Asia and Europe and has an extensive and high quality road network. The current plan aims to develop and upgrade highway infrastructure, motorways and dual-carriageway highways to enhance efficiency and shorten traveling time (Asian Highway Handbook, 2003, p. 108).

2.2.2. Trans European South-North Motorway Project (TEM)

The Project of Trans European South-North Motorway, namely TEM, is a regional transportation infrastructure project. It starts from Poland and reaches Asia via Turkey and also covers Middle East, Southeast European countries. Within the scope of this project, the full members are Austria, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Italy, Lithuania, Poland, Romania, Slovakia and Turkey. Sweden and Ukraine has the observer members status.

TEM road network in Turkey starts at Bulgarian border, passes through Istanbul via Fatih Sultan Mehmet Bridge and parted into two branches in Ankara as eastward and southward. Eastern branch is again parted into two branches in Askale. One of them reaches Trabzon in Black Sea Region, the other ends in Gurbulak at Iranian border. The southern branch ends at Syrian and Iraqi border. Furthermore, it connects İstanbul to İzmir and Antalya. The total length of TEM in Turkey is approximately 6.954 km. by January 2001 (see the Web Portal of KGM).

Turkey, especially after 1984, plays active role in TEM Project activities and realizes significant contributions. General Directorate of Highways is responsible for Turkey's National TEM Project Coordination (Karataş, 2004, p.62).

2.2.3. International E-Roads

The international E-road network is a network of roads in Europe, numbered E01 and up and the responsibility of the United Nations Economic Commission for Erope (UNECE).

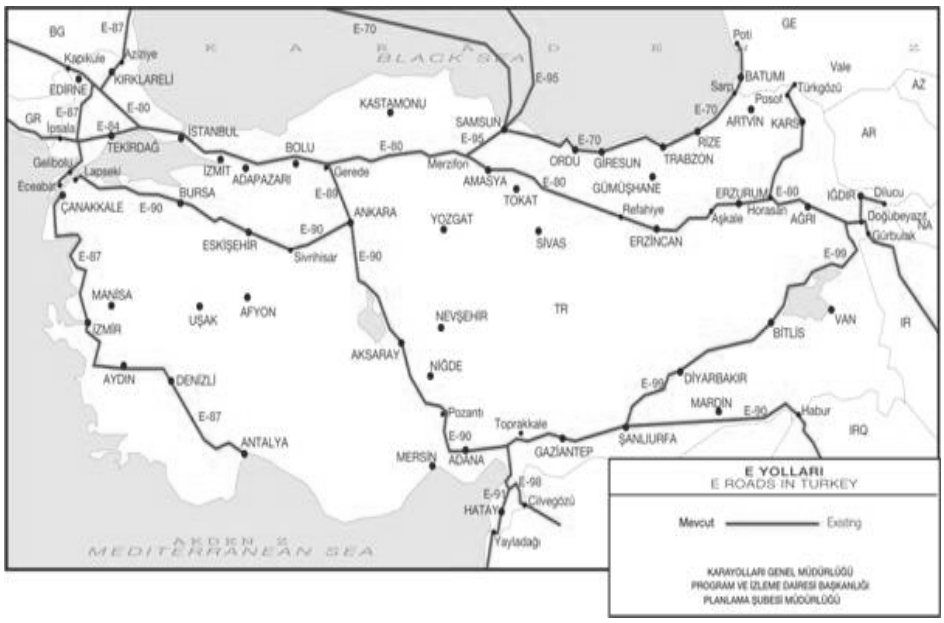
The UNECE has established more than 50 transport agreements and conventions which are negotiated by government representatives and become legally binding for countries which ratify or accede to them. These agreements and conventions create international safety and environmental standards for transport, harmonize national regulations, make border crossings less complicated, and provide for the development of coherent infrastructure networks for road, rail and inland waterway transport (see the Web Portal of United Nations Economic Commission for Europe).

After the Second World War “The Declaration for the Construction of International Arteries” was prepared by United Nations Economic Commission for Europe (UNECE) on September 16, 1950 in Geneva (see the Web Portal of KGM).

In 1975 European Agreement on Main Internatıonal Traffic Arteries, (AGR) was realized by UNECE which defines the "E" road network of routes of strategic importance for international traffic flows.

Turkey is an extension of International Road Network of Southern Europe AGR. According to the provisions of AGR two arteries reach Turkey. These are E-80 entering from Bulgarian border (Kapıkule) and E-90 entering from Greek border (Ipsala). These two main routes reach International Road Network of Middle East and Asia at southern and eastern borders of Turkey via Anatolia. UNECE spends great effort to extend E-Roads to Caucasian and Middle East countries (see the Web Portal of KGM). Figure 5 illustrates the E-roads in Turkey.

Figure 5: E- Roads in Turkey



Source: www.kgm.gov.tr

2.2.4. Trans-European Railway Project (TER)

Trans- European Railway (TER) Project is a regional co-operation framework established by the Governments of the Central and Eastern European countries in 1990 with a view to developing an efficient international rail and combined transport system in those countries in accordance with the Pan–European infrastructure agreements, the European Agreement on Main International Railway Lines (AGC) for rail and the European Agreement on Important International Combined Transport Lines and Related Installations (AGTC) for combined transport developed by all European Governments under the auspices of the United Nations Economic Commission for Europe.

The Project Central Office is in Budapest and it functions in accordance with the Agreement concluded between the Hungarian Government and the UNECE (UNECE, TER Project Progress Report, 2001, p.1).

The general objective of the TER Project is to develop a coherent, efficient rail and combined transport system among Central and Eastern European countries and between those countries and other European countries (UNECE, TER Project Master Plan Work Package 1, 2003, p. 1).

The members of TER Project are: Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Greece, Hungary, Italy, Lithuania, Poland, Romania, Russian Federation, Slovak Republic, Slovenia and Turkey. Additionally six observer countries: Belarus, Former Yugoslav Republic of Macedonia, Moldova, FR Yugoslavia, Latvia and Ukraine participated at various TER actions (UNECE, TER Project Progress Report, 2001, p.2).

Table 2 represents the TER Lines in Turkey. E 070 and E 074 railway lines are the east-west direction lines; however, E 097 line is the north-south direction line. Total length of TER lines in Turkey 3.985 km.1.523 km is the total length of Turkey's TER electrified lines and total length of country's TER non-electrified lines is 2.462 km.

Table 2: TER Lines in Turkey

E70	Kapıkule(Bulgaria Border). – Sirkeci – İstanbul – Haydarpasa – Ankara – Kalın – Cetinkaya – Malatya – Kapıkoy (İran Border).	**TN 109**
	Cetinkaya – Divrigi – Erzurum – Kars – Dogukapı (Armenia Border).	
	Kars – Çıldır – Aktaş (Georgia Border).	
E 074	Eskisehir – Alayunt – Balıkesir – Manisa – İzmir	**TN 118**
E 097	Samsun – Kalın – Çetinkaya – Malatya – Narlı – Toprakkale – İskenderun / Mersin	**TN 133**

Source: www.unece.org

2.2.5. Trans Asian Railway (TAR)

The Trans-Asian-Railway (TAR) was initiated in the 1960s with the objective of providing a continuous 14.000-km rail link between Singapore and Istanbul (Turkey), with possible onward connections to Europe and Africa. The link offered the potential to greatly shorten the distances and reduce transit times between countries and regions, while being a catalyst for the notion of international transport as a tool for trade expansion, economic growth and cultural exchanges.

The network was initially divided into four major components which were studied separately. These components are:

i) a northern corridor connecting the rail networks of China, Kazakhstan, Mongolia, the Russian Federation and the Korean Peninsula;

ii) a southern corridor connecting Thailand and the southern Chinese province of Yunnan with Turkey through Myanmar, Bangladesh, India, Pakistan and the Islamic Republic of Iran with Sri Lanka also part of the corridor;

iii) a subregional network covering the ASEAN and Indo-China subregions. The countries involved are: Cambodia, China (Yunnan province), Indonesia, Malaysia, Myanmar, Singapore, Thailand and Viet Nam.

iv) a north-south corridor linking Northern Europe to the Persian Gulf through the Russian Federation, Central Asia and the Caucasus region. The countries involved are: Armenia, Azerbaijan, Finland, Georgia, the Islamic Republic of Iran, Kazakhstan, the Russian Federation, Turkmenistan and Uzbekistan (see the Web Portal of UNESCAP).

TAR routes in operation cover a distance of almost 81.000 km in 26 countries distributed as in Table 3 below.

Table 3: Trans Asian Railway Network

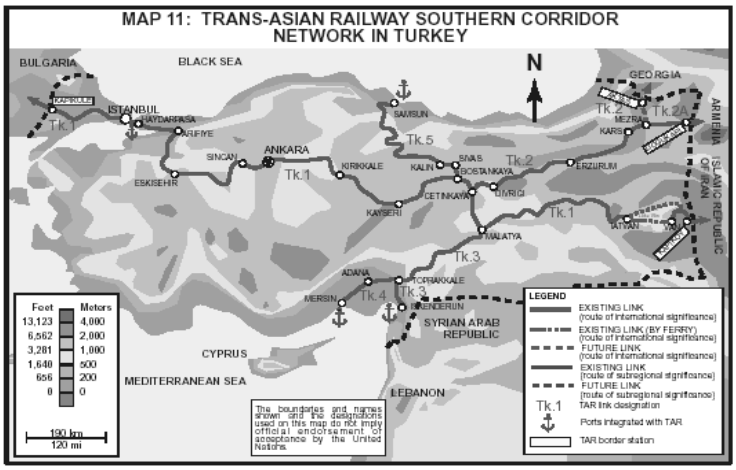
South-East Asia:(TAR SE)	Cambodia, Indonesia, Malaysia, Myanmar, Singapore, Thailand, Viet Nam	12.600 km
North-East Asia(TAR N)	China, Democratic People's Republic of Korea, Mongolia, Republic of Korea, Russian Federation	32.500 km
Central Asia and Caucasus:(TAR C)	Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan	13.200 km
South Asia + Islamic Republic of Iran and Turkey:(TAR S)	Bangladesh, India, Islamic Republic of Iran, Pakistan, Sri Lanka, Turkey	22.600 km
Total:		80.900 km

Source: www.unescap.org

Turkey is significant as the western extremity of the southern corridor of the Trans-Asian Railway between Asia and Europe (Figure 6). The Straits of Bosphorus (at the northern end of the Sea of Marmara) and of Dardenelles (at the southern end)

provide the dividing line between the European and Asian portions of Turkey (UNESCAP, 1999, p. 33).

Figure 6: Trans Asian Railway Network in Turkey



Source: (UNESCAP, 1999, p.34)

Turkey has 5 TAR lines. Link Tk.1 is the main east-west trunk line which forms international route TAR-S1 within Turkey. It runs from the checkpoint on the border with the Islamic Republic of Iran at Kapıköy to the border with Bulgaria at Kapıkule (opposite Svilengrad in Bulgaria), an overall distance of 2.354 km. Link Tk. 2 is a potentially important, but as yet incompletei regional link which will provide a direct rail connection with Caucasus region, via Georgia. It will start from Aktas on the border between Turkey and Georgia, running 92 km to South to Kars, on the existing mainline to the border with Armenia, then on a westerly bearing for 652 km to a junction with link Tk.1 at Cetinkaya. Tk. 3 is regional linj to connect the Caucasus region, as well as significant trade centers in eastern Turkey, with the Mediterranean port of İskenderun. Tk. 4 starts from Toprakkale on Link Tk. 3, running west to Mersin via the important commercial centre of Adana- a distance of

147 km. Tk.5 connects the Black Sea port of Samsun with Trans Asian Railway (UNESCAP, 1999, p.36–37).

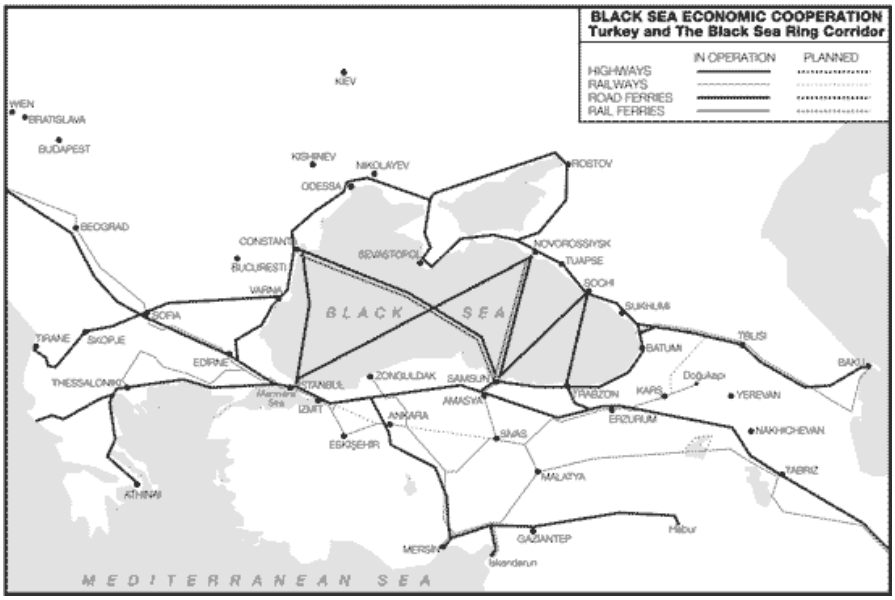
As being at the southern end of TAR network, especially the connection of TAR Link with Turkish ports in Black Sea and Mediterranean, is a significant advantage for Turkey's transit maritime transportation. Especially, taken into consideration that the state owned ports in TAR network have railway connections, to consider this important situation would increase the traffic of maritime transportation in Turkey on a large scale (Akcan, 2005, p.69). Mersin, İskenderun and Samsun ports have connection with TAR Links.

2.2.6. Black Sea Economic Cooperation (BSEC)

The Declaration of Black Sea Economic Cooperation Summit" was signed by Turkey, Greece, Bulgaria, Romania, Albania, Armenia, Georgia, Moldavia and Ukraine on June 25, 1992 in Istanbul. The main target of the cooperation is to establish the required grounds for a transportation network in region and for its development.

Black Sea Ring Corridor in Turkey promotes a new link between East and West. Because of this, two-lane highway standard will be converted into multi-lane one. This corridor will connect our artery network to Black Sea countries, Caucasus, and via Caspian Sea by ferry-boat service to Central Asia and Far East (Figure 7).

Figure 7: Turkey and The Black Sea Ring Corridor



Source: www. kgm.gov.tr

2.2.7. Pan-European Transport Corridors and Areas (PETRAs)

The Pan-European Transport Corridors and Pan-European Transport Areas (PETRAs) were established during three Pan-European Transport conferences. The overall concept was developed at the first conference in Prague in 1991. Nine long-distance transport corridors as priorities for infrastructure development were defined at the second conference in Crete in 1994. A tenth corridor and the Pan-European Transport Areas for maritime basins were added at the third conference in Helsinki in 1997. The Transport Corridors include cross-border road and rail traffic routes between the EU15 and the Central and Eastern European countries as well as airport, sea and river ports along the routes serving as intermodal nodes (Pan-European Transport Corridors and Areas Status Report, 2005, p. 13)

These corridors are as follows:

I. Corridor: Talin- Riga- Warsaw

II. Corridor: Berlin- Warsaw- Minsk- Moscow

III. Corridor: Berlin/Dresten- Wroclaw- Lvov- Kiev

IV. Corridor: Berlin/Nuremberg-Prague- Budapest- Constantsa/Salonica/İstanbul

V. Corridor: Trieste-Ljubijana-Budapest-Bratislava-Uzgorod-Lvov

VI. Corridor: Gdansk-Warsaw-Zilina

VII. Corridor: Danube

VIII. Corridor: Durres-Tirana-Uskup-Sofia-Varna

IX. Corridor: Helsinki-Kiev/Moscow-Odessa/Kishinev/Bucharest-Filibe

X. Corridor : Budapest-Belgrad-Uskup-Salonica-Athens and Titov-Veles-Prilep-Bitola-Greece

The only Pan-European Corridor that involves Turkey through Corridor 4 (Berlin / Nurnberg - Prag - Budapest - Constanta / Thessaloniki / Istanbul) to İstanbul. Several other priority road and railway corridors within the Pan-European Transportation System involves Turkey through corridor 4 to Istanbul. This system aims to develop a Europe-wide transport policy based on co-ordinated infrastructure development, harmonisation of national transport regulations, border crossing facilitation and an expanded research effort (Deveci, Cerit, Tuna, 2002).

2.2.8. Transport Corridor Europe Caucasus Asia (TRACECA)

The TRACECA Program aims to assist and facilitate the recreation of the historical "Greatest Silk Road", which includes any type of transportation from Asia to Europe and the international markets via Caucasus (Lamnidis, 2004).

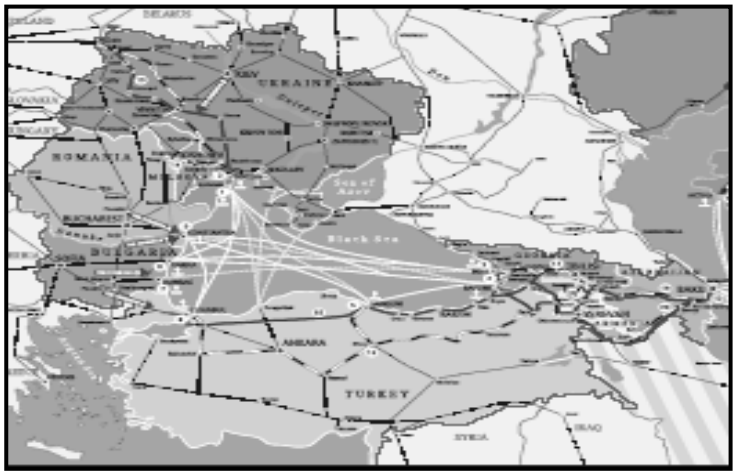
This programme conforms to the global strategy of European Union towards the TRACECA member-states: (Republic of Armenia, Azerbaijan Republic, Republic of Bulgaria, Georgia, Republic of Kazakhstan, Kyrgyz Republic, Republic of Moldova, Mongolia, Romania, Republic of Tajikistan, Turkmenistan, Republic of Turkey, Republic of Uzbekistan, Ukraine) and aims at assisting in political and economic sustainability, promoting regional cooperation and optimal integration of the international transport corridor Europe-Caucasus–Asia–TRACECA with Trans-European Networks (TENs).

Countries along this corridor have high regard for its strategic importance in the context of Euro-Asian transport links and consider it as complementary to commercial exchanges between themselves and the Far East, with the possibility of the ancient Silk Route becoming once again a major trade corridor (UNECE, Inland Transport Committee**,** 2004, p. 4).

The corridor starts in the Eastern Europe (Bulgaria, Rumania, Ukraine) and also crosses Turkey. There are route passing the Black Sea to the ports of Poti and Batumi in Georgia, further using transport network of the Southern Caucasus, and a land connection towards this region from Turkey. From Azerbaijan by means of the Caspian ferries (Baku – Turkmenbashi, Baku – Aktau) TRACECA route reaches

the railway networks of Central Asian states of Turkmenistan and Kazakhstan. The transport networks of these states are connected to destinations in Uzbekistan, Kyrgyzstan, Tajikistan, and reach the borders of China and Afghanistan (see the Web Portal of TRACECA).

Figure 8: Traceca Network in Turkey



Source: www.traceca.org.tr

2.3. Turkey's Transportation Infrastructure

The transportation sector has a significant place in the economy since Turkey covers an extensive area, is surrounded by three seas, to the south, north and the west, and is located between Europe and Asia (see the Web Portal of Directorate General of Press and Information of The Prime Minister)

2.3.1. Road Transportation

Becuse of its characteristics enables transportation directly from the point of origin to the point of use, road transportation is inevitable in most carriages. In

Turkey the sitiuation is the same. Turkey has one of the most important and biggest road fleets in Europe.

Approximately 95% of domestic passanger transportation and 80% of domestic freight transportation are realized by road transportation (see the Web Portal of DPT). When road, rail, sea and air transportation network of Turkey is concerned; it can be inferred that the main significance is given to the road because of its high developed infrastructure among the other modes of transportation; therefore, the large scale of transportation in Turkey is realized by road. Road transportation is used heavily in Turkey compared with the other transportation modes. Share of domestic road transportation in terms of ton x km was 89. 1 % in 1999 (State Plannig Organization, 2006).

From the Otoman Empire had left approximately 3.000 km railway and 18.335 km road (Baki, 2004, p. 39). Turkish goverment had begun to invest in road construction since 1950s; and the peak in road construction was realized in 1990's (Table 4).

Table 4: The Total Length of Highways in Turkey by Years

Length of Road Network(km)				
Years	**Highways**	**State Roads**	**Provincial Roads**	**Total**
1950				
1960				
1970		35 230	24 390	59 620
1975		34 918	24 581	59 499
1980	27	32 208	27 851	60 086
1985	81	30 982	28 130	59 193
1990	281	31 048	27 504	58 833
1995	1 246	31 389	28 443	61 078
1996	1 514	31 422	28 577	61 513
1997	1 528	31 412	28 813	61 753
1998	1 726	31 320	29 521	62 567
1999	1 749	31 345	29 540	62 634
2000	1 774	31 388	29 535	62 697
2001	1 851	31 397	29 693	62 941
2002	1 851	31 376	29 929	63 156
2003	1 892	31 358	30 133	63 383
2004	1892	31446	30368	63 706
2005	1892	31 371	30 568	63 714

Source: General Directorate of Highways

The highways in Turkey are separated into three groups: the state, the provincial and the village roads. The construction, maintenance and repair of these roads are carried out by separate public organizations.

The state roads are the primary highways connecting the regional or provincial centers, the airports and the seaports. The General Directorate of Highways connected to the Ministry of Public Works is responsible for the maintenance and repair of the state roads.

Provincial roads are the secondary roads within the borders of the provinces. They connect the cities, towns, countries and the sub-districts to each other, to the provincial centers and to the nearest centers of the neighboring provinces. The total length of the highways is around 63.000 km, and the length of the village roads is around 350.000 km in Turkey. The motorway network has been expanding rapidly in recent years. The total length of the motorway network reached 1.851 km at the end of 2002 (Office of The Prime Minister, Directorate General of Press and Information, 2000).

However; the infrastructure and the density of road network in Turkey is still insufficient and behind the standarts of EU countries (Akcan, 2005, p.47).

Although having biggest road fleets in Europe is an advantage for Turkey; increasing traffic on roads, maintanance costs and EU's new road taxes depending on the politics aimed at decreasing of road transportation usage seems to be disadvantage for Turkey (Akcan, 2005, p.160).

2.3.2. Rail Transportation

The railroad network transferred from the Ottoman Empire to the Republic administration was around 4.000 km. The construction of the railroad network between 1923-1938 was given a special importance and a total of 3,000 km of new railroads were constructed. The responsibility for constructing and operating railroads was given to the Ministry of Transportation as of 1929 and it was assumed in 1953 by the organization called the Republic of Turkey State Railroads (TCDD) Enterprise (Office of The Prime Minister, Directorate General of Press and Information, 2000).

In Turkey, railways were the main driving force of Turkey's economic development following the foundation of the Republic in 1923 until the 1950s.(un, p.8) The history of railway is separeted into two stages as Republic Stage (1923–1950) and stage after 1950s (see the Web Portal of TCDD).

Between 1923 and 1950 Turkish companies constructed 3.780 km railway and totally there was 7.651 km railway in Turkey between 1923 and 1950 (Sector Investigation Series, 2001, p. 11). After 1950, Turkey shifted its resources from railroads to road building, and no governments since had paid attention to improving the rail system.

TCDD carries passengers and cargo over a total length of 10.984 km of railroads, including 8.697 km of main lines. Almost 95% of railroads consist of a single line, 4% of double lines, 0,3% of triple lines and 0,01 of quadruple lines. Around 21% of the lines are electrical and 24% are operated by signal. The number

of passengers transported by railroads in 2004 totalled 26.049.853. The TCDD lines are the shortest international line between Asia and Europe and are connected to the Pan-European transport corridor No. IV (Office of The Prime Minister, Directorate General of Press and Information, 2005).

According to the European Council of Minister's Plan, The Europe is going to be covered by a high-speed railway network, which is 30.000 km by 2015. Two corridors, which will be a link between the Europe and Asia, are planning to be binded to Turkey (Sector Investigation Series, 2001, p. 13).

On the other hand; much of Turkey's rail system dates back to the late nineteenth and early twentieth century. Since then, only a few lines have undergone renovation and no new lines have been added. Governments in Turkey have systematically concentrated on building roads while neglecting the railways.

However; with the aim of increasing the share of railways in transportation, high speed train projects between Ankara and İstanbul, also between Ankara and Konya are implemented by Ministry of Transportation in 2005. Besides, construction of a Railroad Tube Passageway over the Bosporus, a project known as "Marmaray" began in 2004. This project, linking Europe to Asia with a tube passageway 58 metres under the Marmara Sea is scheduled to be operational in 2008.

2.3.3. Air Transportation

The need felt for airline transportation services in Turkey is rapidly increasing as the importance attached to the concept of time increases.

Airport operations are the responsibility of the DHMI (General Directorate of State Airports Operations) which is a State Economic Enterprise like TCDD under the Ministry of Transport. The number of airports operated by DHMI is 40, including 10 international airports.(UNECE, 2002, p.11)

The Turkish Airlines Corporation (THY), which had a monopoly in airline transportation in Turkey for a long time, started its activities as a state enterprise in 1933, and it was transformed into a corporation with domestic and foreign capital in 1956 (Directorate General of Press and Information, 2000).

In 1998, 90% of the total movements, 99,6% of the international movements were covered by the eight most important international airports of Turkey which are Atatürk, Esenboga, Menderes, Antalya, Dalaman, Adana, Trabzon and Milas-Bodrum (UNECE, 2002, p.11). The aircraft traffic realized in 2001 was 10.057.808 domestic, 23.562.640 international for a total of 33.620.448 (UNECE, 2002, p.12).

Airlines in Turkey in parallel to the same applications over the world, has been realized significant development in recent years; however, the infrastructure is not sufficient as it suppesed to be with that development. The inadequacy of qualified staff, security problems and insufficiency of infrastructrure are the main problems in this area (Akgüngör, Demirel, 2004, p. 428).

2.3.4. Pipeline Transportation

Pipeline transportation, besides maritime transportation, displayed a rapid development, especially after the 1960s, for the transportation of crude oil and petroleum products in the world economy. However, domestic transportation in Turkey remained based on highways and highway tankers.

The first pipeline was laid between Batman and Dortyol (Iskenderun Gulf) by the Turkish Petroleum Corporation (TPAO) and was put into service in 1966. This line was connected by secondary lines to the production fields of Shell and Mobil in Siirt and Diyarbakir Province. The Iraq-Turkey Crude Oil Pipeline, which is the most important petroleum pipeline in Turkey, was put into service in 1977 (Office of The Prime Minister, Directorate General of Press and Information, 2000). BOTAŞ, a state enterprise, was established in 1974 to transport Iraqi crude oil to the Gulf of İskenderun (UNECE, 2002, p.17).

There are several existing oil and gas pipelines going through Turkey: the Ceyhan-Kirikkale Crude Oil Pipeline, for instance, transporting approximately 25 million barrels oil per year, the Batman-Dörtyol Crude Oil Pipeline which goes from the Batman area to the Bay of Iskenderun, carrying about 24 million barrels crude oil annually and the Iraq- Turkey Crude Oil Pipeline, running from Kirkuk, Iraq, to Ceyhan-Turkey, transporting 286 million barrels of oil in 2000. Much of Turkey's future oil supply will come via the Baku-Tbilisi-Ceyhan Pipeline, carrying 1 million barrels of oil per day.

Although it is deprived of oil and natural gas resources, owing to its geographic position Turkey is about to become one of the most important transit pipeline countries in the world in the next few years (Külebi, 2006). The European Commission's Green Paper also mentions Turkey as a potential partner in the creation of a pan-European Energy Community.

As it stated in the working paper of Commission Of The European Communities, Turkey will have a major role to play in the security of energy supply of the enlarged EU and is expected to develop further as a major oil and gas transit country. Accession of Turkey would extend the EU to the borders of the world's most energy-rich regions in the Middle East and the Caspian Basin.

For energy efficiency and renewable energy sources, Turkey is only starting to develop a coherent and comprehensive policy, and more efforts are needed. Turkey should ensure that the relevant acquis on renewable energies and energy efficiency should be fully implemented (Commission Of The European Communities, 2004, p. 26).

2.3.5. Maritime Transportation

Water is the oldest mode of transport. The main advantage of water transport is the capacity to transport extremely large shipments (Bowersox, Closs, Cooper, 2002, p. 344). The development of ports is in response to the foreign trade and its effects on maritime transports which accounts for the transportation of about 87% of the total foreign trade of Turkey (SPO, 2000, p.74).

Although road transportation has dominat role in Turkey, its share in foreign trade is under water transportation (Demir, 2005, p. 27). Shipping movements constitute a major component of Turkish economy with 91,4% of the nation's foreign trade being transported by sea (Turkish Shipping World 2002; Tuna 2002). On the other hand; Turkey has a old fleet which is above the average of EU standart. The EU standart for ship's age is maximum 15 (Baki, 2004, p.47).

The amount of the cargo handled within the international maritime trade was 118.248 million tons in 2000. Of this, 32.291 million tons (27%) were in exports and 85.956 million tons (73%) in imports. Turkish flag has undertaken only 30,5 % of the international maritime transport (Turkish Chamber of Shipping, 2001). Turkish flagged ships recently make nearly one fourth of total Turkish maritime transportation in both import and export while the rest is made by foreign flagged vessels, which was 42% of imports and 39% of exports in 1995 and decreased to 25% of imports and 18% of exports in 2004 (Gunaydın,2006).

Transportation policies in Turkey should be questioned since the level of highway transportation usage reaches to 95% and level of sea transportation usage drops to less than 1 % in spite of being surrounded with sea in three sides of our land. (Akgüngör, Demirel, 2004, p. 423).

Major ports Haydarpaşa, Derince, Bandırma, Samsun, Mersin, İskenderun, İzmir in Turkey are owned by Turkish State Railways (TCDD). TCDD operates seven ports on behalf of the Turkish government, which includes the top container ports of Haydarpasa, İzmir and Mersin. While the Port of Haydarpasa is mainly

focused on import cargo, the Ports of İzmir and Mersin are export-oriented (Akarsu, Kumar, 2002, p. 5).

The state-owned and operated ports in Turkey offer a full range of services such as pilotage and towage, stevedoring services, quay occupation, fresh water supply, solid and liquid waste removal, handling services, storage, commodity weighing and the rental of equipment. TCDD determines the port tariffs that may differ slightly from one port to the other for services such as pilotage (in/out of the port), tug assistance (in/out of the port), quay dues, waste removal, sanitary dues, light dues (both entering and leaving the port), a chamber of shipping fee, an agency fee, and an attendance/supervision fee in addition to other cargo-related such as transshipment fee, a commission on inward freight, freight tax, forwarding fees, harbor dues, etc. (Yercan and Yeni 2001). Bulk of the income of the TCDD ports is generated through stevedoring and storage services. Turkish ports are relatively expensive with close to 60% of the cost of port operation being attributable to port labor while the world average is only 30% (Elliott 1998).

2.3.5.1. Port of Haydarpasa

The port of Haydarpasa is situated on the Anatolian side of Bosphours in İstanbul. As being the biggest container port in Marmara Region, the port serves a hinterland which is the most industrialized area of Turkey. The port has ro-ro terminals in service. The Ro-Ro terminals can accommodate 360 ships per year, and can handle 410.000 tons/year of ro-ro cargo, 65.000 trucks (incoming-outgoing), and 60.000 cars/year. There are daily Ro-ro services between Haydarpasa and Trieste and Constanza ports. The holding capacity of the container terminal is 6000

Twenty Foot Equilavent Unit (TEU). The annual capacity, on the other hand is 144.000 TEU/year. The port has a grain silo of 70.000 tons capacity and has a conveyor connection with the quay.

2.3.5.2. Port of Derince

The port of Derince is situated on the northem shore of the Gulf of İzmit. It is the multipurpose general cargo port on the Gulf. The port is giving to service for the products of automotive industry i.e. cars, tractors, other vehicles etc. and all type of general cargoes. The port is also connected with state railway and highway network. The quay is rail connected and provided with 12.500 suqare meters (sqm) of closed storage and 122.990 sq.m. of open storage. A new silo of 95.000 tons capacity has been completed.

2.3.5.3. Port of Bandırma

Port of Bandirma is situated on the south side on the Sea of Marmara. It is one of the major outlets for exports/imports of dry bulks of Marmara Region. Open storage area of 150.000 sqm and covered storage area of 9.000 sqm and grain silo capacity of 20.000 tons are available at the port. The berth where dry cargo, general cargo, liquid cargo (except fuel products) which are region's export-import goods are being handled. Import goods of the port are bulk phosphate and sulphur, phosphoric acid, ammonia, fertilizer and exports are various ores and acids, marble, grain, canned foods, flour and domestic appliances. The port is also connected with state railway and highway network.

2.3.5.4. Port of Samsun

The port of Samsun is the major for port the central part of Black Sea coast. The port serves export, import cargoes and transit traffic to Iran and also Ro-Ro lines between Turkey and Ukraine, Russia. It has an ideal location both for the trade with the countries having a coast on the Black Sea and for the potential cargoes which will arise due to BSEC Region Project. The port has a ship to shore bridge system to serve the railway-maritime-highway combined transport among North European, Commonwealth Independent States (CIS) and Middle East countries. The port has ample storage areas for containerized cargo. Storage facilities of Samsun consist of 356.530 sqm. of open and 12.019 sqm of covered areas. A grain silo belonging to TMO (Turkish Grain Board) of 30.000 tons capacity is available. There are berths with a total length of 1.430 m. with an alongside depth of 10.5 m.

2.3.5.5. Port of Mersin

Port of Mersin is situated on Mersin Bay on Mediterranean Sea. It is the main port for the Eastern Mediterranean Region's industry and agriculture. The port's rail link and its easy access to the international highway makes it an ideal transit port for trade to the Middle East. With its modern infrastructure and equipment, efficient cargo handling, vast storage areas and its proximity to the free trade zone, Mersin is one the important port is in the East Mediterranean. The facilities at the port handle general cargo, containers, dry and liquid bulk and Ro-Ro. New container berth has 14 m. depth and gives to service for containers with 2 post panamax gantry cranes of 45 tons capacity. Another facility available at the yard is the provision of reefer facilities for refrigerated containers. A reinforced concrete grain silo belonging to TMO (Turkish Grain Board) of 100.000 tons

capacity is available and there is a conveyor system connection with the quay. Total port area is 993.908 sqm Open storage area is 582.230 sqm and covered storage area is 31.855 sqm and the port has 251.350 sqm container storage area. The holding capacity at the container yard is 10,000 TEU.

2.3.5.6. Port of Iskenderun

İskenderun port is situated on the North-East of the Mediterranean Sea. It serves the Southeast, East Anatolian regions as well as transit traffic to the Middle East countries. It also plays an important role as a transit port. The port is also connected with state railway and highway network. As a multi-purpose port, it serves different type of commodities and cargo groups such as general cargo, dry/liquid bulk, container handling, and Ro-Ro vessels. The port has wide storage areas for containerized cargoes. The port has 374.630 sqm open storage area and covered storage area of 19.076 sqm (www.tcdd.gov.tr).

2.4. Negotiations with EU

Relations between the European Union (EU) and Turkey based on the agreement establishing an association between European Economic Community (EEC) and Turkey, the so-called Ankara Agreement, which was signed on 12 September 1963 and came into force on 1 December 1964 (Francois, 2001, p.2).

Turkey is the only candidate country that has a customs union with the EU. Turkey signed a Customs Union (CU) agreement which introduced free circulation of industrial goods and processed agricultural products with the EU harmonizing its

tariff structure with that of the EU in 1995 which started to be implemented in 1996. Therefore with this agreement Turkey became more open to international competition. Accession talks symbolically opened with Turkey on 3 October 2005. According to the mutually agreed negotiating framework, these negotiations are an open-ended process that may last ten to 15 years, the outcome of which cannot be guaranteed and led to an offer of full membership. On the other hand; Turkey's possible accession to EU would incraese the trade between Turkey and EU countries; therefore high developed infrastructure of transportation is a must.

Turkey, especially in the eyes of the EU, is a junction point of vital strategical importance in terms of land, air and naval transportation as well as military affairs (Külebi, 2005). If Turkey accedes to the EU, its role as a corridor for road, rail, air, maritime and pipeline connections between Europe and its south-eastern neighbourhood would increase. The economic development and integration of the region as a whole could thus be enhanced (Commission Of The European Communities, 2004, p. 24).

Turkey has considerable water resources and its neigbours' production of energy meets a very important amount of Europe's requirements. From the perspective of economy and population, Turkey is an indispensable actor on the international scene. It has the world's 20th largest economy (Külebi, 2005).

Turkey's accession would help to secure better energy supply routes for the EU. It would probably necessitate a development of EU policies for the management of water resources and the related infrastructure. Good implementation

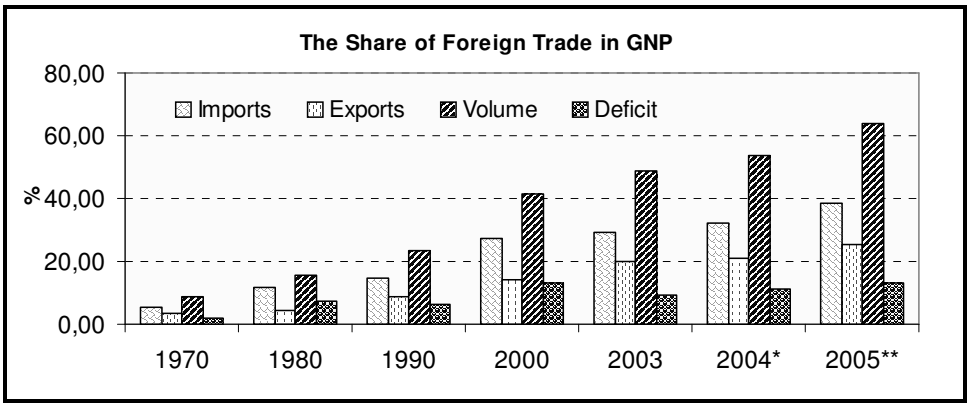
by Turkey of other EU policies in the fields of environment, transport, energy and consumer protection would also have considerable positive effects for EU citizens elsewhere (Commission Of The European Communities, 2004, p. 4).

2.5. Turkey's Economy and Foreign Trade

As was the case in many developing economies in the world, the main economic development strategy of Turkey centered on import-substitution policies during the 1960s and 1970s. This period was characterized by immense public investment programs, which aimed at expanding the domestic production capacity in heavy manufacturing and capital goods. Foreign trade was under heavy protection via quantitative restrictions along with a fixed exchange rate regime that, on the average, was overvalued given purchasing power parity (Central Bank, 2002, p.5).

Beginning from the year 1980, Turkey changed its economic development policy from "import substituting industrialization" to "export led growth" strategy. Economy opened up to world trade. Turkey has increased its share from world markets, from 0,15% in 1980 to 0,6% in the year 2003. Between 1980 and 2004 exports of Turkey has increased from 2.9 billion dollars to 63 billion dollars (Undersecreteriat of Foreign Trade Report, 2004, p.1).

Table 5: The Share of Foreign Trade in GNP



Source: Undersecreteriat of Foreign Trade

The share of the foreign trade in the whole economy has risen steadily starting from 1980's. The volume of foreign trade consisted of 8,6 percent of the GNP in 1970 while this share rose to 15,7 and 23,4 percent in 1980 and 1990, respectively (Table 5) (Undersecretariat of Foreign Trade Report, 2004, p.1).

Turkey's foreign trade gained momentum especially in 1990s. Exports which were $ 13 billion in 1990 rose to $ 21.6 billion in 1995 and $ 27.8 billion in 2000. Turkey showed a great performance in exports in 2001, 2002, 2003 and 2004. Turkey's exports grew by 12,8; 15,1; 31 and 33,6 percent respectively in these four years.

Imports of Turkey, which were $ 22.3 billion in 1990, grew by 12 percent annually on average between 1990 and 1995, and reached $ 35.7 billion in 1995. Turkey's membership to the World Trade Organization in 1995 and the entrance to the final stage of Customs Union with the European Union in 1996 and the growing

economy were reasons of rapid growth rate of Turkey's imports during the last 8 years (Undersecretariat of Foreign Trade Report, 2004, p.2–3).

Table 6: Turkey's Foreign Trade

FOREIGN TRADE ($ MILLION)									
	ANNUAL						JANUARY- FEBRUARY		
	2000	2001	2002	2003	2004	2005	2005	2006	% Change
Exports	27.75	31.334	36.059	47.253	63.167	73.390	10.649	10.750	1
Imports	54.503	41.399	51.554	69.340	97.540	116.537	15.536	17.774	14,4
Foreign Trade Volume	82.278	72.733	87.613	116.593	160.707	189.927	26.185	28.525	8,9
Exports / GNP	13,9	21,5	19,9	19,8	21,1	20,3	...	...	...
Imports / GNP	27,3	28,4	28,5	29	32,6	32,3	...	...	...

Source: Undersecretariat of Foreign Trade

As it seen in Table 6; between 2000 and 2005, export of Turkey rose to $ 73.3 billion from $ 27.7 billion. In the first two months of 2006, exports were $ 10.7 billion compared with the first two months of 2005 with 1 percent change on avarage. While imports were $ 54.5 billion in 2000, it experienced a great increase in 2005 with the number of $ 116.5 billion. When it compared first two months of 2005, imports realized 14,4 % of increase in the fisrt two months of 2006. Besides, foreign trade volume grew to $ 116.593 billion in 2003 with the increase in imports. The share of imports in GNP was higher than exports from 2000 to 2005.

Structure of exported goods has also changed much from mainly agricultural products and raw materials to higher value added industrial products. In Turkey's exports, the share of agricultural and mining products was higher compared to that of world in 1980 while it fell below the world level in 2003. In 1980, the share of the exports of the traditional industrial sectors (clothing, textile, iron & steel) was

higher in Turkey compared to that of the world. But in 2003 while the share of the exports of traditional sectors stayed almost constant in the world exports, it rose enormously in Turkey's exports.

On the other hand, Turkey performed well in the office and telecom equipment, automotive industry and other machines and share of these sectors in Turkey's exports has increased much. Share of automotive industry has risen from % 1,74 in 1980 to % 10,43 in the year 2003 and thus exceeded the sector's share in world trade. While office and telecom equipment exports of Turkey nearly non-existent in exports of Turkey, in 2003, it reached % 4,2 share (Undersecreteriat of Foreign Trade Report, 2004).

Table 7: Turkey's Exports by Country Groups

Exports by Country Groups ($ Million)							
	1990	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**
EU (25)	7327	11 722	15 085	16 854	19 468	25 899	34 399
EU (15)	7 177	11 078	14 510	16 118	18 459	24 484	32 538
EFTA	333	294	324	316	409	538	657
NORTH AMERICA	531	2 066	1 649	1 978	2 279	2 963	3 956
USA		1 238	644	924	1 172	1 368	1 859
CIS	1 032	1 610	3 309	3 297	3 596	3 973	5 174
RUSSIA	968	1 514	3 135	3 126	3 356	3 752	4 832
LATIN AMERICA	44	110	239	329	257	215	420
AFRICA	747	1 062	1 373	1 521	1 697	2 131	2 963
MIDDLE EAST	1 527	1 944	2 211	2 892	3 105	4 994	7 238
OTHERS	1 417	2 829	3 586	4 146	5 248	6 540	8 315
TOTAL	**12 959**	**21 637**	**27 775**	**31 334**	**36 059**	**47 253**	**63 121**

Source: Turkish Statistical Institute, 2004

Western Europe is the most important market for Turkish exports. In particular, European Union (EU) members is a country group that has a major share in it. In 2000, exports to EU (15) reached to 14.5 billion dollars. At the end of 2004 exports to EU (15) reached to 32.5 billion dollars. Exports to USA which were 968 million dollars in 1990, increased to 1.5 billion dollars in 1995 and 3.1 billion dollars in 2000. As of 2004, Turkey's exports to USA is 4.8 billion dollars (Table 7).

With the collapse of Soviet Union, new countries were formed in the region namely Commonwealth of Independent States (CIS). Turkey's proximity to the region and its ability to sell consumer goods that these countries need, gave an opportunity to Turkey to enhance its exports to these countries. Middle East countries are another important country group for Turkey's exports. It was 7,2 billion dollars in 2004.

Table 8: Turkey's Imports By Country Groups

Imports by Country Groups ($ Million)							
	1990	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**
EU (25)	10 219	17 255	27 388	18 949	24 519	33 495	45 428
EU (15)	9 898	16 861	26 610	18 280	23 321	31 696	42 347
EFTA	597	892	1 155	1 481	2 512	3 396	3 890
NORTH AMERICA	2 464	4 017	4 167	3 390	3 421	3 741	5 066
USA	2 282	3 724	3 911	3 261	3 099	3 496	4 697
CIS	1 247	3 315	5 693	4 630	5 555	7 777	12 886
RUSSIA		2 082	3 887	3 436	3 892	5 451	9 027
LATIN AMERICA	546	704	620	447	635	1 169	1 470
AFRICA	1 336	1 384	2 714	2 819	2 696	3 338	4 781
MIDDLE EAST	2 513	2 645	3 122	2 811	2 983	4 059	5 139
OTHERS	3 380	5 497	9 643	6 872	9 234	12 365	18 880
TOTAL	**22 302**	**35 709**	**54 503**	**41 399**	**51 554**	**69 340**	**97 540**

Source: Turkish Statistical Institute, 2004

European Countries have an important share in Turkey's imports, largely due to their geographical proximity to Turkey and their level of economic development. Among the country groups of Europe, European Union Members are in the first rank. EU is followed by CIS because of the imports of crude oil and natural gas from that region. Middle East countries is in the third place in Turkey's imports because of the imports of crude oil.

2.6. Containerazation and Turkey's Role in Container Transportation

Container traffic is distributed unevenly between the Far East (45%), Europe (23%), North America (16%), Near and Middle East (6%), Central and South America (4%), and Africa (3%) (see the Web Portal of Worldbank).

When container transportation in Mediterranean is considered, it obvious that ports on the Mediterranean coast will play an indispensable role for trade between related countries in the region and Asia, especially with China as a growing economy in that region. Increasing trade between east and west as an coincidence of EU enlargement and growth of Asian economy, increases the importance of Turkish ports at the region.

Container routes within Turkey can be stated as follows: (1) Northern Europe: Containerized cargo is carried by the vessels operating on the North Europe-the Mediterranean-Asia route, transshipped at Port Said and transferred to Mersin, Izmir and Istanbul by feeder services. (2) North America: Containerized cargo is carried by ships operating on the North America-the Mediterranean - Asia route, transshipped at Gioiatauro and transferred to Mersin, Izmir and Istanbul by feeder services. (3) Mediterranean Region: Containerized cargo is carried by vessels

operating on the West Mediterranean-Asia route, transshipped at Damietta and transferred to Mersin, Izmir and Istanbul by feeder services. (4) Asia Route: Containerized cargo is carried by vessels connecting Europe and Asia on the West Mediterranean-Asia route (OCDI, 2000).

Table 9: Container Traffic in TCDD ports (TEU)

Ports	1998	1999	2000	2001	2002
Haydarpasa	330 789	270 115	299 044	224 979	224 526
Derince	5087	5501	1716	1020	644
Bandırma	447	500	1138	587	4
İzmir	400 194	435 970	464 455	491 277	559 611
Mersin	241 865	244 002	304 946	306 290	365 790
İskenderun	444	379	714	30	32

Source: Chamber of Shipping, 2002, 2003, Esmer, 2003.

Table 9 represents the container traffic in TCDD port in Turkey. Total container traffic in Mediterranean in 1998 was roughly 19.3 million TEU, with a growth rate of roughly 12,9 % a year since 1990 (Francesetti; Foschi, 2001, p.322). It is worth noting that no later than 1986 the throughput of TEU in the Mediterranean was no more than 4,838 thousand. This had risen to 22 million by the year 2000, and is expected to rise to 30 million TEU by 2005 and 50 million TEU by 2014 (Drewry Shipping Consultants Ltd, 2000).

As far as the developments in the world, East Mediterranean and Turkey are considered, container port service demand is expected to increase in Turkey (Deveci, et. al, 2004). Majority of the container trade will be achieved within Marmara Region, Aegean Region, and the Mediterranean Region in the future (see Table 10) (Deveci, et. al, 2002).

Table 10: Future Container Demand in Turkey (1,000 TEU)

	2010			2020		
Region	**High Case**	**Middle Case**	**Lowe Case**	**High Case**	**Middle Case**	**Lowe Case**
Marmara Sea	**1.550**	**1.460**	**1.370**	**2.680**	**2.400**	**2.160**
Aegean Sea	**1.020**	**960**	**890**	**1.840**	**1.650**	**1.480**
Black Sea	**170**	**160**	**140**	**500**	**460**	**410**
West Black Sea	120	110	100	340	310	280
East Black Sea	50	50	40	160	150	130
Mediterranean	**840**	**800**	**740**	**1.660**	**1.490**	**1.350**
İskenderun	140	130	120	280	250	230
Mersin	640	610	560	1.250	1.120	1.010
Antalya	60	60	60	130	120	110
TOTAL	**3.580**	**3.380**	**3.140**	**6.680**	**6.000**	**5.400**

Source: OCDI, 2000.

As it stated in the study of The Overseas Coastal Area Development Institute of Japan (OCDI) on Nationwide Port Development Master Plan, there will be a growing demand for the movement of containers in the near future and it is forecasted that the container traffic will reach to reach 6 million TEU by the year 2020 at Turkish ports (Table 11).

Table 11: Container Traffic Forecast for Turkish Sea Ports (TEU)

	2010	2015	2020
All ports	3 380 000	4 500 000	6 000 000

Source: OCDI, Study on the Nationwide Port Development Master Plan, 2000

2.7. Hub Port Potential of Turkish Ports

Ports form a vital link between a nation and the world market place. In the past, ports tended to be either simply large major ports dealing with international trade or smaller local ports serving the needs of their own hinterland. The advent of intermodal transport, which is moving goods from door-to-door using more than one mode of transport, and larger ships caused a change in the economies of international transport. Cargo began to move by feeder ships or inland transport modes to a large hub or centre ports where large fast container ships moved the containers to other strtegically located hub ports around the world. The concept of hub ports developed since it was first introduced a couple of decades ago (Deveci et. al, 2004).

Wu (1999) describes the hub port as a port that is point of intersection of main routes and sub-routes of container ship routes. A subsequent UNCTAD Report (1990) defines a hub port as one that is situated at the intersection of arterial trade routes where the main stream of container traffic splits into feeder ports (Akarsu, Kumar, 2002, p. 2).

Tongzon suggestes the key success factors for hub ports as; strategic location, high level of operational efficiency, high port connectivity, adequate infrastructure, adequate info-structure and a wide range of port services (Tongzon, 2001, p. 87). Considering the location, a port is said to be strategically located, if it has at least one of the following three characteristics: situated on the main maritime routes; situated in or near production and/or consumption centers; with natural deep water harbours, natural break-water and big waterfront and land side development

possibilities. In addition to these, a convenient geographical location is also a significant need where favorable climatic conditions prevail (Deveci et. al, 2004).

There has been serious demand for a hub port services in Turkey due to its strategic position, increasing container traffic and logistical activities, and rise in transshipment traffic in East Mediterranean. Turkey is at the mid point of road, railway, maritime and air transportation interconnecting Europe, Central Asia, Caucasus, Northern Africa and the Middle East. Due to geo-strategic position it has, Turkey has a hub port potential to facilitate regional trade and transport (Deveci et. al, 2004).

A recent study recommended three potential hub port scenarios for the nation (Tuna 2002). One alternative, shown below, is to develop a hub port in the Sea of Marmara

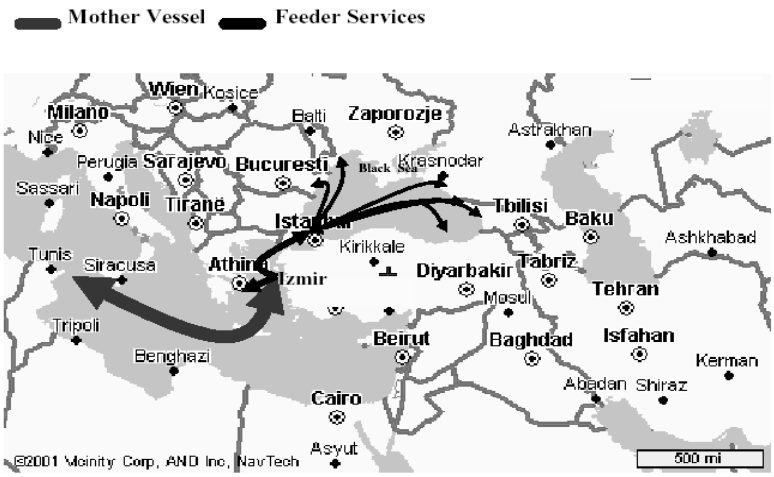
Figure 9: Alternative I – Hub Port in the Sea of Marmara

Source: OCDI, 2000

The Marmara region, one of seven regions of Turkey, is known for its vast contributions to the Turkish economy. Most of Turkey's industrial plants are located in this region and is hence the prime hinterland for the bulk of the nation's export-import cargoes. A hub port in the Sea of Marmara with mother vessel port calls, could serve the Black Sea region as well. Additionally, the anticipated Trans Caucasian Railway project that will connect Europe, the Caucasian countries and the Central Asian countries, could become an efficient artery for the movement of containers to various interior points. The biggest disadvantage of this alternative is the Marmara region's location being far away from the major Mediterranean trade lanes.

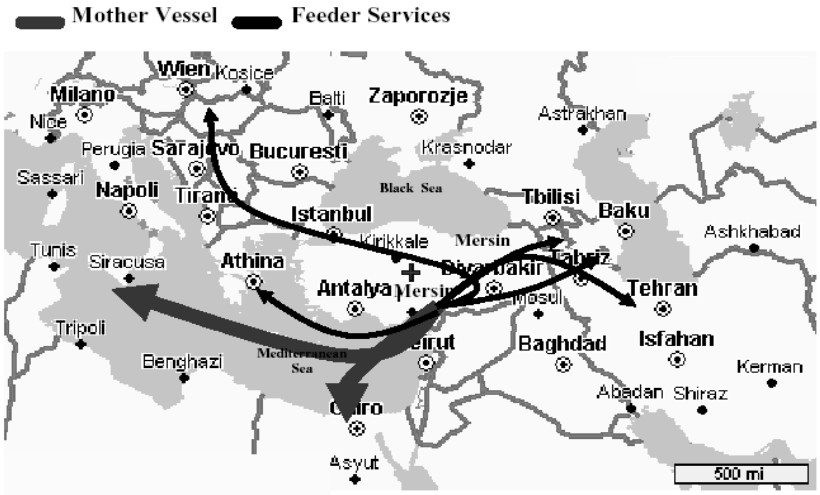
Figure 10 below shows the second alternative in which the Port of Izmir becomes the hub, serving the Sea of Marmara region, the Black Sea region as well as Greece. The port has superb road connections to its natural and extended hinterland, and appears to be a logical hub port choice.

Figure 10: Alternative I I – Hub Port in the Aegean Sea



Source: OCDI, 2000

Figure 11: Alternative III – Hub Port in the Mediterranean Sea



Source: OCDI, 2000

Figure 11 above shows the third alternative in which the Port of Mersin could be a hub port serving the Caucasian countries and the Middle East as well as the northern and eastern parts of Turkey and Greece (Akarsu, Kumar, 2002, p.8-10). Port of Mersin will benefit from the outputs of GAP Regional Development Program in terms of export container in the near future. In addition to that, Port's Free Trade Zone, rail link and easy access to International networks make it an ideal transshipment port for trade to the Middle East (Deveci, Cerit, Tuna, 2002, p. 9).

CHAPTER 3

VALUE ADDED LOGISTICS SERVICES AT PORTS

3.1. Ports as Logistics System and Part of the Supply Chain

Ports have been natural sites for transshipment in order to transfer goods from one mode of transport to another. They have historically provided the link between maritime and inland transport, and the interface between the sea and riversand roads and railways (Carbone and Martino, 2003). However; the world economy has changed thoroughly as a result of an international redistribution of labour and capital, and the process of integration and globalization of markets, production and consumption. The market developments in the world economy have affected the role and the significance of seaports. Modern seaports have become critical nodes within a complex of interacting logistics chains. Seaports have evolved from transport centers to complex logistic and industrial centers. (Huybrechts, Meersman, Van de Voorde, Van Hooydonk, Verbeke, Winkelmans, 2002, p.1). At present, ports play an important role in the management and co-ordination of materials and information flows, as the transport is an integral part of the entire supply chain (Carbone and Martino, 2003, p.305).

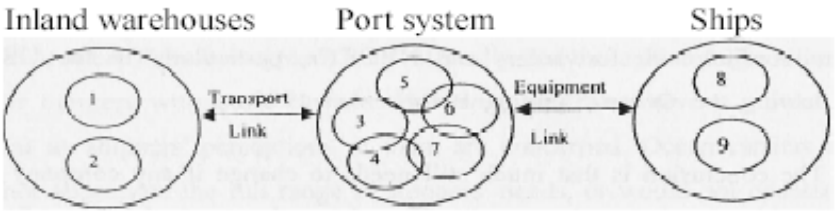
The importance of ports, as an integral part of the maritime transport system, is clear because they are critical connecting points in transferring goods between maritime and land-based modes(Müller-Jentsch, 2002). The port system not only serves as an integral component of the transport system, but is also a major sub-system of the broader production and logistics systems (Bichou and Gray, 2004, p.53). The integration of ports in the concept of logistics and supply chain

management is well argued by Bichou and Gray. Bichou and Gray (2005) conceptualised the role of ports from three perspectives. Firstly from a logistics channel perspective, the port serves as a node in the intermodal/multimodal transport intersection and operates as a logistics centre for the flow of cargo/passengers. Secondly from a trade channel perspective, the port is a key location whereby channel control and ownership can be identified and/or traded. Thirdly from a supply channel perspective, the port not only links outside flows and processes but also creates patterns and processes of its own. In this context, ports can act as networking sites bringing together other members of the supply chain (Panayides, 2006, p. 7).

3.2. Design of a Port Supply Chain

Seaports are areas where there are facilities for berthing or anchoring ships and where there is the equipment for the transfer of goods from ship to shore or ship to ship (Alderton, 1999, p. 2). The primary purpose of a port, or to be more precise a seaport, is to act as a shore facility to transfer goods to and from a ship. A typical port is equipped with quays, sheds, cranes, marshalling yards and warehouses; and is connected to inland warehouses of shippers and others by a linking system of transport such as roads and railways. Thus, a port forms the interface between sea and land, between shipping and land transport (Gray and Kim, 2002, p.139)

Figure 12: A Typical Port System

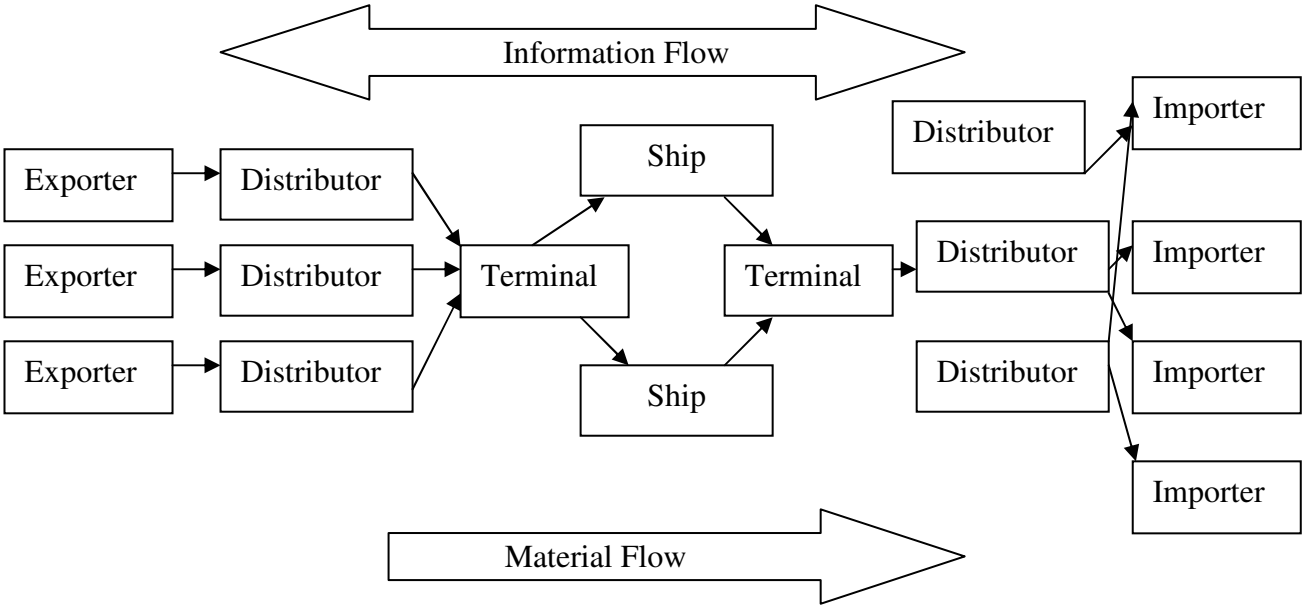


1=Exporters' warehouses
2=Importers' warehouses
3=quays
4=sheds
5=cranes
6=marshalling Yards
7=warehouses
8=container ships
9=bulk ships

Source: Gray and Kim, 2002

Figure 12 above shows a typical port system. The primary objective of a port system is to maintain an efficient and speedy flow of both goods and ships (Gray and Kim, 2002, p.140). On the other hand; a port management system consists of a ship-operation system, a cargo-moving system, storage systems, receipt and delivery systems, gate-operation systems, and management and operation information systems. As Figure 13 below illustrates a proposed port supply chain, it consists of supply chain entities, information and material flow across the supply chain, and inbound and outbound logistics with regard to export and imports operations (Lee, Park and Lee D., 2003, p. 245).

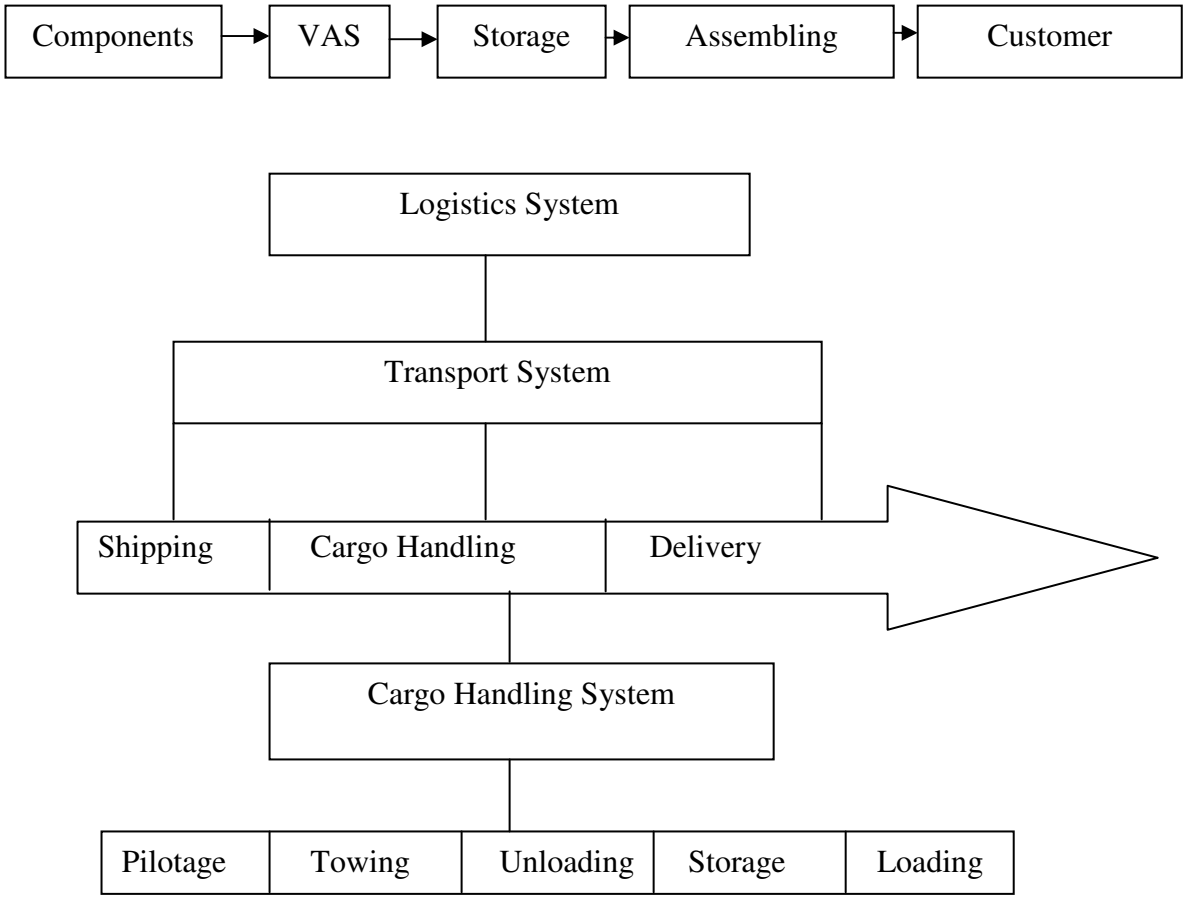
Figure 13: Diagram of a Port Supply Chain



Source: Lee, Park and Lee, 2003

Figure 14 below has to be interpreted starting from the lower part (cargo handling system, part of the transport system) which shows the traditional function and role played by ports. The second step, at the upper level, that is the logistics system, is the area where the added value services can display their effectiveness, thus giving a port a prominent role in a given supply chain. The cargo handling system consists of all activities, such as pilotage, towing and stevedoring, that facilitate the loading and unloading cargoes. Cargo handling is strongly linked to the transport system and is part of the logistics system, since logistics encompasses transport. The necessity of temporary storage in ports and the presence of efficient transport services make ports potentially attractive locations for logistics activities (Carbone, Martino, 2003, p. 310).

Figure 14: The Relation between Cargo Handling, Transport and Logistics



Source: Carbone, Martino. 2003

3.3. Port Services

Since the early 1990s, EU institutions have been active in reinforcing quality in port services and creating a 'level playing field' between and within EU ports (Chlomoudis and Pallis, 2002a). In 1997, Commission of European Union (CEU) announced Green Paper on seaports. The 1997 Green Paper on seaports and maritime infrastructure (CEU, 1997) launched a wide-ranging debate on port issues and possible policies that aimed at increasing efficiency and improving infrastructure. Among other issues, the European Commission advocated the need to enhance access to the market of port services in the main European ports with

international traffic. The Commission divided port services into three catogories. Firstly, technical–navigational services regarding: (a) pilotage, (b) towage, and (c) mooring. Secondly, cargo-handling services including: (a) stevedoring, stowage, transshipment, and other intra-terminal transport, (b) storage, depot, and warehousing, depending on cargo categories, and (c) cargo consolidation. Thirdly, passenger services, including embarkation and disembarkation (Pallis and Vaggelas, 2005, p.118).

Ports provide a range of services and facilities: pilotage, towage, mooring, cargo-handling, storage, etc. They also offer ancillary services, such as fire-fighting, bunkering, water supply and waste-reception facilities. Depending on the port, these services are provided either as a comprehensive package or separately, either on request or automatically.

As to cargo-related services, cargo-handling has been one of the activities most profoundly affected by technological development and inter-port competition. The market trend is towards capital concentration, specialisation and vertical integration. The provision of these services is gradually being transferred from the public to the private sector in order to increase efficiency and reduce public expenditure on port labour costs. With regard to services related to the ship, the Green Paper distinguishes between:

pilotage, a characteristic example of a mandatory technical-nautical service organised on a monopoly basis in most European ports;

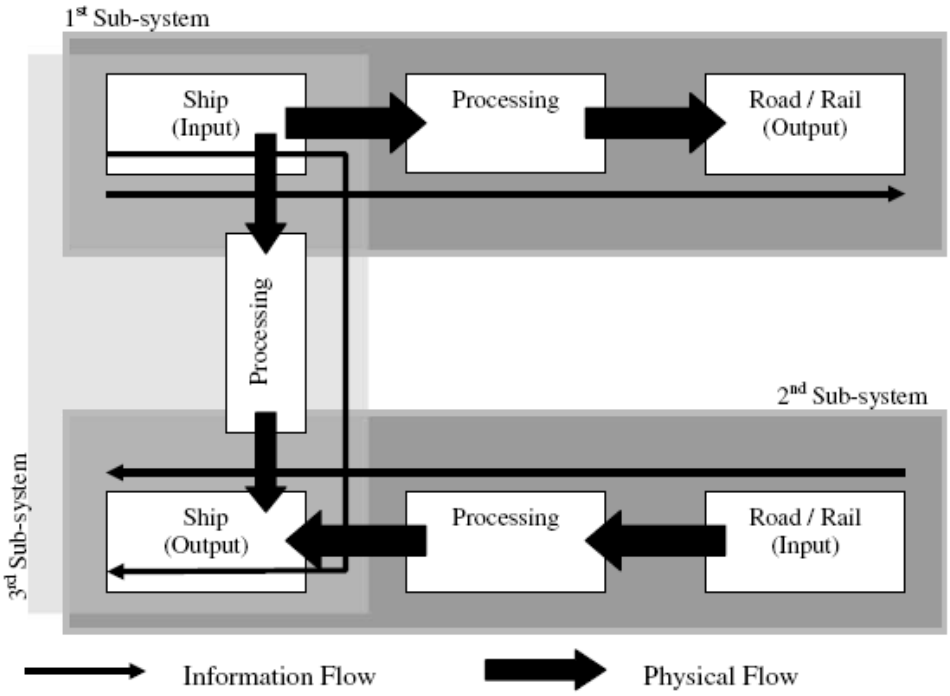
towing and mooring services, provided by either the public or private sector on a voluntary or mandatory basis, exclusively or in competition with other operators (http://europa.eu/scadplus/leg/en/lvb/l24163.htm).

Three flows representing the different activities performed in a container terminal are identified: (1) the import flow where a container arrives by sea and leaves by road/rail; (2) the export flow where a container arrives by road/rail and leaves by sea; and (3) a transhipment flow where freight arrives and departs by sea. To carry out the operations required by the flows which showed on the following page, container terminals are divided into three areas, each of which is equipped with its own materials handling system, and linked by transfer cycles. These areas are: (1) the marine side interface or quay area, (2) the stacking yard or container yard area and (3) the landside interface or in/out gates area (Rebollo et al, 2000a, b; Degano et al, 2001; Chung et al, 2002; Henesey, 2002; Henesey et al, 2002; Corona et al, 2003)

The marine side interface focuses on loading/unloading containers to/from ships. Depending on the size of the terminal, the quayside, where vessels are berthed, is made up of one or several quays. The number of quay cranes (gantry cranes or portainers) used to perform the operation varies according to the size of containerships and the volume of containers being handled. Every quay crane is served by a number of prime movers such as straddle carriers, reachstackers, forklifts, automated guided vehicles, tractors and mafi trailers, or any other vehicles capable of lifting container units and transferring them to the next stage of their logistics process. Besides this equipment, the marine side interface is provided with

a marshalling area where containers are placed while waiting for the materials handling equipment, when this is not immediately available.

Figure 15: The Sub-Systems of Port Logistic Systems

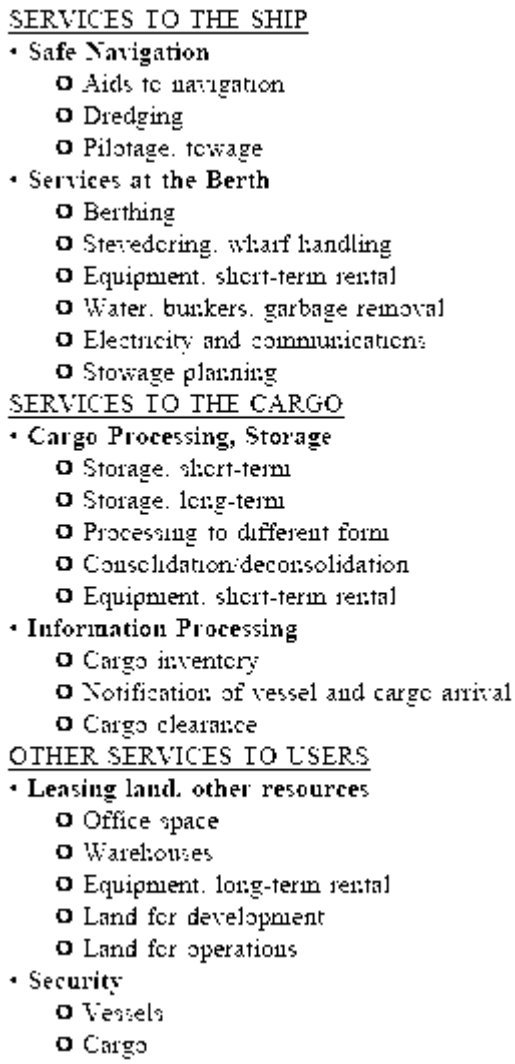


Source: Paixao and Marlow (2003), Casaca (2003)

A marshalling area increases the productivity of gantry cranes and reduces the total container loading time. The stacking yard area is where containers are stacked/stored awaiting to be moved onto the next stage of the transport chain. To carry out these activities, the stacking yard area is furnished with dedicated equipment, inter alia tractor–trailer units, transtainers, straddle-carriers, reach-stackers, mobile lift frames, forklift trucks, and automatic guided vehicles. The landside interface is where the connection to the other transport modes lies.

Depending on the terminal infrastructure, containers can either arrive/be dispatched by rail or by road (Paixao, Casaca, 2005).

Figure 16: Port Services



Source: UNCTAD, 1995

On the other hand, Unctad Strategic Port Pricing Report (1995) defines the port services as the Figure 16 above. Services can be divide into three catagories like services to the ship, services to the cargo and other related services to users.

3.4. Port Generation

Since the Second World War, ports have been going through an evolution which UNCTAD refers to as generations. The concept of ports as nodal points along a transport chain has driven UNCTAD (1992) to classify ports into generations. The generation of a port reflects whether the approach adopted by port authorities/operators in developing their activities is likely to be reactive or proactive. These activities start with the traditional ones (cargo loading and discharging) and end up with the establishment of a wide range of logistics and value-added activities, developed in conjunction with industrial and commercial businesses (Paxia and Marlow, 2003, p.1).

3.4.1. First Generation Ports

Until 1960, ports played a simple role as the junction between sea and inland transportation systems. At that time, the main activities in the port region were cargo handling and cargo stroge, leaving other activities extremely unrepresented. It was enough to develop and invest in only port facilities, as the main functions of the port were cargo handling, storage and navigation assistance. It was for these reasons that important changes in transportation technology were neglected (UNESCAP, 2002). Ports were considered to operate in isolation where they acted as an interface between land and sea transport. A similar isolation would exist between the port and the surrounding municipality with little co-operation taking place (Beresford, Garner, Pettit, et. al., 2003).

3.4.2. The Second Generation Ports

At this level of development, ports are recognized as having a broad range of functions and act as transport, industrial and commercial service centers. The scope of activities in which a port is involved would be extended to commercial activities which add value to the cargoes. Additionally, industrial facilities would be built up which extend towards the port's hinterland (Beresford, Garner, Pettit, et. al., 2003). The second generation ports are those built between 1960 and 1980, and had a system comprising of government and port authority, so the port service providers could understand each other and cooperate for mutual interests. The activities in these ports were expanded ranging from packaging, labeling to physical distribution. Compared to first generation ports, the second generation generation ports have a characteristic that freight forwarders and cargo owners had a tighter relationship (UNESCAP, 2002).

3.4.3. The Third Generation Ports

Ports used in container transportation are usually called third generation ports. These ports emerged in 1980s, principillay due to the worldwide scale containerization and intermodalism combined with the growing requirements of international trade (Alderton, 1999, p.100). From 1980, container transportation has been developed quickly, and the new intermodal transport system emerged. The activities of production and transportation have linkage to form an international network. The former services function has been enlarged to include logistics and distribution services (UNESCAP,2002). Ports, by the 1980s, had become dynamic nodes in the complex international prosuction/distribution network and port management had moved to a proactive approach in order to develop into integrated

transport centers and logistics platforms for international trade. At this stage of development it was recognized that conventional services were being handled by modern equipment and information technology had become more prominent (Beresford, Garner, Pettit, et. al, 2003). The Table 12 on the following page indicates the port generation model.

However, the development of logistics within the service industry and the development of strategies within the port industry have led UNCTAD (1999), Marlow and Paixao (2001), and Paixao and Marlow (2003) to suggest that ports ought to evolve into 4th generation ones. The latter authors went further to propose that ports should develop the concepts of the lean port and a lean ports network through partnerships and become more agile; these ideas are far wider than the simple merger of ports proposed by UNCTAD in 1999. In effect, Paixao and Marlow have suggested that ports should become providers of transport solutions. By evolving in this direction, ports would become more organised and active and by becoming centres of excellence they would be able to apply contemporary logistics trends such as just-in-time, leanness, collaborative attitudes, and agility, which helps them to streamline their operational processes. Activities that create waste and end up creating the so-called friction costs, as presented by the Commission of the European Communities (1997) are eliminated; port processes will embrace activities that either create value or are necessary to the development of the first ones and create synergies (Paixao, Casaca, 2005).

Table 12: UNCTAD Port Generation Model

	First generation	Second generation	Third generation
Start period:	Before 1960s	After 1960s	After 1980s
Principal cargo	Conventional cargo	Conventional cargo and bulk cargo	Bulk and unit cargo containerization
The port development position and development strategy	Conservative junction point of the sea and inland transportation	Expansionism transportation and production centre	Industrial principle international trade base chain connecting transportation system
Activity scope	(1) Cargo handling, storage, navigation assistance-pier and	(1) + (2) Cargo type change (distribution processing), ship related industry - enlargement of port regions	(1)+ (2) + (1) Cargo information, cargo distribution, logistics activity – Formation of the terminal and distribution centres
Structure formation and specifics	- Everybody acts individually in the port - Port and its users maintain informal relations.	- Relations between port and its users become more close - Emergence of the slight correlation among port activities - Negative cooperation relations between port and self-governing community	- Formation of the port cooperation system - Trade and transportation chain concentration in the port - Relations between port and self-governing community become more closer - Extension of the port structure
Character of the productivity	- Invention of the cargo distribution - Individual supply of the simple services - Low value added	- Invention of the cargo distribution - Cargo processing - Complex services - Increase of the value added	- The flow of the cargo and information - Distribution of the cargo and information - Combination of the diversified services and distribution - Value added
Core factors	Labour/capital	Capital	Technology and know-how

Source: Modified from UNCTAD, Port Marketing and the Challenge of the Third Generation Port, 1992.

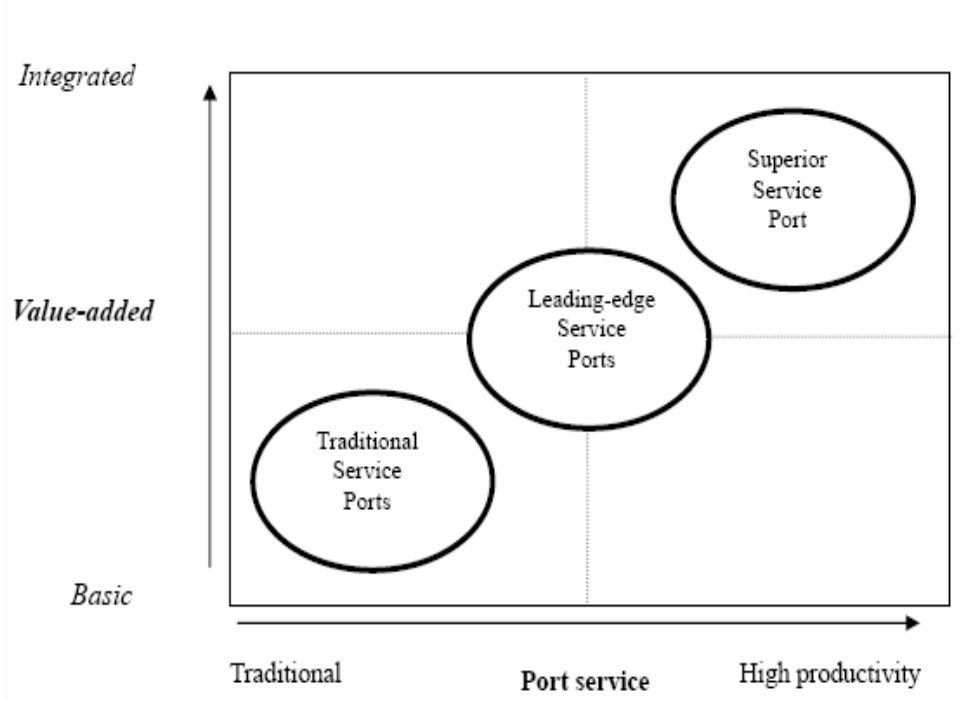
3.5. Changing Role of Ports: From Traditional Services to Value-Added Logistics Services

The traditional conception of the port as a 'gate' that facilitates the uninterrupted flow of transport has been gradually replaced by one conceiving ports operating as logistics centers that provide complementary services to the transport process (Constantinos, Athanasios, 2002, p.136). While ports have always been important nodes in the logistics system, globalization of production has sharpened the need for ports to be value adders, not value subtractors in the supply chain and has given ports a unique opportunity to become value-adding entities (WB Module 2, 2001, p.20). In the past the geographical location of the port, the depth of the port's navigational channel or the security offered by its harbour, handling operations were often enough to provide a competitive advantage. Today, competitive advantage must be derived from providing better services to vessels and cargoes using the port. This can be accomplished through cost leadership or service differentiation. With the former, the port attempts to become the lowest-cost provider of services or facilities; with the latter, the port seeks to offer services and facilities of superior quality (UNCTAD, 1995, p.4).

As major gateways for maritime trade, many ports are taking advantage of their strategic position in the logistics chain by offering numerous additional value-added services. These not only add value to the cargo they handle but can also greatly increase the prosperity of the port. They not only can include the traditional port storage facilities but may also include setting up such services as distribution and market preparation centres (Alderton, 1999, p.150–151). Studies show that the most successful ports are those that not only have a productivity advantage in

cargo-handling services, but that also offer value-added services. Thus, there are several available options for ports to choose from, as shown in the simple matrix in Figure 17.

Figure 17: Matrix of Competitive Advantage



Source: UNESCAP, 2002.

The matrix distinguishes the ports as traditional service ports, leading-edge service ports: these are the ports that are on their way to becoming superior service ports; and superior service ports. The left side of the matrix indicates the value added services provided by a port and the right side the traditional ones. The ports providing traditional services in the bottom left hand corner of the matrix are indistinguishable from their competitors. The only option for such ports is to move to the right side of the matrix, toward productivity-advantage leadership, or to move upwards, towards value-added service leadership (UNESCAP, 2002, p. 22).

Over the past 20 years, the world trade has increased with globalization. Competition among ports around the world has increased dramatically. According to "UNCTAD Port Pricing Report" (1995), increased competition has forced port managers to give priority to users' needs and to assess their added value received from port services and facilities. This value is related to the increase in value of the cargo as a result of its being moved from its place of origin to its destination (UNCTAD Report, 1995, p.3).

Council of Supply Chain Management Professinals (CSCMP) defines value adding as assessing the relative value of activities according to how they contribute to customer value or to meeting an organization's needs. The degree of contribution reflects the influence of an activity's cost driver(s). Walters and Lancaster (2000) describes value as a preferred combination of benefits with acquisition costs.

For the shipper, the value-producing activities are the movement, storage and possible intermediate processing of the cargo. The value of these activities is associated with the delivery of the cargo to the buyer in a specific condition and within a specified time. The cost to shippers is associated with the tariffs charged for each service, any losses as a result of cargo movement, and the duration of the process and timeliness of delivery.

For shipowners and transport operators, the value-producing activities are the collection and distribution of cargoes, the line-haul movement and the intermodal transfers. The value of such activities derives from the increase in value of the cargo when delivered to the buyer at a specific time. Costs include not only

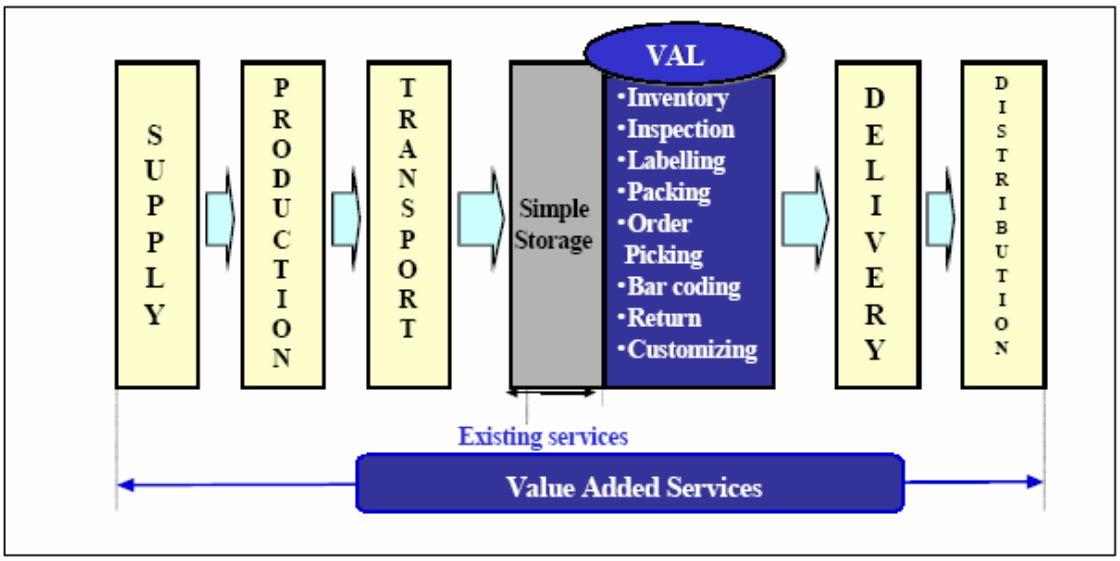
the operating and capital costs of vessels and other vehicles but also the opportunity cost of not deploying them for other ends.

For the port, the value-producing activities range from basic cargo-handling and storage activities to cargo documentation and cargo tracking. The value provided to shippers is derived from the transfer of cargo between modes within a given time and in a specified condition. The port may increase this value by reducing the time required to move cargo through the port without loss or damage. The value provided to ship and transport operators derives from the speedy and careful handling of cargo to and from vessels and vehicles within a predictable lapse of time. The port increases this value by reducing the turn-around time of vessels and vehicles and by increasing their security and that of their cargoes. Ports have also sought to extend this value chain by providing other logistics services, such as the coordination of land transport services, inland storage and distribution/collection services.

There is a significant number of activities which can be classified as value added services in the field of logistics. In an effort to assses the logistics potential of ports, Harding and Juhel (1997) distinguish between General Logistics Services (GLS) and Value-added activities or Logistics (VAL), with the latter being a common feature of containerized and general cargo (Bichou and Gray, 2004, p. 50). GLS are storage, loading/unloading, stripping/stuffing, groupage, consolidation, distribution. These are the more traditional logistics activities, and do not directly affect the nature of the product as it moves through the port (World Bank, Module 3, 2002). VAL are repackaging, customizing, assembly, quality control, testing,

repair, etc. (Juhel,1999). Little (2003) descirbes value added services as additional activities such as assembling, processing, labeling etc. before cargo is transported to inland areas or shipped for other countries. This is a combination of logistics and industrial activities. Tuna (2001) argues that value added services at a modern port can be like cargo consolidation and deconsolidation, stuffing/unstuffing containers, palletizing, packaging/repackaging, labelling, weighing, barcoding, etc.

Figure 18: Value Added Logistics Services in Port Area

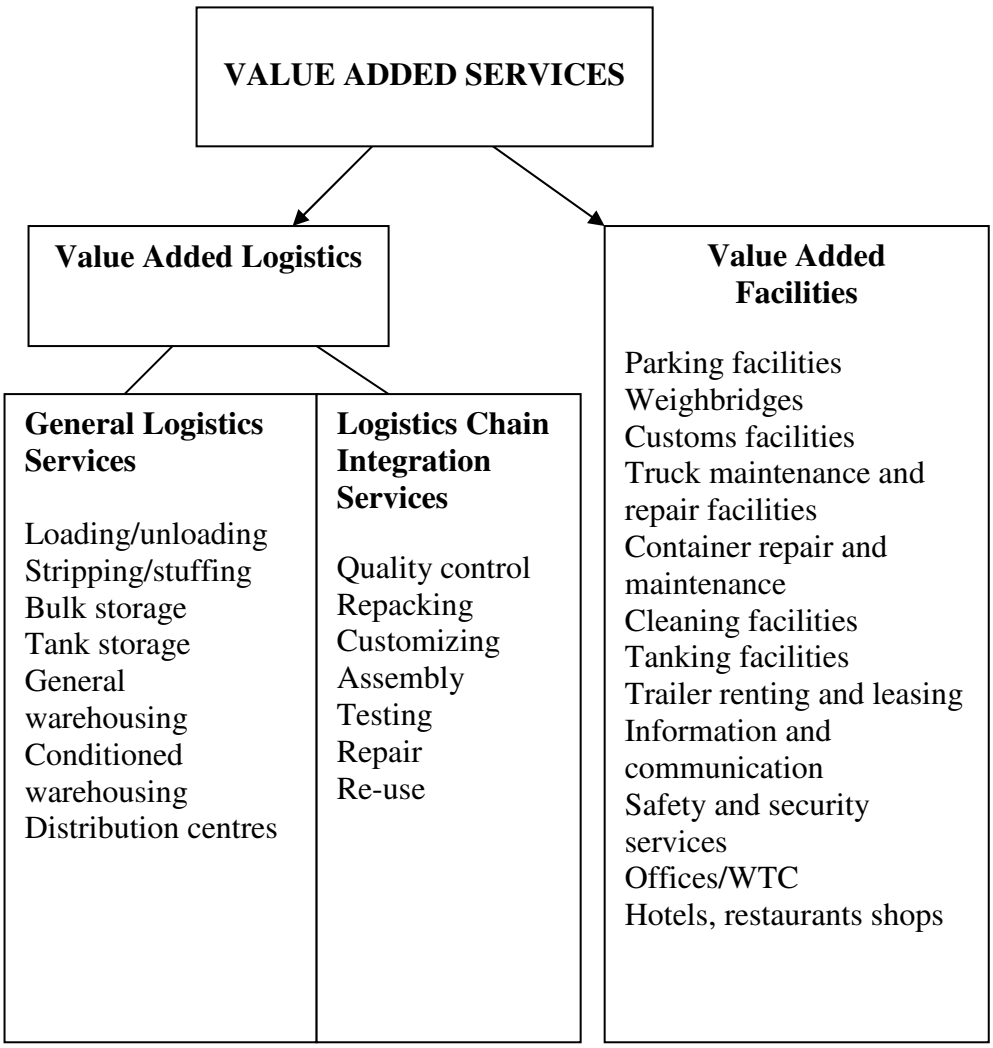


Source: UNESCAP, 2002

Both logistics companies and shippers agree that value added services in logistics centres are important in supply chain management, and this tendency is expected to continue in the future. Figure 18 shows that VAL services encompass far more roles and functions than the existing services. In many cases, these services overlap or include third-party services, such as inventory management, inspection, labeling, packing, barcoding, order picking and reverse logistics etc (UNESCAP,2002, p.27).

On the other hand, value added services are described in World Bank Port Reform Toolkit as it seen in Figure 19. Value added services can roughly be divided into logistics activities strictly speaking, and general value added services. General logistics services are storage, loading/unloading, stripping/stuffing, groupage, consolidation, distribution. Beyond these traditional activities, more complex Logistics Chain Integration Services (LCIS) are being developed. To carry out activities that manufacturers do not consider part of their core business, logistics service providers may take overparts of the production chain (e.g. assembly, quality control, customizing and packing) and after sales services (e.g. repair and re-use) (WB,2002 p.26). However; LCIS are only appropriate for certain types of goods. The products that have the highest potential to benefit from such services include: consumer electronics, pharmaceutics, chemical products (except for those carried in bulk), clothing, cosmetics and personal care products, food, machinery and control engineering products. The second group of Value Added Services; Value Added Facilities (VAF) is very diverse. These types of activities cannot generally be assigned to a particular type of product or freight flow.

Figure 19: Value Added Services



Source: WB, Port Reform Toolkit, Module 3

It is possible, however, to impute a certain "VAF-potential" by analyzing freight flows such as dry and liquid bulk, general cargo, containerized cargo and roll-on/roll-off (Ro-Ro). A large container throughput might create the economic basis for establishing container repair facilities; handling vast quantities of chemicals requires port reception facilities; substantial roll-on/roll-off traffic (Ro-Ro) might justify truck maintenance and repair shops. Value Added Facilities, such

as tanking, cleaning, repair, parking, security, renting and leasing facilities have a better potential to serve the containerized goods. Dry and liquid bulk flows have the lowest potential for both VAL and VAF (WB, 2002,Module 3, p.27).

3.5.1. Assembly

Assembly is often cited as the semi-manufacturing function of logistics centres behind port areas. With a decrease in the travelling frequency between factory and warehouse, the shipper's interest in assembly activities seems poised to increase considerably. Supporting this trend, a new type of logistics centre, called a "manufacturing type warehouse," is emerging throughout the world to provide assembly facilities for customers dispatching cargo.

3.5.2. Quality control

Recently, logistics centres have been providing quality control and product testing services in addition to assembly services. Quality control and product testing services are expected to prosper both globally and domestically.

3.5.3. Packaging / Repackaging

Logistics centres have been introducing packaging functions as well. Packaging is also associated with postponement and breaking bulk, and is usually discussed as an aspect of materials handling, e.g. container packaging and handling operations. Postponement refers to the deliberate delay of an activity until the last possible moment, particularly when making a general product into a customer/country specific product, e.g. adding a special label or packaging. In this context, breaking bulk can be considered as a variation of postponement when it

proves cheaper to transport commodities in bulk over long distances than in consumer-ready packaging.

3.5.4. Localizing and Customizing

In international logistics, shippers are placing greater emphasis not only on the quality of goods but also on customer needs and country requirements. Recognizing this new shipper's demand for customizing some shippers have resorted to providing these services by offering unique offers.

3.5.5. Installation and instruction

Recently, installation and instruction services have emerged as important functions in logistics centres. Shippers have either independently or jointly designated some space in the logistics centres for installing goods at the warehouse, which they have received from the suppliers. Some logistics centres have also become involved in education and instruction and turned themselves into similar customer service centres for end users.

3.5.6. Product Training on Customer's Premises

Increasingly, customers are demanding that logistics centres provide product-training services on their own premises. This trend is particularly noticeable in the case of electronics companies. Customers are using logistics centres to offer more flexible service offerings and reduce the cost of personnel training (UNESCAP, 2002, p.28).

Modern and efficient ports are necessary and powerful tools for facilitating and fostering trade and development and more so at a time of globalization of trade. Nowadays, ports must offer efficient and reliable services to ships and cargo, including communication systems, documentation and customs procedures, to allow the timely flow of goods through the transport chain which has, in fact, become a production chain. To assist in this flow, some countries have developed distribution or logistics centers in the port area which are used for the storage, preparation and transformation of cargo (Juhel,1999). Ports can experience synergistic benefits from the logistics centres to provide value-added services. It is advantageous for a port to also be a logistics centre, since the logistics centre can attract cargo that can be shipped through the port. There is a positive correlation between cargo flows at the logistics centre and the number of ships calling at the port. In other words, the cargo attracts the ships, and the ships attract the cargo. The port benefits by generating increased revenue and creating jobs. The port can profit not only from the logistics centre itself, but also from the increased flow of cargo through the port. Thus, an ideal port should provide a diverse range of services that are highly integrated (UNESCAP,2002).

The pressures of VAL services in the logistics chain have increased the demands of logistics centre behind port areas. The advanced ports around the world have continuously emphasized the function of logistics centres mainly due to the high degree of global production and the need for VAL services. Therefore; when logistics centres are grouped together in a common dedicated area, it is sometimes called a Distripark (distribution park) (UNESCAP,2002). In the early-1990s, ports invested heavily in the development of distriparks, to provide a favorable

environment for VAL and VAF. Harding and Juhel (1997) also highlight the increasing role of ports as 'distriparks' or dedicated areas for both GLS and VAL. A Distripark is an area where companies are established to perform trade and transport related value added services (WB, Module 3, 2002). Therefore, a Distripark is a large-scale, advanced, value-added logistics complex with comprehensive facilities for distribution operations at a single location, which is connected directly to container terminals and multimodal transport facilities for transit shipment, employing the latest information and telecommunication technology. Distriparks provide space for warehousing and forwarding facilities, including the storage and transshipment of cargo and the stuffing and stripping of containers (UNESCAP,2002).

3.6. Cases of the Leading Ports in Developing Logistics Centers

The overall benefits of having a logistics centre for providing value-added logistics services are evident in the examples of successful logistics centres at the ports of Rotterdam and Singapore (UNESCAP,2002).

3.6.1. Port of Rotterdam as an European Logistics Centre

Rotterdam, the biggest European port, is also a pioneer in distribution activities, with the distriparks of Eemhaven, Botlek and, more recently, Maasvlakte (Ferrari, Parola, Morchio, 2006, p.65). Every year the port handles more than 350 million tonnes of cargo. The port is perfectly geared to simultaneously handling chemicals, ore, liquid bulk, dry bulk, vehicles, general cargo, cold cargoes, food stuffs and containers (http://www.portofrotterdam.com).

Rotterdam owes its position as European container mainport to a vast number of factors, such as:

- excellent accessibility, also for the most recent generations of container ships;

  nautical safety;
- dedicated terminal facilities, both on the landside and the waterside;
- European transport hub function;
- excellent hinterland connections, especially via inland vessel, short sea/feeder and rail; for more information click Transport
- possibilities for expansion and setting up new operations;
- fast turnaround times;
- attractive location for bunkering, among other things as a result of competitive tariffs

The port has no draft limitations and can accommodate both current and future larger-scale container vessels, 24 hours a day and seven days a week. Many deep sea shipping lines opt for Rotterdam as their first and / or last port of call in Europe. And use it as their feedering hub for the UK, the Baltic and the Iberian peninsula. Efficient interfaces with all important modalities ensure efficient hinterland transport.

The port is more than just a link in the logistics chain. The intercontinental services of almost all of the major mega-carriers include Rotterdam. For many shipping companies, Rotterdam is both the first and last port of call in Europe. Whether it's pre-transport and post-transport, the handling of Customs formalities or the processing of cargo in the Distriparks The Customs in Rotterdam is

committed to providing the best possible service for importers and exporters. There are attractive tax incentives for foreign companies setting up in the Netherlands. And, last but not least, Rotterdam offers a large, well-educated and motivated workforce. (http://www.portofrotterdam.com).

From the beginnings of containerization in the early 1960s, the Port of Rotterdam gasped the opportunities this new transportation system offered, investing heavily in handling facilities and equipment for efficient transhipment of containers to inland modes of transport. Another strategic advantage for the Port of Rotterdam has been its ability to accommodate the largest bulk ships, which has enabled large container vessels to call upon the Port of Rotterdam without any difficulties. This superior maritime infrastructure enabled not only the establishment of transhipment points and storage facilities but also the emergence of a chemical cluster around the Port of Rotterdam.

Because of its basic logistics infrastructure and liberalization of transport services and logistics trends, the Port of Rotterdam can be classified as a logistics super hub. The European Logistics Centres (ELCs), though located throughout the Netherlands, are some of the best examples in the world of logistics activities that are linked to a port.

ELC is a major trend in European logistics, not only for multinationals but also for medium-sized enterprises, many of which are setting up their logistics centres in the European market. Nowadays, most of these firms adopt centralization of Europe-wide distribution that brings many logistical and other advantages to the

firms involved, including reduction of logistics costs, increased sales, improved control, better product availability, enhanced competitive position, faster market response, as well as savings on workforce and infrastructure investment. In many places the distribution centres have clustered in Distriparks. Distriparks are the Port of Rotterdam's response to the growing demands on shippers and transport service providers for just-in-time distribution at lower cost (UNESCAP, 2002, p.41).

The Municipal Port Management of Rotterdam encouraged the formation of Distriparks in order to consolidate cargo flows to the port and create port-related employment. Cargo destined for the Rotterdam Distriparks comes in mainly by container. Therefore, the proximity of a container terminal is an advantage for a distribution centre in Rotterdam. The concept of the Rotterdam Distriparks is just-in-time delivery at lower cost. To fulfill this mission, the parks:

- Have facilities for distribution operations
- Are located close to cargo terminals so that the empty container, after stripping, can be taken back into the system. Moreover, transport from terminal to warehouse is cheap
- Are located close to various hinterland transport facilities
- Provide value added services
- Have the latest in communication technology
- Have a highly skilled workforce
- Have Customs on site

A major advantage of the distripark concept is that the distribution centre is located very close to the cargo terminal, making transport between these two places

fast and cheap. In addition, from the distribution centre the client may choose among a variety of transport modes, depending on time pressures, costs and destinations (UNESCAP, 2002, p. 42).

Table 13: Distriparks in Port of Rotterdam

Distriparks	**Starting Date of Operations**	**Land (m2)**
Eemhaven Distripark	1989	237.000
Botlek Distripark	1990	165.000
Maasvalkte Distripark	1st phase: 1998 2nd phase: under construction	848,000 1.017.000
Total		2.267.000

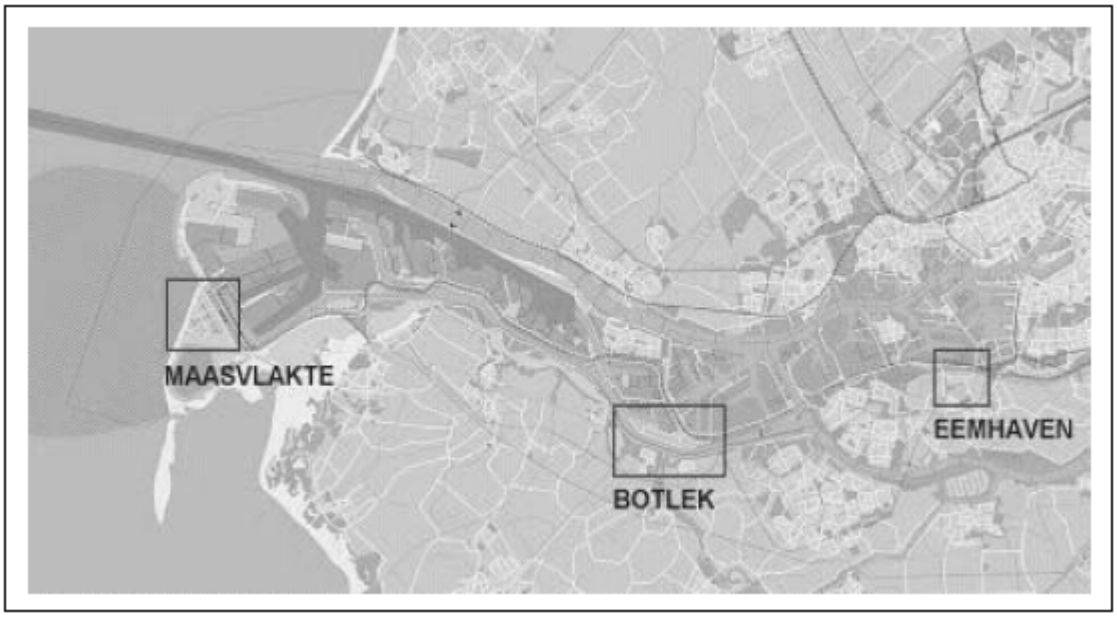
Source: Port of Rotterdam

As it stated before, three distriparks have been established in Port of Rotterdam. Table 13, illustrates the availability of land in distriparks. Each of the Distriparks has its own specific characteristics. Distripark Eemhaven specializes on high quality products; Distripark Botlek emphasis on chemicals; Distripark Maasvlakte focus on containers.

First facilities established next to the existing container terminals in the Eemhaven Region. Construction of the Botlek Distriparks followed. In the 1980s, the container-flows started to grow substantially, and Maasvlakte, a large port basin developed in the late 1960s but still empty because of the stagnation, was devoted to the container trade. In 1984, the Europe Combined Terminal (ECT), the major container-operator in the Port of Rotterdam, developed a completely new terminal

in Maasvlakte, capable of accommodating the largest container-vessels and providing the most advanced Technologies (UNESCAP,2002). Figure 20, shows the layout of Port of Rotterdam.

Figure 20: The Layout of Port of Rotterdam



Source: Port of Rotterdam

The Distriparks provide space for warehousing and forwarding facilities. Companies can, either independently or in partnership with local specialists, process their products there in accordance with customer and country requirements. The logistics service providers can act as a fiscal representative, pack and re-pack, customize products, label, test, execute quality control, sample, assemble, distribute just-in-time and take care of invoicing for their clients. The Distriparks' on-site Customs Office promptly handles import and export documentation. The concentration of facilities yields advantages in terms of both time and transport costs.

3.6.1.1. Eemhaven Distripark

Most of the companies at Distripark Eemhaven predominantly specialize in the storage and distribution of high quality products. This Distripark has a direct link with the European hinterland via the A–15 motorway, the Barge Centre, the Rail Service Centre, the Short Sea Centre (Rotterdam Short Sea Terminal), the container terminals of Hanno Rotterdam, Uniport (see the Web portal of Port of Rotterdam).

3.6.1.2. Botlek Distripark

Distripark Botlek mainly accommodates companies that concentrate on warehousing/distribution and groupage services, with a strong emphasis on chemicals. This Distripark is strategically situated at the heart of the petrochemical cluster, between the two container clusters. It has a customs office, a direct link with the A–15 motorway, an inland shipping terminal where coasters can also be handled, and two Rail Chemical Centers in the immediate vicinity. Some space is still available in existing business premises. A project developer is currently building six warehouses with a total floor area of 100.000 square meters on the last available site on this Distripark (http://www.portofrotterdam.com).

3.6.1.3. Maasvalkte Distripark

Rotterdam's latest area for distribution centers, Distripark Maasvlakte, is located right on the North Sea next to the huge Delta container complex. All the world's major container lines use these terminals, often as their first call in Europe. Distripark Maasvlakte is designed to centralize large-scale distribution activities. Distripark Maasvlakte is divided into standard 3,4-hectare plots – big enough to

accommodate a warehouse covering 20.000 square meter plus offices and all anchillary facilities (http://www.portofrotterdam.com).

Distripark Maasvlakte was completed in 1997. With a logistical park of 125 hectares, it was designed for companies seeking to centralize their distribution activities in order to gain greater control over their European distribution activities. The Port of Rotterdam designed Distripark Maasvlakte for:

• Companies wishing to set up their own European Distribution Centre;

• Mega-carriers wishing to further penetrate the logistics chain;

• Mega-distributors wishing to set up a maritime hub for their European operations;

• Other (global) logistics service providers; and

• European exporters wishing to create a maritime export hub (UNESCAP, 2002).

3.6.2. Port of Singapore as an Asian logistics centre

Singapore has emerged as the logistics leader in Asia, similar to the Netherlands' position in Europe. Singapore's port retained its ranking as the world's busiest in terms of shipping tonnage last year, according to the Maritime and Port Authority of Singapore (Asian Economic News, 2006). The port has been a cornerstone of Singapore's economy for nearly 200 years and has played a key role in Singapore's transformation into a global trading power. Much of this success is attributed to its strategic geographical location, stable government, reliable workforce, pro-business environment, transparent legal system and sound infrastructure. Annually, the port receives an average of 140.000 vessel calls. In 2004, total vessel arrivals for the year, in terms of shipping tonnage, reached 1.04

billion gross tons, crossing the one billion mark for the first time in Singapore's maritime history. It is also a world-leading hub for container transshipment, with over 20 million TEUs handled in 2004 and further growth expected. The terminals can handle over 2.000 containers per vessel routinely and turn vessels around in less than 12 hours. Singapore has been recognised as the 'Best Seaport in Asia' by the Asian Freight and Supply Chain Awards (AFSCA) many times over.

The port of Singapore consists of a number of terminals. They are located at Tanjong Pagar, Keppel, Brani, Pasir Panjang, Sembawang and Jurong, and can accommodate all types of vessels – container ships, bulk carriers, Ro-Ro ships, cargo freighters, coasters and lighters. The terminals are managed by two commercial port operators, namely The Port of Singapore Authority (PSA) and Jurong Port. PSA operates the terminals at Brani, Keppel, Pasir Panjang, Sembawang and Tanjong Pagal, which deal in container and conventional cargo. Jurong Port handles container, conventional and bulk cargo (http://www.mpa.gov).

UNCTAD Report (2002), summarizes the development of Port of Singapore as the following. Singapore has all the necessary infrastructure support. It has world-class seaports and airports, excellent infrastructure, an efficient telecommunication network, a pro-business environment, intensive use of information technology, wide-ranging logistics capabilities, as well as a skilled and professional workforce. The combination of these factors has helped Singapore to become a modern hub of international trade and a base of operations for a large number of multinational and regional companies. Over 5.000 Multinational Companies (MNCs) have chosen Singapore as their Southeast Asian

logistics/distribution hub. The logistics companies in Singapore, which number over 6.000, provide comprehensive services to the MNCs, including transport, forwarding, warehousing, and distribution. Most of them are located in distriparks.

When manufacturing began to shift from higher-cost countries like Japan to Southeast Asian countries in the 1980s, the Government of Singapore embarked on an active campaign to develop the city-state into a transshipment hub for products originating in Singapore, Malaysia, Indonesia, and Thailand. It also began to actively encourage MNCs and a number of international logistics service providers to locate in Singapore, and to establish their regional or global distribution centres in Singapore through various incentive schemes such as pioneer status, tax exemptions, and so on.

Singapore's role as an international warehousing and distribution centre was promoted intensively by Singapore's two key drivers: the Economic Development Board and the Trade Development Board. In the mid-1980s, the government agencies established a vision to develop Singapore into Asia's leading integrated logistics hub by the year 2010. The Port of Singapore Authority (PSA) has also played an instrumental role by working closely with these government agencies in promoting the growth of the logistics hub in Singapore. As the operator of the world's largest container terminal, PSA has offered a wide range of ship- and port-related services by developing centralized warehousing and distribution, which mostly offer value-added logistics services. PSA manages four major distriparks totaling 600.000 square metres of warehouse area within the Singapore distribute.

Since the 1970s, PSA has provided much needed warehousing space in the Alexandra Distripark, Pasir Panjang Distripark and Tanjong Pagar Distripark. These three distriparks are located near the container and cargo terminals and Jurong industrial hub, enabling them to facilitate the shipment of cargoes. The also serve as home to many established multinational distribution centre operators, manufacturers, traders, forwarders and others, providing them with reliable, accessible and well managed distribution centre operations that are synchronized with their supply chain operations (UNCTAD, 2002).

In July 1987, the London Metal Exchange designated Singapore as its first official delivery port outside of Europe. This action helped to stimulate metal trading in Singapore and led to the establishment of several warehouse operations for metals in Singapore. Additionally, a number of international companies have set up warehousing and distribution operations. In 1988, Nedloyd Districentre established an operation in the Jurong area. In 1993, PSA completed the Keppel Distripark within the Free Trade Zone (FTZ) to serve as a premier cargo consolidation hub and meet other major logistics needs. A wide range of customer-friendly and value-added services such as Keppel Distripark Net and the seamless transfer of cargo to and from the container terminals are also provided, expediting the consolidation of transshipment cargo out of Singapore to the region.

But the potential of warehousing and distribution was spotted much earlier. Singapore's FTZ Advisory Committee considered Singapore as being ideal for storage and the subsequent distribution of goods to the rest of Southeast Asia, because of its strategic location and liberal trading environment. The setting up of

free trade zones to facilitate entrepot trade in dutiable and quota-restricted goods also contributed to the success of Singapore as a warehousing and distribution centre.

3.6.2.1. Keppel Distripark

Keppel Distripark is an ultra-modern cargo distribution complex that provides extensive warehousing facilities. Its close proximity to the container terminals and strategic location within the city allows for easy access to the seaport, airport and industrial hubs via an extensive network of expressways. Keppel Distripark (KD) has 45 warehouse modules of covered storage totalling 113.000 sqm. KD has a 14 metre-high ceiling to support high rack automated storage and retrieval systems. The distripark provides not only conventional warehousing services such as storage and regional redistribution of cargo, but also value-added services such as bar-coding, sampling, surveying, quality assurance and control, and repackaging-and-relabeling of goods to be carried out, without the requirement for customs formalities.

3.6.2.2. Alexandra Distripark

Alexandra Distripark is the largest complex of its kind in Singapore, comprising three 11-storey blocks of factories-cumwarehouses and two 10-storey blocks of dedicated warehouse and office space. With 210.000 square metres of warehouse space, it has attracted 300 customers who wish to consolidate their warehouse, office and factory requirements. A high-floor loading deck that allows for the multiple stacking of heavy goods, a high ceiling that increases the efficiency of space usage, good vertical transfer via several banks of lifts, and ample parking

facilities for container vehicles and lorries, are some of the typical benefits that this Distripark offers.

3.6.2.3. Pasir Panjang Distripark

Pasir Panjang Distripark, located next to the main conventional terminal and new container terminal, comprises nine single-storey warehouses, and has a total warehouse area of 144.000 sqm. Its single-storey warehouse offers tenants exclusivity in operations. It is ideal for those dealing in odd-size cargo or cargo with a very fast turnover. The warehouse is supported with an ample open storage yard for heavy machinery storage and heavy lift operations. Also located in the distripark is the new three-storey Pasir Panjang Districentre, which is specially designed for high value goods that require good security, clean environment and facilities for a quick turnover. All in all, Pasir Panjang Distripark provides some 250.000 sqm of warehousing and office space.

3.6.2.4. Tanjong Pagar Distripark

Tanjong Pagar Distripark consists of two five-storey blocks providing 65.000 sqm of warehousing and office space. It is in an excellent location, adjoining the container terminals, yet on the fringe of the central business district. It is popular among companies providing regular services to retail outlets and offices in the city. Operationally, it is well-conceived and well-designed. The ground floor has 135 dock-levelers for container operations, while a dedicated platform is provided for lorry operations. Two banks of four- and six-tonne lifts serve the upper floors(UNESCAP,2002).

Table 14: Factors Influencing the Site Selection of Logistics Centres

Factors	Main features
Port infrastructure	• Adequacy of port facilities • Spaciousness of port area • Availability of feeder vessels
Land/Land prices	• Availability of land • Affordability of land prices • Low rental fees for land
Labour	• Availability of English speaking port workers • Availability of specialized technicians • Availability of trained or nor-trained technical labours • Labour costs in distribution center
Technology/Information	• Level of port information service • Supply of information infrastructure
Market factors	• Distance between port and hinterlands • Distance between port and major cities
Related industries	• Ease of access to parts and raw materials • Distance between port and industrial complex
Back-up city	• Existence of large consumer city behind port areas • Quality of workers in DC
Institutional factors	• Incentive programmes offered by host country • Simplicity, ease and efficiency of administrative procedures needed in operating distribution centres • Financial assistance in constructing distribution centres • Free trade system and related law provided by the host countries
Connecting transport System	• Airport access to provide speedy linkage between the distribution centre and major markets • Effective land transport system • Establishment of feeder service (hub and spoke system)

Source: (Korea Maritime Institute) UNESCAP, 2002

On the other hand, establishing this kind of facilities in the port area requires some considerations. According to UNESCAP Report on Commercial Development of Regional Ports as Logistics Centers (2002) which considers consultancy inputs from the Korea Transport Institute, these main considerations are port infrastructure, land avalibility of the port and land prices, labour of the port, technological infrastructure of the port, market factors and related industries which is considered in port's hinterland concept, institutional factors and connecting transport system (Table 14). Therefore, evaluating Port of Izmir in terms of the factors that are influencing the site selection of logistics centers that are dedicated to value added logistics services in port areas, may give an outcome about the

potential of the port in terms of serving value added services to the researcher. The Port of Izmir will be evaluated by these considerations on the next chapter.

CHAPTER 4

EVALUATION OF PORT OF IZMIR

4.1. General Overview of Port of Izmir

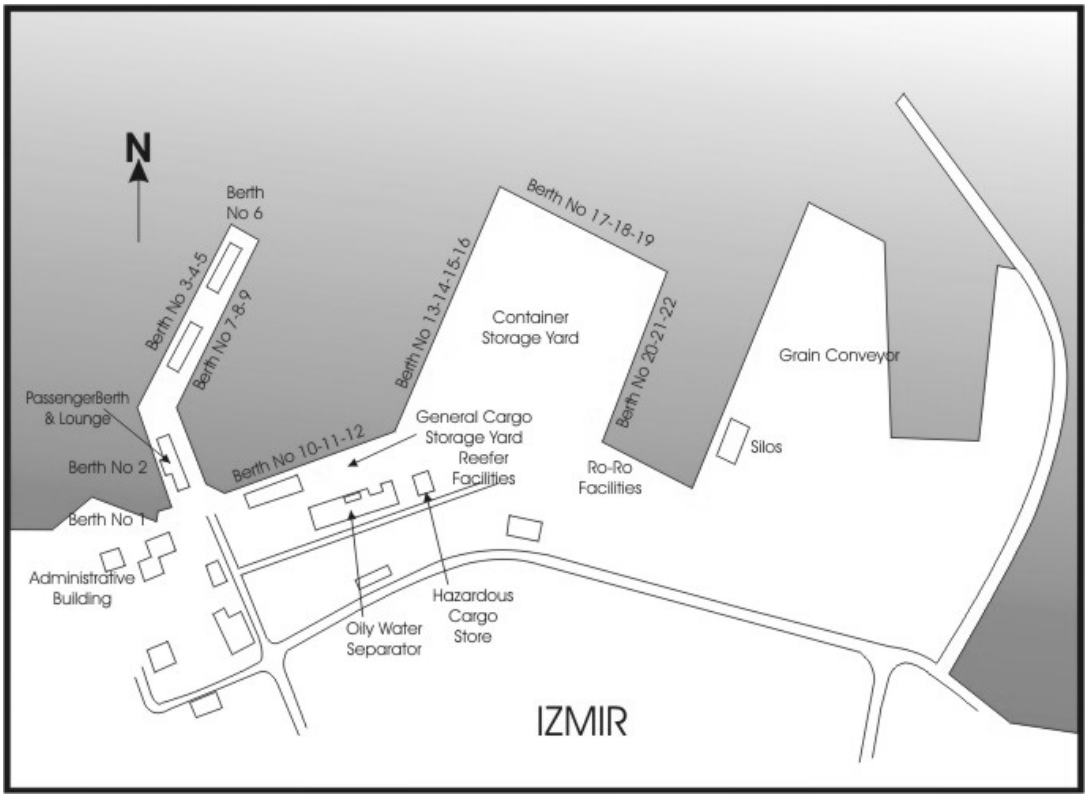
Port of Izmir has vital importance in Izmir's and country's foreign trade with its developed hinterland and geographical location. Having been owned and operated by state institution named the Turkish State Railways (TCDD), the Port of Izmir realises approximately 90% of export of Aegean Reagion as Maritime Chamber of Commerce, Izmir Branch estimates. As being the biggest container port of the Aegean Region in terms of handling capacity and cargo traffic; with its' central geographical location between West Europe and North Africa and powerful hinterland, the Port of Izmir is not only the agricultural and commerce center of Aegean Region but also has an important role in Turkish export goods (State Planning Organization, 2006).

Construction of the port begun in 1954; however, the first stage of the port was put into service in 1959. Begun to serve for passanger ships in 1968, the port's capacity was unable to satisfy increasing cargo volumes in 1970's; therefore, port enlargement projects to enhance port's capacity started with the 'Izmir Port Master Plan' prepared in 1973, and they are still in progress. The port operated by TDİ (Turkish Maritime Organization) until 1989, and then was handed over to TCDD.

The Port of Izmir constitutes three divisions: L -shape pier, land-reclaimed wharf in center and another land reclaimed wharf zones to the east (Figure 21). The pier consists of eight berth, namely NR1 to NR9, the central reclaimed zone holds

thirteen berth, NR10 to NR22, and western reclamation is provide with one marginal wharf of 503 m long (Maritime Chamber of Commerce, Izmir Branch, 2005).

Figure 21: The Layout of Port of Izmir



Source: TCDD

The length, draft and berthing capacity of the quays are shown in Table 15 below. The total length of the berth is 3.400 m with the depth of 8- 13 m. The total port area is 409.000 sqm (Maritime Chamber of Commerce, Izmir Branch, 2005).

Table 15: Quays of the Port of Izmir

Quay No	Length (m)	Draft (m)	Capacity of Berthing Vessels (number)
NR 1	140	7	120
NR 2	190	8,5	120
NR 3	130	10,5	113
NR 4	120	10,5	113
NR 5	150	10,5	113
NR 6	75	10	113
NR 7	130	10	113
NR 8	120	9,5	113
NR 9	122	9,5	113
NR 10	126	6	100
NR 11	97	7,5	100
NR 12	125	8	100
NR 13	150	9,5	120
NR 14	144	10	120
NR 15	144	10	120
NR 16	162	10	120
NR 17	150	10	120
NR 18	150	10	120
NR 19	150	10	120
NR 20	130	10,2	100
NR 21	150	10,2	100
NR 22	120	10	100
NR 23	220	10	113
NR 24	205	10	113

Source: Undersecretariat of Maritime

The port serves for general cargo, container cargo, dry bulk cargo and passengers. The container terminal has seven berths with 1.050 m berth length (Table 16) and container stacking yard covers an area of 250.000 sqm with a holding capacity of 11.000 TEU. General cargo pier has twelve berths with total quay length of 1.922 m and with depth 10.5 m. The berth serving the dry bulk traffic has 150 m (Table 16) length and depth of 10.5 m grain silos with 76.000 tones capacity are also available.

Table 16: The Berthing Capacity of the Port

	Berth Length (m)	Max Depth (m)
General Cargo	1.922	10,5
Container	1.050	13
Bulk	150	10,5
Passenger	330	10,5

Source: TCDD

The port has the berthing capacity of 3.650 vessels per year, 6.500.000 tones/year handling capacity and 11.000.000 tones/year berth capacity. As it seen in the Table 17, the port's dry bulk handling capacity is 5 million tons, while the liquid bulk is 400.000 tons. The numbers are 549.000 TEU in container handling and in 250.000 Ro- Ro ships (Undersecretariat for Maritime Affairs, 2005).

Table 17: The Handling Capacity of the Port

	Passenger	Dry Bulk(tons)	Liquid Bulk(tons)	Genaral Cargo(tons)	Container(TEU)	Ro-Ro(number)
Port Capacity	250.000	5.000.000	400.000	1.357.300	549.000	250.000

Source: Undersecretariat for Maritime Affairs

When the main cargo groups handled in the port is considered, it may be observed that the container throughput has been increasing by years. While the port handled 464.455 TEU containers in 2000, with increasing demand it reached 804.565 TEU containers in 2004. Dry bulk goods have showed a stable increase between 2.7 million tons and 3.9 million tons in the period of 2000- 2004. Tons of liquid bulk goods decreased from 266.306 tons in 2000 to 220.197 tons in 2004.

The same decrease is valid for the number of Ro-Ro ships. The Table 18 below summarizes the handled cargo groups of the port by years.

Table 18: Main Cargo Groups Handled at the Port by Year

Years	Passenger	Dry Bulk(tons)	Liquid Bulk(tons)	Genaral cargo(tons)	Container(TEU)	Ro-Ro(ships)
2000	40.021	2.795.771	266.306	417.676	464.455	7.050
2001	30.091	2.986.219	272.420	394.868	491.277	1.011
2002	20.966	3.454.532	191.910	432.633	573.231	1.338
2003	6.742	3.773.434	251.445	403.100	700.795	2.034
2004	151.896	3.945.370	220.197	427.756	804.565	2.475

Source: Undersecretariat for Maritime Affairs

Pilotage and towage services are carried out safely and efficiently by Turkish Maritime Organization with numerous vehicles and skilled personnel in the Port of Izmir. Prevention of fires at the port is guaranteed by a well equipped fire fighting services as well as city fire service near the port. The port security personnel ensure the continuous safety of the port all year round.

4.2. Port Infrastructure

The storage capacity of the port is 266.000 TEU for containers. The port has 479.205 sqm bonded area and 8.000 sqm nonbonded area. It may seen an advantage for the port to have 3.500 tons per year storage capacity of dangerous goods and 36.500 units refrigerated containers. Open storage area has the capacity of 565.000 tons per year and covered area has the capacity of 394.848 tons per year (Table 19).

Table 19: Storage Capacity of Port of Izmir

Storage Area	
Open (tons/year)	565.000
Covered (tons/year)	394.848
Bonded area sqm	479.205
Nonbonded area sqm	8.000
Dangerous goods (tons/year)	3.500
Container (TEU/years)	266.000
Refrigerated Container capacity	36.500

Source: Undersecretariat for Maritime Affairs

Operations at the Port of Izmir are carried out by 5 gantry cranes with the capacity of 50 tons, 7 berth cranes with the capacity of 3-15 tons, 12 mobile cranes, 1 floating crane with the capacity of 90 tons, 43 container forklifts, 52 general cargo forklifts, 20 reach stackers, 19 transtainers with the capacity of 40 tons, 15 trucks, 50 trailers with the capacity of 25-50 tons, 1 loader with the capacity of 3 tons (Table 20).

Table 20: Equipments of the Port of Izmir

Equipments	**Capacity**	**Number**	**Model Year**
Gantry Crane	50 tons	5	1986- 99
Berth Crane	3-15 tons	7	1960- 84
Mobile Cranes	6- 25 tons	12	1977- 83
Floating Crane	90 tons	1	
Forklifts			
Container	8- 42 tons	43	
General Cargo	2- 5 tons	52	
Reach Stackers	25-42 tons	20	1998
Transtainer	40 tons	19	
Truck		15	
Trailer	25-50 tons	50	

Source: TCDD

As it stated by the port authorities, infrastructure of the port is insufficient especially in cargo handling operations which leads to reduce the port productivity and income. Insufficient number of berth cranes, gantry cranes, mobile cranes with high tonnage capacity, forklifts in order to serve Ro-Ro ships affects the handling capacity of the port negatively.

Moreover, with a projected life span of 20 years, the container cranes were constructed in 1986 with credit funding from the World Bank. In 2006, they will reach the end of their economic lifecycle (Bates, Baltacıoglu, Kazancoglu, 2004). Broken cargo handling equipments and long acting repairment operations due to the bureaucratic obstacles of purchasing spare parts of the equipments have been causing waste of time in the port operations (www.utikad.org.tr). It may be argued that the loading and unloading operations are too long as they supposed to be because of the insufficiency of port infrastructure.

Further to that, the port has already reached its saturation point in terms of handling capacity. The port's present handling capacity is exhausted by the needs of the surrounding cities of Bursa, Canakkale, Manisa, Usak, Afyon, Aydin, Denizli as well as the area extending deep into Anatolia, its natural hinterland (Akarsu, Kumar, 2002).

Inadequateness of infrastructure and the congestion in the port area because of the increasing demand to the port results long waiting hours for the vessels to be loaded or unloaded. Due to the increasing waiting hours for the ships, the cost of the

carriages is also increased. The shipping liners have been marked up an extra fee to the freight charges as called congestion surcharge owing to the cost of wait.

On the other hand, biggest problem facing the port capacity is the inadequacy of water depth for high tonnage ships to enter the port. The port's inability to accomodate third generation container vessels causes approximately $120 million / year loss of revenue for the port as the experts estimated.

Alsancak port is located at the innermost part of the İzmir bay. This location has been ideal both as a nodal point of different transportation modes and sheltering advantage for the ships since ancient times. On the other hand, inner parts of the Izmir Bay has been filled and shoaled with the sediments transported by the rivers throughout geological periods. The gate of İzmir harbour is the Yenikale passage. The sand, mud and sediments generated by the material originating from old Gediz delta to the north of this passage restricts the entrance of ships have 13 m or more than 13 m draft (Uslu and Akyarlı, 1993).

A project named The Dredging and Enlargement of the Port of İzmir prepared by Railroad, Sea and Airports Construction Agency in 1999 as a construction of The Second Stage of the port including dredging of 6.000.000 m3 material, enlargement of 750.000 m2 land, widening the entry channel (between the İzmir harbour and Yenikale passage) of the port from 7 miles to 250 m. The new channel would have 11 km length and minimum 13.5 depths. Moreover, number of the berths would be increased. The Project would be carried out under Do-Operate-Transfer model and it is expected that it would increase the berthing capacity of the port more than 500.000 TEU.

Table 21: Construction Statistics for the Dredging and Enlargement Project

The new land area for the operations	750.000 sqm
The length of the new berth	1.060 m
The length of the new berth for the container vessels	700 m
The depth of the new berth	12 m
The annual capacity of berthing vessels	720 vessels per year
For Containers	
Stacking Area	275.000 sqm
Loading Area	42.000 sqm
Unloading Area	13.000 sqm
CFS Area	20.000 sqm
Total	350.000 sqm

Source: Maritime Chamber of Commerce

The Project also implies construction of 275.000 sqm stacking area, 42.000 sqm loading and 13.000 sqm unloading area (Table 21) for the containers at the back stage of the port. Current operations of the Port of İzmir are derived from the First Stage of port development. The First Stage started in 1954 and ended 1999 with bidding on the second stage. However, various construction projects continue from the 1954 plan, due to ongoing maintenance and upkeep projects, with an appearance of a lack of comprehensive planning for the port over the long term (Baltacıoğlu, Bates, Kazancoğlu, 2004).

It is foreseen that if the second stage of the port's expansion is completed, it would increase the port's container traffic and the transshipment volumes by 50%, and hence, a significant rise in the port's income. The port's current income is about US$ 75-80 million dollar per year and is expected to gross approximately US$125-130 million dollar per year upon the completion of the expansion works (Turkish

Shipping World, 2002). It is foreseen that if the second stage of the port's expansion is completed, it would increase the port's container traffic and the transshipment volumes by 50%, and hence, a significant rise in the port's income (Akarsu, Kumar, 2002).

4.3. Land / Land Prices

The availability of the land for the Port of Izmir is scarce because of the space limitations and problems with Municipalities of Izmir Greater City & Konak. The problems can be listed as trade-offs between land prices and space allocations. While the municipality endeavors to provide the land at a fair value, port authorities tries to lower the value to a level where they can assure making reasonable returns.

As the Marmara Region is becoming increasingly congested and further industrial expansion areas are becoming scarcer, the Aegean Region is seen as one of Turkey's prime future industrial expansion areas. This development is fostered by the high level of education, the quality of the workforce and the fact that land is relatively cheap (www.izto.org.tr).

On the other hand; most logistics services, if they can benefit from being carried out close enough to the port, do not need to take place physically in the port itself. In fact, it will often be preferable to set up the logistics services area outside the port itself, where it will be easier to find adequate land available at a reasonable cost, the main criteria being easy connections with the different land transport modes. Of course, the connection with the port will remain the critical issue to make the whole system work, but in many instances solving this specific connection

problem may well prove to be cheaper, or to make more economic sense for both the port and the city, than to try to expand port land at high cost: the traffic generated on this expansion would require higher capacity accesses anyway, and would just concentrate the traffic management problem a the single port/city interface (Juhel, 1999).

4.4. Labour

Port labor from crane and equipment operators to stevedores to harbor pilots is one of the keys to success or failure in today's competitive port and international trade environment. Too often port labor is blamed for a port's failure to play an appropriate and productive role in port operations and its nation's economic development (WB, Module 7, 2006).

Nevertheless, the deficiencies of port labour in terms of education and qualification stated as one of the weaknesses of Turkish ports in the 9th Development Report of State Planning Organization (SPO, 2006, p.48). This subject is also argued by many authors.

The Port of Izmir operates with 202 officials of administration and 574 workers in the port area.157 of the workers are temprorary while 417 of them are perminant. Within the perminant workers, number of the workers work as an operator in cargo handling processes are 122, while 113 of the workers deals with technical support, repeair and maintenance. There are only 30 stewards at the port. The education level of the officials is university degree from such universities not related to the maritime administration, however, well experienced as being worked

by years. On the other hand, the education level of the workers depends on primary school level. Only a small majority of the workers are high scholl graduated. As the level of education considered, the number of English spoken workers are scarce. The new personel has not been hired to the avaliable positions of retired ones. On the other hand, the Chamber of Machenical Engineering is able to provide certificate of operator for cargo hadling operations in the port area.

Moreover, as stated by the port authorities, most of the equipments are not in use due to the insufficient number of port personel especially qualified port operators in handling operations. The authorities also states that the loading and unloading operations of vessels has been too long as they supposed to be owing to the lack of port personel.

4.5. Technology / Information

Information technology has become an essential part of the rapid and accurate transfer and processing of enormous volumes of data processed in international transport firms and port organizations. The proper management of systems, which process this information and communicate it to those who manage port operations, is vital for efficient transport. Electronic devices employed in container terminals reduced the manual effort and paper flow, facilitated timely information flow and enhance control and quality of services and decision made (Kia, Shayan, and Ghotb, 2000).

When the information system of Port of İzmir is considered; as it also stated by the authorities of the Port; although Computer Aided Working System had been implemented in 1992, the most of the work are still done manually.

There is no information exchange between ship operators' agencies and the Port Authority except at weekly meetings. The shipper remains in contact with the ship operators, thereby resulting in almost no information exchange between shippers and the Port. Vessel data are collected from the ship manifests by the Ship Operators Association and used by their members to forecast business levels of activity (Bates, Baltacıoglu, Kazacoglu, 2004).

4.6. Market Factors

In this context, hinterlad of the Port of Izmir, and the distance between the major cities and the port is mentioned. Literally, hinterland means the land behind a city or a port. A port's hinterland is the area from which the port's customers are drawn from. Following are general definitions of port hinterland. The hinterland is the:

- area where a port has a monopolistic position (Fageda, 2005)
- origin and destination area of a port, that is, the inner region provided by a port (Fageda, 2005)
- land space over which a port sells its services and interacts with its clients
- the market area served by a port and from where a port draws its cargo
- market reach of the port, that is, the areas from which cargo originates, as well as the areas where cargo moving through the port is destined. Some ports will

have hinterlands that extend across many states, while other ports will have smaller hinterlands (see the Web portal of Strauss- Wieder Inc, online)

Port of Izmir has a vast, agricultural and industrial hinterland. Izmir is the third largely populated city of Turkey and Port of Izmir is the main port of Aegean Region as an export gate as well as the country. The economy of Izmir is centered on industry, commerce, transport-communication and agriculture. There are 6,500 companies operating in various sectors in Izmir such as food, textiles, paper and printing, cement, industrial equipment, marble, steel and metal, furniture, cooling and heating equipment and the automotive sector (http://www.turkishdailynews.com.tr). With its qualified and well educated labour force, sources of raw material, high ratios of income per capita, proximity of domestic and international markets; city of Izmir has been countinueing to appeal the interest of the domestic and foreign investors. The ratios of 30,5% industry, 22,9% commerce, 13,5% transport and communication, 7,8% agriculture are the indicators of economic demography of the city (Karayıgıt, 2006, p.16).

Next to the Marmara Region, the Aegean Region is Turkey's second most important region. Traditionally, the economy of the Aegean Region has centered on agricultural (among other tobacco and dried fruit) and agro-industrial goods, textiles and the iron and steel industry. In recent years, this traditional base has broadened considerably with the location of new industries such as the automotive industry and electronics in Izmir and Manisa. Traditionally, the Aegean Region has been a predominately export oriented region (whereas the Marmara Region is import

oriented). The export orientation has increased over the past 10 years (http://www.izto.org.tr).

As it seen in the Table 22, Aegean Region achived second highest export values after Marmara Region in 2001- 2005 periods. In 2005, export of the region had a high rate with the number of 7.3 billion $. It can be inferred that Aegean Region had a steady growth export values in five year period. Aegean Region has a 21% share in total exports in Turkey. In other words, one good out of five is exported from Aegean Region (Baran, 2003).

Table 22: Export Value of Turkey by Regions ($1000)

REGIONS	2001	2002	2003	2004	2005
Mediterranean	1.766.454	1.802.592	2.422.905	3.086.410	3.309.699
Eastern Anatolia	128.943	164.284	234.603	366.403	590.550
Aegean	3.836.446	4.127.069	5.206.733	6.441.462	7.328.665
South Eastern Anatolia	683.256	660.268	937.821	1.432.708	1.954.088
Central Anatolia	2.321.535	2.266.571	2.944.535	3.530.868	4.220.861
Black Sea	639.927	748.641	875.187	1.459.440	2.112.212
Marmara	21.957.655	26.289.664	34.631.053	46.849.861	53.873.792
TOTAL	**31.334.216**	**36.059.089**	**47.252.836**	**63.167.153**	**73.389.867**

Source: Prime Ministry Turkish Statistical Institute

Table 23: Import Value of Turkey by Regions ($1000)

REGIONS	2001	2002	2003	2004	2005
Mediterranean	1.162.656	1.593.328	2.058.047	2.900.601	3.616.777
Eastern Anatolia	54.438	70.029	125.861	116.731	172.121
Aegean	2.228.708	3.016.738	4.283.795	5.822.450	6.419.443
South-Eastern Anatolia	551.530	769.156	1.157.335	1.521.411	1.892.114
Central Anatolia	6.092.261	7.261.796	7.787.135	8.924.459	12.038.305
Black Sea	626.584	799.619	1.193.262	1.738.861	2.386.880
Marmara	30.682.908	38.043.132	52.734.257	76.515.254	90.027.744
TOTAL	**41.399.083**	**51.553.797**	**69.339.692**	**97.539.766**	**116.553.384**

Source: Prime Ministry Turkish Statistical Institute

When the import values are considered (Table 23), Central Anatolia and Marmara Regions are followed by Aegean Region. The import value of Aegean Region was 2.2 billion$ in 2001 and had an increase in 2005 with value of 6.4 billion$.

The hinterland of Izmir comprises the provinces of Izmir, Manisa, Kütahya, Aydın, Uşak, Afyon, Denizli, Mugla, parts of the provinces of Canakkale, Balıkesir and Bursa.

Afyon's economic structure heavily depends on agriculture (34,1%), transportation and communication (17%) and commerce (13,1%). In contrast to the share of agricultural sector, industrial sector has only 12,3% share in economic structure of the city.

Aydın's economic structure depends on mainly on commerce, agriculture and construction business. Commerce with a share of 27,6% takes the first place; agriculture with a share of 27,3% takes the second place. In contrast to these numbers, industrial sector has a share of 8,1% in economic structure.

Denizli's economic structure consists of agriculture (27,21%), commerce (22,6%) and industry (14,2%) in which industry has a constant increasing share by the help of textiles. Denizli has become an attractive city which can be one of the alternatives to Izmir, with its developing industrial and commercial sector. Development of textile sector and specialization in cotton weaving and home textiles makes Denizli the centre of the textile sector in the Aegean Region.

Kutahya's economic structure heavily depends on industry (51,1%) and agriculture (17,5%).

Manisa's economic structure consists of industry (32,9%), agriculture (26,8%) and commerce (15,3%) (Esmer, 2003). Its suitable land and rail transport, its proximity to Izmir (31) km, and to the Izmir Adnan Menderes International Airport (60km), its location on the Izmir-Bursa-Istanbul highway and its developing industrial sector has made Manisa an attractive city in the Aegean Region. Manisa also won the title of FDI (Foreign Direct Investment) Magazine's European City of the Future 2004 – 2005 for being one of Europe's most cost-effective cities.

Mugla's economic structure consists of commerce (30,7%), agriculture (20%), and industry (17,6% and transportation and communication (11,4%). Mugla high revenues from tourism and agriculture have contributed to the accumulation of capital in the city.

Usak's economic structure mainly depends on agriculture (29,5%), commerce (20,9%) and transport and communication (13,7%). In contrast to high share of agriculture, industry has a low share such as 11,8% in the economic structure (Esmer, 2003).

The Port is connected with state railway and highway network. The rail line comes from Manisa with connections to Bandırma, Aydın and Ankara. The port has also a direct access to national highway system with links to Manisa, Bursa, and Istanbul, Ankara as well as the South of Turkey. Besides, the port has a direct access to the international highway system via Kapıkule cross border with links to West Europe (Germany, Netherlands, Italy, Switzerland, Belgium, France) and East Europe (Bulgaria, Yugoslavia, Slovenia, Austria). The regional airport is one of the most modern international airports of Turkey, and has many direct international connections to several European locations, besides the major Turkish cities. The

city airport, Adnan Menderes, is one of the biggest in the country and accommodates several international airline companies and most of the European charter flights. The Port is 25 minutes away from Adnan Menderes Airport.

4.7. Related Industries

In this context, free zones and organized industrial zones of Izmir are considered. Free zones are defined as special sites within the country but deemed to be outside of the customs territory and they are the regions where the valid regulations related to foreign trade and other financial and economic areas are not applicable, are partly applicable or new regulations are tested in. Free zones are also the regions where more convenient business climate is offered in order to increase trade volume and export for some industrial and commercial activities as compared to the other parts of country. In general all kind of activities can be performed in Turkish free zones such as manufacturing, storing, packing, general trading, banking and insurance. Investors are free to construct their own premises, while zones have also available office spaces or warehouses on rental basis with attractive terms (http://www.foreigntrade.gov.tr/sb/english/general.htm).

The trade volume of free zones in the first half of 2005 reached US $ 11.1 billion with an increase rate of 4,4 percent as compared to the same period of the previous year. Particularly the dynamism in the free zones that became operative in the recent years indicates that the trade volume of the Turkish free zones will follow a steady increase rate. Istanbul Leather and Industry, Aegean and Istanbul Ataturk Airport free zones are at the first three ranks in the free zones trade volume

of the first half of 2005 (Undersecretariat for Foreign Trade General Directorate of Free Zones, 2005).

4.7.1. The Aegean Free Zone (AFZ)

The Aegean Free Zone (AFZ), as having the first ISO-2002 standart certificate, with more than 11.500 employments has been achieved more than 19 billion dollars trade income since 1990. While AFZ's trade volume 3.2 billion dollars in 2004, this volume reached 3.7 billion dollars in 2005 (Karayıgıt, 2006, p.24).

Aegean Free Zone was established and is operated by ESBAŞ within the scope of a build-operate-transfer agreement between the State and ESBAŞ. All the infrastructure and superstructure-related investments are carried out by ESBAŞ. Currently, there are 347 firms in the Aegean Free Zone that are active and 59 of these are foreign companies. So far, close to 200 million dollars worth of investments have been made in the zone. Among the operating foreign companies are Delphi Packard, German Hugo Boss, Akzo Nobel, etc. whereas the domestic ones include Vestelcom Telecommunications, Hidromek Construction Machinery and Beşer Brake-linings, among others. In addition to the business and industrial investments within the campus of the Free Zone, ESBAŞ has so far constructed a day care center, a gym, open air sports fields, a restaurant, cafeteria, canteens, a clinic, dental clinic and an industrial kitchen. ESBAŞ is also engaged in various activities to promote the Aegean Free Zone home and abroad. "Business Development Days", "Space Camp Turkey" and "Foundation for Global Friendship through Education of Space Sciences" are some examples to these promotional initiatives (http://www.elegans.com.tr).

4.7.2. Izmir-Menemen Leather Free Zone

It is the first leather sector based free zone of the world which was established in 1998 by 138 leather production partners in Turkey. Menemen Leather Free Zone is dominant on the leather markets of EU countries, Russia and Middle East and it is the only center that has leather treatment system in Turkey and it is an industrial center which is a leader in the procurement and treatment of raw leather. İzmir Menement Leather Free Zone, which is the right address for leather processing and production, offers parcels with established infrastructure and factory premises ready for use, especially for secondary industries of leather sector and all heavy metal industry (http://www.idesbas.com).

4.7.3. Izmir Ataturk Organized Industrial Zone (IAOIZ)

Izmir Ataturk OrganizedIndustrial Zone (IAOIZ) is one of the largest and most modern organizedindustrial zones in Turkey. It started operating in 1990. The zone is located on the northwest of Izmir, in Cigli district. It is 25 km to city center, 35 km toAdnan Menderes Airport and 20 km to Port of Izmir. Total area of the zone is 7.500.000 sqm. 485 factories manufacture where 30.000 people are employed. 200 companies are exporters and there are 20 companies of direct foreign investment. The companies in the Zone are mainly active in machinery, textile, ready-made garments, and food, plastics, chemicals, and metal, automotive erelated industry, electric and electronic sectors. The annual turnover of our Zone is approximately 3 billion, the export is 1.5 billion and the import is around 700million U.S. Dollars.

The industrial zones, into practice aiming to utilize the industrial potential of the region in the best possible way and support well-planned urbanization.

4.8. Back-up City

In this context, to evaluate the large consumer city behind the Port of Izmir, some economic indicators of the city is considered. As it stated before, Izmir is the third largely populated city of Turkey with the population of 3.387.908 according to census datas in 2000. It is reported that income per capita reached 3.215$ in 2001 which makes Izmir the 6th city in Turkey's Gross National Product (GNP). Total tax payment of Izmir was 10 billion YTL in 2005 which constitues the 9,3% of the country's tax income (Karayıgıt, 2006).

Table 24: Izmir's Share in Turkey's Foreign Trade

	Izmir			**Turkey**		
	2003	**2004**	**2005**	**2003**	**2004**	**2005**
Export (billion$)	9,10	11,20	12.8	47,00	62,70	73.2
Import (billion$)	8,60	11,50	14,60	68,90	97,10	116.3
Izmir's share in Turkey(%)						
Export	% 19.5	% 17.9	% 17.4			
Import	% 12.5	% 11.8	% 12.5			

Source: Prime Ministry Turkish Statistical Institute

When the foreign trade of Izmir is considered (Table 24), in 2003 exports of Izmir was 9.1 billion$ with the share of 19,5% of Turkey's 47 billion dollars exports. Although the share of Izmir's exports in Turkey's exports was decraesed relatively, the export value showed 23% increase with 2.1 billion$. In 2005 exports reached 12.8 billion dollars with 17,4% share in Turkey's 73.2 billion dollars

exports. Imports also showed an increasing change. When the share of Izmir imports in country's imports was 19,5% with the number of 8.6 billion$ in 2003, this number reached 14.6 billion dollars in 2005 while Turkey's imports was 116.3 billion$. In 2005, the share of Izmir's imports in country's imports remained the same in 2003.

Table 25: Number of Exporter Firms in Izmir

Years	Number of Exporter Firms	Export Value ($)
2001	2.685	2.752.489
2002	2.989	2.793.832
2003	3.339	3.489.385
2004	3.652	4.131.398
2005	3.696	4.649.059

Source: Prime Ministry Turkish Statistical Institute

In addititon, multinational companies such as General Motors, Philip Morris, British American Tobacco, Japan Tobacco, Dr. Otker, Carlsberg, Akzo Nobel, Tesco, Ikea, Hugo Boss, Delphi, RJ Reynolds, Citibank, Samsung, Eldor located their investments and businesses in Izmir. As it seen in Table 25, the number of exporter firms in Izmir has been increasing. The number of the firms was 2.685 in 2001, this number reached 3.696 in 2005.

4.9. Institutional Factors

Developing logistics centres requires a long construction period and large investments. Considering the examples from successful ports, tax incentives and other supporting schemes are essential for developing the logistics centres. However, as it stated in the report of State Planning Organization (2006), insufficiency of the updated regulations about the bureaucracy in port operations is one of the deficiencies of ports in Turkey. The public bureaucracy may be noticed in port operations and even in port management intensively as the port authorities stated. It is about the delegation which is not given to the port management by the government that infleunces the simplicity and efficiency of the port operations and procedures negatively. On the other hand, state's tax incentives and related supporting schemes are valid for investment to the privileged cities for development; however, Izmir city is exempt from this category.

4.10. Connecting Transport System

Efficiency of inland transport to serve an increasing, and most often disputed hinterland, has become a critical factor of the ports potential future, as well as of overall trade growth prospects. Smooth interaction between the port and the city often surrounding it, in terms of transport networks requirements, environmental protection, and overall safety, therefore appears a prerequisite for effective delivery of integrated logistics services. Quick and safe access to port facilities from inland transport networks becomes a basic requirement to be met in all cases (Juhel, 1999).

When considering the implementation of this kind of facility, the city and the port must work together to manage the traffic flows because logistics services

are dynamic activities and they generate significant traffic flows.Average truck movements per day in European distriparks range between 3,000 and 4,000. So accesses to the distripark, and connections between the distripark and the transport system, must be properly designed to accommodate such flows. Needless to say, it would be highly advisable to make every attempt to keep this traffic from merging with local urban traffic on city streets. This objective will again call for close cooperation between transport authorities and municipalities on access design and implementation (Juhel, 1999).

Table 26: The Traffic Flow of Port of Izmir / From Hinterland to the Port

From Hinterland to Port			
	2004	**2005**	**Change %**
Truck Units	730.735	670.160	8%
Truck Tons	8.768.814	8.041.920	8%
Railway car Units	10.131	7.798	23%
Railway carTons	208.225	177.830	15%

Source: TCDD İzmir Port Management

Table 26, indicates the traffic flow from the hinterland of the port to the Port of Izmir by truck and railway car units and the carriage tons of the flows. The number of truck movements from the hinterland to the port was 730.735 with 8.7 million tons while the railway car number was 10.131 with 208.225 tons in 2004. The units of both truck and railway car had a decrase in 2005, while truck units were 670.160 and railway car were 7.798. Paralel to the units, the tons of the

carriages had decreased from 8.7 million tons to 8 million tons in truck flow and from 208.225 to 177.830 in railway car flow.

As it seen in Table 27, the truck flow from the port to the hinterland and the tons of truck carriages increased in 2005 with the 2% change and the tons of the carriges also increased with the 2% change to 3.557.405 tons. However; units of railway car declined from 9.867 to 7.103 with the 28% of decrease.

Table 27: The Traffic Flow of Port of Izmir / From Port to Hinterland

From Port to Hinterland			
	2004	**2005**	**Change %**
Truck Units	288.364	294.784	2%
Truck Tons	3.460.373	3.537.405	2%
Railway car Units	9.867	7.103	28%
Railway carTons	62.853	54.304	14%

Source: TCDD İzmir Port Management

When considering the truck movements of European distriparks, it can be inferred from the datas that Port of Izmir is far beyond the average of European ports, moreover struggles to coordinate the flow of cargos from the port and to the port. As it stated by many authors, the lack of connecting roads and railways in ports is one of the problems of Turkish ports suffer from unlike those in most developing nations (Akarsu, Kumar, 2002, p.7).

The Port of Izmir is located very close to the city center and had suffered from severe congestion in the past. This situation has improved through the construction of a direct access to the national highway sysytem and the port may now be reached via a continuous dual carriage way. Although the port has a direct access to the national highway system with links to major cities, the congestion problem has only partially improved. The main reason is that the access to the port is via the main traffic routes into and out of Izmir so that morning and evening rush hours seriously restrict the cargo flow to and from the terminal. Initially, it was planned to extend the current dual carriage way beyond the port to improve traffic flows in and out of the inner city; however, this plan has been dropped and the current dual carriage way ends just behind the port. To cope with the morning and evening rush hour traffic, a curfew on truck traffic entering and leaving the city has been imposed. Thus, truck access is effectively limited from 7 am to 9 am in the morning and 5 pm to 7 pm in the evening.

As a result, the road transport companies are forced to secure permission for the entry to the city only at the times of operation, thus causing long queues at the gates of the port or on the highway to the port (Bates, Baltacıoglu, Kazancoglu, 2004).

The port also has a direct rail access but overwhelming majority of containers arrives and leaves the port by truck. The rail line comes from Manisa with connections to Bandırma, Aydın and Ankara. Nevertheless, the railroad transport is managed also by TCDD; there are a few containers transported by rail (Bates, Baltacıoglu, Kazancoglu, 2004).

Table 28 on the next page, indicates the container flow transported by mode of road and rail with TEU capacities of the port. Majority of the carriages realized by mode of land with the only 2% change in the flow of containers from the port and flow of containers to the port, both in 2004 and 2005. While 21.275 TEU of containers transported by rail in 2004, this number had 27% decreases in 2005 in the carriages to the port. It may be seen that usage of land transport seems to be increasing by the years while railway usage tends to decreasing. As it also stated in Chapter 2, the potential of Port of Izmir serving as a hub port in the Aegean Region is high with road and rail connections and proximity to the Adnan Menderes Airport.

Table 28: Container Flow of Port of Izmir by TEU: From the Port / to the Port

	2004	**2005**	**% Change**
To the Port			
Land transport(TEU)	269.600	275.664	2%
Railway transport(TEU)	21.275	15.592	27%
From the port			
Land transport(TEU)	273.687	269.072	2%
Railway transport(TEU)	15.874	13.650	14%
TOTAL			
Land transport(TEU)	543.287	544.736	
Railway transport(TEU)	37.149	29.242	21%

Source: TCDD İzmir Port Management

CONCLUSION

The incresing world trade in a borderless market as being a consequence of globalization requires more complex transportation systems. International transportation of goods heavily depends on maritime transportation.With the increasing growth of container transportation, development of IT, continuing changes of production and distribution sysytems and increasing demand of the shippers, ports face increasing pressures to satisfy the needs of the customers and now compete with each other on a global basis. Being aware to that there will be no longer possible to compete on the basis of basic, traditional functions to gain a competitive advantage, the port industry created a new dimension of port development which depends on serving value added logistics services such as packaging, labelling, assembly, quality control, customizing, etc. With expanding their functions business activities to provide users with value added logistics, ports today also exceeds their simple function from being a pure transhipment point in transportation chain as an interface between the land and sea to a complex logistics centers within the supply chain. Further to that, many ports established different dedicated areas which is called 'distriparks' for enhancing value added logistics services in port areas. Port of Rotterdam and Port of Singapore are important examples of these facilities. On the other hand, there are some factors influecing the site selecting of establishing this kind of facilities. The factors includes such as port infrastructure, IT, land/land prices, labour, market factors, related industries, back-up city, institutional factors and connecting transportation systems. Evaluation of Port of Izmir, as being the biggest container port of the country and its inevitable role in country's and Aegean Region foreign trade, in terms of these factors

indicates the potential of Port of Izmir serving value added services and offer us precise consequences. First of all, the insufficiency of equipment and the limitation of the port area to be expanded may be seen as the major obstacles of the port to serve value added services. The lack of IT in port operations and insufficient number of qualified work-force, intensive bureaucracy in port operations and management are the another deficiencies of the port which affects value added serving potential of the port negatively. On the other hand, the developed hinterland of the port with a growing economy and foreign trade and its well connections to the hinterland can be seen as a potential to become serving value added services in the future.

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