Container Corporation of India

ESTABLISHMENT OF A TRANSSHIPMENT HUB

Final Report

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Establishment of a Transshipment Hub

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Preface

India is on a high growth trajectory. After eight per cent GDP growth, policy prescriptions are directed at attaining ten per cent growth rate. The present emphasis is on integrating Indian economy with the world economy. Achieving robust growth in exports and increasing the share of India's external trade in the world trade thus assume great importance. Globalisation will induce competition and thereby lay stress on cost reduction both in production and in the commodity logistics.

Heavy investments in infrastructure, including the transport sector, are planned. Apart from physical structure, financial inputs must allow attributes of quality to be imparted in the system. Containerisation brings about a qualitative change in transport system and plays a crucial role in the logistics-chain cost-reduction and improvement in quality at the delivery level. Containerisation has totally transformed the structure of the transport industry. Though late, India is catching up fast in attaining world standards in containerisation. CONCOR has played a stellar role in promoting containerisation in the country by rail though in a quarantined environment, protected by the state from competition.

As new problems emerge, new challenges will also be thrown up. The present study relates to examination of one such problem – that of mixed loads arriving at Jawaharlal Nehru Port. Basically, it is a problem of inter-operator coordination. Severely limited in scope, the Terms of Reference revolve around setting up of a container hub en-route to Mumbai for sanitizing loads to ensure these can be handled by a single terminal operator. The entire question has been examined, though, in the larger context of growth of economy, operational problems at ports and rationalization of traffic to ports.

The study was conducted by S.K. Khanna, K.L. Thukral and V.S. Ghai. During the visits of the team to field locations and discussions with the concerned officers, the team received numerous valuable suggestions and inputs from officers and staff of CONCOR and Indian Railways. We are grateful for the help and courtesies extended.

K.L. Thapar

Acronyms Used

BG	-	Broad Gauge
BGKT	-	Bhagat-ki-Kothi
BOT	-	Build, Operate and Transfer
BPC	-	Brake Power Certificate
BRC	-	Vadodara
BTPN	-	Bogie Petrol Tanks
CAGR	-	Compound Annual Growth Rate
CFS	-	Container Freight Station
CONCOR	-	Container Corporation of India
CPC	-	Kanpur – refers to ICD
CR	-	Central Railway
CSR	-	Clear Standing Room
DDL	-	Dhandarikalan
DRE	-	Dadri
GTIL	-	Gateway Terminal India Ltd.
ICD	-	Inland Container Depot
IR	-	Indian Railway
JNPCT	-	Jawaharlal Nehru Port Container Terminal
JNPT	-	Jawaharlal Nehru Port Trust
KKU	-	Kanakpura
MB	-	Moradabad
MG	-	Metre Gauge
MJ	-	Marwar Junction
MTJ	-	Mathura
NSICT	-	Nhava Sheva International Container Terminal
PNP	-	Panipat
PRCL	-	Pipavav Railway Corporation Ltd.
RE	-	Rewari
RMGC	-	Rail Mounted Gantry Crane
SBI	-	Sabarmati
TEUs	-	Twenty-foot Equivalent Container Units
TKD	-	Tughlakabad
WR	-	Western Railway

Executive Summary

Introduction

International trade is on the increase. There is emphasis on liberalization and trade facilitation. The present world trade scenario is marked by improvements in the means of transport. Containerisation is the buzzword; it has affected the process and pattern of physical movement of goods. Considering the profound influence of containerisation on growth of world trade, it is worthwhile to study its evolution and growth in the world as well as in India. Another important dimension of the study is to make projections of the container traffic in the coming years in order to appreciate the need for development of CONCOR, setting up of new ICDs and the demands on port infrastructure in the country. These aspects have been examined in the first three sections of the report. In the following sections, operational problems of ports, line capacity requirements and the candidate locations for establishment of hubs have been examined.

Growth of Container Industry

- World ocean borne container trade started in 1957. The growth of container trade has exceeded the growth in maritime trade. While maritime trade grew at an average rate of 3.3 per cent per annum, container trade increased at a higher growth rate of 8.3 per cent during 1986-99. Globally, 70-80 per cent of sea borne bulk cargo moves through containers. Containerisation has transformed port infrastructure in the world. A large number of ICDs are being established away from the ports for cargo consolidation and dispersal activities. Custom activities have been simplified and are now carried out at the ICDs rather than at the seaport.
- Over the years, the container ships have undergone substantial changes in their size, shape, carrying capacity etc. Presently, the 6^{th} generation container ships with a capacity of 8000-9000 TEUs are in use in major container ports. It is expected that soon the bigger container ships (capacity of 12000-14000 TEUs) will be introduced for movement of international cargo.
- Containerisation in India started in 1973. The container traffic has been growing steadily and the present level of traffic is 4.52 million TEUs. In India, the share of containers in the general cargo has reached a level of 64 per cent and this is expected to surge to 75 per cent in the near future.
- There are over 500 shipping lines operating in the world container trade. More and more shipping lines are seeking dedicated terminals and direct control over landside operations.

Containeristation in India

- The container traffic in India grew at around 14.6 per cent between 1990-91 and 2004-05.
- Nearly 69 per cent of the total container traffic originates in or around northern and western India with the south accounting for 26 per cent and the east only 5 per cent. JNP handled 56 per cent of the container traffic handled at *major ports* or 52 per cent of the container traffic handled at all the ports in the country.
- Mumbai and Cochin were the first to start handling containers in India. With the passage of time, other ports also took to handling containers. Presently, many of the major ports have dedicated terminals and specialized handling equipment. The principal ports handling container traffic in India are:
  - West coast ports – Kandla, Mundra, Pipavav, JNPT, Mumbai, Cochin;
  - East coast ports – Tuticorin, Chennai, Visakhapatnam, Kolkata/Haldia.

  The ports of Marmugao, New Mangalore and Paradip handle a limited number of containers on the general cargo berths. There are, however, plans to upgrade the facilities at these ports to increase their share in container traffic.
- The opening up of the ports sector to private entrepreneurs has facilitated the development of containerisation. Container terminals are being privatized under BOT arrangements. There are four private container terminals operating at JNPT, Tuticorin, Chennai and Visakhapatnam. Contracts for two more such terminals at Cochin and JNPT have been awarded recently. Mumbai port has also finalized the operator for its container terminal. A container terminal has come up at Mundra (Gujarat) which has also being given to a private operator for operation and management on BOT basis.
- Mention may be made of Hazira port in Gujarat. This is located 23 km inside the river estuary of Tapi. At present, it is a lighterage port. It is being developed for the state government by Shell International of Netherlands. It is proposed to be developed as a multi-purpose port. Work for reclamation/development of land for the container terminal has been initiated. Considering that the creation of new facilities is likely to take substantial time, the consultants have not taken into account any container handling capacity in respect of this port.
- The current capacity at major ports is around 4 million TEUs. In addition, the state ports of Mundra and Pipavav in Gujarat have developed capacities for handling containers. As per the present estimates, capacity buildup will increase from 5.73-5.88 million TEUs in 2006-07 to 23.49-27.46 million TEUs in 2021-22. Details in this regard are given in Table 2.3.

- Government of India has accorded priority to port connectivity with the hinterland with time bound schedules for completion of road and rail projects. At present, CONCOR has the sole authority for transporting containers between ports and the hinterland by rail. Ministry of Railways have initiated steps to open up the container train business to private entrepreneurs. Meanwhile, CONCOR is expanding its network of ICDs, opening up new service corridors and augmenting its wagon fleet. Double stack container trains between ports in the western India and Delhi have been introduced. This will change the economics and the pattern of container transport in the country.

Container Trade Forecast for India

- Growth in container traffic is dependent on growth in GDP, growth in general cargo and the level of containerisation adjusted for improvement in this level in the coming years. The consultants have made forecast of container traffic using regression analysis based on two alternative scenarios assuming (i) GDP growth of 7 per cent per annum and (ii) GDP growth of 8 per cent per annum. The other assumptions made for the forecast are mentioned in para 3.11.1.
- The projected container traffic ranges between 9.7-10.5 million TEUs under normal growth conditions in 2011-12. The traffic is expected to grow to 14.44-16.39 million TEUs in 2016-17 and further to 21.09-25.06 million TEUs in 2021-22.

Operational Problems of Container Ports

Presently, a major share of exim container traffic is handled by west coast ports in Mumbai area and Gujarat. While the share of west coast ports in container traffic was 68 per cent, that of JNPT was 52 per cent during 2004-05. JNPT is presently the largest container handling port in the country. It was set up in 1989. Traffic at this port has picked up at a fast rate since 1995-96. It has two terminals namely (i) Jawaharlal Nehru Port Container Terminal (JNPCT) operated by the port trust itself and (ii) Nhava Sheva International Container Terminal (NSICT) operated on BOT basis. While NSICT registered a growth of 27 per cent in the number of containers handled (due to better equipment and better labour productivity), the rate of growth at JNPCT was lower at 19 per cent. In 2004-05, 2.37 million TEUs were handled at JN port including 1 million handled at JNPCT and 1.37 at NSICT.

At present, railways clear about 30 per cent of the container traffic handled at JNPT. This share is likely to surge in the coming years growing at 15 per cent per annum during the first three years, followed by 11 per cent growth per annum for the next three years; thereafter, the increase tapers off to 9 per cent per annum. Analysis of rail traffic handled at the Port brings out the following facts:

- Eighty three per cent of the trains are received from the western railway route.
- Tughlakabad, Dhandari Kalan and Sabarmati ICDs account for around three fourth of the total trains received at JNPT. 51 per cent of the trains originate from Tughlakabad, 10 per cent from Dhandari Kalan and balance 14 per cent from Sabarmati. The despatches from JNPT also follow the same pattern.
- There are five railway lines at the port. Lines 1 and 2 are allocated to JNPCT; lines 4 and 5 are allocated to NSICT. Line No. 8 is used by JNPCT for handling mixed loads.
- The current share of JNPT may be impacted by likely diversion of traffic to Mundra and Pipavav ports which have very good road and rail connectivity and are closer to ICDs in the north. Another factor which is likely to impact the share of JNPT is the increase in imports from South East Asia and the Eastern markets. Further, development of Vallarpadam port may also impact the movement patterns of internal traffic.
- It is seen that only five ICDs viz Dadri (DER), Tughlakabad (TKD), Dhandari Kalan (DDL), Sabarmati (SBI) and Nagpur (NGP) can make full trainloads for JNPT either daily or in two days. Similarly, JNPT will generate traffic only for 7 ICDs where full trainloads mature daily or in two days. Mixed loads, therefore, will remain an inherent part of the traffic pattern to this port; the number of mixed loads is likely to get accentuated with the commissioning of 3rd and later the 4th and 5th terminals.
- With the present and planned configuration of yards, formation of train loads for one or two ICDs will become difficult. Even with the 7% sustained growth of economy and higher levels of containerisation as indicated in Section III, one or more trains per day can be formed only for six points viz, New Muland (Mumbai area), Nagpur, Sabarmati, Dadri, Dhandari Kalan and Tughlakabad. Traffic for other destinations will have to be clubbed and mixed loads formed.
- There is heavy detention to trains at the Holding Yard, Jasai Yard and Panvel; this *inter alia* is a manifestation of inadequate rail terminal capacity. Skewed location of running staff and traction change also affect smooth operation. Running staff is based at Panvel and traction (from electric to diesel and vice versa) is changed at Jasai Yard. Running staff moves from Panvel to work between Jasai Yard and the port ICD. Balancing of running staff remains a major problem and causes detention to trains.

- Movement of empties will remain an operational feature on account of imbalance between export and import trade.
- Gujarat ports of Kandla, Mundra and Pipavav are emerging as important exit/entry points for dealing with external trade, particularly connecting ICDs in Gujarat and the north. Shorter distances to these ICDs, excellent road connectivity, adequate rail capacity, investment in terminal capacity, make these ports natural choice for exporters in the north
- Mixed loads will remain an integral port of this traffic.

Line Capacity

Line Capacity on Tughlakabad-Mumbai area including JNPT is saturated and barring some alleviation through marginal investments, may remain so in the foreseeable future. Proposed freight corridor may provide some relief.

Adequate backup including rail capacity shall be available for Saurashtra ports of Kandla, Mundra and Pipavav.

Candidate Locations for Hubs

Candidate locations for hubs have been discussed. Traffic pattern on Dhandarikalan-Tughlakabad-Mumbai does not offer sufficient traffic for Gujarat ports via Vadodara. Pilol, Samlaya, Vadodara are not suitable for setting up ICDs with the main purpose of forming pure loads for JNPT. Traffic for JNPT from different directions congregates at Jasai Yard. However, the solution lies having a unitary system of handling at JNPT. This should solve problems of mixed inward and outward loads. Some cushion in the form of 2 R&D lines and stacking space can be provided adjoining the present Jasai-Yard for peaking. Bhagat-ki-Kothi can be an ideal place for rationalization of imported consignments (TEUs) for ICDs in the north.

- A separate study to look into the justification for locating an intermediate hub at or close to Ahmedabad may be undertaken.

Introduction

We are witnessing a new world economic order marked by globalization, trading blocks, free trading areas, changing locational pattern of industries and unprecedented foreign exchange reserves of countries in Asia. These developments determine world trading patterns. There is renewed emphasis on liberalization and trade facilitation which not only necessitate reduction in costs of transportation of goods but also minimizing transaction costs. The present world trade scenario is as much a result of improvements in means of transportation as that of other factors like information technology which enables expanding the span of control.

Containerisation has had the most profound influence on the process and pattern of physical movement of goods. It has totally transformed global trade and transportation characteristics. External trade of industrialised countries is largely effected in containers. India has been a late starter in ushering in containerization but is catching up at a fast pace. There is a paradigm shift in economic policies of the country. There is legitimate emphasis on export promotion and diversification of exports much beyond primary commodities. Containerisation is necessary in attaining this objective.

Till now, CONCOR had the mandate to handle and promote container transport by rail. This avenue has now been opened to private operators. This will usher in competition and competition imparts its own dynamism. New players, new ICDs and new patterns of traffic to ports are bound to emerge. This may also set new benchmarks in efficiency. So far the traffic to ports has been fragmented, leading to the problem of sub-optimal loads arising from many ICDs and the consequent problem of mixed loads which throw up operational problems at ports. CONCOR's concern is obvious. It was in this context that CONCOR desired a proposal to set up an ICD on the north-west route to form pure loads for ports to be gone into. Hence this Study. This Study was entrusted to the Asian Institute of Transport Development with the following Terms of Reference.

- To study the existing flows of EXIM traffic between the inland container depots located in the northern region and ports in Gujarat and Maharashtra.
- To assess the lead time of the containers at the ICDs and the associated costs.
- To project the traffic flows in the time horizon – medium and long term (10 years).
- To assess the investment required for setting up the hub at Pilol.
- To assess the costs involved in shuffling the containers to the hub.
- To assess the dwell time of the containers at the hub.

- To make comparative analysis of costs and benefits associated with the existing pattern of movement and the new pattern arising with the location of a hub at Pilol.
- To assess the suitability of the proposed hub at Pilol, keeping in view the rail operations and linkages with road transport.
- To make suitable recommendations both for short-term and long-term scenario, for movement of north-west stream of container traffic from ICDs.

The methodology adopted for the study included field inspections and discussions, analysis of container traffic to and from ports on the west coast and study of ICDs in the north west region. To understand the growth of container traffic at the ports, projections were made under two scenarios, namely, (i) 7 per cent growth in GDP and (ii) 8 per cent growth in GDP, level of containerization and the prospects of its growth in future. It is well known that government has accorded priority to port connectivity with the hinterland with time bound schedules for completion of rail and road projects. The existing and projected line capacity and its utilization on various sections of Mumbai-Vadodara-Tughlakabad sections were studied. The potential offered by the minor ports, particularly Mundra and Pipavav ports to offload the pressure on JNPT was also assessed in order to arrive at linkages between the ports and the ICDs.

The report is divided into eight sections. Sections I to III deal with growth of container industry and container traffic forecast for India. Section IV deals with operational problems of container handling ports. Line capacity and its utilization is discussed in Section V. Section VI deals with candidate locations for hubs and alternative suggestions for improving container handling in the country. Section VII examines the financial viability of the proposed sorting yard for container trains at or near Jasai. The final section VIII mentions about various new initiatives taken by the government which may favour location of the container hub at or near Ahmedabad.

Section I

Growth of Container Industry

Introduction

1.1 Containerisation is the technique of stowing freight in reusable containers of uniform size and shape for transportation of goods. It involves movement from the origin to the destination; the carriage of goods is by one or more modes of transport.

1.2 Though used for the first time during the Second World War as a unit of carriage, till mid-1960s, there was slow handling of break bulk cargo; ship loading and unloading was generally manual. The invention of container as a unit for transport of goods revolutionized handling of general cargo and related shipping and port activities on account of benefits such as door-to-door delivery, speedy intermodal transfers, low handling costs, reduced breakage and pilferage, lower insurance costs, etc. It expedited the loading and unloading of ships which led to improvement in the efficiency of operations and increase in trade volumes. Gradually, cargoes that used to be shipped in break bulk started getting containerised. Textiles, leather, tamarind seeds, coffee, onions, waste paper, wood pulp, electrical and electronic goods and chemicals now move largely in containers. The oceanborne containerisation commenced in 1957. It has been playing a major role in the world's maritime sector for the last three decades. Presently, world ports handle a large share of break bulk cargo through containers involving carriage of over 300 million TEUs per annum.

1.3 The development of containerisation has given rise to the demand for adaptable organizations with worldwide logistics capability. On the transport side, one notices the evolution of mega transport operators. Acquisition of ships, owning and leasing of containers, having dedicated terminals, trucking, etc. are the various activities performed by these operators. Containerisation has brought together competing groups i.e. shipowners, railways, road hauliers, freight forwarders and port/terminal operators for collective and mutual interest. Customs activities have been simplified and are now carried out more at inland terminals than at sea ports. Besides the ports, other establishments, such as road authorities, railways, factories and warehouses, are acquiring equipment to handle containers.

Growth of Containerisation

1.4 The growth of container trade has exceeded the growth of maritime trade. Between 1987 and 1999, while the total maritime trade grew at an average rate of 3.3% per annum, the container trade increased at a higher growth rate of 8.3%. Container growth rate was still higher at 10.05% during the period between 1990-2003. According to an ESCAP study, over the next 10 years, maritime trade is expected to grow between 3.5% to 4% per annum; container trade, however, is expected to grow at a higher rate of 6 to 8%. The growth in container traffic is expected to be higher in less developed countries, such as China, India, Indonesia, which offer substantial scope for further penetration of containers in handling the general cargo.

1.5 Globally, 70-80% of the sea-borne bulk cargo moves through containers. The total container traffic is expected to more than double in the next decade with Asia recording the highest growth. The top 5 container terminals are located in Asia and account for 23% of global container traffic. Over 26% of the world container trade is intra-Asia involving movement of over 16 million TEUs annually.

World Container Fleet

1.6 World fleet of fully cellular container ships is expanding both in terms of their number and their container carrying capacity. At the end of 2004, there were 7335 ships with an aggregate carrying capacity of 8.47 million TEUs. Around 85.6 million TEUs were handled in 1990-91; their number increased to 231.7 million TEUs in the year 2000-01 and further to 297.2 million TEUs in 2003-04. India joined the league of container ship owning countries in the early 1990s with Shipping Corporation of India acquiring 3 cellular vessels. At present, India has 10 cellular vessels with a tonnage of 1,79,613 DWT equivalent to 14,968 TEUs.

Increasing Size of Container Vessels

1.7 Sealand was the first shipping line to introduce containers in 1957. It may be noted that till mid-1980s, size of the container vessels was limited by the size of the Panama Canal. Over the years, the container ships have experienced vast changes in their size, shape, carrying capacity, etc. Based on these parameters, these ships can be classified into different generations. Presently, sixth generation container ships with a capacity of 8000-9000 TEUs are in use in major container ports. The evolution and growth of container ships together with their length and width is shown in the following table.

Table 1.1: Evolution of Container Ships

Generation	Year of introduction	Capacity in TEUs	Length in mtrs.	Width in mtrs.	Draft in mtrs.
First	1968	750	180	25	9.0
Second	1969	1500	225	29	11.5
Third	1972	2500-3000	275	32	12.5
Fourth (Panamax)	1985	4200	290	33	11.6
Fifth (Over Panamax)	Late 1990	6600	300+	47	12.0
Sixth (Over Panamax)	Post 2000	8000+	340+	47	14.0

It is understood that the shipping industry is now planning for the next generation of container ships with a length of 400m, width of 60m, draft of 21m and capacity of 12000-14000 TEUs. Considering the constraint of port infrastructure, such bigger ships will be handled only at select super container ports.

1.8 The emergence of large sized ships has two significant effects: it determines the competitive power in the shipping industry and becomes a major criterion in determining the size of a port. Hitherto, it was believed that once the container ship size reached 10000 TEUs, diseconomies of scale would start operating, as two engines would be required to power such a huge ship. But with technological advancement in engine design, single engine vessels of 10000 TEUs and above can now be built. Concept design already exists for ships upto 18000 TEUs. A recent ESCAP study has revealed that by 2011, a total of 490 very large container vessels will be in operation globally; out of these, 130 will have a capacity of 10000 TEUs and above.

World Container Ports

1.9 The major container ports in the world are located in USA, Europe, Asia and the Middle East. Hong Kong and Singapore occupy the top two slots with container throughput of 21.93 million TEUs and 20.6 million TEUs respectively in 2004. The Chinese Ports of Shanghai and Shenzen occupy 3rd and 4th positions by handling 14.6 million and 13.6 million TEUs, respectively. The details of throughput of 30 container ports during 2002-2004 is presented in the statement at Annexure I-1. It is observed that no port in India figures in this list. JNPT, however, managed the 31st position, handling 2.36 million TEUs during 2004. Overall, the leading 30 container ports handled around 196.04 million TEUs, or about 65.9% of the total world container throughput during the year.

1.10 Containerisation has transformed port infrastructure in the world. There is a greater demand on port facilities in terms of both capacity and performance. With increase in vessel size, there is need for greater channel depth. Ports and terminals that propose to attract bigger vessels need to acquire quay cranes which are taller and with a larger outreach; higher discharge rates call for faster and more efficient intermodal connections. The physical infrastructure at the ports has changed from wharves, docks, covered storage sheds, etc to open quay berths along with large open areas for storage of containers. Ports are also setting up container freight stations to stuff and destuff containers as a separate activity. Besides, a large number of inland container depots are being established away from the ports to perform cargo consolidation and dispersal activities, decongest the ports and set up port related activities closer to the shipper.

Hub-and-Spoke System

1.11 With increase in the size of ships and growth in container trade, shipping networks have become complex giving rise to several new developments. One such development relates to hub-and-spoke system. A fully loaded container ship will spend more time in loading/unloading operations if it has to call at multiple ports. Under the hub-and-spoke system, to save time, large mainline vessels serve only a limited number of major ports to which cargoes are carried from tributary ports by feeder vessels. The smaller vessels call at several ports and feed the “mother” vessels at special “hub” ports. Asia has surpassed other continents of the world in this particular area. In the late 1980s, Singapore emerged as the first port in the world that depended primarily on transhipment cargo for its existence. It was subsequently joined by other ports in Asia, including Colombo, some ports in the Persian Gulf and ports of Salalah, Aden and Tanjung Pelepas which attracted transhipment cargo.

1.12 Transhipment cargo offers to the ports and terminal operators an opportunity to develop their trade at a faster rate than the development of their natural hinterlands would permit. The commonest form of transhipment involves export cargo being taken by feeder vessel from one country to another normally in the same continent, for onward shipment to another vessel to a third port in another continent. The process is reversed for import cargo. This form of transhipment is controlled either by the shipping line or the shipper.

1.13 There are a number of ports in the world competing for the hub status. The essential conditions for a hub port are its proximity to a major sea route and the existence of an established network of services connecting a number of origin and destination ports.

Major Container Shipping Lines

1.14 There are over 500 shipping lines operating in the world container trade. The top 30 container liner operators control around 31% of the world container fleet but carry about 69% of the freight in terms of TEUs. The details of these operators along with the number of ships owned, total freight handled and the number of Indian ports served are given in Annexure I-2.

1.15 It is interesting to note that over the last decade, some shipping lines have grown in size through mergers and acquisitions and these control large volumes of container traffic. This development has impacted the balance of power between shipping lines and ports; the former have become more powerful. More and more shipping lines are now seeking dedicated terminal facilities and direct control over landside operations.

Section II

Containerisation in India

Evolution of Containerisation in India

2.1 India is a relatively new entrant in container cargo business. Containerisation in India started in a limited way in 1973 when American President Lines brought 400 containers to the country. Container traffic has been steadily growing since then. From 400 boxes in 1973, the traffic increased to 0.68 million TEUs in 1991, 3.98 million TEUs in 2003-04 and 4.52 million TEUs in 2004-05. The container traffic in TEUs recorded an annual growth rate of around 14.6% between 1990-91 and 2004-05. The rate of growth of container traffic in volumetric terms was marginally higher at 15.76% during the same period. Statement at Annexure II-1 gives the details of container traffic at the Indian ports.

2.2 The share of Indian container traffic in the world container traffic is small but growing. This share was 0.79% in 1990-91 which increased to 1.34% in 2003-04. The details may be seen in the statement at Annexure II-2.

2.3 The present Indian gateway ports do not attract sufficient number of mainline vessels due to infrastructural constraints and the distance from the international shipping routes. As of now, 51% of Indian export/import containers are shipped directly to the Indian ports, namely, JN Port and Chennai Port. The balance 49% of the containers are transhipped through the nearby foreign ports of Colombo, Singapore and Dubai. Besides, Salalah and Aden Ports in the Gulf region also handle India-bound container traffic. Port-wise transhipment traffic is given in the following table:

Table 2.1: Transhipment Traffic in India during the Year 2003

Name of Port	Transhipment Traffic (in lakh TEUs)	% Share to Total Traffic
Singapore/Klang	5.58	32.8
Dubai	1.10	6.5
Colombo	5.08	30.0
Salalah	0.79	4.6
Others	3.25	19.2
Indian Coastal Ports	1.17	6.9
Total	16.97	100.0

Source: Ministry of Shipping, Government of India.

Share of Container Traffic in Total Cargo

2.4 The share of containerised cargo in total cargo handled at major ports showed a steady increase from 5.26% in 1990-91 to 14.27% in 2004-05 (see Annexure II-3). Dissection of container traffic between exports and imports shows that in terms of tonnage, the share of exports was higher than that of imports; in terms of TEUs, the variation in the proportion of imports and exports was rather marginal. The details may be seen in the statement at Annexure II-4.

2.5 Nearly 69% of total container traffic originates in or is bound for northern and western India with the south accounting for 26% and the east a mere 5%. JNP handled 56% of the container traffic at *major ports* or 52% of the total container traffic handled at all the ports (including minor ports) in 2004-05.

Share of Empties in Total Container Traffic

2.6 The share of empties handled at major ports is around 18%. The details may be seen in the statement at Annexure II-5.

Share of Air Cargo

2.7 Some import-export container traffic is also moved by air. Volume of this traffic has been increasing over the years. The build up of this traffic, both international and domestic, since 2001-02, is shown in the following table:

Table 2.2: Growth of Air Cargo

(in thousand tonnes)

Traffic	**2001-02**	**2002-03**	**2003-04**	**2004-05**
International	560.23	648.79	693.18	822.25
Domestic	294.05	333.68	375.09	458.52
Total	854.28	982.47	1068.27	1280.77

Note: Data of air cargo moved in TEUs is not available

It is observed that during 2004-05 total air cargo aggregated 1.28 million tonnes. Of this, international traffic accounted for 65% and the domestic traffic 32%. While volume of air cargo is just a small fraction, less than 1%, of international cargo traffic, it has significance in value terms; it accounts for around 30% of our international trade. With the growth in international trade, the share of air cargo, both in terms of quantity and value, will also increase in future years. Major commodities exported by air are garments and leather goods. Civil Aviation Sector in the country has opened up significantly in the last 3 years. Presently, the emphasis in this sector has been on carriage of passenger traffic. However, freight traffic including containerised cargo, is likely to witness major thrust in the coming years.

Container Ports

2.8 The principal ports handling container traffic in India are given below:

West Coast Ports: Kandla, Mundra, Pipavav, JNPT, Mumbai, Cochin

East Coast Ports: Tuticorin, Chennai, Visakhapatnam, Kolkata/Haldia

2.8.1 Ports are broadly categorised as major ports which are constituted under the Major Ports Act. These include Kolkata, Haldia, Paradip, Visakhapatnam, Chennai, Tuticorin on the east coast and Cochin, New Mangalore, Mormugao, Mumbai, JN Port and Kandla on the west coast. These are controlled and operated under the Central Government. Minor ports are placed under the State Governments.

2.8.2 The ports of Mormugao, New Mangalore and Paradip handle a limited number of containers on general cargo berths. However, these ports propose to upgrade their facilities in order to increase their share in container trade.

2.8.3 Mundra and Pipavav, though emerging as important ports with substantial capacity to handle traffic, are categorized as minor ports under Gujarat Maritime Board.

Container Traffic Handled at Major Ports

2.9 Port-wise container traffic handled at major ports is given in the statement at Annexure II-6. It is observed that west coast ports handle predominant share of container traffic. Their share in the total container traffic was the highest at 73.7% in 2002-03; it was around 70.3% in 2004-05.

2.10 The present combined share of three western ports, namely, Mumbai, JNP and Kandla accounts for 65.5% of the country's total container traffic. Considering their vast hinterland, the west coast ports will continue to handle large volumes of container traffic. The traffic flow to east coast ports will also increase since significant traffic is likely to be generated in South Asian countries, especially China, which have proximity to these ports.

2.11 The government have announced the "Sagar Mala" project costing over Rs. 1 lakh crore. It is an integrated infrastructure development project covering all facets of maritime transport, including ports, shipping and inland waterways. The programme will, *inter alia*, include setting up of new ports, modernization and expansion of existing ports, improvement in draft, productivity and efficiency of Indian ports and benchmarking them against international standards. It will bring about a sea change in the Indian maritime sector and the pattern of inland transport. The project will be executed through public-private partnership.

2.12 The opening up of the port sector to private entrepreneurs has boosted the development of containerisation. Container terminals are being privatized under BOT arrangements involving a 30-year concession agreement with 100% foreign equity being permitted in such projects. New sites are being offered for developing container terminals; at some ports, break-bulk cargo berths are being converted into container terminals. The bidders and port authorities are entering into revenue sharing agreements which ensure part of the revenues as well as a royalty fee to the port for allowing the private party to operate. Besides, several ports have added container capacity of their own.

2.13 There are four private container terminals operating at the major ports of JNPT, Tuticorin, Chennai and Visakhapatnam. Contracts for two more such terminals at Cochin and JNPT have been recently awarded. Mumbai port has also finalized the operator for its container terminal. A container terminal has come up at Mundra in Gujarat which has also been given to a private operator for operation and management on BOT basis.

Capacity at Indian Ports

2.14 The current capacity at major ports for container traffic is estimated at 4 million TEUs. There are 29 container berths at major ports; in addition, container traffic is also being handled at general cargo/multi-purpose berths at some of the ports. Among the state ports, Mundra and Pipavav in Gujarat have developed facilities for handling containers. These are deep draft ports and the terminals are operated by international shipping/terminal management companies. These ports share a common hinterland with the existing major ports. Traffic handled in 2004-05 has already exceeded the available capacity. Based on available information on existing capacity and present/future plans for augmentation of container facilities at various ports, the container handling capacity of the ports sector will be as indicated in the table below:

Table 2.3: Port-wise Traffic and Capacity

(in million TEUs)

Ports	Actual Traffic 2003-04	Estimated Capacity			
		2006-07	2011-12	2016-17	2021-22
West Coast Ports					
Kandla	0.17	0.17	0.30	0.60	0.60
Mundra	0.05	0.50	1.00	2.50	2.50
Pipavav	0.03	0.50	1.30	1.30	1.30
JNP	2.27	2.30	3.50	4.50	9.00
Mumbai	0.20	0.25	0.45	0.90	0.90
Cochin					
- RGICT	0.17	0.25	0.40	0.00	0.00
- ICTT (Vallarpadam)	0.00	0.00	0.00	1.40	3.40
Total (West Coast)	***2.89***	***3.97***	***6.95***	***11.20***	***17.70***
East Coast Ports					
Tuticorin	0.25	0.42	0.75	0.75	0.75
Chennai	0.54	0.65	0.80	0.90	0.90
Visakhapatnam	0.02	0.25	0.51	0.51	0.51
Kolkata	0.26	0.58	0.58	0.58	0.58
Total (East Coast)	***1.07***	***1.90***	***2.64***	***2.74***	***2.74***
Total estimated capacity	**3.96**	**5.87**	**9.59**	**13.94**	**20.44**
Estimated Traffic	**3.98**	**5.73-5.88**	**11.32-12.12**	**16.84-18.79**	**23.49-27.46**

2.15 It may be pointed out that the capacity estimates are only indicative. These are based on intentions of the ports concerned and do not consider the priorities of private operators who are expected to play a crucial role in capacity augmentation through private investment since the ports do not have adequate funds for this purpose. Further, there is an implicit assumption that necessary rail-road connectivity to/from ports to hinterland for evacuation of containers will be arranged by the concerned departments. Port-wise capacities may show variations if the above assumptions do not hold good.

2.16 Further, the above capacity estimates do not include the capacities being planned at Ennore, Paradip and Mangalore. Ennore port with deep draft facilities, vast vacant land to stack containers and good rail-road connectivity, offers good scope for development of a modern container terminal. If container facilities are developed at this port, it may create capacity of one million TEUs by 2011-12 and 2.1 million TEUs by 2016-17. Besides, further capacity augmentation would be possible in future. Given the demand, expansion of container facilities can also be taken up at other ports, including the minor ones.

Performance of Container Handling Ports

2.17 Mumbai and Cochin were the first to start handling containers in the country. With the passage of time, other ports also took to handling containers. Presently, many of the major ports have dedicated terminal/s as well as specialized handling equipment for this purpose. Available facilities and handling capacity are discussed below, port-wise.

Jawaharlal Nehru Port

2.18 There are presently two container terminals at this port; Jawaharlal Nehru Container (JNC) terminal is operated by the Port itself; Nhava Sheva International Container Terminal Ltd. (NSICT) is operated by a BOT operator. The port-operated terminal has three berths with a quay length of 680 metres; the NSICT operates two berths of 600 metres quay length. Both the terminals have 16 quayside cranes, 37 RTGs and 6 RMGs cranes. The present capacity of the Port is around 2.2 million TEUs per annum.

2.18.1 Considering the expected increase in container traffic, it has been decided to convert the existing bulk terminal (two berths with a quay length of 500 metre) into a third terminal. Work has already been awarded to a private group. This terminal is expected to handle 1.3 million TEUs in the 7th year (2012-13). There are plans to set up two more terminals by 2020. These terminals will add a capacity of 3 million and 2.5 million TEUs per annum, respectively. The overall capacity of the port is expected to reach around 9 million TEUs per annum on completion of the 5th terminal.

Operational problems at this port have significant impact on overall capacity of ports in the country and are discussed in a subsequent section.

Mumbai Port

2.19 Container handling at Mumbai port is concentrated at berth nos. 1-5 of Indira Dock (depth of 8.84-9.14 mtr) and a berth at Ballard Pier. These berths have two quayside gantry cranes, three RTGs and other supporting equipment. The capacity is around 0.25 million TEUs per annum which may gradually increase to 0.9 million TEUs by 2016-17.

Hazira

2.20 This is a minor port in Gujarat which is being considered for development. A separate Hazira Notified Area Authority has been set up for rapid development of the area which is in the vicinity of Surat township. This area is connected by four major state highways as also through a single broad gauge line connected from Gothangam.

2.20.1 There is at present no independent entity by the name of Hazira port. The entire Hazira coastline is dotted with captive jetties of RIL, L&T, ESSAR, KRIBHCO and other major industrial units and falls under the jurisdiction of Magdalla port. This port is located 23 km inside the river estuary of Tapi. It is located on the southern bank of river Tapi and is a lighterage port, navigable through a channel on the river. However, functioning of some of the private jetties gets adversely affected during the monsoon period.

2.20.2 The port deals with both solid and liquid cargo. Iron ore, sponge iron, coal/coke, clinker, rock phosphate, scrap as also naphtha and paraxylene constitute major imports. Main commodities exported are H.R. coils, oil cakes, molasses and chemicals like benzene, ethylene. Imports constitute the major portion of the traffic handled at this port. Considering the fact that most of imports are presently handled at private jetties, the potential for existing traffic shifting to the new port is limited to steel scrap, which is increasingly being received in containerised form. Steel scrap is meant largely for the steel furnaces in the north.

2.20.3 Hazira port is being developed on the basis of 30 years concession to Shell International of Netherlands for waterfront development. The port is, however, proposed to be developed as a multi-purpose port. It will be situated on the mouth of the Gulf of Khambhat. It will be well protected and will serve highly developed industrial area in its very backyard. Two integrated terminals are proposed to be developed as follows:

(a) A container terminal with the ultimate capacity of two million TEUs per annum. The capacity would be developed in phases.

(b) LNG Terminal with a capacity of 2.5 MTPA, later proposed to be expanded to 5.0. MTPA. This terminal is already in an advanced stage of execution.

2.20.4 Hazira port is not handling any traffic at present. Work for reclamation/development of land for the container terminal has been initiated. However, setting up of the container terminal is likely to take time; earlier estimates of container facilities being available by 2006-07 may not, therefore, be realized in entirety.

2.20.5 The traffic estimates reveal that mostly imports will be handled at Hazira. These estimates are as follows:

Estimates of Traffic

Imports	2006-07	18000 tonnes	Equivalent to 1500 TEUs/year
	2010-11	28000 tonnes	Equivalent to 2300 TEUs/year
	2015-16	36000 tonnes	Equivalent to 3000 TEUs/year
Exports	Negligible		

2.20.6 Considering that port development is likely to take time and only meagre container traffic is expected at this port, consultants have not taken into account any port and rail capacity in their assessment. In any case, Western Railway have taken 0.5 trains per day in their line capacity assessment for relevant years on account of the fact that though this industrial area may not generate sufficient containerised traffic, bulk traffic may originate from this region.

Chennai Port

2.21 Containers are presently handled at the container terminal (3 berths) in the Bharathi Dock with a quay length of 885 metres and depth of 13.4 mtrs. The terminal which was awarded to a private operator in November 2001 for operation and management, has 6 quay cranes, 16 RTGs and other container handling equipment and has a capacity of around 0.65 million TEUs per annum.

2.21.1 There is a plan to shift the iron ore traffic from Chennai Port to Ennore Port in 2008. The existing iron ore berth will then be converted into a container berth; this will increase the container handling capacity to 0.8 million TEUs by 2011-12 and 0.9 million TEUs by 2012-13.

Kolkata Port

2.22 Containers are presently handled at 4 berths at Netaji Subhash Dock (depth of 6.8-8.9 mtr) at Kolkata and 4 berths at Haldia Dock complex (draft 12.2 m). At

Kolkata, there are 3 gantry cranes and other supporting equipment. At Haldia, there is one gantry crane and other supporting equipment. The capacity of Kolkata Dock is assessed at 0.28 million TEUs and that of Haldia 0.3 million TEUs per annum.

Kandla Port

2.23 Containers are presently handled at 2-3 multi-purpose berths with a draft of 11.2 mtr. utilizing ships' own gear.

2.23.1 There is a proposal to develop a dedicated container terminal on BOT basis with two berths having a quay length of 545 mtr and a draft of 12.5 mtr. The capacity of these two berths is assessed at 1.7 lakh TEUs which is proposed to be increased to 6 lakh TEUs by 2010-11. However, in the context of the development of Mundra and Pipavav ports, the capacity target is likely to be revised to 3 lakh TEUs in 2011-12 and 6 lakh TEUs in 2016-17.

Cochin Port

2.24 Containers are presently handled at Rajiv Gandhi Container Terminal (2 berths with a quay length of 414 mtr). The terminal has 2 gantry cranes, 5 RTGs and other supporting equipment. Its management has recently been passed on to Dubai Ports International (DPI) for a maximum period of 10 years. The licensee will also develop International Container Transhipment Terminal (ICTT) at Vallarpadam once the traffic reaches 0.4 million TEUs by 2011-12.

2.24.1 The new Integrated Terminal at Vallarpadam near Cochin will include container terminal, special economic zone (SEZ), international bunkering terminal and ship repair yard. A quay length of 1800 mtr will be developed at Vallarpadam in 3 phases. The total capacity of the port is expected to go up by 1 million TEUs on completion of each phase. The new transhipment container terminal is designed to accommodate container ships upto 8000 TEUs capacity with a draft of 14.5 mtr. The capacity of RGIC will increase to 0.25 million TEUs by 2006-07 and 0.4 million TEUs by 2011-12. With the commissioning of the first phase of Vallarpadam Project, the capacity is expected to reach 1.4 million TEUs by 2016-17. The total capacity by 2021-22 is assessed at 3.4 million TEUs per annum.

Tuticorin Port

2.25 Containers are presently handled at berth no.7 with a quay length of 370 mtr. There are two quay cranes, 4 RTGs and other supporting equipment. The draft at berth is 10.7 mtr. The terminal is being operated on BOT basis. The present capacity is assessed at 0.25 million TEUs per annum which can be augmented by deploying additional equipment. Traffic projections made by Indian Ports Association (IPA) indicate that the port container traffic is likely to go up to 0.42 million TEUs by 2006-2007 and 0.75 million TEUs by 2011-12.

Visakhapatnam Port

2.26 Container handling at this port started in 1985 at one of the multi-purpose berths, using ships' own gear. A new berth with a quay length of 449 mtr and draft of 14.9 mtr was built in the Outer Harbour in June 2003. There are two quay cranes, two RTG cranes and other supporting equipment. The capacity is assessed at 0.25 million TEUs per annum. It is proposed to increase the capacity in 2011-12 by 0.26 million TEUs through extension of the quay length by 350 mtr.

Gujarat Adani Port Limited (Mundra Port)

2.27 This port is a joint venture between Adani Group and Government of Gujarat. Though cargo handling commenced in 1998, the container berth is in operation since July 2003. The port has a container terminal with 632 mtr quay length and depth of 17.5 mtr, presently, the deepest among the Indian ports. It can accommodate vessels of 8000 plus TEUs. The container terminal has been given to P&O Ports for operation and management on BOT basis. The operator has the option of taking over two more berths, presently under construction by the port, after crossing 0.8 million TEUs. It has been renamed as Mundra International Container Terminal. It has a capacity of 0.5 million TEUs. With two additional berths, the capacity will gradually increase to 2.5 million TEUs in 2016-17. This is the closest Indian port to international routes connecting ports in the Middle East and those further west.

Gujarat Pipavav Port Limited

2.28 The port does not have any dedicated container terminal. The container operations at the port started in 1988; at present, about 20-30 thousand TEUs are being handled along with general cargo. There is a plan to develop modern container terminals at the port. In the first phase, one berth with 440 mtr quay length will be constructed and quay cranes supported by 10 RTGs will be acquired; the draft in the channel and the alongside berth will be increased from the existing 10.5 mtr to 13.5 mtr. The berth has a capacity of 0.5 million TEUs. In phase 2, a second container berth measuring 350 mtr will be constructed; it will be equipped with 3 quay cranes and 18 RTGs. The draft will be increased to 15.5 mtr. With the completion of phase 2 by 2007, the container handling capacity of the port will increase to 1.3 million per annum.

Port Connectivity is Top Priority

2.29 The task of consolidation and transfer of cargo from the production centres to the gateway ports and vice-versa would require an efficient and fast transport system by rail, road and inland waterways. Government has accorded priority to port connectivity with the hinterland with time-bound schedules for completion of rail and road projects.

Rail Projects

2.30 Government has launched the National Rail Vikas Yojana to remove capacity constraints on the golden quadrilateral and other important routes, strengthen rail connectivity to ports and augment transportation corridors between ports and their hinterlands. These projects are being implemented by Rail Vikas Nigam Ltd. (RVNL) which has been set up as a 100% government-owned company. It is implementing 13 such projects involving laying of 1372 km of railway lines connecting ports; it also plans to lay additional 1605 km lines to connect the hinterland. The cost of these projects which are scheduled to be completed by March 2008 is estimated at Rs. 5720 crore. Further, government has announced its intension to set up "freight corridors" between Delhi-Mumbai and Delhi-Kolkata to provide safe, fast and efficient railway system which will, *inter alia*, improve freight movement between the hinterland and the ports. The dedicated rail line is expected to provide world class service giving further impetus to the growth of container traffic.

Road Projects

2.31 Modernising road connectivity between ports and the hinterland is of crucial importance for efficient port operations. Towards this objective, government has made efforts to improve the existing highway network and to build roads which give 80 km per hour sustained performance. Government of India has undertaken National Highways Development Programme, the largest highway project in the country. This project has the following components.

- Provision of 4 to 6 links on the entire Golden Quadrilateral (5846 km) connecting the 4 major cities of Delhi, Mumbai, Chennai and Kolkata along with their diagonals
- North-South and East-West Corridors (7300 km): highway links from Srinagar in the North to Kanyakumari in the South and Silcher in the East to Porbandar in the West.
- Highway connectivity to all major ports and large industrial townships (1133 km).

More than 75% of the Golden Quadrilateral project has been completed and its impact on the economy is already visible. The focus now is on corridor management i.e. managing the highways to deliver maximum throughput in terms of velocity and number of vehicles while minimizing the cost.

CONCOR Projects

2.32 Presently, CONCOR has the sole mandate for transporting containers between the ports and their hinterlands by rail. During 2003-04, it carried over 21% of the import/export containers. The name of ICD terminals connected to west coast ports together with their area, type of container traffic handled, railway lines serving the terminals, number and capacity of warehouses, availability of weigh bridges and equipment etc are set out in Annexure II-7. To cope up with the growing container traffic, CONCOR is expanding its network of ICDs, opening up new service corridors and rapidly augmenting its wagon fleet. It proposes to increase its train services to west coast ports that are most frequented by the trade. It plans to double its fleet size of high-speed BLC wagons and to increase the number of export-import terminals from 52 to 60-65 by 2007-08. Besides, it plans to set-up 15 domestic terminals. It is also working on a proposal to run double-stack container trains between the ports in Western India and Delhi; it has already appointed consultants to prepare the detailed project report in this regard.

Section III

Container Trade Forecast for India

Introduction

3.1 The global container trade has been growing at a faster rate than the overall maritime trade. According to the Maritime Report 2004 of UNCTAD, while world maritime trade grew at 3.7%, container trade registered growth rate of 9.2% in 2003 over the year 2002. This rate of growth is likely to be sustained in future partly due to the robust growth in manufactured goods (which are mostly transported in containers) and partly due to the entry of new commodities/cargo in the container trade. Besides, the developing countries are likely to achieve a higher growth rate in container traffic compared to that of the world container traffic.

3.2 External trade has played an important role in India's economic development. Over the years, the country's export base has gradually been expanding with inclusion of new items, like computer software and project exports. Simultaneously, share of commodity groups, such as marine products, ores & minerals, electronics, chemicals & allied products, engineering goods, textiles and handicrafts is steadily increasing.

3.3 Imports are increasingly becoming important inputs for exports. The principal import commodity groups include POL, capital goods, fertilizers, precious & semi-precious stones, machinery, chemicals and project goods. It may be mentioned that a change is taking place in the composition of imports and exports with a shift from basic commodities to processed primary products and manufactured goods, particularly in skill-intensive industries like auto components, specialty chemicals and industrial electronics. These commodities favour growth in container volumes.

National Trade Policy

3.4 India's 2004-09 National Trade Policy envisages its merchandise imports and exports to rise to $ 195 billion and $ 210 billion, respectively, by 2009. Inclusive of service transactions, the trade is expected to exceed $ 500 billion by the end of the decade. This rising trend in trade is substantiated by the findings of the Confederation of Indian Industry – Mckinsey Report; the report mentions that exports from India's manufacturing sector have the potential to jump up to $ 300 billion by the year 2015. At this level, India's share in world's manufacturing trade would stand at 3.5% against the present level of 0.8%. This is expected to significantly increase container traffic in the country.

Bilateral Trading Arrangements

3.5 Several policy measures have been taken in recent years to increase India's share in global trade. There have been efforts towards regional and bilateral trading arrangements. Indian government initiated the "Look East Policy" in 1991. It has since operationalised bilateral trade agreements with Sri Lanka and Thailand. Efforts are on to facilitate trade with other BIMSTEC countries. Comprehensive pacts have been negotiated with Singapore and ASEAN. Bilateral agreements with China and Korea have been proposed and joint study groups have been established. An India-Japan study group has also been set-up to examine the feasibility of a similar agreement.

3.5.1 The status of India's recently established or proposed Free Trade Agreements (FTA) in Asia is as follows:

Table 3.1: Trade Agreements with East Asian Countries

Partners	Status of Agreement, 2004
ASEAN	Framework signed
China	Proposed
Korea	Proposed
Japan	Proposed
Singapore	In force
Sri Lanka	In force
Thailand	In force
BIMSTEC	Framework signed
Mauritius	Under negotiation
SAARC/SAFTA	In force

Trade with EU & US

3.6 India is also deepening its linkages with the EU and the US. The bilateral trade between India and EU was Euro 27.5 billion in 2003-04 and it is expected to rise rapidly. Likewise, the bilateral trade with US which stood at $ 18 billion in 2003 is growing fast. India, Brazil, South Africa have also been having a dialogue covering a wide range of economic and security issues. BRIC (Brazil, Russia, India and China) are also pursuing a common agenda at international fora.

Trade with East Asia

3.7 India's merchandise trade with other East Asian countries has increased rapidly since 1997-98. Generally, growth rate of India's exports to and imports from East Asian countries, namely, China, Japan, Korea and ASEAN-6 was higher than that of India's exports and imports to the rest of the world. This is apparent from the data given in the statement at Annexure III-1. It is seen that India's overall merchandise trade with East Asia doubled from about $ 13 billion in 1997-98 to about $ 27 billion in 2003-04, registering an annual growth rate of 13%. Bulk of this was contributed by increase in merchandise trade between India and China; it expanded four times from about $ 1.7 billion in 1997-98 ($ 0.7 billion in exports and $ 1 billion in imports) to about $ 7 billion in 2003-04 ($ 3 billion in exports and $ 4 billion in imports). This trade is expected to cross the level of $ 10 billion in 2004. There is, thus, a substantial scope for expansion of trade between India and East Asia.

3.7.1 India's bilateral trade with the countries of ASEAN-6 expanded from $ 5.8 billion in 1997-98 to $ 12.7 billion in 2003-04. Among these countries, Malaysia, Singapore, Thailand and Indonesia are emerging as strong trading partners of India.

Forecast of Container Traffic

3.8 The forecast of container traffic has to take into account the past growth in the general cargo traffic, the existing level of containerisation, the scope for further growth therein and the future growth in GDP.

Level of Containerisation

3.9 Break-bulk traffic includes a large number of low volume commodities like electrical and electronic goods, consumer goods, white goods, machinery and machine parts, automobile components, iron and steel scrap, food grains, processed food products, newsprint, agricultural produce, handicraft, etc. A substantial part of this traffic is amenable to containerisation. The structural changes in the country's economy, reorientation of India's external trade and development in the maritime transport sector have brought about a rapid growth of containerisation in India since the mid-1980s. As a result, the share of containerised traffic in general cargo has been increasing as shown in the table at Annexure III-2. It is seen that the penetration of containers crossed 50% level in 1997-98 from a level of 36% in 1992-93. As of now, the penetration of containers in general cargo has reached a level of 64%. Notwithstanding the substantial growth, even the present level is low compared to the international standards. With the container capacity build-up at Indian ports, the share of container traffic is expected to gradually increase to 75% by the year 2010-11 and get stabilized at that level.

Container Traffic Projections

3.10 A number of agencies prepared container traffic projections. These include the Planning Commission Working Group for the Tenth Plan, RITES – Vision 2020 study, CII study (2004) and forecasts made by the Ministry of Shipping. A comparison of the various forecasts is presented in the following table.

Table 3.2: Container Traffic Forecast by various Agencies

Agency	Traffic Forecasts in million TEUs			
	2006-07	**2011-12**	**2016-17**	**2021-22**
RITES – Vision 2020 study (i) Excluding Transhipment	4.5	8.0	12.0	18.0
(ii) Including Transhipment	7.6	13.6	20.6	30.6
Tenth Plan Working Group, Planning Commission	5.51	-	-	-
CII Study-Potential for Development for Container Terminal (assuming GDP growth of 6.5%)	5.79	11.58	23.27	-
Ministry of Shipping – National Maritime Development Programme for Major Ports		14.12*		

** relates to the year 2013-14*
Note: Level of containerisation assumed by CII is 45.2% to 65%

The vast variation in projections by different agencies is on account of disparity in commodity baskets under general cargo traffic, level of containerisation and the variation in growth rates of GDP assumed by these agencies.

Consultant's Estimate of Container Traffic

3.11 An easy way to forecast container traffic at Indian ports including minor ports is to apply the growth rate of 14.56% achieved during the period between 1990-91 and 2004-05 on the assumption that there is no let up in the growth rate. On this basis, container traffic would work out as follows:

Table 3.3: Growth of Container Traffic

Year	Container Traffic in million TEUs
2006-07	5.93
2011-12	11.71
2016-17	23.71
2021-22	45.61

These projections, however, appear to be over-stretched since it may not be possible to sustain a *high growth rate* of 14.56% on the present level of container traffic.

3.11.1 Projections of container traffic are dependent, *inter alia*, on growth of agricultural and industrial production which form part of GDP. Accordingly, the consultants have made forecast of container traffic in India using regression analysis, based on future growth in GDP at factor cost (independent variable), the past growth in general cargo (dependent variable), present level of containerisation adjusted for further improvement in this level in the coming years. The assumptions made in the forecast are as follows:

- The container traffic of 4.52 m TEUs in 2004-05 has been taken as the base figure. The forecast period is upto 2021-22.
- Projections of general cargo traffic have been worked out assuming (i) GDP growth of 7% per annum, and (ii) GDP growth of 8% per annum. The consultants have noted the pronouncements made by the government

of higher GDP growth rates of 9-10 per cent to be achieved in the medium term. However, in making traffic forecasts, these higher rates have not been applied since presently, these represent only intentions and lack concrete investment proposals.

- For estimating the future traffic, the level of containerisation has been assumed to grow at 2% per annum beginning 2005-06 from the present level of 64%; this is expected to get stabilized at 75% beginning 2010-11.
- The traffic projections have been made with and without transhipment traffic.
- Average weight of a TEU is 12 tonnes.

Based on the above assumptions, the container traffic projections have been arrived at and the details are set out in the statements at Annexures III-3 & III-4. The estimates are summarized in the following table.

Table 3.4: Forecast of Container Traffic

(in million TEUs)

Year	Scenario I	Scenario II
2004-05	4.52	4.52
2006-07	5.73	5.88
2011-12	9.70	10.50
2016-17	14.44	16.39
2021-22	21.09	25.06
CAGR (%)	9.03	10.11

3.11.2 Graphical presentations of the growth in general cargo and container traffic under two alternative scenarios based on GDP growth rate of 7% and 8% are given at Annexures III-5 & III-6.

3.12 ESCAP has also projected container traffic for India: 4.22 million TEUs in 2006-07 and 6.41 million TEUs in 2011-12. Apparently, these projections are lower compared to Consultant’s estimates. The reasons for the variation are as follows. ESCAP considers past traffic data upto 1999-2000 whereas container traffic has seen significant growth since 1997-98. GDP growth rate assumed in ESCAP study is 6.8% per annum against 7-8% assumed in Consultant’s study.

Transhipment Traffic

3.13 At present, around 51% of container traffic meant for India is shipped directly to the Indian ports. For the remaining traffic, Indian ports continue to be served by feeder vessels from the transhipment hubs of Colombo, Singapore, Dubai, Salalah and Aden Port in the Gulf region. According to the ESCAP study, the transhipment traffic from Colombo is estimated at 4 million TEUs by 2011; 80% of this traffic is meant for India. The routing of cargo through transhipment ports results in additional shipping cost of about $ 200 per TEU. Considering that several Indian ports have plans to develop container handling facilities and achieve higher standards of performance, it may be possible to wrest a part of the transhipment traffic from Colombo. Assuming, that Indian ports are able to attract around 50% of the projected transhipment traffic through Colombo in 2011-12 and a higher level of 75% beginning 2016-17, the projected container traffic for India including transhipment traffic will exceed the normal forecast traffic. The yearwise estimates of traffic, including transhipment traffic, are also set out in the statements at Annexures III-3 & III-4.

3.14 The container traffic estimates, including transhipment traffic, are summarized in the table below:

Table 3.5: Forecast of Container Traffic

(in million TEUs)

Year	Scenario I			Scenario II		
	Normal traffic	Transhipment traffic	Total	Normal traffic	Transhipment traffic	Total
2004-05	4.52	-	4.52	4.52	-	4.52
2006-07	5.73	-	5.73	5.88	-	5.88
2011-12	9.70	1.62	11.32	10.50	1.62	12.12
2016-17	14.44	2.40	16.84	16.39	2.40	18.79
2021-22	21.09	2.40	23.49	25.06	2.40	27.46

Note: Traffic forecast under scenario I is based on 7% growth in GDP; scenario II forecast is based on 8% growth in GDP

Mismatch Between Capacity and Traffic Estimates

3.15 The projections of ports' capacity for containers have already been given in Table 2.3. These estimates are based on the assumption that the development/expansion programmes proposed by the ports are implemented as per schedule. To understand the mismatch between the port capacity and traffic estimates, the two are juxtaposed in the following table:

Table 3.6: Container Traffic and Capacity Build up

(in million TEUs)

Year	Container Traffic		Container Capacity	Net shortage	
	Scenario I	Scenario II		Scenario I	Scenario II
2006-07	5.73	5.88	5.87	-	-
2011-12	11.32	12.12	9.59	1.73	2.53
2016-17	16.84	18.79	13.94	2.90	4.85
2021-22	23.49	27.46	20.44	3.05	7.02

3.15.1 Broadly speaking, the projected container capacity would fall short of the expected traffic from 2011-12 onwards, even for lower traffic estimates under scenario I, assuming the expansion programmes are implemented as per schedule. The shortfall in capacity will be comparatively bigger for higher traffic estimates under scenario II. It is, therefore, essential to implement the expansion projects on time and plan for additional container facilities at the appropriate ports to cope up with the projected traffic levels.

Section IV

Container Handling at Ports

4.1 Jawaharlal Nehru Port Trust (JNPT) is the premier container handling port, which handles about 52% of the total container traffic. Its performance will continue to have a major impact on the volume, pattern and direction of India's external trade. Hence, a detailed assessment of its operational problems is called for.

4.2 Christened initially as the Nhava Sheva Port, this major port was commissioned in 1989 with two major objectives (a) to decongest Mumbai port, which had served as the largest port in the country for well over a century and (b) to develop a modern world-class facility to handle anticipated dry bulk and container traffic. This was also the first major port in the country to develop facilities through induction of private capital. Apart from a container terminal operated by JN Port itself, a new container terminal was developed through the BOT route by P&O of Australia, called the Nhava Sheva International Container Terminal (NSICT). This concept has now been pursued further for conversion of the existing bulk terminal to a container terminal. This will be the third terminal at the port for handling container traffic.

4.3 JNPT has the following terminals and facilities:

- (i) Jawaharlal Nehru Port Container Terminal (JNPCT), having 3 berths. This is operated by the JN Port Trust.
- (ii) NSICT, having 2 berths, run by P&O, Australia; almost exclusively handles containers.
- (iii) Bulk Terminal has two bulk berths, which are being converted into a container terminal by Gateway Terminal India Ltd. (GTIL), a joint venture of CONCOR & Maersk.
- (iv) Shallow draft & port craft berths (2 nos) for handling dry bulk cargo.
- (v) Liquid Cargo Jetty (2 berths) to handle liquid cargo and chemicals.

4.4 The port had a sluggish start, but from 1995-96, traffic picked up at a fast pace. Presently, this is the largest container handling port in the country.

4.4.1 The port has a draft of 11 metres. Work on deepening the channel to 13 metres is being taken up. This would enable handling of container vessels of 6000 TEUs by making use of tidal window. Later, the channel would be deepened to accommodate vessels with a capacity of 8000 TEUs.

4.5 Presently, a major share of container traffic catering to import/export traffic at ports is handled by western region ports in Mumbai area and Gujarat. The share of these ports in the total container traffic was 68% during the year 2004-05; of this, JN Port handled the major share. In Table 4.1 below, details of traffic handled at Mumbai port, JNPT and three Gujarat ports are given:

Table 4.1: Traffic Handled by Mumbai Area and Gujarat Ports (in 000 TEUs)

Year	Mumbai	JNPT	Kandla	Pipavav	Mundra	Total	All Ports	% share
1995-96	518	339	65			922.00	1449	63.63
1996-97	583	423	77			1083.00	1689	64.12
1997-98	601	504	84			1189.00	1892	62.84
1998-99	509	669	64			1242.00	1932	64.29
1999-00	429	889	79			1397.00	2185	63.94
2000-01	321	1189	91			1601.00	2485	64.43
2001-02	254	1573	126			1953.00	2886	67.67
2002-03	213	1930	157			2300.00	3366	68.33
2003-04	197	2269	170	24.63	49.30	2709.93	3980	68.09
2004-05	219	2371	181	68.82	216.19	3056.01	4520	67.61

4.5.1 To sustain a high rate of growth of exports and imports, overall traffic is expected to surge by at least 15% upto 2007-08, 11% for the next 3 years and thereafter taper off to 9% per annum upto 2021-22. Year-wise growth on this basis has been worked out for JNPT in Annexures IV-8 & IV-8.1. In each year for which capacity augmentation is shown, total projected traffic would outstrip the projected handling capacity. Traffic projections, therefore, have been tempered down to the available capacity at JNPT. Year-wise progression, on this basis, is also shown juxtaposed in the same table. Projections of traffic would therefore, be based on the actual 2.37 million TEUs handled in 2004-05; this grows to 9 million TEUs in 2021-22.

4.5.2 Presently, railways clear about 30% of traffic handled at JNPT. Railway's share is likely to rise in the coming years to sustain growth rates mentioned in the preceding para 4.5.1.

4.5.3 The total traffic handled at JNPCT and NSICT in terms of tonnage and TEUs along with CAGR is given at Annexure IV-1. Commodity-wise breakup of this traffic is at Annexure IV-1.1. It may be observed that:

(i) Between 1999-2000 and 2004-05, containerized traffic recorded a CAGR of over 22% both in terms of tonnage and TEUs handled. "Other traffic" declined except in 2004-05.

(ii) Of the two terminals, NSICT registered a growth of about 27% in the number of containers handled and outpaced JN Port which grew by 19%. It may be mentioned that NSICT handles only container traffic.

(iii) Container traffic constitutes 88% of the total traffic handled at JNPT.

(iv) In 2004-05, out of 2.37 m TEUs handled at JNPT, railways handled 0.7 m TEUs or about 30% of the total.

4.6 The port handling capacity has been augmented through induction of modern cargo handling equipment. (NSICT has maintained its high growth rate due to better equipment and better labour productivity). JNPCT has the capacity to handle 1m TEUs per annum against NSICT's 1.2m TEUs (55% of the total handling capacity). By 2011-12, the total handling capacity at JNPT (with three terminals) will be 3.50 m TEUs (see Annexure IV-4)

4.6.1 The actuals for 2004-05 and projections of container traffic upto 2021-22 along with CAGR are given in the table 4.2.

Table 4.2: Projections of Container Traffic at JNPT

(million TEUs)

Year	Scenario A*	Scenario B**
2004-05	2.27	2.27
2005-06	2.61	2.46
2006-07	3.00	2.67
2007-08	3.45	2.89
2008-09	3.83	3.14
2009-10	4.25	3.40
2010-11	4.72	3.69
2011-12	5.15	4.00
2012-12	5.61	4.34
2013-14	6.11	4.71
2014-15	6.66	5.10
2015-16	7.26	5.53
2016-17	7.92	6.00
2017-18	8.63	6.51
2018-19	9.41	7.06
2019-20	10.25	7.65
2020-21	11.18	8.30
2021-22	12.18	9.00
CAGR(%)	9.97	8.44

* Assumes growth rates of 15% p.a. for the period 2004-05 to 2007-08, 11% p.a. for the period 2008-09 to 2010-11 and 9% p.a. for the period 2011-12 to 2021-22

** The estimate is based on anticipated handling capacity of 9m TEUs at JNPT in 2021-22. By the year 2010-11, anticipated traffic will outstrip the capacity and the capacity constraints will get accentuated by 2016-17.

4.6.2 Annexure IV-1 gives year-wise growth rate of containers handled at JNPT. CAGR between 1999-2000 and 2004-05 works out to about 23%. However, there is consistent fall in the annual growth rate of containers handled, touching a low of 4.51% in 2004-05. Projections under Scenario B above may be closer to the future development as this is based on the assessed handling capacity at the port. The projections point to the necessity of advancing creation of port as well as transport capacity, if future growth rate is to be adequately met.

4.7 Eight container freight stations (CFSs) are located within the port area. In addition, more than 20 CFSs are located in the vicinity of the port. This has significant impact on the pattern of rail/road movement as also on the overall handling capacity of the port.

4.8 Analysis of the rail traffic received at JNPT during 2004-05 brings out the following facts (Annexure IV-2):

(i) Eighty three per cent of the trains are received from the Western Railway route. The only significant point of origin via Central Railway despatching traffic to JNPT is Nagpur.

(ii) Three ICDs viz Tughlakabad, Dhandari Kalan and Sabarmati account for around $3/4^{th}$ of the total trains received at JNPT. Of these trains, 51% originate from Tughlakabad, 10% from Dhandari Kalan and 14% from Sabarmati.

(iii) Despatches by rail from JNPT follow the same pattern i.e. 83% via the Western Railway route.

(iv) ICD-wise break-up of 3 months (April, May and June 2005) average traffic, inward and outward (both TEUs and trains) handled has been shown as a matrix at Annexure IV-3

4.9 Presently, the railway yard in the port has five lines: lines 1&2 are allocated to JNPCT and lines nos 4&5 to NSICT. The middle line no.3 is used as the run-round line. Line No.8 is largely used by JNPCT for handling mixed loads. Railway yard line Nos. 1&2 (CSR 700M) are straddled over by 3 Nos. Han Jung (DUSANG) Rail Mounted Gantry Cranes (RMGCs). A service road and space for stacking of about 500 TEUs have also been provided under the gantry. However, a major impediment is that stacking outside the portal is not possible.

4.10 NSICT handles traffic on two lines Nos. 4&5 and is straddled by 3 NOEL RMGCs with a span of 25.5 metres and lift capacity of 40 tonnes. Service roads are provided at both ends outside the gantry portals. Stacking space for about 1000 TEUs is provided under the gantry. The cranes have cantilevers on either side, thereby enabling these to perform lift-on and lift-off operations outside their portal.

4.11 JNPCT has developed line No. 8 within the port premises complete with RMGCs. Container stacking under the gantry can be done in 4 rows, besides the road on either side of the gantry where RMGCs can operate through their cantilever. These are used mostly for dealing with mixed rakes. Line No.6 was laid earlier, but is presently inoperative.

Traffic Flow Between ICDs and Port

4.12 The matrix of the break-up of TEUs dealt with at different ICDs during April, May and June 2005 and converted to trains/day on the basis of 80 TEUs per train may be seen at Annexure IV-3. This matrix shows the volume of traffic exchanged between the ports and ICDs or between ICDs. Empty containers are also received at ICDs by road; this explains the divergence between total container traffic received and despatched from certain ICDs.

4.12.1 It may be seen that *Pipavav and Mundra* are emerging as important ports for exim containerized traffic. Movement of import container traffic from Mundra and Pipavav ports may be seen at Annexures IV-6 & IV-6.1. Data with regard to imports/exports from Mundra port via rail and road is given at Annexure IV-7.

4.13 In Section III, mention has been made of the initiatives taken by the Government to integrate India with other trading blocks. It includes entering into regional and bilateral trading pacts, with a view to increasing India's share in the global trade. Annexure III-1 indicates a very robust export growth during the last 3 years. Simultaneously, imports from the East Asian countries have also increased. However, in the long run, the important factors determining the composition of external trade would remain: (a) overall growth of the economy, (b) composition of the external trade and its (c) directional pattern.

4.14 Medium term projections have already been made assuming a minimum growth rate of 7% in GDP. Government now proposes to attain and sustain a growth rate of 8% per annum and possibly 10 per cent. Policy initiatives to step up exports, particularly in textiles, machine parts, auto components, etc are already visible. Recent trade agreements with the countries in the East and South East Asia will give a fillip to trade with these countries. The trade upturn is likely to significantly impact the pattern of traffic to and from the ports.

4.15 Growth in external trade will have impact on the overall container traffic at the ports. The overall volume of traffic to/from ports will depend upon: (i) growth in the overall volume of import/export trade, principally in "merchandise", (ii) major trading partners, (iii) level of containerized traffic, (iv) pattern of aggregation/dispersal of traffic for export and the destinations of imported goods, (v) container handling capacity at ports, (vi) rolling-stock and line capacity available, (this would be particularly important for CONCOR), (vii) rail/road connectivity, and (viii) terminal capacity at the ICDs

4.16 As stated above, major ports on the west coast handle 68% of impex trade. By far, the largest volume of this traffic originates and dissipates in the ICDs located in the north. However, the following factors have to be considered in assessing the future growth of traffic on the west coast. The point to be considered is whether JNPT, though retaining its pre-eminent position in container handling, will be able to retain its present share of rapidly increasing container traffic. This, in turn, will determine the route capacity of rail and road networks. Annexure IV-4 gives projected capacity on West and East Coast Ports and their likely share in future growth. The following points are also important:

(i) Mundra and Pipavav ports are developing facilities for large volumes of container traffic. Mundra port is slated for handling 2.5 million TEUs by 2016-17. Considering the prospects of high growth rate, the schedule for capacity augmentation is likely to be advanced. Private capital will be infused for development of facilities and modern handling equipment may be deployed for efficient operations. P&O Group which is already operating the Nhava Sheva Container Terminal at JNPT, has been selected for port operations at Mundra port also.

(ii) Mundra Port has certain distinct advantages: (a) It is a naturally protected harbour for year-round operations; (b) it has a draught of 18 metres, the deepest among Indian ports, where post-panamax ships carrying 8000 TEUs and above can be berthed; (c) it has the shortest distance from the ports in the Middle East and those further west; (d) the distances from Mundra port to ICDs in the north are shorter compared to other west coast ports, as may be seen at Annexure IV-5. This annexure gives rail and road distances from important ICDs in the north to the ports on the West coast.

(iii) Exporters from the north prefer Mundra and Pipavav ports and considerable volume of traffic from the ICDs is already being diverted to these ports. Mundra port has recorded a healthy growth of 322% in container traffic in 2004-05, *the first full year of operation* over the previous year. It handled 2.11 lakh TEUs in 2004-05 against only 0.5 lakh TEUs in 2003-04. Pipavav handled 0.69 lakh TEUs in 2004-05. For future projections, the consultants have assumed a modest growth of 15% per annum for the next 3 years followed by 11 per cent for the years 2008-09 to 2010-11 and 9 per cent for the subsequent years, for both the ports (Annexure IV-9 & IV-10).

(iv) Both Mundra and Pipavav ports have excellent rail and road connectivity. The hinterland is now connected by broad gauge routes to all important ICDs in the north. Samdari-Bhiladi section, the only MG section left to be converted to BG for an alternative route to ICDs in the north has also been taken up for gauge conversion.

(v) Double stack container traffic have already been introduced between Kanakpura and Pipavav port and may be extended to other ICDs in the north in the near future. This will considerably improve average load per train, release line capacity and reduce handling and freight costs.

4.17 Another factor which may impact the current share of traffic at JNPT is the likely increase in imports from South-East Asia and the eastern markets. Container handling capacities of the ports on the east coast are being increased. Vallarpadam may not only become the hub port and wean away transhipment traffic from Colombo, it may also impact movement patterns of internal traffic, particularly by rail.

4.18 Induction of additional rakes will enable CONCOR to maintain high growth rate and improve its share in the overall container traffic in the country. Though JNPT's share of the international container traffic is likely to come down, the port may still handle considerably larger volumes of such traffic. The projections of traffic received/ despatched from JNPT on the basis of 7% and 8% growth in economy and the related growth in international container traffic are given at Annexures IV-8 & IV-8.1.

Mixed Loads, an Inherent Traffic Pattern

4.19 It may be seen from Annexures IV-11.1 to IV-11.4 that only five ICDs viz Dadri (DER), Tughlakabad (TKD), Dhandari Kalan (DDL), Sabarmati (SBI) and Nagpur (NGP) can make full train loads for JNPT either daily or in two days. Similarly, JNPT will generate traffic only for 7 ICDs where full train loads mature daily or in two days. Mixed loads, therefore, will remain an inherent part of the traffic pattern to this port. This pattern will also be discernible in other important ports like Mundra and Pipavav. At JNPT, the number of mixed loads is likely to get accentuated with 3rd and later the 4th and 5th terminals.

4.20 Present handling capacity at JNPT (JNPCT and NSICT) is 2.2 m TEUs per year. However, the spaced layout of the railway yards do not permit rational aggregation or disaggregation. Presently, two groups of lines 1-5 and line 8 are separately located. This does not lend itself to easy transferability. A new configuration of 3 lines is also coming up close to lines 6-8 for handling traffic to and from the third terminal, likely to be completed by late 2006. In that case, 3 separate blocks of containers have to be carried to JNPT. In the reverse direction also, a mechanism for reconstitution of trains for different ICDs will have to be evolved, as each separate container berth will bring imported cargo for different ICDs. With the present and planned configuration of mini-yards, formation of train loads for one or two ICDs will become difficult. Even with the 7% sustained growth of economy and higher levels of containerisation as indicated in Section III, one or more trains per day can be formed only for six points viz, New Mulund (Mumbai area), Nagpur, Sabarmati, Dadri, Dhandari Kalan and Tughlakabad. Traffic for other destinations will have to be clubbed and mixed loads formed.

Detention to Trains

4.21 Unduly high detention of railway rakes in the port area has severely dented the capacity to deal with the rising volume of traffic. Severe detention of trains at the Holding Yard, Jasai Yard, and Panvel are to a large extent manifestation of low port productivity and inadequate rail terminal capacity in the port area. Detention at these points also causes severe backlash on the entire section. Skewed locations of running staff and traction change also severely hamper smooth operations. Running staff is based at Panvel and traction from electric to diesel and vice-versa is changed at Jasai Yard. Running staff moves from Panvel to work between Jasai Yard and Port ICD. Balancing of running staff remains a major problem. Heavy detention to trains in both directions occurs due to these constraints.

4.22 Detention of trains on the Panvel-JNPT section were analysed for the month of June 2005 and important reasons for detention are given below in Table 4.3.

Table 4.3: Detention of Trains on Panvel-JNPT Section during the Month of June 2005

Section JN Port-Vasai	**Average Detention (hrs. mts)**		**Reasons for Detention**
Holding line	0.17	5.37	For crossing
Jasai-Yard	4.40		Traction change, verification revalidation of BPC and C&W examination
Panvel Yard	0.40		Crew change and line clear
Section Vasai-JN Port	**Detention (hrs. mts)**		**Reasons for Detention**
Kalamboli	0.35	4.42	Room at Panvel
Panvel	1.39		Crew change, Room at Port and line clear
Jasai Yard	2.11		Room at JNPT
Holding line	0.17		Crossing and Room at Port

Trains suffer about 5 hrs detentions for room in JNPT and this, in turn, accentuates the problems of crew and traction changes. In the reverse direction, heavy detention also is observed for “verification/revalidation” of brake-power certificate (BPC) and due to loads for carriage and wagon examination.

4.23 By the end of 2006, the third terminal with two handling berths will be available for container traffic. Simultaneously, doubling of Panvel-JNPT section will increase sectional capacity to 22 trains each way. With the normal progression of traffic and the current level of detention, four additional trains per day can be handled. However, if the present level of detention continues, terminal capacity shall remain a severe constraint. Marginal additional traffic may be handled with the third terminal but a major breakthrough is unlikely. Moreover, even with the double line on JNPT-

Panvel Section, relief may not be available to import traffic, i.e. trains carrying traffic to hinterland. Therefore, as we bring out in a later section, an integrated approach is required.

Growth at Pipavav and Mundra Ports

4.24 Table 4.4 gives the capacity progression at Pipavav and Mundra ports.

Table 4.4: Train Projections (Inward and Outward Trains) at Pipavav and Mundra Ports

ICD	2004-05	2006-07	2010-11	2015-16	2021-22
Pipavav	1.64	2.16	3.40	5.22	8.76
Mundra	2.46	3.26	5.12	7.88	13.22

Future growth pattern of despatches from the two Gujarat ports is given in Annexures IV-9 & IV-10. These are based on assumed growth of 15% for 3 years beginning 2006-07, 11% from 2008-09 upto 2010-11 and thereafter at 9% per annum.

Terminal Problems at ICDs

4.25 ICDs at Tughlakabad (TKD) and Dhandari Kalan (DDL) have peaked their capacities. Dadri & Jalandhar (Sansi) will provide additional capacity and considerably relieve these major hubs. Panipat, Rewari and Gurgaon may emerge as strong contenders for high capacity ICDs. Exports from Jaipur and Jodhpur may go up, thereby increasing the traffic volumes. However, as would be seen:

(a) Traffic from Rewari, Kanakpura and Bhagat ki Kothi would largely move to Gujarat ports.

(b) Presently, import traffic for Bhagat-ki-Kothi (BGKT), Kanakpura (KKU) and Rewari (RE) is meagre. This imbalance, even with projected growth in traffic, will continue; rather, it may get accentuated.

4.25.1 Gurgaon may also provide some relief to Tughlakabad particularly if double-stack containers are moved.

Road Connectivity

4.26 At present, JNPT is connected through two-lane national highway (NH-4B) to the Mumbai-Pune Expressway, Mumbai-Goa Highway (NH-17) and through two-lane state highway (SH-54) to Navi Mumbai, Thane, Nasik and Ahmedabad. To meet the future requirements of increasing container traffic, the government has decided to improve the road connectivity by forming Special Purpose Vehicle (SPV) among JNPT, NHAI and CIDCO.

4.26.1 The normal capacity of a two-lane highway is 10,000 PCUs. For trucks, the capacity is reduced to 1/3rd of the normal capacity or about 3300 trucks per day. However, the projected traffic for Mumbai area ports is as follows:

Table 4.5: Projected Container Traffic for Mumbai Area Ports

(in million TEUs)

Year	Total Traffic	CONCOR's share	Balance Traffic	Balance Traffic to be cleared by road/day
2011-12	3.95	2.0	1.95	5343
2016-17	5.40	2.3	3.10	8500
2021-22	9.90	3.8	6.10	16712

Unless major augmentation of road capacity connecting JNPT is undertaken on a priority basis, serious problems of feeding the port and evacuation of import traffic may arise.

Considerations for New ICDs

4.27 Inland Container Depots are vital links in the overall logistics chain for aggregation and dispersal of containerized export and import traffic. These cater to the needs of exporters and importers in the interiors of the country through transport linkages to the ports.

4.27.1 In the foregoing paragraphs and Table 4.2, growth of traffic at ports and other linkages in the chain has been shown, based on the existing important ICDs in the North and the West. Other important points from where export traffic may originate or which receive import traffic may be candidates for future ICDs. While considering the proposal for a new ICD, the following important points may be kept in view:

(i) A new rail-linked ICD should generate at least two trains per week. Thus location, facilities and the size of the ICD shall be determined by the level of originating and terminating traffic.

(ii) Road linkages for transport of containers over short distances will remain an integral part of the movement strategies of CONCOR.

(iii) CONCOR/Railways, it is presumed, will undertake train-load movement and rake sanctity shall be maintained.

(iv) Satellite ICDs or traffic generating/terminating points will either feed a hub through road or traffic from smaller ICDs can be clubbed through topping up operations enroute for formation of train loads for ports. Formation of dedicated trains to ports remains the desired objective.

4.27.2 This pattern is already being followed for clearance of TEUs from Rewari, Kanakpura, Bhagat-ki-Kothi, Kanpur, Ballabhgarh, Gwalior, to name a few. Supply of empties by road is also widely prevalent.

4.27.3 It is realized that (a) Imbalance between export and import trade exists and transport agencies can hardly influence the pattern of movement to and from ports. Empty running becomes inevitable in certain circumstances, (b) Container-owning multinationals operate on global scale and balance their requirements of containers based on global requirements. This also necessitates haulage of empty containers at short notice, and (c) Just-in-time transportation of export oriented consignments by exporters determine the division of traffic between rail and road, as it may not be possible to ensure full-train movement form a particular ICD to a particular port at the crucial moment.

4.27.4 However, CONCOR must remain a train-load long distance operator – a "bulk" carrier of containers and not aspire to become a piecemeal operator. Its major objectives must remain: (a) to increase CONCOR's share of the overall container traffic, (b) to establish ICD-port linkages, and (c) to reduce empty haulage. However, it is realized that rationalisation of rail-linked container traffic for train-load formation will be a continuing exercise.

4.27.5 It may be mentioned that setting up of new ICDs, based on growth in container traffic, is unlikely to affect the volume of overall traffic. Accordingly, assessment of future levels of traffic as given in Section III will remain as indicated therein.

Section V

Line Capacity

5.1 Transport sector as a whole is encumbered with inadequate capacity due to dilapidated infrastructure. Consequently, its inability to meet mounting demands of external trade are manifested in slow and costly operations. Its inadequacy is accentuated by topical distortions of floods, strikes, external trade imbalances and uneven modal capacities between rail and road. Recent initiatives through investments in infrastructural projects do provide some comfort by correcting structural distortions, but the transport sector as a whole and railways in particular would remain under severe strain at least for the next decade. Inadequate line capacity, particularly on the North-West corridor is a case of the same genre.

5.1.1 Apart from railways, road operations, in the view of the Consultants, shall remain an integral part of the operations of CONCOR. Setting up of new ICDs not only entails additional detention of rail-stock but also additional cost. Unless commensurate benefits in the form of additional traffic can be obtained, peripheral originating points may be linked through road operations to ICDs. This would obviate running of short-distance under-load container trains and avoidable strain on some critical rail sections. Line (rail) capacity on important sections is, and would remain inadequate for some time. This would have far-reaching effect on routing of the container traffic.

Delhi-Mumbai

5.1.2 Inadequate line capacity on Delhi-Mumbai route on most of the sections will remain a major constraint on movement of additional goods traffic, including container traffic catering to impex trade. Annexure IV-4 has brought out present and projected capacity, volume and percentage of traffic from Mumbai area and Gujarat ports. Though the level of traffic handled at Mumbai area ports may rise, their share as a percentage of the total container traffic will slide down. CONCOR plans to induct about 1000 wagons (22 rakes) per year in the next five years. This will take care of about 15 per cent of the additional traffic.

Line Capacity and Utilisation

5.1.3 A brief overview of the sectional capacity and utilization is given in the following paragraphs. However, the following broad points may be noted:

- Line capacity utilization on most of the sections of Mumbai-Vadodara-Tughlakabad corridor is more than 100 per cent.
- Traffic on these sections is passenger dominated, including suburban traffic at extremities in Mumbai and Delhi areas.

- Overall share of CONCOR will increase with induction of additional rakes. This is reflected in the projected growth in rail-borne container traffic. But line capacity (despite some line capacity works in hand) will remain under severe strain till a separate freight corridor, presently at conceptual stage, is provided.
- Share of Gujarat ports will increase. Gauge conversion to BG on a massive scale in the western sector has increased line capacity manifold. Gujarat ports will play an increasingly important role in boosting exports. Additional works to augment capacity need to be taken up.
- Road capacity will remain under strain even after enhancement of capacity under the Golden Quadrilateral projects.

5.2 The 437 km long rail route between J.N. Port and Vadodara carries two major streams of traffic: (i) to ICDs in Northern India which turn North East towards Ratlam-Kota section for destinations like Tughlakabad, Dadri, Dhandari Kalan and Pitampura (Indore) and that (ii) for destinations in the North-West towards Ahmedabad-Mehsana-Palanpur for onward destinations such as Jodhpur (Bhagat-ki-Kothi), Jaipur (Kanakpura) and Rewari. Sabarmati, a major import/export hub lies in Ahmedabad area.

JNPT-Vasai Road

5.3 The common route JN Port-Vasai Road, rail section of 93 km, is operated by Central Railway. Capacity on the sub-sections is discussed below:

J.N. Port – Holding Yard-Jasai

5.3.1 The JN Port-Jasai section, 6.6 km long, has been bifurcated into two block sections – JN Port-Holding Yard and Holding Yard-Jasai. These are single line non-electrified sections, provided with MACL signalling. Trains are worked on absolute block system. The Port-Jasai section is open to goods traffic only with maximum permissible speed of 65 kmph. The present charted capacity of the section is 12 trains each way (10 with maintenance blocks). Running time of trains between Jasai and JN Port varies from 35 minutes to 50 minutes. However, severe detention of trains occurs short of JN Port. During the past 3 months (April to June 2005), the average detention of trains for want of line at JN Port was more than 30 minutes. Line capacity utilization on the section in 2004-05 was 149 per cent (with MB). However, the work of doubling the section is in progress and is scheduled to be completed by March 2006. After doubling, the capacity of the section will augment to 38 paths each way. With the current share of rail-borne traffic at JN Port, doubling should provide sufficient capacity to handle traffic upto middle of next decade. Considering the peaking factors and larger number of terminal operators, optimal line-capacity utilization would require: (i) twin single line operation, (ii) automatic signalling and (iii) track-layout facilitating transfer of engines from one group to the other.

Beyond 2016-17, perhaps provision of 3rd line between Panvel and JNPT may be required.

Jasai-Dapoli-Panvel

5.3.2 It is a single line electrified section interspersed by Dapoli, a two-line crossing station. The section is provided with MACL signalling. The section is currently open for goods trains only and the maximum permissible speed is 65 kmph. However, it suffers from a severe gradient of 1:100 rising towards Jasai. Container trains take 35 to 55 minutes for journey across the section. Normally, down trains run through from Panvel to Jasai as there are chances of their being stalled between Dapoli and Jasai due to steep rising gradient. The capacity of the section is 22 trains each way. The line capacity utilization during 2004-05 was 94.4 per cent with maintenance blocks (MBs). After doubling, the theoretical capacity of the section will augment to 44 paths each way. With the projected growth based on past trends, theoretically, the augmented line capacity of 44 trains each way would be sufficient to sustain traffic upto 2019-20 for JNPT. Practical considerations defy handling 44 trains eachway (44 trains workout to running time of 32 minutes for each time. 80 per cent utilization, peaking factors, seasonal variations would hardly permit goods trains of this level). Easing of gradient and laying third line would be required.

Panvel-Kalamboli-Diva

5.3.3 Panvel is a tri-junction and Panvel-Kalamboli-Diva Section is a double-line electrified section, provided with MACL signalling. The section is open for goods and passenger trains. Maximum permissible speed on the section is 75 kmph for goods trains and 100 kmph for mail/express trains. The capacity of the section is 40 trains each way with MBs. It caters to 14 passenger trains and 21 goods trains (including 12 container trains) in each direction. Capacity utilization is at 153 per cent without maintenance blocks and 184 per cent with maintenance blocks.

Diva-Vasai Road

5.3.4 It is a double-line electrified section with 4 stations in-between. The section is provided with MACL signalling and is open for both goods and passenger trains. Maximum permissible speed on this section is 65 kmph for goods trains and 75 kmph for mail/express trains. Sectional capacity is 40 trains each way with maintenance blocks and utilization in 2004-05 was 75 per cent.

Vasai Road-Surat-Vadodara

5.4 The Vasai Road-Surat-Vadodara sections (344 kms) are operated by Mumbai and Vadodara Divisions of Western Railways.

Vasai Road-Virar (8.2 km)

5.4.1 It is an electrified section, comprising two double-line corridors. Maximum permissible speed for goods trains is 100 kmph and for mail/express is 120 kmph. Sectional capacity is 126 trains each way. However, suburban (105) and through passenger (41) trains alone account for more than the assessed capacity. The utilization of all trains including 16 freight trains is 116 per cent.

5.4.1.2 Quadrupling of section between Borivali and Vasai Road is in progress. Presently, the section has a capacity of 126 trains each way. Utilization is 132 per cent. Quadrupling of the section will not, however, be of benefit to trains approaching from Diva side. The section will be able to cater to the increased container traffic, consequent to commissioning of the 3rd container terminal in 2006-07.

Virar-Surat (207 km)

5.4.2 This section is divided in four sub-sections. The present capacity and its utilization by 2006-07 will be as under:

Table 5.1: Capacity and Utilisation of Virar-Surat Section

Section	Capacity 2004 with M/B	Capacity 2006 with M/B	Percentage utilisation 2004 with M/B	Percentage utilisation 2006 with M/B
Virar-Dahanu Road	63	63	116.9	126.4
Dahanu Road-Valsad	50	63	139.6	120.4
Valsad-Udhana	50	63	141.6	122.0
Udhana-Surat	58	63	143.6	144.0

All these sections are electrified double line. The work on automatic signalling on Virar-Dahanu Road-Bhestan Section is in progress and work of additional loop line at seven stations (Vaitama, Pardi, Atul, Kelve Road, Sachin, Vedchha and Udvada) between Virar and Surat is in progress. Maximum permissible speed on this section is 100 kmph for goods trains and 120 kmph for mail/express trains. The existing line capacity is expected to increase by 25 per cent after completion of these works by 2006-07. However, it being already saturated, even the augmented line capacity will not be able to meet the full impact of normal growth in freight traffic with the result that the line capacity will remain under severe strain.

Surat-Vadodara (129 km)

5.4.3 This double line electrified section is provided with MACL signalling. Maximum permissible speed on the section is 100 kmph for container trains, 75 kmph for other goods trains and 120 kmph for Mail/Express trains. The capacity is as under:

Table 5.2: Capacity and Utilisation of Surat-Vadodara Section

Section	**Capacity with M/B**		**Pass**		**Goods**		**Percentage utilisation with M/B**	
	2004	**2006-07**	**2004**	**2006**	**2004**	**2006**	**2004**	**2006**
Surat-Bharuch	54	63	49	51	23.32	31.36	140.8	136.6
Bharuch-Vadodara	54	63	48.5	50.5	23.46	31.06	141.3	136.3
Vadodara(P)-Vadodara(D)	71	71	69.5	71.5	23.82	31.42	152.6	166.1

5.4.4 The following works are reported to be in progress: (a) extension of loop line at Bajva; (b) additions and alterations in Vadodara yard; (c) providing additional loop line in Pansli; (c) conversion of C-class stations into B class at Kashipura and Vanama; and (e) automatic signalling between Surat-Vadodara.

Vadodara-Ratlam-Mathura-Tughlakabad

5.5 The Vadodara-Ratlam-Mathura-Tughlakabad, 963 km route, is operated by four railways viz Western, West Central, North Central and Northern Railways. Important sections of the route are discussed below:

Vadodara-Godhra (74 km)

5.5.1 The charted capacity and utilization of the section is as under:

Table 5.3: Capacity and Utilisation of Vadodara-Godhra Section

Section	**Capacity with M/B**		**Pass**		**Goods**		**Percentage utilisation**	
	2004	**2006**	**2004**	**2006**	**2004**	**2006**	**2004**	**2006**
Vadodara(D)- Vadodara(Z)	46	46	25.5	27.5	12.5	17.25	87.2	103.2
Vadodara(Z)- Godhra	46	46	25.5	27.5	19.09	22.09	102.8	114.7

5.5.1.2 *Godhra-Anand* 85km section is single line electrified section. Capacity utilization with M/B was 94% in Godhra-Sevaliya section and 63% on Sevaliya-Anand section in 2004-05. Anticipated utilization till 2009-10 will be 119% and 97% respectively. Presently, container loads for Gujarat ports are separately being formed at Ratlam and despatched via this route.

Godhra-Ratlam-Nagda Sections (227 km)

5.5.2 This double-line electrified section is provided with MACL signalling. The speed of trains on the section is 75 kmph for goods trains, 100 kmph for container trains and 120 kmph mail/express trains. The capacity of the section and utilization thereof is as under:

Table 5.4: Capacity and Utilisation of Godhra-Ratlam-Nagda Section

Section	Capacity with M/B		Pass		Goods		Percentage utilisation with M/B	
	2004	2006	2004	2006	2004	2006	2004	2006
Godhra-Ratlam	46	46	25	27	26.78	32.18	125.7	141.8
Ratlam-Nagda	46	46	26	28	28.29	33.69	126.9	143.0

Nagda-Kota-Mathura Section (549 kms)

5.5.3 This double-line electrified section is provided with MACL signalling and trains are worked on absolute block system. Maximum permissible speed on the section is 100 kmph for container trains, 75 kmph for goods trains and 120 kmph for mail/express trains. The section presently caters to 18 pass, 7 container and 23 other goods trains. The line capacity utilization of the section is as under:

Table 5.5: Capacity and Utilisation of Nagda-Kota-Mathura Section

Section	Capacity with M/B		Pass		Goods		Percentage utilisation with M/B	
	2004	2006	2004	2006	2004	2006	2004	2006
Nagda-Kota	40	40	10	20.16	22.10	25.34	110.75	123.08
Kota-SWM	40	40	23	24.40	23.00	26.31	128.25	141.95
SWM-MTJ	40	40	13	13.79	18.40	21.14	84.00	93.65

SWM – Sawai Madhopur MTJ – Mathura Junction

Mathura Junction-Tughlakabad Section (113 kms)

5.5.4 This is a triple line section i.e. a standard double line and an additional single line between Palwal and Tughlakabad. The sectional capacity is of 80 trains eachway upto Palwal and 90 trains between Palwal and Tughlakabad with M/Bs. The section has as many as 48 passenger carrying trains between Mathura and Palwal and 63 passenger carrying trains between Palwal and Tughlakabad. Capacity utilization in 2004-05 was 132.75 per cent; it is likely to increase to 143.15 per cent in the year 2005-06.

Transit Time: Tughlakabad to JN Port

5.5.5 Analysis of running time shows that only 15 per cent of trains between Tughlakabad and JNPT take upto 40 hrs, 50 per cent take upto 50 hrs and 25 per cent upto 60 hrs. About 10 per cent take beyond 70 hrs. Segment-wise analysis of running time shows that maximum detention occurs on Vasai-JN Port followed by Tughlakabad-Mathura section. Running time profile of container trains during the month of June 2005 is as under:

Table 5.6: Running Time Profile of Container Trains

Section	Length Km	Time (in hrs)		Average speed KMPH	
		UP	Down	UP	Down
Tughlakabad-Mathura Jn	113	5.33	5.23	25.38	21.80
Mathura Jn-Nagda	549	10.35	11.25	52.76	50.00
Nagda-Godhra	229	5.45	6.35	39.23	35.23
Godhra-Surat	202	7.23	6.48	27.30	29.71
Surat-Vasai	215	8.21	7.00	30.65	30.71
Vasai-J.N. Port	93	10.23	9.58	8.84	10.94
Total	1401	54.25	47.09	25.82	29.75

5.6 The *projected evaluation of line capacity* for the years 2006-07, 2010-11, 2016-17 and 2021-22 of JNPT-TKD route is given in Annexure V-1.

5.6.1 The projected evaluation of line capacity of JNPT-Surat route has been given in Annexure V-2 which shows separately passenger trains, container trains, non-container trains and department/light engines, etc.

5.6.2 It may be seen that right through the year 2021-22, inadequate line capacity will stare the railways in the face from Virar in Mumbai area to Tughlakabad. Two ameliorating factors would be (a) the projected freight corridor from Delhi to Mumbai and (b) the Rajasthan and Gujarat rail routes to Gujarat ports, which after conversion to broad-gauge will substantially increase line capacity.

Routes connecting Pipavav-Mundra-Kandla ports

5.7 Annexures IV-9 & 10 give the growth projections of rail traffic on routes connecting Mundra and Pipavav ports.

5.7.1 Annexure V-3 gives line capacity utilization of sections connecting Saurashtra ports to ICDs in the north during 2004-05. Rail network in this area is largely old metre-gauge route converted to broad-gauge or being taken up for this purpose.

5.7.2 Three important Gujarat ports likely to play important role in dealing with exim traffic are Pipavav, Mundra and Kandla. It has already been indicated in earlier sections that the volume of exim traffic at these ports will grow at a faster rate than that at other ports in the country.

5.7.3 Kandla/Mundra ports are presently connected to the network via Viramgam-Mehsana-Palanpur BG route and onwards via Marwar and Jaipur to ICDs in the north. Traffic from Pipavav port on the Pipavav-Surendranagar-Viramgam sections also traverses the same route from Viramgam onwards. Annexure V-3 shows that the entire section from Viramgam to Hissar via Palanpur, Marwar, Jaipur, Rewari and Bandikui is overstretched. Line capacity utilization ranges from 100% to 152%. From Marwar, an alternative route via Jodhpur-Merta Road is available for Dhandarikalan. However, even on this route, Jodhpur-Merta Road section presently has capacity utilization of 124%.

5.7.4 Nevertheless, the following works already under execution would provide the much-needed capacity for the projected container and other goods traffic:

(i) Conversion of Gandhidham-Bhildi and Bhildi-Palanpur sections to broad-gauge. Apart from providing additional evacuation through broad-gauge, this would avoid the presently strained Viramgam-Mehsana-Palanpur section, releasing additional capacity for projected traffic at Pipavav. Without this alternative route, exim traffic would have suffered. Bhildi-Palanpur is a 45 km section which permits diversion of traffic via Marwar or from Palanpur via Bhildi.

(ii) Conversion of Bhildi-Samdari section. This, as alluded to elsewhere, would release capacity on Palanpur-Marwar-Phullera-Jaipur sections. Released capacity can accommodate additional traffic from/to JNPT for Bhagat ki Kothi, Kanakpura and Rewari.

(iii) Phalodi-Kolayat, the newly constructed section provides relief for Jodhpur-Merta Road and sections further on. Traffic for Dhandarikalan can be routed through this section.

(iv) Doubling of Delhi-Rewari section.

Section VI

Candidate Locations for Hubs

6.1 The Inland Container Depots (ICDs) are important links in the transport logistics chain and are expected to facilitate door-to-door movement of containers. As at present, CONCOR is the only agency for rail movement of container traffic from these ICDs to/from the ports. However, with the open-door policy of the government, new (private) operators are entering the field. This will add new dimensions to the complex problem of linkage to ports.

6.2 It appears that even after private operators are licenced to operate container trains in the country, these licencees shall also be responsible for providing the rolling stock.

6.3 However, the number of ICDs is likely to increase. New ICDs will be set up by new players in order to relieve capacity constraints at existing ICDs due to increased traffic. Thus Dadri was set up to relieve Tughlakabad as also to capture additional traffic from Greater Noida, Panipat, Aligarh and neighbouring areas. Sansi near Jullundur may provide relief to Dhandari Kalan.

6.3.1 Another factor to be considered is that if the thrust on exports has to be maintained, productivity levels at ports need to be improved. A dedicated freight corridor from Delhi to Mumbai, is now a certainty. Double stack container trains are already on the anvil. Traffic to Mumbai ports, principally to JNPT, will increase sharply. Imports are also likely to register robust growth. The number of inland destinations will be much larger than at present. All this calls for sharp reduction in handling time both of vessels and trains. Faster evacuation, consonant with block loads for important ICDs will be a pre-requisite to improved productivity at ports.

6.4 Kanpur receives traffic from Allahabad, Mirzapur and Bhadoi apart from Kanpur industrial area. In due course, Mirzapur may itself get an ICD. Panipat, Amritsar, Aligarh, Gurgaon and some other locations may have to be upgraded as independent ICDs. Two problems may arise:

- Each of these may not be able to generate sufficient traffic within short spans to offer full train loads and hence pick-up operations may be a necessity. Short-distance, empty-haulage will be unavoidable.
- Diffused loading for larger number of destinations from ports may be inevitable.

6.4.1 Additional ICDs, however, are not likely to affect projections of overall countrywide volumes of container traffic.

6.5 In order to overcome the various problems, CONCOR considered the possibility of setting up one or more hubs to consolidate loads to and from the ports. Apart from the direct and indirect costs involved, this will affect the operational patterns of container traffic. This, in turn, will necessitate looking into the need and feasibility of creating such a hub, its location and the attendant issues of estimating the capacity of the hub, capital and operating costs and the impact on quality of service, etc. Major consideration here is whether a new hub may be established for consolidating loads and formation of dedicated trains. Discussion in earlier sections brings out:

- That Gujarat ports are developing capacity to deal with rising exim traffic;
- Distance to Gujarat ports from ICDs enroute, both by rail and road, is shorter than that to JNPT.
- These ports have good rail and road connectivity. Gauge conversion to Broad Gauge executed and planned, new routes (Phalodi to Kolayat), doubling of Delhi-Rewari Section, all add up to provide adequate capacity. Traffic from ICDs in north will continue to move to Gujarat ports via Rewari, Jaipur, and Jodhpur. There is little likelihood of this traffic being routed to Gujarat ports via Vadodara.
- Mixed loads of the type that affect operations at JNPT are not likely to pose problems at Gujarat ports. Gujarat ports may not be able to generate sufficient import traffic to form trainloads within reasonably short span of time for ICDs in the north. This will be no different from the pattern of import traffic at other ports. Intermediate location of ICDs on Delhi-Mumbai route for *rationalization of loads to form block loads* for ports will, therefore, largely deal with traffic to Mumbai ports. The only point generating traffic for Gujarat ports may be Indore/Ratlam-Kota. Container traffic from these points are rationalized at Ratlam and despatched as full train loads. In the reverse direction, Mumbai ports will generate traffic via Vadodara for Sabarmati, Bhagat-ki-kothi (Jodhpur), KKU (Jaipur) and Rewari. Viability and justification for probable locations has to be considered, keeping these aspects in view.

Probable Location of Hubs

Pilol

6.6 Pilol, a station 14 km east of Vadodara Junction was suggested by CONCOR for development as a hub for transposition of the containers to form pure loads for JNPT. Pilol has five running lines - two for each direction and a common running line. Besides, an electrified goods siding with a capacity of 36 four wheelers is also provided. Running lines have varying holding capacity of 85,92, 74 and 69 four wheelers respectively. The station has the disadvantage of having three level crossings. One traffic level crossing (10-C) cuts across all the running lines, being located inside the up starter signal. This level crossing connects road traffic to a highway through a village and again through another level crossing. Serious difficulty is experienced in stabling loads, whenever necessitated by operational exigencies, at Pilol. Western railway has already included a proposal in their Works Programme for extension of lines 4 and 5 (presently having length of 74 and 69 four-wheelers) to standard length as also of shifting traffic level-crossing further towards the West (i.e. at the Vadodara end). This may enable stabling of loads when necessary but with more than 50 trains running each way, which by the year the hub comes up shall be 55 trains each way or one train up or down every 15 minutes, the problem of passage of road traffic shall remain. Presently, loads, particularly BTPN rakes for Karchia, are held back at Samlaya (BTPN rakes get detained for heavy traffic on Vadodara-Ahmedabad section and are routed via the Bajwa bypass) due to operational reasons. The following need consideration:

(i) Pilol is a station short of a major junction station. Some trains get detained almost daily for passage through Bajwa chord as stated above and for room at Vadodara yard. This is an inherent pattern of transportation. Possibilities of temporarily accommodating such trains short of major yards, junctions or bypasses must be allowed to remain. An additional common running line, wherefrom container handling lines will takeoff, shall have to be provided.

(ii) Railway land for setting up an ICD for readjustment of containers is not available at Pilol. Additional land will have to be acquired. Minimum length will be about 1000 mtrs. (with appropriate width). State government will need to be approached for acquisition of land and required cost of land will have to be provided for.

(iii) Habitation around Pilol is meagre. Though railways have provided staff quarters, a sizable number of railway staff stay at Vadodara. Location of staff for operating an ICD at Pilol may pose problems. Pilol is located more than 5 kms from the highway connecting Vadodara and serious detention to road traffic at the intervening level crossings does not lend itself to frequent road services.

(iv) Pilol is located on Vadodara-Godhra section. Even if a hub at a huge capital and running cost is set up at Pilol for rationalization of loads to JNPT, it will still deal with only one stream of traffic to JNPT. Mixed traffic from Sabarmati, and from ICDs at Rewari, Kanakpura and Bhagat-ki-Kothi shall continue to flow to JNPT. So will the mixed loads from Central Railway.

(v) While container trains for reshuffling may suffer detention of 4 to 6 hours to maintain purity of rakes for individual operators at JNPT, TEUs involving sensitive export traffic, may suffer heavy detention.

(vi) The tentative route of the proposed 'dedicated freight corridor' has been finalized and shall not be along Kota-Vadodara section. In fact part of the existing freight traffic may also not touch this section.

Financial Implications

6.6.1 ICD at Pilol cannot be recommended for the aforesaid reasons. However, assuming it is set up at some later stage, the following factors will impact the financial costs:

(i) Volume of traffic in the relevant years

(ii) Likely percentage of mixed loads to be handled at this hub and at the port

(iii) The number of terminal operators at the port

(iv) Costs involved – capital and operational.

(a) Setting up the hub at this location involves acquisition of land and construction, which in the opinion of the consultants may take minimum 3 years. Even if the decision is taken immediately, the earliest the hub can be functional will be in the year 2008-09. Traffic projections are considered for this year.

(b) In the year 2003-04, the percentage of mixed loads received at JNPT was 37. This was brought down to 24 per cent the next year and this level has been maintained during the months April, May and June 2005. With the new ICDs and much larger number of operators, this percentage is likely to go up. However, for considering financial implications hereunder, the percentage of mixed trains is assumed at the current level of 24.

(c) Presently, two terminal operators provide services at JNPT. This will go upto three before the proposed container hub becomes functional.

(d) The percentage of mixed trains handled presently are 60 per cent by JNPCT and 40 per cent by NSICT. For three operators, it is assumed that two operators will handle 33% each and JNPCT the balance.

(e) The average trainload (both incoming and outgoing) is assumed as 80 TEUs.

(f) Detention of each train at Pilol is assumed as 4 hours.

(g) Train detention and dwell time has been assumed only for trains going to JNPT and not for the traffic in the reverse direction. Though container handling will be effected in non-electrified area, it is assumed that the electric train engine will wait. This will be akin to the 'engine on load' for the purposes of this exercise.

(h) Unlike IR, CONCOR's earnings shall be subjected to Income Tax.

6.6.2 On the basis of these assumptions, the following facts emerge:

(a) In 2008-09, the total number of inward trains at JNPT will be 20 with an average load of 80 TEUs.

(b) Sixty four per cent of this traffic or 13 trains a day will be received from ICDs in the north which will pass through Pilol. This excludes traffic from Rewari, Kanakpura, Bhagat-ki-Kothi, Sabarmati and Vadodara.

(c) At 24 per cent, the number of mixed trains to be dealt with at Pilol will be 3.12 or 3 per day.

(d) With two operators at the port, each train is assumed to bring 40 per cent or 32 TEUs for NSICT and 60 per cent or 48 TEUs for JNPCT. With three operators, the number of containers each train will carry will be in the ratio of 26:26:28.

(e) In 2003-04, 110 rakes are employed for exim traffic, assumed accretion is 22 rakes per year till 2008-09.

(f) Earnings likely to rise @ 15% p.a.

6.6.3 Findings:

(a) Average dwell time of TEUs for formation of pure loads shall be 12 hours for NSICT and 10 hrs for JNPCT. However, with 3 terminal operators, the average dwell time shall be 11 hrs at Pilol.

(b) 12 train hours will be lost per day (3 trains x 4 hours) at Pilol.

(c) Consequent to the formation of pure loads at Pilol, the number of mixed trains will be reduced by one for NSICT and two for JNPCT. Saving of train hours at JNPT will be 1x4 (NSICT) and 2x2 for JNPCT. Total saving 8 hours (the difference in the detention of pure and mixed loads dealt with by NSICT is 4 hours and that by JNPCT is less than 2 hrs). In the case of three operators, saving in handling time at JNPT will be 10 hrs, assuming that the new operator shall be as efficient as NSICT (4 hrs + 4 hrs + 2hrs for JNPCT).

(d) Correspondingly, 10 hrs saving of train hours approaching JNPT will also be effected.

(e) Total saving in train hours = 10 + 10 = 20 hrs.
Net saving in time = 20 – 12 = 8 hrs per day (20 hrs saved at and short of JNPT and 12 train hours lost at Pilol.
Savings in train hours per year will be 2920 hrs.

(i) Capital cost Rs. 36 crores comprising of Rs. 20 crores for land, Rs.4 crores for handling equipment and Rs. 12 crores for construction

(ii) Life span of assets assumed as 30 years.

(iii) Amortisation per year Rs.1.20 crores

(iv) Interest on reducing balance per year @12% p.a. Rs. 2.16 crores

(v) Total outgo per year on capital account – Rs. 3.36 crore

(Note: If handling equipment is provided by a contractor, correspondingly his charges shall reflect cost, interest on the equipment and cost of staff apart from an element of profit.)

(f) Staff to be employed at the new hub: 1 Chief yard master, 3 yard masters, 3 shunting jamadars, 4 support staff, 3 TXRs, 6 ATXRs and 4 security staff.

Two main routes to assess financial viability of the project were considered. These were:

(i) Based on operational revenue of exim traffic on the basis of 30% of gross revenue. (In other words 70% is considered as operational cost. However, it will still not include depreciation and income tax).

(ii) On the basis of cost per trip.

On both the counts the result is negative i.e. even if after assumed overall savings in train hours, the return will be negative.

Samlaya Junction

6.7 An alternative suggestion to Pilol was Samlaya junction which is 26 km east of Vadodara. It was a broad gauge/narrow gauge junction. NG has now been disbanded. Railways preferred this location since it would have enabled them to create the much-needed line capacity through conversion of some NG portions to BG and after conversion, the new line could also serve as Vadodara bypass. However, there is no land available for creating the hub. Presently, this station is used for stabling up trains (particularly empty BTPN) as Pilol has the problem of short running lines and level crossings spanning the width of these running lines, where stabling becomes difficult.

Vadodara

6.8 Presently, a part of goods shed area has been taken over for handling container traffic. Containers are handled from a single line with capacity of 42 flats. Plans are afoot to extend the platform to accommodate a full rake. Currently, the major problems are:

(i) Supply of empty flats is uncertain. No rake has been assigned for traffic between BRC and JNPT or Gujarat ports.

(ii) Meagre customs staff at CFS.

(iii) Rail and road distances to JNPT are almost the same. However, road transport direct from factory to the port is stated to be faster.

6.8.1 Suggestions were received to dismantle three lines in the down departure yard and provide space for stacking and loading/unloading of containers. This proposal has not been seriously examined at appropriate levels and, in any case, is inappropriate both from the angle of road connectivity and by-pass container traffic from Godhra to Sabarmati side. No extra space is available for expansion of ICD. Railway wants to have more space as sectional capacity is already saturated; additional movements may affect the capacity further.

6.8.2 Annexure IV-3 indicates inadequacy of traffic from ICDs in north via Vadodara to justify separate ICD for dealing with mixed loads. However, it is realized that mixed loads cannot be entirely wished away. The solution lies in an integrated authority for handling container traffic at JNPT. This problem does not arise at other ports.

Ankleshwar

6.9 Located 80 kms south of BRC, the city is known for chemical Industries. CONCOR has recently opened an ICD. Presently, the ICD has capacity to accommodate only half a rake, though plans are afoot to extend the same to full length. Rakes will be first received from BRC on the goods reception lines, engine reversed, drawn ahead on the main line and placement done. Down trains from Surat are first received on the Common Loop, drawn ahead through goods reception line on to the main line and placement effected. Placement and removal shall remain a tortuous process and not amenable to handling large volumes of container traffic. This location is singularly unsuitable for rationalization of container loads in either direction.

Jasai Yard

6.10 As already discussed, JNPT is handling 24% of mixed trains per month. It is understood that RITES had earlier recommended development of sorting yard at Jasai to ensure feeding of dedicated trains to respective terminals. This proposal, however, fell through.

6.10.1 Presently, Jasai yard is provided with a common DOWN/UP main line in addition to five full length reception-cum-despatch loop lines (R & D lines). In the ongoing project for doubling of Panvel-JNPT section, one of the loop lines will be converted to UP main line. The existing engine run-round line will thereupon be converted into an R&D line and a new engine run-round line is programmed to be laid.

Annexure VI-1 shows that 24 per cent trains received at JNPT are mixed. Two main culprits are Dadri and Nagpur. Correspondingly, 11% trains despatched from JNPT are mixed – major destinations being Dadri and Sabarmati. Factors impacting the number of mixed loads in future have already been indicated. It has already been indicated earlier that JNPT receives traffic from three main streams – Mumbai area (largely by road), Central Railway and Western Railway. Though the convergence is at Panvel, full yard facilities are available at Jasai. Railway land for additional facilities is also available. This could be an eminently suitable location for rationalization of loads for JNPT.

6.10.2 When the volume of traffic increases to 37 trains each way in 2016-17, some cushion for temporary ups and downs or dislocations at JNPT may be necessary. This may be in the form of rationalization of loads for JNPT or those from JNPT for different ICDs. In addition, these facilities may provide for additional stabling or even for faster evacuation by road.

6.10.3 The above discussion is to highlight the issues involved. Consultants are of the view that proper long-term remedy lies in constituting a special purpose vehicle for container-handling at JNPT. This has been discussed in detail, later.

Viramgam

6.11 It has the advantage of being a tri-junction providing access to Pipavav and Kandla/Mundra ports from Ahemedabad area. However, after conversion of Gandhidham-Palanpur section to broad gauge, traffic to/from Kandla and Mundra ports will be serviced through the direct route via Palanpur/Bhildi (Bhildi-Samdari section is programmed for conversion to broad gauge). Rationalisation of mixed loads from JNPT/Mumbai for Bhagat-ki-kothi, Kanakpura (Jaipur), Rewari or even for upcoming ICD at Gurgaon cannot be dealt with here.

Bhagat-ki-Kothi

6.12 Located 4 kms west of Jodhpur, this ICD is carved out of the railway yard of the same nomenclature. A single line with a capacity of 20 flats is provided at the ICD sandwiched between an old goods shed and the engineering stockyard. The ICD has stacking capacity of about 3000 TEUs which with multiple stacking can increase to 8000 TEUs. In 2003, CONCOR entered into a temporary arrangement with the railways for a period of two years for setting up this ICD. The said period has already elapsed. The permanent location suggested by railways is Salawas, a station another 13 kms west of the present location. Extension of the present handling line by another 5 flats should not pose much problem given the willingness to allow the ICD at the present location. Discussions with railway authorities brought out that coaching facilities from Jodhpur are proposed to be shifted to Bhagat-ki-Kothi. Width at the other side i.e. towards the engineering stockyard may permit additional line to be provided. However, this question needs to be resolved between the railways and CONCOR.

6.12.1 Apart from CONCOR, two other ICDs, Rajsico (operated by Rajasthan Small Industries Corporation) and Thar (a private ICD) also cater to the export needs of the local industry. During the period April-October 2005, while CONCOR's share of the export business from Jodhpur area was 54%, that of Rajsico was barely 6% and the balance 40% was captured by the private operator Thar. However, from April 2005 onwards, the share of CONCOR has been declining. Competition from the road is intense.

6.12.2 Traffic at this ICD is mainly export-oriented. During 2004-05, while 12605 TEUs were loaded for various ports, only 525 loaded TEUs were received at Bhagat-ki-Kothi, including 90% from JNPT (including NSICT). During this period, as many as 5700 empty TEUs were received by rail apart from another 10200 by road. Export traffic is largely for JNPT (including NSICT) Mundra and Pipavav ports. During 2005-06, while traffic for Mumbai area ports has declined, that for Gujarat ports has increased. This trend is likely to continue in the foreseeable future, principally due to short lead both by rail and road to Gujarat ports.

6.12.3 Important commodities loaded for export at these ICDs are guargum, hand-tools, handicrafts and furniture. Handicrafts and furniture export has an important bearing on the pattern and volume of traffic offered to CONCOR. Furniture is high-volume low-weight traffic. Exporters prefer 40 foot containers to the more commonly used 20-ft containers. In 2004-05, as many as 4321 40-ft containers were loaded as against 3962 20-ft containers. In 2005-06, during the period April-October 2005, as many as 2220 40-ft containers were loaded as against 2075 20-ft containers. Road-hauliers charge freight on the basis of weight, while CONCOR charges double the freight rate of 20-ft containers. Road haulage, therefore, proves cheaper than rail for 40-ft containers. In the circumstances, preference for road is obvious.

6.12.4 O-D breakup of traffic, current and projected, is given in Table 6.1. Traffic for Gujarat ports has been projected at a higher rate of 15% per annum for the next three years.

Table 6.1: Number of TEUs/Trains per day Outward and Inward at Bhagat-ki-Kothi

(TEUs in 000)

YEAR	JNPT/NSICT		Pipavav		Mundra		TKD		DDL		Total	
	O/W	I/W	O/W	I/W	O/W	I/W	O/W	I/W	O/W	I/W	O/W	I/W
2005-06												
TEUs	27.99	6.51	2.03	0.57	1.31	-	0.71	0.71	2.09	2.09	34.13	9.88
Trains	0.35	0.08	0.03	0.01	0.02	-	0.01	0.01	0.03	0.03	0.43	0.13
2007-08												
TEUs	37.02	8.61	2.69	0.75	1.73	-	0.94	0.94	2.76	2.76	45.14	13.06
Trains	0.46	0.11	0.03	0.01	0.02	-	0.01	0.01	0.03	0.03	0.56	0.16
2010-11												
TEUs	50.62	11.78	3.68	1.02	2.37	-	1.29	1.29	3.78	3.78	61.74	17.87
Trains	0.63	0.15	0.05	0.01	0.03	-	0.02	0.02	0.05	0.05	0.77	0.23
2021-22												
TEUs	130.63	30.39	9.49	2.64	6.12	-	3.32	3.32	9.75	9.75	159.31	46.10
Trains	1.63	0.38	0.12	0.03	0.08	-	0.04	0.04	0.12	0.12	1.99	0.57

Note: The averages are based on actual data of 3 months April to June 2005 and adjusted for growth by 15, 11 and 7% for the years 2007-08, 2010-11 and 2021-22 respectively

6.12.5 Even with meagre rail capacity provided, the present and projected volume of traffic can be comfortably handled, including a few mixed loads for rationalization of loads for other ICDs. This is irrespective of the location – at BGKT or at Salawas.

6.12.6 The average time taken from placement to release was only 2 hrs 30 mts in September 2005; the overall detention to rakes from arrival to despatch was 6 hrs 26 mts. (However, in May-July 2005, the overall detention ranged from 12 hours to about 17 hrs. This was attributed to late provision of train engines).

6.12.7 Another factor to be considered is that gauge conversion of Bhildi-Samdari section is already programmed and is proposed to be taken up shortly. This would provide sufficient capacity to move the projected traffic for ICDs in the north or Rajasthan areas. While Jodhpur-Merta Road section might be saturated (line capacity utilization with maintenance blocks is indicated as 113%), a new connection between Phalodi and Kolayat provides a suitable alternative route to Bikaner from where ICDs in Punjab area can be accessed. The new route takes off from Rai-ka-bag, a station next to Jodhpur. From the sanctioned amount of Rs. 163 crore for the project, Rs. 97 crore have already been spent. This would provide considerable relief to Jodhpur-Merta Road section. Additional capacity generated by gauge-conversion of Bhildi-Samdari section and the new route to Bikaner via Phalodi, can accommodate traffic for ICDs in north originating from Pipavav, Kandla and Mundra ports.

Palanpur

6.13 Palanpur is the junction station of BG section Mehsana-Abu Road and metre gauge section of Bhildi-Palanpur. With the conversion of Gandhi Dham-Bhildi-

Samdari sections from metre gauge to broad gauge, which is in hand, a new route will be available for movement of container trains from/to Kandla, Mundra and Pipavav ports. The station is surrounded by constructed area and there may be difficulty in acquiring land. Since traffic from/to Kandla/Mundra may bypass Palanpur, this may not be the natural choice.

Observations on Mixed Trains

6.14 In paras 6.19 and 6.20, it is indicated that mixed loads will continue to be integral to container traffic to ports as also import traffic arising at the ports for inland destinations.

6.14.1 The proposal of container sorting yard was discussed with all the concerned stakeholders and the following views emerged:

- The dedicated trains take less time in handling. This ensures handling more trains on limited ICD lines. In turn, it results in proper planning of terminal operations and improvement in efficiency and productivity through optimal utilization of equipment. Clearance of more TEUs results in better turnround of the stock.
- Though the number of mixed trains to ports increased for a few months, there are concerted efforts by CONCOR to bring them down to manageable levels.
- The detention in the case of mixed trains is much higher compared to dedicated trains. Detention after loading i.e attachment of brake van, safety checks, pre-departure formalities and running time gap between two rakes (departure to arrival of next rake) takes about one hour; pre-departure detention ranges between 45 minutes and 90 minutes.
- Decline in the number of mixed trains will save CONCOR expenditure in setting up of a captive sorting yard and operational cost since no other agency is likely to invest in this facility.

Problems of Mixed Rakes

6.15 The problem of mixed rakes arises mainly at ports/ICDs with multiple handling agencies and is acute at JNPT. This problem is not faced at ports like Mumbai, Pipavav and Mundra with single terminal operator. Annexure VI-1 gives monthwise number of trains handled at JNPT by two operators – JNPCT and NSICT. Annexure VI-2 gives linewise rakes handled and detention to dedicated and mixed trains. Type of trains received and despatched from important destinations are given at Annexure VI-3.

6.15.1 Month-wise number of inward and outward trains at JNPT (including mixed trains) and their percentage to total trains (inward/outward) for the year 2004-05 is given in Annexure VI-1. During 2004-05, as many as 900 mixed trains (2.5 trains/day) were received at JN Port; this constituted 24% of the total number of trains received. This is a significant improvement over the previous year when as many as 1375 trains (3.8 trains/day) or 37% of the total were mixed trains. However, during the quarter April to June 2005, the number of mixed trains received was 256 (2.8 trains/day) against 167 (1.9 trains/day) received during the same period in 2004-05, an increase of 53%. Percentage of mixed trains received at JNPT during the years 2004-05 and 2005-06 are given in the table below:

Table 6.2: Percentage of Mixed Trains Received at JNPT

Month	2004-05	2005-06
April	14%	24%
May	19%	23%
June	19%	27%

6.15.2 An analysis of containers received at JNPT from five major ICDs during April, May and June 2005 (Annexure 6.3) shows that the largest number of mixed loads were received from Dadri in the north via Western Railway and Nagpur via Central Railway. During these months, as many as 63, 35 and 68% loads received from Dadri were mixed. One reason for such a large number of mixed trains was the attachment of power packs (PP); trains with such attachments get precedence over normal traffic. This explains why some mixed loads are despatched to JNPT from Dadri. After June 2005, the number of mixed trains despatched from Dadri has come down. However, with the cold-chain operation gathering momentum, changing pattern in the near future may be observed.

6.15.3 Nagpur is another major ICD, from where mixed loads emanate. During the months April-June 2005, JNPT received 30, 46 and 18% mixed trains from Nagpur.

6.15.4 CONCOR, presently the sole mandated agency for carriage of containers by rail, has been striving to minimize the number of mixed trains to JNPT. This is mainly dependent upon the trade-off between the volume of traffic on offer for a particular destination and the extent of detention the carrier/consignor is willing to suffer at the originating point. Presently, only three ICDs viz DDL, TKD and SBI can form full train loads daily for JNPT. Mixed loads from these are negligible.

6.15.5 The following may impact the level of mixed load traffic to/from JNPT:

- With the commissioning of third terminal at JNPT, present and projected traffic may split between three terminals instead of the present two. This can considerably dilute the purity of rakes even with significantly increased traffic.

- With the setting up of new ICDs, the possibility of less than train load traffic will increase, necessitating clubbing with traffic from other ICDs. Per contra, higher growth rate may enable some ICDs (eg. Dadri) to form larger number of full train loads for this port.

6.15.6 A third container terminal will be built and operated by Gateway Terminals India (P) Ltd. (GTIL), at JNPT by August 2006. With this terminal, two additional loading/unloading lines will be available at JNPT. Assuming that GTIL will exhibit at least the same level of efficiency as that of NSICT, and that line No.6 (presently dismantled) will be re-laid, the port would handle 18 trains including four mixed trains a day.

6.15.7 While an integrated authority (SPV) for JNPT may rationalize procedures and improve efficiency, there is likely to be demand for additional capacity to deal with growth in traffic beyond 2015-16. The proposal for the fourth terminal at JNPT has already been initiated and the fifth one is at the conceptual stage. With the present and proposed herringbone layout, integration of outward loads for much larger number of ICDs may be possible only through ICD-wise stacking area where import traffic from all the handling agencies can be clubbed. Additional facility to rationalize outward loading may be required at Jasai, where space may not be a constraint. Initially, two handling lines with appropriate stacking area and handling equipment would be required.

Traffic to/from Gujarat Ports – Consolidation of Import Traffic

6.16 On the north-western routes, traffic for Gujarat ports originates from major ICDs in the north. This traffic largely originates from Dhandari Kalan, Tughlakabad, Kanakpura and Bhagat ki Kothi. Consolidation of loads is done at Rewari, Kanakpura and Bhagat ki Kothi. Traffic flow to Pipavav, Mundra and Kandla during the period April to June 2005 is given at Annexure IV-3.

6.16.1 It may be observed that all the three routes presently converge at Mehsana. However, after conversion of Gandhidham-Palanpur Bhildi-Samdari as also Bhildi-Palanpur sections, routing of traffic from/to Kandla and Mundra will be different from that of the traffic arriving from Pipavav and Mumbai area. The need for consolidation, however, will be acutely felt as the growth rate of traffic at Gujarat ports in the near future is likely to remain above 15%; though it may subsequently taper off to about 11%. An ICD for consolidation of loads can, therefore, be located at Palanpur or Bhagat-ki-Kothi. Land at Palanpur for this purpose is not available. The latter has the advantage of also generating considerable export traffic, necessary facilities for which already exist. It is felt that the need for rationalization of import traffic for ICDs in the north may be slightly different and Bhagat ki Kothi may be an appropriate place.

6.16.2 Gujarat ports, as already indicated in earlier sections, will emerge as important centres for handling exim traffic. Their share of container traffic will increase. As assessed, sufficient stacking capacity will be available at these ports and the problem of multiple operators may not arise at these ports. The problems of outward mixed loads may not pose much problem.

Suggestions for Improving Container Handling

6.17 The advent of multimodal transport system has brought about major geo-political and economic changes in the world trade. While containerisation galloped, new logistical patterns emerged. This posed new challenges and called for new responses. JNPT, the largest container handling port in India, not only faced new challenges but also was part of new experimentations and approaches. Thus infusion of private capital and sharing of handling facilities posed their own problems. Need for inter-operator coordination arises from this emerging scenario. With new players (including CONCOR) entering the field, other problems can get accentuated and call for urgent attention. The convergence of traffic at JNPT has created the problem of mismatch between the facilities available and the need for coordinated use of these facilities. At present, JNPT is facing problems in handling the mixed loads due to lack of coordinated approach among the two terminal operators. From operational angle, these are practically two ports (and later, shall be three) lying cheek by jowl. There are a number of possibilities to cope up with this problem, as indicated below:

6.17.1 The objective of reducing, if not totally eliminating, mixed loads to JNPT is unassailable. This has to be approached in four stages, as follows:

- Marketing strategies and consolidation through road linkages
- Mutually agreed inter-operator terms for handling and stacking containers in port area.
- Establishing a unitary system of handling containers through an outside agency or through formation of a special purpose vehicle.
- Provide additional facilities at Jasai Yard to supplement those within the port.

Stage 1: Consolidation

6.17.2 The first option is to continue with the existing arrangements and introduce a reform process through management reorientation. For example, CONCOR may *consider formation of dedicated trains at the ICDs* by soliciting *additional traffic through aggressive marketing* strategies, particularly at smaller ICDs. With projected growth, this problem may get automatically solved in some cases: while in other cases, it may get accentuated. Besides, consolidation of loads through road networking should continue, wherever possible.

Stage 2: Inter-operator Coordination: Levy of Mutually Agreed Charges

6.17.3 There is also the need for co-ordination among the terminal operators to minimize the detention of trains. Efficient loading/unloading of containers at the port is possible through:

- Unloading and dwell-time charges to be settled through mutual consultations and levied by principal operator. This would impart a sense of urgency for the secondary operator to minimize delay in removing its containers.
- Advance exchange of information regarding arrival/departure of trains and O-D particulars;
- Timely mobilization of trailer-tractors for handling containers;
- Unloading of *all* containers and temporary stacking to be undertaken by the principal operator;
- The underlying theme remains that expeditious release and reloading is the primary concern of all operators. If necessary, additional truck-trailers be put in the circuit.

Stage 3: Establishing Unitary System for Container Handling:

(a) Entrusting the handling operations to an outside agency

6.17.4 The terminal operators may consider forming a joint venture to create and operate common handling facilities. This will facilitate infusion of private capital in augmenting the facilities. However, its success will depend upon the following:

- The operation and management of the facilities may be entrusted to a Board vested with sufficient powers to take independent decisions. This will allow initiative and resilience in formulating policies and strategies.
- Government may frame policies to protect the larger interests of all the stakeholders.
- The share of equity of the joint holders should be linked to their capacity to handle TEUs. Handling capacity, in turn, may be assessed by an independent agency, taking into consideration various relevant factors.
- The joint venture must ensure optimal use of all resources including the rolling stock. Railways/CONCOR may consider levy of heavy demurrage for detention beyond stipulated period.

While formation of such a joint venture between two terminal operators is not a problem, problems may arise if the number of terminal operators increases.

Stage 3 (b): Special Purpose Vehicle

6.17.5 Notwithstanding the merits of coordination among the terminal operators, in the ultimate analysis, there is no substitute for a unitary system – a single agency undertaking all the operational work. This will have the following advantages:

- Unified command will obviate the need for inter-operator coordination on day-to-day basis for each train. Parallel set-up by each operator can be dispensed with.
- Optimal use of resources, namely, land (including stacking area), handling equipment, road vehicles, manpower, rolling stock etc.
- Reduction in operational cost.
- Higher efficiency levels.
- Will facilitate holistic view on development projects.

6.18 Presently, the organizations involved in handling containers at JNPT are the Port Trust, P&O Group and CONCOR. Shortly, Maersk will also join the group through GTIL. CONCOR will then have a stake both as transporter and terminal operator. A Special Purpose Vehicle (SPV) needs to be set up to improve the operations. Landowners (JNPT), present terminal operators, CONCOR and other stakeholders can be partners in this Special Purpose Vehicle (SPV). Railway operations have serious impact on the total handling capacity and determine the level of investments inside and outside the ports for handling trains. Railways should be recognized as an important stakeholder.

6.18.1 It is presumed that the Port Trust has the power to enter into such an SPV. NSICT, a subsidiary of P&O Group which has been awarded work under BOT terms for thirty years, is to agree to the SPV rules. Government reserves the right to alter/amend the terms under certain conditions. Maersk and CONCOR have also entered into agreement with JNPT for setting up a third terminal. Certain rights are vested in them. The government will need to incorporate the SPV clause in the future agreements pertaining to ICDs and the ports.

6.18.2 For smooth operation of SPV, certain apprehensions of the private operators must be addressed. Their contention is that they had invested heavily on the basis of long-term business plans with certain minimum standards of efficiency and projections of return on capital. Accordingly, they would be hesitant to hand over the entire structure to a new entity to run the business unless their concerns are looked into. Serious doubts also arise about the possibility of attracting private capital for port-development if container handling operations are handed over to a body constituted under SPV.

6.18.3 The creation of SPV would require prior action on the following aspects:

- In principle agreement between various stakeholders to become partners in the new venture
- Valuation of the assets of shake-holders

- Share holding pattern and the basis on which profit distribution is to be done. Stakeholders would have to decide whether minimum profit, based on minimum assumed efficiency standards, has to be guaranteed.
- Legal refinements to align clauses of different agreements with the proposed objectives.

Role of Government

6.19.1 In the case of container handling, there are three parties: CONCOR, responsible for loading, railways for traffic movement and ports for handling TEUs. In addition, private sector participants investing in port infrastructure will be important stakeholders. This will require government involvement for resolving the problems arising out of expansion of economic and port activities. Clarity on the policy and legal issues pertaining to formation of Special Purpose Vehicle for this sector is a sine-qua-non for success in this area.

6.19.2 Even when SPV is formed, two important aspects must receive attention:

(i) Efficiency in handling containers on Lines 1 & 2, presently under JNPCT must be improved; the time in handling a train (inward and outward) by JNPCT is 80% higher than that by NSICT. Extra detention is partly attributed to older equipment. It is presumed that with doubling, the transaction time, detention for line-clear, etc.; for train operation will significantly come down, both for inward and outward trains.

(ii) Adequate stacking capacity should be available. It is understood that automobile export would be shifted to Mumbai port. Therefore, automobile parking area may be released at JNPT for stacking containers.

6.19.3 With the formation of SPV and additional terminal capacity at JNPT, mixed trains should not pose any serious problem. Meanwhile, inter-operator coordination can certainly lead to improved utilization of rail-infrastructure inside the port.

6.19.4 Government has initiated steps and is offering incentives for private sector participation in port development. The experience at JNPT should serve as a lesson for cases where more than one operator (including the port trusts) is allowed to function. Suitable management structure to enable expeditions handling of containers or to attain other efficiency parameters should be ensured at these ports at the time of awarding the contract on BOT or other terms.

6.19.5 JNPT has had problems in dealing with *inward* mixed loads. However, with modernisation and operationalisation of new ports, the outward traffic will also be dissipated and much larger number of outward mixed loads may be on the horizon.

Thus containers for TKD may land up at JNPT or Pipavav or at Mundra in total contrast to the existing monopoly of JNPT for these containers.

6.20 It is indicated elsewhere that a new hub enroute for rationalization of loads for JNPT is not justified for various reasons. However, by the year 2015-16, the volume of traffic is estimated at 37 trains each way. In operational terms, one train either inward or outward will be dealt with about every 20 minutes. However, since four terminals for handling containers will be operative by that time, each terminal operator will deal with 10 trains every 24 hrs or one train every 2 hrs 40 minutes. Loading and unloading will have to be completed within this period. (Total detention to train will be higher as pre-departure formalities like mechanical examination, vacuum creation, TXR check, and line-clear etc. will consume additional time). Handling agencies will have to strictly adhere to the norm of 1 minute per TEU for each operation of loading/unloading. This however, leaves no cushion for the peaking factor or for even minor dislocations. Additional detention will have serious repercussions on the entire section, the main brunt being borne by Jasai Yard. Additional capacity will therefore, be provided at or close to Jasai Yard. Since additional time is taken up in dealing with mixed loads, facilities at Jasai should be able to handle this level of traffic. The main advantages would be (i) traffic from all directions congregates at Jasai, (ii) this facility can also be used for refining loads of import traffic for ICDs. The more the number of operators, the smaller the percentage of traffic for each direction or ICD. (Presently, 11 per cent of trains originating at JNPT for ICDs are mixed loads).

6.21 Three possible locations are: (i) option IA: a separate location for dealing with mixed loads unhindered by reception and despatch operations of Jasai (see Sketch 1). The main disadvantage is in circuitous movement of train engines (electric and diesel), (ii) option IB: a container hub, integral to Jasai Yard (see Sketch 2). The main advantage lies in easy transferability between the main and the auxiliary container yard. The staff required will be relatively less, easy availability of shunting engines etc., better supervision. However, road accessibility will be circuitous. (iii) option II: a container hub located between Jasai and Holding Yard (see Sketch 3). Movement in forward direction and better accessibility by road are the main advantages. In case of congestion in the port, clearance by road to the stacking area can easily be done. However, it has a disadvantage too; the staff strength would be higher.

6.22 In Section VII, we give financial appraisal of different options mentioned above. All the three options are financially justified. Notwithstanding this, the SPV will remain the most viable option as savings in wagon hours to the extent of 50% can be effected without heavy cost of construction. However, that option does not provide the extra cushion for holding wagons/trains, which may be necessitated by the year 2015-16.

Conclusion

6.23 To recapitulate, containerisation has transformed world trade logistics in the last half a century. Seventy to eighty per cent of sea-borne bulk cargo in international trade is presently containerized. Port and inland infrastructure, location of storage, rail and road portability have all undergone major changes.

6.23.1 Ninety per cent of India's international trade is sea-borne. Trade logistics in India are also witnessing revolutionary changes. Presently, 64 per cent of general cargo in India is transported in containers; this share is likely to catch up to international standards in the next few years.

6.23.2 India's exim trade is likely to increase sharply and trade patterns may change due to higher GDP growth, increased levels of containerisation, larger number of players and emphasis on boosting trade with the East.

6.23.3 Presently, major west coast ports handle 68 per cent of the exim container traffic, JNPT being the principal operator. Though JNPT will retain its pre-eminence, its share in overall container traffic is likely to dwindle due to (i) development of Gujarat ports which have better rail and road connectivity with ICDs in the north, (ii) development of east coast ports for handling container traffic and (iii) projected increase in external trade with the East.

6.23.4 CONCOR handles only about 20 per cent of the overall container traffic dealt with at ports. However, at JNPT, its share is about 27 per cent. Though JNPT is the largest container handling port in the country, its productivity is low compared to international standards. One major problem is receipt of mixed loads – trains carrying containers for more than one terminal operator. This is likely to be an integral part of the rail transport to and from ports. Presently, the problem is peculiar to JNPT, but may assume serious dimensions at other ports also with more than one terminal operator.

6.23.5 Though serious efforts have been made by CONCOR to reduce mixed loads and form dedicated loads, some mixed loads for multiple operators can only be wished away but remain unavoidable. The solution does not lie in setting up container hubs enroute for sanitisation of loads merely because land may be available. The most appropriate solution seems to be to integrate handling operations at ports like JNPT through SPV or other formal agreements. Future projections, though do call for providing a cushion in the backyard of the port to take care of minor dislocations or even to take load off the ports by rationalization of incoming traffic. It is in this context that Consultants recommend study for additional facilities at Jasai after 2015-16.

Section VII

Financial Appraisal of Different Options

7.1 This section examines the financial viability of provision of sorting yard for container trains at Jasai or between Holding Yard and Jasai Yard. Container traffic forecast for different reference years have already been discussed. Savings that would accrue to the implementing agency due to the creation of additional rail facilities have been arrived at on year-to-year basis over the life of the project. The discounted cash flow (DCF) technique has been adopted for working out the Financial Internal Rate of Return (FIRR).

7.2 The financial analysis has been carried out under two options: option I: Construction of a sorting yard at Jasai station, option II: Construction of a sorting yard between Holding Yard and Jasai Yard. Further, option I has been given two proposed layouts namely option IA & option IB. For each option, cost of construction has been worked out with new track material and released track material separately.

7.2.1 The cost and revenue figures are based on 2004-05 price levels. The project appraisal period including the construction period has been taken as 32 years including construction period from 2006-07 to 2007-08, followed by 30 years of operation.

Project Cost

7.3 Project costs mainly comprise the cost of construction of the different rail facilities (including the S&T, electrification and mechanical components of work) and recurring expenses incurred at the sorting yard involved in handling the mixed train container traffic. Cost of electrification of one line with full length shunting neck & link portion has been taken at 2 crore/km). The different cost components have been given in detail, in Annexures VII-1 to VII-4. In summary form, these are given hereunder:

Cost of Construction

7.4 The capital cost for construction of the proposed rail related facilities at Jasai Yard for the two options as well as between Jasai Yard and Holding Yard are given in the table below:

Table 7.1: Cost of Construction of Sorting Yard at Jasai – Option IA

(Rs. Crore)

Option	Civil	S&T	Electrical (G)	Electrical (TRD)	Total
With new track material	9.91	0.89	0.41	4.00	15.21
With released track material	7.22	0.89	0.41	4.00	12.52

Table 7.2: Cost of Construction of Sorting Yard at Jasai – Option IB

(Rs. Crore)

Option	Civil	S&T	Electrical (G)	Total
With new track material	6.86	0.62	0.28	7.76
With released track material	5.47	0.62	0.28	6.37

Table 7.3: Cost of Construction of Sorting Yard at Jasai – Holding Yard – Option II

(Rs. Crore)

Option	Civil	S&T	Electrical (G)	Total
With new track material	6.78	1.77	0.28	8.83
With released track material	5.30	1.77	0.28	7.35

Phasing of Investment

7.5 The phasing of investment over the construction period, beginning 2006-07 under the two options is brought out in table below:

Table 7.4: Investment Phasing under Option IA

(i) ***With New Track Material*** *(Rs. Crore)*

Year	Civil	S&T	Elect.	Elect. (TRD)	Mech.	Total
2006-07	7.64	0.56	0.31	3.00	0.75	12.26
2007-08	2.27	0.32	0.10	1.00	2.25	5.94
Total	9.91	0.88	0.41	4.00	3.00	18.20

(ii) ***With released track material***

Year	Civil	S&T	Elect.	Mech.	Total
2006-07	6.02	0.56	0.31	0.75	7.64
2007-08	1.21	0.32	0.10	2.25	3.88
Total	7.23	0.88	0.41	3.00	11.52

Table 7.5: Investment Phasing under Option-IB

(i) ***With new track material***

Year	Civil	S&T	Elect.	Mech.	Total
2006-07	5.95	0.46	0.19	0.75	7.35
2007-08	0.91	0.16	0.09	2.25	3.41
Total	6.86	0.62	0.28	3.00	10.76

(ii) ***With released material***

Year	Civil	S&T	Elect.	Mech.	Total
2006-07	4.56	0.45	0.19	0.75	5.95
2007-08	0.91	0.16	0.09	2.25	3.41
Total	5.47	0.61	0.28	3.00	9.36

Table 7.6: Investment Phasing under Option-II

(i) ***With new track material***

Year	Civil	S&T	Elect.	Mech.	Total
2006-07	4.97	1.07	0.19	0.75	6.98
2007-08	1.80	0.71	0.09	2.25	4.85
Total	6.77	1.78	0.28	3.00	11.83

(ii) ***With released material***

Year	Civil	S&T	Elect.	Mech.	Total
2006-07	3.90	1.07	0.19	0.75	5.91
2007-08	1.39	0.71	0.09	2.25	4.44
Total	5.29	1.78	0.28	3.00	10.35

Residual Value and Replacement Costs

7.6 The residual/salvage value in the terminal year of the project has been duly accounted for by adopting the straight line depreciation method. Likewise, replacement cost has been worked out and provided for in respect of such of the assets whose economic life is less than the project life of 30 years. The anticipated economic life of the different assets is indicated below:

Economic Life of Assets

Assets	Life (Years)
Civil works	40
S&T works	25
Electrical (both G & TRD)	25
Mechanical	30

Financial Rate of Return

7.7 The project costs and earnings have been arrayed in the form of a cash flow over the project life and financial internal rate of returns (FIRR) for the two options have been arrived at by adopting the DCF technique.

7.8 **Working Expenses of Sorting yard**

(i) ***Handling of containers***

Mixed trains are to be dealt with in the sorting yard. The number of trains are as per projections for different years given in the report. TEUs to be handled are based on 90 TEUs per train. Handling costs are taken from the Annual Statement of Accounts and Audit of JN Port for the year 2003-04 and inflated @ 5% per annum upto 2007-08. This works out to Rs. 1537.09.

(ii) ***Cost of Staff***

The following staff will be required to man the sorting yard:

Yard Master	-	4
Shunting Jamadar	-	4
Shuntman/points man	-	8
Other support staff	-	4

The cost of staff has been worked out taking the actual cost of 2003-04 of Indian Railways and adjusting it for inflation.

(iii) ***Cost of equipment for handling container***

Lump sum of Rs. 3 crore has been taken and divided into two years namely 2006-07 (initial cost taken at Rs. 75 lakh) and 2007-08 (Rs. 2.25 crore) for two numbers of stackers and loaders. Maintenance cost of crane has been taken as 5% per annum of capital value as per railway norms. Details of expenditure on handling and storage of containers in the sorting yard are given at Annexure 7.5.

(iv) ***Savings on wagon hours***

Train and wagon hours have been worked out on the basis of detention to mixed trains dealt with by JNPCT and NSICT and percentage of trains has been worked out on the basis of past traffic at the port; the same percentage has been adopted for subsequent years. Details are given at Annexure VII-6. With the proposed public private participation scheme in container train operations, while the *number* of mixed trains may increase, the *percentage* of mixed trains has been kept constant.

The detention per day has been worked out on the basis of 365 days and hire charges at the rate of Rs. 424 per day/ 4-wheeler and Rs. 848 for 8-wheeler inclusive of depreciation and interest as per the Railway Board's circular dated 27.10.2004.

FIRR

7.9 Based on the capital cost of construction and equipment, working expenses and savings due to reduction in detention to wagons, the rates of return have been worked out in the statements at Annexures VII-7 to VII-9. Briefly, these are given as under:

Track material/options	Option I A	Option IB	Option II
With new material	33%	44%	42%
With released material	42%	48%	46%

The FIRR is significant and indicates that all the options are viable.

Section VIII

New Initiatives

8.1 A holistic view of what has been discussed in the foregoing sections and the possible patterns of container movement brings out, the following important points:

(i) India is on high growth trajectory. GDP growth, fillip to export promotion particularly in merchandise and mechanical ancillaries will sharply increase container traffic.

(ii) JNPT will retain its pre-eminent position in container handling. Gujarat ports will also attract considerable volume of container traffic. High growth rate of both imports and exports will ensure high growth of container traffic on west coast ports, though increase will also be registered on the east coast.

(iii) Northern region will continue to be an important originating point for exports in merchandise.

(iv) Railways' share in container traffic is likely to increase.

(v) Line capacity constraints on Delhi-Mumbai and Delhi-Ahmedabad routes pose serious problems in increasing throughput.

8.2 Three important initiatives in the recent past to overcome infrastructural bottlenecks and having bearing on the pattern of container movement between ICDs in the north and the ports in the west have been taken. These are as follows:

(i) Policy decision on construction of a high capacity Dedicated Freight Corridor between Delhi and Mumbai (also between Delhi and Kolkata).

(ii) Licences issued to private parties for setting up ICDs' and run their own container trains under Concession Agreements. Private parties will not only set up ICDs but also own their own rolling stock. Private capital will be infused for infrastructural backup.

(iii) Improving loading capacity of existing rolling stock including introduction of Double Stack Container Trains.

8.3 The problems being faced by IR are that:

(i) Both the existing routes are congested and as indicated in the Report, passenger-oriented. Line capacity is over-saturated – on some sections beyond 150%. Ameliorating investment is needed but the palliatives may not suffice.

(ii) Present track-structure does not permit high axle load rolling stock.

(iii) If the new corridor is electrified, new parameters for the electric installations shall have to be laid. Height of contact wires to be raised, to enable double stack container trains to run.

8.4 The parameters for the proposed dedicated freight corridor (DFC) are:

(a) Double line system, exclusively for freight trains.

(b) High-speed corridor with capability to run at 100 kmph and above.

(c) Thirty-tonne axle load and higher moving dimensions. This would provide the required flexibility to run high capacity wagons including double-stack container trains.

(d) Two possible routes between Delhi and Mumbai are:

i. Along the present electrified Delhi-Mathura-Kota-Vadodara-Mumbai route

ii. Delhi-Jaipur-Ahmedabad-Mumbai. This is non-electrified diesel route (Delhi includes Tughlakabad, Dadri and Gurgaon and Mumbai includes JNPT and Mumbai ports).

iii. The section between Mumbai and Vadodara shall be common to the two routes.

iv. Additional land along both routes would be required and have to be acquired. Despite efforts, it may not be possible to run the new corridor close to the existing route along the entire length. Deviations would be inevitable.

8.5 It may be difficult to introduce double-stack container trains straightaway between Delhi and Gujarat ports as maximum moving dimensions are restrictive.

8.6 Worldover, most of the routes over which double-stack container trains run, are dieselised. Enhanced parameters for electrified routes will also be obviated on dieselised routes. Another advantage of the alignment of the dedicated freight corridor via Ahmedabad is that it can serve both the traffic for Gujarat and Mumbai ports. However, Delhi-Mumbai distance via Ahmedabad is about 90 km longer, and yet this route may hold some advantages as it can service two important routes for exim traffic and also suitably connect Delhi to Ahmedabad for domestic container traffic. Traffic on this route is likely to increase substantially.

8.7 Overall, the following picture will emerge:

(a) The possibility of mixed loads for different Gujarat ports or partly for Gujarat ports and partly for Mumbai area ports will increase. This will get further accentuated with the additional traffic emanating from ICDs of the private operators. Purely from the angle of handling mixed trains the feasibility/desirability of setting up a container hub enroute to rationalise loads for different ports at a suitable location at or around Ahmedabad area needs to be gone into.

(b) The benefits of introduction of double stack trains are obvious. The operating cost will come down sharply – even by 50%. The carrying capacity of the rolling stock will increase sharply. Considerable volume of additional traffic can be carried by railways. At a modest estimate, throughput can increase by about 40%. In the long-run, this will result in economy in capital cost. Double-stacking in future is inevitable, though not all trains can be so formed.

(c) Double stack container trains would necessitate higher moving dimensions. Railways are already considering modification/ reconstruction of installations enroute wherever feasible.

(d) With a larger volume of exim traffic handled at west coast ports, the problem of rationalisation of import traffic for inland container depots including those being set up by private operators needs serious consideration. Rationalization of import container traffic from Gujarat ports and that from Mumbai ports routed via Ahmedabad at Bhagat-ki-Kothi has been suggested in the Report. This can be done at a low cost. Movement of traffic via Bhildi-Samdri-Bhagat-ki-Kothi can also relieve the present highly congested route via Phulera. The benefit of a new route via Bhagat-ki-Kothi-Rai-ka-Bagh-Phalodi-Kolayat can also be drawn. However, in the long run, hub for rationalization of import loads may be considered at a different location depending upon the level and pattern of traffic.

(e) The economics of routing traffic to/from ICD's in the north via Phulera-Ringus, bypassing Jaipur has to be considered.

(f) The proposed dedicated freight corridor whether along the electrified or the dieselised route reinforces the need to provide additional facilities, at a later stage, at Jasai, as recommended in the Report

8.8 With the increase of in the number of mixed loads, the possibility of setting up an intermediate container hub at or near Ahmedabad area needs to be seriously gone into. The location of the hub should be such as can provide connection to Gujarat ports, Mumbai and of course to ICDs in the north both via Palanpur and Bhildi. Ahmedabad area is highly congested. Land is scarce. A separate study needs to be mounted as this is beyond the scope and the mandate of the present study.

Annexure I-1

Major Container Ports in the World

Name of Port	Container Throughput (in million TEUs)			Rank (Basis: TEUs handled)		
	2002	**2003**	**2004**	**2002**	**2003**	**2004**
Hong Kong	19.140	20.100	21.932	1	1	1
Singapore	16.800	18.100	20.600	2	2	2
Shanghai	8.610	11.280	14.557	4	3	3
Shenzen	7.614	10.610	13.650*	6	4	4
Busan	9.453	10.367	11.430	3	5	5
Kaosiung	8.493	8.840	9.710	5	6	6
Rotterdam	6.515	7.100	8.300	7	8	7
Los Angeles	6.106	7.180	7.321	8	7	8
Hamburg	5.374	6.138	7.003	9	9	9
Dubai	4.194	5.152	6.429	13	11	10
Antwerp	4.777	5.445	6.064	10	10	11
Long Beach	4.526	4.658	5.780	12	13	12
Port Klang	4.533	4.800	5.244	11	12	13
Qindao	3.410	4.240	5.220	15	14	14
New York/New Jersey	3.749	4.145	4.400E	14	15	15
Tanjung Pelepas	2.660	3.487	4.020	20	16	16
Ningbo	1.860	2.750	4.005	31	24	17
Tianjin	2.410	3.000	3.814	23	21	18
Leam Chabang	2.657	3.180	3.624	21	19	19
Tokyo	2.712	3.280	3.580	19	17	20
Bremen/Bremerhaven	3.032	3.191	3.469	16	18	21
Guangzhou	2.180	2.770	3.308	26	22	22
Tanjung Priok	NA	2.758	3.248	NA	23	23
Giola Tauro	2.955	3.149	3.192	17	20	24
Algeciras	2.229	2.516	2.937	25	27	25
Xiamen	1.750	2.331	2.872	35	29	26
Felixstowe	2.750	2.700	2.700	18	25	27
Manila	2.462	2.552	2.629	22	26	28
Yokohama	2.365	2.469	2.577	24	28	29
Jeddah	NA	NA	2.426	NA	NA	30
Jawaharlal Nehru	1.850	2.174	2.360	28	30	31
Total	**147.170**	**167.270**	**198.401**			

Source: Containerisation International Yearbooks, 2004&05
* *Includes Chiwan, Shekou and Yantian*
E Estimated

Annexure I-2

Top 30 Container Liner Operators as on 01.01.2005

Name of Company	Total Freight in TEUs	No. of Container Ships	No. of Indian Ports being served by the Company
World Fleet	8471343	7335	
Maersk Sealand	789129	291	5
Mediterranean Shipping Co SA	545294	215	2
P&O Nedlloyd Ltd	390766	143	3
Evergreen Marine Corp (Taiwan)	354719	123	4
Hanjin Shipping Co.	280075	70	2
CMA-CGM SA	278992	108	4
APL	278853	85	6
Cosco Container Lines	249686	130	4
NYK Line	223517	67	2
Mitsui OSK Lines	204126	63	1
Orient Overseas Container Line	198638	58	2
Kawasaki Kisen Kaisha	195235	65	4
China Shipping Container Lines Co.	193608	92	2
CP Ships Group	187978	80	
Hapag-Lloyd Container Group	174834	44	3
Yang Ming Marine Transport Corp	151312	56	2
Hyundai Merchant Marine Co	143409	38	4
Zim Israel Navigation Co	139337	55	2
Hamburg Sudamerikanische	113267	57	
Wan Hai Lines	97657	70	3
Pacific International Lines Pte	89549	59	4
Compania Sud Americana de Vapores	74773	35	
United Arab Shipping Co	70173	31	2
Safmarine Container Lines NV	68630	36	2
Lloyd Triestino di Navigazione SpA	64028	23	2
Norasia Container Lines	62835	21	3
Delmas	57568	47	4
Star shipping A/S	54189	36	
Islamic Republic of Iran Shipping Lines	47889	43	1
Gold Star Line	40747	27	4

Source: Containerisation International Online

Annexure II-1

Container Traffic Handled at Indian Ports

Year	Traffic in Million Tonnes	Traffic in Million TEUs
1990-91	8.04	0.68
1991-92	7.63	0.68
1992-93	9.01	0.80
1993-94	12.25	1.05
1994-95	15.36	1.26
1995-96	17.62	1.45
1996-97	20.59	1.70
1997-98	23.30	1.89
1998-99	23.78	1.93
1999-00	27.69	2.19
2000-01	32.22	2.47
2001-02	37.24	2.89
2002-03	43.67	3.37
2003-04	51.90*	3.98*
2004-05	58.18**	4.52**
CAGR(%)	**15.76**	**14.56**

CAGR stands for Compound Annual Growth Rate between 1990-91 and 2004-05.

* Includes 76689 TEUs handled at minor ports of Mundra (49305 TEUs) and Pipavav (27384 TEUs). In terms of tonnage, the equivalent container traffic is estimated at 0.9 million tonnes

** Includes 0.36 million TEUs handled at minor ports of Mundra (216191 TEUs) and Pipavav (143568 TEUs). In terms of tonnage, the equivalent container traffic is estimated at 3.42 million tonnes

Annexure II-2

Share of India in World Container Traffic

Year	World Container Traffic (Million TEUs)	Indian Container Traffic (Million TEUs)	% share of India in World Container Traffic
1990-91	85.6	0.68	0.79
1991-92	93.6	0.68	0.73
1992-93	102.9	0.80	0.78
1993-94	112.4	1.05	0.93
1994-95	124.8	1.26	1.01
1995-96	137.2	1.45	1.06
1996-97	150.8	1.70	1.13
1997-98	160.7	189	1.18
1998-99	171.5	1.93	1.13
1999-00	203.2	2.19	1.08
2000-01	231.7	2.47	1.07
2001-02	243.8	2.89	1.19
2002-03	266.3	3.37	1.27
2003-04	297.2*	3.98**	1.34

* *Provisional*

** Includes 76689 TEUs handled at minor ports of Mundra (49305 TEUs) and Pipavav (27384 TEUs)

Annexure II-3

Share of Containers in Total Traffic at Major Ports

(in million tonnes)

Year	Total Cargo Traffic handled at Major Ports	Total Container Traffic handled at Major Ports	% Share of Container Cargo to Total Port Traffic
1990-91	152.86	8.04	5.26
1991-92	157.60	7.63	4.84
1992-93	166.58	9.01	5.41
1993-94	179.26	12.25	6.83
1994-95	197.26	15.36	7.79
1995-96	215.34	17.62	8.18
1996-97	227.26	20.59	9.06
1997-98	251.66	23.30	9.26
1998-99	251.72	23.78	9.45
1999-00	271.92	27.69	10.18
2000-01	281.11	32.22	11.46
2001-02	287.58	37.23	12.95
2002-03	313.53	43.67	13.93
2003-04	344.80	51.00	14.79
2004-05	383.62	54.76	14.27
CAGR(%)	**6.57**	**15.54**	

CAGR stands for Compound Annual Growth Rate between 1990-91 and 2004-05.

Annexure II-4

Share of Imports and Exports Handled at Major Ports

Year	Container Traffic (in million tonnes)			Container Traffic (in million TEUs)		
	Import	**Export**	**Total**	**Import**	**Export**	**Total**
1990-91	3.85	4.19	8.04	0.33	0.35	0.68
1991-92	3.15	4.48	7.63	0.34	0.34	0.68
1992-93	3.90	5.11	9.01	0.40	0.40	0.80
1993-94	5.40	6.85	12.25	0.53	0.52	1.05
1994-95	7.20	8.16	15.36	0.63	0.63	1.26
1995-96	8.11	9.51	17.62	0.73	0.72	1.45
1996-97	9.11	11.48	20.59	0.85	0.85	1.70
1997-98	10.49	12.63	23.12	0.94	0.95	1.89
1998-99	11.70	12.08	23.78	0.94	0.95	1.89
1999-00	13.61	14.08	27.69	0.97	0.96	1.93
2000-01	15.63	16.59	32.22	1.24	1.23	2.47
2001-02	17.94	19.29	37.23	1.46	1.43	2.89
2002-03	19.95	23.72	43.67	1.69	1.68	3.37
2003-04	23.87	27.13	51.00	1.97	1.93	3.90
CAGR(%)	**14.70**	**15.53**	**15.14**	**14.64**	**14.09**	**14.37**

CAGR stands for Compound Annual Growth Rate between 1990-91 and 2003-04.

Annexure II-5

Share of Loaded and Empties in Total Container Traffic
(in million TEUs)

Year	Loaded	Empties	Total
1997-98	1.55	0.34	1.89
1998-99	1.57	0.36	1.93
1999-00	1.83	0.36	2.19
2000-01	2.01	0.43	2.44
2001-02	2.37	0.52	2.89
2002-03	2.76	0.61	3.37
2003-04	3.25	0.65	3.90
CAGR(%)	**13.13**	**11.41**	**12.83**

CAGR stands for Compound Annual Growth Rate between 1990-91 and 2003-04.

Annexure II-6

Growth of Container Traffic at Major Ports of India

Name of Port	Container Traffic handled (figures in 000s tonnes)						
	1990-91	1995-96	2000-01	2001-02	2002-03	2003-04	2004-05
East Coast Ports							
Kolkata	664	1814	2011	1411	1498	1746	2357
	(49)	(121)	(138)	(98)	(106)	(123)	(159)
Haldia	316	51	806	1523	1850	2275	2029
	(22)	(4)	(51)	(93)	(117)	(137)	(128)
Paradip	-	-	8	7	33	60	31
	-	-	-	-	(2)	(4)	(2)
Visakhapatnam	82	94	278	320	296	277	635
	(8)	(8)	(20)	(22)	(22)	(20)	(45)
Chennai	1132	2308	5769	5857	7218	8628	9864
	(109)	(227)	(352)	(344)	(425)	(539)	(617)
Tuticorin	119	758	1569	2198	2301	2687	3205
	(20)	(69)	(157)	(214)	(213)	(254)	(307)
Total	2313	5025	10441	11316	13196	16673	18121
	(208)	(429)	(718)	(771)	(885)	(1077)	(1258)
West Coast Ports							
Cochin	275	796	1790	1899	2070	2125	2315
	(49)	(96)	(143)	(152)	(166)	(170)	(185)
New Mangalore	10	-	20	37	84	96	136
	(2)	-	(2)	(4)	(6)	(7)	(9)
Mormugao	-	19	44	58	90	103	117
	-	(2)	(4)	(6)	(9)	(10)	(10)
Mumbai	4286	6748	4364	3684	3143	2816	2571
	(324)	(518)	(321)	(254)	(213)	(197)	(219)
Jawaharlal Nehru	657	4069	14277	18484	22864	27785	28747
	(55)	(339)	(1189)	(1573)	(1930)	(2269)	(2371
Kandla	502	961	1286	1752	2225	2404	2754
	(43)	(65)	(91)	(126)	(157)	(170)	(181)
Total	5730	12953	21781	25914	30476	35329	36640
	(473)	(1020)	(1750)	(2115)	(2481)	(2823)	(2975)
Grand Total	8043	17618	32222	37230	43672	51002	54761
	(681)	(1449)	(2468)	(2886)	(3366)	(3900)	(4233)
Share of west coast ports (TEUs)	69.4%	70.4%	70.9%	73.1%	73.7%	72.4%	70.3%

Note: Figures in brackets represent no. of TEUs handled (in thousand)
Source: Major Ports of India – A Profile, Indian Ports Association

Annexure II-7

Terminal Details of Selected ICDs in North-West Region

Rly Zone	Name of ICD	Total area	Paved area sq.mts	Type of pavings	Pavement Condition	Un-paved area (sqmts)	Container Traffic dealt with	No.of BLC rakes	No.of Rly lines	Line Capacity (in mts)	Ware House Capacity		Weigh bridge availability	Equipment Availability
											Nos	Size sqmt		
NCR	DADRI	245.73 acre or 110 hectare	16000	CC/DBM	Good	180000	EXIM	18	4	1:719 2:719 3:780 4:825	1	9000	Yes	RTGC:4, R/S:2, SC:2, F/L:2, TT:12
NCR	Dhandari Kalan	34.79 acre	115104	CC	Satisfactory	28776	EXIM	12	2	685 each	2	2125 & 2175	Yes	R/S:3 SC(L):1, SC(E):1, T.T:6
NCR	Agra	53000 sq.mts	2800	Bitumen	Not Complete	25000	COMBINED	NIL	1	646	1	2000	Yes	SC(L):2 SC(E):1, T.T:5
NR	Babarpur (PNP)	8 acre	5300	Concrete WBM	Moderate	19000	EXIM	NIL	-	-	1	1200	No	Not Available
NR	Ballabhgarh	2.86 hectare	15000	CC	Good	370 sqm	DOM	NIL	2	300 350	-	-	No	PPM:1
NCR	Juhi (Kanpur)	87925 sq.mts	32900	Bitumen	Sound	57100	COMBINED	2	1	700	1	2000	Yes	R/S : 1, SC(L):1, SC(E):1, TT.:3
NCR	Malanpur (GWL)	15600 sq.mts	10000	Asphalt	Ruptured	5600	EXIM	NIL	1	645	1	2000	Yes	F/L:1, SC(L):3, TT:7
NR	Moradabad	70000 sq.mts	41600	Premixed concrete	Not Good	-	COMBINED	NIL	1	765	3	1400	Yes	R/S:1, SC(L):2, SC(E) :2
NR	Tughlakabad	50 hectare	29500	CC Black Top paving	Normal	31500	EXIM	53	4	685 each	3	1000 6000 5000	Yes	RMGC:2, RTGC:4, R/S(L):12, R/S(E):6, SC(L):1, TT:33
WR	Sabarmati	128428 sq.mts	63597	CC	OK	8250	EXIM	7	2	470 each	3	3000	Yes	R/S:2, SC(L):1, SC(E):3, F/L:1, TT:5
WR	Vadodara	20000 sq.mts	16720	CC	OK	-	COMBINED	-	1	620	1	200	No	SC(L):3, SC(E):1, TT:13
WCR	Jodhpur (BGKT)	40000 sq.mts	1000	Asphalt	Good	-	COMBINED	-	1	640	1	1000	Yes	F/L:1, HYDRA:1, RS:1, SC(L):2, SC(E):2, TT:10
WCR	Rewari	32 acre	26640	Bitumen	Not good	12440	COMBINED	-	2	685 each	-*	-*	No	SC(L):1, TT:2
WCR	Kanakpura (Jaipur)	58145 sq mts	17727	CC WBM Kutcha compact	Poor	7625	COMBINED	7	1	646	1	600	Yes	R/S:2, SC(L):1, TT:20

* Warehousing and 75 sqmts office space at Rewari provided by Haryana Ware Housing Corporation (HWC)

<u>Abbreviations used :</u>

Exim : Export-Import
Combined : Exim & Domestic
CC : Cement Concrete
DBM : Dense Bituminous Macadam
WBM : Water Bound Macadam

RTGC : Rubber Tyred Gantry Crane
RMGC : Rail Mounted Gantry Crane
R/S : Reach Stacker
F/L : Forklift
TT : Tractor Trailers
SC : Sling Cranes

Annexure III-1

India's Trade (Export & Import) to East Asia

(US $ million)

Year		World	China		Korea		Japan		ASEAN-6		East Asia	
			Total	% share to world trade	Total	% share to world trade	Total	% share to world trade	Total	% share to world trade	Total	% share to world trade
1997-98	Export	35048.7	719.0	2.1	468.0	1.3	1901.0	5.4	2419.6	6.9	5507.6	15.7
	Import	41534.6	1120.7	2.7	1002.9	2.4	2147.5	5.2	3382.3	8.1	7653.4	18.4
	Total	76583.3	1839.7	2.4	1470.9	1.9	4048.5	5.3	5801.9	7.6	13161.0	17.2
1998-99	Export	33211.0	427.0	1.3	307.0	0.9	1651.0	5.0	1589.2	4.8	3974.2	12.0
	Import	42379.2	1096.5	2.6	1394.1	3.3	2465.2	5.8	4142.6	9.8	9098.4	21.5
	Total	75590.2	1523.5	2.0	1701.1	2.3	4116.2	5.4	5731.8	7.6	13072.6	17.3
1999-00	Export	36760.0	539.0	1.5	476.5	1.3	1685.0	4.6	2190.3	6.0	4890.8	13.3
	Import	49798.6	1288.3	2.6	1274.9	2.6	2538.9	5.1	4918.9	9.9	10021.0	20.1
	Total	86558.6	1827.3	2.1	1751.4	2.0	4223.9	4.9	7109.2	8.2	14911.8	17.2
2000-01	Export	44147.0	830.0	1.9	447.0	1.0	1782.0	4.0	2813.7	6.4	5872.7	13.3
	Import	50056.3	1494.9	3.0	891.0	1.8	1835.5	3.7	3881.2	7.8	8102.6	16.2
	Total	94203.3	2324.9	2.5	1338.0	1.4	3617.5	3.8	6694.9	7.1	13975.3	14.8
2001-02	Export	43976.0	955.0	2.2	473.0	1.1	1515.6	3.4	3390.2	7.7	6333.8	14.4
	Import	51588.4	2043.3	4.0	1145.3	2.2	2153.7	4.2	4025.0	7.8	9367.3	18.2
	Total	95564.4	2998.3	3.1	1618.3	1.7	3669.3	3.8	7415.2	7.8	15701.1	16.4
2002-03	Export	52856.0	1981.0	3.7	646.0	1.2	1869.0	3.5	4528.0	8.6	9024.0	17.1
	Import	61571.6	2799.3	4.5	1525.9	2.5	1841.1	3.0	4825.0	7.8	10991.3	17.9
	Total	114427.6	4780.3	4.2	2171.9	1.9	3710.1	3.2	9353.0	8.2	20015.3	17.5
2003-04	Export	63622.0	2967.0	4.7	764.0	1.2	1719.0	2.7	5700.0	9.0	11150.0	17.5
	Import	77237.0	4059.1	5.3	2460.1	3.2	2649.3	3.4	6959.0	9.0	16127.5	20.9
	Total	140859.0	7026.1	5.0	3224.1	2.3	4368.3	3.1	12659.0	9.0	27277.5	19.4

Note: 1. ASEAN-6 includes Indonesia, Malaysia, Philipians, Singapore, Thailand and Vietnam

2. East Asia includes: China, Korea, Japan and Asean-6

Source: CMIE (2004)

Annexure III-2

Export of Containers in General Cargo at Major Ports

(in Million Tonnes)

Year	General Cargo Traffic (including Container Traffic)	Containerized Cargo Traffic	Containerisation % achieved
1991-92	20.80	7.63	36.7
1992-93	24.95	9.01	36.1
1993-94	28.51	12.25	43.0
1994-95	34.83	15.36	44.1
1995-96	38.44	17.62	45.8
1996-97	41.64	20.59	49.5
1997-98	44.22	23.30	52.7
1998-99	44.03	23.78	54.0
1999-00	50.75	27.69	54.6
2000-01	52.73	32.22	58.6
2001-02	60.48	37.23	61.6
2002-03	68.91	43.67	63.4
2003-04	79.82	51.00	63.9
2004-05	87.11	54.76	62.9
CAGR%	**10.49**	**15.67**	

Note: In addition, container traffic of 3.42 million tonnes was handled at the minor ports of Mundra and Pipavav. Inclusive of this traffic, level of containerisation works out to 64%.

Source: Indian Ports Association

Annexure III-3

Projections of Container Traffic at Indian Ports
(Scenario I: GDP Growth Rate at 7% per annum)

Year	GDP at factor cost at 93-94 prices	General Cargo Traffic (including Container Traffic)	Share of Container Traffic (in Million)		Transshipment Traffic	Total Container Traffic
			Tonnes	TEUs	Million TEUs	Million TEUs
1991-92	701863	20.8				
1992-93	737792	24.95				
1993-94	781345	28.51				
1994-95	835864	34.83				
1995-96	896990	38.44				
1996-97	970083	41.64				
1997-98	1016594	44.22				
1998-99	1082748	44.03				
1999-00	1148442	50.75				
2000-01	1198592	52.73				
2001-02	1267945	60.48				
2002-03	1318362	68.91				
2003-04	1430548	79.82				
2004-05	1529408	90.53*	58.18*	4.52**		
2005-06	1636467	92.42	60.99	5.08	0.00	5.08
2006-07	1751019	101.20	68.82	5.73	0.00	5.73
2007-08	1873591	110.60	77.42	6.45	0.00	6.45
2008-09	2004742	120.66	86.88	7.24	0.00	7.24
2009-10	2145074	131.43	97.25	8.10	0.00	8.10
2010-11	2295229	142.94	107.21	8.93	1.62	10.55
2011-12	2455895	155.27	116.45	9.70	1.62	11.32
2012-13	2627808	168.45	126.34	10.53	1.62	12.15
2013-14	2811754	182.56	136.92	11.41	1.62	13.03
2014-15	3008577	197.66	148.24	12.35	1.62	13.97
2015-16	3219177	213.81	160.36	13.36	2.40	15.76
2016-1	3444520	231.09	173.32	14.44	2.40	16.84
2017-18	3685636	249.59	187.19	15.60	2.40	18.00
2018-19	3943631	269.37	202.03	16.84	2.40	19.24
2019-20	4219685	290.55	217.91	18.16	2.40	20.56
2020-21	4515063	313.20	234.90	19.58	2.40	21.98
2021-22	4831117	337.44	253.08	21.09	2.40	23.49

* Includes container traffic of 3.42 million tonnes handled at minor ports of Mundra and Pipavav

** Includes container traffic of 0.29 million TEUs handled at minor ports of Mundra and Pipavav

Annexure III-4

Projections of Container Traffic at Indian Ports
(Scenario II: GDP Growth Rate at 8% per annum)

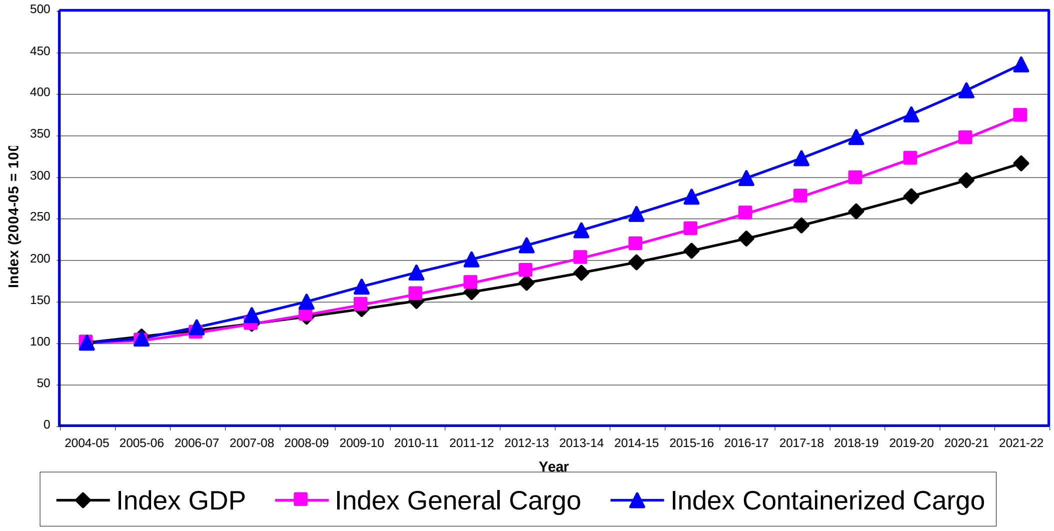
Year	GDP at factor cost at 93-94 prices	General Cargo Traffic (including Container Traffic)	Share of Container Traffic (in Million)		Transsshipment Traffic	Total Container Traffic
			Tonnes	Million TEUs	Million TEUs	TEUs
1991-92	701863	20.8				
1992-93	737792	24.95				
1993-94	781345	28.51				
1994-95	835864	34.83				
1995-96	896990	38.44				
1996-97	970083	41.64				
1997-98	1016594	44.22				
1998-99	1082748	44.03				
1999-00	1148442	50.75				
2000-01	1198592	52.73				
2001-02	1267945	60.48				
2002-03	1318362	68.91				
2003-04	1430548	79.82				
2004-05	1529408	90.53*	58.18*	4.52**		
2005-06	1651760.6	93.59	61.77	5.15	0.00	5.15
2006-07	1783901.5	103.72	70.53	5.88	0.00	5.88
2007-08	1926613.6	114.67	80.27	6.69	0.00	6.69
2008-09	2080742.7	126.49	91.07	7.59	0.00	7.59
2009-10	2247202.1	139.26	103.05	8.59	0.00	8.59
2010-11	2426978.3	153.05	114.79	9.57	1.62	11.19
2011-12	2621136.5	167.94	125.95	10.50	1.62	12.12
2012-13	2830827.5	184.02	138.02	11.50	1.62	13.12
2013-14	3057293.7	201.39	151.04	12.59	1.62	14.21
2014-15	3301877.2	220.15	165.11	13.76	1.62	15.38
2015-16	3566027.3	240.41	180.31	15.03	2.40	17.43
2016-17	3851309.5	262.29	196.72	16.39	2.40	18.79
2017-18	4159414.3	285.93	214.44	17.87	2.40	20.27
2018-19	4492167.4	311.45	233.59	19.47	2.40	21.87
2019-20	4851540.8	339.01	254.26	21.19	2.40	23.59
2020-21	5239664.1	368.78	276.59	23.05	2.40	25.45
2021-22	5658837.2	400.93	300.70	25.06	2.40	27.46

* Includes container traffic of 3.42 million tonnes handled at minor ports of Mundra and Pipavav

** Includes container traffic of 0.29 million TEUs handled at minor ports of Mundra and Pipavav

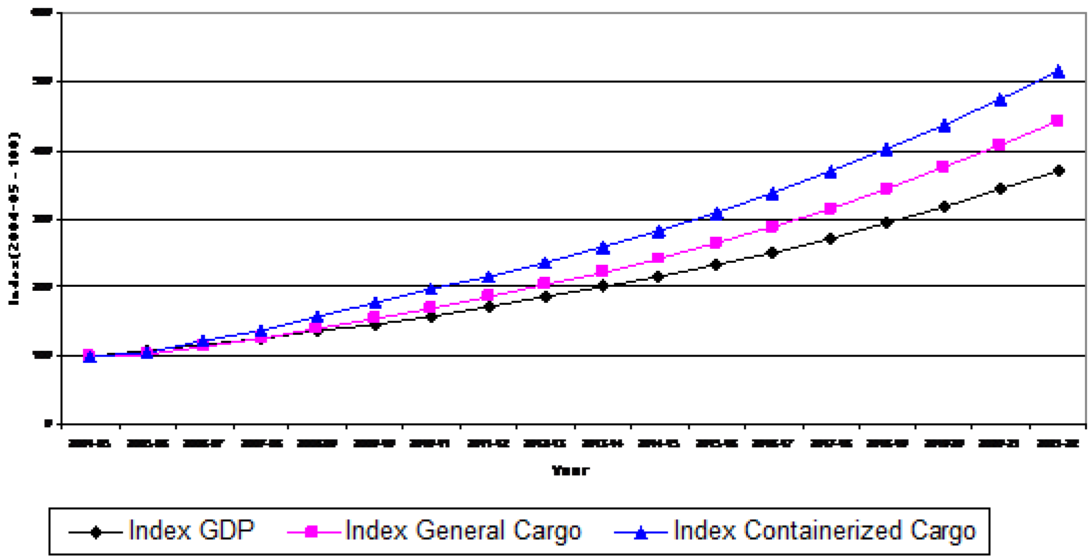
Annexure III-5

Projections of General and Containerized Cargo based on GDP growth of 7% per annum for the period from 2004-05 to 2021-22



Annexure III-6

Projections of General and Containerized Cargo based on GDP growth rate of 8% per annum for the period 2004-05 to 2021-22



Annexure IV-1

Traffic Handled at JNPCT and NSICT Port Terminals

Ports	Description	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	CAGR(%)
JNPCT + NSICT	Containerised traffic (million tonne)	10.6797	14.2774	18.4839	22.8637	27.7850	28.7466	22.70
	Annual Growth Rate (%)	-	33.69	29.46	23.70	21.52	3.46	
	Other Traffic (million tonne)	4.2961	4.2970	4.0639	3.9803	3.4048	4.0621	-2.81
	Annual Growth Rate (%)	-	0.02	-5.42	-2.06	-14.46	19.31	
	Total Traffic (million tonne)	14.9758	18.5744	22.5478	26.8440	31.1898	32.8087	17.52
	Annual Growth Rate (%)	-	24.03	21.39	19.05	16.19	5.19	
	No. of Containers in TEUs	889,978	1,189,780	1,573,678	1,929,531	2,268,989	2,371,338	22.28
	Annual Growth Rate (%)	-	33.69	32.27	22.61	17.59	4.51	
JNPCT	Containerised Traffic (million tonne)	6.5343	5.9386	7.7878	9.3707	13.2031	13.9083	19.92
	Annual Growth Rate (%)	-	-9.12	31.14	20.33	40.90	5.34	
	Other Traffic (million tonne)	4.2961	4.2970	4.0639	3.9803	3.4048	4.0621	-2.81
	Annual Growth Rate (%)	-	0.02	-5.42	-2.06	-14.46	19.31	
	Total Traffic (million tonne)	10.8304	10.2356	11.8517	13.3510	16.6079	17.9704	12.44
	Annual Growth Rate (%)	-	-5.49	15.79	12.65	24.39	8.20	
	No. of containers (in TEUs)	544524	494881	629749	728412	1038434	1138868	18.90
	Annual Growth Rate (%)	-	-9.12	27.25	15.67	42.56	9.67	
NSICT	Containersed Traffic (million tonne)	4.1454	8.3388	10.6961	13.493	14.5819	14.8383	26.71
	Annual Growth Rate (%)	-	101.16	28.27	26.15	8.07	1.76	
	Others Traffic (million tonne)	NIL	NIL	NIL	NIL	NIL	NIL	-
	Annual Growth Rate (%)	-	-	-	-	-		
	Total Traffic (million tonne)	4.1454	8.3386	10.6961	13.493	14.5819	14.8383	26.71
	Annual Growth Rate (%)		101.15	28.27	26.15	8.07	1.76	
	No. of containers (in TEUs)	-	694899	943929	1201119	1230555	1232470	26.82
	Annual Growth Rate (%)	-	101.16	35.84	27.25	2.45	0.16	

Note: Other Traffic includes liquid, dry bulk, vehicles and other general cargo.

Annexure IV-1.1

Commodity-wise Total Traffic (including containerised) Handled at JN Port (million tonnes)

	Commodity	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
1	Fertilizers	0.6271	0.2458	0.2646	0.0954	0.0946	0.0000
2	Fertilizers raw material	0.1636	0.1480	0.0681	0.1431	0.0529	0.0058
3	Foodgrains	0.5554	0.0000	0.0299	0.0000	0.0000	0.0000
4	Total Dry Bulk (1+2+3)	1.3461	0.3938	0.3625	0.2385	0.1475	0.0058
5	Cement	0.4649	0.6913	0.6629	0.5206	0.3690	0.4734
6	Vehicle	0.0437	0.0408	0.0275	0.0403	0.0827	0.0583
7	Others	0.2705	0.2116	0.1372	0.1392	0.1261	0.0362
8	Total Break Bulk (5+6+7)	0.7791	0.9437	0.8276	0.7001	0.5779	0.5679
9	Total POL	1.4123	1.8111	1.7471	1.6104	0.1877	0.0000
10	Total chemicals	0.2099	0.2043	0.1900	0.2585	0.0438	0.0000
11	Total other liquids	0.5491	0.9450	0.9096	0.8947	0.2403	0.0000
12	Total liquide bulk (9+10+11)	2.1713	2.9604	2.8468	2.7636	0.4718	0.0026
13	Total liquid BPCL	0.0000	0.0000	0.0000	0.2783	2.2077	3.4848
14	Total liquid JNPT+BPCL (12+13)	2.1712	2.9604	2.8468	3.0419	2.6795	3.4884
15	Total Bulk (4+8+14)	4.2962	4.2970	4.0370	3.9804	3.4048	4.0621
16	Container (JNPCT) tonnage	6.5343	5.9386	7.7878	9.3707	13.2031	13.9083
	Number of TEUs	544524	494881	629749	278412	1038434	1138868
17	Container (NSICT) tonnage	4.1454	8.3388	10.6961	13.4930	14.5819	14.8383
	Number of TEUs	345454	694899	943929	1201119	1230555	1232470
18	Total Tonnage (16+17)	10.6797	14.2774	18.4839	22.8637	27.7850	28.7466
19	Total TEUs (JNPCT+NSCIT)	889978	1189780	1573678	1929531	2268989	2371338
20	Grand Total (15+18)	14.9758	18.5744	22.5208	26.8440	31.1835	32.8087

Note: Minor difference may be due to rounding off

No. of Trains Despatched To and Received from ICDs at JNPT (Western Railwayroute) during 2004-05

Station To	No. of Trains	%	Station From	No. of Trains	%
BRC	43	1.44	BRC	65	1.98
CPC	71	2.38	CPC	100	3.04
DDL	415	**13.89**	DDL	327	**9.95**
MB	49	1.64	MB	120	3.65
SBI	230	7.70	SBI	444	**13.51**
TKD	1909	**63.92**	TKD	1685	**51.26**
JAB	4	0.13	JAB	25	0.76
BGKT	27	0.90	BGKT	129	3.92
DER	111	3.72	DER	139	4.23
GWL	0	0.00	GWL	0	0.00
KKU	44	1.47	KKU	111	3.38
RTM	56	1.87	RTM	67	2.04
RE	0	0.00	RE	0	0.00
BVH	17	0.57	BVH	75	2.28
MLAR	11	0.37	MLAR	0	0.00
TOTAL	**2987**	**100.00**	**TOTAL**	**3287**	**100.00**

No. of Trains Despatched To and Received from ICDs at JNPT (Central Railwayroute) during 2004-05

Station To	No. of Trains	%	Station From	No.of Trains	%
CCH	21	2.59	CCH	16	3.11
TNPM/GNI	5	0.62	TNPM/GNI		
NGP	247	**30.48**	NGP	236	**45.92**
NGSM	187	**23.09**	NGSM		
SNF	156	**19.26**	SNF	189	**36.77**
BSL	2	**0.25**	AWB	1	**0.19**
VZP			DER		
CED			BGM/DUR	4	0.78
NRH			KNW/SSL	7	1.36
GWL			MLAR	31	6.03
DRT	40	4.94	EMPT	30	5.84
EMPT	152	18.77			
TOTAL	**810**	**100.00**	**TOTAL**	**514**	**100.00**
Note: The number of trains of western and central routes have been summarised below:					

No. of Trains	Route via		
	Western Rly	**Central Railway**	**Total**
Received	3287	514	3801
%	**86**	**14**	**100**
Despatched	2987	810	3797
%	**79**	**21**	**100**
Total	6274	1324	7598
%	**83**	**17**	**100**

Annexure V-3

Line Capacity Utilisation of Sections from Saurastra Ports (2004-05)

Section	Kms	Track	Traction	Capacity		Pass	Containers	Other goods	Deptt.	Total	Utilization %	
				WOB	WB						WOB	WB
PPBR-Surinder Ngr	274.00	SL	DSL	20.00	14.00	9.00	1.00	1.00	1.00	12.00	60.00	85.00
Surinder Ngr-Virmgram	65.00	SL	DSL	22.00	19.00	8.00	1.41	15.50	0.00	24.91	113.23	127.74
Viramgram-Mahesana	65.00	SL	DSL	16.00	13.00	0.00	1.93	2.87	0.05	4.85	30.30	37.30
Mehesana-Palanpur	65.10	SL	DSL	24.00	20.00	17.00	2.87	5.00	0.38	25.26	105.30	126.30
Palanpur-Abu Rd.	52.64	SL	DSL	22.00	19.50	15.91	0.00	9.00	2.70	27.61	125.50	141.59
ABU Rd-Marwar	165.20	SL	DSL	20.00	18.00	14.91	0.00	9.05	2.70	26.66	133.30	148.11
Marwar-Beawar	87.66	SL	DSL	20.00	18.00	11.13	0.00	5.76	1.11	18.00	90.00	100.00
Beawar-Ajmer	52.00	SL	DSL	20.00	18.00	12.13	0.00	7.46	2.06	21.65	108.25	120.28
Ajmer-Phullera	69.27	SL	DSL	20.00	18.00	12.13	0.00	0.91	0.66	13.70	68.55	76.11
Phullera-Jaipur	124.31	SL	DSL	23.00	18.00	21.00	0.00	8.45	0.00	31.21	135.70	173.40
Phullera-Ringus	66.74	SL	DSL	16.00	14.00	4.00	0.00	7.00	0.00	11.00	68.80	76.00
Jaipur-Bandi Kui	90.32	SL	DSL	20.00	15.00	14.08	0.00	6.79	1.38	22.25	111.25	130.88
Bandi Kui-Alwar	60.37	SL	DSL	21.00	19.00	14.08	0.00	8.30	0.96	23.34	111.14	122.84
Alwar-Rewari	74.21	SL	DSL	22.00	19.50	14.07	0.00	7.44	1.23	22.74	103.36	116.62
Rewari-Bhiwani	82.56	SL	DSL	20.00	15.00	8.00	0.10	8.49	0.50	20.68	103.40	137.90
Bhiwani-Hissar	60.00	SL	DSL	20.00	15.00	10.00	0.10	12.58	0.00	22.68	113.40	151.20
Hissar-Sirsa	81.74	SL	DSL	20.00	15.00	7.00	0.02	8.18	0.00	15.20	76.00	101.30
Sirsa-Jakhal	95.28	SL	DSL	22.00	16.00	7.00	0.50	7.50	0.00	15.00	67.10	89.40
Jakhal-Dhuri	66.00	SL	DSL	18.00	12.00	5.00	0.50	3.60	0.00	9.10	51.70	77.50
Dhuri-Ludhiana	62.00	SL	DSL	22.00	16.00	7.00	0.50	7.50	0.00	15.00	68.20	93.80
Mundra-Adipur	57.00	SL	DSL	16.00	14.00	5.00	2.00	4.76	0.24	12.00	75.00	85.71
Adipur-Gandhidham	9.00	SL	DSL	20.00	16.00	6.00	2.00	1.00	0.50	9.50	47.50	59.38
Gandhidham-Viramgam	235.00	SL	DSL	20.00	14.00	9.00	2.00	0.76	0.24	12.00	60.00	85.71
New Bhuj-Gandhidham	57.90	SL	DSL	14.00	11.00	6.00	2.07	2.10	0.01	4.18	77.60	98.70
Gandhidam Samakhiali	53.00	SL	DSL	20.00	15.00	7.00	1.81	12.06	0.00	20.87	104.40	152.70
Samakhiali-Dhrangadhra	117.00	SL	DSL	20.00	15.00	7.00	1.81	12.06	0.00	20.87	104.40	152.70
Dhrangadra-Viramgam	65.00	SL	DSL	22.00	19.50	8.00	1.41	15.50	0.00	24.91	113.23	127.74
Marwar-LUNI	71.71	SL	DSL	24.00	18.00	10.00	0.50	4.50	1.00	15.50	64.60	86.10
LUNI-BGKT	29.00	SL	DSL	24.00	18.00	10.00	0.50	4.50	1.00	16.00	66.70	76.20
BGKT-JU	3.40	DL	DSL	42.00	34.00	0.00	0.30	21.50	2.00	23.80	113.23	127.74
Jodhpur-Merla road	104.00	SL	DSL	16.00	12.00	10.00	0.50	5.80	0.00	16.30	101.50	124.30
MERTA ROAD-FL	154.00	SL	DSL	22.00	18.00	10.00	0.00	5.50	1.00	16.50	75.00	82.50
Phullera-Jaipur	124.31	SL	DSL	23.00	18.00	21.00	0.00	8.45	0.00	31.21	135.70	173.40
Sadalpur-Suralgarh	57.80	SL	DSL	18.00	16.00	9.00	0.00	2.70	0.00	11.70	61.40	76.40
Merta Road-FL	142.79	SL	DSL	22.00	18.00	10.00	0.50	5.50	1.00	16.50	75.00	91.71
Gandhidam-Bhildi (M.G)	255.00	SL	DSL	16.00	14.00	5.00	0.00	1.00	0.50	6.50	48.80	57.80
Bhildi-Samdhari (M.G)	225.00	SL	DSL	20.00	16.00	7.00	0.00	5.50	1.20	13.70	65.40	78.50

Note: 1. The above 2 MG sections are likely to be converted to BG

2. Capacity utilisation on MG Viramgam-Mehsana section was 128%. The section was converted to BG in December 2004. Projected capacity utilisation on BG in 2009-10 is 86%

3 Delhi Cantt.-Rewari MG section is under conversion to BG

Annexure IV-3

Matrix Showing the Performance of ICD's in terms of Number of TEUs and Trains Despatched/Received per day (2005-06)

From		JNPT/ NSICT	Mumbai	DNODE	BRC	RTM	INDORE	GWL	AGC	CPC	BVH	TKD	DER	MB	DDL	PNP	RE	BGKT	JP KKU	SBI	Pipavav	Mundra	Kandla	PPBR	NGP	VZP	Others	Total	Average per month	Average per day	No of trains per day
To																															
JNPT	I	0.00	0.00	0.00	8.39	15.90	0.00	7.93	9.98	21.32	31.46	319.56	43.33	37.83	73.60	6.31	8.68	27.99	24.28	100.32	0.00	0.00	0.00	0.00	68.30	0.00	0.00	805.18	24155.33	805.18	10.06
	ii	0.00	0.00	0.00	0.10	0.20	0.00	0.10	0.12	0.27	0.39	3.99	0.54	0.47	0.92	0.08	0.11	0.35	0.30	1.25	0.00	0.00	0.00	0.00	0.85	0.00	0.00	10.06	301.94	10.06	0.13
Mumbai	I	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.29	0.00	0.00	1.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.00	7.01	210.33	7.01	0.09
	ii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.09	2.63	0.09	0.00
Local	I	63.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.53	1906.00	63.53	0.79
	ii	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	23.83	0.79	0.01
BRC	I	8.39	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.71	291.33	9.71	0.12
	ii	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	3.64	0.12	0.00
RTM	I	15.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.90	477.00	15.90	0.20
	ii	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	5.96	0.20	0.00
INDORE	I	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	ii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GWL	I	3.62	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.47	224.00	7.47	0.09
	ii	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	2.80	0.09	0.00
AGC	I	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	28.67	0.96	0.01
	ii	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.36	0.01	0.00
CPC	I	12.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00	17.22	516.67	17.22	0.22
	ii	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.22	6.46	0.22	0.00
BVH	I	14.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.17	455.00	15.17	0.19
	ii	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	5.69	0.19	0.00
TKD	I	477.49	5.57	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.53	0.00	0.00	0.71	0.00	0.00	31.39	71.10	0.00	0.00	0.89	0.00	0.00	598.68	17960.33	598.68	7.48
	ii	5.97	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.01	0.00	0.00	0.39	0.89	0.00	0.00	0.01	0.00	0.00	7.48	224.50	7.48	0.09
DER	I	66.81	0.00	3.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.02	0.00	0.00	0.00	0.00	0.00	0.00	87.00	2610.00	87.00	1.09
	ii	0.84	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	1.09	32.63	1.09	0.01
MB	I	24.53	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09	1.33	0.00	0.00	0.00	0.00	0.00	29.28	878.33	29.28	0.37
	ii	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.37	10.98	0.37	0.00
DDL	I	142.47	0.83	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	4.78	0.00	0.00	0.00	1.03	2.09	0.78	2.00	18.27	46.02	0.00	17.96	0.00	0.00	0.11	238.83	7165.00	238.83	2.99
	ii	1.78	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.01	0.03	0.01	0.03	0.23	0.58	0.00	0.22	0.00	0.00	0.00	2.99	89.56	2.99	0.04
PNP	I	6.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.38	191.33	6.38	0.08
	ii	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	2.39	0.08	0.00
RE	I	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.46	0.00	0.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.78	173.33	5.78	0.07

	ii	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	2.17	0.07	0.00
BGKT	I	6.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.00	0.00	2.09	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	9.88	296.33	9.88	0.12
	ii	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.12	3.70	0.12	0.00
JP KKU	ii	10.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.50	0.74	0.00	0.00	0.00	0.00	0.00	12.49	374.67	12.49	0.16
	I	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.16	4.68	0.16	0.00
SBI	ii	38.27	0.00	18.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	10.18	3.87	0.00	0.00	0.00	0.00	0.00	73.24	2197.33	73.24	0.92
	I	0.48	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.13	0.05	0.00	0.00	0.00	0.00	0.00	0.92	27.47	0.92	0.01
Pipavav	ii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	31.61	8.86	0.29	17.96	0.06	0.00	2.03	4.24	7.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.14	2164.33	72.14	0.90
	I	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.11	0.00	0.22	0.00	0.00	0.03	0.05	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	27.05	0.90	0.01
Mundra	ii	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.23	0.00	0.00	83.32	0.63	0.36	22.57	1.40	2.98	1.31	7.93	1.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	122.43	3673.00	122.43	1.53
	I	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.01	0.00	0.28	0.02	0.04	0.02	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53	45.91	1.53	0.02
Kandla	ii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	I	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PPBR	ii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.96	0.00	0.00	0.00	4.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.20	666.00	22.20	0.28
	ii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	8.33	0.28	0.00
NGP	I	64.92	0.89	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.48	2024.33	67.48	0.84
	ii	0.81	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84	25.30	0.84	0.01
VZP	I	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.50	225.00	7.50	0.09
	ii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	2.81	0.09	0.00
Others	I	39.18	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.11	1383.33	46.11	0.58
	ii	0.49	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	17.29	0.58	0.01
Total	I	998.58	7.43	34.94	8.39	15.90	0.00	8.24	10.29	21.32	31.46	465.62	57.60	38.48	148.34	7.77	12.69	34.13	41.48	110.73	76.01	124.01	0.00	17.96	70.08	0.00	0.11	2341.57	70247.00	2341.57	29.27
	ii	12.48	0.09	0.44	0.10	0.20	0.00	0.10	0.13	0.27	0.39	5.82	0.72	0.48	1.85	0.10	0.16	0.43	0.52	1.38	0.95	1.55	0.00	0.22	0.88	0.00	0.00	29.27			

Note:

(1) The averages are based on the data of 3 months April to June 2005

(2) While (i) represnts TEUs, (ii) stands for trains

Annexure IV-5
Rail Road Distances (Kms)

From	To	DDL	PNP	MB	CPC	AGC	DER	TKD	BGKT	KKU	SBI	GWL (Malanpur)	BRC
Pipavav	Road	1537	1323	1369	1359	1029	1266	1190	776	950	337	1205	341
	Rail	1593	1378	1469	1484	1230	1332	1319	816	988	431	1373	531
MDPT	Road	1461	1242	1397	1416	1130	1241	1312	664	898	425	1280	538
	Rail	1528	1313	1388	1419	1165	1267	1239	754	923	356	1283	456
JNPT	Road	1713	1494	1566	1607	1516	1442	1387	984	1188	561	1251	442
	Rail	1741	1522	1588	1547	1293	1464	1413	998	1167	580	1436	437
TKD	Road	326	107	158	408	182	39	-	610	279	894	300	1007
	Rail	335	110	175	450	183	51	-	818	441	1076	326	975
DER	Road	354	141	169	372	221	-	39	625	294	933	355	1046
	Rail	335	130	158	408	229	-	51	831	452	1127	372	1027
SBI	Road	1200	1001	1073	1077	889	933	894	439	657	-	868	113
	Rail	1185	970	1045	1210	956	1127	1076	461	630	-	1099	105
DDL	Road	-	219	463	713	508	354	326	793	563	1200	625	1333
	Rail	-	216	382	740	503	335	335	969	590	1185	646	1302
PNP	Road	219	-	244	494	289	141	107	675	344	1001	407	1114
	Rail	216	-	250	524	287	130	110	753	498	970	430	1085
MB	Road	463	244	-	421	267	169	158	747	499	1073	385	1186
	Rail	382	250	-	-	358	158	175	834	385	1045	501	1150
CPC	Road	713	494	421	-	286	372	408	849	518	1077	276	1018
	Rail	740	524	-	-	254	408	450	875	496	1210	397	1115
AGC	Road	508	289	267	286	-	221	182	563	232	889	118	927
	Rail	503	287	358	254	-	229	183	625	246	956	143	855
GWL (Malanpur)	Road	625	407	385	276	118	355	300	681	350	868	-	809
	Rail	646	430	501	397	143	372	326	1020	389	1099	-	998
BRC	Road	1333	1114	1186	1018	927	1046	1007	552	770	113	809	-
	Rail	1302	1085	1150	1115	855	1027	975	561	730	105	998	-
BGKT	Road	793	675	747	849	563	625	610	-	331	439	681	552
	Rail	969	753	834	875	625	831	818	-	379	461	1020	561
KKU	Road	563	344	499	518	232	294	279	331	-	657	350	770
	Rail	590	498	385	496	246	452	441	379	-	630	389	730

Note: **(I) Rail distances are based on Railway Time Tables**
(ii) Road distances are based on Indian Distance Guide (TTK Publication)

Annexure IV-6

Movement of Container Traffic from Mundra & Pipavav Ports

Year	GDP at factor cost at 93-94 prices	General Cargo Traffic (including Container Traffic)	Share of Container Traffic (in Million)													
			Tonnes	TEUs												
1991-92	701863	20.8														
1992-93	737792	24.95														
1993-94	781345	28.51														
1994-95	835864	34.83														
1995-96	896990	38.44														
1996-97	970083	41.64														
1997-98	1016594	44.22														
1998-99	1082748	44.03														
1999-00	1148442	50.75														
2000-01	1198592	52.73														
2001-02	1267945	60.48			Container (in million tonnes)			Container (in TEUs million)			Rail Share TEUs in thousand			No of Trains each way per day*		
2002-03	1318362	68.91			Pipavav	Mundra	Pipavav+Mundra	Pipavav	Mundra	Pipavav+Mundra	Pipavav	Mundra	Pipavav+Mundra	Pipavav	Mundra	Pipavav+Mundra
2003-04	1430548	79.82	51.00		1.90	4.53	6.43	0.16	0.38	0.54	43	102	145	0.65	1.55	2.20
2004-05	1529408	85.51	54.73		2.04	4.86	6.90	0.17	0.41	0.58	46	109	155	0.70	1.66	2.36
2005-06	1636466.6	90.59	59.79	4.98	2.23	5.31	7.54	0.19	0.44	0.63	50	119	170	0.76	1.82	2.58
2006-07	1751019.2	99.07	67.37	5.61	2.51	5.98	8.49	0.21	0.50	0.71	63	150	212	0.96	2.28	3.23
2007-08	1873590.6	108.16	75.71	6.31	2.82	6.72	9.55	0.24	0.56	0.80	71	168	239	1.07	2.56	3.63
2008-09	2004741.9	117.88	84.87	7.07	3.16	7.54	10.70	0.26	0.63	0.89	79	188	268	1.20	2.87	4.07
2009-10	2145073.8	128.27	94.92	7.91	3.54	8.43	11.97	0.29	0.70	1.00	88	211	299	1.35	3.21	4.55
2010-11	2295229	139.40	104.55	8.71	3.90	9.29	13.18	0.32	0.77	1.10	97	232	330	1.48	3.53	5.02
2011-12	2455895	151.31	113.48	9.46	4.23	10.08	14.31	0.35	0.84	1.19	113	269	382	1.72	4.09	5.81
2012-13	2627807.7	164.04	123.03	10.25	4.58	10.93	15.51	0.38	0.91	1.29	122	291	414	1.86	4.44	6.30
2013-14	2811754.2	177.67	133.26	11.10	4.96	11.84	16.80	0.41	0.99	1.40	132	316	448	2.01	4.80	6.82
2014-15	3008577	192.26	144.19	12.02	5.37	12.81	18.18	0.45	1.07	1.51	143	342	485	2.18	5.20	7.38
2015-16	3219177.4	207.86	155.90	12.99	5.81	13.85	19.66	0.48	1.15	1.64	155	369	524	2.36	5.62	7.98
2016-17	3444519.8	224.56	168.42	14.04	6.27	14.96	21.23	0.52	1.25	1.77	183	436	619	2.79	6.64	9.43
2017-18	3685636.2	242.43	181.82	15.15	6.77	16.15	22.92	0.56	1.35	1.91	198	471	669	3.01	7.17	10.18
2018-19	3943630.8	261.55	196.16	16.35	7.31	17.42	24.73	0.61	1.45	2.06	213	508	721	3.24	7.73	10.98
2019-20	4219684.9	282.00	211.50	17.63	7.88	18.79	26.67	0.66	1.57	2.22	230	548	778	3.50	8.34	11.84
2020-21	4515062.9	303.89	227.92	18.99	8.49	20.24	28.74	0.71	1.69	2.39	248	590	838	3.77	8.99	12.76
2021-22	4831117.3	327.31	245.48	20.46	9.15	21.80	30.95	0.76	1.82	2.58	267	636	903	4.06	9.68	13.74

* Based on average load of 90 TEUS per train and assuming equal traffic in either direction

7% GDP Growth Rate

ANNEXURE: IV-7

Rail Movement of Import Traffic from Mundra Port (2005-06)

Month/ICD	TKD		DDL		DER		SBI		KKU/BGKT		OTHER		TOTAL	
	LDD	ETY	LDD	ETY	LDD	ETY	LDD	ETY	LDD	ETY	LDD	ETY	LDD	ETY
Apr-05	1663	14	1252	69	324	0	70	198	15	16	40	0	3364	297
May-05	2132	1	1751	0	336	0	0	0	27	2	6	0	4252	3
Jun-05	2589	0	1070	0	247	0	80	0	63	0	144	0	4193	0
Jul-05	1624	40	1931	2	457	0	48	16	31	30	141	0	4232	88
Aug-05	1978	90	1185	0	445	0	47	31	63	80	239	0	3957	201
Total	9986	145	7189	71	1809	0	245	245	199	128	570	0	19998	589

Rail Movement of Import Traffic from Pipavav Port

Month/ICD	TKD		DDL		DER		SBI		KKU/BGKT		OTHER		TOTAL	
	LDD	ETY	LDD	ETY	LDD	ETY	LDD	ETY	LDD	ETY	LDD	ETY	LDD	ETY
Apr-05	909	119	489	60	130	30	19	275	0	50	62	0	1608	534
May-05	646	108	530	0	580	26	116	334	4	20	44	0	1920	488
Jun-05	1043	0	565	0	406	0	172	0	22	0	82	0	2290	0
Jul-05	711	174	800	0	229	12	60	22	13	1	96	0	1909	209
Aug-05	1021	548	610	0	674	88	113	25	12	8	184	1	2614	670
Total	4330	949	2994	60	2019	156	480	656	51	79	468	1	10341	1901

Source: CONCOR

Annexure IV-8

No of Trains received at JNPT per day

	BRC	CPC	DDL	MB	SBI	TKD	AGC	BGKT	KKU	RTM	DER	BVH	CED	**Total via WR**	CCH	TNPM	NGP	NGSM	SNF	AWB	DER	BGM	KNW	MLAR	EMPTY	**Total CR**	**Grand Total**
2004-05	0.18	0.27	0.90	0.33	1.22	4.62	0.07	0.35	0.30	0.18	0.38	0.21	0.00	**9.01**	0.04	0.00	0.64	0.01	0.52	0.00	0.00	0.01	0.02	0.08	0.08	**1.42**	**10.42**
2005-06	0.20	0.32	1.03	0.38	1.40	5.31	0.08	0.41	0.35	0.21	0.44	0.24	0.00	10.36	0.05	0.00	0.74	0.01	0.60	0.00	0.00	0.01	0.02	0.10	0.09	1.63	11.99
2006-07	0.24	0.36	1.18	0.43	1.61	6.11	0.09	0.47	0.40	0.24	0.50	0.27	0.00	11.91	0.06	0.00	0.85	0.01	0.68	0.00	0.00	0.01	0.03	0.11	0.11	1.87	13.78
2007-08	0.27	0.42	1.36	0.50	1.85	7.02	0.10	0.54	0.46	0.28	0.58	0.31	0.00	13.70	0.07	0.00	0.98	0.02	0.79	0.00	0.00	0.02	0.03	0.13	0.13	2.15	15.85
2008-09	0.30	0.46	1.51	0.56	2.05	7.79	0.12	0.60	0.51	0.31	0.64	0.35	0.00	15.20	0.07	0.00	1.09	0.02	0.87	0.00	0.00	0.02	0.03	0.14	0.14	2.39	17.59
2009-10	0.33	0.51	1.68	0.62	2.28	8.65	0.13	0.66	0.57	0.34	0.71	0.39	0.00	16.88	0.08	0.00	1.21	0.02	0.97	0.01	0.00	0.02	0.04	0.16	0.15	2.65	19.53
2010-11	0.37	0.57	1.86	0.68	2.53	9.60	0.14	0.74	0.63	0.38	0.79	0.43	0.00	18.73	0.09	0.00	1.34	0.02	1.08	0.01	0.00	0.02	0.04	0.18	0.17	2.95	21.68
2011-12	0.41	0.63	2.07	0.76	2.81	10.66	0.16	0.82	0.70	0.42	0.88	0.47	0.00	20.79	0.10	0.00	1.49	0.03	1.20	0.01	0.00	0.03	0.04	0.20	0.19	3.27	24.06
2012-13	0.46	0.70	2.30	0.84	3.12	11.83	0.18	0.91	0.78	0.47	0.98	0.53	0.00	23.08	0.11	0.00	1.65	0.03	1.33	0.01	0.00	0.03	0.05	0.22	0.21	3.63	26.71
2013-14	0.51	0.78	2.55	0.94	3.46	13.13	0.19	1.01	0.87	0.52	1.08	0.58	0.00	25.62	0.12	0.00	1.83	0.03	1.47	0.01	0.00	0.03	0.05	0.24	0.23	4.03	29.65
2014-15	0.56	0.87	2.83	1.04	3.84	14.58	0.22	1.12	0.96	0.58	1.20	0.65	0.00	28.44	0.14	0.00	2.03	0.03	1.64	0.01	0.00	0.03	0.06	0.27	0.26	4.47	32.91
2015-16	0.62	0.96	3.14	1.15	4.26	16.18	0.24	1.24	1.07	0.64	1.33	0.72	0.00	31.56	0.15	0.00	2.26	0.04	1.81	0.01	0.00	0.04	0.07	0.30	0.29	4.96	36.53
2016-17	0.69	1.07	3.49	1.28	4.73	17.96	0.27	1.37	1.18	0.71	1.48	0.80	0.00	35.04	0.17	0.00	2.50	0.04	2.01	0.01	0.00	0.04	0.07	0.33	0.32	5.51	40.55
2017-18	0.77	1.18	3.87	1.42	5.25	19.94	0.30	1.53	1.31	0.79	1.64	0.89	0.00	38.89	0.19	0.00	2.78	0.05	2.24	0.01	0.00	0.05	0.08	0.37	0.35	6.12	45.01
2018-19	0.85	1.31	4.29	1.58	5.83	22.13	0.33	1.69	1.46	0.88	1.83	0.98	0.00	43.17	0.21	0.00	3.09	0.05	2.48	0.01	0.00	0.05	0.09	0.41	0.39	6.79	49.96
2019-20	0.95	1.46	4.77	1.75	6.47	24.56	0.36	1.88	1.62	0.98	2.03	1.09	0.00	47.92	0.23	0.00	3.43	0.06	2.76	0.01	0.00	0.06	0.10	0.45	0.44	7.54	55.45
2020-21	1.05	1.62	5.29	1.94	7.18	27.26	0.40	2.09	1.80	1.08	2.25	1.21	0.00	53.19	0.26	0.00	3.80	0.06	3.06	0.02	0.00	0.06	0.11	0.50	0.49	8.37	61.55
2021-22	1.17	1.80	5.87	2.16	7.97	30.26	0.45	2.32	1.99	1.20	2.50	1.35	0.00	59.04	0.29	0.00	4.22	0.07	3.39	0.02	0.00	0.07	0.13	0.56	0.54	9.29	68.32

No of TEUs (in '000) received per year at JNPT/NSCIT (80 TEUs per train)

	BRC	CPC	DDL	MB	SBI	TKD	AGC	BGKT	KKU	RTM	DER	BVH	CED	Total via WR	CCH	TNPM	NGP	NGSM	SNF	AWB	DER	BGM	KNW	MLAR	EMPTY	Total CR	Grand Total
2004-05	5.20	8.00	26.16	9.60	35.52	134.80	2.00	10.32	8.88	5.36	11.12	6.00	0.00	**262.96**	1.28	0.00	18.80	0.32	15.12	0.08	0.00	0.32	0.56	2.48	2.40	**41.36**	**304.32**
2005-06	5.98	9.20	30.08	11.04	40.85	155.02	2.30	11.87	10.21	6.16	12.79	6.90	0.00	**302.40**	1.47	0.00	21.62	0.37	17.39	0.09	0.00	0.37	0.64	2.85	2.76	**47.56**	**349.97**
2006-07	6.88	10.58	34.60	12.70	46.98	178.27	2.65	13.65	11.74	7.09	14.71	7.94	0.00	**347.76**	1.69	0.00	24.86	0.42	20.00	0.11	0.00	0.42	0.74	3.28	3.17	**54.70**	**402.46**
2007-08	7.91	12.17	39.79	14.60	54.02	205.01	3.04	15.70	13.51	8.15	16.91	9.13	0.00	**399.93**	1.95	0.00	28.59	0.49	23.00	0.12	0.00	0.49	0.85	3.77	3.65	**62.90**	**462.83**
2008-09	8.78	13.51	44.16	16.21	59.96	227.57	3.38	17.42	14.99	9.05	18.77	10.13	0.00	**443.92**	2.16	0.00	31.74	0.54	25.53	0.14	0.00	0.54	0.95	4.19	4.05	**69.82**	**513.74**
2009-10	9.74	14.99	49.02	17.99	66.56	252.60	3.75	19.34	16.64	10.04	20.84	11.24	0.00	**492.75**	2.40	0.00	35.23	0.60	28.33	0.15	0.00	0.60	1.05	4.65	4.50	**77.50**	**570.26**
2010-11	10.82	16.64	54.41	19.97	73.88	280.38	4.16	21.47	18.47	11.15	23.13	12.48	0.00	**546.96**	2.66	0.00	39.10	0.67	31.45	0.17	0.00	0.67	1.16	5.16	4.99	**86.03**	**632.98**
2011-12	12.01	18.47	60.40	22.16	82.01	311.23	4.62	23.83	20.50	12.38	25.67	13.85	0.00	**607.12**	2.96	0.00	43.41	0.74	34.91	0.18	0.00	0.74	1.29	5.73	5.54	**95.49**	**702.61**
2012-13	13.33	20.50	67.04	24.60	91.03	345.46	5.13	26.45	22.76	13.74	28.50	15.38	0.00	**673.90**	3.28	0.00	48.18	0.82	38.75	0.21	0.00	0.82	1.44	6.36	6.15	**106.00**	**779.90**
2013-14	14.79	22.76	74.42	27.31	101.04	383.46	5.69	29.36	25.26	15.25	31.63	17.07	0.00	**748.03**	3.64	0.00	53.48	0.91	43.01	0.23	0.00	0.91	1.59	7.05	6.83	**117.66**	**865.69**
2014-15	16.42	25.26	82.60	30.31	112.16	425.64	6.32	32.59	28.04	16.92	35.11	18.95	0.00	**830.32**	4.04	0.00	59.36	1.01	47.74	0.25	0.00	1.01	1.77	7.83	7.58	**130.60**	**960.91**

2015-16	18.23	28.04	91.69	33.65	124.49	472.46	7.01	36.17	31.12	18.79	38.97	21.03	0.00	**921.65**	4.49	0.00	65.89	1.12	52.99	0.28	0.00	1.12	1.96	8.69	8.41	**144.96**	**1066.62**
2016-17	20.23	31.12	101.77	37.35	138.19	524.43	7.78	40.15	34.55	20.85	43.26	23.34	0.00	**1023.03**	4.98	0.00	73.14	1.24	58.82	0.31	0.00	1.24	2.18	9.65	9.34	**160.91**	**1183.94**
2017-18	22.46	34.55	112.97	41.46	153.39	582.12	8.64	44.57	38.35	23.15	48.02	25.91	0.00	**1135.57**	5.53	0.00	81.19	1.38	65.29	0.35	0.00	1.38	2.42	10.71	10.36	**178.61**	**1314.18**
2018-19	24.93	38.35	125.40	46.02	170.26	646.15	9.59	49.47	42.57	25.69	53.30	28.76	0.00	**1260.48**	6.14	0.00	90.12	1.53	72.48	0.38	0.00	1.53	2.68	11.89	11.50	**198.26**	**1458.74**
2019-20	27.67	42.57	139.19	51.08	188.99	717.23	10.64	54.91	47.25	28.52	59.17	31.92	0.00	**1399.13**	6.81	0.00	100.03	1.70	80.45	0.43	0.00	1.70	2.98	13.20	12.77	**220.06**	**1619.20**
2020-21	30.71	47.25	154.50	56.70	209.78	796.13	11.81	60.95	52.45	31.66	65.67	35.44	0.00	**1553.04**	7.56	0.00	111.03	1.89	89.30	0.47	0.00	1.89	3.31	14.65	14.17	**244.27**	**1797.31**
2021-22	34.09	52.45	171.50	62.93	232.86	883.70	13.11	67.65	58.21	35.14	72.90	39.33	0.00	**1723.87**	8.39	0.00	123.25	2.10	99.12	0.52	0.00	2.10	3.67	16.26	15.73	**271.14**	**1995.01**

Assumption: (1) Growth Rate of 15% from 2005-06 to 2007-08 (2) Growth rate of 11% from 2008-09 to 2021-22

No of TEUs (in '000) received per year at JNPT/NSCIT (90 TEUs per train)

2004-05	5.85	9.00	29.43	10.80	39.96	151.65	2.25	11.61	9.99	6.03	12.51	6.75	0.00	**295.83**	1.44	0.00	21.15	0.36	17.01	0.09	0.00	0.36	0.63	2.79	2.70	**46.53**	**342.36**
2005-06	6.73	10.35	33.84	12.42	45.95	174.40	2.59	13.35	11.49	6.93	14.39	7.76	0.00	**340.20**	1.66	0.00	24.32	0.41	19.56	0.10	0.00	0.41	0.72	3.21	3.11	**53.51**	**393.71**
2006-07	7.74	11.90	38.92	14.28	52.85	200.56	2.98	15.35	13.21	7.97	16.54	8.93	0.00	**391.24**	1.90	0.00	27.97	0.48	22.50	0.12	0.00	0.48	0.83	3.69	3.57	**61.54**	**452.77**
2007-08	8.90	13.69	44.76	16.43	60.77	230.64	3.42	17.66	15.19	9.17	19.03	10.27	0.00	**449.92**	2.19	0.00	32.17	0.55	25.87	0.14	0.00	0.55	0.96	4.24	4.11	**70.77**	**520.69**
2008-09	9.88	15.19	49.68	18.23	67.46	256.01	3.80	19.60	16.86	10.18	21.12	11.40	0.00	**499.41**	2.43	0.00	35.70	0.61	28.72	0.15	0.00	0.61	1.06	4.71	4.56	**78.55**	**577.96**
2009-10	10.96	16.86	55.15	20.24	74.88	284.17	4.22	21.76	18.72	11.30	23.44	12.65	0.00	**554.35**	2.70	0.00	39.63	0.67	31.87	0.17	0.00	0.67	1.18	5.23	5.06	**87.19**	**641.54**
2010-11	12.17	18.72	61.21	22.46	83.12	315.43	4.68	24.15	20.78	12.54	26.02	14.04	0.00	**615.33**	3.00	0.00	43.99	0.75	35.38	0.19	0.00	0.75	1.31	5.80	5.62	**96.78**	**712.11**
2011-12	13.51	20.78	67.95	24.93	92.26	350.13	5.19	26.81	23.06	13.92	28.88	15.58	0.00	**683.01**	3.32	0.00	48.83	0.83	39.27	0.21	0.00	0.83	1.45	6.44	6.23	**107.43**	**790.44**
2012-13	14.99	23.06	75.42	27.68	102.41	388.64	5.77	29.75	25.60	15.45	32.06	17.30	0.00	**758.14**	3.69	0.00	54.20	0.92	43.59	0.23	0.00	0.92	1.61	7.15	6.92	**119.25**	**877.39**
2013-14	16.64	25.60	83.72	30.72	113.67	431.39	6.40	33.03	28.42	17.15	35.59	19.20	0.00	**841.54**	4.10	0.00	60.16	1.02	48.39	0.26	0.00	1.02	1.79	7.94	7.68	**132.36**	**973.90**
2014-15	18.47	28.42	92.93	34.10	126.18	478.85	7.10	36.66	31.54	19.04	39.50	21.31	0.00	**934.11**	4.55	0.00	66.78	1.14	53.71	0.28	0.00	1.14	1.99	8.81	8.53	**146.92**	**1081.03**
2015-16	20.50	31.54	103.15	37.85	140.06	531.52	7.89	40.69	35.01	21.13	43.85	23.66	0.00	**1036.86**	5.05	0.00	74.13	1.26	59.62	0.32	0.00	1.26	2.21	9.78	9.46	**163.08**	**1199.94**
2016-17	22.76	35.01	114.50	42.02	155.46	589.99	8.75	45.17	38.87	23.46	48.67	26.26	0.00	**1150.91**	5.60	0.00	82.28	1.40	66.18	0.35	0.00	1.40	2.45	10.85	10.50	**181.02**	**1331.94**
2017-18	25.26	38.87	127.09	46.64	172.56	654.89	9.72	50.14	43.14	26.04	54.02	29.15	0.00	**1277.51**	6.22	0.00	91.33	1.55	73.46	0.39	0.00	1.55	2.72	12.05	11.66	**200.94**	**1478.45**
2018-19	28.04	43.14	141.07	51.77	191.55	726.92	10.79	55.65	47.89	28.90	59.97	32.36	0.00	**1418.04**	6.90	0.00	101.38	1.73	81.54	0.43	0.00	1.73	3.02	13.37	12.94	**223.04**	**1641.08**
2019-20	31.13	47.89	156.59	57.46	212.62	806.89	11.97	61.77	53.15	32.08	66.56	35.91	0.00	**1574.02**	7.66	0.00	112.53	1.92	90.51	0.48	0.00	1.92	3.35	14.84	14.37	**247.57**	**1821.60**
2020-21	34.55	53.15	173.81	63.78	236.00	895.64	13.29	68.57	59.00	35.61	73.88	39.87	0.00	**1747.17**	8.50	0.00	124.91	2.13	100.46	0.53	0.00	2.13	3.72	16.48	15.95	**274.81**	**2021.97**
2021-22	38.35	59.00	192.93	70.80	261.96	994.16	14.75	76.11	65.49	39.53	82.01	44.25	0.00	**1939.36**	9.44	0.00	138.65	2.36	111.51	0.59	0.00	2.36	4.13	18.29	17.70	**305.03**	**2244.39**

Assumption: (1) Growth Rate of 15% from 2005-06 to 2007-08 (2) Growth rate of 11% from 2008-09 to 2021-22

Annexure IV-9

Future Growth Pattern of Despatches from Mundra

No. of TEUs Despatched From Mundra Port

Year	Container Carried by Rail (TEUs in thousand)	TKD	DDL	Dadri	Sabarmati	Jaipur	Others	Rewari	BKGT	CNB	Moradabad	Agra	Total
2004-05	80.91	28.23	6.94	0.82	1.61	1.77	0.20	0.20	0.32	0.06	0.26	0.05	40.46
2005-06	93.05	32.46	7.98	0.94	1.85	2.04	0.23	0.23	0.37	0.07	0.30	0.06	46.52
2006-07	107.00	37.33	9.18	1.08	2.12	2.34	0.26	0.27	0.42	0.08	0.34	0.07	53.50
2007-08	123.05	42.93	10.56	1.24	2.44	2.69	0.30	0.31	0.48	0.10	0.39	0.08	61.53
2008-09	136.59	47.65	11.72	1.38	2.71	2.99	0.33	0.34	0.54	0.11	0.43	0.09	68.29
2009-10	151.61	52.89	13.01	1.53	3.01	3.32	0.37	0.38	0.60	0.12	0.48	0.10	75.81
2010-11	168.29	58.71	14.44	1.70	3.34	3.68	0.41	0.42	0.66	0.13	0.54	0.11	84.15
2011-12	183.44	64.00	15.74	1.85	3.64	4.02	0.44	0.46	0.72	0.14	0.58	0.12	91.72
2012-13	199.95	69.76	17.16	2.02	3.97	4.38	0.48	0.50	0.79	0.16	0.64	0.14	99.97
2013-14	217.94	76.03	18.70	2.20	4.32	4.77	0.53	0.54	0.86	0.17	0.69	0.15	108.97
2014-15	237.56	82.88	20.39	2.40	4.71	5.20	0.57	0.59	0.93	0.19	0.76	0.16	118.78
2015-16	258.94	90.33	22.22	2.61	5.14	5.67	0.63	0.64	1.02	0.20	0.82	0.18	129.47
2016-17	282.24	98.47	24.22	2.85	5.60	6.18	0.68	0.70	1.11	0.22	0.90	0.19	141.12
2017-18	307.65	107.33	26.40	3.11	6.10	6.74	0.74	0.76	1.21	0.24	0.98	0.21	153.82
2018-19	335.33	116.99	28.78	3.39	6.65	7.34	0.81	0.83	1.32	0.26	1.07	0.23	167.67
2019-20	365.51	127.52	31.37	3.69	7.25	8.00	0.88	0.91	1.44	0.29	1.16	0.25	182.76
2020-21	398.41	138.99	34.19	4.02	7.91	8.72	0.96	0.99	1.57	0.31	1.27	0.27	199.20
2021-22	434.27	151.50	37.27	4.39	8.62	9.51	1.05	1.08	1.71	0.34	1.38	0.29	217.13
No. of Trains Despatched from Mundra Port per day (80 TEUs per train)													
2004-05		0.97	0.24	0.03	0.05	0.06	0.01	0.01	0.01	0.00	0.01	0.00	1.39
2005-06		1.11	0.27	0.03	0.06	0.07	0.01	0.01	0.01	0.00	0.01	0.00	1.59
2006-07		1.28	0.31	0.04	0.07	0.08	0.01	0.01	0.01	0.00	0.01	0.00	1.83
2007-08		1.47	0.36	0.04	0.08	0.09	0.01	0.01	0.02	0.00	0.01	0.00	2.11
2008-09		1.63	0.40	0.05	0.09	0.10	0.01	0.01	0.02	0.00	0.01	0.00	2.34
2009-10		1.81	0.45	0.05	0.10	0.11	0.01	0.01	0.02	0.00	0.02	0.00	2.60
2010-11		2.01	0.49	0.06	0.11	0.13	0.01	0.01	0.02	0.00	0.02	0.00	2.88
2011-12		2.19	0.54	0.06	0.12	0.14	0.02	0.02	0.02	0.00	0.02	0.00	3.14
2012-13		2.39	0.59	0.07	0.14	0.15	0.02	0.02	0.03	0.01	0.02	0.00	3.42
2013-14		2.60	0.64	0.08	0.15	0.16	0.02	0.02	0.03	0.01	0.02	0.01	3.73
2014-15		2.84	0.70	0.08	0.16	0.18	0.02	0.02	0.03	0.01	0.03	0.01	4.07
2015-16		3.09	0.76	0.09	0.18	0.19	0.02	0.02	0.03	0.01	0.03	0.01	4.43
2016-17		3.37	0.83	0.10	0.19	0.21	0.02	0.02	0.04	0.01	0.03	0.01	4.83
2017-18		3.68	0.90	0.11	0.21	0.23	0.03	0.03	0.04	0.01	0.03	0.01	5.27
2018-19		4.01	0.99	0.12	0.23	0.25	0.03	0.03	0.05	0.01	0.04	0.01	5.74
2019-20		4.37	1.07	0.13	0.25	0.27	0.03	0.03	0.05	0.01	0.04	0.01	6.26
2020-21		4.76	1.17	0.14	0.27	0.30	0.03	0.03	0.05	0.01	0.04	0.01	6.82

2021-22		5.19	1.28	0.15	0.30	0.33	0.04	0.04	0.06	0.01	0.05	0.01	7.44
No. of Trains Despatched from Mundra Port per day (90 TEUs per train)													
2004-05		0.86	0.21	0.02	0.05	0.05	0.01	0.01	0.01	0.00	0.01	0.00	1.23
2005-06		0.99	0.24	0.03	0.06	0.06	0.01	0.01	0.01	0.00	0.01	0.00	1.42
2006-07		1.14	0.28	0.03	0.06	0.07	0.01	0.01	0.01	0.00	0.01	0.00	1.63
2007-08		1.31	0.32	0.04	0.07	0.08	0.01	0.01	0.01	0.00	0.01	0.00	1.87
2008-09		1.45	0.36	0.04	0.08	0.09	0.01	0.01	0.02	0.00	0.01	0.00	2.08
2009-10		1.61	0.40	0.05	0.09	0.10	0.01	0.01	0.02	0.00	0.01	0.00	2.31
2010-11		1.79	0.44	0.05	0.10	0.11	0.01	0.01	0.02	0.00	0.02	0.00	2.56
2011-12		1.95	0.48	0.06	0.11	0.12	0.01	0.01	0.02	0.00	0.02	0.00	2.79
2012-13		2.12	0.52	0.06	0.12	0.13	0.01	0.02	0.02	0.00	0.02	0.00	3.04
2013-14		2.31	0.57	0.07	0.13	0.15	0.02	0.02	0.03	0.01	0.02	0.00	3.32
2014-15		2.52	0.62	0.07	0.14	0.16	0.02	0.02	0.03	0.01	0.02	0.00	3.62
2015-16		2.75	0.68	0.08	0.16	0.17	0.02	0.02	0.03	0.01	0.03	0.01	3.94
2016-17		3.00	0.74	0.09	0.17	0.19	0.02	0.02	0.03	0.01	0.03	0.01	4.30
2017-18		3.27	0.80	0.09	0.19	0.21	0.02	0.02	0.04	0.01	0.03	0.01	4.68
2018-19		3.56	0.88	0.10	0.20	0.22	0.02	0.03	0.04	0.01	0.03	0.01	5.10
2019-20		3.88	0.95	0.11	0.22	0.24	0.03	0.03	0.04	0.01	0.04	0.01	5.56
2020-21		4.23	1.04	0.12	0.24	0.27	0.03	0.03	0.05	0.01	0.04	0.01	6.06
2021-22		4.61	1.13	0.13	0.26	0.29	0.03	0.03	0.05	0.01	0.04	0.01	6.61

Assumption

TEUs Growth Rate	2005-06 to 2007-08	15% p.a.	2008-09 to 2010-11	11% p.a.	2011-12 to2021-22	9% p.a.

Annexure IV-10

Future Growth Pattern of Despatches from Pipavav

No. of TEUs Despatched From Pipavav Port													
Year	Container Carried by Rail (TEUs in 000)	TKD	DDL	Dadri	Sabarmati	Jaipur	Others	Rewari	BKGT	CNB	Moradabad	Agra	Total
2004-05	47.71	12.28	6.81	1.39	1.51	1.17	0.00	0.00	0.50	0.01	0.16	0.01	23.86
2005-06	54.87	14.12	7.84	1.60	1.73	1.35	0.01	0.00	0.58	0.01	0.19	0.01	27.43
2006-07	63.10	16.24	9.01	1.84	1.99	1.55	0.01	0.00	0.66	0.01	0.22	0.01	31.55
2007-08	72.56	18.67	10.36	2.11	2.29	1.79	0.01	0.00	0.76	0.02	0.25	0.01	36.28
2008-09	80.54	20.73	11.50	2.35	2.54	1.98	0.01	0.00	0.85	0.02	0.28	0.02	40.27
2009-10	89.40	23.01	12.77	2.60	2.82	2.20	0.01	0.00	0.94	0.02	0.31	0.02	44.70
2010-11	99.24	25.54	14.17	2.89	3.14	2.44	0.01	0.00	1.04	0.02	0.34	0.02	49.62
2011-12	108.17	27.84	15.45	3.15	3.42	2.66	0.01	0.00	1.14	0.02	0.37	0.02	54.08
2012-13	117.90	30.34	16.84	3.43	3.73	2.90	0.01	0.00	1.24	0.03	0.41	0.02	58.95
2013-14	128.51	33.08	18.35	3.74	4.06	3.16	0.01	0.00	1.35	0.03	0.44	0.03	64.26
2014-15	140.08	36.05	20.01	4.08	4.43	3.45	0.01	0.00	1.47	0.03	0.48	0.03	70.04
2015-16	152.69	39.30	21.81	4.45	4.82	3.76	0.01	0.00	1.60	0.04	0.53	0.03	76.34
2016-17	166.43	42.83	23.77	4.85	5.26	4.10	0.02	0.00	1.75	0.04	0.57	0.03	83.21
2017-18	181.41	46.69	25.91	5.28	5.73	4.47	0.02	0.00	1.91	0.04	0.62	0.04	90.70
2018-19	197.74	50.89	28.24	5.76	6.25	4.87	0.02	0.00	2.08	0.05	0.68	0.04	98.87
2019-20	215.53	55.47	30.78	6.28	6.81	5.31	0.02	0.00	2.26	0.05	0.74	0.04	107.77
2020-21	234.93	60.46	33.55	6.84	7.42	5.78	0.02	0.00	2.47	0.05	0.81	0.05	117.46
2021-22	256.07	65.90	36.57	7.46	8.09	6.30	0.02	0.00	2.69	0.06	0.88	0.05	128.04
No. of Trains Despatched from Pipavav Ports per day (80 TEUs per train)													
2004-05		0.42	0.23	0.05	0.05	0.04	0.00	0.00	0.02	0.00	0.01	0.00	0.82
2005-06		0.48	0.27	0.05	0.06	0.05	0.00	0.00	0.02	0.00	0.01	0.00	0.94
2006-07		0.56	0.31	0.06	0.07	0.05	0.00	0.00	0.02	0.00	0.01	0.00	1.08
2007-08		0.64	0.35	0.07	0.08	0.06	0.00	0.00	0.03	0.00	0.01	0.00	1.24
2008-09		0.71	0.39	0.08	0.09	0.07	0.00	0.00	0.03	0.00	0.01	0.00	1.38
2009-10		0.79	0.44	0.09	0.10	0.08	0.00	0.00	0.03	0.00	0.01	0.00	1.53
2010-11		0.87	0.49	0.10	0.11	0.08	0.00	0.00	0.04	0.00	0.01	0.00	1.70
2011-12		0.95	0.53	0.11	0.12	0.09	0.00	0.00	0.04	0.00	0.01	0.00	1.85
2012-13		1.04	0.58	0.12	0.13	0.10	0.00	0.00	0.04	0.00	0.01	0.00	2.02
2013-14		1.13	0.63	0.13	0.14	0.11	0.00	0.00	0.05	0.00	0.02	0.00	2.20
2014-15		1.23	0.69	0.14	0.15	0.12	0.00	0.00	0.05	0.00	0.02	0.00	2.40
2015-16		1.35	0.75	0.15	0.17	0.13	0.00	0.00	0.05	0.00	0.02	0.00	2.61
2016-17		1.47	0.81	0.17	0.18	0.14	0.00	0.00	0.06	0.00	0.02	0.00	2.85
2017-18		1.60	0.89	0.18	0.20	0.15	0.00	0.00	0.07	0.00	0.02	0.00	3.11
2018-19		1.74	0.97	0.20	0.21	0.17	0.00	0.00	0.07	0.00	0.02	0.00	3.39
2019-20		1.90	1.05	0.22	0.23	0.18	0.00	0.00	0.08	0.00	0.03	0.00	3.69
2020-21		2.07	1.15	0.23	0.25	0.20	0.00	0.00	0.08	0.00	0.03	0.00	4.02
2021-22		2.26	1.25	0.26	0.28	0.22	0.00	0.00	0.09	0.00	0.03	0.00	4.38

No. of Trains Despatched from Pipavav Ports per day (90 TEUs per train)													
2004-05		0.37	0.21	0.04	0.05	0.04	0.00	0.00	0.02	0.00	0.00	0.00	0.73
2005-06		0.43	0.24	0.05	0.05	0.04	0.00	0.00	0.02	0.00	0.01	0.00	0.84
2006-07		0.49	0.27	0.06	0.06	0.05	0.00	0.00	0.02	0.00	0.01	0.00	0.96
2007-08		0.57	0.32	0.06	0.07	0.05	0.00	0.00	0.02	0.00	0.01	0.00	1.10
2008-09		0.63	0.35	0.07	0.08	0.06	0.00	0.00	0.03	0.00	0.01	0.00	1.23
2009-10		0.70	0.39	0.08	0.09	0.07	0.00	0.00	0.03	0.00	0.01	0.00	1.36
2010-11		0.78	0.43	0.09	0.10	0.07	0.00	0.00	0.03	0.00	0.01	0.00	1.51
2011-12		0.85	0.47	0.10	0.10	0.08	0.00	0.00	0.03	0.00	0.01	0.00	1.65
2012-13		0.92	0.51	0.10	0.11	0.09	0.00	0.00	0.04	0.00	0.01	0.00	1.79
2013-14		1.01	0.56	0.11	0.12	0.10	0.00	0.00	0.04	0.00	0.01	0.00	1.96
2014-15		1.10	0.61	0.12	0.13	0.10	0.00	0.00	0.04	0.00	0.01	0.00	2.13
2015-16		1.20	0.66	0.14	0.15	0.11	0.00	0.00	0.05	0.00	0.02	0.00	2.32
2016-17		1.30	0.72	0.15	0.16	0.12	0.00	0.00	0.05	0.00	0.02	0.00	2.53
2017-18		1.42	0.79	0.16	0.17	0.14	0.00	0.00	0.06	0.00	0.02	0.00	2.76
2018-19		1.55	0.86	0.18	0.19	0.15	0.00	0.00	0.06	0.00	0.02	0.00	3.01
2019-20		1.69	0.94	0.19	0.21	0.16	0.00	0.00	0.07	0.00	0.02	0.00	3.28
2020-21		1.84	1.02	0.21	0.23	0.18	0.00	0.00	0.08	0.00	0.02	0.00	3.58
2021-22		2.01	1.11	0.23	0.25	0.19	0.00	0.00	0.08	0.00	0.03	0.00	3.90

Assumption TEUs Growth Rate

2005-06 to 2007-08 15% p.a. 2008-09 to 2010-11 11% p.a. 2011-12 to2021-22 9% p.a.

Annexure IV-11.1

Future Growth Pattern of Despaches from JNPT

Number of TEUs (in thousand) despatched from JNPT/NSCIT per year

	Dronagiri	New Mulund	Chinch wad	Local	Bhusawal	Nagpur	Vizag	Sanat nagar	Central Railways	UPTO BRC	BRC	Bhaght ki Kothi	Kanak pura	Rewari	Sabarmati	Via BRC towads SBI	Via SBI	AGC	BVH	Dadri	GWL	CNB	DDL	Moradabad	Ratlam	TKD	Via BRC towards North	Total
2003-04	0.34	21.99	4.38	26.71	1.24	24.97	0.07	10.59	36.86	298.34	3.06	2.29	3.68	0.80	20.11	26.88	6.77	0.34	5.17	24.57	1.27	4.23	50.43	8.62	5.59	168.19	268.40	361.92
2004-05	0.40	25.71	5.12	31.24	1.45	29.20	0.08	12.38	43.11	348.89	3.58	2.68	4.30	0.94	23.51	31.43	7.92	0.39	6.05	28.73	1.49	4.94	58.97	10.08	6.54	196.69	313.88	423.25
2005-06	0.44	28.09	5.60	34.13	1.58	31.90	0.09	13.53	47.09	381.13	3.91	2.92	4.70	1.03	25.68	34.34	8.65	0.43	6.61	31.39	1.63	5.40	64.42	11.02	7.14	214.86	342.88	462.35
2006-07	0.51	32.64	6.51	39.66	1.84	37.07	0.10	15.72	54.73	442.90	4.55	3.40	5.46	1.19	29.85	39.90	10.05	0.50	7.68	36.47	1.89	6.27	74.86	12.80	8.30	249.68	398.45	537.28
2007-08	0.57	36.68	7.31	44.57	2.07	41.65	0.12	17.66	61.50	497.72	5.11	3.82	6.14	1.34	33.54	44.84	11.30	0.56	8.63	40.99	2.12	7.05	84.13	14.39	9.32	280.58	447.77	603.79
2008-09	0.66	42.37	8.44	51.47	2.39	48.11	0.14	20.40	71.03	574.85	5.90	4.41	7.09	1.55	38.74	51.79	13.05	0.65	9.96	47.34	2.45	8.14	97.16	16.62	10.77	324.06	517.16	697.35
2009-10	0.74	47.38	9.44	57.57	2.67	53.81	0.15	22.82	79.44	642.93	6.60	4.93	7.93	1.73	43.33	57.92	14.59	0.72	11.14	52.95	2.74	9.11	108.67	18.58	12.04	362.45	578.41	779.95
2010-11	0.84	53.73	10.71	65.27	3.03	61.01	0.17	25.87	90.07	728.97	7.48	5.59	8.99	1.97	49.13	65.67	16.55	0.82	12.63	60.03	3.11	10.33	123.22	21.07	13.66	410.95	655.82	884.32
2011-12	0.91	58.31	11.62	70.85	3.28	66.22	0.19	28.08	97.77	791.23	8.12	6.07	9.76	2.13	53.32	71.28	17.96	0.89	13.71	65.16	3.38	11.21	133.74	22.87	14.82	446.05	711.83	959.84
2012-13	0.99	63.22	12.60	76.81	3.56	71.79	0.20	30.44	106.00	857.85	8.80	6.58	10.58	2.31	57.81	77.28	19.47	0.97	14.87	70.65	3.66	12.15	145.00	24.80	16.07	483.60	771.76	1040.66
2013-14	1.07	68.48	13.65	83.19	3.86	77.76	0.22	32.97	114.81	929.12	9.54	7.13	11.46	2.51	62.61	83.71	21.09	1.05	16.10	76.52	3.97	13.16	157.05	26.86	17.41	523.78	835.88	1127.12
2014-15	1.16	74.10	14.77	90.02	4.17	84.14	0.24	35.68	124.23	1005.39	10.32	7.71	12.40	2.71	67.75	90.58	22.82	1.13	17.43	82.80	4.29	14.24	169.94	29.06	18.83	566.78	904.50	1219.64
2015-16	1.25	80.11	15.97	97.33	4.51	90.97	0.26	38.58	134.31	1087.00	11.16	8.34	13.40	2.93	73.25	97.93	24.67	1.22	18.84	89.52	4.64	15.40	183.73	31.42	20.36	612.78	977.91	1318.64
2016-17	1.35	86.55	17.25	105.15	4.87	98.28	0.28	41.68	145.10	1174.32	12.05	9.01	14.48	3.17	79.14	105.79	26.66	1.32	20.35	96.71	5.01	16.63	198.49	33.94	22.00	662.01	1056.47	1424.57
2017-18	1.46	93.43	18.62	113.51	5.26	106.10	0.30	44.99	156.65	1267.75	13.01	9.73	15.63	3.42	85.43	114.21	28.78	1.43	21.97	104.40	5.41	17.96	214.28	36.64	23.75	714.68	1140.53	1537.91
2018-19	1.58	100.80	20.09	122.47	5.68	114.46	0.32	48.54	169.00	1367.72	14.04	10.49	16.87	3.69	92.17	123.22	31.05	1.54	23.71	112.64	5.84	19.37	231.18	39.53	25.62	771.04	1230.47	1659.19
2019-20	1.70	108.69	21.66	132.04	6.12	123.42	0.35	52.34	182.22	1474.69	15.13	11.31	18.19	3.98	99.38	132.86	33.47	1.66	25.56	121.45	6.29	20.89	249.26	42.62	27.63	831.34	1326.70	1788.95
2020-21	1.83	117.12	23.34	142.29	6.59	132.99	0.37	56.40	196.36	1589.15	16.31	12.19	19.60	4.29	107.09	143.17	36.07	1.79	27.54	130.87	6.78	22.51	268.61	45.93	29.77	895.86	1429.67	1927.80
2021-22	1.97	126.15	25.14	153.26	7.10	143.24	0.40	60.74	211.49	1711.62	17.57	13.13	21.11	4.62	115.35	154.20	38.85	1.93	29.67	140.96	7.30	24.24	289.31	49.47	32.06	964.91	1539.85	2076.37
No of Trains despatched from JNPT/NSCIT per day (80 TEUs)																												
2003-04	0.01	0.75	0.15	0.91	0.04	0.86	0.00	0.36	1.26	10.22	0.10	0.08	0.13	0.03	0.69	0.92	0.23	0.01	0.18	0.84	0.04	0.14	1.73	0.30	0.19	5.76	9.19	12.39
2004-05	0.01	0.88	0.18	1.07	0.05	1.00	0.00	0.42	1.48	11.95	0.12	0.09	0.15	0.03	0.81	1.08	0.27	0.01	0.21	0.98	0.05	0.17	2.02	0.35	0.22	6.74	10.75	14.49
2005-06	0.02	0.96	0.19	1.17	0.05	1.09	0.00	0.46	1.61	13.05	0.13	0.10	0.16	0.04	0.88	1.18	0.30	0.01	0.23	1.07	0.06	0.18	2.21	0.38	0.24	7.36	11.74	15.83
2006-07	0.02	1.12	0.22	1.36	0.06	1.27	0.00	0.54	1.87	15.17	0.16	0.12	0.19	0.04	1.02	1.37	0.34	0.02	0.26	1.25	0.06	0.21	2.56	0.44	0.28	8.55	13.65	18.40
2007-08	0.02	1.26	0.25	1.53	0.07	1.43	0.00	0.60	2.11	17.05	0.17	0.13	0.21	0.05	1.15	1.54	0.39	0.02	0.30	1.40	0.07	0.24	2.88	0.49	0.32	9.61	15.33	20.68
2008-09	0.02	1.45	0.29	1.76	0.08	1.65	0.00	0.70	2.43	19.69	0.20	0.15	0.24	0.05	1.33	1.77	0.45	0.02	0.34	1.62	0.08	0.28	3.33	0.57	0.37	11.10	17.71	23.88
2009-10	0.03	1.62	0.32	1.97	0.09	1.84	0.01	0.78	2.72	22.02	0.23	0.17	0.27	0.06	1.48	1.98	0.50	0.02	0.38	1.81	0.09	0.31	3.72	0.64	0.41	12.41	19.81	26.71
2010-11	0.03	1.84	0.37	2.24	0.10	2.09	0.01	0.89	3.08	24.96	0.26	0.19	0.31	0.07	1.68	2.25	0.57	0.03	0.43	2.06	0.11	0.35	4.22	0.72	0.47	14.07	22.46	30.28
2011-12	0.03	2.00	0.40	2.43	0.11	2.27	0.01	0.96	3.35	27.10	0.28	0.21	0.33	0.07	1.83	2.44	0.62	0.03	0.47	2.23	0.12	0.38	4.58	0.78	0.51	15.28	24.38	32.87
2012-13	0.03	2.17	0.43	2.63	0.12	2.46	0.01	1.04	3.63	29.38	0.30	0.23	0.36	0.08	1.98	2.65	0.67	0.03	0.51	2.42	0.13	0.42	4.97	0.85	0.55	16.56	26.43	35.64
2013-14	0.04	2.35	0.47	2.85	0.13	2.66	0.01	1.13	3.93	31.82	0.33	0.24	0.39	0.09	2.14	2.87	0.72	0.04	0.55	2.62	0.14	0.45	5.38	0.92	0.60	17.94	28.63	38.60
2014-15	0.04	2.54	0.51	3.08	0.14	2.88	0.01	1.22	4.25	34.43	0.35	0.26	0.42	0.09	2.32	3.10	0.78	0.04	0.60	2.84	0.15	0.49	5.82	1.00	0.64	19.41	30.98	41.77
2015-16	0.04	2.74	0.55	3.33	0.15	3.12	0.01	1.32	4.60	37.23	0.38	0.29	0.46	0.10	2.51	3.35	0.85	0.04	0.65	3.07	0.16	0.53	6.29	1.08	0.70	20.99	33.49	45.16
2016-17	0.05	2.96	0.59	3.60	0.17	3.37	0.01	1.43	4.97	40.22	0.41	0.31	0.50	0.11	2.71	3.62	0.91	0.05	0.70	3.31	0.17	0.57	6.80	1.16	0.75	22.67	36.18	48.79
2017-18	0.05	3.20	0.64	3.89	0.18	3.63	0.01	1.54	5.36	43.42	0.45	0.33	0.54	0.12	2.93	3.91	0.99	0.05	0.75	3.58	0.19	0.61	7.34	1.25	0.81	24.48	39.06	52.67
2018-19	0.05	3.45	0.69	4.19	0.19	3.92	0.01	1.66	5.79	46.84	0.48	0.36	0.58	0.13	3.16	4.22	1.06	0.05	0.81	3.86	0.20	0.66	7.92	1.35	0.88	26.41	42.14	56.82
2019-20	0.06	3.72	0.74	4.52	0.21	4.23	0.01	1.79	6.24	50.50	0.52	0.39	0.62	0.14	3.40	4.55	1.15	0.06	0.88	4.16	0.22	0.72	8.54	1.46	0.95	28.47	45.43	61.27
2020-21	0.06	4.01	0.80	4.87	0.23	4.55	0.01	1.93	6.72	54.42	0.56	0.42	0.67	0.15	3.67	4.90	1.24	0.06	0.94	4.48	0.23	0.77	9.20	1.57	1.02	30.68	48.96	66.02
2021-22	0.07	4.32	0.86	5.25	0.24	4.91	0.01	2.08	7.24	58.62	0.60	0.45	0.72	0.16	3.95	5.28	1.33	0.07	1.02	4.83	0.25	0.83	9.91	1.69	1.10	33.04	52.73	71.11

Assumption: (1) Growth Rate of 15% from 2005-06 to 2007-08 (2) Growth rate of 11% from 2008-09 to 2010-11 (3) Growth rate of 9% from 2011-12 to 2021-22

Annexure IV-11.2

Future Growth Pattern of Despaches from JNPT

Number of TEUs (in thousand) despatched from JNPT/NSCIT per year

	Dronagiri	New Mulund	Chinchwad	Local	Bhusawal	Nagpur	Vizag	Sanatnagar	Central Railways	UPTO BRC	BRC	Bhaght ki Kothi	Kanakpura	Rewari	Sabarmati	Via BRC towads SBI	Via SBI	AGC	BVH	Dadri	GWL	CNB	DDL	Moradabad	Ratlam	TKD	Via BRC towards North	Total
2003-04	0.34	21.99	4.38	26.71	1.24	24.97	0.07	10.59	36.86	298.34	3.06	2.29	3.68	0.80	20.11	26.88	6.77	0.34	5.17	24.57	1.27	4.23	50.43	8.62	5.59	168.19	268.40	361.92
2004-05	0.40	25.71	5.12	31.24	1.45	29.20	0.08	12.38	43.11	348.89	3.58	2.68	4.30	0.94	23.51	31.43	7.92	0.39	6.05	28.73	1.49	4.94	58.97	10.08	6.54	196.69	313.88	423.25
2005-06	0.44	28.09	5.60	34.13	1.58	31.90	0.09	13.53	47.09	381.13	3.91	2.92	4.70	1.03	25.68	34.34	8.65	0.43	6.61	31.39	1.63	5.40	64.42	11.02	7.14	214.86	342.88	462.35
2006-07	0.51	32.64	6.51	39.66	1.84	37.07	0.10	15.72	54.73	442.90	4.55	3.40	5.46	1.19	29.85	39.90	10.05	0.50	7.68	36.47	1.89	6.27	74.86	12.80	8.30	249.68	398.45	537.28
2007-08	0.57	36.68	7.31	44.57	2.07	41.65	0.12	17.66	61.50	497.72	5.11	3.82	6.14	1.34	33.54	44.84	11.30	0.56	8.63	40.99	2.12	7.05	84.13	14.39	9.32	280.58	447.77	603.79
2008-09	0.66	42.37	8.44	51.47	2.39	48.11	0.14	20.40	71.03	574.85	5.90	4.41	7.09	1.55	38.74	51.79	13.05	0.65	9.96	47.34	2.45	8.14	97.16	16.62	10.77	324.06	517.16	697.35
2009-10	0.74	47.38	9.44	57.57	2.67	53.81	0.15	22.82	79.44	642.93	6.60	4.93	7.93	1.73	43.33	57.92	14.59	0.72	11.14	52.95	2.74	9.11	108.67	18.58	12.04	362.45	578.41	779.95
2010-11	0.84	53.73	10.71	65.27	3.03	61.01	0.17	25.87	90.07	728.97	7.48	5.59	8.99	1.97	49.13	65.67	16.55	0.82	12.63	60.03	3.11	10.33	123.22	21.07	13.66	410.95	655.82	884.32
2011-12	0.91	58.31	11.62	70.85	3.28	66.22	0.19	28.08	97.77	791.23	8.12	6.07	9.76	2.13	53.32	71.28	17.96	0.89	13.71	65.16	3.38	11.21	133.74	22.87	14.82	446.05	711.83	959.84
2012-13	0.99	63.22	12.60	76.81	3.56	71.79	0.20	30.44	106.00	857.85	8.80	6.58	10.58	2.31	57.81	77.28	19.47	0.97	14.87	70.65	3.66	12.15	145.00	24.80	16.07	483.60	771.76	1040.66
2013-14	1.07	68.48	13.65	83.19	3.86	77.76	0.22	32.97	114.81	929.12	9.54	7.13	11.46	2.51	62.61	83.71	21.09	1.05	16.10	76.52	3.97	13.16	157.05	26.86	17.41	523.78	835.88	1127.12
2014-15	1.16	74.10	14.77	90.02	4.17	84.14	0.24	35.68	124.23	1005.39	10.32	7.71	12.40	2.71	67.75	90.58	22.82	1.13	17.43	82.80	4.29	14.24	169.94	29.06	18.83	566.78	904.50	1219.64
2015-16	1.25	80.11	15.97	97.33	4.51	90.97	0.26	38.58	134.31	1087.00	11.16	8.34	13.40	2.93	73.25	97.93	24.67	1.22	18.84	89.52	4.64	15.40	183.73	31.42	20.36	612.78	977.91	1318.64
2016-17	1.35	86.55	17.25	105.15	4.87	98.28	0.28	41.68	145.10	1174.32	12.05	9.01	14.48	3.17	79.14	105.79	26.66	1.32	20.35	96.71	5.01	16.63	198.49	33.94	22.00	662.01	1056.47	1424.57
2017-18	1.46	93.43	18.62	113.51	5.26	106.10	0.30	44.99	156.65	1267.75	13.01	9.73	15.63	3.42	85.43	114.21	28.78	1.43	21.97	104.40	5.41	17.96	214.28	36.64	23.75	714.68	1140.53	1537.91
2018-19	1.58	100.80	20.09	122.47	5.68	114.46	0.32	48.54	169.00	1367.72	14.04	10.49	16.87	3.69	92.17	123.22	31.05	1.54	23.71	112.64	5.84	19.37	231.18	39.53	25.62	771.04	1230.47	1659.19
2019-20	1.70	108.69	21.66	132.04	6.12	123.42	0.35	52.34	182.22	1474.69	15.13	11.31	18.19	3.98	99.38	132.86	33.47	1.66	25.56	121.45	6.29	20.89	249.26	42.62	27.63	831.34	1326.70	1788.95
2020-21	1.83	117.12	23.34	142.29	6.59	132.99	0.37	56.40	196.36	1589.15	16.31	12.19	19.60	4.29	107.09	143.17	36.07	1.79	27.54	130.87	6.78	22.51	268.61	45.93	29.77	895.86	1429.67	1927.80
2021-22	1.97	126.15	25.14	153.26	7.10	143.24	0.40	60.74	211.49	1711.62	17.57	13.13	21.11	4.62	115.35	154.20	38.85	1.93	29.67	140.96	7.30	24.24	289.31	49.47	32.06	964.91	1539.85	2076.37
No of Trains despatched from JNPT/NSCIT per day (90 TEUs)																												
2003-04	0.01	0.67	0.13	0.81	0.04	0.76	0.00	0.32	1.12	9.08	0.09	0.07	0.11	0.02	0.61	0.82	0.21	0.01	0.16	0.75	0.04	0.13	1.54	0.26	0.17	5.12	8.17	11.02
2004-05	0.01	0.78	0.16	0.95	0.04	0.89	0.00	0.38	1.31	10.62	0.11	0.08	0.13	0.03	0.72	0.96	0.24	0.01	0.18	0.87	0.05	0.15	1.80	0.31	0.20	5.99	9.56	12.88
2005-06	0.01	0.86	0.17	1.04	0.05	0.97	0.00	0.41	1.43	11.60	0.12	0.09	0.14	0.03	0.78	1.05	0.26	0.01	0.20	0.96	0.05	0.16	1.96	0.34	0.22	6.54	10.44	14.07
2006-07	0.02	0.99	0.20	1.21	0.06	1.13	0.00	0.48	1.67	13.48	0.14	0.10	0.17	0.04	0.91	1.21	0.31	0.02	0.23	1.11	0.06	0.19	2.28	0.39	0.25	7.60	12.13	16.36
2007-08	0.02	1.12	0.22	1.36	0.06	1.27	0.00	0.54	1.87	15.15	0.16	0.12	0.19	0.04	1.02	1.36	0.34	0.02	0.26	1.25	0.06	0.21	2.56	0.44	0.28	8.54	13.63	18.38
2008-09	0.02	1.29	0.26	1.57	0.07	1.46	0.00	0.62	2.16	17.50	0.18	0.13	0.22	0.05	1.18	1.58	0.40	0.02	0.30	1.44	0.07	0.25	2.96	0.51	0.33	9.86	15.74	21.23
2009-10	0.02	1.44	0.29	1.75	0.08	1.64	0.00	0.69	2.42	19.57	0.20	0.15	0.24	0.05	1.32	1.76	0.44	0.02	0.34	1.61	0.08	0.28	3.31	0.57	0.37	11.03	17.61	23.74
2010-11	0.03	1.64	0.33	1.99	0.09	1.86	0.01	0.79	2.74	22.19	0.23	0.17	0.27	0.06	1.50	2.00	0.50	0.02	0.38	1.83	0.09	0.31	3.75	0.64	0.42	12.51	19.96	26.92
2011-12	0.03	1.78	0.35	2.16	0.10	2.02	0.01	0.85	2.98	24.09	0.25	0.18	0.30	0.06	1.62	2.17	0.55	0.03	0.42	1.98	0.10	0.34	4.07	0.70	0.45	13.58	21.67	29.22
2012-13	0.03	1.92	0.38	2.34	0.11	2.19	0.01	0.93	3.23	26.11	0.27	0.20	0.32	0.07	1.76	2.35	0.59	0.03	0.45	2.15	0.11	0.37	4.41	0.75	0.49	14.72	23.49	31.68
2013-14	0.03	2.08	0.42	2.53	0.12	2.37	0.01	1.00	3.49	28.28	0.29	0.22	0.35	0.08	1.91	2.55	0.64	0.03	0.49	2.33	0.12	0.40	4.78	0.82	0.53	15.94	25.45	34.31
2014-15	0.04	2.26	0.45	2.74	0.13	2.56	0.01	1.09	3.78	30.61	0.31	0.23	0.38	0.08	2.06	2.76	0.69	0.03	0.53	2.52	0.13	0.43	5.17	0.88	0.57	17.25	27.53	37.13
2015-16	0.04	2.44	0.49	2.96	0.14	2.77	0.01	1.17	4.09	33.09	0.34	0.25	0.41	0.09	2.23	2.98	0.75	0.04	0.57	2.73	0.14	0.47	5.59	0.96	0.62	18.65	29.77	40.14
2016-17	0.04	2.63	0.53	3.20	0.15	2.99	0.01	1.27	4.42	35.75	0.37	0.27	0.44	0.10	2.41	3.22	0.81	0.04	0.62	2.94	0.15	0.51	6.04	1.03	0.67	20.15	32.16	43.37
2017-18	0.04	2.84	0.57	3.46	0.16	3.23	0.01	1.37	4.77	38.59	0.40	0.30	0.48	0.10	2.60	3.48	0.88	0.04	0.67	3.18	0.16	0.55	6.52	1.12	0.72	21.76	34.72	46.82
2018-19	0.05	3.07	0.61	3.73	0.17	3.48	0.01	1.48	5.14	41.64	0.43	0.32	0.51	0.11	2.81	3.75	0.95	0.05	0.72	3.43	0.18	0.59	7.04	1.20	0.78	23.47	37.46	50.51
2019-20	0.05	3.31	0.66	4.02	0.19	3.76	0.01	1.59	5.55	44.89	0.46	0.34	0.55	0.12	3.03	4.04	1.02	0.05	0.78	3.70	0.19	0.64	7.59	1.30	0.84	25.31	40.39	54.46
2020-21	0.06	3.57	0.71	4.33	0.20	4.05	0.01	1.72	5.98	48.38	0.50	0.37	0.60	0.13	3.26	4.36	1.10	0.05	0.84	3.98	0.21	0.69	8.18	1.40	0.91	27.27	43.52	58.68
2021-22	0.06	3.84	0.77	4.67	0.22	4.36	0.01	1.85	6.44	52.10	0.53	0.40	0.64	0.14	3.51	4.69	1.18	0.06	0.90	4.29	0.22	0.74	8.81	1.51	0.98	29.37	46.88	63.21

Assumption: (1) Growth Rate of 15% from 2005-06 to 2007-08 (2) Growth rate of 11% from 2008-09 to 2010-11 (3) Growth rate of 9% from 2011-12 to 2021-22

Annexure IV-11.3

Future Growth Pattern of Receipt at JNPT/NSCIT
No of Trains received at JNPT/NSCIT per day (90 TEUs per train)

	BRC	CPC	DDL	MB	SBI	TKD	AGC	BGKT	KKU	RTM	DER	BVH	CED	**Total via WR**	CCH	TNPM	NGP	NGSM	SNF	AWB	DER	BGM	KNW	MLAR	EMPTY	**Total CR**	**Grand Total**
2004-05	0.18	0.27	0.90	0.33	1.22	4.62	0.07	0.35	0.30	0.18	0.38	0.21	0.00	**9.01**	0.04	0.00	0.64	0.01	0.52	0.00	0.00	0.01	0.02	0.08	0.08	**1.42**	**10.42**
2005-06	0.20	0.32	1.03	0.38	1.40	5.31	0.08	0.41	0.35	0.21	0.44	0.24	0.00	**10.36**	0.05	0.00	0.74	0.01	0.60	0.00	0.00	0.01	0.02	0.10	0.09	1.63	11.99
2006-07	0.24	0.36	1.18	0.43	1.61	6.11	0.09	0.47	0.40	0.24	0.50	0.27	0.00	**11.91**	0.06	0.00	0.85	0.01	0.68	0.00	0.00	0.01	0.03	0.11	0.11	1.87	13.78
2007-08	0.27	0.42	1.36	0.50	1.85	7.02	0.10	0.54	0.46	0.28	0.58	0.31	0.00	**13.70**	0.07	0.00	0.98	0.02	0.79	0.00	0.00	0.02	0.03	0.13	0.13	2.15	15.85
2008-09	0.30	0.46	1.51	0.56	2.05	7.79	0.12	0.60	0.51	0.31	0.64	0.35	0.00	**15.20**	0.07	0.00	1.09	0.02	0.87	0.00	0.00	0.02	0.03	0.14	0.14	2.39	17.59
2009-10	0.33	0.51	1.68	0.62	2.28	8.65	0.13	0.66	0.57	0.34	0.71	0.39	0.00	**16.88**	0.08	0.00	1.21	0.02	0.97	0.01	0.00	0.02	0.04	0.16	0.15	2.65	19.53
2010-11	0.37	0.57	1.86	0.68	2.53	9.60	0.14	0.74	0.63	0.38	0.79	0.43	0.00	**18.73**	0.09	0.00	1.34	0.02	1.08	0.01	0.00	0.02	0.04	0.18	0.17	2.95	21.68
2011-12	0.41	0.63	2.07	0.76	2.81	10.66	0.16	0.82	0.70	0.42	0.88	0.47	0.00	**20.79**	0.10	0.00	1.49	0.03	1.20	0.01	0.00	0.03	0.04	0.20	0.19	3.27	24.06
2012-13	0.46	0.70	2.30	0.84	3.12	11.83	0.18	0.91	0.78	0.47	0.98	0.53	0.00	**23.08**	0.11	0.00	1.65	0.03	1.33	0.01	0.00	0.03	0.05	0.22	0.21	3.63	26.71
2013-14	0.51	0.78	2.55	0.94	3.46	13.13	0.19	1.01	0.87	0.52	1.08	0.58	0.00	**25.62**	0.12	0.00	1.83	0.03	1.47	0.01	0.00	0.03	0.05	0.24	0.23	4.03	29.65
2014-15	0.56	0.87	2.83	1.04	3.84	14.58	0.22	1.12	0.96	0.58	1.20	0.65	0.00	**28.44**	0.14	0.00	2.03	0.03	1.64	0.01	0.00	0.03	0.06	0.27	0.26	4.47	32.91
2015-16	0.62	0.96	3.14	1.15	4.26	16.18	0.24	1.24	1.07	0.64	1.33	0.72	0.00	**31.56**	0.15	0.00	2.26	0.04	1.81	0.01	0.00	0.04	0.07	0.30	0.29	4.96	36.53
2016-17	0.69	1.07	3.49	1.28	4.73	17.96	0.27	1.37	1.18	0.71	1.48	0.80	0.00	**35.04**	0.17	0.00	2.50	0.04	2.01	0.01	0.00	0.04	0.07	0.33	0.32	5.51	40.55
2017-18	0.77	1.18	3.87	1.42	5.25	19.94	0.30	1.53	1.31	0.79	1.64	0.89	0.00	**38.89**	0.19	0.00	2.78	0.05	2.24	0.01	0.00	0.05	0.08	0.37	0.35	6.12	45.01
2018-19	0.85	1.31	4.29	1.58	5.83	22.13	0.33	1.69	1.46	0.88	1.83	0.98	0.00	**43.17**	0.21	0.00	3.09	0.05	2.48	0.01	0.00	0.05	0.09	0.41	0.39	6.79	49.96
2019-20	0.95	1.46	4.77	1.75	6.47	24.56	0.36	1.88	1.62	0.98	2.03	1.09	0.00	**47.92**	0.23	0.00	3.43	0.06	2.76	0.01	0.00	0.06	0.10	0.45	0.44	7.54	55.45
2020-21	1.05	1.62	5.29	1.94	7.18	27.26	0.40	2.09	1.80	1.08	2.25	1.21	0.00	**53.19**	0.26	0.00	3.80	0.06	3.06	0.02	0.00	0.06	0.11	0.50	0.49	8.37	61.55
2021-22	1.17	1.80	5.87	2.16	7.97	30.26	0.45	2.32	1.99	1.20	2.50	1.35	0.00	**59.04**	0.29	0.00	4.22	0.07	3.39	0.02	0.00	0.07	0.13	0.56	0.54	9.29	68.32
No of TEUs (in '000) received per year at JNPT/NSCIT (90 TEUs per train)																											
2004-05	5.85	9.00	29.43	10.80	39.96	151.65	2.25	11.61	9.99	6.03	12.51	6.75	0.00	**295.83**	1.44	0.00	21.15	0.36	17.01	0.09	0.00	0.36	0.63	2.79	2.70	**46.53**	**342.36**
2005-06	6.73	10.35	33.84	12.42	45.95	174.40	2.59	13.35	11.49	6.93	14.39	7.76	0.00	**340.20**	1.66	0.00	24.32	0.41	19.56	0.10	0.00	0.41	0.72	3.21	3.11	**53.51**	**393.71**
2006-07	7.74	11.90	38.92	14.28	52.85	200.56	2.98	15.35	13.21	7.97	16.54	8.93	0.00	**391.24**	1.90	0.00	27.97	0.48	22.50	0.12	0.00	0.48	0.83	3.69	3.57	**61.54**	**452.77**
2007-08	8.90	13.69	44.76	16.43	60.77	230.64	3.42	17.66	15.19	9.17	19.03	10.27	0.00	**449.92**	2.19	0.00	32.17	0.55	25.87	0.14	0.00	0.55	0.96	4.24	4.11	**70.77**	**520.69**
2008-09	9.88	15.19	49.68	18.23	67.46	256.01	3.80	19.60	16.86	10.18	21.12	11.40	0.00	**499.41**	2.43	0.00	35.70	0.61	28.72	0.15	0.00	0.61	1.06	4.71	4.56	**78.55**	**577.96**
2009-10	10.96	16.86	55.15	20.24	74.88	284.17	4.22	21.76	18.72	11.30	23.44	12.65	0.00	**554.35**	2.70	0.00	39.63	0.67	31.87	0.17	0.00	0.67	1.18	5.23	5.06	**87.19**	**641.54**
2010-11	12.17	18.72	61.21	22.46	83.12	315.43	4.68	24.15	20.78	12.54	26.02	14.04	0.00	**615.33**	3.00	0.00	43.99	0.75	35.38	0.19	0.00	0.75	1.31	5.80	5.62	**96.78**	**712.11**
2011-12	13.51	20.78	67.95	24.93	92.26	350.13	5.19	26.81	23.06	13.92	28.88	15.58	0.00	**683.01**	3.32	0.00	48.83	0.83	39.27	0.21	0.00	0.83	1.45	6.44	6.23	**107.43**	**790.44**
2012-13	14.99	23.06	75.42	27.68	102.41	388.64	5.77	29.75	25.60	15.45	32.06	17.30	0.00	**758.14**	3.69	0.00	54.20	0.92	43.59	0.23	0.00	0.92	1.61	7.15	6.92	**119.25**	**877.39**
2013-14	16.64	25.60	83.72	30.72	113.67	431.39	6.40	33.03	28.42	17.15	35.59	19.20	0.00	**841.54**	4.10	0.00	60.16	1.02	48.39	0.26	0.00	1.02	1.79	7.94	7.68	**132.36**	**973.90**
2014-15	18.47	28.42	92.93	34.10	126.18	478.85	7.10	36.66	31.54	19.04	39.50	21.31	0.00	**934.11**	4.55	0.00	66.78	1.14	53.71	0.28	0.00	1.14	1.99	8.81	8.53	**146.92**	**1081.03**
2015-16	20.50	31.54	103.15	37.85	140.06	531.52	7.89	40.69	35.01	21.13	43.85	23.66	0.00	**1036.86**	5.05	0.00	74.13	1.26	59.62	0.32	0.00	1.26	2.21	9.78	9.46	**163.08**	**1199.94**
2016-17	22.76	35.01	114.50	42.02	155.46	589.99	8.75	45.17	38.87	23.46	48.67	26.26	0.00	**1150.91**	5.60	0.00	82.28	1.40	66.18	0.35	0.00	1.40	2.45	10.85	10.50	**181.02**	**1331.94**
2017-18	25.26	38.87	127.09	46.64	172.56	654.89	9.72	50.14	43.14	26.04	54.02	29.15	0.00	**1277.51**	6.22	0.00	91.33	1.55	73.46	0.39	0.00	1.55	2.72	12.05	11.66	**200.94**	**1478.45**
2018-19	28.04	43.14	141.07	51.77	191.55	726.92	10.79	55.65	47.89	28.90	59.97	32.36	0.00	**1418.04**	6.90	0.00	101.38	1.73	81.54	0.43	0.00	1.73	3.02	13.37	12.94	**223.04**	**1641.08**
2019-20	31.13	47.89	156.59	57.46	212.62	806.89	11.97	61.77	53.15	32.08	66.56	35.91	0.00	**1574.02**	7.66	0.00	112.53	1.92	90.51	0.48	0.00	1.92	3.35	14.84	14.37	**247.57**	**1821.60**
2020-21	34.55	53.15	173.81	63.78	236.00	895.64	13.29	68.57	59.00	35.61	73.88	39.87	0.00	**1747.17**	8.50	0.00	124.91	2.13	100.46	0.53	0.00	2.13	3.72	16.48	15.95	**274.81**	**2021.97**
2021-22	38.35	59.00	192.93	70.80	261.96	994.16	14.75	76.11	65.49	39.53	82.01	44.25	0.00	**1939.36**	9.44	0.00	138.65	2.36	111.51	0.59	0.00	2.36	4.13	18.29	17.70	**305.03**	**2244.39**

Assumption: (1) Growth Rate of 15% from 2005-06 to 2007-08 (2) Growth rate of 11% from 2008-09 to 2021-22

Annexure IV-11.4

Future Growth Pattern of Receipt at JNPT/NSCIT
No of Trains received at JNPT/NSCIT per day (90 TEUs per train)

	BRC	CPC	DDL	MB	SBI	TKD	AGC	BGKT	KKU	RTM	DER	BVH	CED	Total via WR	CCH	TNPM	NGP	NGSM	SNF	AWB	DER	BGM	KNW	MLAR	EMPTY	Total CR	Grand Total
2004-05	0.18	0.27	0.90	0.33	1.22	4.62	0.07	0.35	0.30	0.18	0.38	0.21	0.00	**9.01**	0.04	0.00	0.64	0.01	0.52	0.00	0.00	0.01	0.02	0.08	0.08	**1.42**	**10.42**
2005-06	0.20	0.32	1.03	0.38	1.40	5.31	0.08	0.41	0.35	0.21	0.44	0.24	0.00	**10.36**	0.05	0.00	0.74	0.01	0.60	0.00	0.00	0.01	0.02	0.10	0.09	1.63	11.99
2006-07	0.24	0.36	1.18	0.43	1.61	6.11	0.09	0.47	0.40	0.24	0.50	0.27	0.00	**11.91**	0.06	0.00	0.85	0.01	0.68	0.00	0.00	0.01	0.03	0.11	0.11	1.87	13.78
2007-08	0.27	0.42	1.36	0.50	1.85	7.02	0.10	0.54	0.46	0.28	0.58	0.31	0.00	**13.70**	0.07	0.00	0.98	0.02	0.79	0.00	0.00	0.02	0.03	0.13	0.13	2.15	15.85
2008-09	0.30	0.46	1.51	0.56	2.05	7.79	0.12	0.60	0.51	0.31	0.64	0.35	0.00	**15.20**	0.07	0.00	1.09	0.02	0.87	0.00	0.00	0.02	0.03	0.14	0.14	2.39	17.59
2009-10	0.33	0.51	1.68	0.62	2.28	8.65	0.13	0.66	0.57	0.34	0.71	0.39	0.00	**16.88**	0.08	0.00	1.21	0.02	0.97	0.01	0.00	0.02	0.04	0.16	0.15	2.65	19.53
2010-11	0.37	0.57	1.86	0.68	2.53	9.60	0.14	0.74	0.63	0.38	0.79	0.43	0.00	**18.73**	0.09	0.00	1.34	0.02	1.08	0.01	0.00	0.02	0.04	0.18	0.17	2.95	21.68
2011-12	0.41	0.63	2.07	0.76	2.81	10.66	0.16	0.82	0.70	0.42	0.88	0.47	0.00	**20.79**	0.10	0.00	1.49	0.03	1.20	0.01	0.00	0.03	0.04	0.20	0.19	3.27	24.06
2012-13	0.46	0.70	2.30	0.84	3.12	11.83	0.18	0.91	0.78	0.47	0.98	0.53	0.00	**23.08**	0.11	0.00	1.65	0.03	1.33	0.01	0.00	0.03	0.05	0.22	0.21	3.63	26.71
2013-14	0.51	0.78	2.55	0.94	3.46	13.13	0.19	1.01	0.87	0.52	1.08	0.58	0.00	**25.62**	0.12	0.00	1.83	0.03	1.47	0.01	0.00	0.03	0.05	0.24	0.23	4.03	29.65
2014-15	0.56	0.87	2.83	1.04	3.84	14.58	0.22	1.12	0.96	0.58	1.20	0.65	0.00	**28.44**	0.14	0.00	2.03	0.03	1.64	0.01	0.00	0.03	0.06	0.27	0.26	4.47	32.91
2015-16	0.62	0.96	3.14	1.15	4.26	16.18	0.24	1.24	1.07	0.64	1.33	0.72	0.00	**31.56**	0.15	0.00	2.26	0.04	1.81	0.01	0.00	0.04	0.07	0.30	0.29	4.96	36.53
2016-17	0.69	1.07	3.49	1.28	4.73	17.96	0.27	1.37	1.18	0.71	1.48	0.80	0.00	**35.04**	0.17	0.00	2.50	0.04	2.01	0.01	0.00	0.04	0.07	0.33	0.32	5.51	40.55
2017-18	0.77	1.18	3.87	1.42	5.25	19.94	0.30	1.53	1.31	0.79	1.64	0.89	0.00	**38.89**	0.19	0.00	2.78	0.05	2.24	0.01	0.00	0.05	0.08	0.37	0.35	6.12	45.01
2018-19	0.85	1.31	4.29	1.58	5.83	22.13	0.33	1.69	1.46	0.88	1.83	0.98	0.00	**43.17**	0.21	0.00	3.09	0.05	2.48	0.01	0.00	0.05	0.09	0.41	0.39	6.79	49.96
2019-20	0.95	1.46	4.77	1.75	6.47	24.56	0.36	1.88	1.62	0.98	2.03	1.09	0.00	**47.92**	0.23	0.00	3.43	0.06	2.76	0.01	0.00	0.06	0.10	0.45	0.44	7.54	55.45
2020-21	1.05	1.62	5.29	1.94	7.18	27.26	0.40	2.09	1.80	1.08	2.25	1.21	0.00	**53.19**	0.26	0.00	3.80	0.06	3.06	0.02	0.00	0.06	0.11	0.50	0.49	8.37	61.55
2021-22	1.17	1.80	5.87	2.16	7.97	30.26	0.45	2.32	1.99	1.20	2.50	1.35	0.00	**59.04**	0.29	0.00	4.22	0.07	3.39	0.02	0.00	0.07	0.13	0.56	0.54	9.29	68.32
No of TEUs (in '000) received per year at JNPT/NSCIT (80 TEUs per train)																											
2004-05	5.20	8.00	26.16	9.60	35.52	134.80	2.00	10.32	8.88	5.36	11.12	6.00	0.00	**262.96**	1.28	0.00	18.80	0.32	15.12	0.08	0.00	0.32	0.56	2.48	2.40	**41.36**	**304.32**
2005-06	5.98	9.20	30.08	11.04	40.85	155.02	2.30	11.87	10.21	6.16	12.79	6.90	0.00	**302.40**	1.47	0.00	21.62	0.37	17.39	0.09	0.00	0.37	0.64	2.85	2.76	**47.56**	**349.97**
2006-07	6.88	10.58	34.60	12.70	46.98	178.27	2.65	13.65	11.74	7.09	14.71	7.94	0.00	**347.76**	1.69	0.00	24.86	0.42	20.00	0.11	0.00	0.42	0.74	3.28	3.17	**54.70**	**402.46**
2007-08	7.91	12.17	39.79	14.60	54.02	205.01	3.04	15.70	13.51	8.15	16.91	9.13	0.00	**399.93**	1.95	0.00	28.59	0.49	23.00	0.12	0.00	0.49	0.85	3.77	3.65	**62.90**	**462.83**
2008-09	8.78	13.51	44.16	16.21	59.96	227.57	3.38	17.42	14.99	9.05	18.77	10.13	0.00	**443.92**	2.16	0.00	31.74	0.54	25.53	0.14	0.00	0.54	0.95	4.19	4.05	**69.82**	**513.74**
2009-10	9.74	14.99	49.02	17.99	66.56	252.60	3.75	19.34	16.64	10.04	20.84	11.24	0.00	**492.75**	2.40	0.00	35.23	0.60	28.33	0.15	0.00	0.60	1.05	4.65	4.50	**77.50**	**570.26**
2010-11	10.82	16.64	54.41	19.97	73.88	280.38	4.16	21.47	18.47	11.15	23.13	12.48	0.00	**546.96**	2.66	0.00	39.10	0.67	31.45	0.17	0.00	0.67	1.16	5.16	4.99	**86.03**	**632.98**
2011-12	12.01	18.47	60.40	22.16	82.01	311.23	4.62	23.83	20.50	12.38	25.67	13.85	0.00	**607.12**	2.96	0.00	43.41	0.74	34.91	0.18	0.00	0.74	1.29	5.73	5.54	**95.49**	**702.61**
2012-13	13.33	20.50	67.04	24.60	91.03	345.46	5.13	26.45	22.76	13.74	28.50	15.38	0.00	**673.90**	3.28	0.00	48.18	0.82	38.75	0.21	0.00	0.82	1.44	6.36	6.15	**106.00**	**779.90**
2013-14	14.79	22.76	74.42	27.31	101.04	383.46	5.69	29.36	25.26	15.25	31.63	17.07	0.00	**748.03**	3.64	0.00	53.48	0.91	43.01	0.23	0.00	0.91	1.59	7.05	6.83	**117.66**	**865.69**
2014-15	16.42	25.26	82.60	30.31	112.16	425.64	6.32	32.59	28.04	16.92	35.11	18.95	0.00	**830.32**	4.04	0.00	59.36	1.01	47.74	0.25	0.00	1.01	1.77	7.83	7.58	**130.60**	**960.91**
2015-16	18.23	28.04	91.69	33.65	124.49	472.46	7.01	36.17	31.12	18.79	38.97	21.03	0.00	**921.65**	4.49	0.00	65.89	1.12	52.99	0.28	0.00	1.12	1.96	8.69	8.41	**144.96**	**1066.62**
2016-17	20.23	31.12	101.77	37.35	138.19	524.43	7.78	40.15	34.55	20.85	43.26	23.34	0.00	**1023.03**	4.98	0.00	73.14	1.24	58.82	0.31	0.00	1.24	2.18	9.65	9.34	**160.91**	**1183.94**
2017-18	22.46	34.55	112.97	41.46	153.39	582.12	8.64	44.57	38.35	23.15	48.02	25.91	0.00	**1135.57**	5.53	0.00	81.19	1.38	65.29	0.35	0.00	1.38	2.42	10.71	10.36	**178.61**	**1314.18**
2018-19	24.93	38.35	125.40	46.02	170.26	646.15	9.59	49.47	42.57	25.69	53.30	28.76	0.00	**1260.48**	6.14	0.00	90.12	1.53	72.48	0.38	0.00	1.53	2.68	11.89	11.50	**198.26**	**1458.74**
2019-20	27.67	42.57	139.19	51.08	188.99	717.23	10.64	54.91	47.25	28.52	59.17	31.92	0.00	**1399.13**	6.81	0.00	100.03	1.70	80.45	0.43	0.00	1.70	2.98	13.20	12.77	**220.06**	**1619.20**
2020-21	30.71	47.25	154.50	56.70	209.78	796.13	11.81	60.95	52.45	31.66	65.67	35.44	0.00	**1553.04**	7.56	0.00	111.03	1.89	89.30	0.47	0.00	1.89	3.31	14.65	14.17	**244.27**	**1797.31**
2021-22	34.09	52.45	171.50	62.93	232.86	883.70	13.11	67.65	58.21	35.14	72.90	39.33	0.00	**1723.87**	8.39	0.00	123.25	2.10	99.12	0.52	0.00	2.10	3.67	16.26	15.73	**271.14**	**1995.01**

Assumption: (1) Growth Rate of 15% from 2005-06 to 2007-08 (2) Growth rate of 11% from 2008-09 to 2021-22

Annexure V-1

Projected Evaluation of Line Capacity and Utilisation upto 2021-22

Sections	Capacity									
	2004-05		2006-07		2010-11		2016-17		2021-22	
	Available with M/B	Percentage Utilisation (with MB)	Available with M/B	Percentage Utilisation (with MB)	Available with M/B	Percentage Utilisation (with MB)	Available with M/B	Percentage Utilisation (with MB)	Available with M/B	Percentage Utilisation (with MB)
JNPT-Jasai	10	149.00	38	45.30	38	68.90	38	112.80	38	130.60
Jasai-Panvel	18	94.40	38	51.88	38	77.34	38	121.34	38	136.85
Panvel-Diva	40	100.00	40	140.50	40	155.90	40	169.90	40	185.20
Diva-Vasai Road	40	67.00	40	78.20	40	103.30	40	147.50	40	171.60
Vasai Road-Virar	108	28.06	108	32.83	108	43.54	108	62.46	108	72.69
Virar-Surat	58	142.60	63	151.00	63	164.60	63	179.40	63	195.50
Surat-Vadodara	54	140.80	63	136.60	63	149.20	63	162.60	63	177.20
Vadodara-Nagda	46	125.60	46	141.80	46	155.10	46	168.90	46	184.10
Nagda-Mathura	46	126.90	46	143.00	46	155.80	46	169.80	46	185.10
Mathura-Palwal	67	132.61	67	143.27	67	164.30	67	193.50	67	216.80
Palwal-Thuglakabad	80	132.75	80	143.10	80	163.50	80	191.40	80	214.14

Source: Line Capacity Statements of Central and Western Railways

Annexure V-2

Projected Evaluation of Line Capacity upto 2021-22

Railway	Section	Year	Avilability line capacity WOMB	Avilability line capacity WMB	Passenger trains	Container trains	Non-container trains	Deptt & LE	Total trains	Percent age utilization (with MB)
CR	J.N Port-JSLE	2004-05	12	10	0	14.17	0.91	2.03	17.11	45.03
	KM 9	2006-07	12	10	0	14.17	0.91	2.03	17.11	45.03
	Track S/L	2011-12	12	10	0	22.84	0.91	2.42	26.17	68.86
		2021-17	12	10	0	39.36	0.91	2.58	42.85	112.77
		2021-22	12	10	0	46.96	0.91	1.79	49.66	130.67
	JSLE-PNVL	2004-05	22	18	0	13.19	0.75	3.60	17.00	94.00
	KM 16	2006-07	22	18	0	14.17	0.75	4.79	19.71	51.88
	Track S/L	2011-12	22	18	0	22.84	0.75	5.8	29.39	77.34
		2021-17	22	18	0	39.36	0.75	6.2	46.31	121.87
		2021-22	22	18	0	46.96	0.75	4.3	52	136.85
	PNVL-DW	2004-05	48	40	14	18.00	5.00	3.00	40.00	100.00
	KM 26	2006-07	48	40	13.79	14.17	8.12	3.65	39.74	99.34
	Track D/L	2011-12	48	40	15.23	22.84	8.96	5.21	52.24	130.60
		2021-17	48	40	16.81	39.36	9.89	8.07	74.13	185.33
		2021-22	48	40	18.56	46.96	10.92	9.49	85.93	214.81
	DW-BASR	2004-05	48	40	10.00	11.48	5.40	2.00	29.80	74.50
	KM 11	2006-07	48	40	9.55	12.84	6.45	2.44	31.28	78.20
	Track D/L	2011-12	48	40	10.54	20.20	7.12	3.46	41.32	103.31
		2021-17	48	40	11.64	34.20	7.86	5.32	59.03	147.56
		2021-22	48	40	12.85	40.84	8.68	6.27	68.64	171.59
WR	BSR-VR	2004-05	120	108	9.40	10.48	5.40	6.00	32.08	85.80
	KM 8.2	2006-07	120	108	9.55	12.84	6.99	6.08	35.46	32.83
	Track Q/L	2011-12	120	108	10.54	20.20	7.72	8.56	47.02	43.54
		2021-17	120	108	11.64	34.20	8.52	13.10	67.46	62.46
		2021-22	120	108	12.85	40.84	9.41	15.40	78.50	72.69
	VR-DRD	2004-05	75	63	53.00	8.69	7.12	4.49	73.12	116.90

	KM 63.8	2006-07	75	63	56.78	12.84	6.99	3.42	80.03	127.04
	Track D/L	2011-12	75	63	62.69	20.20	7.72	4.81	95.42	151.46
		2021-17	75	63	69.21	34.20	8.52	7.36	119.29	189.35
		2021-22	75	63	76.41	40.84	9.41	8.66	135.31	214.78
	DRD-BL	2004-05	60	50	47.00	8.71	9.17	4.22	69.80	139.60
	KM 74.4	2006-07	75	63	50.36	12.84	8.86	3.51	75.56	119.94
	Track D/L	2011-12	75	63	55.59	20.20	9.78	4.84	90.42	143.52
		2021-17	75	63	61.37	34.20	10.80	7.27	113.64	180.39
		2021-22	75	63	57.76	40.84	11.92	8.53	129.04	204.83
	BL-UDN	2004-05	75	63	48.00	8.77	9.39	4.30	70.82	141.60
	KM 64.55	2006-07	75	63	50.36	12.84	9.22	3.42	75.56	120.43
	Track D/L	2011-12	75	63	55.59	20.20	10.18	4.70	90.42	144.00
		2021-17	75	63	61.37	34.20	11.24	7.03	113.64	180.79
		2021-22	75	63	57.76	40.84	12.41	8.24	129.04	205.24
	UDN-ST	2004-05	70	58	59.00	8.84	11.16	2.60	82.71	142.60
	KM 4.01	2006-07	70	58	63.06	12.84	11.41	1.27	88.57	152.70
	Track D/L	2011-12	70	58	69.61	20.20	12.59	171.00	104.12	179.52
		2021-17	70	58	76.85	34.20	13.90	251.00	127.47	219.77
		2021-22	70	58	84.85	40.84	15.35	294.00	143.97	248.22
Source: Line Capacity Statements of Central and Western Railways										

Annexure V-3

Line Capacity Utilisation of Sections from Saurastra Ports (2004-05)

Section	Kms	Track	Traction	Capacity		Pass	Containers	Other goods	Deptt.	Total	Utilization %	
				WOB	WB						WOB	WB
PPBR-Surinder Ngr	274.00	SL	DSL	20.00	14.00	9.00	1.00	1.00	1.00	12.00	60.00	85.00
Surinder Ngr-Virmgram	65.00	SL	DSL	22.00	19.00	8.00	1.41	15.50	0.00	24.91	113.23	127.74
Viramgram-Mahesana	65.00	SL	DSL	16.00	13.00	0.00	1.93	2.87	0.05	4.85	30.30	37.30
Mehesana-Palanpur	65.10	SL	DSL	24.00	20.00	17.00	2.87	5.00	0.38	25.26	105.30	126.30
Palanpur-Abu Rd.	52.64	SL	DSL	22.00	19.50	15.91	0.00	9.00	2.70	27.61	125.50	141.59
ABU Rd-Marwar	165.20	SL	DSL	20.00	18.00	14.91	0.00	9.05	2.70	26.66	133.30	148.11
Marwar-Beawar	87.66	SL	DSL	20.00	18.00	11.13	0.00	5.76	1.11	18.00	90.00	100.00
Beawar-Ajmer	52.00	SL	DSL	20.00	18.00	12.13	0.00	7.46	2.06	21.65	108.25	120.28
Ajmer-Phullera	69.27	SL	DSL	20.00	18.00	12.13	0.00	0.91	0.66	13.70	68.55	76.11
Phullera-Jaipur	124.31	SL	DSL	23.00	18.00	21.00	0.00	8.45	0.00	31.21	135.70	173.40
Phullera-Ringus	66.74	SL	DSL	16.00	14.00	4.00	0.00	7.00	0.00	11.00	68.80	76.00
Jaipur-Bandi Kui	90.32	SL	DSL	20.00	15.00	14.08	0.00	6.79	1.38	22.25	111.25	130.88
Bandi Kui-Alwar	60.37	SL	DSL	21.00	19.00	14.08	0.00	8.30	0.96	23.34	111.14	122.84
Alwar-Rewari	74.21	SL	DSL	22.00	19.50	14.07	0.00	7.44	1.23	22.74	103.36	116.62
Rewari-Bhiwani	82.56	SL	DSL	20.00	15.00	8.00	0.10	8.49	0.50	20.68	103.40	137.90
Bhiwani-Hissar	60.00	SL	DSL	20.00	15.00	10.00	0.10	12.58	0.00	22.68	113.40	151.20
Hissar-Sirsa	81.74	SL	DSL	20.00	15.00	7.00	0.02	8.18	0.00	15.20	76.00	101.30
Sirsa-Jakhal	95.28	SL	DSL	22.00	16.00	7.00	0.50	7.50	0.00	15.00	67.10	89.40
Jakhal-Dhuri	66.00	SL	DSL	18.00	12.00	5.00	0.50	3.60	0.00	9.10	51.70	77.50
Dhuri-Ludhiana	62.00	SL	DSL	22.00	16.00	7.00	0.50	7.50	0.00	15.00	68.20	93.80
Mundra-Adipur	57.00	SL	DSL	16.00	14.00	5.00	2.00	4.76	0.24	12.00	75.00	85.71
Adipur-Gandhidham	9.00	SL	DSL	20.00	16.00	6.00	2.00	1.00	0.50	9.50	47.50	59.38
Gandhidham-Viramgam	235.00	SL	DSL	20.00	14.00	9.00	2.00	0.76	0.24	12.00	60.00	85.71
New Bhuj-Gandhidham	57.90	SL	DSL	14.00	11.00	6.00	2.07	2.10	0.01	4.18	77.60	98.70
Gandhidam Samakhiali	53.00	SL	DSL	20.00	15.00	7.00	1.81	12.06	0.00	20.87	104.40	152.70
Samakhiali-Dhrangadhra	117.00	SL	DSL	20.00	15.00	7.00	1.81	12.06	0.00	20.87	104.40	152.70
Dhrangadra-Viramgam	65.00	SL	DSL	22.00	19.50	8.00	1.41	15.50	0.00	24.91	113.23	127.74
Marwar-LUNI	71.71	SL	DSL	24.00	18.00	10.00	0.50	4.50	1.00	15.50	64.60	86.10
LUNI-BGKT	29.00	SL	DSL	24.00	18.00	10.00	0.50	4.50	1.00	16.00	66.70	76.20
BGKT-JU	3.40	DL	DSL	42.00	34.00	0.00	0.30	21.50	2.00	23.80	113.23	127.74
Jodhpur-Merla road	104.00	SL	DSL	16.00	12.00	10.00	0.50	5.80	0.00	16.30	101.50	124.30
MERTA ROAD-FL	154.00	SL	DSL	22.00	18.00	10.00	0.00	5.50	1.00	16.50	75.00	82.50
Phullera-Jaipur	124.31	SL	DSL	23.00	18.00	21.00	0.00	8.45	0.00	31.21	135.70	173.40
Sadalpur-Suralgarh	57.80	SL	DSL	18.00	16.00	9.00	0.00	2.70	0.00	11.70	61.40	76.40

Merta Road-FL	142.79	SL	DSL	22.00	18.00	10.00	0.50	5.50	1.00	16.50	75.00	91.71
Gandhidam-Bhildi (M.G)	255.00	SL	DSL	16.00	14.00	5.00	0.00	1.00	0.50	6.50	48.80	57.80
Bhildi-Samdhari (M.G)	225.00	SL	DSL	20.00	16.00	7.00	0.00	5.50	1.20	13.70	65.40	78.50

Note: 1. The above 2 MG sections are likely to be converted to BG

2. Capacity utilisation on MG Viramgam-Mehsana section was 128%. The section was converted to BG in December 2004. Projected capacity utilisation on BG in 2009-10 is 86%

3 Delhi Cantt.-Rewari MG section is under conversion to BG

Annexure VI-1

Number of Trains (including percentage of mixed trains) handled at JNPCT/NSICT (2004-05 and 2005-06)

Year 2004-05	No. of Trains Inward					No. of Trains Outward				
	JNPCT	NSICT	MIXED	TOTAL	% of mixed trains to total trains	JNPCT	NSICT	MIXED	TOTAL	% of mixed trains to total trains
Apr-04	129	142	45	316	14	135	155	26	316	8
May-04	111	136	59	306	19	115	171	20	306	7
Jun-04	128	144	63	335	19	149	155	31	335	9
Jul-04	142	145	77	364	21	151	179	34	364	9
Aug-04	108	131	66	305	22	127	140	38	305	12
Sep-04	111	150	62	323	19	127	156	40	323	12
Oct-04	93	172	80	345	23	133	173	39	345	11
Nov-04	73	132	86	291	30	108	111	72	291	25
Dec-04	83	131	84	298	28	66	133	99	298	33
Jan-05	82	141	97	320	30	86	129	105	320	33
Feb-05	68	116	101	285	35	82	128	75	285	26
Mar-05	98	152	80	330	24	125	151	54	330	16
Total	1226	1692	900	3818	24	1404	1781	633	3818	17
Average/day	3.4	4.6	2.5	10.5	24	3.9	4.9	1.7	10.5	16
2005-06										
Apr-05	100	153	79	332	24	126	173	33	332	10
May-05	121	153	82	356	23	143	192	31	366	8
Jun-05	125	138	95	358	27	135	171	52	358	15
Total	346	444	256	1046	24	404	536	116	1056	11
Average/day	3.8	5.0	2.8	11.6	24	4.5	5.9	1.3	11.7	11
Source: CONCOR										

Annexure VI-2

Linewise Handling of Rakes and their Detention at J.N. Port

Month	Line No.	No. of Rakes								Detention*			
		Inward				Outward				Port			Railway
		JNPCT	NSICT	MIX	Total	JNPCT	NSICT	MIX	Total	JNPCT	NSICT	MIX	DET*
April 2005	1	46	1	12	59	49	1	9	59	7.20	4.10	8.15	1.51
	2	39	1	13	53	48	0	5	53	8.25	0.00	9.20	1.26
	6	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	8	21	2	21	44	38	1	5	44	8.30	9.20	10.30	2.30
	4	8	20	63	91	0	82	9	91	0.00	4.35	7.40	1.09
	5	0	72	13	85	0	80	5	85	0.00	5.00	6.00	1.15
Total		**114**	**96**	**122**	**332**	**135**	**164**	**33**	**332**				
May 2005	1	50	2	10	62	53	0	9	62	7.45	0.00	9.40	1.22
	2	44	0	11	55	49	0	6	55	7.30	0.00	11.30	1.43
	6	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	8	24	1	17	42	35	1	6	42	9.05	8.30	12.10	2.11
	4	0	80	26	106	0	101	5	106	0.00	4.40	6.15	0.56
	5	3	70	18	91	0	86	5	91	0.00	4.15	9.30	1.00
Total		**121**	**153**	**82**	**356**	**137**	**188**	**31**	**356**				
June 2005	1	45	1	18	64	52	1	11	64	6.15	4.50	9.10	2.03
	2	42	0	16	58	45	0	13	58	7.05	0.00	11.30	1.52
	6	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	8	31	0	21	52	38	1	13	52	8.10	8.25	8.05	2.14
	4	1	76	17	94	0	86	8	94	0.00	4.55	7.05	1.03
	5	2	65	23	90	0	83	7	90	0.00	4.50	9.20	1.04
Total		**121**	**142**	**95**	**358**	**135**	**171**	**52**	**358**				

* Detention is in Hours and Minutes Source: CONCOR

Annexure VI-3

Number of Trains Handled at JNPCT/NSICT and Percentage of Mixed Trains to and from Five Major ICDs (2005-06)

Months	No. of Trains Inward					ICDs	No. of Trains Outward				
	JNPCT	NSICT	MIXED	TOTAL	MIX%		JNPCT	NSICT	MIX	TOTAL	MIX%
April 2005	14	12	2	28	7	DDL	22	15	0	37	0
	1	5	10	16	63	DER	3	10	4	17	24
	44	61	2	107	2	TKD	61	87	1	149	1
	4	10	6	20	30	NGPR	6	10	1	17	6
	18	23	2	43	5	SBI	9	6	3	18	17
May 2005	24	20	1	45	2	DDL	23	27	0	50	0
	4	9	7	20	35	DER	5	13	4	22	18
	61	76	12	149	8	TKD	69	97	2	168	1
	1	6	6	13	46	NGPR	5	10	1	16	6
	14	16	1	31	3	SBI	4	5	4	13	31
June 2005	18	19	0	37	0	DDL	27	29	0	56	0
	1	6	15	22	68	DER	6	14	6	26	23
	66	61	12	139	9	TKD	63	83	7	153	5
	7	11	4	22	18	NGPR	13	21	1	35	3
	12	14	5	31	16	SBI	3	2	5	10	50

Source : CONCOR

Annexure VI-4

Transit Time between important Terminal during the Month of June 2005

Section	KM	No. of rake involved	Actual time taken	Target	Extra time taken from actual
			Hrs./Mts.	Hrs./Mts.	Hrs./Mts.
TKD-JNPT	1401	3	54.25	37.00	17.25
JNPT-TKD	1401	10	47.09	37.00	10.09
TKD-MDPT	1484	7	51.06	44.00	7.06
MDPT-TKD	1484	16	67.57	44.00	23.57
TKD-PPBR	1502	2	54.55	44.00	10.55
PPBR-TKD	1502	3	61.22	44.00	17.22
NGP-JNPT	841	14	45.16	43.00	2.16
JNPT-NGP	841	17	46.31	43.00	3.31
SBI-JNPT	580	10	34.43	21.00	13.43
JNPT-SBI	580	4	30.23	21.00	9.22
JNPT-DDL	1741	7	71.29	42.00	29.29
DDL-JNPT	1741	71	74.38	42.00	32.38

Source: CONCOR