



## A Diagnostic Study of Jawaharlal Nehru Port Trust

G. Raghuram

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**INDIAN INSTITUTE OF MANAGEMENT  
AHMEDABAD-380 015  
INDIA**

## A Diagnostic Study of Jawaharlal Nehru Port Trust

G. Raghuram  
Indian Institute of Management, Ahmedabad  
India

## Table of Contents

|  |    |
|--|----|
| <b>Abstract</b>  | 4  |
| <b>Executive Summary</b>   | 5  |
| <b>Acknowledgements</b>  | 8  |
| <b>1. Introduction</b>   | 9  |
| <b>2. Diagnostics</b>  | 13 |
| <b>3. Recommendations</b>  |    |
| 3.1: Immediate Strategies  | 19 |
| 3.2: Short Term Strategies   | 20 |
| 3.3: Medium Term Strategies  | 21 |
| <b>Exhibits</b>  |    |
| Exhibit 1: Congestion at JNPT: Causes and Consequences                   | 22 |
| Exhibit 2: Import Flow of Container                                      | 25 |
| Exhibit 3: Export Flow of Containers                                     | 26 |
| Exhibit 4: Import Destination Data                                       | 27 |
| Exhibit 5: Export Origin Data  | 28 |
| Exhibit 6: Dedicated vs Mixed Trains                                     | 29 |
| Exhibit 7: TEU to Road Traffic Conversion                                | 30 |
| Exhibit 8: Ongoing Projects  | 32 |
| Exhibit 9: Immediate Proposals   | 33 |
| Exhibit 10: Short Term Proposals   | 38 |
| Exhibit 11: Future Proposals   | 40 |
| Exhibit 12: CFS Infrastructure   | 41 |
| Exhibit 13: CFS Import Handling Capacities                               | 42 |
| Exhibit 14: CFS Export Handling Capacities                               | 43 |
| Exhibit 15: Cost of CFS in and outside CIDCO Land                        | 44 |
| Exhibit 16: JNPT Layout  | 45 |
| Exhibit 17: JNPT Y Junction to Karal Junction                            | 46 |
| Exhibit 18: JNPT CFS Vicinity  | 47 |
| Exhibit 19: JNPT Vicinity  | 48 |
| Exhibit 20: JNPT Regional Road Connectivity                              | 49 |
| Exhibit 21: JNPT Rail Network  | 50 |
| Exhibit 22: Customs Processes  | 51 |
| <b>Appendices</b>  |    |
| Appendix 1: CWC Labour Issue   | 54 |
| Appendix 2: Arbitration issues between JNPCT and NSICT                   | 56 |
| Appendix 3: Gujarat Double Stack Container Project                       | 57 |
| Appendix 4: Dedicated Rail Corridor for High-Quality Multi-Modal Service | 59 |
| <b>Visits and Meetings</b>   | 63 |
| <b>References</b>  | 65 |

### Abstract

The Jawaharlal Nehru Port Trust (JNPT), an autonomous body under the Major Port Trusts Act, 1963, was commissioned on 26<sup>th</sup> May, 1989. The port was originally planned to decongest the Mumbai port and serve as a hub port for container handling for the region.

JNPT became the first Indian port to handle more than 1 million TEUs (twenty foot equivalent unit, the measure used for container traffic) in 2000-01. In view of the increasing containerised trade, a third container terminal was tendered in October 2002 and awarded in August 2004 to Gateway Terminals of India Private Limited (GTIPL). GTIPL has begun the construction and operations are expected to begin by early 2006.

As stated by the Department of Shipping, “The increased volume of container traffic has put a lot of strain on the existing (landside) infrastructure, leading to the problem of frequent congestion in the port.” The author was approached by the Ministry of Commerce for a diagnostic study of JNPT. The study was carried out during February to April 2005.

As part of the study, it was decided to keep in perspective three scenarios of traffic: (i) upto 2.5 million TEUs, ie the current levels, (ii) upto 4 million TEUs, ie from mid 2006 as GTIPL becomes operational and (iii) beyond 4 million TEUs, when the fourth box terminal is made operational.

This paper presents the analysis and recommendations of the study.

## Executive Summary

| <i>Immediate strategies (for current levels of traffic)</i>   |   |
|---|---|
| <b>Recommendations</b>  | <b>Actor</b>  |
| <ul style="list-style-type: none"> <li>Continue the functioning of III-C. Apart from being an effective coordinating and problem anticipating body, it can serve the more important role of a stakeholder understanding the perspective of other stakeholders, so that there is less of a blame game.</li> </ul>  | JNPT, III-C   |
| <ul style="list-style-type: none"> <li>Road development, as provided in the immediate and short term proposals (Exhibits 9 and 10) should be executed with utmost speed. The major bottleneck, if at all would be the fact that there are a multiplicity of players, including JNPT, CIDCO, SPV, NHAI and Traffic Police.</li> </ul>  | JNPT, CIDCO, SPV, NHAI and Traffic Police               |
| <ul style="list-style-type: none"> <li>The critical road related activities, keeping the flow of the import container, would be construction of additional gates, six laning of the container road, traffic arrangements at Y Junction, six laning of the road from Y Junction to Karal Junction, traffic arrangements at Karal Junction, (including grade separation between the traffic coming from SH 54 and the traffic going to NH 4B), development around import CFS including Buffer Yard, alternate evacuation routes from Buffer Yard to SH 54 and from the parking area to NH 4.</li> </ul>   | JNPT, CIDCO, CFS Operators, NHAI and Traffic Police     |
| <ul style="list-style-type: none"> <li>It is critical to facilitate the high levels of efficiency achieved by NSICT by providing them extra land. If doing this in a direct manner would lead to significant legal complexities, then alternate solutions like moving the rail loading of all low volume destinations to the CONCOR DRT should be immediately implemented. Apart from releasing valuable yard space of containers waiting for trains to such destinations, it would also eliminate the problem of mixed trains. Another solution would be to have NSICT as a partner in the operations of the import CFS, so that certain containers can be directly moved into this location, almost as a remote extension to the NSICT terminal container yard. There could be certain legal hurdles, especially raised by the labour working in this CFS, which is on JNPT land and contracted out by JNPT to CWC (Appendix 1).</li> </ul> | NSICT, JNPT, CWC, CONCOR                                |
| <ul style="list-style-type: none"> <li>Given the incentive of empty container yard development in non CIDCO land, it would be imperative to involve the Raigarh district (and the government of Maharashtra) to ensure a controlled growth of container yards, so that provisioning of infrastructural facilities becomes more efficient. CIDCO should also seriously consider reducing land prices to make it attractive for container yards to be developed in the zoned CIDCO land.</li> </ul>   | CIDCO, Empty Container Yard Operators, State Government |
| <i>Short term strategies (for upto four million TEUs, to be ready by March 2007)</i>  |   |
| <b>Recommendations</b>  | <b>Actor</b>  |

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>Road development would be a critical focus area. Some of the projects listed under future proposals (Exhibit 11) should be taken up, keeping in view the additional traffic levels. The priorities would be for improving the road access to and between the CFSs and container yards (f-7, f-8, f-10, f-13 and f-14). If the growth of the empty container yards outside CIDCO land can be controlled and zoned, then the appropriate road access to that would need to be developed. Under the current free market growth condition, f-17 and f-19 become essential.</li> </ul> | CIDCO, CFS Operators, Empty Container Yard Operators, NHAI, Traffic Police |
| <ul style="list-style-type: none"> <li>A second road link to JN Port from a reliability perspective should be developed (f-6).</li> </ul>  | JNPT, CIDCO  |
| <ul style="list-style-type: none"> <li>Evacuation infrastructure for containerised traffic and the destuffed cargo towards the north is critical. Some of the sections of NH-4 pass through the congested areas of Kalamboli, Mumbra and Thane. The six laning project (f-11) and the bypassing roads (f-2 and f-5) should be developed.</li> </ul>  | NHAI   |
| <ul style="list-style-type: none"> <li>Evacuation of cargo from the private CFSs in the non CIDCO land could happen through NH-17. Consequently, apart from the project f-7 which improves connectivity to NH-17, strengthening and widening of NH-17 as an alternate route is essential (f-12).</li> </ul>  | NHAI   |
| <ul style="list-style-type: none"> <li>Rail connectivity would become critical. The doubling of JNPT to Panvel should be completed at the earliest. The section from Vasai Road to Vadodara could become a bottleneck, though improved signalling (automatic signalling) could take on the required additional traffic in this stretch. One million TEUs would result in an addition of about 10 trains a day, of which six to seven would have to get routed on the Vasai Road to Vadodara stretch.</li> </ul>  | CONCOR, IR, JNPT   |
| <ul style="list-style-type: none"> <li>For improving service levels, it is important to have at least one competitor to CONCOR in place at the earliest. This would make container movement by rail more customer oriented than is right now. Even if a framework were to be put in place for competitors to enter this market, the entry barriers would be high due to the large infrastructural base that CONCOR enjoys. It may be important to think of even breaking up CONCOR into two or three entities which can effectively compete with each other.</li> </ul>  | IR, CONCOR, JNPT   |
| <ul style="list-style-type: none"> <li>Additional CFS infrastructure, beyond the 17, including the two new and three proposed CFSs (Exhibit 12) may not be essential. Expansion of some of the existing CFSs and through improved productivity of the public sector CFSs could provide significant capacity addition. Standards for CFSs and container yards should be developed. This should ideally happen through an industry association, rather than the government.</li> </ul>   | CFS Operators  |
| <b>Recommendations</b>   | <b>Actor</b>   |
| <ul style="list-style-type: none"> <li>Customs are putting in place an EDI which is expected to be fully operational (realistically speaking) by the end of 2005. This implementation should be completed. The proposed systemic improvements (Exhibit 22) should be implemented. The “no SMTP” should be regularised for all ICD bound import containers.</li> </ul>  | Customs, CFS Operators, Customs House Agents, Shipping Agents              |
| <ul style="list-style-type: none"> <li>It has been quite difficult to collect, compile and analyse data for policy making. Commoditywise and origin/destinationwise data, which can be sourced from Customs, should be periodically analysed by the relevant decision makers in the port. Understanding the customer profile through this data and the changing trends would go a long way in improving strategic perspectives.</li> </ul>   | JNPT, Customs  |

|  |                                     |
|--|-------------------------------------|
| <ul style="list-style-type: none"> <li>JNPCT and JNPT should be unbundled into two entities with JNPT being the landlord of the three container terminals. This will lend itself to greater role clarity, with JNPT being a “landlord”, performing the arbiter and licensing role. This would also facilitate an eventual privatisation of JNPCT.</li> </ul> | Department of Shipping, JNPT, JNPCT |
|--|-------------------------------------|

| <i>Medium term strategies (for upto seven million TEUs)</i>  |   |
|--|---|
| <b>Recommendations</b>   | <b>Actor</b>  |
| <ul style="list-style-type: none"> <li>It is imperative that progress on 4th container terminal (and airport/SEZ) is put on hold right now. This should be bootstrapped with the creation of a statutory body, growing out of (i) JNPT, (ii) Southern part of CIDCO and (iii) parts of Raigarh district with all powers for area development, law and order, subject to Maharashtra state/ Centre as the case may be.</li> </ul>                       | Department of Shipping, JNPT, CIDCO, State Government |
| <ul style="list-style-type: none"> <li>In the mean time, it is important to urgently develop rail linkages to Mundra, Kandla and Pipavav, with double stacked movement, so that these ports can be used by the market for serving the north Indian hinterland. That P&amp;O operates in Mundra, and Maersk in Pipavav should help. Further, the Kandla container terminal has recently been awarded to ABG-Voltri consortium on a BOT basis</li> </ul> | CONCOR, IR, Mundra, Kandla, and Pipavav Ports         |
| <ul style="list-style-type: none"> <li>Road and rail development would need to be considered with a fresh perspective, for example container expressways and a dedicated rail corridor with double stacking. Appendix 3 gives excerpts from a report on the Gujarat Double Stack Container Project. Appendix 4 provides excerpts from a report on a Dedicated Rail Corridor to north India from JNPT.</li> </ul>                                       | JNPT, NHAI, IR, Department of Shipping                |

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|                    |                                       |
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| Mr J Dasgupta      | Ministry of Commerce                  |
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| Mr C Fernandez     | Ministry of Commerce                  |
| Mr HD Gujarati     | CONCOR                                |
| Mr G Haldea        | Planning Commission                   |
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| Mr RK Jain         | Department of Shipping                |
| Mr D Joseph        | Customs                               |
| Mr DT Joseph       | Department of Shipping                |
| Mr Kadam           | JNPT                                  |
| Mr P Kokate        | TransIndia Logistics                  |
| Mr SM Kulkarni     | JNPT                                  |
| Mr R Kumar         | Department of Shipping                |
| Mr CS Mahohar      | MANSA                                 |
| Mr R Maroo         | Mangalam Shipping & Logistics Pvt Ltd |
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| Ms N Saggi         | JNPT                                  |
| Capt MM Saggi      | Directorate General of Shipping       |
| Ms A Sharma        | Ministry of Commerce                  |
| Mr S Singh         | CWC                                   |
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| <br>               |                                       |
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| Sangeetha Krishnan | IIMA                                  |
| Kirpal Singh       | IIMA                                  |



## 1. Introduction

1.1. The Jawaharlal Nehru Port Trust (JNPT), an autonomous body under the Major Port Trusts Act, 1963, was commissioned on 26<sup>th</sup> May, 1989. The port was originally planned to decongest the Mumbai port and serve as a hub port for container handling for the region. The container traffic had a sluggish growth in the initial years. The subsequent steady growth of the container traffic touched a high in 1998-99 during which the port handled 6.69 lakhs TEUs (twenty foot equivalent unit, the measure used for container traffic) (Table 1).

**Table 1: JNPT Traffic**

| Year    | '000 TEUs | Annual Growth Rate % |
|---------|-----------|----------------------|
| 1989-90 | 34        |                      |
| 1990-91 | 55        | 61.76                |
| 1991-92 | 109       | 98.18                |
| 1992-93 | 143       | 31.19                |
| 1993-94 | 173       | 20.98                |
| 1994-95 | 244       | 41.04                |
| 1995-96 | 339       | 38.93                |
| 1996-97 | 423       | 24.78                |
| 1997-98 | 504       | 19.15                |
| 1998-99 | 669       | 32.74                |

Source: [IPA, various years]

1.2. In view of the anticipated increase in container traffic, it was decided to construct a second container terminal in 1993 (but effected in 1995) on Build, Operate and Transfer (BOT) basis. A consortium lead by P&O Ports, Australia got the bid in 1997 and started operations as Nhava Sheva International Container Terminal (NSICT) in 1999-00.

For clarity, the existing container terminal is referred to as Jawaharlal Nehru Port Container Terminal (JNPCT). JNPT refers to both the container terminals, JNPCT and NSICT.

JNPT became the first Indian port to handle more than 1 million TEUs in 2000-01. There had been steep increase in container traffic at JNPT, with a four year compounded annual growth rate of 26.4% between 1999-00 and 2003-04 (Table 2). In 2003-04, JNPT handled about 58% of India's total container trade. This increase in traffic resulted in congestion in and around JNPT. The throughput potential has reached saturation levels, resulting in only a marginal increase of 4.5% in traffic during 2004-05.

**Table 2: JNPCT and NSICT Traffic ('000 TEUs)**

| Year    | JNPCT | NSICT | Total | Annual Growth Rate % |
|---------|-------|-------|-------|----------------------|
| 1999-00 | 546   | 343   | 889   | 32.88                |
| 2000-01 | 494   | 695   | 1189  | 33.75                |
| 2001-02 | 630   | 943   | 1573  | 32.30                |
| 2002-03 | 729   | 1201  | 1930  | 22.70                |
| 2003-04 | 1038  | 1231  | 2269  | 17.56                |
| 2004-05 | 1138  | 1232  | 2371  | 4.50                 |

CAGR between 1999-00 and 2003-04 is 26.4%

CAGR between 1999-00 and 2004-05 is 21.7%

Source: [IPA, 2004], [JNPT, 2005]

1.3. In view of the increasing containerised trade, a third container terminal was tendered in October 2002, based on the decision of converting the JNPT bulk fertiliser terminal. The BOT contract was finalised in March 2004, though it was formally awarded in August 2004 to Gateway Terminals of India Private Limited (GTIPL), a consortium of Maersk, Denmark and CONCOR, India. GTIPL has begun the construction and operations are expected to begin by early 2006. It is expected that the capacity of 1.5 million TEUs will be reached within the first couple of years of operations.

With GTIPL, the potential throughput at JNPT due to marine infrastructure at the three container terminals is expected to be close to 4 million TEUs. Table 3 gives the infrastructure facilities at the three terminals.

**Table 3: Container Terminals at JNPT**

| Facility                     | JNPCT                                      | NSICT                                      | GTIPL<br>(proposed) |
|------------------------------|--|--|---------------------|
| Quay length                  | 680 mtrs                                   | 600 mtrs                                   | 712 mtrs            |
| RMQC                         | Post Panamax - 6<br>Super Post Panamax - 2 | Post Panamax - 6<br>Super Post Panamax - 2 | 8                   |
| RMGC                         | 3  | 3  | 3                   |
| RTGC                         | 18   | 29   | 29                  |
| Container yard<br>(hectares) | 41   | 28   | 52                  |
| Railway siding               | 4  | 2  | 2                   |
| Tractor trailers             | 119  | 34 owned + about 100<br>hired              | 86                  |
| Reach stackers               | 11   | 3  | 4                   |
| Reefer points                | 280  | 672  |                     |

Source: [III-C, 2004], [Presentation by GTIPL, 2005a]

1.4. Plans are on the anvil for a fourth container terminal, by shifting the existing liquid bulk terminal. While the first three terminals have quay lengths of 600, 680 and 712 mtrs respectively, the fourth terminal is planned for over 1500 mtrs.

1.5. As stated by the Department of Shipping, “The increased volume of container traffic has put a lot of strain on the existing (landside) infrastructure, leading to the problem of frequent congestion in the port. The problem has engaged the attention of the government and this department has been in regular touch with the JNPT, NSICT, CONCOR, Ministry of Railways and Ministry of Commerce to meet the situation.”

1.6. Mr Christy Fernandez, Additional Secretary, Ministry of Commerce approached the Indian Institute of Management, Ahmedabad in February 2005 for a quick diagnostic study of JNPT, leading to implementable recommendations. Professor Raghuram, a faculty in the Public Systems Group with interests in infrastructure, logistics and transportation, agreed to take up this study. A proposal was submitted to which sanction was given. The inception meeting was held on February 24, 2005 in New Delhi.

1.7. The agreed “Terms of Reference” are listed in Table 4.

**Table 4: Terms of Reference**

- (i) To carry out a quick diagnostic study within a period of two months, leading to immediately implementable recommendations covering:
- Operational aspects pertaining to roads and railways including traffic management; taking into account the growth of additional terminals of JNPT, emphasizing on the network on which larger portion of the throughput moves
  - Identification of the nature and means of possible coordination that is required between various authorities and an area development plan to facilitate container movement
  - Scheduling, routing and other practices regarding traffic management of container and other traffic movements.
  - Port practices including that of Customs and CFSs/ICDs.
- (ii) To recommend specific measures for removing the bottlenecks in the quick movement of cargo in and out of the port.
- (iii) To recommend long term measures that can increase the carrying capacity of the systems to evaluate and supply cargo to the port covering:
- Investments in roads and rail facilities to augment connectivity alongwith financing mechanism
  - Possible arrangements for ensuring appropriate coordination between various authorities
  - Dovetailing of existing facilities and proposed facilities like terminals
  - Major changes in operating practices of Customs, CFSs/ICDs and Ports
  - Augmentation of necessary and corresponding investments required for additional port and Customs facilities

Given the urgency and the time for the report, the recommendations will perforce be issue based, with a systems perspective, rather than in depth data based analysis.

1.8. As part of the study, it was decided to keep in perspective three scenarios of traffic: (i) upto 2.5 million TEUs, ie the current levels, (ii) upto 4 million TEUs, ie from mid 2006 as GTIPL becomes operational and (iii) beyond 4 million TEUs, when the fourth box terminal is made operational.

1.9. The methodology for the study included (i) discussions with policy makers, (ii) deliberations at JNPT with various stakeholders, both during a workshop and individually, (iii) data collection from the different stakeholders, (iv) initial analysis and interim presentation and (v) further analysis and report preparation. A list of the visits and the meetings is given towards the end. The draft final report was sent on April 19, 2005 for comments. The final report is being submitted on May 12, 2005.

## **2. Diagnostics**

### ***Congestion in 2004***

2.1. The diagnostic assessment began with an attempt at understanding the serious congestion that took place at JNPT during August to October 2004. Exhibit 1 gives a brief on the causes and consequences of this congestion, as excerpted from various sources.

2.2. According to many of the stakeholders, including GTIPL and NSICT, the seeds for the congestion were first sown in April/May 2004, with a slowing down of the container movement by CONCOR. The holiday season resulting in increased passenger trains at the cost of freight trains, maintenance works of the railways (mega block between May 21 to 28), monsoon, shortage of container rakes and the inability of ICD Ludhiana to handle the required rate of incoming traffic all caused the reduced CONCOR movement. There was a surge in import traffic of metal scrap due to the reduction of international prices. All this resulted in a shift to road, also

choking up the CFSs and finally back into the port container yard, primarily that of NSICT. The problem was accentuated for NSICT since it has lesser yard space, ie 28 hectares vs JNPT's 41 hectares. (This amount of yard space is what was provided in its BOT contract with JNPT. Though JNPT has more land, it feels restricted by the contract to provide additional land to NSICT.)

A truckers' strike, which affected the road traffic movement in the last week of August, further fuelled the congestion. [GTIPL, 2005b]

2.3. The net result was choking up of the NSICT container yard, resulting in container traffic having to be diverted away from NSICT, causing losses to importers and exporters. Inordinate delays to containers, tractor trailers, and haphazard parking and movement of traffic were other consequences. Contingency actions such as shifting of import containers from the container yard to the buffer yard at the customer's cost (which is being disputed today, with the Ministry's intervention), easing of a Customs procedure for import containers moving onwards to rail ICDs, shifting of car carriers to Mumbai Port, and withdrawal of permission for metal scrap imports through JNPT eased the congestion. Timely consequences of earlier investments like infusion of additional rolling stock by CONCOR further helped.

2.4. While normalcy was restored by November 2004, and has continued since then at a monthly traffic levels of about 200,000 TEUs (upto 2.4 million TEU per annum) the issues related to dealing with peaks of traffic have come to focus. The inadequacy of the land side infrastructure has become a critical bottleneck, more so in the context of the growth of investments on the marine side of JNPT.

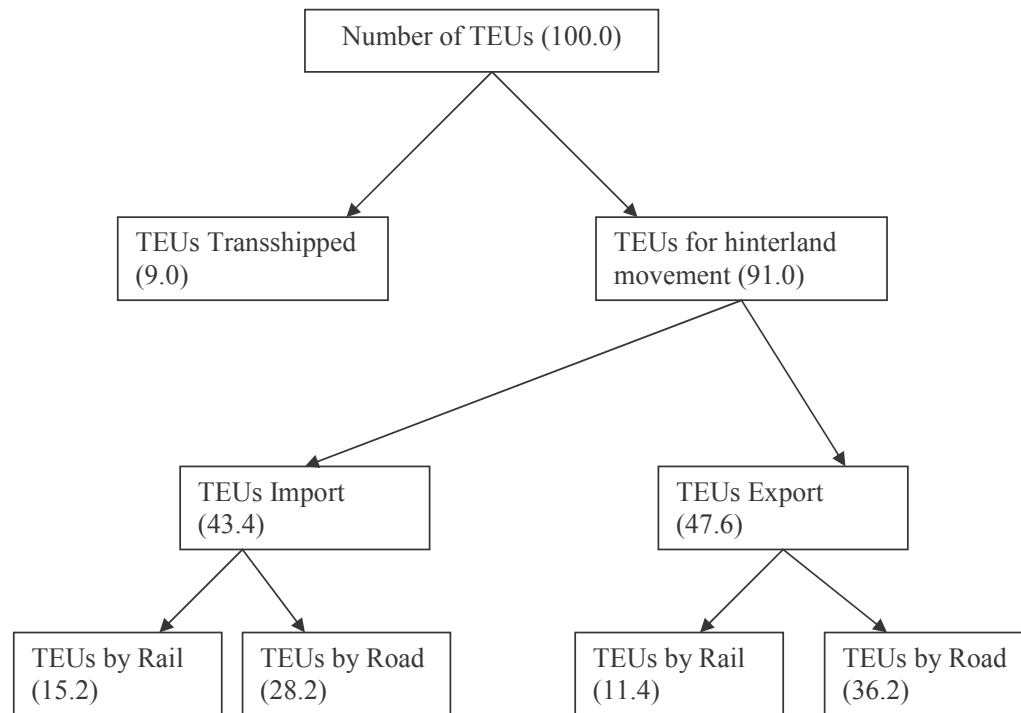
#### ***Container Coordination Committee***

2.5. A taskforce under the chairpersonship of Chairperson, JNPT was constituted by the Department of Commerce in October 2004 to examine and suggest measures to decongest the port. Apart from initiating many of the actions listed above, they set up a Container Coordination Committee (III-C) with representatives from various stakeholders under the chairpersonship of Deputy Chairperson, JNPT. The III-C started functioning immediately and submitted a report in December 2004. The III-C has been asked to continue to review the situation at JNPT on a regular basis.

The III-C has played a proactive role in easing the congestion and then monitoring and even taking coordinating action to prevent possible occurrence of congestion.

#### ***Modal Analysis of Container Flows***

2.6. The percentage split of total TEUs handled at JNPT (during 2003-04) into transshipment (9%), import (43%) and export (48%) is given in Table 5 below. Each transhipped TEU is accounted for twice in the total TEU handled figure. About 36% of import containers move to rail ICDs. For exports, 23% come from rail ICDs. While overall import traffic is lower than exports, there is still an imbalance in that more trains move loaded from JNPT than in the reverse.

**Table 5: Percentage Split of TEUs**

Source: [Author's Analysis, (data based on IPA, 2004)]

The “flow chart” of container imports and exports along with known percentages for the various flows are given in Exhibits 2 and 3.

Out of the import containers, nearly 57% go to the local CFSs for customs inspection, after which most are destuffed, with the goods moving further by trucks and empty containers going to the empty container yard. Some percentage of the goods move in the containers (unsealed) directly to the customer locations after customs inspection. (The author has not been able to get this data accurately, though one CFS reported about 15%.)

In the export direction, nearly 36% of the containers come directly as factory stuffed.

Exhibit 4 gives the hinterland destination data for imports, local CFSwise and rail ICDwise. Exhibit 5 gives the hinterland origin data for exports, statewide for CFS and factory stuffed containers and rail ICDwise. For imports, it is notable that one CFS (Gateway Distriparks Ltd, in the private sector) handles over 30% of the CFS traffic. Similarly, for rail, one ICD (Delhi – Tughlakabad) handles over 51% of the ICD traffic. For exports, over 53% of the exporters' originating state is Maharashtra, for road movement. For rail, over 46% comes from one ICD (Delhi – Tughlakabad).

### ***Rail Movement***

2.7. Though inadequate rail movement by CONCOR was a key cause of the congestion in 2004, the situation has significantly improved primarily due to availability of the required rolling stock. For current levels of traffic, route capacity is not a bottleneck, though sometimes terminal capacity at the hinterland destination causes a ripple effect in the loading of containers at the port.

A major issue of contention at the port is the use of “mixed” rakes by CONCOR, wherein containers from/for both JNPCT and NSICT are required to be loaded in the same rake. This involves coordination between the two terminals and the rake is dealt with sequentially between the two terminals, adding to the turnaround time. (Mixed rakes also create a contentious problem

in the monetary transaction between JNPCT and NSICT, when they use each others' loading/unloading facilities. Charges by NSICT are 16% more than that of JNPCT, due to TAMP regulations, which allow for higher rates based on equipment costs. This matter is under arbitration currently. Arbitration issues between JNPCT and NSICT are given in Appendix 2)

CONCOR's response to the need for mixed rakes has been that low volume origins and destinations don't have the required traffic arisings and hence mixed rakes enable faster movement of the containers. The data (Exhibit 6), however, does not substantiate this since the top eight destinations of mixed rakes are also the top eight of the total traffic destinations. In fact, the maximum number of mixed rakes are to Delhi – Tughlakabad, which one would presume can be serviced effectively by dedicated rakes. Ideally, the onus of mixed rakes should be with the terminal operators, who could see an opportunity in collaborating for certain destinations at certain times to get the containers cleared out faster. This of course, requires CONCOR (and possibly the Indian Railways) being ready to go more by customers' requests and requirements

The turnaround performance between dedicated and mixed trains does not seem to be significantly different, especially in the above six hour bracket. This shows that the coordination for mixed rakes between the two terminals is effective. The turnaround performance of both dedicated and mixed rakes on NSICT tracks are significantly better (all under six hours) than JNPCT tracks, due to superior practices and use of space. It is interesting to note that a larger proportion of trains on JNPCT tracks are mixed. Also, a larger number of the mixed trains are on JNPCT tracks, presumably because they have more tracks and payment to JNPCT is less contentious.

### **Road Movement**

2.8. The current road infrastructure, while “managing” to service the requirements, is less than desirable at many locations. The issues that need to be addressed are (i) need to move away from single route dependence, (ii) separation of cross traffic at important junctions, (iii) separation of container and trailer traffic from other vehicles, (iv) shortening the road access between key points, (v) widening the roads where container traffic is expected to move and (vi) providing parking and appropriate service infrastructure for trailers.

Exhibit 7 provides a relationship between number of TEUs and number of container and goods related movements, excluding empty vehicle movements to and from CFSs. Each additional million TEUs of traffic in a year would result in at least 0.9 million trailer movements outside of the gates and at least 1.65 million trailer movements in the vicinity of the CFSs. At the rate of four PCUs per trailer, this would amount to about 11,000 PCUs per day outside of the gates and 20,000 PCUs per day in the vicinity of the CFSs.

Exhibit 8 lists two ongoing road projects, being executed by an SPV called Mumbai-JNPT Port Road Co Ltd. These projects are focussed on improving the road evacuation of container and other traffic from JNPT and the CFSs towards Mumbai and beyond. These roads would also help movement of empty containers and empty trailers between CFSs and some of the empty container yards.

A clutch of proposals by JNPT for immediate implementation to ease traffic conditions at current levels have been listed, along with their rationale in Exhibit 9. A few more proposals, called short term proposals for implementation concurrently with the third container terminal are listed, along with their rationale in Exhibit 10. Exhibit 11 provides a list of possible future proposals. In terms of financing and execution, the immediate proposals have been provided for. There is however scope in speeding up the execution on a mission mode.

### **Container Freight Stations**

2.9. There are 12 CFSs serving JNPT (Exhibit 12). Two CFSs are ready to begin operations, while three more are making the necessary investments.

The total capacity in the 12 CFSs in terms of ground slots for import containers is about 10,000, which results in a container stacking capacity of 35,000 TEUs (Exhibit 13). At a normal CFS import throughput of 2000 TEUs per day and a normal average dwell time of 14 days, the capacity required is 28,000 TEUs. The total CFS capacity is just about right, accounting for some long pending containers due to Customs (about 2000 TEUs) and minor surges. During the congestion period, the average dwell time went to 20 days, along with an increase in the daily arrivals. This obviously led to a breakdown in servicing by the CFSs [MANSA, 2005]. Some of the existing CFSs have planned an expansion, resulting in a 20% addition to aggregate import capacity.

In terms of exports, the capacity is more than the current normal throughput. Further, a 50% increase in capacity due to warehouse expansion is on the anvil (Exhibit 14).

All this, along with the new CFSs would provide for reasonable surges in traffic at current levels. It is interesting to note from both exhibits 13 and 14 that CWC Dronagiri has the maximum infrastructure, while its market share is significantly lower than the market leader.

Apart from CFSs, there is also requirement of container yards to store empty containers. While some of the CFSs provide space for empty containers, nearly 20 empty container yards have come up in the vicinity of JNPT. Some of the empty container yards also provide CFS like services under the guise of “factory stuffing”.

The most vexatious issue is that all new growth is happening outside the CIDCO land, since CIDCO land prices are 6 to 10 times the private land available outside the CIDCO boundary (Exhibit 15). One existing CFS is on private land. Three of the new CFSs are coming up on private land (Exhibit 12). Most of the empty container yards are coming up on private land. All this is happening even though CIDCO has zoned areas for CFSs and container yards.

This unregulated growth of container yards and CFS like operations leads to road accidents, local extortion and inability to leverage road development in an efficient way.

Many of the existing operators are seeking interventions by which new CFSs and container yards would be given permission only if they meet standards. This is a step in the right direction, except that the intervention should not be by government (since it would only add to the bureaucracy, in an otherwise welcome free market context), but by say, a CFS industry association, in the spirit of self regulation.

2.10. Exhibits 16 to 21 provide sketch maps of JNPT and its environs, highlighting the location of various facilities and the road project proposals.

2.11. A summary of the key diagnostics discussed above is given in Table 6.



**Table 6: Diagnostic Study of JNPT**

|  |
|--|
| <ul style="list-style-type: none"> <li>• Congestion <ul style="list-style-type: none"> <li>– delays</li> <li>– haphazard movement</li> <li>– congestion charges on ships</li> <li>– diversion of ships and cargo</li> </ul> </li> <li>• More processing time than required <ul style="list-style-type: none"> <li>– for containers</li> <li>– for trailers</li> <li>– for rail ICD, due to low volume destinations and mixed rakes</li> </ul> </li> <li>• Unregulated growth of container yards and CFS like operations <ul style="list-style-type: none"> <li>– accidents</li> <li>– local extortion</li> <li>– inability to leverage road development in an efficient way</li> </ul> </li> <li>• Impact on trade logistics service levels and consequent impact on trade competitiveness</li> <li>• Growth of traffic faster than infrastructure and systems. Also, significant latent demand</li> </ul> |
|--|

2.12. The key stakeholders in the container operations are given in Table 7.

**Table 7: Key Stakeholders**

|   |
|---|
| <ul style="list-style-type: none"> <li>• JNPCT (quay, yard, ICD and gate operations)</li> <li>• NSICT (quay, yard, ICD and gate operations)</li> <li>• JNPT (roads, parking)</li> <li>• Shipping Agents</li> <li>• Customs</li> <li>• Customs House Agents</li> <li>• CONCOR</li> <li>• Road Transporters</li> <li>• CFS Operators</li> <li>• Empty Container Yard Operators</li> <li>• CIDCO</li> <li>• Traffic Police</li> <li>• GTIPL</li> <li>• NHAI</li> <li>• IR</li> </ul> |
|---|

### 3. Recommendations

#### 3.1. Immediate strategies (for current levels of traffic)

- Continue the functioning of III-C. Apart from being an effective coordinating and problem anticipating body, it can serve the more important role of a stakeholder understanding the perspective of other stakeholders, so that there is a less of a blame game.
- Road development, as provided in the immediate and short term proposals (Exhibits 9 and 10) should be executed with utmost speed. The major bottleneck, if at all would be the fact that there are a multiplicity of players, including JNPT, CIDCO, SPV, NHAI and Traffic Police.



- The critical road related activities, keeping the flow of the import container, would be construction of additional gates, six laning of the container road, traffic arrangements at Y Junction, six laning of the road from Y Junction to Karal Junction, traffic arrangements at Karal Junction, (including grade separation between the traffic coming from SH 54 and the traffic going to NH 4B), development around import CFS including Buffer Yard, alternate evacuation routes from Buffer Yard to SH 54 and from the parking area to NH 4.
- It is critical to facilitate the high levels of efficiency achieved by NSICT by providing them extra land. If doing this in a direct manner would lead to significant legal complexities, then alternate solutions like moving the rail loading of all low volume destinations to the CONCOR DRT should be immediately implemented. Apart from releasing valuable yard space of containers waiting for trains to such destinations, it would also eliminate the problem of mixed trains. Another solution would be to have NSICT as a partner in the operations of the import CFS, so that certain containers can be directly moved into this location, almost as a remote extension to the NSICT terminal container yard. There could be certain legal hurdles, especially raised by the labour working in this CFS, which is on JNPT land and contracted out by JNPT to CWC (Appendix 1).
- Given the incentive of empty container yard development in non CIDCO land, it would be imperative to involve the Raigarh district (and the government of Maharashtra) to ensure a controlled growth of container yards, so that provisioning of infrastructural facilities becomes more efficient. CIDCO should also seriously consider reducing land prices to make it attractive for container yards to be developed in the zoned CIDCO land.

### 3.2. Short term strategies (for upto four million TEUs, to be ready by March 2007)

- Road development would be a critical focus area. Some of the projects listed under future proposals (Exhibit 11) should be taken up, keeping in view the additional traffic levels. The priorities would be for improving the road access to and between the CFSs and container yards (f-7, f-8, f-10, f-13 and f-14). If the growth of the empty container yards outside CIDCO land can be controlled and zoned, then the appropriate road access to that would need to be developed. Under the current free market growth condition, f-17 and f-19 become essential.
- A second road link to JN Port from a reliability perspective should be developed (f-6).
- Evacuation infrastructure for containerised traffic and the destuffed cargo towards the north is critical. Some of the sections of NH-4 pass through the congested areas of Kalamboli, Mumbra and Thane. The six laning project (f-11) and the bypassing roads (f-2 and f-5) should be developed.
- Evacuation of cargo from the private CFSs in the non CIDCO land could happen through NH-17. Consequently, apart from the project f-7 which improves connectivity to NH-17, strengthening and widening of NH-17 as an alternate route is essential (f-12).
- Rail connectivity would become critical. The doubling of JNPT to Panvel should be completed at the earliest. The section from Vasai Road to Vadodara could become a bottleneck, though improved signalling (automatic signalling), could take on the required additional traffic in this stretch. One million TEUs would result in an addition of about 10 trains a day, of which six to seven would have to get routed on the Vasai Road to Vadodara stretch.

- For improving service levels, it is important to have at least one competitor to CONCOR in place at the earliest. This would make container movement by rail more customer oriented than is right now. Even if a framework were to be put in place for competitors to enter this market, the entry barriers would be high due to the large infrastructural base that CONCOR enjoys. It may be important to think of even breaking up CONCOR into two or three entities which can effectively compete with each other.
- Additional CFS infrastructure, beyond the 17, including the two new and three proposed CFSs (Exhibit 12) may not be essential. Expansion of some of the existing CFSs and though improved productivity of the public sector CFSs could provide significant capacity addition. Standards for CFSs and container yards should be developed. This should ideally happen through an industry association, rather than the government.
- Customs are putting in place an EDI which is expected to be fully operational (realistically speaking) by the end of 2005. This implementation should be completed. The proposed systemic improvements (Exhibit 22) should be implemented. The “no SMTP” should be regularised for all ICD bound import containers.
- It has been quite difficult to collect, compile and analyse data for policy making. Commoditywise and origin/destinationwise data, which can be sourced from Customs, should be periodically analysed by the relevant decision makers in the port. Understanding the customer profile through this data and the changing trends would go a long way in improving strategic perspectives.
- JNPCT and JNPT should be unbundled into two entities with JNPT being the landlord of the three container terminals. This will lend itself to greater role clarity, with JNPT being a “landlord”, performing the arbiter and licensing role. This would also facilitate an eventual privatisation of JNPCT.

### 3.3. Medium term strategies (for upto seven million TEUs)

- It is imperative that progress on 4th container terminal (and airport/SEZ) is put on hold right now. This should be bootstrapped with the creation of a statutory body, growing out of (i) JNPT, (ii) Southern part of CIDCO and (iii) parts of Raigarh district with all powers for area development, law and order, subject to Maharashtra state/Centre as the case may be.
- In the mean time, it is important to urgently develop rail linkages to Mundra, Kandla and Pipavav, with double stacked movement, so that these ports can be used by the market for serving the north Indian hinterland. That P&O operates in Mundra, and Maersk in Pipavav should help. Further, the Kandla container terminal has recently been awarded to ABG-Voltri consortium on a BOT basis.
- Road and rail development would need to be considered with a fresh perspective, for example container expressways and a dedicated rail corridor with double stacking. Appendix 3 gives excerpts from a report on the Gujarat Double Stack Container Project. Appendix 4 provides excerpts from a report on a Dedicated Rail Corridor to north India from JNPT.

### Exhibit 1: Congestion at JNPT: Causes and Consequences

- The increased volume of container traffic at Jawaharlal Nehru Port (JN Port), handling over 60% of container traffic in the country, had put a lot of strain on the existing infrastructure, leading to frequent congestion in the port. The port was facing severe congestion problems since July 2004. A container took at least nine hours to reach port gate from the road. The road was congested with vehicles waiting to get entry. Vehicles were even leaving the port without loading. Exporters were estimated to lose around Rs 800 crore a month because of delayed shipments. Textile, chemicals, pharmaceuticals, iron and steel, and petrochemicals were the worst hit by the congestion. [*JNPT Congestion Plays Havoc*, Business World, August 23, 2004].
- Meanwhile at NSICT, the huge pile of import boxes forced it to close export gates indefinitely. The entire terminal and about 18 CFSs around it were all clogged. [*Transport Strike Likely to Confound JNPT Congestion Further*, Times Shipping Journal, August 2004]
- The congestion issue at JN Port aggravated further because both the Maharashtra Heavy Vehicles & Inter-State Container Operators Association and All India Motor Transport Congress went on a strike from Aug 21 to Aug 31. The Association pointed out that neither the Port Trust nor the NSICT management had created or invested in infrastructure resulting in 5,000 vehicles being detained for 5 days for offloading at port premises, causing a loss of Rs 188 crore in detention charges over the last five months. The Association alleged that the authorities were shifting blames instead of going for any corrective measure.

The Ministry of Commerce told JN Port not to accept import containers containing HMS from September 15 for a period of 60 days. CONCOR was asked to run an average of 2.5 rakes daily from JNP for Dhandari Kalan ICD near Ludhiana. In addition, the PSU container transporter agreed to run 1 rake each from JN Port and NSICT daily for Dadri ICD to evacuate the containers destined for Ludhiana. [*Transport Strike Likely to Confound JNPT Congestion Further*, Times Shipping Journal, August 2004]

- Liners and shipping companies were complaining for returning empty from the port. [*JNPT: The Brimming Port of Woes*, Business World, September 6, 2004]
- According to the Ministry of Commerce, the main reason behind the congestion was excessive import of heavy metal scrap (HMS). Due to the steadily declining prices of scrap metal over the last five months, the importers who had ordered huge consignments refused to pick these up from the ports. Close to 40% of the containers lying inside NSICT was scrap metal manifested for Dhandari Kalan ICD at Ludhiana. [*JNPT: The Brimming Port of Woes*, Business World, September 6, 2004]
- JNPT also has plans to commission its 4th container terminal. The work is expected to start in the middle of 2006, soon after the conversion of the existing bulk terminal to third container terminal. This would include widening of existing bulk berths, widening of the approaches, developing container yards in the back up area, and provision of state-of-the-art facilities and equipment. [*JNPT to Commission 4th Container Terminal*, Piyush Pandey, Ahmedabad, September 15, 2004]
- In the SCOPE-Shipping meeting on September 15, while confirming that MANSA members could move out more than 5,000 containers by road, Mr C R Nambiar of the Association called for waiver of the bank guarantee as required by the Customs, which was a hefty amount. Mr Thyagarajan of CONCOR informed that CONCOR could also undertake movement of containers by road as a special case to expedite decongestion of the port but for a period of 30 days only. [*Scope Leads to Hope: JNPT to be Decongested Within a Month*, ET Shipping, September 20, 2004]

- On October 9, the government unveiled a three-point strategy to ease congestion at JNPT. As per the strategy, the piled up containers at JNPT would be shifted to three locations. Apart from shifting 4,500 containers to CWC CFS, additional 2,000 would be shifted to Vashi. Some containers would also be shifted to Mumbai Port Trust, which has a capacity to accommodate up to 10,000 containers. The requirement of bank guarantee for removing of containers directly by shipping lines has been waived. This would help in speedy lifting of 5,000 containers. [*JNPT Declogging Plan Unveiled*, Press Trust of India, New Delhi, October 9, 2004]
- The 20-member taskforce constituted by the Commerce Ministry suggested measures to decongest the port. The members felt that there was an urgent need to restrict the flow of import containers by serving advance notice to the importers. But it would not be possible to impose complete stoppage on handling of import containers for a period of two weeks, since it would adversely affect the country's foreign trade.

Another step that the taskforce suggested involved reducing free period given to consignees by CFS operators and shipping lines. This proposal was made in light of the fact that a majority of the import boxes lying at various CFSs around JNPT for longer periods contained low-value cargoes, such as waste paper and plastic materials. On the other hand, high-value items such as chemicals and machinery were cleared quickly.

NSICT requested that in order to facilitate faster evacuation of ICD traffic from the terminal, one rail line at JNPT could be allotted exclusively for back loading of its ICD containers for a period of one month. JNPT agreed to this and also promised to deploy adequate number of reach stackers for loading such containers on rakes. [*JNPT Congestion: NSICT May Restrict Import Boxes*, Business Line, October 13, 2004]

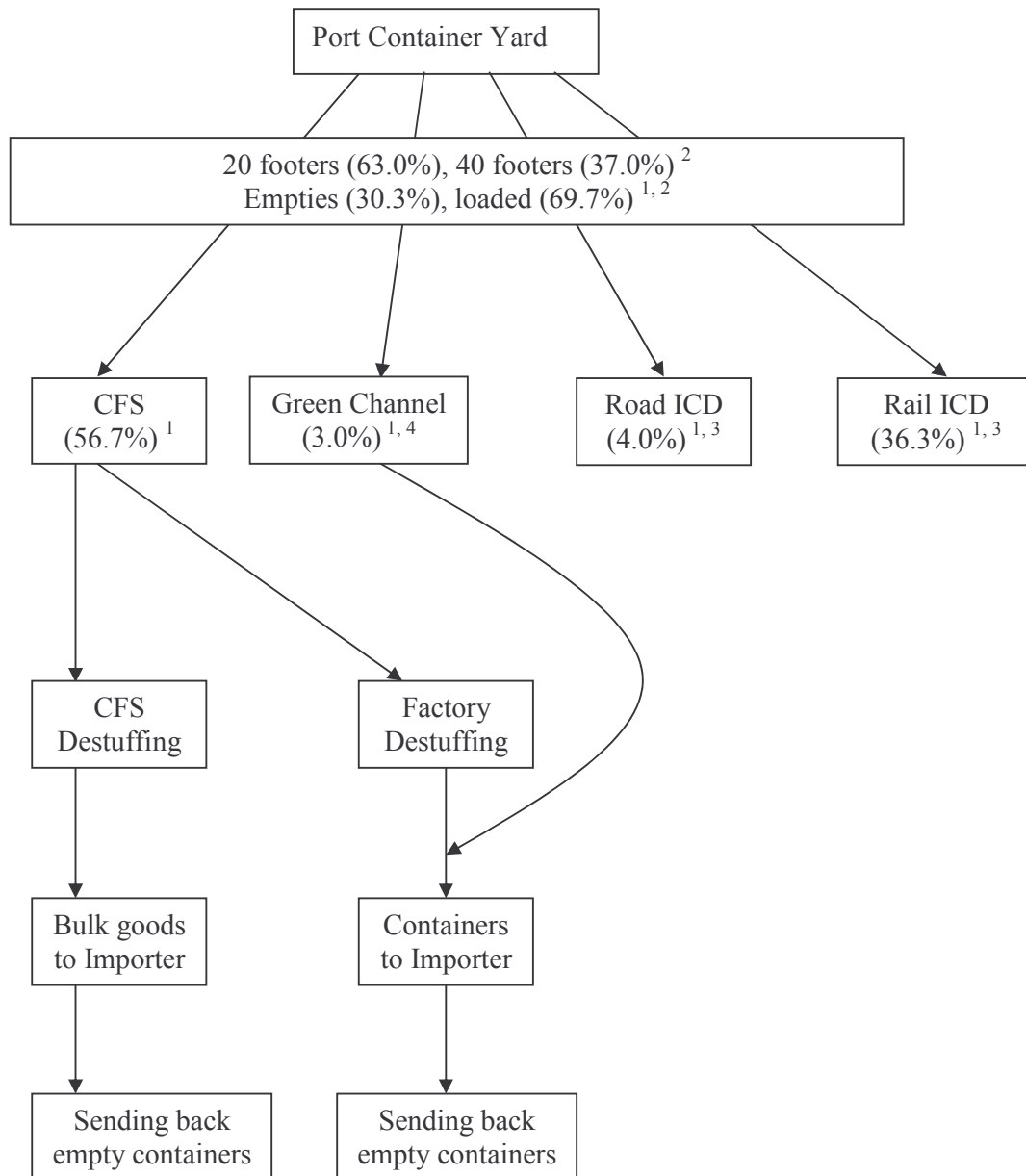
- A shortage of rakes for carrying containers was also one of the reasons for congestion at the JNPT. CONCOR, which deals with most of the rail-based movement of containers to and from ports, was finding it difficult to procure new rakes. This resulted in containers piling up at JNPT. [*Decongestion Drive at JNPT Successful*, Business Standard, New Delhi, November 22, 2004]
- The quick clampdown on once-thriving metal imports was necessitated after the authorities found abandoned shells, rockets and bombs as part of the scrap imports. The Customs notified two areas at Wadala and Dronagiri for storing and examination of consignments, as 100% inspections were made mandatory. Feared by a backlash, some consignees dumped their consignments and decided not to claim their cargo from the port. In many cases, the ground rent and demurrage charges were more than the cost of consignment.

All CFSs refused to conduct inspections. The government notified that all imports henceforth should be accompanied by pre-shipment inspection certificates by 23 agencies. But scrap importers said most inspection agencies were unwilling to take responsibility and issue certificates.

JNPT extended the suspension of handling metal scrap imports till January 15, 2005. Another issue faced by lines was the bad reputation of scrap importers. Over and above the usual inspection of arms, ammunition, etc, inspection agencies were also required to certify that the cargo was not radioactive. Foreign importers were reluctant to ship to India with all these constraints as they were able to ship to other destinations without any problems. Also, shipping companies were reluctant to give containers for Indian ports basically due to the slow turnaround of their containers. [*In Deadlock*, Times Shipping Journal, November 2004]

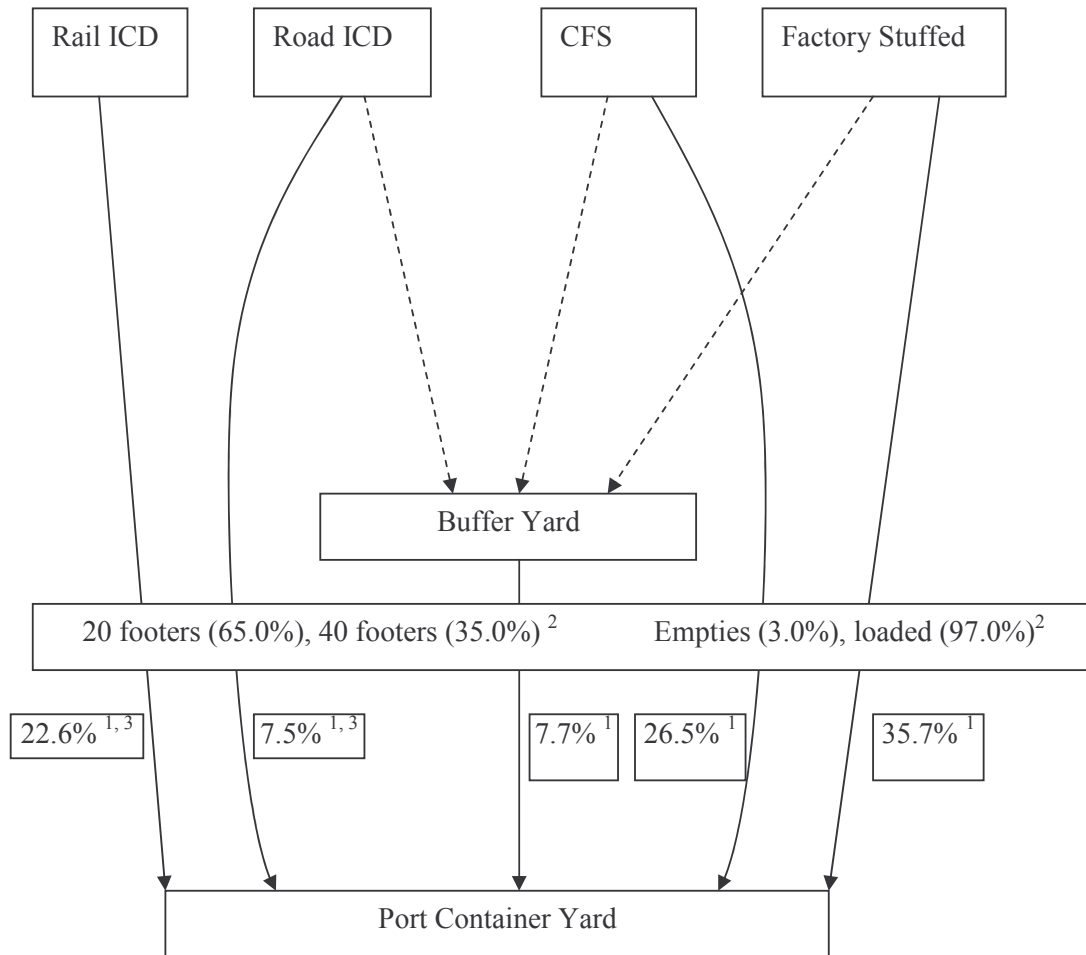
- Container yard capacity especially at NSICT was a constraint while ICD handling and rail-line capacity was just adequate to meet the present requirements. Similarly, the CFSs in and around JN port could handle about 794,000 TEUs per year against the requirement of 705,000 TEUs of CFS traffic anticipated for 2004-05. Normally to handle peaks and spurts in traffic, there should be at least 30% excess capacity. Also, the non-functioning of CWC CFS and under performance of public sector CFSs led to slow and delayed evacuation of containers and consequently created congestion on the landside. [*Congestion at Jawaharlal Nehru Port Trust*, Government of India, Ministry of Shipping, Road Transport & Highways, Department of Shipping, February 14, 2005]

Source: [Various sources, as mentioned]

**Exhibit 2: Import Flow of Container**

Source: [<sup>1</sup> MANSA, 2005], [<sup>2</sup> IPA, 2004], [<sup>3</sup> CONCOR, 2005], [<sup>4</sup> Customs, 2005]

**Exhibit 3: Export Flow of Containers**



Source: [<sup>1</sup> MANSA, 2005], [<sup>2</sup> IPA, 2004], [<sup>3</sup> CONCOR, 2005]

**Exhibit 4: Import Destination Data**

| <b>CFS</b>                      | <b>TEU %</b>  |
|---------------------------------|---------------|
| Gateway Distriparks Ltd         | 30.94         |
| TransIndia Logistics Park       | 12.42         |
| Maersk                          | 11.81         |
| Punjab Conware                  | 8.81          |
| JNP Import CFS (CWC)            | 6.56          |
| Seabird Marine Services Pvt Ltd | 6.56          |
| United Liner                    | 5.44          |
| Balmer Lawrie & Co Ltd          | 4.92          |
| CONCOR                          | 4.79          |
| CWC Dronagiri                   | 3.99          |
| CWC Distripark                  | 3.19          |
| CWC Kalamboli                   | 0.58          |
| <b>Total</b>                    | <b>100.00</b> |

Seven weeks January-February, 2005  
Source: [MANSA, 2005]

| <b>Rail ICD</b>           | <b>TEU %</b>  |
|---------------------------|---------------|
| Delhi - Tughlakabad       | 51.42         |
| Ludhiana - Dhandari Kalan | 12.25         |
| Ahmedabad – Sabarmati     | 6.43          |
| Mumbai – Mulund           | 6.06          |
| Nagpur                    | 5.64          |
| Hyderabad – Sanatnagar    | 2.47          |
| Jaipur – Kanakpura        | 1.98          |
| Kanpur                    | 1.88          |
| Delhi – Dadri             | 1.58          |
| Ratlam                    | 1.47          |
| Others                    | 9.80          |
| <b>Total</b>              | <b>100.00</b> |

April 2003 to July 2004  
Source: [CONCOR, 2005]

| <b>Rail ICD</b>           | <b>Trains %</b> |
|---------------------------|-----------------|
| Delhi - Tughlakabad       | 51.52           |
| Mumbai – Mulund           | 8.91            |
| Ahmedabad – Sabarmati     | 6.96            |
| Ludhiana - Dhandari Kalan | 5.65            |
| Nagpur                    | 5.65            |
| Hyderabad – Sanatnagar    | 4.78            |
| Delhi – Dadri             | 4.13            |
| Kanpur                    | 2.61            |
| Indore – Pithampur        | 1.96            |
| Jaipur                    | 1.52            |
| Vadodara                  | 1.30            |
| Jodhpur – Bhagat ki Kothi | 1.30            |
| Moradabad                 | 1.09            |
| Gwalior – Malanpur        | 0.87            |
| Delhi – Ballabgarh        | 0.65            |
| Surat                     | 0.65            |
| Pune – Chinchwad          | 0.43            |
| Aurangabad                | 0.00            |
| <b>Total</b>              | <b>100.00</b>   |

Seven weeks January-February, 2005  
Source: [MANSA, 2005]

**Exhibit 5: Export Origin Data**

| <b>CFS and Factory Stuffed:<br/>State</b> | <b>TEUs</b>   | <b>Overall Share %</b> | <b>Share Excluding<br/>Maharashtra %</b> |
|---|---------------|------------------------|--|
| Maharashtra                               | 348881        | 53.05                  |  |
| Other than Maharashtra                    | (308767)      | (46.95)                |  |
| Gujarat                                   | 75907         | 11.54                  | 24.58                                    |
| Delhi                                     | 64876         | 9.86                   | 21.01                                    |
| Uttar Pradesh                             | 55095         | 8.38                   | 17.84                                    |
| Haryana                                   | 23660         | 3.60                   | 7.66                                     |
| Madhya Pradesh                            | 22566         | 3.43                   | 7.31                                     |
| Rajasthan                                 | 19451         | 2.96                   | 6.30                                     |
| Karnataka                                 | 12318         | 1.87                   | 3.99                                     |
| Punjab                                    | 11243         | 1.71                   | 3.64                                     |
| Tamil Nadu                                | 4944          | 0.75                   | 1.60                                     |
| Daman & Diu                               | 4277          | 0.65                   | 1.39                                     |
| Andhra Pradesh                            | 3928          | 0.60                   | 1.27                                     |
| West Bengal                               | 2600          | 0.40                   | 0.84                                     |
| Goa                                       | 2450          | 0.37                   | 0.79                                     |
| Dadra & Nagar Haveli                      | 2073          | 0.32                   | 0.67                                     |
| Kerala                                    | 1026          | 0.16                   | 0.33                                     |
| Others                                    | 2353          | 0.36                   | 0.76                                     |
| <b>Total</b>                              | <b>657648</b> | <b>100.00</b>          | <b>100.00</b>                            |

April-2004 to February-2005

Source: [Customs, 2005]

| <b>Rail ICD</b>           | <b>TEU %</b>  |
|---------------------------|---------------|
| Delhi - Tughlakabad       | 46.38         |
| Ahmedabad – Sabarmati     | 11.53         |
| Ludhiana – Dhandari Kalan | 10.59         |
| Nagpur                    | 5.23          |
| Moradabad                 | 3.83          |
| Jaipur – Kanakpura        | 3.59          |
| Jodhpur – Bhagat ki Kothi | 3.56          |
| Hyderabad – Sanatnagar    | 3.15          |
| Kanpur                    | 3.01          |
| Others                    | 9.10          |
| <b>Total</b>              | <b>100.00</b> |

April 2003 to July 2004  
Source: [CONCOR, 2005]



## Exhibit 6: Dedicated vs Mixed Trains

| Rail ICD for Import Trains | Dedicated  |            |            | Mixed     |            |            | Total      |
|----------------------------|------------|------------|------------|-----------|------------|------------|------------|
|                            | JNPCT      | NSICT      | Sub Total  | JNPCT     | NSICT      | Sub Total  |            |
| Delhi – Tughlakabad        | 79         | 91         | 170        | 26        | 41         | 67         | 237        |
| Mumbai – Mulund            | 12         | 19         | 31         | 4         | 6          | 10         | 41         |
| Ahmedabad – Sabarmati      | 13         | 4          | 17         | 6         | 9          | 15         | 32         |
| Ludhiana - Dhandari Kalan  | 3          | 3          | 6          | 13        | 7          | 20         | 26         |
| Nagpur                     | 6          | 8          | 14         | 3         | 9          | 12         | 26         |
| Hyderabad – Sanatnagar     | 1          | 2          | 3          | 6         | 13         | 19         | 22         |
| Delhi – Dadri              | 2          | 1          | 3          | 7         | 9          | 16         | 19         |
| Kanpur                     | 0          | 1          | 1          | 8         | 3          | 11         | 12         |
| Indore – Pithampur         | 0          | 1          | 1          | 4         | 4          | 8          | 9          |
| Jaipur                     | 0          | 0          | 0          | 1         | 6          | 7          | 7          |
| Vadodara                   | 0          | 0          | 0          | 2         | 4          | 6          | 6          |
| Jodhpur - Bhagat ki Kothi  | 0          | 1          | 1          | 1         | 4          | 5          | 6          |
| Moradabad                  | 0          | 1          | 1          | 3         | 1          | 4          | 5          |
| Gwalior – Malanpur         | 1          | 0          | 1          | 2         | 1          | 3          | 4          |
| Delhi –Ballabgarh          | 0          | 0          | 0          | 3         | 0          | 3          | 3          |
| Surat                      | 0          | 0          | 0          | 0         | 3          | 3          | 3          |
| Pune – Chinchwad           | 0          | 0          | 0          | 1         | 1          | 2          | 2          |
| Aurangabad                 | 0          | 0          | 0          | 0         | 0          | 0          | 0          |
| <b>Total</b>               | <b>117</b> | <b>132</b> | <b>249</b> | <b>90</b> | <b>121</b> | <b>211</b> | <b>460</b> |

Seven weeks January-February, 2005

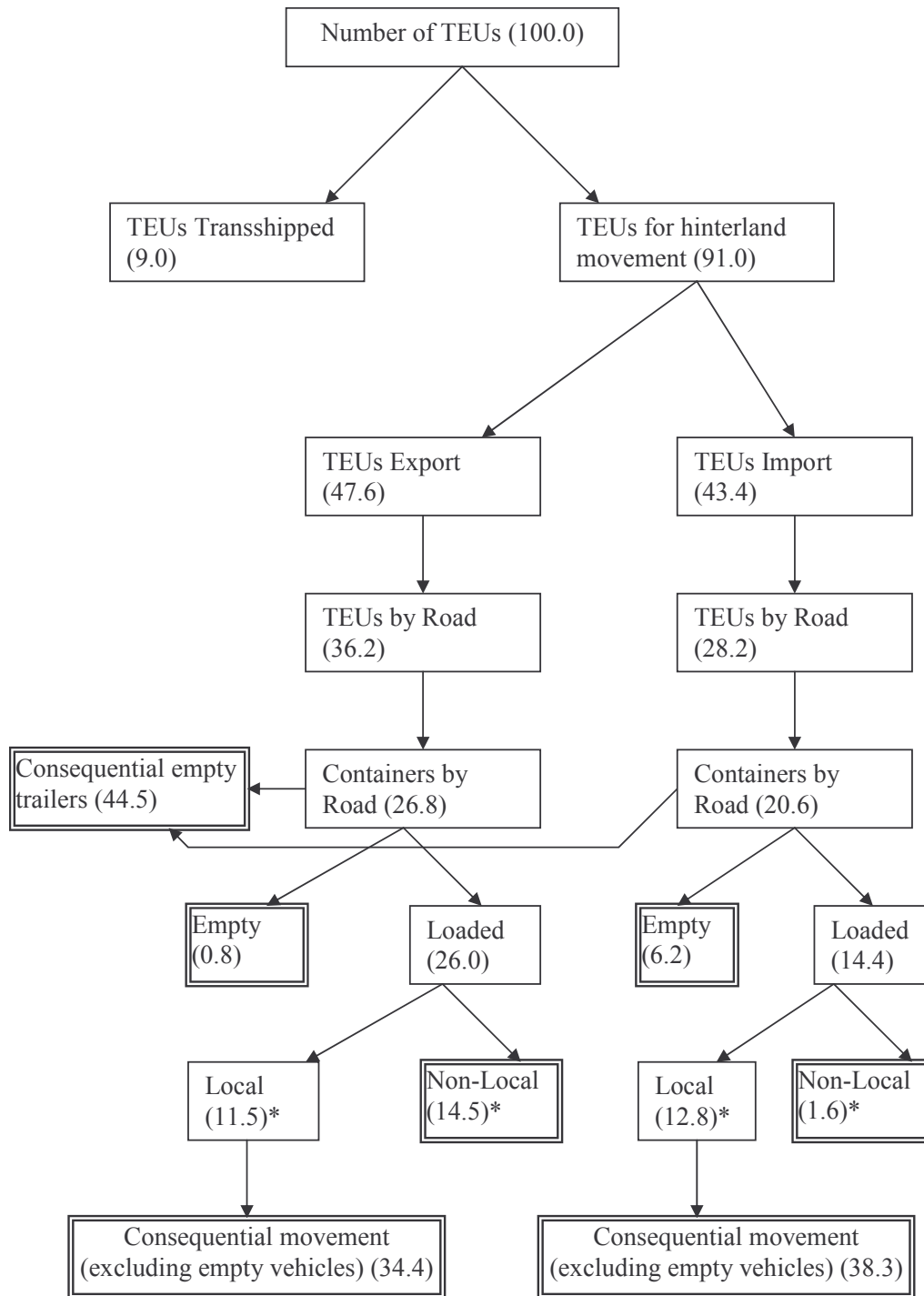
Source: [MANSA, 2005]

|                    | JNPCT      | NSICT      |
|--------------------|------------|------------|
| <b>Dedicated</b>   |            |            |
| 6 hours or Less    | 53         | 156        |
| >6 <8 hours        | 15         | 0          |
| >8<10 hours        | 2          | 0          |
| >10<12 hours       | 0          | 0          |
| > 12 hours         | 0          | 0          |
| <b>Sub Total</b>   | <b>70</b>  | <b>156</b> |
| <b>Mixed</b>       |            |            |
| 6 hours or Less    | 141        | 130        |
| >6 <8 hours        | 18         | 0          |
| >8<10 hours        | 6          | 0          |
| >10<12 hours       | 2          | 0          |
| > 12 hours         | 0          | 0          |
| <b>Sub Total</b>   | <b>167</b> | <b>130</b> |
| <b>Total</b>       | <b>237</b> | <b>286</b> |
| <b>Grand Total</b> |            | <b>523</b> |

Seven weeks January-February, 2005

Source: [MANSA, 2005]

**Exhibit 7: TEU to Road Traffic Conversion (Flow Chart)**



Source: [Author’s Analysis (\* based on MANSA, 2005; rest based on IPA, 2004)]

## TEU to Road Traffic Conversion (Spreadsheet)

|   |               |        |               | Remarks                            |
|---|---------------|--------|---------------|------------------------------------|
| <b>No of TEUs</b>   | <b>100.00</b> |        |               |                                    |
| TEUs Transhipped  | 8.99          |        |               | IPA, 2004                          |
| TEUs for hinterland movement  | 91.01         |        |               | IPA, 2004                          |
| Ratio of Export to Total hinterland                                     | 0.52          |        |               | IPA, 2004                          |
|   | Export        | Import |               |                                    |
| No of TEUs  | 47.64         | 43.37  |               |                                    |
|   |               |        |               |                                    |
| Proportion of TEUs by Rail ICD  | 0.24          | 0.35   |               | IPA, 2004                          |
| TEUs by Road  | 36.21         | 28.19  |               |                                    |
|   |               |        |               |                                    |
| <b>At the gate</b>  |               |        |               |                                    |
|   |               |        |               |                                    |
| Ratio of containers to TEUs   | 0.74          | 0.73   |               | IPA, 2004                          |
| No of containers by road  | 26.79         | 20.58  | 47.37         |                                    |
|   |               |        |               |                                    |
| Ratio of trailer movements to containers                                |               |        | 1.94          |                                    |
|   |               |        |               |                                    |
| <b>No of trailer movements through the gate</b>                         |               |        | <b>91.90</b>  |                                    |
|   |               |        |               |                                    |
| No of empty trailers  |               |        | 44.53         |                                    |
| No of loaded trailers   |               |        | 47.37         |                                    |
|   |               |        |               |                                    |
| Ratio of empty containers to total                                      | 0.03          | 0.30   |               | IPA, 2004                          |
| Empty containers  | 0.81          | 6.23   | 7.04          |                                    |
| Loaded containers   | 25.98         | 14.35  | 40.33         |                                    |
|   |               |        |               |                                    |
| <b>Outside the gate</b>   |               |        |               |                                    |
|   |               |        |               |                                    |
| Ratio of local CFS to total road movement                               | 0.44          | 0.89   |               | MANSA                              |
| Loaded container movements between gate and CFS                         | 11.48         | 12.77  |               |                                    |
| Commodity weight per container  | 16.55         | 16.78  |               |                                    |
|   |               |        |               |                                    |
| Ratio of consequential movements to/from CFS (excluding empty vehicles) | 3.00          | 3.00   |               | 2 for goods, 1 for empty container |
| Total consequential movements   | 34.44         | 38.31  | 72.76         |                                    |
| Total movements in the port vicinity (excluding empty vehicles)         |               |        | <b>164.66</b> |                                    |

Source: [Author's Analysis (\* based on MANSA, 2005; rest based on IPA, 2004)]

**Exhibit 8: Ongoing Projects**

|   | <b>Particulars</b>  | <b>Civil Contract Award Amount<br/>(Rs crs)</b> | <b>Status</b>   |
|---|---|---|---|
| 1 | Package 1: Four laning of NH-4B and NH-4  | 142.72  | 86.31 % of work has been completed up to 28 <sup>th</sup> February 2004 |
| 2 | Package 2: Four laning of SH-54 and construction of four lane Amra Marg including six lane major creek bridge across Panvel Creek | 127.21  | 0.93% of work completed up to February 2005                             |
|   | <b>Total</b>  | <b>269.93</b>                                   |   |

Source: [MJRCL, 2005]

The revised estimate for the above packages is Rs 358 crs. The above projects have been taken up under an SPV, "Mumbai-JNPT Port Road Co Ltd", which is financed as follows.

| <b>Particulars</b>                           | <b>Rs crs</b> | <b>Rs crs</b> |
|--|---------------|---------------|
| <i>Equity</i>                                |               | <i>146</i>    |
| NHAI   | 97            |               |
| JNPT   | 40            |               |
| CIDCO  | 9             |               |
|  |               |               |
| <i>Senior Debt by Financial Institutions</i> |               | <i>143</i>    |
|  |               |               |
| <i>Subordinate Debt</i>                      |               | <i>69</i>     |
| JNPT   | 60            |               |
| CIDCO  | 9             |               |
|  |               |               |
| <b>Total</b>                                 |               | <b>358</b>    |

Source: [JNPT, 2005]

## Exhibit 9: Immediate Proposals

| No | Particulars   | Present Block Estimate d Cost (including 3% contingencies) (Rs crs) | Status                   |                  |                            |
|----|---|---|--------------------------|------------------|----------------------------|
|    |   |   | Tendering                | Award of Work by | Completion Period (months) |
| 1  | a. Karal Junction widening & signalization<br>b. Improvement of CFS Junction<br>c. Improvement of Y Junction<br>d. Improvement of circulation inside port.  | 4.71  | February to May '05      | June '05         | 18                         |
| 2  | Additional container gates<br>a. Container gate structure   | 0.97  | February to May '05      | May '05          | 10                         |
|    | b. Roads and additional pavements for new container gates   | 0.99  | December to March '05    | April '05        | 10                         |
| 3  | Six laning of port road<br>a. Container road (3.5 kms) – Rs 7.00 crs<br>b. PUB-Karal Junction road (2.3 Kms) – Rs 5.50 crs.<br>c. Karal Junction to CFS road (500 mtrs) – Rs 0.52 crs<br>d. Widening of culvert over ONGC pipeline–Rs 1.1 crs | 14.12   | January to April '05     | May '05          | 15                         |
| 4  | Buffer yard development (14,000 sq mtrs area)   | 1.71  | December to February '05 | March '05        | 8                          |
| 5  | Development around CFS<br>a. Parking area opposite to CFS – Rs 2.45 crs.<br>b. New four lane road connecting SH-54 and CFS road – Rs 5.5 crs  | 7.95  | December to March '05    | April '05        | 8                          |
| 6  | Development of road for passenger corridor  | 1.05  | November '05             |                  |                            |
| 7  | New evacuation road from JNPT to NH-4   | 2.64  | November '05             |                  |                            |
| 8  | Parking facility behind PUB   | 1.64  | Awaiting CRZ clearance   |                  |                            |
| 9  | Electrical sub-station  | 1.03  | Provisional estimate     |                  |                            |
|    | <b>Total</b>  | <b>35.78</b>  |                          |                  |                            |

Source: [JNPT, 2005]

### 1a. Karal Junction widening and signalization

**Rationale:** Karal is one of the important intersections at the entry point of JNP area. The link between SH and NH should be established beyond the JNP area so that the Karal Junction remains free. As a short term measure rotary intersection has been planned which needs to be upgraded to a flyover/grade separated intersection.

1. Widening of road on both sides of the junction by about 2 to 4 m.
2. Improvement of the junction between NH-4 and SH-54 with larger turning radius.
3. Construction of new central verge as per new alignment SH-54.
4. Construction of new bus bays and auto rickshaw stand at NH-4 and SH-54 to avoid obstructions to through traffic.
5. Construction of island/channelisers for SH-54 to NH-4B movement.
6. Installation of traffic signals at the junction.
7. Construction of pedestrian footpath at the junction.

### 1b. Improvement of CFS Junction

**Rationale:** A large number of trips are originated and destined to nearby CFS. Out of the total traffic entering JNP area from NH and SH, about 35% turns to the CFS area.

1. Removing parking area from this location.
2. Resurfacing the road at junction.
3. Development of channelisers and central verges at the junction on roads leading to CFS and on port road.

### 1c. Improvement of Y Junction

**Rationale:** The main bottleneck on the container road is created because of parking of vehicles on the road near the check post and lacks of central verges and channelisers in the junction. 10 Ha parking area at this junction has been recommended to overcome the parking problem at the check post as well the Container gate. A petrol pump has been allotted at this junction where construction of island with large turning radius, approach road for petrol pump from both container and bulk road, and the parking area is recommended in improvement proposal.

### 1d. Improvement to circulation inside the port

**Rationale:** Traffic going from the gate to jetty is obstructed by turning of vehicles coming from NSICT and JNP to bulk gate road and to parking/ICD. Many transport operators park their vehicles in the middle of the road resulting into chaos.

Following measures have been suggested to counter this problem.

1. Segregation of incoming JNP and NSICT traffic, by diverting JNP traffic to left. (road adjacent to railway/ICD leading to bulk gate)
2. Traffic signals and central verges for the major junctions.

Vehicles coming to JNP from the gate can travel clockwise around the container stacking area. There will be only one-way movement on the both sides of bay No.5. The road in between the NSICT area and JNP area is having a divider. One side of this road will be used by JNP for coming out of the container yard while other side can be used by NSICT vehicles for going to container yard. The existing NSICT traffic circulation is already one way clockwise hence it need not be distributed.

In future, present parking area/gate for Maruti cars can be used for entry to the vehicles from NSICT to ICD will segregate the traffic of JNP and NSICT going to ICD resulting into smooth

traffic flow with the help of signalization. The shifting of central verges to suitable location and installation of island will further improve the traffic circulation.

One more traffic signal will be installed at the 'T' Junction near ICD helping in streamlining of traffic coming for jetty to ICD and JNP container yard to bulk gate as well as passenger movement from bulk gate to port operation offices. It is proposed that the JNP and container area will very well provided with road markings as well as signboards.

## 2. Additional container gates

**Rationale:** As far as land side traffic is concerned, the difference in the arrival rate on the approach road and the service time at the gate leads to queuing at the gates. From port side traffic point of view, the number of gates required at the container terminal depends on the container handling capacity of the stacking yard. JNP gates should be able to clear 180 vehicles per hour but the maximum number of vehicles cleared is 90 vehicles per hour through existing five gates. With the service time of 2.5 min per vehicle, seven gates are required.

With the conversion of bulk terminal into container terminal, JNPT may decide to move empty trucks, car carrier cargoes, and over dimension cargo through the container gates. In view of this, additional container gates will be required.

The cost estimates have been prepared with construction of additional gates with shifting of existing compound wall, heavy duty slab covers over the existing storm water nallah, road widening, paving for the parking area etc.

## 3. Six laning of port road

**Rationale:** The six laning of the port road has been proposed as the immediate improvements which will give some relief to the present traffic. Accordingly, the cost estimates for six laning has been proposed. The existing container road is four lane. For the operational efficiency, two lanes are given to NSICT and two lanes are being used by JN Port. Operating the vehicles on two undivided lanes can cause accidents and if a lane is blocked due to some reasons, the total traffic at the road gets hampered. So it is proposed to widen the container road to six lanes from Y Junction to container gate.

### 5a. Development of parking area in front of existing CFS

**Rationale:** There exists already reclaimed area of 2.0 Ha in front of the JNP CFS, which can be extended so as to convert it into a parking lot and the parked vehicles in front of existing CFS as well as CFS Junction can be shifted at this location. Thus, if this 5 Ha plot is developed, about 240 vehicles can be parked at this location.

### 5b. New road from CFS to SH-54

**Rationale:** About 30-35% total trips at Karal Junction are local trips generated from nearby CFS and destined to JNP CFS. Constructing a road joining CFS to SH-54, these vehicles can bypass Karal Junction and go to CFS directly. This will reduce the traffic entering at Karal Junction and CFS Junction. The proposed road can be four lane road and can be extended in future up to container terminal 1 and 2.

## 6. Development of road for the passenger corridor

**Rationale:** The passenger traffic is normally destined to customs building and JNP administrative building via port road and then bulk road. The through traffic gets affected because of turning of vehicles at this junction due to the traffic mainly to and from the township area. Closing the access to township at this junction will solve the problem, which can be accessed through the

passenger corridor. The present junction can cater to the emergency movement of containers giving access to the evacuation road.

It is proposed to segregate the passenger traffic at CFS Junction itself from the container traffic. All the passenger vehicles coming from Karal Junction will turn left at CFS Junction without allowing to go straight and will use existing road passing between the pipelines. Vehicles going to customs office and PUB can turn right and park at existing parking lot near the customs building by crossing the port road in front of PUB Junction.

Approach road for going to JNP administrative building and Y Junction parking lots from this pipeline road also will be built and traffic movement will be very smooth, fast and mainly safe not allowing permission for commercial vehicles through this road. This road should be resurfaced and street furniture like signages, street lights etc. can be installed.

#### **7. New evacuation road from JNPT to NH-4**

**Rationale:** There is only one road which connects to National Highway network of India. In case of emergency another evacuation road is required. A road from tank area crossing the railway line and meeting to the junction of SH-54 and NH-4B has been envisaged and the cost estimates for the same have been prepared.

#### **8. Parking facility behind the PUB**

**Rationale:** The large number of two wheelers and cars park at PUB and at customs building. It is suggested that a separate parking lot for two wheeler (in front of customs building) and car parking should be created so that the parking of these vehicles is systematic. Accordingly, a parking area has been designed behind each of PUB and customs, which can accommodate about 110 car parks.

#### **9. Electric sub-station**

**Rationale:** The parking area, road widening etc. involves the area lighting arrangement. Hence, the street lighting for the roads and high mast lights for the parking area has been proposed. As per the electric department, these proposals will involve additional source development. The cost of electric source development as mentioned by the electrical department, JNP has been incorporated as part of the immediate improvements.

Source: [TPA, 2005]



**Exhibit 10: Short Term Proposals**

| No | Particulars  | Estimated Amount<br>(Rs crs) |
|----|--|------------------------------|
| 1  | Signalisation of CFS Junction                            | 0.12                         |
| 2  | Eight laning of port road from Karal to Y Junction       | 5.19                         |
| 3  | Passenger corridor box                                   | 0.78                         |
| 4  | PUB Junction signalization                               | 0.14                         |
| 5  | Passenger car parking near 3 <sup>rd</sup> Terminal gate | 2.51                         |
| 6  | Road to administration building                          | 0.51                         |
|    | <b>Total</b>   | <b>9.97</b>                  |
|    | Add 3% contingencies                                     | 0.30                         |
|    | Add 3% for detailed design and PMC charges               | 0.30                         |
|    | <b>Grand Total</b>                                       | <b>10.57</b>                 |

Source: [JNPT, 2005]

These proposals are to cater to the increased traffic due to the third container terminal, ie when the total traffic is expected to go upto four million TEUs.

### 1. Signalization of CFS Junction

**Rationale:** The CFS signal will segregate the traffic to various destinations as well as by vehicle type i.e container traffic to terminal 1, 2 and 3 will be bifurcated from this junction. Similarly, the passenger movement and the movement of tank farm vehicles will also be segregated from this junction. Hence the junction has been proposed for the signalization.

### 2. Eight laning of port road from Karal to Y Junction

**Rationale:** Based on the traffic flow observations after the improvement in the immediate improvement phase, if the need is felt then the existing road can be widened to eight lanes. This will also operationally help segregating the container terminal 1, 2 and 3 traffic.

Out of eight lanes, four lanes will be exclusively used for third terminal. The remaining four lanes will be used for traffic from terminal 1 and 2. Suitable road dividers will be constructed for this segregation.

### 3. Passenger corridor box

**Rationale:** Mixing of passenger and commercial vehicles leads to accident.

In the immediate improvement plan, the exclusive passenger road is connected to bulk road due to commission of traffic from third terminal. It is also proposed to construct an underpass below the bulk road to connect passenger road to JNP administrative building for cross movement of passenger traffic going to JNP administrative building. Existing level of passenger road/and nearby ground is much lower than the level of bulk road, hence there will not be any difficulty in constructing a box culvert type underpass. A two lane divided carriage way with vertical clearance of 5.5 m has been proposed.

### 4. PUB Junction signalization

**Rationale:** Signals at PUB Junction will provide safety for the cross movement of passenger vehicles going to customs office.

### 5. Passenger car parking near third terminal gate

**Rationale:** Use of personal vehicles to the terminal 1, 2 and 3 should be restricted to avoid accidents. Near to the ROB/bulk gate location shuttle service can be started so that passenger vehicles can be parked near the ROB. The triangular portion near ROB has been designed to accommodate parking of personal vehicles and shuttle service bus-bays etc.

#### **6. Road to administrative building**

The passenger corridor will continue below the bulk road and travel up to the administrative building. The cost of developing this road has been taken in to consideration as the short term proposal.

Source: [TPA, 2005]

**Exhibit 11: Future Proposals**

| <b>No</b> | <b>Particulars</b>  | <b>Estimated Amount (Rs crs)</b> |
|-----------|---|----------------------------------|
| 1         | Obstructions in widening of SH-54 <sup>1</sup>  |                                  |
| 2         | Linking of NH-4 and NH-8 bypassing Thane  |                                  |
| 3         | Shifting of integrated water supply line parallel to SH-54 and taking water from CIDCO <sup>1</sup> |                                  |
| 4         | Revision of development plan for Navi Mumbai (appointment of CIDCO as nodal agency)                 |                                  |
| 5         | Linking of NH-4 and NH-8 bypassing Mumbra <sup>1</sup>  | 72.0                             |
| 6         | Second link to JN Port <sup>1</sup>   | 168.0                            |
| 7         | Upgradation of Khopta Bridge and link road to NH-17 <sup>1</sup>                                    | 35.0                             |
| 8         | Construction of two grade separated junctions <sup>1</sup>  | 80.0                             |
| 9         | Six laning of NH-4B <sup>1</sup>  |                                  |
| 10        | Extension of NH-4B towards south <sup>1</sup>   |                                  |
| 11        | Six laning of NH-4 from Kalamboli to Mumbra (add two lane for separate access) <sup>1</sup>         | 50.40                            |
| 12        | Strengthening and widening of NH-17 <sup>1</sup>  | 51.0                             |
| 13        | Road infrastructure in Dronagiri Node <sup>1</sup>  | 74.0                             |
| 14        | Truck terminals in Dronagiri Node <sup>1</sup>  |                                  |
| 15        | Empty container yard along side SH-54 and NH-4B <sup>1</sup>  |                                  |
| 16        | Extension of NH-4B towards Dronagiri Node <sup>1</sup>  |                                  |
| 17        | Gavan Phata Chirner Road (SH-81) <sup>2</sup>   | 21.12                            |
| 18        | Khoproli Kelawane Sai Road (SH-85) <sup>2</sup>   | 18.36                            |
| 19        | Dastan Phata Dighode Ransai Road (MDR-5) <sup>2</sup>   | 18.60                            |
|           | <b>Total</b>  | <b>514.48</b>                    |

Source: [<sup>1</sup> JNPT, 2005], [<sup>2</sup> TransIndia, 2005]

**Exhibit 12: CFS Infrastructure**

| <b>Existing CFSs</b>   | <b>Ownership</b> | <b>Land</b> | <b>Reach Stackers</b> | <b>Trailers</b> |
|--|------------------|-------------|-----------------------|-----------------|
| Maersk CFS   | Private          | CIDCO       | 5                     | 70              |
| Gateway Distriparks Ltd (GDL)                                    | Private          | CIDCO       | 7                     | 80              |
| United Liner (ULA)   | Private          | CIDCO       | 2                     | 20              |
| TransIndia Logistics Park (TLP)                                  | Private          | Private     | 4                     | 55              |
| Seabird Marine Services Pvt Ltd                                  | Private          | CIDCO       | 2                     | 25              |
| <b>Sub Total – 1</b>   |                  |             | <b>20</b>             | <b>250</b>      |
| Balmer Lawrie & Co Ltd (BL)                                      | Public           | CIDCO       | 0                     | 0               |
| Punjab Conware (PNC)   | Public           | CIDCO       | 0                     | 0               |
| Concor (DRT)   | Public           | CIDCO       | 3                     | 25              |
| JNP Import CFS – CWC   | Public           | CIDCO       | 4                     | 33              |
| CWC Distripark   | Public           | CIDCO       | 2                     | 25              |
| <b>Sub Total – 2</b>   |                  |             | <b>9</b>              | <b>83</b>       |
| CWC Dronagiri  | Public           | CIDCO       | 3                     | 40              |
| CWC Kalamboli  | Public           | CIDCO       | 0                     | 0               |
| <b>Sub Total - 3</b>   |                  |             | <b>3</b>              | <b>40</b>       |
| <b>Total</b>   |                  |             | <b>32</b>             | <b>373</b>      |
|  |                  |             |                       |                 |
| <b>New CFSs</b>  |                  |             |                       |                 |
| Maharashtra State Warehousing Corporation                        | Public           | CIDCO       |                       |                 |
| Natvar Parikh Industries Ltd                                     | Private          | CIDCO       |                       |                 |
|  |                  |             |                       |                 |
| <b>Proposed CFSs</b>   |                  |             |                       |                 |
| Ameya Logistics (Evergreen)                                      | Private          | Private     |                       |                 |
| Continental Warehousing Corporation (Nhava Sheva) Ltd (CWCL)     | Private          | Private     |                       |                 |
| Forbes Patvolk Container Terminal (Presently Empty Storage Yard) | Private          | Private     |                       |                 |

(as in December 2004)

Source: [III-C, 2004]

Exhibit 13: CFS Import Handling Capacities

| CFS                             | Plot Area<br>(sq mtrs) | Stack<br>Area<br>(sq mtrs) | Ground<br>Slots<br>TEUs <sup>1</sup> | Expansion<br>12 months<br>(sq mtrs) | Ground<br>Slots<br>TEUs <sup>1</sup> | Estimated Stack<br>Capacity<br>TEUs <sup>2</sup> |
|---------------------------------|------------------------|----------------------------|--------------------------------------|-------------------------------------|--------------------------------------|--|
| Maersk CFS                      | 68,000                 | 45,000                     | 900                                  | 43,000                              | 860                                  | 3,010  |
| Gateway Striparks Ltd (GDL)     | 125,900                | 88,730                     | 1,775                                | 0                                   | 0                                    | 0  |
| United Liner (ULA)              | 20,000                 | 10,000                     | 200                                  | 0                                   | 0                                    | 0  |
| TransIndia Logistics Park (TLP) | 42,850                 | 32,000                     | 640                                  | 0                                   | 0                                    | 0  |
| Seabird Marine Services Pvt Ltd | 25,000                 | 18,000                     | 360                                  | 0                                   | 0                                    | 0  |
| <b>Sub Total - Group A</b>      | <b>281,750</b>         | <b>193,730</b>             | <b>3,875</b>                         | <b>43,000</b>                       | <b>860</b>                           | <b>3,010</b>                                     |
| Balmer Lawrie & Co Ltd (BL)     | 90,000                 | 73,500                     | 1,100                                | 0                                   | 0                                    |  |
| Punjab Conware (PNC)            | 10,700                 | 50,000                     | 1,000                                | 0                                   | 0                                    |  |
| Concor (DRT)                    | 105,000                | 61,500                     | 1,230                                | 60,000                              | 1,200                                | 4,200  |
| JNP Import CFS – CWC            | 215,000                | 70,500                     | 1,225                                | 0                                   | 0                                    | 0  |
| CWC Distripark                  | 125,000                | 25,000                     | 550                                  | 0                                   | 0                                    | 0  |
| <b>Sub Total - Group B</b>      | <b>545,700</b>         | <b>280,500</b>             | <b>5,105</b>                         | <b>60,000</b>                       | <b>1,200</b>                         | <b>4,200</b>                                     |
| CWC Kalamboli                   | 90,000                 | 10,000                     | 200                                  | 0                                   | 0                                    | 0  |
| CWC Dronagiri                   | 195,000                | 45,000                     | 850                                  | 0                                   | 0                                    | 0  |
| <b>Sub Total - Group B1</b>     | <b>285,000</b>         | <b>55,000</b>              | <b>1,050</b>                         | <b>0</b>                            | <b>0</b>                             | <b>0</b>   |
| <b>Total all CFS's</b>          | <b>1,112,450</b>       | <b>529,230</b>             | <b>10,030</b>                        | <b>103,000</b>                      | <b>2,060</b>                         | <b>7,210</b>                                     |

Note: <sup>1</sup> One TEU per 50 sq mtrs

<sup>2</sup> 3.5 TEUs per ground slot  
(as in December 2004)

Source: [III-C, 2004]

Exhibit 14: CFS Export Handling Capacities

| CFS                             | W/H Area<br>sq mtrs | Usable<br>W/H Area<br>sq mtrs | Capacity<br>TEU/month <sup>1</sup> | Actual<br>Exports<br>TEUs/month<br>(Sept, 2004) | W/H<br>Expansion<br>6 months<br>sq mtrs | Capacity<br>TEU/month <sup>1</sup> | W/H<br>Expansion<br>12 months<br>sq mtrs | Capacity<br>TEU/month <sup>1</sup> |
|---------------------------------|---------------------|-------------------------------|------------------------------------|---|---|------------------------------------|--|------------------------------------|
| Maersk CFS                      | 10,000              | 5,000                         | 1,750                              | 2,000   | 0                                       | 0                                  | 7,000                                    | 2,450                              |
| Gateway Striparks Ltd (GDL)     | 34,000              | 17,000                        | 5,950                              | 3,440   | 6,300                                   | 2,205                              | 0  | 0                                  |
| United Liner (ULA)              | 5,400               | 2,700                         | 945                                | 668   | 0                                       | 0                                  | 5,000                                    | 1,750                              |
| TransIndia Logistics Park (TLP) | 4,650               | 2,325                         | 815                                | 353   | 9,750                                   | 3,410                              | 0  | 0                                  |
| Seabird Marine Services Pvt Ltd | 9,000               | 4,500                         | 1,575                              | 0   | 0                                       | 0                                  | 0  | 0                                  |
| <b>Sub Total - Group A</b>      | <b>63,050</b>       | <b>31,525</b>                 | <b>11,035</b>                      | <b>6,461</b>                                    | <b>16,050</b>                           | <b>5,615</b>                       | <b>12,000</b>                            | <b>4,200</b>                       |
| Balmer Lawrie & Co Ltd (BL)     | 6,500               | 3,250                         | 1,135                              | 463   | 0                                       | 0                                  | 0  | 0                                  |
| Punjab Conware (PNC)            | 36,000              | 18,000                        | 6,300                              | 645   | 0                                       | 0                                  | 0  | 0                                  |
| Concor (DRT)                    | 6,200               | 3,100                         | 1,085                              | 1,235   | 0                                       | 0                                  | 27,000                                   | 9,450                              |
| JNP Import CFS – CWC            | 0                   | 0                             | 0                                  | 0   | 0                                       | 0                                  | 0  | 0                                  |
| CWC Distripark                  | 17,000              | 8,500                         | 2,975                              | 2,189   | 0                                       | 0                                  | 0  | 0                                  |
| <b>Sub Total - Group B</b>      | <b>65,700</b>       | <b>32,850</b>                 | <b>11,495</b>                      | <b>4,532</b>                                    | <b>0</b>                                | <b>0</b>                           | <b>27,000</b>                            | <b>9,450</b>                       |
| CWC Kalamboli                   | 18,500              | 9,250                         | 3,235                              | 852   | 0                                       | 0                                  | 0  | 0                                  |
| CWC Dronagiri                   | 52,000              | 26,000                        | 9,100                              | 6,773   | 0                                       | 0                                  | 0  | 0                                  |
| <b>Sub Total - Group B1</b>     | <b>70,500</b>       | <b>35,250</b>                 | <b>12,335</b>                      | <b>7,625</b>                                    | <b>0</b>                                | <b>0</b>                           | <b>0</b>                                 | <b>0</b>                           |
| <b>Total all CFS's</b>          | <b>199,250</b>      | <b>99,625</b>                 | <b>34,865</b>                      | <b>18,618</b>                                   | <b>16,050</b>                           | <b>5,615</b>                       | <b>39,000</b>                            | <b>13,650</b>                      |

Note: <sup>1</sup> 35 teu per month for 100 sq mtrs of CFS space

Thus, expansion to the tune of 55000 sq mtrs, with a possible throughput of 19000 TEUs per month is on the anvil (as in December 2004)

Source: [III-C, 2004]

**Exhibit 15: Cost of CFS in and outside CIDCO Land**

|                                   | <b>Proposed CFS<br/>outside CIDCO</b> | <b>Proposed CFS in<br/>CIDCO</b> | <b>Existing CFS at<br/>Dronagiri (CIDCO)</b> |
|-----------------------------------|---------------------------------------|----------------------------------|--|
| Land (acres)                      | 10                                    | 10                               | 6  |
| Land rate (Rs crs per<br>acre)    | 0.25                                  | 2.00                             | 1.25   |
| Cost of land (Rs crs)             | 2.5                                   | 20                               | 7.5  |
| Additional facilities (Rs<br>crs) | 10                                    | 10                               | 12.50  |
| Total Cost of Project<br>(Rs crs) | 12.5                                  | 30                               | 20   |

Source: [Maroo, 2005]

Maroo, 2005. Private correspondence from Mr Raj Maroo, MD, Mangalam Shipping & Logistics Pvt Ltd, Mumbai.

Exhibit 16: JNPT Layout

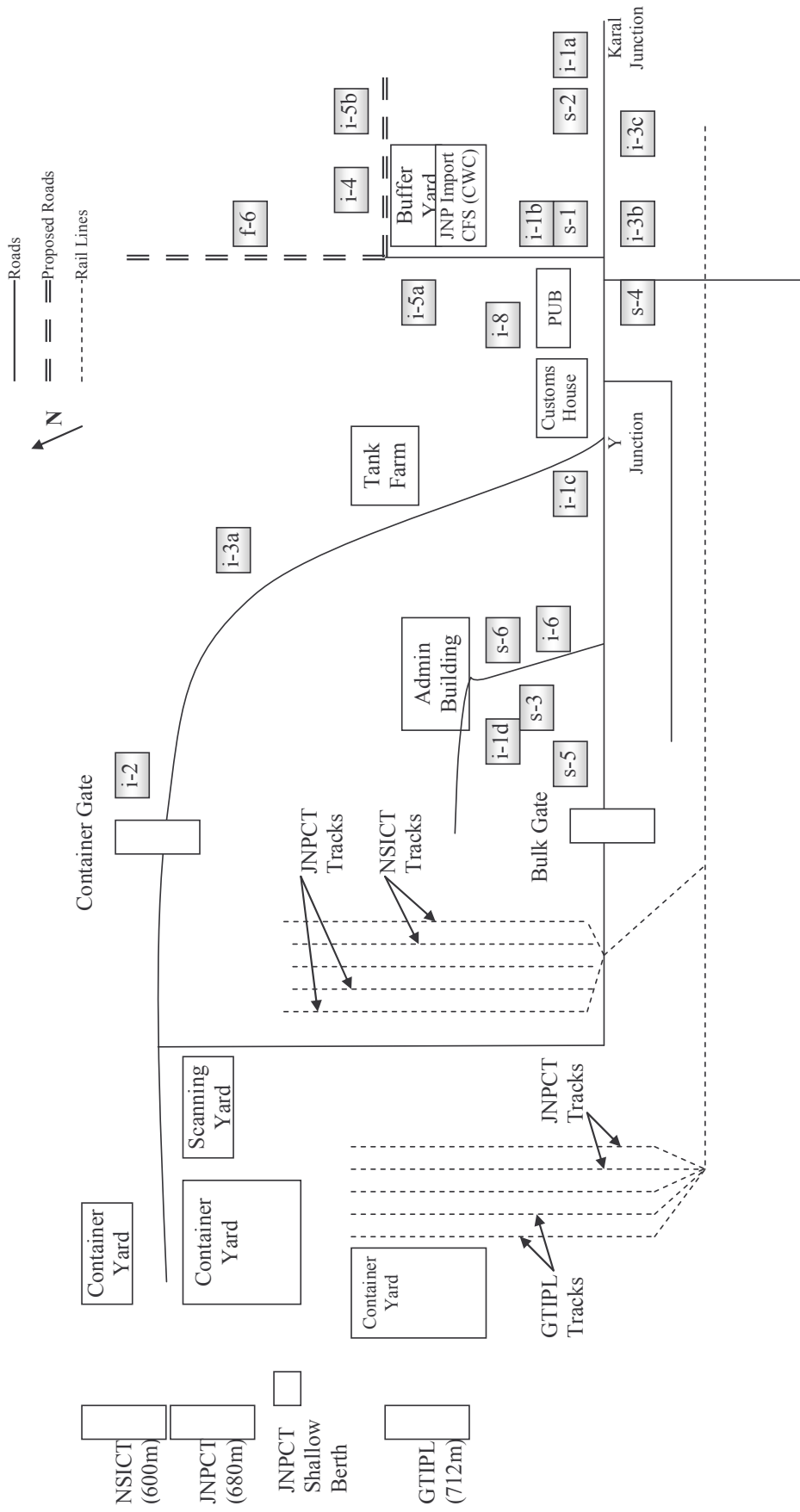
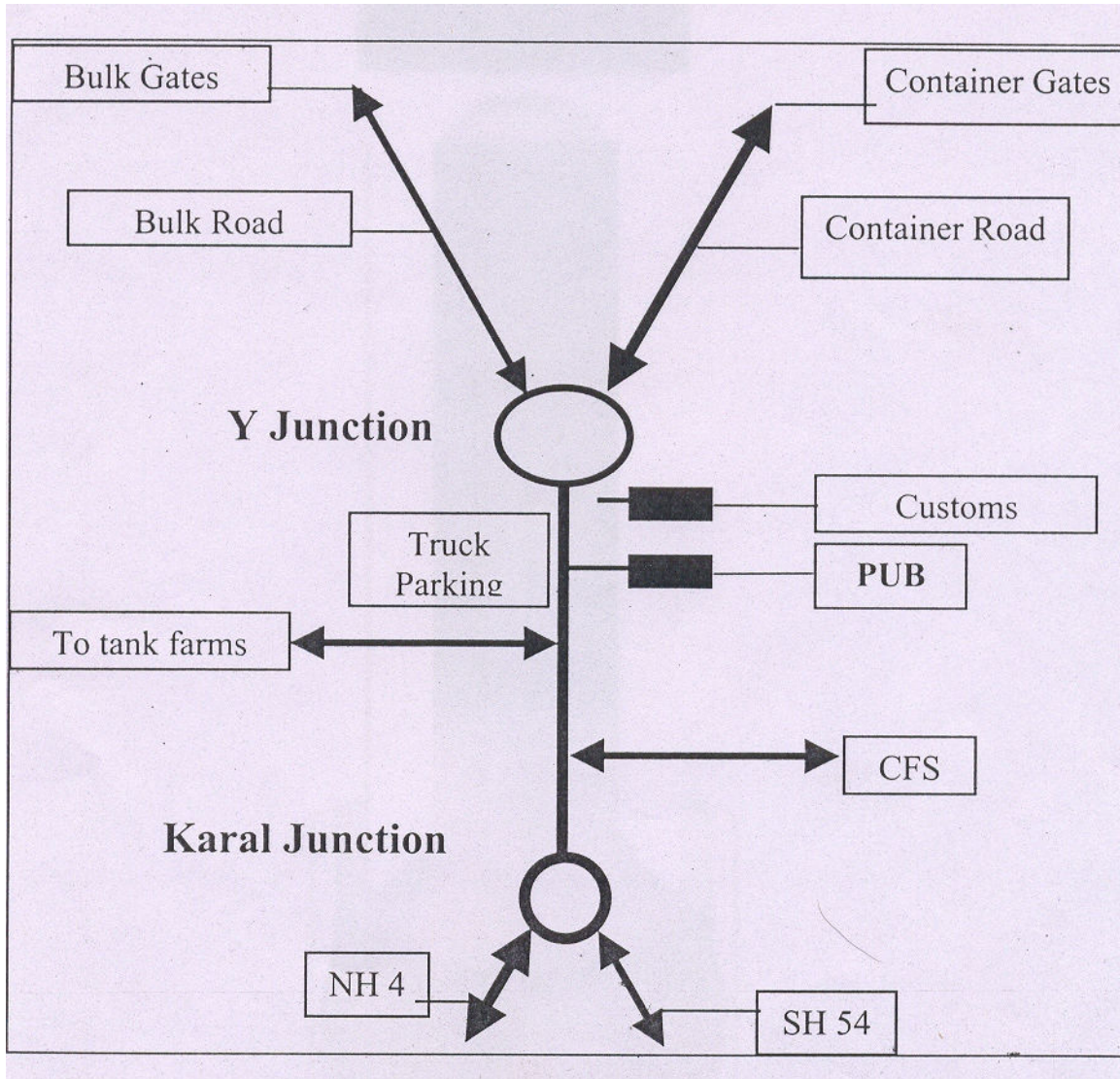




Exhibit 17: JNPT Y Junction to Karal Junction



Source: [TPA, 2004]

Exhibit 18: JNPT CFS Vicinity

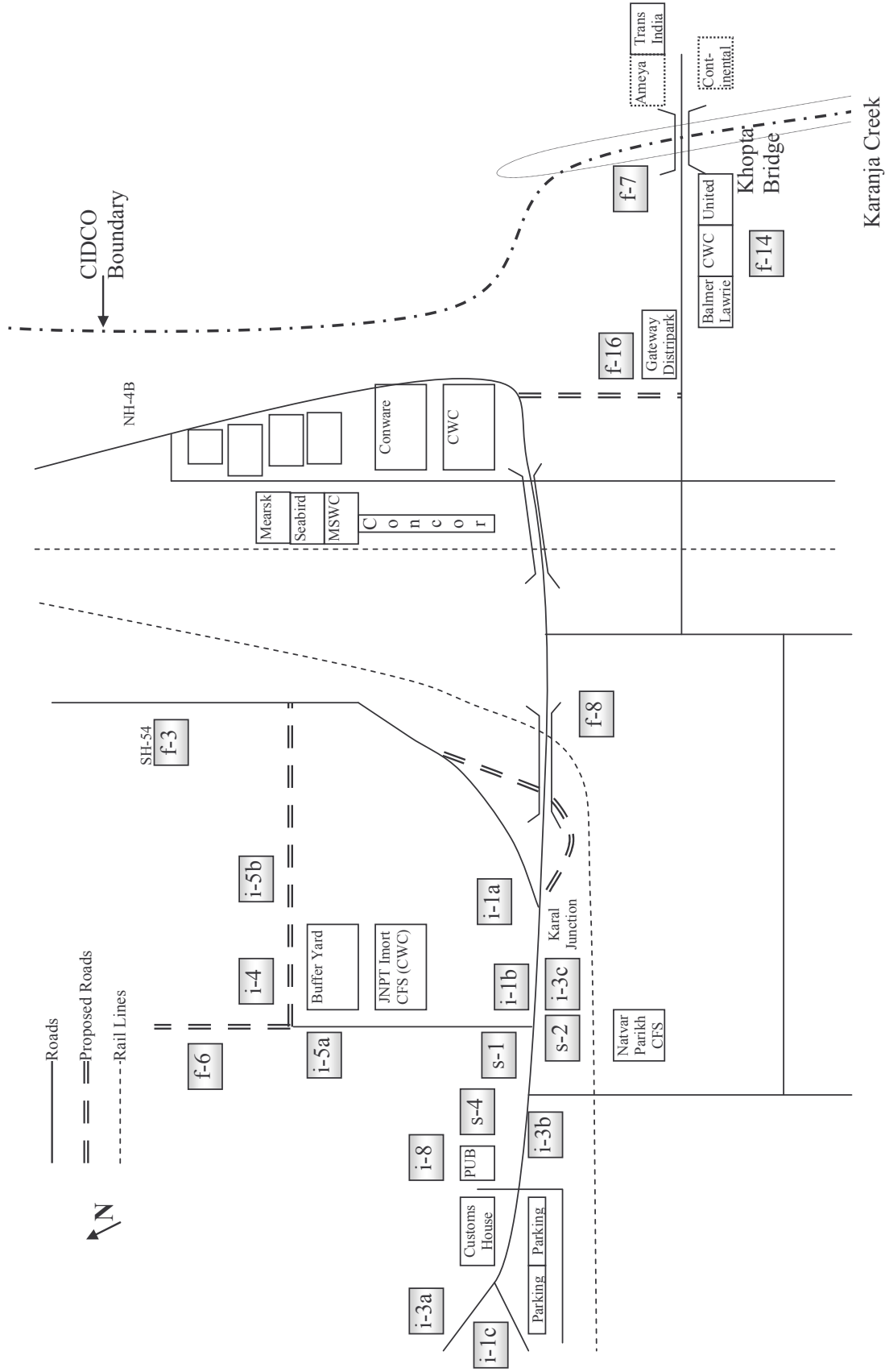
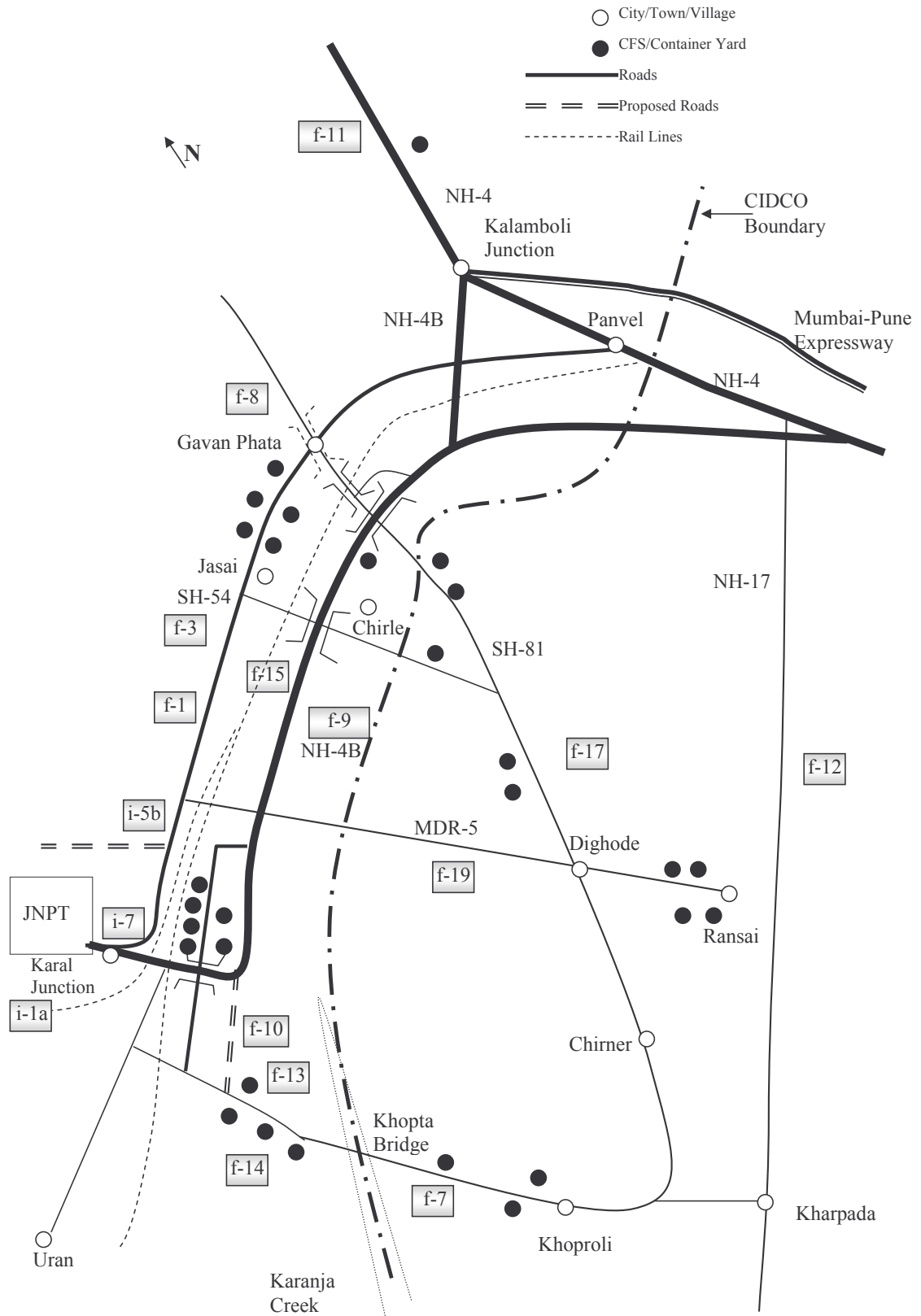


Exhibit 19: JNPT Vicinity



**Exhibit 20: JNPT Regional Road Connectivity**

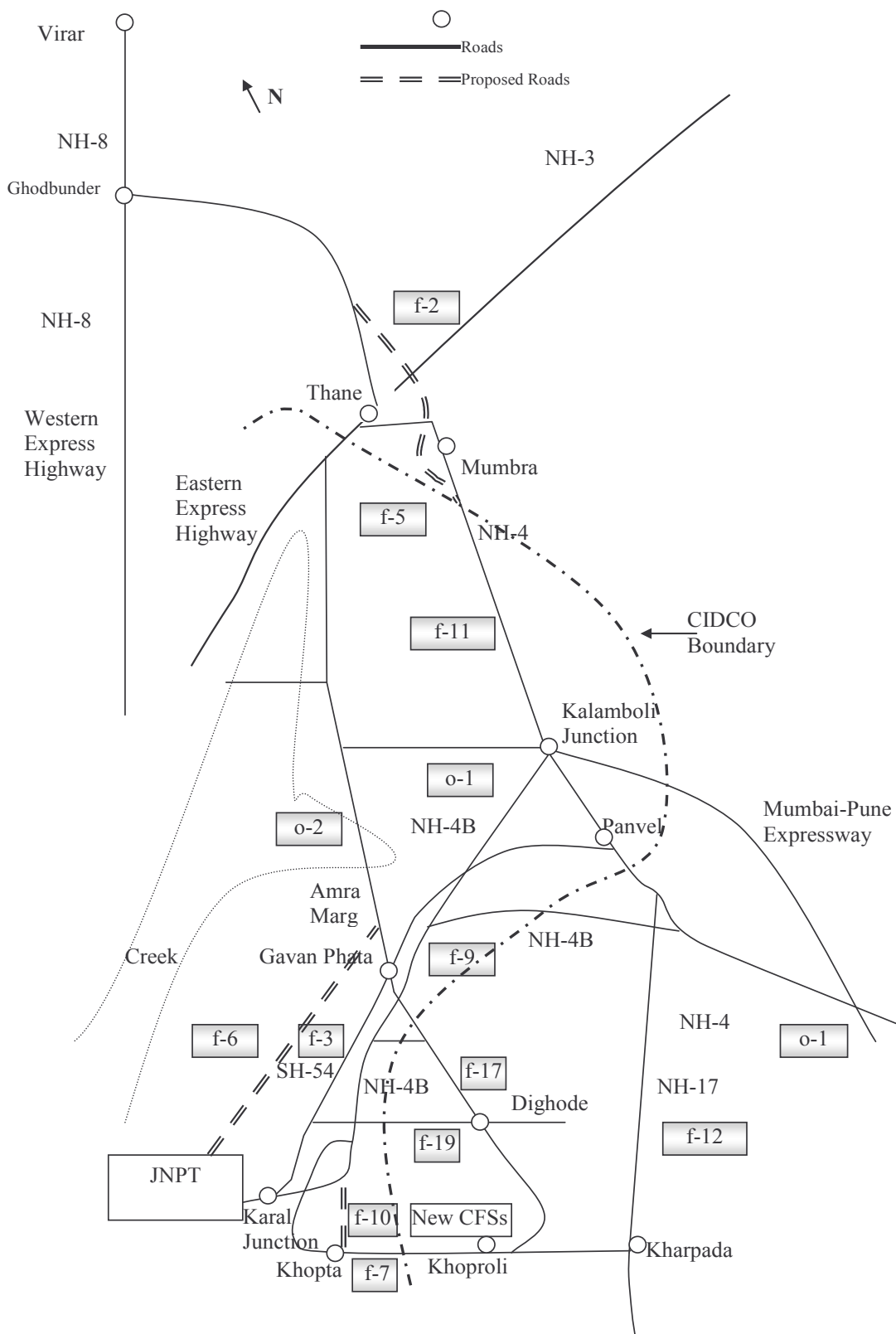
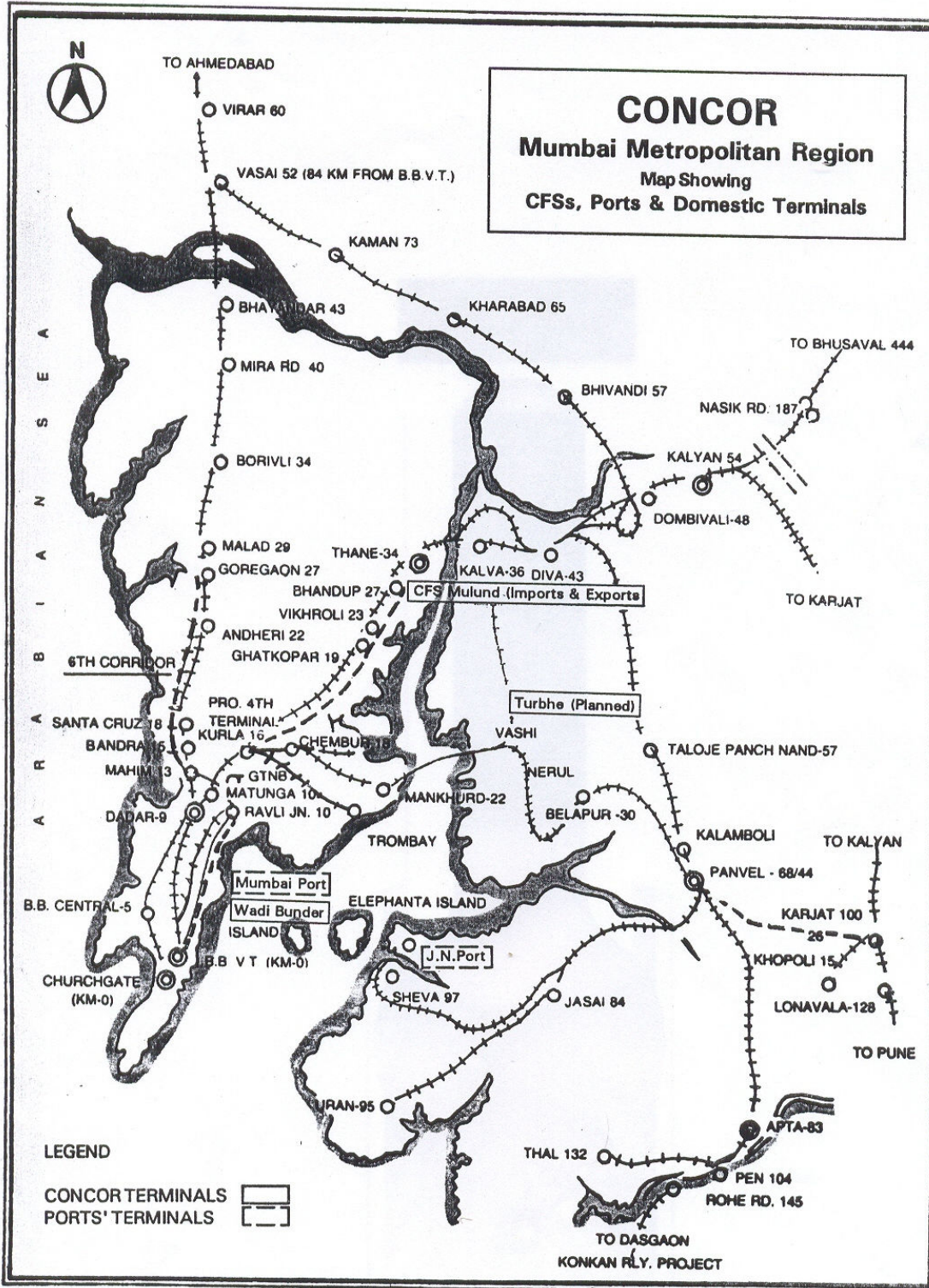


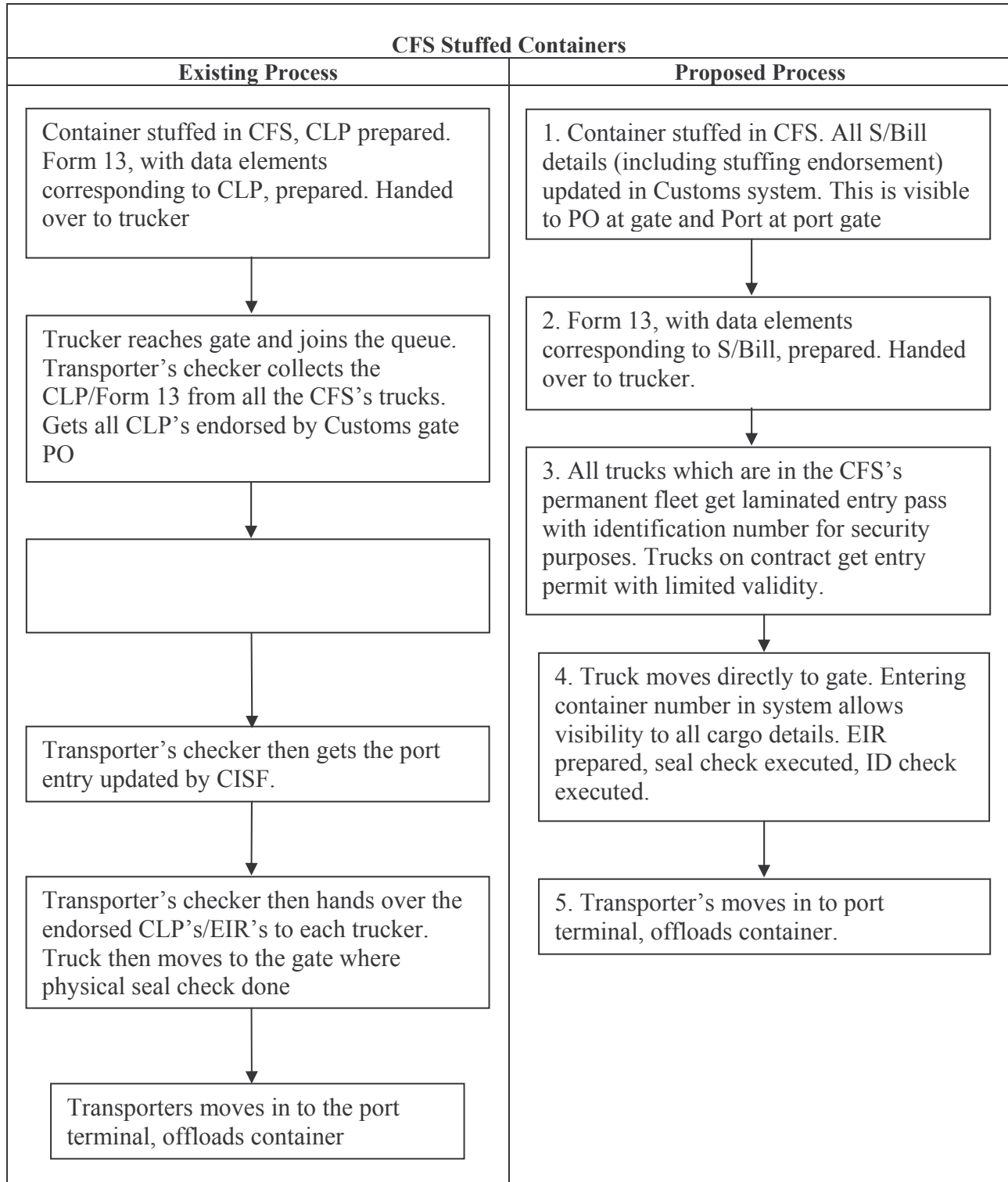


Exhibit 21: JNPT Rail Network



Source: [CONCOR, 2005]

**Exhibit 22: Customs Processes**

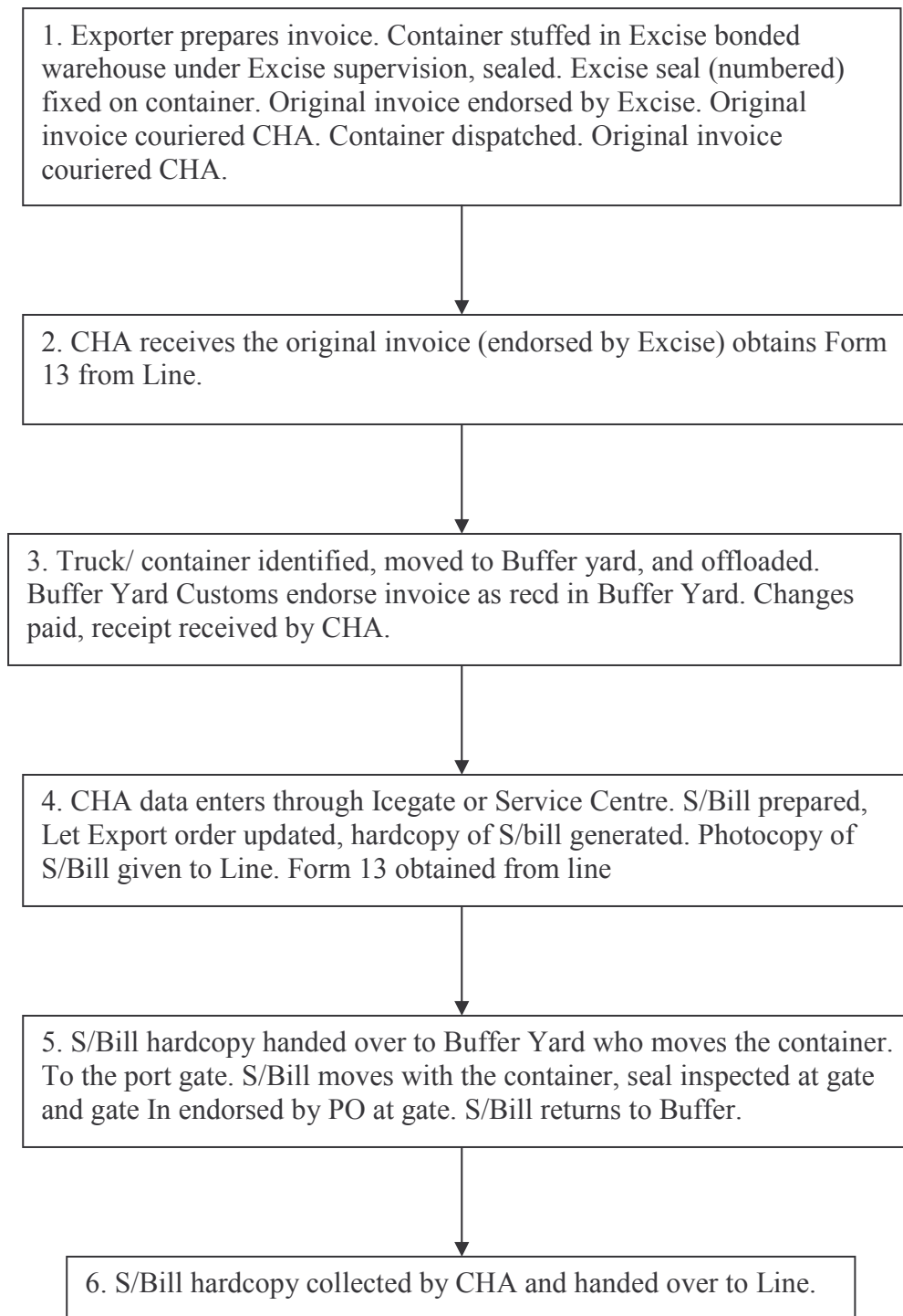


Source: [III-C, 2005]

| <b>Factory Stuffed Containers</b>   |  |
|---|--|
| <b>Existing Process</b>   | <b>Proposed Process</b>  |
| <p>1. Exporter prepare invoice. Sends a copy to CHA. Container stuffed in Excise bonded ware house under Excise supervision, sealed. Excise seal (numbered) fixed on container. Original Invoice endorsed by Excise. Excise Seal number informed CHA. Original invoice couriered CHA. Container despatched.</p> | <p>1. Exporter prepare Invoice. Sends copy to CHA. Container stuffed in Excise bonded warehouse under Excise supervision, sealed. Excise seal (numbered) fixed on container. Original invoice endorsed by Excise. Excise seal number informed CHA. Original invoice couriered CHA. Container despatched.</p> |
| <p>2. CHA receives copy invoice, Excise seal number. Data enters details through Icegate or Service Centre. Generates checklist. Receives original invoice, endorsed by Excise. <i>These activities could predate or antedate actual arrival of container.</i></p>  | <p>2. CHA receives copy invoice, Excise seal number. Data enters details through Icegate or Service Centre. Generates checklist. Receives original invoice, endorsed by Excise. <i>These activities could predate or antedate actual arrival of container.</i></p>   |
| <p>3. Truck / container identified and instructed move to Gate. Form 13 issued by CHA/ Line. PO at gate checks seal number on container, endorses the original invoice and the Checklists as gated in. <i>No Customs Systems update at gate.</i></p>  | <p>Customs /Port Checkpoint (before entering Container Road) check whether document in system. <i>If document not in system, truck/ container directed to Buffer Yard. If document in system, truck allowed to proceed.</i></p>  |
| <p>4. Hardcopy original invoice (endorsed by gate PO), Check list (endorsed by gate PO) given to appraiser or appropriate Customs Officer at JNPCH or any CFS in Nhava Sheva. Let Export Order updated in Customs system. Hardcopy S/Bill with Let export generated</p>   | <p>3. Form 13 issued CHA/Line. PO at gate checks seal number on container, endorses the original invoice and the checklist as gated In. Customs systems update on gate in at gate or locations close to gate</p>   |
| <p>5. S/Bill Hardcopy handed over to shipping Line by CHA</p>   | <p>4. S/Bill updated in Customs system triggered by the gate in report. Let Export Order updated in System. Hardcopy S/Bill with Let export order generated</p>  |
|   | <p>5. S/Bill Hardcopy handed over to shipping Line by CHA</p>  |

Source: [III-C, 2005]

### Buffer Yard Containers: Existing (and Proposed) Process



Source: [III-C, 2005]



### Appendix 1: CWC Labour Issue

Nhava Sheva Bandar Kamgar Sanghatana had filed a petition in high court about the unemployment of the registered workers of Clearing Forwarding Unprotected Dock Labour Board. Union of India and 24 others were the respondents.

According writ petition 4306 of 2004 the High Court of Judicature at Bombay passed minutes of the Order on 29<sup>th</sup> July 2004 to direct state government to consult with Advisory committee and take decision on, which case is applicable for respondents 7 to 19. A committee had been constituted by Government of Maharashtra with Minister of Labour as the Chairman. As per directions by High court all the concerned parties (headed by advisory committee) are allowed to file their written representation. The first meeting was convened on 4-1-2005 and the second was on 13-1-2005. The petitioner was also invited for the meeting. The following decisions were unanimously taken by the committee.

1. The list of registered workers (Clearing Forwarding Unprotected Dock Labour Board-presently no work) with their photographs will be prepared.
2. They will be given work in new coming CFS around Nhava Sheva-Dronagiri area
3. These new CFS will be registered as employer with (Clearing Forwarding Unprotected Dock Labour Board-presently no work).
4. So the present CFS will not get affected.

Government considered the matter. Since the problem of unemployment could be resolved to some extent, the petitioner agreed to withdraw the petition. The recommendations should be implemented accordingly.

#### Container Freight Station

TransIndia Logistic Park and Central Warehousing Corporation are two organizations for managing and operating the container freights at Jawaharlal Nehru Port. Because of the labor issue TransIndia Logistic Park charges more tariff than the latter.

#### CWC (Central Warehousing Corporation)

The Central Warehousing Corporation came in to being in 1989 for taking up the work of managing and operating the container freight station at JNP. CWC has been accredited with ISO-9001 and ISO-14001 certification for the CFS being operated in JN Port area.

The centre wise break up of the capacity as under.

| Name of the Centre            | Covered Area<br>(sq mtrs) | Open Area<br>(sq mtrs) | Capacity<br>(tons) |
|-------------------------------|---------------------------|------------------------|--------------------|
| CFS, JNP                      | 34,000                    | 70,500                 | 1,15,325           |
| CFS, Dronagiri                | 50,500                    | 54,550                 | 1,60,125           |
| Buffer Container Yard, JNP    |                           | 40,000                 | 50,000             |
| CWC Distripark, Dronagiri     | 16,500                    | 50,000                 | 1,18,360           |
| CFS, Kalamboli                | 17,200                    | 32,200                 | 78,750             |
| Logistics Park (30 Ha) D'Node |                           | 23,400                 | 43,578             |

### **New Projects**

CWC has also purchased 30ha of additional land for establishing Railside Logistics Park for facilitating the handling and movement of Import/Export containers through rakes.

- Traffic comes from both terminals – JNPCT and NSICT
- In September CWC tender was scrapped because there were only two bidders.
- More than 420 workers
- Unable to withstand competition
- Tariff 40% less than other CFSs due to TAMP
- Piecemeal extensions by High court

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### **Advisory Committee**

As per the Advisory Committee meeting convened on 13/01/2005, the unanimous decisions taken were to prepare the list of registered workers along with their photographs of Clearing Forwarding Unprotected Dock Labour Board to whom no work is available. The workers from this list who are available will be provided work in new coming CFS (Container Freight Station) around Nhava Sheva-Dronagiri area. These new CFSs will be registered as the employer with Clearing Forwarding Unprotected Dock Labour Board. In view of this, the present system of getting work done in present CFS through different respective Mathadi Boards will be continued without any disturbance and status quo should be maintained. Since the recommendations made by the Advisory committee were acceptable by the petitioner, he agreed to withdraw the petition 4306 of 2004. The recommendations of the Advisory Committee will be implemented accordingly.

Source: [CWC, 2005]

## **Appendix 2: Arbitration Issues between JNPCT and NSICT**

Jawaharlal Nehru Port (JN Port) has commenced arbitration procedures over four vexed issues with P&O Ports, which operates Nhava Sheva International Container Terminal (NSICT). Two former chief justices of India were appointed by them, who in turn appointed one umpire in Mumbai. Arbitration hearings commenced from October 2004. All four issues were placed before the arbitration panel for a final solution.

- JNPT has contested payment of annual royalties and bank guarantees which, according to the concession agreement, increases over years. A few components were contested by P&O Ports, especially on the clause related to enhanced bank guarantees. JNPT Board has decided not to invoke any guarantees, pending the arbitration proceedings.
- Another issue is over part payment to Central Industrial Security Force (CISF), which provides security to the entire port premises. JNPT claims that since CISF provides a security cover to all of NSICT cargo as well, they must chip in with a part of the total payments. But NSICT has refused to make any part payment saying that it is the duty of a landlord port to provide security.
- The third issue is related to discriminatory charges on rail-bound containers. Whenever NSICT handles 'mixed trains' (trains that carry boxes to both NSICT and JNPT terminals), it charges high rates (16% higher than the TAMP-notified rates in JNPT), while JNPT charges low rates whenever it handles NSICT boxes in 'mixed trains'. Despite repeated requests, NSICT has continued to levy higher rates, forcing JNPT customers to pay more.
- Meanwhile, NSICT will get two hectares of additional land from the landlord, JNPT, to develop as a container yard. This yard will stock all ICD-bound boxes, and will aim at reducing congestion at the terminal and other yards. This has been a long standing demand from NSICT. But JNPT was not willing to part with additional land, because NSICT declined to pay any annual lease rental, and claimed that the land was part of the original concession agreement, which is again a contentious issue, now up for arbitration.

Though NSICT disagreed to make any payment, JNPT board decided to hand over the land, since the trade was at the receiving end of a major congestion. The board, in fact, decided to de-link the issue of handling over the additional land from payment-related arguments.

Source: [JNPT, 2005]

### Appendix 3: Gujarat Double Stack Container Project

#### Recommendations

Indian Railways is a reasonably well-run enterprise catering to an increasing demand for passenger and freight service, which is expected to continue strongly in future. So it is necessary to pursue the detailed technical feasibility and financial analysis of implementing DSC train operations.

The four main reasons for this recommendation are

- The projected rapid growth of EXIM container traffic
- The potential increasing share of this traffic which will be handled by Indian Railways
- The current backlog and congestion at container handling facility of JNPT port
- Full utilization of present line capacity and the lack of new lines to accommodate the ever growing traffic at JNPT

To develop capacity to handle EXIM container traffic, DSC technology should be applied on container movements to and from Gujarat ports.

The three stages of implementation are

#### 1 Short Term

Implement DSC operations with existing BLC wagons of CONCOR using 20.32 ton axle load for 8'6" high containers after removing the infringements to a revised schedule of dimensions. Develop suitable ICDs for DSC loading and implement unloading arrangements at port.

#### 2 Medium Term

Upgrade DSC operations with the use of new design of wagons with low platforms, thus allowing DSC movement of 9'6" high containers. Line capacity improvement works, primarily gauge conversions, on the projects corridors may be completed.

#### 3 Long Term

Improve the track structure and strengthen the bridge. Increase the axle load restriction to allow unrestricted DSC movement of containers with higher gross weight, subject to the carrying capacity of the new wagon design. Implement operating and safety improvements.

#### Major policy issues

The Railway Board needs to immediately agree upon and publish to all affected departments and agencies a new standard for minimum overhead clearance to apply to all routes.

### **Decisions prior to sanctioning New Electric Traction projects**

The Railway Board should not allow any extension of the electrified network until RB conclusively determines that any route proposed for electrification will not be a candidate for DSC operation.

### **Review of track standards**

A detailed comparative analysis of track design standards should be undertaken to assess whether the existing axle load maximum (20.32 tons) is relevant, and to determine what actions would be required to increase the axle load maximum. Such analysis should look at experience elsewhere in the world and should benchmark best practices. As an interim step, axle load maximum should be kept as at least 25 tons. A further detailed study work plan should be developed

Source: [CANAC, 2004]

## Appendix 4: Dedicated Rail Corridor for High-Quality Multi-Modal Service

### Introduction

Container traffic in India has seen a phenomenal 20% compound growth rate in the last decade. The traffic volume has gone up from 0.68 MTEUs (Million Twenty Feet Equivalent Units) in 1990-91 to 3.9 MTEUs in 2003-04. Recent policy initiatives taken by the government will give a further fillip to this growth. As per present trends in the EXIM trade, container traffic is expected to increase to a level of 7.0 MTEUs in year 2006-07.

Despite all the efforts to meet the demand of increasing containers, the ports are unable to accommodate the additional traffic. The recent problem is the evacuation of these ports. Huge investments made in the port sector may not bring the required results and will soon become infructuous unless the interlinked aspect of movement to hinterland is also addressed appropriately and timely through bold initiatives.

### Congestion at Jawahar Lal Nehru Port (JNPT) and Nhava Sheva International Container Terminal (NSICT)

Of the total 3.9 MTEUs handled at all the major ports in 2003-04, 2.26 MTEUs were handled by JNPT/NSICT alone. NSICT which operates the 2nd terminal had to very often shut the gates to prevent entry of export containers as volumes inside the port had gone beyond manageable levels. Even now the port is regulating the container traffic and some containers such as those carrying steel scrap are not handled at the port. The shipping lines, trade and industry have been suffering due to the congestion in port. The EXIM trade and the very economy of the country are affected calling for urgent long-term and short-term steps to mitigate the situation. The present initiatives and investment plans are aimed at maintaining this status. The port capacity has always remained ahead of actual requirement of the past three years.

### Evacuation of Containers from JN Port

While the evacuation constraints are in existence for various destinations in the hinterland, the most pressing bottleneck pertains to the containers meant for Delhi-Ludhiana region. Against the requirement of evacuating nearly 4000 containers per day, Railways are hardly able to take out 1000 containers. Railways have not found it possible to run more trains for this purpose and evacuation of the EXIM trade spill over traffic is being done by road which besides being slow and environmentally unfriendly is also costly thus impinging on the export competitiveness.

### Scenario in the Railways Sector

The railway infrastructure in terms of line capacity (number of trains that can be run on this route) and rolling stock are not able to satisfy the existing demand of container transportation especially between the western ports and the northern hinterland. The capacity utilization on the Delhi-Mumbai route is well above 140% for the year 2003-04 and will go up beyond 160% in 2006-07. Over the years, planning in the Railways has been aimed at bringing incremental growth of 3-5% in their infrastructural capacities and even this growth has often been difficult to achieve. Immediate bold initiatives are required to be taken in order that we are not left behind in this growth scenario.

### Why Dedicated Freight Corridor

The Indian Railway freight train technology has lagged behind the developed railways in spite of

adequate knowledge of the relevant technologies, capabilities to manufacture, maintain and operate a modern system. The benefits of such technologies in providing a reliable, cost effective and guaranteed time service to the customers are established well beyond any doubt. The reasons for the inability to tap these benefits however lie in the structure of the Indian Railway network physically, financially and organizationally. With the mixed traffic being handled by the Railways the slower trains get further slowed down. This has resulted in a situation where the container train performs a journey of 1340 km from Delhi to Mumbai in 47 hours at an average speed of about 28.5 kmph. It is therefore imperative that if the container traffic has to grow at rates above 20% and the quality of service has to match world class in terms of journey time, guaranteed time delivery, cost of movement etc, the corridor of such trains has to be freed from above constraints. Such a dedicated freight corridor can incorporate state-of-art features such as double stack containers, long trains carrying 10 times more containers per train, long block sections and high speeds etc.

### **Other Rail Corridors for Container Movements**

While the container traffic is growing exponentially and ports have taken adequate action to match this demand, Railways are nowhere in a position to address this problem. The problem of clearance is most acute in Mumbai, but the virus will soon spread to other ports also. Rail corridors between Delhi-Mumbai, Chennai-Delhi connecting the ports on east and west, and Delhi-Kanpur-Kolkata can perhaps provide a lasting solution to this problem.

### **Studies Done in this Area**

World Bank has done a study in 2001 for Delhi-Mumbai Corridor projecting the need for a dedicated freight corridor on this segment.

A study carried out to evaluate the viability of a separate dedicated rail corridor for multimodal traffic between Delhi and Mumbai, with intermediate terminals at Kota and Vadodara, showed that such a rail corridor would be financially viable and would generate substantial economic benefits. The project envisages the development of a dedicated high-speed non-electrified single line of 1340 km. The moving dimensions will provide for double stack containers to ensure that running of high-speed double stack containers is possible at a future date. The total investment including that on track, stations, terminal facilities, signaling, container flats, 4000 HP diesel locomotives etc is Rs 5771 crores. Assuming a total project life of 25 years, the Internal Rate of Return works out to 11.78%.

The report also justifies a dedicated corridor on environmental considerations and the need to reduce congestion on the roads.

Essential ingredients of such a line are

- Delhi to Mumbai non electrified single line with 30 ton axle load passing through Kota and Vadodara as minor hubs
- Long trains with 150 to 200 wagons hauling 15,000 to 20,000 tons with double stack containers at 120 km per hour. Such trains can carry 600-800 containers, as against 60-90 containers as of today. Long block station with inter-block distances of 30 - 40 km (only 40 to 60 stations en route)
- High speed wagons with articulated bogies to carry double stack containers
- End of train telemetry to avoid brake vans thus providing for more pay-load
- Cab signaling, centralized traffic control, absence of level crossings etc
- Containers to be transported between Delhi to Mumbai within 24 hours with a "money back guarantee" in the event of non compliance



In other words, the dedicated rail line should usher in a world class service giving further impetus to the growth of container traffic.

### Investment Required

The distance between Mumbai and Delhi is about 1300 to 1500 km. Cost per km is likely to be about Rs 3 crs per km in view of many major bridges such as over Narmada, Tapti and Thane creek.

|                                   |              |
|-----------------------------------|--------------|
| 1 Cost of track and bridges       | Rs 4,500 crs |
| 2 Cost of 70 diesel locos         | Rs 700 crs   |
| 3 Cost of 3000 wagons             | Rs 450 crs   |
| 4 Signaling costs                 | Rs 200 crs   |
| 5 Station Buildings and Terminals | Rs 300 crs   |
| 6 Road Over / Under Bridges       | Rs 250 crs   |
| 7 Total                           | Rs 6,400 crs |

### Internal Rate of Return

It is rather difficult to assess at this stage, with any reasonable accuracy likely rate of return on this project. However the World Bank study on the dedicated line between Mumbai and Delhi with marginal technological inputs the existing parameters such as single stack containers, without deploying rolling stock, signal, etc of latest design. The entire equity was to be funded by Indian Railways. The benefits that accrue from this line are so enormous. An IRR of 11.8% can be easily achieved.

On the contrary, the current proposal envisages

- State of the art of rolling stock, high speed heavy haul trains with double stack containers
- Adopting an optimal debt-equity ratio such as 2:1, getting loans at 6-7% interest rate, as readily available
- We must also consider the large quantum of unsatisfied demands that can be met, once there is a separate line for dealing with containers. And with heavily curtailed transit time and tariff rates, the volumes handled will increase exponentially, transmitting the benefits of scale economy.

The IRR in this case is therefore not expected to be less than 30%.

### Investment Agencies

The conventional approach, if taken in this case, would lead to a situation wherein the development of dedicated freight corridor would land amongst the burgeoning basket of Railways' other infrastructural projects, even if it meets the ready approval of the Railway Ministry. On the other hand, the need for this initiative is already overdue and cannot wait any longer.



### **Competition as a Catalyst for Improvement**

Indian Railways were stagnating with a lackluster growth rate of 3% to 4%. In fact whenever private sector participation is permitted it also led to improvement in performance to public sector.

### **Conclusion**

If the need for setting up a dedicated freight corridor finds favor, urgent action is required to initiate action for envisaging a detailed feasibility study for the Mumbai-Delhi sector. Such a project should aim at developing a modern, state of the art multimodal rail freight corridor for movement of containers and other traffic providing a world class service.

Towards this end, the feasibility study should

- Assess traffic potential for the period of project and means of improving rail share
- Identify the optimal route alignment between Mumbai and Delhi, indicating intermediate stations, duly weighing the pros and cons of routing the line via Ahmedabad thereby also linking Gujarat ports
- Lay down system parameters with reference to standards of track, rolling stock, signaling, operations, etc in order to achieve maximum efficiency
- Indicate costs, revenues and IRR with an optimal equity structure

Source: [IPA, 2005]

### Visits and Meetings

| Date    | Place  | Organisation           | People   | Subject   |
|---------|--------|------------------------|--|---|
| Feb. 23 | Delhi  | CONCOR                 | Mr PG Thyagarajan<br>Mr HD Gujarati  | Issues related to CONCOR in terms of traffic to and from JNPT             |
| Feb. 24 | Delhi  | Department of Shipping | Mr DT Joseph, Mr RK Jain, Mr Rajiv Kumar                                       | Issues related to JNPT congestion and MoST's perspective                  |
|         | Delhi  | Ministry of Commerce   | Mr Christy Fernandez,<br>Mr Jayant Dasgupta,<br>Ms Anju Sharma                 | Inception meeting of the study  |
| Feb. 28 | JNP    | NSICT                  | Capt Rustom E Dastoor  | Exploratory understanding of container handling issues at JNPT            |
|         | JNP    | JNPT                   | Mr Ravi B Budhiraja,<br>HODs   | Exploratory understanding of container handling issues at JNPT            |
|         | Mumbai | CONCOR                 | Mr Arvind Bhatnagar  | Exploratory understanding of container handling issues at JNPT            |
| March 6 | JNP    | JNPT                   | Mr Gajendra Haldea, Mr RK Jain, Mr Ravi B Budhiraja and HODs                   | Perspectives on strategic planning for JNPT                               |
| March 7 | JNP    | Study Workshop         | Mr Gajendra Haldea, Mr RK Jain, Mr Ravi B Budhiraja, Ms Neera Saggi and others | Discussions with different stakeholders regarding port development        |
|         | JNP    | Study Workshop         | Representatives of BCHAA, MANSA, MAERSK, Shahi Shipping                        | Discussions with different stakeholders regarding port operations         |
|         | JNP    | TransIndia Logistics   |  | Issues affecting private CFS operators                                    |
| March 8 | Mumbai | Mumbai Port Trust      | Mr Gajendra Haldea, Mr RK Jain, Ms Rani A Jadhav and others                    | Discussions with different stakeholders regarding Mumbai port development |
|         | Mumbai | MANSA                  | Mr CS Manohar  |   |
|         | JNP    | Gate Visit             |  | Interactions with truck drivers/transporters                              |

|          |        |                        |  |  |
|----------|--------|------------------------|--|--|
| March 9  | JNP    | Gate Visit             |  | Interactions with truck drivers/transporters     |
|          | JNP    | Customs                | Customs Officials at the Gate                                  | Discussions about gate clearance procedures      |
|          | JNP    | JNPT                   | Mr SM Kulkarni   | Road development                                 |
|          | JNP    | JNPT                   | Mr N Bhaskara Rao  | Improving operations at JNPT                     |
|          | JNP    | Customs                | Mr Dominic Joseph and others                                   | Container movement and customs procedures        |
|          | JNP    | Customs                | Mr Shafat A Usmani   | Container movement and customs procedures        |
|          | JNP    | NSICT                  | Capt Rustom E Dastoor  | Operations at NSICT                              |
| March 10 | JNP    | Exploring Roads        |  | CFS development around the port                  |
|          | JNP    | Gate visit             |  | Interactions with truck drivers/transporters     |
|          | JNP    | JNPT                   | Mr Anil Chopade  | Operations data                                  |
|          | JNP    | NSICT                  | Mr Rustom E Dastoor  | Operations at NSICT                              |
|          | JNP    | JNPT                   | Ms Neera Saggi   | Issues affecting port operations and development |
|          | Mumbai | BCHAA                  | Mr R Radhakrishnan and others                                  | Customs House Agents' perspectives               |
|          | Mumbai | MANSA                  | Mr CS Manohar  | Shipping Agents' perspectives                    |
| March 11 | JNP    | NSICT                  | Operations Superintendent                                      | Overview of handling containers at the dock      |
|          | JNP    | CONCOR                 | Mr Rajeev Kumar Sinha  | Rail connectivity and operations                 |
|          | JNP    | CWC                    | Mr S Singh   | Problems faced by CFS under TAMP                 |
|          | JNP    | JNPT                   | Mr SM Kulkarni   | Road development                                 |
|          | JNP    | JNPT                   | Traffic Police Officials                                       | Road development                                 |
|          | JNP    | JNPT                   | CIDCO  | Road development                                 |
| March 12 | JNP    | Exploring Roads        |  | CFS development around the port                  |
|          | JNP    | JNPT                   | Mr N Bhaskara Rao  | Improving operations at JNPT                     |
|          | JNP    | Daily Berthing Meeting | Various Port Users and Stakeholders                            | Coordination issues                              |
|          | JNP    | Customs                | Mr Shafat A Usmani   | Data collection                                  |
|          | JNP    | JNPT                   | Mr SM Kulkarni   | Development of roads                             |
|          | JNP    | Exploring Roads        |  | CFS development around the port                  |
| March 30 | Delhi  | Ministry of Commerce   | Mr Christy Fernandez,<br>Mr Jayant Dasgupta,<br>Ms Anju Sharma | Presentation of draft recommendations            |

References:

1. CANAC, 2004. Market Study: Gujarat Double Stack Container Project by CANAC, Canarail, CPCS Transcom and LEA, November 2004.
2. CONCOR, 2005. Data Obtained from CONCOR Officials
3. Customs 2005. Data Obtained from Customs Officials.
4. CWC, 2005. Various Internal Documents.
5. GTIPL, 2005a. Presentation by GTIPL, Presentation by GTIPL Congestion: Infrastructure Requirements and Systemic Regulatory Changes, March 2005, JNPT, Mumbai.
6. GTIPL, 2005b. Presentation by GTIPL, Nhava-Sheva 2004, Specific Issues, JNPT, Mumbai.
7. III-C, 2004. Final Report on Container Coordination Committee, December 2004, Mumbai.
8. IPA, 2004. Major Ports of India: A Profile: 2003-04, Indian Ports Association, New Delhi.
9. IPA, 2005. Study on Construction of a Dedicated Railway Line between Delhi and JNP for Movement of Containers, January 2005, New Delhi.
10. JNPT, 2005. Various Internal Documents.
11. MANSA, 2005. Data Obtained from MANSA Officials, March 2005, Mumbai.
12. Maroo, 2005. Private Correspondence.
13. MJRCL, 2005. Status Report, Mumbai-JNPT Port Road Co Ltd, STUP Consultants Pvt Ltd, February 2005, Mumbai.
14. TPA, 2004. Executive Summary: Widening of Port Roads from Container and Bulk Gate Terminal to Junction near ROB up to JNP CFS, Transport Planning Associates.
15. TransIndia, 2005. Presentation on Special Project Circle (PWD), Navi Mumbai.