PLANNING, DEVELOPMENT AND OPERATION OF DRY PORTS OF INTERNATIONAL IMPORTANCE

Report on trends in the development of inland ports and policies underlying their development in selected countries of the UNESCAP region

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Section A: Planning, Development and Operation of Dry Ports

1. Introduction

An assessment of dry port (or inland port) development and of the policies underlying and assisting this development was undertaken as a basis for discussion at the First Meeting of the Working Group on Dry Ports in Bangkok from 25-26 November 2015.

This assessment is based on information obtained during fact-finding missions to five countries of the region: Australia, People’s Republic of China, India, Republic of Korea, and Thailand, which were considered to have achieved some measure of success in the establishment and operation of dry ports. It was expected that the experience of these countries could be used to assist other countries of the region whose experience is fairly limited and which might benefit from applying best practice planning techniques and policy formulation to the development of dry ports.

2. Dry Port – definition and function

For the purpose of the Intergovernmental agreement on Dry Ports, a dry port of international importance “refers to an inland location as a logistics centre connected to one or more modes of transport for the handling, storage and regulatory inspection of goods moving in international trade and the execution of applicable customs control and formalities” (Article 1 of Inter-governmental Agreement on Dry Ports).

Dry Ports can be considered as an essential part of an inland trade distribution system. Such a system is illustrated in Figure 2.1. Although the Inter-governmental agreement provides a standardized definition of a dry port, in fact a number of different terms are in use throughout the UNESCAP region to describe facilities which have the functions of a dry, or inland, port.

Thus, the terms: “Dry Ports”; “Inland Container Depots”; “Inland Clearance Depots”; and in a limited number of cases, “Container Freight Stations” are used almost interchangeably within the region to describe such facilities. It is important to note that inland trade distribution systems of the type illustrated in Figure 2.1 may be, and are being, developed for the handling of all types of cargo, i.e. containerized, non-containerized break-bulk and bulk cargoes – not just for containerized cargoes, although these tend to dominate the composition of foreign trade.

In reality, different types of inland trade distribution facilities offering a range of different services will be required depending on the type of cargo to be transported. However, all...
share the common characteristic that their main functions are to complete customs and other border crossing formalities for traded cargo and to transfer this cargo between the different modes used for transportation between a port origin and an ultimate inland destination, or vice versa. In the longer term, the Inter-governmental Agreement on Dry Ports will offer the benefit that trade consignments will be directly transported and customs cleared between an inland port in one country and another inland port in another country, as illustrated in Figure 2.1.

If an inland trade distribution facility is used solely for the handling of containers and container cargoes, it is almost exclusively referred to as an Inland Container Depot, or ICD. An exception to this is the use in India of the term “Container Freight Station”, or CFS, to describe a small container handling terminal usually located close to ports and served solely by road transport. Normally, however, a CFS is not a stand-alone unit, but rather is an operating component within an ICD, providing facilities for the stuffing and de-stuffing of containers.

In reality, ICDs are a sub-set of Dry Ports, as is apparent from Tables 1 and 2 which outline the characteristics of both types of inland trade distribution facility.
Figure 2.1: Inland trade distribution and customs clearance within UNESCAP region

Source: Based on UNESCAP, Promoting the role of the Asian Highway and Trans-Asian Railway: Intermodal interfaces as focus for development, August 2007
3. Trade growth and development of inland trade distribution systems

Several countries of the UNESCAP region depend on their hinterlands as a source of foreign trade. Rapidly increasing foreign trade in many of these countries, especially over the past two decades, has generated a requirement for long distance transport feeder services between major inland trade generating centres and the seaports. Similarly, the strong foreign trade growth of the landlocked countries of Central Asia and Mongolia has generated a requirement for the connection of the trade sources of these countries with seaports in neighbouring countries.

The distances involved can be vast: for example, some of the major inland manufacturing and commercial centres of China and India are 1,400 – 1,800 km from the seaports, while the international trade of Central Asia must travel between 1,000 and 8,000 km to find an outlet to the sea.

By contrast, in other countries, such as the Republic of Korea and those of Southeast Asia, distances between trade origins or destinations and seaports are comparatively short, in some cases being in the range of 100-300 km.

Increasingly in China, as well as in the Russian Federation, established dry ports are also serving as terminals for Asia-Europe container traffic along the Trans-Asian Railway.¹

Since railways can offer significant cost efficiency for freight (including container) haulage over distances in excess of 300 km, rail is assuming an increasingly important role in trade feeder transport. It is being supported in this role by truck transport which assumes a local feeder role, involving the local distribution of traded commodities between inland ports stations and the trade originating and terminating locations, designated as Trade Generating Locations (TGL), over distances which rarely exceed 50 km. Effectively these facilities operate respectively as “hub” and “spoke” facilities, as shown in Figure 2.1.

The viability of dry ports will in no small measure depend on whether they are well located to serve international trade customers and minimize total transport costs. Whether the distances between dry ports and seaports or other trade origins or destinations are short or long, certain principles must be applied in determining the location of dry ports, including:

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¹ In July 2015, the first Yunnan-Europe container train departed from Kunming to the Port of Rotterdam, following other similar services originating in Chengdu, Zhengzhou, Wuhan and Yiwu (Yunnan Express Newspaper).
<table>
<thead>
<tr>
<th>Type/Brief Description</th>
<th>Location</th>
<th>Component Facilities</th>
<th>Types of cargo handled</th>
<th>Served by (mode)</th>
<th>Services provided</th>
</tr>
</thead>
</table>
| **Dry Port (DP).**    | Usually remote from seaport(s), but close to trade sources. Example: Pakistan – Lahore (1,220 km by rail from Port of Karachi); | • CY (with or without reefer points)  
• CFS  
• Access roads, railway link and sidings, IWT berths  
• Breakbulk receiving/ storage area (open)  
• Warehouses, bonded and unbonded (for storage of breakbulk cargo)  
• Bulk receiving and storage area  
• Administrative office with space for banks, forwarders and cargo agents  
• Customs office  
• Container light repair facility  
• Secure fence and entry point  
• Cargo handling equipment (RTGs, RMGs, reach-stackers, empty lifters, forklifts, container chassis, prime movers) | • Containers international and domestic (ISO and non-ISO)  
• Breakbulk freight for unloading from or loading into containers  
• Non-containerized breakbulk freight (e.g. steel, general merchandise on pallets, bagged cement)  
• Bulk freight * (construction materials including cement, coal, fertilizer, chemicals etc) | • Rail (most)  
• IWT (some)  
• Road (some) | • Road  
|                       |          |                       |                       |                 | Container handling and storage  
|                       |          |                       |                       |                 | Container stripping and stuffing  
|                       |          |                       |                       |                 | Breakbulk cargo handling and storage  
|                       |          |                       |                       |                 | Bulk cargo handling and storage  
|                       |          |                       |                       |                 | Customs inspection and clearance  
|                       |          |                       |                       |                 | Container light repairs  
|                       |          |                       |                       |                 | Freight forwarding and cargo consolidation services  
<p>|                       |          |                       |                       |                 | Banking/insurance/financial services |</p>
<table>
<thead>
<tr>
<th>Type/Brief Description</th>
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<th>Component Facilities</th>
<th>Types of cargo handled</th>
<th>Served by ( mode)</th>
<th>Services provided</th>
</tr>
</thead>
</table>
| **Inland Container Depot (ICD)** | Usually remote from seaport(s), but close to trade source(s). | • CY (with or without reefer points)  
• CFS  
• Access roads, railway link and sidings, IWT berths  
• Warehouses, bonded and unbonded (for short term storage of breakbulk cargo)  
• Administrative office with space for banks, forwarders and cargo agents  
• Customs office  
• Container light repair facility  
• Secure fence and entry point  
• Cargo handling equipment (RTGs, RMGs, reach-stackers, empty lifters, forklifts, container chassis, prime movers) | • Containers international and domestic (ISO and non-ISO)  
• Breakbulk freight for unloading from or loading into containers | | • Rail (most)  
• IWT (some)  
• Road (some) |
| | Examples:  
China – currently 9 large intermodal rail hubs in hinterland (e.g. Kunming 1,500 km by rail from Shenzhen Port);  
India - 52 mostly rail served in hinterland (largest Tuklakabad in Delhi, which is 1,510 km by rail from Mumbai area ports);  
Republic of Korea – 5 terminals (largest Uiwang is 380 km by road and 410 km by rail from Busan Port)  
Thailand - Lard Krabang (118 km by rail from Laem Chabang Port). | | | • Road |

Source: Based on UNESCAP, Promoting the role of the Asian Highway and Trans-Asian Railway:Intermodal interfaces as focus for development, August 2007
i. Location of dry ports within a short delivery distance by road of trade sources, be they factories, warehouses or retail stores. This would imply that they should be located *within or close to industry, manufacturing or logistics precincts or zones*;

ii. Dry port sites must be accessible by high quality railways and highways with direct connections to seaports.

A major terminal operator interviewed in Melbourne, Australia indicated that it selects the location of its inland terminals, first to minimize the distance from its customers’ premises and second to optimize the relative use of road and rail transport, in order to minimize total transport cost.²

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² Meeting on 28 August 2015 with SCT Logistics, Altona, Victoria.
4. Status of dry port development in selected countries of the UNESCAP region

The experience of the five countries visited during fact-finding missions varies significantly.

(i) Australia

Australia is a special case in that in that some 75% of international trade volume does not move outside of the metropolitan areas of the state capital cities, all of which have seaports. In the case of the southern state of Victoria, approximately 87% of import containers (representing 60% of total container trade) and 50% of export containers shipped through the Port of Melbourne are estimated to be sourced within the Melbourne metropolitan area.

Thus the throughputs of established inland intermodal freight terminals tend to be dominated by domestic freight. Nevertheless, export oriented terminals are currently operating in several important inland regions of Southeastern Australia. As shown in Figure 4.1, examples with connections through the Port of Melbourne are:

- **Western Victoria**, where terminals have been established at Merbein, near Mildura and at Warrnambool, on the southwestern coast of Victoria, for the handling of agricultural, mining and other diverse exports in containers; also at Dooen near Horsham in Western Victoria, for the handling of containerized export grain;
- **Eastern Victoria**, where containerized paper is transported by rail from Maryvale for export through the Port of Melbourne;
- **Southern New South Wales**, where terminals have been established for the transport of: containerized rice from Deniliquin and Leeton, containerized wheat, barley and sorghum grain from Tocumwal, containerized wine for export from Griffith and Leeton, and containerized imports and exports through the Ettamogah Rail Hub, near Albury.

With only one exception, (the Wimmera Grain terminal near Horsham), these terminals are operated solely by the private sector. All are served by rail transport.

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3 Information provided at a meeting with officials of the Department of Infrastructure and Regional Development, Canberra 25 August 2015.
4 Information provided at a meeting with officials of the Department of Transport Victoria, Melbourne 28 August 2015.
the longest haul distance being that between Merbein and the Port of Melbourne (565 km). Few, if any, provide facilities for the completion of customs formalities, which is mostly undertaken in the Port of Melbourne.

**Figure 4.1:** Inland container terminals serving Port of Melbourne

These terminals handle only small container volumes, comprising both international and domestic containers. For example, the Ettamogah Rail Hub which was visited during the fact finding mission to Australia was reported to be handling only 16,000 TEU per year, while all 4 terminals in the Riverina District of southern NSW were reported to have handled 120,000 TEU of export containers in 2012/13.⁵

In a recent study undertaken on behalf of Transport for NSW it was observed that “combined with distance to destination, volume is a highly critical factor in the viability of a regional intermodal terminal.”⁶ The study concluded that a terminal with a transport distance of more than 400 km would be viable provided it had a threshold throughput of 30,000 TEU per annum. The rail distance between Griffith in the heart

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⁵ RDA Riverina Regional Plan 2013-2016.
of the Riverina District and the Port of Melbourne is about 450 km, suggesting that the existing terminals (each with an annual throughput of about 30,000 TEU) might be financially viable, but only just.

New rail served inland terminals are being planned for the Logic Industrial, south of Wodonga, in northeastern Victoria (near Albury), and for Griffith and Wagga Wagga in the Riverina District of NSW. However, given the importance of trade sourcing within the capital cities and the perceived need to combat increasing road traffic congestion around the major ports, the policy focus for both Federal and State Governments is now on the consolidation of container handling facilities in the suburbs and the diversion of port related container traffic from road to rail. This is so despite the relatively short rail hauls involved, but the initiatives taken so far in Melbourne and Sydney suggest that short-haul rail movement of containers can be sustained if annual volumes are large and movement patterns are regular.

Figure 4.2: Container handling at Ettamogah Rail Hub, Albury, NSW, Australia

Source: ESCAP Study Team

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7 This would represent a reversal of the trend to road haulage of containers to/from the ports which became apparent from the early 1990s when “B Double” prime mover-trailer combinations (i.e. prime mover plus two trailers) were licensed to enter the Port of Melbourne.
Among these initiatives is a plan to develop Australia’s largest intermodal terminal (with an ultimate throughput capacity of 1.7 million TEU per annum), at Moorebank on the south-western outskirts of Sydney. This terminal will have the primary function of handling export/import containers which will be transported by rail to/from Port Botany, a distance of only 31 km. In addition, the terminal will handle, store, dispatch and receive domestic containers moved to and from interstate locations.

The terminal will be built on 243 hectares of industrial land much of which was formerly an Army stores depot and is being transferred by the Federal Government for development by a joint venture operating company under a 99 year lease.

Warehousing will be a major income earner for the new terminal which will ultimately have a massive warehousing area of 850,000 m² (85 hectares), as shown in Figure 4.3.

The project will be developed by a Public Private Partnership between the Federal Government and a joint venture of two major private sector logistics operators (QUBE and Aurizon). It has an estimated capital cost of A$ 1.83 billion (of which A$ 1.5 billion is to be financed by the private sector) and has a first phase completion date of September 2017.8

Elsewhere, the state and federal governments are funding a project to develop a limited number of export/import terminals in suburban Melbourne connected by rail shuttle services to the Port of Melbourne. As is the case with the Moorebank project, the main purpose of the Port Rail Shuttle (PRS) project will be to reduce the worsening road traffic congestion around the port and along the arterial roads connecting to the port by converting container transfer from truck to rail transport.

(ii) China

China has been making rapid progress in establishing and developing inland intermodal freight terminals, but this progress has not matched the growth of the container throughput of Chinese Ports.

In 2014, the total container throughput of China’s ports was nearly 178 million TEU and over the 10 years between 2004 and 2014 had been growing at a rate averaging 8.7 per cent per annum. Although not supported by available statistics, it is estimated

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8 By which date it is expected that the Import/Export (IMEX) terminal will enter service (Qube Holdings Ltd., Investor Presentation June 2015)
that about 20 per cent of the overall container throughput is sourced in the inland regions of China, specifically those which are more than 300 km from the coast. On this basis, the volume of inland containers requiring transport to or from the ports would currently amount to 35.6 million TEU. Since there are currently only about 17 inland ports in operation, this would mean that each inland port would need, on average, to have a capacity to handle more than 2 million TEU per year. Clearly this is not practical, suggesting that a large portion of the inland sourced volume must now be transported directly to/from the ports – yet it demonstrates the urgency of the need to accelerate the construction of inland ports in China.
The inland port network which is being developed in China includes facilities which are either under private ownership or under joint public/private sector ownership. The former comprise facilities which are regulated by the Ministry of Transport, while the latter are major railway hub terminals being developed by a joint venture partnership between CR Intermodal and the private sector.

**Inland ports developed by the private sector**

In total, 17 inland ports have been proposed for development by private investors under regulation by the Ministry of Transport. Of these, 12 are currently in operation or under construction at the locations shown in Figure 4.4.

**Figure 4.4: Location of inland ports being developed by private investors**

Of these, 8 are located at border crossing points with neighbouring countries, these being:

(i) Hunchun (border with DPRK); Suifenhe (border with Russian Federation); Manzhouli (border with Russian Federation); Erenhot (border with Mongolia); Ili (border with Kazakhstan); Kashgar (border with Kyrgyzstan); Zhangmu (border with Nepal); and Hekou (border with Viet Nam). All except Ili and Zhangmu have railway connections, while Kashgar is connected with the Chinese rail network but lacks a through rail connection to Kyrgyzstan or Tajikistan.
The remaining 4 are located in important trade generating centres. Those at Kunming and Yiwu are particularly large facilities.

The Yunnan Tengjun International Dry Port is one of 3 major inland ports currently, or soon to be, in operation in the Kunming area. It is being developed by the Yunnan Gallops Investment Group at a cost (for the first phase) of 1.234 billion Yuan (nearly US$ 190 million), has an area of 1.6 square km and a design container handling capacity of about 1.2 million TEU. It is understood that in its ultimate development phase it will have an area of 2.45 square km and an investment cost of US$ 1.42 billion. The Yunnan Tengjun International Dry Port is currently in operation and is rail connected. It handles the majority of container trade between Yunnan Province, Lao PDR, Thailand and Viet Nam.

The Yiwu International Dry Port (YIDP) is located 300 km to the southwest of Ningbo Seaport and about 100 km south of the Zhejiang provincial capital of Hangzhou. It is the largest inland port in China, with a developed area of 0.7 square kilometres and a design capacity of 1.1 million TEU per annum. It serves a burgeoning manufacturing export trade in the central part of Zhejiang Province. Approximately 50,000 different types of consignments (mostly consumer goods) are dispatched annually to 100 countries in 1 million TEU. It was reported that more than 260 logistics companies have set up operation within the inland port.

YIDP is fully connected to the Chinese trunk line rail network and block container trains to Western Europe are now in regular operation. In addition, block container trains operate between YIDP and Ningbo Port.

Inland ports developed by public/private joint ventures

A network of inland ports is also being developed by a joint venture partnership of CR (Chinese Railways) Intermodal and 4 logistics companies.

Ultimately (by 2020), this network will comprise 18 major intermodal rail hubs and 40 mid-size container freight stations, linked by railway lines which have been adapted for the operation of double stack container trains. The locations of these 18 major rail hubs, as shown in Figure 4.5 are: Harbin, Urumqi, Beijing, Shenyang, Dalian, Tianjin, Qingdao, Lanzhou, Xi’an, Zhengzhou, Shanghai, Chengdu, Kunming, Chongqing, Wuhan, Ningbo, Guangzhou, and Shenzhen. The vast expanse of this network is apparent from Figure 4.5. It will extend 3,020 from Urumqi in the far west of China to
the Port of Tianjin on the eastern seaboard and 3,600 km from Shenzhen in the south to Harbin in the north of China.

Figure 4.5: Location of inland ports being developed by CR Intermodal joint venture

For three major inland manufacturing centres in the southwest of China – Chengdu, Chongqing and Kunming – haulage distances to the nearest ports are of the order of 1,500-1,800 km. While the primary purpose of this network will be to connect inland trade sources with seaports, it will also interconnect inland centres of commerce and industry, thereby satisfying a need for low cost domestic freight transport.

At the time of fact finding missions by the UNESCAP consultant to Beijing and Kunming in August 2015, only 9 of the proposed 18 rail hubs had been completed and were in operation, these being: Kunming, Shanghai, Chongqing, Chengdu, Zhengzhou, Qingdao, Dalian, Wuhan and Xi'an. Kunming was the first of the intermodal rail hubs to open for service, on 04 November 2006.

Most of the established rail hubs have been designed for handling capacities of the order of 1 million TEU per year, well in excess of their current throughputs. For example, the Kunming Wangjiaying Hub with a CY (container yard) area of 300,000 square km has capacity to handle up to 1.6 million TEU per year, but its annual throughput during seven years of operation has never exceeded 400,000 TEU.

Most rail hubs are connected to the mainline electrified network. In future it is proposed that they will be served by double stack container trains, but adaptation for
double stack operation on lines in the southwest of China will require major engineering works to provide the required clearance through tunnels and bridges in mountainous terrain.

Information received for the Kunming West Wangjiaying intermodal hub indicates that it achieves a surplus of revenue over operating costs. It is probable that this would also be true of the other major intermodal hubs currently in operation, although it is not necessarily true of the smaller inland ports which may not generate sufficient throughput to cover their fixed costs.

**Figure 4.6: Kunming Intermodal Rail Hub**

Need to boost attraction of container traffic to rail

Despite the fact that the major container handling ports of China are connected to the trunk railway network, rail has so far failed to capture other than a very minor share of the container haulage task. Rail container terminals in Chengdu, Chongqing and Kunming are estimated to despatch and receive annually about 2.03 million TEU. It is likely that the remaining 6 major hub terminals currently in operation would handle another 2 million TEU, giving a total of 4 million TEU of rail hauled containers. Thus
the rail share of total container throughput in China is only about 2 per cent, while road and IWT shares are estimated at 84 per cent and 14 per cent respectively.

(ii) India

The development of inland ports in India has, until comparatively recently, been the sole preserve of the Container Corporation of India Ltd (CONCOR) which was established in 1988 as a subsidiary of the Indian Railways to take over operation of a rail served ICD network, then numbering only 7 terminals. As from 2006, the Indian Government approved the licensing of private container train operators (CTOs) and several logistics companies have since established inland ports which operate in competition with CONCOR. Nevertheless, CONCOR continues to command a dominant position in the market for inland distribution of container trade.

As shown in Figure 4.8, the total volume of containers, both international and domestic containers, moving through the seaports of India in 2014 amounted to 11.53 million TEU, reflecting an increase of 10.3 per cent over the 2013 volume.
It has been estimated that 19 per cent of this volume, or 2.19 million TEU, moves between the ports and inland locations.\(^9\)

By comparison, the share of the Container Corporation of India (CONCOR) in this volume is about 23 per cent, but this includes throughputs of CONCOR terminals located near to ports. Thus, it may be concluded that the CONCOR share of all inland container volume is significantly more than 90%.

**Figure 4.8: CONCOR share of port container throughput in India**

![Bar chart showing CONCOR share of port container throughput in India.]

*Source: Container Corporation of India Ltd, Annual Report 2015*

Currently, within India, some 52 Inland Container Terminals (ICDs) are licensed to handle international containers: 36 under the management of CONCOR\(^10\) and 16 under the management of private operators.

Their principal function is to provide a conduit for the transport of containers between the seaports and their hinterland in such a way that total logistics costs, comprising line-haul transport, handling, storage and local transport costs will be minimized. Some of these facilities, especially those operated by CONCOR, handle domestic containers in addition to their primary function of handling international containers. Across the CONCOR network, domestic containers account for an average of 16 per cent of total TEU throughput.

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\(^9\) Container Corporation of India Ltd, *Annual Report 2014-15*

A majority of the 52 licensed ICDs are rail served – that is, they are accessed by rail, and receive and dispatch container trains into/from dedicated sidings located within the terminal boundaries. A majority is in fact located along the electrified mainline network, and is served by container trains hauled by electric locomotives.

Containers are hauled in trains comprising standard rakes of 45 container flat wagons, each carrying 2 TEU (90 TEU per train).

With the commencement of operations on the western section of the Dedicated Freight Corridor (DFC), Double Stack container trains have begun operation as from mid October 2015. These trains, carrying up to 180 TEU each, are initially linking a new Multimodal Terminal at Khatuwas in Rajasthan State with Mumbai area ports. The trains originate in Dadri ICD but since this terminal currently lacks the facilities to load double stack wagons, they run as single tier trains from Dadri to Khatuwas, where a second tier is added for the journey to the ports.11

The locations of the CONCOR terminals are shown in Figure 4.9.

For many ICDs in the north of India, haulage distances to the seaports are of the order of 1,000-1,500 km. For example, the Dadri ICD near New Delhi is 1,536 km by road and 1,493 by rail from Mumbai area ports. By contrast, ICDs in the south tend to be located closer to the seaports (e.g. the CONCOR Whitefield terminal is 350 km by road and 346 km by rail from Chennai Port), and while rail served, are much more vulnerable to competition from road transport.

Among the ICDs operated by CONCOR, those near New Delhi have the largest annual container throughputs. Tughlakabad with 463,163 TEU and Dadri with 270,665 TEU accounted for nearly one quarter of CONCOR’s entire throughput of international and domestic containers in 2014/15. By comparison, there are several inland terminals, which handle less than 30,000 TEU per year.

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11 Information provided at meeting with Shri M K Nabi, Chief Manager of ICD Dadri, Noida, 19 October 2015.
CONCOR has a forward development plan to construct another 16 dry ports (not including the recently commissioned multimodal terminal at Khatuwas), mostly in inland locations.
As an indication of the land intensity of container terminal development, a total area of 105 hectares (1,050,000 m²) was initially acquired for the development of the Dadri ICD, which opened in January 2004. Currently only half of this area has been utilized for the CY, CFS’s, truck parking, rail sidings and warehousing, and the balance remains available for future development. More recently, 113 hectares was acquired for development of the Khatuwas Multimodal Terminal, of which only 48 hectares has so far been taken up for development (16 hectares for an ICD and 32 hectares for a domestic terminal), with the balance being available for warehousing and future development. Land acquisition in India often requires a long lead time and has become so fraught with speculation in price determination that CONCOR has been forced to secure the assistance of State Government authorities in securing land parcels at values which will make terminal development viable.

Significantly, CONCOR is not solely a terminal developer and operator, but is also licensed as a container train operator (CTO) and owns a rolling stock fleet of 13,111

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12 Dry Port questionnaire completed for Dadri ICD (October 2015)
13 Motilal Oswal, Container Corporation of India – On High Ground, 15 October 2012
14 Meeting with Shri Anil Kumar Gupta, Chairman and Managing Director, CONCOR. New Delhi 20 October 2015.
wagons, of which high speed wagons number 11,754. As a condition of their license, private sector CTOs are also required to invest in a fleet of container wagons, since the Indian Railways is in effect a “hook and haul” operator which provides the infrastructure and the motive power to haul container trains on behalf of the CTOs. The private sector fleet of container wagons currently numbers about 6,000 (or 134 rakes).15

CONCOR is highly profitable, with a profit after tax in 2014/15 of INR 1,047.5 crore (US$ 157.8 million), representing nearly 19 per cent of its operating income in that year.16 It is likely that the private CTOs are also trading profitably.

(iii) Republic of Korea

Inland intermodal freight terminals are currently operating at five locations throughout the Republic of Korea. They are referred to as “Inland Logistics Depots” and have the dual functions of an ICD (Inland Container Depot), which handles foreign trade containers and cargo, and an Integrated Freight Terminal (IFT), which handles domestic cargo.

In addition, one terminal is still under construction and another is in the late stages of planning.

Locations of the five current terminals – at Uiwang, Yangsan, Sejong, Chilgok, and Jangseong - are shown in Figure 4.11. The terminal which is under construction is a second terminal at Janseong, while the terminal in planning is at Paju, north of Seoul.

The first ICD was constructed at Uiwang, 25 km southwest of Seoul over the period 1992-1996. The remaining four facilities were constructed over the period 2003-2012. As shown in Figure 4.12, the five ICDs in 2014 handled only a very small share (6%) of the combined TEU throughput of Busan and Gwangyang international ports, suggesting that:

(i) A large proportion of import and export containers are handled within, or close to, the ports; and

(ii) Some proportion of import and export containers is moved inland directly to or from factories and warehouses by road transport.

15 Ibid (Motilal Oswal October 2012)
16 CONCOR, Annual Report 2014/15
While all five facilities are connected to both the major highway and railway networks, only the Uiwang ICD receives and despatches significant volumes of containers by rail. Rail is at a disadvantage as compared with road transport to serve these
facilities mainly as a result of their proximity to the ports. For example, Uiwang is located furthest from both Busan and Gwangyang Ports, but is still only 380 road km and 410 rail km from the former, and 320 road km and 386 rail km from the latter.

Uiwang, with a throughput of 1,007,655 TEU in 2014, is operating close to capacity, but 56 per cent of this volume now moves to and from ports by road. The Yangsan ICD, located close to Busan Port, handles about 195,000 TEU per year, but the remaining three ICDs have throughputs within the range of about 11,000-35,000 TEU per year. It is debatable whether these facilities would be viable at this low volume.

Figure 4.13: Rail loading/unloading tracks at Uiwang ICD, Republic of Korea

Source: ESCAP Study Team

It is understood that the Uiwang ICD comfortably covers its operating costs with handling revenue, but that the rail haulage of containers between Uiwang and Busan Port is barely cost covering. It is also understood that rail haulage charges to and from Uiwang exceed those of road transport.

Given that containers are hauled efficiently to/from Uiwang in unit trains each carrying a minimum of 60 TEU, it is difficult to comprehend why: (a) railway haulage

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17 Information provided at meeting of UNESCAP staff with management of Uiwang ICD, 11 August 2015.
charges should barely cover costs; and (b) why railway haulage charges should not be competitive with those of road transport, which can only haul 2 TEU or 1 FEU per trip. The high cost structure of Korail (Korean Railways) is blamed for this situation, but it is nevertheless difficult to understand why rail cannot realize significant economies of scale which would support lower rail haulage charges.

(iv) Thailand

About 80 per cent of Thailand’s throughput of international containers is handled by Laem Chabang International Port, located on the Eastern Seaboard 132 km southeast of Bangkok.

The growth in inbound and outbound container volumes through Laem Chabang Port has been strongly positive for all but one of the past 13 years. Only in the year of the global financial crisis (2009) did container trade record negative growth.

Overall, the port’s container throughput grew at a rate averaging nearly 9 per cent per year for the period 2001-2014. In 2014, it reached 6.6 million TEU.

Since 1996, Laem Chabang Port has been connected to a road and rail served ICD at Lard Krabang, about 27 km east of Bangkok and 118km by rail from Laem Chabang Port. This facility is owned by the Government and administered by the State Railway of Thailand (SRT). It comprises 6 independent modules, each with its own CY and warehouses and operated independently under an operating concession. Each operator has common access to centrally located rail loading and unloading sidings.

The Lard Krabang ICD was established in order to free up landside capacity and accelerate vessel turnarounds within the Port of Laem Chabang, by transferring the customs clearance, as well as the stuffing/unstuffing processes, of containers outside of the port.

*It is likely that the requirement for a proportion of the transferred containers to be moved by rail was a secondary goal, designed to eliminate vehicular congestion at the port entrance/exit and along the arterial roads providing access to the port from Bangkok.*

In this sense, the Lard Krabang ICD has a somewhat different function from most of those in China and India which are located well into the hinterland and are primarily
intended to provide a seamless connection with ports and ultimately with ICD’s in the interior of other countries.

In practice, during the past 11 years, the Lard Krabang ICD has handled a declining proportion of the total container throughput of Laem Chabang Port. As shown in Figure 4.14, the proportion of total throughput by-passing Lard Krabang has increased from 63 per cent in 2001 to 79 per cent in 2014. Stated inversely, the proportion handled at Lard Krabang has fallen from 37 per cent to 21 per cent over the same period. All of the container volume which by-passes the Lard Krabang terminal is transported to and from the port by road.

**Figure 4.14: Distribution of Laem Chabang container throughput**

A major factor in the declining role of Lard Krabang in the handling of Laem Chabang’s container throughput has been the relocation of several major exporters and some importers from areas in and around Bangkok to areas closer to the port. In addition some larger factories have recently acquired customs inspection facilities, with the result that export consignments are transported directly by road to the port.
Although the State Railway of Thailand has recently invested in 20 new 3,500 HP diesel electric locomotives and some 370 new container wagons, specifically to reduce unit operating costs by increasing train size, these new assets have yet to be fully mobilized.\textsuperscript{18}

While it was originally intended that a major proportion of the ICD’s throughput would move in and out by rail, in fact the proportion moved by rail has never exceeded 34 per cent.

The operation of all ICD modules is understood to be profitable, but it is unlikely that railway haulage revenue covers train operating costs between Laem Chabang and Lard Krabang.

\textbf{Figure 4.15: Rail loading/unloading sidings at Lard Krabang ICD}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{image}
\caption{Rail loading/unloading sidings at Lard Krabang ICD}
\end{figure}

\textit{Source: ESCAP Study Team}

\textsuperscript{18} The deployment of higher horsepower locomotives will allow container train lengths to be increased from 30 wagons as at present to 40 wagons in future, with a potential 25 per cent saving in operating costs, which could be passed on to shippers in the form of reduced container haulage charges (Consultant’s estimate).
5. Dry Port ownership

While private sector ownership and operation of dry ports is not necessarily a condition for their sustainability, there appears to be a widespread acceptance that the operation of these facilities can benefit from participation in their management (if not ownership) by companies with logistics expertise.

To varying degrees, in all five countries reviewed for this study, there is private sector participation in the ownership and operation of inland ports.

The various approaches used may be categorized within four models: (i) full ownership by the public sector; (ii) full ownership by the private sector; (iii) joint public/private sector ownership; and (iv) Public/Private Partnerships (PPPs).

Within each of these models there are different alternatives with respect to investment and/or management/operation. For example:

- full ownership by the public or private sectors can be accompanied by responsibility for terminal operation, or alternatively operation may be contracted out, as in a Management Contract;
- joint public/private sector shareholding can involve pooling of investment for infrastructure and handling equipment or individual investment responsibility for infrastructure (public sector) and equipment (private sector);
- PPPs can involve either shared responsibility between public and private partners for infrastructure investment and individual responsibility by the private partner for equipment investment and terminal operation, or individual responsibility of the public sector partner for land and infrastructure provision and of the private sector partner for equipment investment and terminal operation.

Examples of these models and of their variations can be found throughout the five counties surveyed and in India examples of three of the four basic models can be found.

(i) Australia

In Australia, the ownership and operation of inland intermodal freight terminals and investment in their development is almost wholly in private sector hands.
A major exception will be the Moorebank Intermodal Terminal project near Sydney, which is to be developed by a Public Private Partnership between the Federal Government and a joint venture comprising two major private sector logistics companies (Qube Holdings Ltd and Aurizon Holdings Ltd).

The public sector partner is a government business enterprise, Moorebank Intermodal Company (MIC) formed by the Federal Government in December 2012 to oversee the development of the Moorebank Intermodal Terminal and to work with industry to achieve the project’s full potential. Its contractual responsibility will be to hand over (from land reserves formerly occupied by an Army stores depot) a large part of the terminal’s land requirement, and to invest in the provision of railway infrastructure to connect with the Port Botany container terminal. It is the intention of the Federal Government to privatize MIC once the intermodal terminal is fully operational. The public sector partner will contribute $A 320 million out of the estimated overall project cost of $A 1.83 billion.

The private sector partner is the Sydney Intermodal Terminal Alliance (SIMTA), a joint venture partnership of two large logistics companies – Qube Holdings (formerly P&O Terminals) with a share of 67 per cent and Aurizon Holdings (formerly Queensland railways) with a share of 33 per cent. Its contractual responsibility will be to hand over a neighbouring parcel of land currently occupied by a Qube owned intermodal terminal as well as to invest in construction of the import-export terminal, the interstate terminal and the warehousing component of the project.

The PPP transactions structure of the project is illustrated in Figure 5.1. The key element of the PPP will be a land trust formed as a partnership between MIC with 65 per cent and SIMTA with 35 per cent. This land trust will lease land to separate warehouse and terminals trusts established by the SIMTA partners, for a period of up to 99 years.

In another case, the local, state and federal governments have wholly financed the development of the Wimmera Intermodal Freight Terminal at Dooen, near Horsham
Figure 5.1: PPP transaction structure – Moorebank Logistics Precint

Source: Qube holdings Ltd., Investor Presentation, June 2015, Moorebank Integrated Precinct

operator in this case was in-kind provision of some handling equipment. Intermodal trains operate between this terminal and the Port of Melbourne carrying containerized grain.19

(ii) China

A joint stock company comprising shareholding by China Railway Container Transport Corporation (37%), NWS Holdings Ltd of Hong Kong (30%), China Shipping Corporation (10%), Lucky Glory International Ltd of Hong Kong (15%), and DB (Deutsche Bahn) International (8%) was established to invest in and operate 18 major rail container hub terminals throughout China. To date, only 9 of these terminals are in operation, with the first of these, at Kunming, starting operation on 04 November 2006. Total investment in the terminals, comprising infrastructure and handling equipment, is shared among the investors in proportion to their shareholding (i.e. Chinese Government 47%; private sector 53%), while operation is the responsibility of Chinese Railway Intermodal, the successor of CRCTC.

There are a few examples of wholly private sector investments in inland port development in China. In Yunnan Province, two major terminal development projects

19 Victorian Department of Economic Development response to Questionnaire for Policy Makers/Formulators, November 2015.
are underway in Anning and Jinning prefectures, to complement the major rail hub terminal at Wangjiaying.

At Jinning, the Yunnan Gallops Investment Group, comprising many companies investing in logistics, is developing an inland port on a land plot of 160 hectares (1.6 million square metres), with a design capacity to handle, by 2020, 9 million tonnes of cargo by rail and 4 million tonnes of cargo by road. Some 60 per cent of the road hauled cargo will be from/to international origins and destinations in Lao PDR, Thailand and Viet Nam.

At Anning, another private sector investor, the Kunming Transport Investment Group, is developing a smaller road and rail served terminal. It is understood that this terminal will have a CY (container yard) area of 266,800 m².

In the case of these wholly private sector investments, the terminal operators will lease land from the provincial governments in whom ownership is vested.

(iii) India

In India, there are examples of the application of three of the four basic inland port ownership models: (i) public sector ownership and operation; (ii) private sector ownership and operation; and (iii) joint public/private sector ownership and operation.

CONCOR is itself a public/private joint venture. It was floated by the Indian Railways in 1989 and the initial share offering was quickly oversubscribed. Its paid-up share capital currently stands at INR 194.97 crore (INR 1,950 million), with the Indian Railways owning 61.8 per cent and the private sector (mainly foreign institutional investors) owning 38.2 per cent of the share capital.

Of the 52 inland ports, or ICDs, in India, some 16 are owned outright and operated by private sector logistics companies, the main ones being:

- Gateway Rail Freight Limited, with rail linked terminals at Garhi-Harsaru (Gurgaon, Haryana), Ludhiana (Punjab), Kalamboli (Navi Mumbai), and Asaoti (Faridabad, Haryana), and fleets of 24 trains (1,080 container wagons) and 235+ road trailers; and
- Arshiya Ltd, with a large (120,000 TEU per annum) rail linked terminal at Khurja, Uttar Pradesh, near Delhi and a fleet of 20 trains (900 container wagons).
Both of these companies operate in competition with CONCOR by providing container haulage to/from Jawaharlal Nehru (JN), Mundra and Pipavav ports, but carry a very small share of the total volume of containers moving in the Dedicated Freight Corridor.

Of the 36 ICDs operated by CONCOR, a majority could be categorized as *public sector owned and operated facilities*. This category includes the Tughlakabad ICD near New Delhi with the highest throughput volume of any ICD in India as well as the Whitefield ICD near Bengaluru, which was visited during the course of the UNESCAP fact finding mission to India in October 2015.

A third category may be described as *joint venture public-private facilities*. The first of these to be established was the large CONCOR ICD at Dadri, Greater Noida, near Delhi. Container handling and storage as well as the loading/unloading of trains is the responsibility of CONCOR, but the facility incorporates 4 container freight stations (CFSs) which are operated as joint venture undertakings between CONCOR and private logistics companies. Shares in these undertakings are: 51 per cent logistics companies and 49 per cent CONCOR. It is the responsibility of CONCOR to provide land and infrastructure and of the logistics companies to provide handling equipment (if any) and to operate the CFS with their own staff. CFS areas, including covered warehouses, are leased to the logistics companies for 30 years. Details of the CFS areas leased within the Dadri ICD are as follows:

**Table 5.1: Leasing of CFS area to Joint Venture Partners, Dadri ICD**

<table>
<thead>
<tr>
<th>Joint venture partner</th>
<th>Total area leased (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albatross Inland Ports Pvt.Ltd.</td>
<td>90,000</td>
</tr>
<tr>
<td>CMA-CGM Logistics Park (Dadri) Pvt.Ltd.</td>
<td>60,000</td>
</tr>
<tr>
<td>Allcargo Logistics Park Pvt.Ltd.</td>
<td>40,000</td>
</tr>
<tr>
<td>APM Terminals (Star Track Terminals Pvt.Ltd)</td>
<td>67,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>257,000</strong></td>
</tr>
</tbody>
</table>

*Source: Shri M K Nabi, Chief Manager of ICD Dadri, Noida, 19 October 2015*

20 In fact, it was found that most of the cargo handled in the CFSs is not palletized and hence is loaded and unloaded using manual labour. It was estimated that 95 per cent of the cargo volume handled in the CFSs is manually handled, while only 5 per cent is handled with small (2.5-3 tonne) forklifts.
The net revenue (income less operating costs including lease charges) generated by each CFS venture is then distributed between CONCOR and the joint venture partner in proportion to their shares in the venture.

The layout of the CFSs in relation to the overall layout of the Dadri ICD is given in Figure 5.2 below.

Figure 5.2:  ICD layout, Dadri near Delhi, India

Source: APM Terminals, Powerpoint Presentation 2015

(iv) Republic of Korea

In the Republic of Korea, Inland Container Depots currently operate at five locations as part of Inland Logistics Depots with broader functions for the handling of domestic as well as international cargo. All operate under Public Private Partnership (PPP) contracts with public and private shareholdings of 25% and 75% respectively.

Ownership of the land under the terminals is vested in the public sector partner (Korean National Railroad Network Authority), which then leases the land at less than commercial rates to the private partners who operate the terminals. The private partners are logistics companies and road hauliers.

The public sector partner is responsible for investing in the road and rail accesses to the terminals, while investment in infrastructure and handling equipment within the
boundaries of the terminals (including CY paving, rail sidings and internal roadways) is the responsibility of the private partners. The latter investment is provided under a 30 year Build-Operate-Transfer (BOT) concession in the case of the Uiwang Logistics Depot and a Build-Own-Operate (BOO) concession in the case of the other four facilities.

(v) **Thailand**

The Lard Krabang ICD comprises six modules each with its own CY and warehousing, but with a common access to three rail sidings, each with a length of 1,000 metres (one each for container loading and unloading, and one for release of the locomotive). The facility has not been developed beyond its Phase 1 plan and a planned second phase has been suspended owing to the non-availability of a sufficient contiguous land area. The total infrastructure investment cost of Phase 1 was US$ 73.9 million, the project being funded jointly by a World Bank loan, the Thai Government and institutional investors.

The ICD is financed and managed as a type of PPP (Public Private Partnership) scheme in which the government provides the land and finances the infrastructure, and the private sector operators finance, provide and operate the container and cargo handling equipment under an operating concession. The operators pay concession fees to the State Railway of Thailand which manages the ICD on behalf of the Thai Government.

Initially the ICD modules were offered through a public bidding process for operation during a concession period of 10 years, with an option of extension for another 5 years. The 15 year concession period ended in 2012 and contracts were not renewed pending a decision by the government as to the future governance of the ICD. The operators have now been advised that the government proposes to integrate the six modules into a single facility, **effectively creating a monopoly in the operation of the ICD**. This proposal has now been challenged in the Administrative Court by one of the current module operators (Thai International Freight Forwarders’ Association or TIFFA), and an injunction issued to prevent a re-bidding process.\(^{21}\)

With only two exceptions, the existing concessionaires are the subsidiaries of shipping lines, as shown in Table 5.2 below.

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\(^{21}\) Information provided by management of the TIFFA Terminal during a visit by the UNESCAP team on 29 October 2015
Table 5.2: Lard Krabang ICD, operating concessionaires and annual TEU volumes

<table>
<thead>
<tr>
<th>Module</th>
<th>Name of Concessionaire</th>
<th>TEU volume (2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Siam Shoreside Services, a subsidiary of the Maersk Line</td>
<td>332,272</td>
</tr>
<tr>
<td>2</td>
<td>Eastern Seaboard Laem Chabang, a port terminal operator owned by the Port of Singapore Authority and a Japanese port company</td>
<td>292,981</td>
</tr>
<tr>
<td>3</td>
<td>Evergreen Shipping Line</td>
<td>328,820</td>
</tr>
<tr>
<td>4</td>
<td>Thailand International Freight Forwarders’ Association (TIFFA)</td>
<td>122,985</td>
</tr>
<tr>
<td>5</td>
<td>Thai Hanjin (shipping line)</td>
<td>91,584</td>
</tr>
<tr>
<td>6</td>
<td>NYK (shipping line)</td>
<td>235,812</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>1,404,454</td>
</tr>
</tbody>
</table>

Source: Bangkok Ship-owners’ and Agents’ Association

The type of PPP model applied at Lard Krabang has much to recommend it, since (issues of governance aside) it has at least the potential to stimulate competition among the operators.
6. Dry port development incentives

Financial incentives may be provided by governments to encourage the development by the private sector of dry ports, especially in areas which are the focus of government decentralization or income equalization policies. Such incentives can often determine the viability of an operator’s investment in construction of a terminal.

A limited range of such incentives is provided by governments of some of the five countries reviewed in this study, the most significant of these being the provision of low cost land, or low land rent. In some countries, governments provide incentives in the form of subsidized infrastructure development.

Other forms of financial incentive which can be provided by governments are in the nature of tax (especially business or corporate tax) waivers or holidays, whereby taxes are waived for an agreed period of time, usually to allow operators some time to establish their businesses and generate income.

(i) Australia

In Australia, very few direct incentives are applied to encourage dry port development. Meetings held with an operator of an existing terminal and with the developer of a future terminal in the Albury/Wodonga area indicated that the land for these terminals had been purchased by the operators from companies managing the industrial estates in which the terminals are/will be situated.

These industrial estates were in turn developed by local government authorities in Albury and Wodonga. It is not known whether land sold for the development of these intermodal freight terminals was sold below prevailing commercial prices.

However, there are indications that local government authorities can and do collect land taxes (called local government rates in Australia) at concessional rates from developers of industrial land, including from developers of inland ports, in order to improve the potential rate of return on a developer’s investment. For example, there is evidence that the development by Specialized Container Transport, a major logistics operator, of a rail served intermodal terminal within the Logic Industrial Estate south of Wodonga was assisted by an offer by the Wodonga City Council of a land rate concession.22

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22 Minutes of a special meeting of the Wodonga City Council, Wednesday 28 January 2015.
At the level of state governments, indirect incentives are often provided in the form of grants or subsidies for the accelerated development of the transport infrastructure on which the inland port will depend. As an example of this, the Victorian State Government within the past decade has provided grant funding amounting to $A 29 million for the provision and/or upgrading of road and rail accesses to selected inland ports.\(^{23}\)

(ii) China

Direct financial incentives for the development of inland ports in China are generally applied at the level of provincial and local governments.

In China, all terminal land is owned by the government and payment for its use is recovered in the form of land taxes, payable by terminal operators. By keeping land valuations low relative to prevailing market rates, the government can provide land use incentives to terminal operators. For example in Yunnan Province, if the CY area occupied by an operator exceeds 60,000 square metres, that operator will receive a 50% reduction in the rate of land tax applied.\(^{24}\)

Often, railway freight rates are used in order to modify the level of demand for rail transport, and hence the demand for rail served inland ports. For example, in some areas, such as Shanghai, preferential freight rates (incorporating discounts of up to 50 per cent) are applied in order to attract shippers to rail and inland water transport. In other more remote areas, such as Xinjiang, preferential railway freight rates will be applied for the rail transportation of staple commodities.

(iii) India

An Inter-Ministerial Committee (IMC) assesses and approves applications for the development of ICDs. Business plans are often submitted in support of these applications, but the long term viability of the proposed terminal is not a factor which is taken into account in determining whether or not to approve a development application. There is, however, a broad presumption of viability in the case of all applications which come before the committee.

\(^{23}\) Victorian Department of Economic Development response to Questionnaire for Policy Makers/Formulators, November 2015.  
\(^{24}\) Information provided at a meeting with the Department of Transport, Yunnan Province in Kunming on 20 August 2015.
Given the presumption of viability, no direct incentives are provided in India for the development of inland ports, except that the activities of state government agencies in securing land for terminal development may succeed in delivering land parcels at less than market rates.

(iv) Republic of Korea

In the Republic of Korea, private terminal operators lease land at the Uiwang ICD from Korean Railways (Korail) at rates which are significantly lower than those of properties in the industrial zones surrounding the ICD. Otherwise, no direct financial incentives are provided for the development of inland ports.

(v) Thailand

No direct incentives are provided for dry port development, other than through the provision of low cost land as part of the operating concession. This will be reflected in a reduction in the concession fee to be paid by ICD operators.
7. Assessment of issues and policies related to Dry Port operation and sustainability

It is important that, once established, dry ports should continue in operation, generating a reasonable level of profit for their operators and/or developers and at the same time minimizing transport and cargo handling costs between cargo origins/destinations and ports.

Government policies can assist in achieving these objectives particularly through measures designed to accelerate the turnaround of containers in terminals and to maximize rail haulage of containers to/from ports.

The main issues and policies associated with these objectives are outlined below.

7.1 Reform of customs and other border control procedures

If (for example) the average dwell time of import containers in a terminal can be reduced from 7 days to 3 days, the annual throughput of that terminal can be expanded nearly 2½ times, meaning that handling revenues can be more than doubled without a commensurate increase in costs (since fixed costs will be spread over a greater throughput). Operating efficiency and border control processes are the most significant contributors to the detention of containers in a terminal.

Many member countries of the UNESCAP region have made substantial progress in streamlining the efficiency of their customs, quarantine and border security processes, including, in the case of customs, moving to pre-clearance of import consignments. However, few have adopted a genuine single window system for the processing of trade consignments, and thus delays owing to the need to comply with multiple sets of border procedures can be substantial.

In the Republic of Korea, border control procedures are conducted separately by separate agencies, while in China the separate procedures are carried out in the same office, but without an exchange of information among the different agencies.

(i) Australia

In Australia, the Customs and Border Protection Service now unifies customs, immigration, quarantine and border control functions within a single agency. Customs
and Border Protection have adopted a trade consignment approval and clearance process in which all forms, applications and related decisions are available online. Information relating to import consignments is received online 72 hours before arrival at seaports and a customs risk assessment, which is the basis for deciding whether or not a consignment is to be inspected, is made before the vessel actually arrives in port.

Data were provided by officers of the Australian Customs and Border Protection Service to show that last year on average only 100,000 out 2 million import TEU arriving in Australia were physically inspected or X-rayed, so that the delay factor attributable to customs clearance processes was minimal. Pre-clearance in this way allows import containers to be taken out of the port and despatched to inland destinations without any delay. The Customs and Border Protection Service regularly assesses the efficiency of its clearance and inspection procedures, at the same time measuring the extent to which its procedures contribute to delay in the movement of import consignments.

(ii) China

At inland ports, the various border control processes are now accommodated within the same building but there is as yet no exchange of information among the different responsible agencies. In order to address this problem, the State Council is promoting a scheme for customs reform which will: strengthen cooperation among agencies involved in border control; realize information exchange; and encourage mutual assistance in the enforcement of regulations for border control. Also the General Administration of Customs has taken the initiative of establishing “multimodal transport customs supervision centres” within important trade node cities in inland and coastal China, such as Xi’an, Qingdao and Zhengzhou, presumably with the objective of monitoring and reinforcing the efficiency of border control procedures.

Despite the absence of a genuine single window system of border control, the efficiency of border crossing procedures in China has been rated as “moderate”. In

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25 Meeting with 2 senior officers of the Customs and Border Protection Service, Canberra, 25 August 2015.
26 Such assessments are published in a series of regular reports, e.g. Australian Customs and Border Protection Service: “Time Release Study, 2013”.
27 Ministry of Transport response to UNESCAP Questionnaire for Policy Makers and Formulators, August 2015.
other words, excessive delays due to completion of border formalities are considered to be infrequent.

(iii) India

As in Australia, in India also, all customs documentation is now submitted on line and inspections are carried out on the basis of a customs risk assessment. However, up to 40 per cent of import consignments are physically inspected as compared with only 5 per cent in Australia. The need to inspect import consignments of specific goods which have not had a good record of compliance (e.g. scrap metal) explains why the inspection rate is high.

In the case of exports, more than 80% of consignments are not examined – customs examination is restricted to an inspection of seals before dispatch.

Inland ports are disadvantaged through not being equipped with X-ray scanners – only JN Port has scanning equipment. This factor alone makes it more likely that a high proportion of import consignments will be inspected. This is particularly the case with imports of second hand machinery, which must be discharged from the container to allow assessment for the payment of duties.

While India is moving towards a single window system, progress is slow as multiple agencies are involved. If consignments contain food items, samples must be sent for laboratory testing, often a long distance from the ICD, which can add substantially to delays. Data provided during the visit of UNESCAP staff to the Whitefield ICD, near Bengaluru, indicate an average dwell time for completion of customs formalities for import containers of 10.25 days. There is a target to reduce this dwell time to 3 days, which if achieved could result in the throughput of import containers expanding by a factor of nearly 3.5. More than half of the average delay is attributed to delay in the filing of the Bill of Entry after arrival of the container at the ICD.²⁸

(iv) Republic of Korea

Separate border control processes, for customs, plant and animal quarantine, and food inspection, are carried out in the ICDs. A single window service is now available at airports, but has yet to be extended to seaports and inland logistics facilities.

²⁸ Meeting of UNESCAP staff with Mr Sandeep Kumar, Commissioner (Customs), Central Board of Excise and Customs, North Block, New Delhi 20 October 2015 and visit to CONCOR ICD, Whitefield 21 October 2015.
In the first instance, customs inspection is undertaken through a check of documentation. This can be rigorous in the case of import consignments, 2-3 per cent of which are also physically inspected.

ICDs are not equipped with X-ray scanners, but trade consignments are scanned in Busan Port.

Delays to trade consignments due to the completion of border control procedures are considered to be minimal at Uiwang ICD.29

(v) Thailand

Customs inspectors are based in all six modules of the Lard Krabang ICD. All documentation is submitted on line. While the single window system was approved for adoption in Thailand many years ago, implementation has been slow, owing to the need to harmonize and integrate the activities of some 40 separate control agencies. So far only 12 of these agencies have signed up to the system.

Approximately 10 per cent of trade consignments are inspected by X-ray scanning at Lard Krabang. Scanners have been installed at Laem Chabang Port, but are not yet in use. If there is a need for quarantine testing, samples are sent to a nearby laboratory, with a delay of only one day.

Importers can pay duties on line, up to one week before receiving their consignments. This allows a large reduction in turnaround time. Dwell times for both export and import containers at Lard Krabang average only 3 days.30

7.2 Minimization of total logistics cost

One of the key indicators of the success of dry ports is the extent to which they can contribute to the minimization of the total logistics cost between cargo origins/destinations and seaports, or in the case of domestic intermodal freight terminals, between ultimate cargo origins and destinations.

Logistics costs are the costs (or charges) associated with the entire logistics chain, payable by cargo owners or shippers for:

29 Meeting with staff of the Ministry of Land, Infrastructure and Transport, Sejong, 12 August 2015.
30 Information provided by management of the TIFFA Terminal during a visit by the UNESCAP team on 29 October 2015
a) Local delivery
b) Terminal handling and storage
c) Linehaul transport (i.e. transport between dry ports and seaports or between domestic intermodal freight terminals)
d) Other intermediate costs (such as those related to customs clearance)

Of these components, the level of terminal handling and storage costs will reflect the operational efficiency of terminals, but also the effectiveness of streamlining customs and other border control procedures in order to accelerate the turnaround of containers and cargo in terminals.

The level of the transport components of the total cost, related to local delivery and line-haul transport, will be influenced by modal choice decisions. It is important that these decisions should be based on the relative efficiency and cost effectiveness of road and rail for each type of transport task. Modal choice decisions will not only affect the total transport cost in financial terms, but also the environmental cost associated with the intermodal transport mix.

It is usually the case that road is more suited for short-haul delivery of container cargo between a shipper/consignee’s premises and the dry port or intermodal freight terminal than for line-haul transport of containers over longer distances, and the reverse is usually true for rail. The level of delivery cost can also be influenced by the proximity of a terminal to a shipper/consignee’s premises. Similarly, the level of line-haul cost will be affected by the distance between a terminal and a seaport, or between terminals in the case of domestic freight. Thus, decisions relating to location of a terminal can be major determinants of transport cost, both as it relates to the short-haul and line-haul components of transport cost.

(i) Australia

The significance of government transport policies in determining modal choice cannot be overstated, as is well demonstrated by the Australian experience of licensing “B-Double” truck and trailer combinations in the mid-1990s to haul cargo and containers between major inland terminals and the seaports.

“B-Doobles” of which there are two main types: a B-Double with a maximum trailing length of 18 metres and a carrying capacity of 3 TEU and a “Super B-Double” with a maximum trailing length of 24 metres and a carrying capacity of 4 TEU, were first
licensed to enter the Port of Melbourne, via the arterial road network. Subsequently they were licensed to enter Port Botany (the main port of Sydney), but their use quickly proliferated to the Hume Highway linking Sydney with Melbourne. They now dominate inter-capital freight traffic between the two cities.

While these new road vehicles dramatically reduced road unit operating costs as compared with the conventional semi-trailer units previously used for inland terminal-port container transfers, they could clearly not match the efficiency and operating economics of shuttle rail services being proposed for Melbourne (as illustrated in Figure 7.1 below).

To a major extent, the advent of the B-Double extended the role of road transport to providing linehaul movement to/from the seaports and in so doing displaced rail transport from this role. In the case of the Port of Melbourne, this role was reinforced by the removal of some of the rail access lines to the port.

**Figure 7.1:** Intermodal transport system equipment configurations and capacities

There is now recognition that this major shift in transport policy may not have been in the public interest and the present Victorian State Government has authorized the resumption of planning for rail container shuttle services to be accommodated within the port.

(ii) China

In China, government transport policy remains focused on large-scale development of the intermodal rail network, in particular on the development of major intermodal rail hub terminals at 18 inland locations, connected both to seaports and to other inland industrial centres. The first of these was established at Kunming in 2006, and to date 9 are in operation. It is expected that, in the longer term, all intermodal hubs will be connected by double stack rail container services, thereby substantially expanding their use and reducing their unit operating costs. The use of alternative transport modes (road and Inland Waterway Transport) for the line-haul movement of containers is now generally restricted to corridors which are not connected to the railway network, of which the corridor for international trade between China (Kunming) and Lao PDR is an example.

(i) India

The network of 52 dry ports in India is served almost exclusively by the electrified mainlines of the Indian Railways. Much of the railway network benefits from the generally long container hauls available between the dry ports and the seaports, the main exceptions being several lines in the south of India, such as the Chennai-Bengaluru line, where the container haul distance is only 346 km.

In such cases, rail is highly vulnerable to competition from road transport which can offer greater flexibility in loading cut-off times, as well as an ability to transport export containers from originating factories or warehouses directly to the export container stack at the port. This is despite major transit delays often associated with truck traffic congestion and queueing at the port. Arguably, rail faces a treble handling disadvantage in ports which in the case of short-haul routes will exaggerate the competitive advantage of road transport.

31 Since rail loading/unloading sidings in a port are usually located far from the berths, a container moved by rail to the port will on average require 3 lifts to reach the export stack as compared with a single lift for a road hauled container.
Even in the case of long haul routes, rail has occasionally faced competition from road, particularly for the transport of high cube, low weight containers. As an example, although Mumbai area ports are more than 1,500 km by road from Dadri ICD, CONCOR has recently been facing intense competition from road in the transportation of light 40 ft containers loaded with ready-made garments for export. Recently, the CONCOR charge for the haulage of these containers was INR 45,000 per FEU (40 ft equivalent unit) which compared unfavourably with the road haulage charge of INR 32-35,000 per FEU (of up to 20 tonnes in weight).

In an effort to re-capture this traffic, a plan was devised to move export containers in single tier container trains to the new Khatuwas multi-modal terminal where another tier of containers would be added for the journey to Mumbai, as a double stack train. Since the unit operating cost of a double stack train will only be slightly more than half that of a single tier train, the savings could be used to offset the additional costs of hauling trains to, and handling containers at, Khatuwas. In this way it was possible for CONCOR to match the haulage charge of road (at INR 35,000 per FEU) and (it was hoped) recover the lost traffic.

(ii) Republic of Korea

In the Republic of Korea, while all inland terminals are connected by rail with Busan Port (and some with Gwangyang Port), rail has faced steadily increasing competition from road transport, which is dominated by owner-drivers who, since 2003, have had the advantage of access to cheap fuel through a diesel subsidy provided by the central government. Initially, the subsidy was offered to compensate drivers for the rapid rise in fuel prices at that time, but remains in place even after world oil prices collapsed from the second half of 2014.

Of the five inland terminals, only Uiwang attracts a significant volume of rail-hauled containers, but even then road transport has been capturing an increasing share of the overall of the line-haul container volume between Uiwang and Busan Port. In 2014, approximately 56 per cent of the overall volume of 1.01 million TEU was moved by road transport between Uiwang and Busan Port. The proximity of the Uiwang terminal to Busan Port (410 km by rail and 380 km by road), coupled with the greater flexibility of road transport to allow later loading cut-off times, the apparent

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32 This subsidy is provided through monthly rebates which are proportional to truck size. The average rebate now stands at US$ 0.30 per litre, or 25% of the average fuel price of 1,400 Won, or US$ 1.20 per litre.
inability of rail to control its costs and the freight rate advantage said to be enjoyed by road\textsuperscript{33}, in large part explains the declining rail share.

\textbf{(iii) Thailand}

In the case of most UNESCAP member countries, governments have the ability to influence the level of competition between road and rail by restricting the gross vehicle weights (and hence payloads) of heavy road vehicles. The purpose of such restrictions is mainly to avoid the damage to road pavements from operation of overloaded vehicles, but they can be shown to have had a significant impact on competition between road and rail, particularly in the haulage of containers. Many member countries (among them most countries of Southeast Asia and the Republic of Korea) now apply a gross vehicle weight restriction of 40-45 tonnes on prime mover and trailer combinations using national highways. If the tare weight of these vehicles is about 12 tonnes, then the maximum allowable payload will be 28-33 tonnes.

A trend which has recently become apparent throughout the region is that the average gross weights of 20 ft containers have been increasing to something in excess of 20 tonnes. At these weights, the carrying capacity of a 40ft trailer unit would be restricted to only a single 20ft container per trailer unit.\textsuperscript{34} Effectively, this would double the road operator’s haulage costs and significantly reduce profit margins. No such load restrictions apply to railways, giving them a substantial advantage over road transport for the haulage of 20 ft containers. In some countries - for example, Thailand – this competitive advantage has been used by railways to sustain high charges for the movement of 20ft containers, but to apply discounted charges for the haulage of 40ft containers, where they remain vulnerable to competition from road. \textit{In this case, market conditions, combined with regulatory control, favour a transport solution which is environmentally sustainable.}

\section*{7.3 Adoption of mechanized cargo handling technology}

The cargo pallet provides a platform for unitizing breakbulk cargo and transferring it between transport modes, with and without the intermediate use of containers.

\textsuperscript{33} It was indicated during a meeting with Uiwang ICD management on 11 August 2015 that road freight rates were lower than those of rail despite the greater efficiency of rail (containers moved in trainloads of 60 TEU, as compared with 2 TEU per road trailer). The high and uncontrollable fixed costs of rail transport were claimed to be responsible for the lack of rail’s competitiveness.

\textsuperscript{34} Information provided by Manager of TIFFA terminal at Lard Krabang, 02 April 2013.
Although the use of pallets predates the advent of containers (which have themselves been in global use for nearly 50 years), their use is not yet widespread within the dry ports sector of the UNESCAP region. Several dry ports in India, including the Dadri ICD which was visited during the course of a fact finding mission by UNESCAP staff, continue to rely on manual labour for cargo loading and unloading in their CFSs.\textsuperscript{35}

Where labour is in plentiful supply and is inexpensive, manual handling techniques of the type illustrated in Figure 7.2 will prevail, but it may be argued, are incompatible with the efficient operation of CFS warehouse facilities and hence with the overall long term viability of the dry ports themselves.

**Figure 7.2: Manual unloading of a BCN rake in India**

![Image of manual unloading](source: Freight Operations Information System, Ministry of Railways, Government of India)

Although the picture portrays the unloading of railway vans, similar methods are used for the handling of cargo in the CFS facilities of several dry ports in India. (There are nevertheless some exceptions – for example, at the CONCOR Whitefield ICD, a majority of the cargo handling activity is mechanized).

By contrast, all cargo handled within the CFS facilities of the Lard Krabang ICD is palletized and transfers of cargo to and from trucks and containers are done with 2.5-3 tonne forklifts as shown in Figure 7.3 below.

\textsuperscript{35} The UNESCAP team was informed that 95 % of the cargo loaded into or from containers and trucks in the five CFSs of Dadri ICD is handled manually, with the balance (5%) being handled by mechanized equipment, specifically light forklifts.
Inevitably, manual handling of cargo will be slow by comparison with mechanized handling. For example, in the case of the manual unloading of BCN boxcars as shown in Figure 7.2, four labourers (three in the wagon and one on the truck) would take about 7 hours to unload bagged cargo from one wagon\(^\text{36}\).

By comparison, the unloading of 20 ft containers by forklift, as shown in Figure 7.3 takes about 40 minutes utilizing only one person to drive the forklift.\(^\text{37}\) If the capacity of a BCN wagon is about three times that of a 20ft container, the manual handling time required is at least 3.5 times that of the mechanical handling time (2.3 hours vs. 40 mins = 0.667 hours). Clearly, therefore, mechanical handling will speed up the

\(^{36}\) Assuming 50t payload and 60 kg per bag with unloading time per bag of 0.5 minutes.

\(^{37}\) Assuming 20 pallets per TEU with loading time per pallet of 2 minutes
turnaround time of cargo and containers in the dry port, thereby increasing throughputs, revenues and profitability.

Further, advanced GPS based systems may be used to track and trace cargo loaded or discharged by mechanical means, and to cost the handling operations involved.

For the above reasons, it would pay ICD operators to offer discounted handling tariffs to shippers and cargo consignees in order to encourage them to palletize their consignments.
8. Conclusions

Recent fact-finding missions to five member countries of the UNESCAP region have identified a number of significant issues and policies which are considered to affect the establishment, development and sustained operation of dry ports and related intermodal freight terminals throughout the region.

Among the issues and policies, with an influence on dry port development, are:

(i) **Function and location issues**, with dry ports being seen to have a main function of supporting the movement of international trade between inland origins or destinations and seaports, for which purpose they need to be located within, or close to, the sources of trade and accessible by rail to the seaports;

(ii) **Ownership issues**: Private ownership of dry ports is not necessarily a precondition for their sustainability, but they could benefit from an infusion of private sector logistics expertise plus private and public capital injection in the form of a PPP (Public Private Partnership) contract;

(iii) **Dry port development incentives**: Governments can encourage the establishment of dry ports through a range of incentives designed to attract private sector investment, specifically through the provision of low cost land and tax holidays or waivers

Among the issues and policies, with an influence on the sustainability of dry port operations, are:

(i) **Reform of customs and other border control procedures** which can result in the reduction of delays to trade consignments and accelerate the turnaround of containers in terminals, with a commensurate reduction in their unit operating costs and an improvement of their profitability;

(ii) **Measures to minimize total logistics cost**: Policy interventions are necessary to ensure least cost intermodal solutions to container and cargo haulage between trade sources and seaports. In particular, planning of terminal development and regulation of road vehicle dimensions and weights should be focussed on the optimum use of road for local delivery and rail for line-haul transport of containers and cargo. This will be necessary, in order to ensure that terminal and transport operations are both financially and environmentally sustainable.
(iii) Offers of tariff incentives to encourage the adoption of modern cargo handling technology, specifically involving the palletization of cargo, which by speeding up the turnarounds of containers and cargo, will add to the profitability of CFS operations in dry ports and will contribute to the minimization of total logistics cost.
Section B: Mission reports

1. Australia

1. Introduction

A mission to Australia was conducted by staff of the UNESCAP Transport Division for the express purpose of collecting information on the development and operation of inland intermodal freight terminals of international significance in Australia.

The mission was conducted from 25-28 August 2015, during which period the following meetings and site visits were scheduled:

- Meeting with staff of the Federal Department of Infrastructure and Regional Development in Canberra;
- Meeting with officials of the City of Wodonga (Victoria);
- Visit to Logic Logistics Park (south of Wodonga Victoria);
- Visit to Ettamogah Rail Hub (intermodal terminal north of Albury NSW);
- Meeting with staff of Victorian Department of Transport, Planning, and Local Infrastructure;
- Meeting with management of SCT Logistics, Altona. Victoria.

This report describes the current status of inland port development in Australia and documents matters discussed with at the various meetings and site visits conducted during the mission.

2. Status of inland intermodal freight terminal development

The six mainland capital cities and one island capital city of Australia all have their own seaports with container handling capacity. All of the mainland capitals are now interconnected by standard gauge (1,435 mm) rail and most have trunk-line connections with export manufacturing centres in the interior (see Figure 1).

Australia is a special case in that in that some 75% of international trade volume does not move outside of the metropolitan areas of the state capital cities. Information provided at a meeting with officials of the Department of Infrastructure and Regional Development, Canberra 25 August 2015.
through the Port of Melbourne are estimated to be sourced within the Melbourne metropolitan area.\textsuperscript{39}

Figure 1: Australian railway network, July 2014

Thus the throughputs of established inland intermodal freight terminals tend to be dominated by domestic freight. Nevertheless, export oriented terminals are currently operating in several important inland regions of Southeastern Australia. As shown in Figure 2, examples with connections through the Port of Melbourne are:

- \textit{Western Victoria}, where terminals have been established at Merbein, near Mildura and at Warrnambool, on the southwestern coast of Victoria, for the handling of agricultural, mining and other diverse exports in containers; also at Dooen near Horsham in Western Victoria, for the handling of containerized export grain;

\textsuperscript{39} Information provided at a meeting with officials of the Department of Transport Victoria, Melbourne 28 August 2015.
• *Eastern Victoria*, where containerized paper is transported by rail from Maryvale for export through the Port of Melbourne;

• *Southern New South Wales*, where terminals have been established for the transport of: containerized rice from Deniliquin and Leeton, containerized wheat, barley and sorghum grain from Tocumwal, containerized wine for export from Griffith and Leeton, and containerized imports and exports through the Ettamogah Rail Hub, near Albury.

With only one exception, (the Wimmera Grain terminal near Horsham), these terminals are operated solely by the private sector.\(^{40}\) All are served by rail transport, the longest haul distance being that between Merbein and the Port of Melbourne (565 km). However, a large share of the container volumes of these terminals is understood to be transported by road to the Port of Melbourne.\(^{41}\) *Few, if any, provide facilities for the completion of customs formalities, which is mostly undertaken in the Port of Melbourne.*

**Figure 2: Inland container terminals connected to the Port of Melbourne**

\(^{40}\) Ownership of the Wimmera Grain terminal is vested in a local government authority, the Horsham Rural City Council, which has leased out the terminal for operation by a major logistics company and rail operator, SCT (Specialized Container Transport).

\(^{41}\) The licensing in the early 1990s of B-Double semi-trailers to enter the Port of Melbourne and the withdrawal of government support for branch-line operation has strengthened the competitive position of road to serve inland terminals.
These terminals handle only small container volumes, comprising both international and domestic containers. For example, the Ettamogah Rail Hub which was visited during the fact finding mission to Australia was reported to be handling only 16,000 TEU per year, while all 4 terminals in the Riverina District of southern NSW were reported to have handled 120,000 TEU of export containers in 2012/13.42

In a recent study undertaken on behalf of Transport for NSW it was observed that “combined with distance to destination, volume is a highly critical factor in the viability of a regional intermodal terminal.”43 The study concluded that a terminal with a transport distance of more than 400 km would be viable provided it had a threshold throughput of 30,000 TEU per annum. The rail distance between Griffith in the heart of the Riverina District and the Port of Melbourne is about 450 km, suggesting that the existing terminals (each with an annual throughput of about 30,000 TEU) might be financially viable, but only just.

New rail served inland terminals are being planned for the Logic Industrial, south of Wodonga, in northeastern Victoria (near Albury), and for Griffith and Wagga Wagga in the Riverina District of NSW. However, given the importance of trade sourcing within the capital cities and the perceived need to combat increasing road traffic congestion around the major ports, the policy focus for both Federal and State Governments is now on the consolidation of container handling facilities in the suburbs and the diversion of port related container traffic from road to rail.44 This is so despite the relatively short rail hauls involved, but the initiatives taken so far in Melbourne and Sydney suggest that short-haul rail movement of containers can be sustained if annual volumes are large and movement patterns are regular.

Among these initiatives is a plan to develop Australia’s largest intermodal terminal (with an ultimate throughput capacity of 1.7 million TEU per annum), at Moorebank on the south-western outskirts of Sydney. This terminal will have the primary function of handling export/import containers which will be transported by rail to/from Port Botany, a distance of only 31 km. In addition, the terminal will handle, store, dispatch and receive domestic containers moved to and from interstate locations.

42 RDA Riverina Regional Plan 2013-2016.
44 This would represent a reversal of the trend to road haulage of containers to/from the ports which became apparent from the early 1990s when “B Double” prime mover-trailer combinations (i.e. prime mover plus two trailers) were licensed to enter the Port of Melbourne and when indeed some port access lines were removed.
The terminal will be built on 243 hectares of industrial land much of which was formerly an Army stores depot and is being transferred by the Federal Government for development by a joint venture operating company under a 99 year lease.

*Warehousing will be a major income earner for the new terminal which will ultimately have a massive warehousing area of 850,000 m² (85 hectares).*

The project will be developed by a Public Private Partnership between the Federal Government and a joint venture of two major private sector logistics operators (QUBE and Aurizon). It has an estimated capital cost of A$ 1.83 billion (of which $A 1.5 billion is to be financed by the private sector) and has a first phase completion date of September 2017.45

**Figure 3: Operational design features of Moorebank Integrated Logistics Precinct (NSW, Australia)**

![](image)

*Source: Qube Holdings Ltd, Investor Presentation, June 2015*

Elsewhere, the state and federal governments are funding a project to develop a limited number of export/import terminals in suburban Melbourne connected by rail shuttle services to the Port of Melbourne. As is the case with the Moorebank project, the main purpose of the Port Rail Shuttle (PRS) project will be to reduce the worsening road traffic congestion around the port and along the arterial roads connecting to the port by converting container transfer from truck to rail transport.

45 By which date it is expected that the Import/Export (IMEX) terminal will enter service (Qube Holdings Ltd., Investor Presentation June 2015)
3. Meeting with Department of Infrastructure and Regional Development (DIRD) in Canberra

Meeting held in DIRD office in Canberra at 0930 hours on 25 August 2015. Present at the meeting were officers of DIRD, Bureau of Infrastructure, Transport and Regional Economics (BITRE), representatives of the Australian Customs and Border Protection Service, and the two ESCAP representatives (S Kumra and P Hodgkinson). Discussion of policy issues associated with inland port establishment, development and operation in Australia were led by Richard Wood, General Manager Rail and Intermodal, Infrastructure Investment Division, DIRD.

3.1 Role of DIRD

Role was described as looking after Australian Government’s infrastructure investments, in particular:

- 50 per cent of debt financing of the Australian Rail Track Corporation (ARTC), the government owned rail infrastructure maintenance organization;
- 50% of land and infrastructure investment in Moorebank International Logistics Terminal;
- as well as evaluation/recommendation of broad railway policy.

It was observed that during the last 40-50 years there had been massive investment in roads and relative neglect of investment in railways. Now there is a federal government commitment to invest in rail, as an environmentally sustainable form of transport. Yet road transport continues to dominate non-bulk freight transport on all inter-capital routes, except East Coast to Perth, as a result of government encouragement of B-doubles.

It was admitted that there are very weak regulatory mechanisms for rail (as indeed it may be claimed that there are also for Australian airports, now mostly in private hands). The policy of the current federal government is driven by a laissez-faire philosophy of “letting the market decide”.

In addition to Moorebank, federal government is part funding state government intermodal initiatives, especially in Victoria. Examples are:

- the Wimmera Intermodal Grain Terminal where the federal government is contributing A$ 6.5 million out of a total of A$ 16.75 million (with the balance being funded by the Victorian Government A$ 8.75 million, the Horsham Rural City Council A$ 750,000 and the private sector A$ 750,000)
- the Port Rail Shuttle project in Melbourne where federal government has contributed A$ 38 million out of a total of A$ 58 million committed so far

DIRD has had a leading role in promoting the Inland Rail project, involving the development of an alternative North-South railway route principally for freight transport. Logistics operators, such as Linfox and Toll are interested in this project, which some time ago had a price tag of $A 4.7 billion (now likely to be much more).

It was observed that the Australian Government has a policy to privatize ARTC, notwithstanding the global history of failure of similar railway infrastructure privatization schemes, e.g. UK, South America. A similar policy of state governments to privatize seaport authorities is likely to have an adverse impact on rail operations into and out of Australian ports.

3.2 Border crossing issues

The Australian Customs and Border Protection Service (ACBPS) provides a single window service for completion of all border formalities, including Customs, Quarantine and Plant Inspection, and Food Inspection.

All information, related to export and import consignments, is submitted on line. In the case of import consignments, full declarations are made on-line and consignments are risk assessed electronically, 72 hours before arrival of the vessel in port. Risk assessments are made as a basis for deciding whether or not consignments are to be physically inspected. Last year only 100,000 TEU out of an import total of 2 million TEU for all of Australia was physically inspected or X-rayed.

The risk assessment system contains alerts to identify risk targets. If data does not hit targets, cargo goes straight through. If target is hit, decision is made about type of inspection. Different risks and types of inspection are associated with: narcotics, firearms and tobacco.

In the case of Quarantine, the security risk is assessed. If there is a big security interest, ACBPS has procedures to hold cargo (these are applied electronically).

ACBPS does not have X-ray equipment in the ports. If risk assessment determines that cargo should be X-rayed it is transferred out of the port to an inspection centre
located 2-3 km from the port. Of the 100,000 import TEU inspected or X-rayed in 2014, 98% was cleared and duty-paid on-line.

Inland clearance depots may be licensed under Section 77G of the Customs Act. Customs is encouraging the establishment of inland depots, but business is reluctant to invest. Very few have been established in recent years. In some cases regulations require the establishment of inland depots, e.g. LCL containers cannot be unpacked in ports, must be sent to inland depots (licensed under Section 77G) for this purpose. Concern of ACBPS is to establish secure customs route to such depots.

ACBPS continually reviews its own performance. Latest time release study (copy given to ESCAP staff) indicates negligible delays to cargo as a result of customs formalities. Significant source of delays at ports is vehicle queuing. At Port Botany, there are only half a dozen vehicle access points. In case of Port of Melbourne, a computerized vehicle queuing system has been introduced – provides details of arrival of vessels and indication of when containers will be coming off vessels.

Main customs problem is overweight containers and incorrect declaration of weights. In order to combat this problem, Sydney Ports have introduced in motion weighing of trucks and containers.

3.3 Morebank International Intermodal Terminal

Details of this project were given. These are reflected in Section 2 above.

3.4 Role of government in providing incentives

Federal Government sees its main role in terms of providing a “good stable climate for private investment”, as well as good infrastructure. It was observed that the Federal Government is providing A$ 250 million for upgrading of rail infrastructure at Port Botany, including the provision of a new access line from Moorebank to Port Botany. DIRD is recommending that ARTC should take over ownership of this link and allow private operators to run trains.

3.5 Tax incentives

No tax waivers are provided by Federal Government, but in some states, operational subsidies are provided by state government. For example, Victoria offers shippers a subsidy for every container shipped, in order to encourage increased volume at certain regional locations.
In some cases, local governments apply discounted local rates and land taxes to development of intermodal terminals (example, proposed SCT Terminal in Wodonga). In other cases discounted utilities charges are applied to the development and operation of intermodal terminals.

3.6 Government attitude to regulation of operations

It was observed that “our basis for regulation is open competition”. If competition exists, there is no need for regulation.

ACCC (Australian Competition and Consumer Commission) is involved in regulation and ensuring fair trading in both intrastate and interstate transport.

Intermodal terminals are not regulated in Australia, as it is considered that there is sufficient competition between them. ACCC would become involved only in the case of mergers of terminal operators.

Moorebank will have an open access arrangement for rail transport between the terminal and Port Botany, but Import/Export terminal will have a single operator.

3.7 Truck size issues

Limiting of truck size on highways is not practised in Australia, but within ports state governments have limited B-Double length to 25 metres. No information on truck weights was provided. It is clear that the widespread licensing in Australia of B-Double and larger prime mover and trailer combinations has had a detrimental effect on the rail share of non-bulk freight volume on major intrastate and interstate routes. For example rail modal share Melbourne-Sydney and Sydney-Brisbane is less than 5 per cent.

3.8 Trade enhancement

Australia no longer has Free Trade Zones, which were numerous 25 years ago. Focus of Australian trade policy is reduction of trade barriers through negotiation of Free Trade Agreements. Recently FTAs have been concluded with China and Japan.

4. Meeting with Wodonga City Council, Wodonga Victoria

Meeting held in Wodonga City Council office at 1100 hours on 26 August 2015. Present at the meeting were: Adam Wiseman, Manager Economic Development of City of Wodonga; a consultant of the City Council; and the two ESCAP
representatives (S Kumra and P Hodgkinson). The main issue discussed was the policy and activities of the City Council related to the establishment and operation of inland ports in the Albury/Wodonga region.

4.1 Export oriented industry in Albury/Wodonga

The Albury/Wodonga region at the border between the Australian states of New South Wales and Victoria has a large industrial base which generates a moderate volume of export and import trade.

In Wodonga, the principal exporting industry is the food processing industry, comprising two major enterprises: QAF Foods (a pork producer) and Mars (a pet food producer). Mars exports about 4,000 TEU per year, mostly to Japan. Its exports are currently transported by road to the Port of Melbourne.

4.2 Decline of railway transport in Wodonga

Since 2010, Wodonga has been by-passed by rail as a result of a decision to re-gauge the former broad gauge (1600 mm) dual line to standard gauge and the re-location of Wodonga Station. Previously, three rail container depots served Wodonga, but these were made redundant by the standard gauge by-pass project.

Photo 1: B-Double, overall length 24 metres, capacity 3 TEU

Substantial road improvements have made the Hume Highway between Melbourne and Sydney a high grade road corridor. B-Doubles (see Photo 1 below) dominate truck traffic on this highway, while Super B-Doubles conveying 4 TEU (see Photo 2)
may operate at reduced loads, pending the upgrading of bridges to increase allowable weights.

A lack of co-ordination between federal and state governments, with the former favouring road, helped to reinforce the dominant position of road freight transport in the Melbourne-Sydney corridor – which includes Albury/Wodonga.

**Photo 2: Super B-Double, or B-Triple, overall length 30 metres, capacity 4 TEU**

Failure to account for externalities, such as environmental costs, and the lack of effective regulation also helped to mask the disadvantages of road transport and contribute to its market dominance.

4.3 **Logic Logistics Park development**

The City Council made the decision encourage private investment in new intermodal terminals in, or close to, the City of Wodonga. It was desired to locate logistics facilities close to the sources of trade. Albury/Wodonga differs from other regions in that it has a diversity of industry and so is much better able to balance export and import cargo flows.

Initially, in 2004, the council acquired 567 hectares of land, 14 km south west of Wodonga City, near the intersection of the Hume and Murray Valley Highways (providing connections to Sydney and Melbourne respectively), and adjacent to the standard gauge railway line to Melbourne.
The Council has developed at this site the Logic Logistics Park which has attracted the following industries:

(i) Woolworths Ltd., a major retailer (regional distribution centre);
(ii) Border Express, a road based logistics company (warehouse and cargo consolidation facility);
(iii) Wodonga Technical and Further Education (TAFE) college (further education campus);
(iv) A truck service and trailer interchange centre.

In early 2015, the City Council received an offer from and agreed to sell to Specialized Container Transport (SCT), a major logistics operator, a parcel of land within the Logic park, for the construction of an integrated road/rail freight terminal (see Figure 4, below). This land is adjacent to, and is directly accessible from, the Melbourne-Sydney standard gauge rail line. The cost of the terminal construction project is estimated at A$ 17 million. When complete, the terminal is expected to employ 118 full time people and to contribute value added to the local economy of the order of A$ 33 million.

The SCT terminal would be designed with loading/unloading tracks of 1800 metre length to be provided as a loop line access off the main running lines, in order to avoid shunting activity. This is consistent with the length of trains – 73 wagons with an average length of 24 metres - operated by SCT on their East-West intermodal services (Melbourne and Sydney to Perth).

It was planned that construction of the terminal would begin in November 2015 and be completed one year later, i.e. November 2016.

The terminal will provide comprehensive container and cargo transport, handling and storage services, including:

- Rail and road line haul;
- Refrigerated transportation;
- Contract management;
- Warehousing;
- Intermodal development; and
• Tailored rail solutions.\textsuperscript{46}

In particular, the terminal will provide for cargo consolidation and for the \textit{intermodal transportation of cargo on pallets, as well as in containers}.\textsuperscript{47}

Other particulars of the terminal design and operation proposed by SCT include the following:

• Utilising the latest GPS, satellite tracking technology, RFID process flow technology and SAP to optimise efficiency in the outcomes of the project;
• Constructing state of the art automated loading technology at the site;
• Incorporate full container load (FCL) and less than container load (LCL) integrated pallet management design;
• Introduce Certificate IV training in Competitive Systems;
• Represent a benchmark within the SCT Logistics group for warehouse design and intermodal capabilities;
• Direct access for the train to be driven into the terminal to enable loading and unloading in all weather conditions;
• A fully undercover operation including awnings to cover truck access in addition to packing and staging areas; and
• Direct warehouse access for truck and trailers\textsuperscript{48}

The SCT proposal does not make it clear whether customs clearance will be carried out at the terminal or in the Port of Melbourne. At a subsequent meeting with SCT in Melbourne, it was indicated that a total container volume (both import/export and domestic) for the Albury/Wodonga region of only 40,000 TEU had been estimated. Assuming that the Ettamogah Rail Hub would handle about half of this volume, this would leave only 20,000 TEU for the SCT terminal, of which only 4,000 TEU might be import/export containers, \textit{suggesting that customs clearance is more likely to be undertaken in the port}. It is probable that that the SCT terminal will handle a substantially larger volume of domestic cargo than import/export cargo, much of it transported on pallets rather than in containers, so that it is still likely to have a profitable outlook.

\textsuperscript{46} SCT Logistics information provided to Wodonga City Council and incorporated in minutes of a Special Meeting of the Council 28 January 2015.
\textsuperscript{47} As observed in a later section of this report, SCT is the only rail operator in Australia to have developed transcontinental pallet transport services, utilizing louvre vans.
\textsuperscript{48} SCT Logistics (January 2015).
The SCT project will receive financial assistance from the Wodonga City Council in the form of reduced, or discounted, local rates (or land tax). It was also claimed that it
would be receiving an infrastructure subsidy from the state government, but this could not be confirmed.

5. Visit to Ettamogah Rail Hub, near Albury NSW

Meeting held at 0930 hours on 27 August 2015 with management of the Ettamogah Rail Hub. Participants in this meeting were: Cameron Jackson, Chief Operating Officer; Kellie Rees Office & Marketing Manager (Ettamogah Rail Hub); and S.Kumra; P.J.Hodgkinson (UNESCAP)

Matters related to the establishment and operation of the Ettamogah Rail Hub were discussed, as below.

5.1 Location, ownership and history

The rail hub was developed and is operated by a family owned company, the Colin Rees Group, whose Chairman Col Rees is the founder. He previously managed the Bandiana Freight Terminal which closed after standard gauge rail by-pass was constructed at Wodonga.

The hub is located adjacent to the Melbourne-Sydney mainline at Ettamogah NSW, about 7 km north of Albury, and is also easily accessible by truck from the Hume Expressway.

The terminal site was surveyed in 2008 and opened in 2009. It is located, next to the Norske Skog paper factory, within the Nexus Industrial Estate, a 450 hectare development of the Albury City Council.

5.2 Terminal layout (see Figure 5)

The land area occupied by the terminal is 20 hectares, of which area for future warehousing is 7 hectares, area of CY is 10,200 square metres, area of workshop is 2,500 square metres, movement area (including rail sidings) is 5.7 hectares and remaining area for future development is 7 hectares.

ERH is accessed by rail from the Melbourne-Sydney mainline. Three tracks are available to ERH for rail handling. One of these, with a standing length of 850 metres, is alongside the loading/unloading platform in the terminal. Rakes of wagons attached to or detached from Pacific National trains are never longer than 600
metres. The 3 access tracks, plus a fourth track proceed on to the neighbouring paper factory of Norske Skog.

5.3 Investment

Total investment in the terminal was reported at A$ 12 million (A$ 8 million for infrastructure and A$ 4 million for equipment)

5.4 Handling equipment (all owned by Colin Rees Group)

- 2 reach-stackers each of 45 tonne capacity;
- 1 heavy duty container handling forklift
- 1 “Y” class shunting locomotive
- 2 “Cargo Sprinters”

Figure 5: Layout of Ettamogah Rail Hub

The long and thin layout of the terminal permits reach-stackers to transfer containers directly from wagons to the container stack without the use of yard trailers. Similarly reach-stackers are used to lift containers between wagons and road trailers and between the container stack and road trailers (see Photo 3 below). The unit purchase
cost (new) of a reach-stacker (Clarke brand, from the USA) was reported as A$ 650,000.

A Cargo Sprinter (see Photos 4-5) is a 18 metre container carrying platform attached to a driving cab, with an overall length of 21.1 metres. Sprinters usually operate as 2 car units coupled back to back, utilizing “push-pull” traction. With 4 engines, a coupled 2 car unit has installed power of 1,200 HP, but with a maximum payload of only 58 tonnes can load two 40ft containers only at restricted loads.

**Photo 3:** Reach-stacker working at Ettamogah Rail Hub 27 August 2015

The Sprinters were manufactured in Germany by Windhoff and were designed specifically for freight haulage on short lines, where their relatively light axle loading (18.5 tonnes) is compatible with operation on light track structures.

At the Ettamogah Rail Hub, the Sprinters were used to shunt wagons onto the mainline (to be collected by passing Pacific National freight trains), before acquisition of the Y Class shunting locomotive. The company expects to use them in future for branchline operation, to transfer Melbourne-bound containers from Griffith in the NSW Riverland to Junee on the Sydney-Melbourne mainline. The Colin Rees Group has an interest in the development of a new intermodal terminal in Griffith.
The Y class shunting locomotive (Y151) was operated by the former Victorian Railways and first entered service in 1976.

It has a 645 HP GM diesel engine, electric transmission, and a gross weight of 64 tonnes (16 tonne axle load). Its function is to shunt loaded container wagons on to the mainline where they are picked up by passing Pacific National freight trains for haulage to the Port of Melbourne.

5.5 **Terminal capacity and throughput**

(i) **Capacity**

Data provided by ERH were used to calculate the annual TEU throughput or handling capacity of the terminal, as shown in Table 1.
Achieved annual throughput

The current throughput of the terminal was reported as 16,000 TEU per annum. Thus only 10 per cent of the estimated capacity is utilized. Approximately 75 per cent of this throughput is domestic containers and only 25 per cent, or about 4,000 TEU, is export/import containers. A major containerized export cargo is newsprint for India and Indonesia.

Table 1: Annual TEU throughput capacity of Ettamogah Rail Hub

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of CY (sq.metres)</td>
<td>10,200</td>
<td>Given by ERH (300 m x 34 m)</td>
</tr>
<tr>
<td>Av .TEU area (sq.metres)</td>
<td>19.32</td>
<td>Calculated by consultant with 30% allowance for manoeuvring of equipment</td>
</tr>
<tr>
<td>No. ground slots in CY</td>
<td>528</td>
<td>Calculated by consultant</td>
</tr>
<tr>
<td>Average stacking height</td>
<td>3</td>
<td>Given by ERH</td>
</tr>
<tr>
<td>Capacity of CY (TEU)</td>
<td>1,584</td>
<td>Calculated by consultant</td>
</tr>
<tr>
<td>Av. Container dwell time (days)</td>
<td>3</td>
<td>Given by ERH</td>
</tr>
<tr>
<td>No. stock turns in year (312 days)</td>
<td>104</td>
<td>Calculated by consultant</td>
</tr>
<tr>
<td><strong>Annual TEU throughput capacity</strong></td>
<td><strong>164,700</strong></td>
<td>Calculated by consultant</td>
</tr>
</tbody>
</table>

Domestic containerized cargoes include:

- Packaged building products
- Consumer products for supermarkets
- Raw PVC materials (for local extrusion)
- Other finished goods, such as fabrics

Elsewhere in this report, it is observed that STC have estimated that the volume of containers generated by the Albury/Wodonga region is only 40,000 TEU per annum. Clearly, ERH has nearly half of this volume already, raising the question as to whether the region can support two intermodal freight terminals. While SCT is able to diversify its business, e.g. pallet rather than container handling, fewer options are available for ERH. One possible source of diversification is warehousing, since the ERH site includes an area of 7 hectares set aside, but not yet developed, for the construction of warehouses.
5.6 Rail schedules

Five (5) services per week in each direction are provided by the mainline operator, Pacific National between ERH and the Port of Melbourne. Trains cannot be operated directly into and out of the port. “Last mile” service is provided by truck between the PN South Dynon Terminal and the port. *It was claimed that this “last mile” service accounted for 40 per cent of the total cost.*

Another (2) services per week in each direction are provided by PN between ERH and Acacia Ridge (Brisbane). *It was claimed that rail cannot compete with B-Double road services to Sydney – therefore no rail services are provided to Port Botany.*

5.7 Observations on road/rail competition

It was claimed that between Albury and Melbourne, the cost of road infrastructure attributable to freight is about A$ 4 per tonne. Only A$ 0.70, or 17.5 per cent of this cost is recovered through vehicle registration fees.

It is very difficult for rail to be competitive between Albury and Melbourne, with a distance of only 350 km. However, this is not the case with long haul routes, e.g. Albury to Perth (about 3,500 km). Recently ERH quoted A$ 3,000 for transport of a 20 ft container to Perth – this is equivalent to only A$ 0.86 per TEU-km.

5.8 Profitability and future business opportunities

ERH is profitable (“head above water”). Company has only 6 employees. It is profitable largely because of multi-skillling of staff. All staff (including the Chairman) are licensed to operate handling equipment and some are licensed to operate shunting locomotives. It was claimed that the terminal had not received “one cent of government money”. *Notwithstanding this claim, it is possible that the Albury City Council may have sold the land occupied by the terminal at lower than commercial prices and perhaps waived local rates, or land taxes.*

The overall impressions from the site visit were that ERH was a very well managed and efficient enterprise operating in a difficult competitive environment.

Future business opportunities include: establishment of a new inland terminal in Griffith NSW and entry into the warehousing business at ERH.
The Colin Rees Group recently received development approval to establish a new intermodal terminal at Widgeilli, about 10 km from Griffith, which is the centre of a large wine exporting industry, as well as rice and cotton production. The new terminal will be "a carbon for rail transport to the Port of Melbourne via a branchline to Junee on the Sydney-Melbourne mainline.

6. Meeting with staff of the Victorian Department of Transport, Planning and Infrastructure, Melbourne, 28 August 2015

Meeting held at 1000 hours on 28 August 2015 with staff of the Victorian Department of Transport, Planning and Infrastructure. Participants in this meeting were: Andrew Stephens, Project Director, Metropolitan Intermodal System, Freight, Logistics and Marine Division; David Harris, Senior Policy Manager, Freight, Logistics and Marine Division; John Hearsch, Principal, John Hearsch Consulting Pty Ltd; and P.J. Hodgkinson (UNESCAP).

Matters related to Victorian Government plans and policies for the establishment and operation of inland ports were discussed, as below.

6.1 Geographical distribution of Port of Melbourne container throughput

Port currently moves about 2.5 million TEU per year, of which 60 per cent are imports, and 40 per cent exports. About 87 per cent of imports are destined for the Melbourne metropolitan area, while 50 per cent of exports come from regional Victoria (200-500 km from Melbourne).

Thus, about 1.85 million TEU or 85 per cent of the Port of Melbourne's throughput remains within the Melbourne metropolitan area.

Export containers are transported to the Port of Melbourne from 7 regional terminals, as shown in Table 2. As from the end of 2016, it is expected that the SCT Logic Terminal (Wodonga) will be added to this list. All are operated by the private sector.

While all of these terminals are accessed by rail, not all of their throughputs are transported by rail. Some of the terminals which are closer to Melbourne are likely to despatch their containers by road transport.

Rail operators are: Pacific National (PN), QUBE Logistics and SCT Logistics. PN is the largest operator. SCT run the Horsham operate (standard gauge) rail services
to/from Horsham and in addition operate the Wimmera Intermodal Terminal. QUBE run the paper train (broad gauge) from Maryvale. Most trains run 3-5 days per week.

Table 2: Location of inland export terminals, Victoria and southern NSW

<table>
<thead>
<tr>
<th>Terminal location</th>
<th>Region</th>
<th>Principal commodity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horsham (Dooen)</td>
<td>Western</td>
<td>Grain</td>
</tr>
<tr>
<td>Mildura (Merbein)</td>
<td>North-western</td>
<td>Fresh/dried/canned fruit</td>
</tr>
<tr>
<td>Mooroopna (near Shepparton)</td>
<td>North-eastern</td>
<td>Canned fruit, wine</td>
</tr>
<tr>
<td>Tocumwal</td>
<td>Southern NSW</td>
<td>Grain</td>
</tr>
<tr>
<td>Warrnambool (Australian Paper Manufacturers)</td>
<td>South-western</td>
<td>Dairy products</td>
</tr>
<tr>
<td>Maryvale</td>
<td>Eastern</td>
<td>Paper products</td>
</tr>
<tr>
<td>Deniliquin</td>
<td>Southern NSW</td>
<td>Rice, meat products</td>
</tr>
</tbody>
</table>

Source: Victorian Department of Transport, Planning and Infrastructure

(i) Intermodal projects being promoted by Victorian Government

The Victorian Government is promoting two major intermodal projects, both of which are also receiving funding from the Federal Government: the Western Interstate Freight Terminal (WIFT) project and the Port Rail Shuttle (PRS) project.

(ii) Western Interstate Freight Terminal

This is a project currently being evaluated to construct an interstate terminal and freight precinct at Truganina to the west of Melbourne. This terminal would link up with another terminal to be constructed at Beveridge, to the north of Melbourne, to replace the existing interstate freight terminal at Dynon near the city centre, thereby eliminating some 2,000 truck movements per day from inner north and inner west city streets.

The Truganina terminal would be designed to accept trains of up to 3 km in length. The terminal will need to connect to the standard gauge network in order to provide for through freight movement to/from Sydney and Adelaide. The estimated cost of this connection is A$ 400 million.

(ii) Port Rail Shuttle

The PRS project was first proposed about 10 years ago in an attempt to resolve the problem of road traffic congestion in and around the Port of Melbourne and to extend the life of the port which is limited to only another 20 years. Commencement of the project has been delayed by the privatization of the port which is still under
negotiation. The Federal and Victorian State governments have so far committed A$ 58 million (A$ 38 million by the Federal Government and A$ 20 million by the State Government) in development funding to the project.

The PRS project would involve the creation of a metropolitan rail freight network by upgrading a disused short rail spur to Swanson Dock in the Port of Melbourne and connecting it to three existing freight terminals on Melbourne’s northern, eastern and western outskirts (see Figure 6 below).

Figure 6: Melbourne Port Rail Shuttle Map

The PRS would utilize parts of the existing suburban passenger network to operate 600 metre long container trains between the Port of Melbourne and three outer suburban freight terminals at Somerton, Lyndhurst and Altona.

These container trains would use paths vacated by suburban passenger trains during the night time hours. Each train, weighing up to 3,300 tonnes, would comprise 42 two slot container wagons and 3,000 HP locomotives at each end. Trains would shuttle back and forth between the Port of Melbourne and the suburban terminals with a 2.5 hour turnaround. The port would receive up to 20 shuttle trains per day.
Consultants engaged by the Victorian Government have estimated that even in its first phase, the PRS will remove nearly 3,500 truck trips from the port per day, cut carbon dioxide emissions by 23,000 tonnes a year and expand Swanson Dock’s capacity by 1.4 million containers a year.49

Haulage distances will be short (no more than 30 km), but it has been estimated by staff of the Department of Transport, Planning and Infrastructure that the minimum container volume required for viability across three suburban terminals will be 345,000 TEU per annum.

7. Meeting with SCT Logistics, Altona, Victoria, 28 August 2015

Meeting held at 1400 hours on 28 August 2015 with SCT management staff. Participants in this meeting were: Robert Comley, Port Logistics Manager, SCT; Andrew Williams, Chief Operations Officer-Rail, SCT; and P.J.Hodgkinson (UNESCAP).

Matters discussed were SCT’s approach and plans for the establishment and operations of inland intermodal terminals.

7.1 History and current operations

SCT (Specialized Container Transport) is a leading logistics company in Australia. It was founded as a privately owned freight forwarding company in 1974 by Peter Smith who is currently Chairman.

In July 1995, SCT began operating trains conveying forwarder loading in covered wagons between Melbourne and Perth. Initially these trains were operated under “hook and haul” contracts with specialized private railway operators, but as from November 2006, SCT began running trains in their own right.

SCT currently owns twenty-five (25) 4,500 HP diesel electric locomotives and some 700 freight wagons, and operates rail services on all mainland inter-capital routes, including 6 return weekly services between Melbourne and Perth.

The company owns large intermodal terminals at the following locations:

- Altona, Victoria, about 12 km from Melbourne
- Forrestfield, Western Australia, 15 km west of Perth

49 M Berry: Melbourne’s storm in a port is de-railing freight, 09 December 2015.
• Acacia Ridge, Queensland, 25 km south of Brisbane
• Penfield, South Australia, 25 km north of Adelaide (and 37 km from Outer Harbour)
• Parkes, New South Wales, 265 km west of Sydney

In addition, SCT recently took over the lease of the Wimmera Intermodal Grain Terminal near Horsham, Victoria and is developing an intermodal terminal within the Logic Logistics Park near Wodonga, Victoria.

7.2 SCT intermodal terminal design and operation

SCT terminals handle both domestic and import/export containers, but do not incorporate customs clearance facilities. All import/export consignments are cleared in the ports.

The great majority of SCT’s income is derived from domestic cargo handling and, within that category, from the handling and transport of palletized cargo (conveyed in high cube covered vans).

Warehousing is also a major source of income for SCT. As can be seen in Photo 7 below, warehousing occupies a major portion of the overall area of SCT’s Altona terminal, near Melbourne. More than 13,000 square metres, or 1.3 hectares, of warehousing is provided at this site and the adjacent Heinz national distribution centre has an area of nearly 47,000 square metres, or 4.7 hectares.

All SCT terminals are designed to receive and despatch long trains which are loaded and unloaded within the terminal boundaries. Standard inter-capital freight trains comprise 73 wagons and have an overall length of 1,800 metres and a gross weight of 5,000-6,000 tonnes. Thus multiple long loading/unloading tracks are provided within the terminal boundary, the Altona terminal, for example, incorporating 10 km of railway tracks.

Shorter trains are operated from terminals to ports. For example, one rail shuttle service per day is provided between the Penfield Terminal and the Outer Port container terminal, with 40 wagons loaded with 80 TEU, operating on a 3 hour cycle.

Container loading and unloading is performed with straddle carriers and ITVs (Integrated Terminal Vehicles). The straddle carriers can lift up to 2 TEU at a time.
and have a load capacity of 65 tonnes. The ITVs consist of a prime mover with two or more trailers.

Photo 7: SCT Intermodal Terminal, Altona, Victoria

Source: SCT Logistics

The SCT staff stressed the importance of proximity to customer premises as a major determinant of terminal location. In the case of Altona, SCT succeeded in locating a major customer (Heinz) adjacent to their own terminal. Another important criterion which was emphasized was that selected sites should be capable of making the best use of transport assets, i.e. close to cargo sources for truck operation and far enough from cargo destinations, to be able to take advantage of rail linehaul economies.
2. People’s Republic of China

1. Introduction

A mission to Beijing and Kunming was conducted by a consultant of the UNESCAP Transport Division for the express purpose of collecting information on the development and operation of inland intermodal freight terminals of international significance in China.

The mission to Beijing was conducted from 18-21 August 2015, during which period meetings were held with the Ministry of Transport in Beijing and the Department of Transport for Yunnan Province in Kunming, and the West Wangjijaying container terminal of CR Intermodal was visited.

This report describes the current status of dry port development in China and documents matters discussed with officials of the Ministry of Transport in Beijing and of the Yunnan Department of Transport in Kunming, as well as with the management of the West Wangjijiang container terminal.

2. Status of inland intermodal freight terminal development

China has been making rapid progress in establishing and developing inland intermodal freight terminals, but this progress has not matched the growth of the container throughput of Chinese Ports.

In 2014, the total container throughput of China’s ports was nearly 178 million TEU and over the 10 years between 2004 and 2014 had been growing at a rate averaging 8.7 per cent per annum. Although not supported by available statistics, it is estimated that about 20 per cent of the overall container throughput is sourced in the inland regions of China, specifically those which are more than 300 km from the coast. On this basis, the volume of inland containers requiring transport to or from the ports would currently amount to 35.6 million TEU. Since there are currently only about 17 inland ports in operation, this would mean that each inland port would need, on average, to have a capacity to handle more than 2 million TEU per year. Clearly this is not practical, suggesting that a large portion of the inland sourced volume must now be transported directly to/from the ports – yet it demonstrates the urgency of the need to accelerate the construction of inland ports in China.
The inland port network which is being developed in China includes facilities which are either under private ownership or under joint public/private sector ownership. The former comprise facilities which are regulated by the Ministry of Transport, while the latter are major railway hub terminals being developed by a joint venture partnership between CR Intermodal and the private sector.

2.1 Inland ports developed by the private sector

In total, 17 inland ports have been proposed for development by private investors under regulation by the Ministry of Transport. Of these, 12 are currently in operation or under construction at the locations shown in Figure 1.

**Figure 1: Location of inland ports being developed by private investors**

Of these, 8 are located at border crossing points with neighbouring countries, these being:

Hunchun (border with DPRK); Suifenhe (border with Russian Federation); Manzhouli (border with Russian Federation); Erenhot (border with Mongolia); Ili (border with Kazakhstan); Kashgar (border with Kyrgyzstan); Zhangmu (border with Nepal); and Hekou (border with Viet Nam). All except Ili and Zhangmu have railway connections, while Kashgar is connected with the Chinese rail network but lacks a through rail connection to Kyrgyzstan or Tajikistan.
The remaining 4 are located in important trade generating centres. Those at Kunming and Yiwu are particularly large facilities.

The Yunnan Tengjun International Dry Port is one of 3 major inland ports currently, or soon to be, in operation in the Kunming area.\textsuperscript{50} It is being developed by the Yunnan Gallops Investment Group at a cost (for the first phase) of 1.234 billion Yuan (nearly US$ 190 million), has an area of 1.6 square km and a design container handling capacity of about 1.2 million TEU.\textsuperscript{51} It is understood that in its ultimate development phase it will have an area of 2.45 square km and an investment cost of US$ 1.42 billion.\textsuperscript{52} The Yunnan Tengjun International Dry Port is currently in operation and is rail connected. It handles the majority of container trade between Yunnan Province, Lao PDR, Thailand and Viet Nam.

The Yiwu International Dry Port (YIDP) is located 300 km to the southwest of Ningbo Seaport and about 100 km south of the Zhejiang provincial capital of Hangzhou. It is the largest inland port in China, with a developed area of 0.7 square kilometres and a design capacity of 1.1 million TEU per annum. It serves a burgeoning manufacturing export trade in the central part of Zhejiang Province. Approximately 50,000 different types of consignments (mostly consumer goods) are dispatched annually to 100 countries in 1 million TEU. It was reported that more than 260 logistics companies have set up operation within the inland port.

YIDP is fully connected to the Chinese trunk line rail network and block container trains to Western Europe are now in regular operation. In addition, block container trains operate between YIDP and Ningbo Port.

(i) \textit{Inland ports developed by public/private joint ventures}

A network of inland ports is also being developed by a joint venture partnership of CR (Chinese Railways) Intermodal and 4 logistics companies.

Ultimately (by 2020), this network will comprise 18 major intermodal rail hubs and 40 mid-size container freight stations, linked by railway lines which have been adapted for the operation of double stack container trains. The locations of these 18 major rail hubs are: Harbin, Urumqi, Beijing, Shenyang, Dalian, Tianjin, Qingdao, Lanzhou, The others being the CR Intermodal operated rail container hub at West Wangjiaying and a privately developed logistics facility in the Anning district.

\textsuperscript{50} Information provided at a meeting with Yunnan Department of Transport officials and representatives of Yunnan Gallops Investment company in Kunming on 20 August 2015.

\textsuperscript{51} Country presentation of China at Dry Port Working Group meeting, Bangkok 25 November 2015
Xi'an, Zhengzhou, Shanghai, Chengdu, Kunming, Chongqing, Wuhan, Ningbo, Guangzhou, and Shenzhen. The vast expanse of this network is apparent from Figure 2.

**Figure 2:** Location of inland ports being developed by CR Intermodal joint venture

![Location of inland ports being developed by CR Intermodal joint venture](image)

*Source: CR Intermodal publicity brochure, August 2015*

It will extend 3,020 km from Urumqi in the far west of China to the Port of Tianjin on the eastern seaboard and 3,600 km from Shenzhen in the south to Harbin in the north of China. For three major inland manufacturing centres in the southwest of China – Chengdu, Chongqing and Kunming – haulage distances to the nearest ports are of the order of 1,500-1,800 km. While the primary purpose of this network will be to connect inland trade sources with seaports, it will also interconnect inland centres of commerce and industry, thereby satisfying a need for low cost domestic freight transport.

At the time of fact finding missions by the UNESCAP consultant to Beijing and Kunming in August 2015, only 9 of the proposed 18 rail hubs had been completed and were in operation, these being: Kunming, Shanghai, Chongqing, Chengdu, Zhengzhou, Qingdao, Dalian, Wuhan and Xi'an. Kunming was the first of the intermodal rail hubs to open for service, on 04 November 2006.

Most of the established rail hubs have been designed for handling capacities of the order of 1 million TEU per year, well in excess of their current throughputs. For example, the Kunming Wangjiaying Hub with a CY (container yard) area of 300,000
square km has capacity to handle up to 1.6 million TEU per year, but its annual throughput during seven years of operation has never exceeded 400,000 TEU.

Most rail hubs are connected to the mainline electrified network. In future it is proposed that they will be served by double stack container trains, but adaptation for double stack operation on lines in the southwest of China will require major engineering works to provide the required clearance through tunnels and bridges in mountainous terrain.

Information received for the Kunming West Wangjiaying intermodal hub indicates that it achieves a surplus of revenue over operating costs. It is probable that this would also be true of the other major intermodal hubs currently in operation, although it is not necessarily true of the smaller inland ports which may not generate sufficient throughput to cover their fixed costs.

(ii) Need to boost attraction of container traffic to rail

Despite the fact that the major container handling ports of China are connected to the trunk railway network, rail has so far failed to capture other than a very minor share of the container haulage task. Rail container terminals in Chengdu, Chongqing and Kunming are estimated to despatch and receive annually about 2.03 million TEU. It is likely that the remaining 6 major hub terminals currently in operation would handle another 2 million TEU, giving a total of 4 million TEU of rail-hauled containers. Thus the rail share of total container throughput in China is only about 2 per cent, while road and IWT shares are estimated at 84 per cent and 14 per cent respectively.

3. Meeting with Ministry of Transport in Beijing

Meeting held in Ministry of Transport (MoT) office in Beijing at 1400 hours on 18 August 2015. Present at the meeting were: Ms Lu Juan, Director, Division for Asia-Pacific Affairs, Department of International Cooperation, Ministry of Transport; Mr Li ?? Technical Specialist, MoT; and the ESCAP consultant (P J Hodgkinson). The purpose of the meeting was to discuss policy issues associated with Dry Port establishment and development in China.

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53 Response to UNESCAP Dry Port Operator questionnaire, August 2015
54 Chengdu is estimated to handle about 1.14 million TEU per annum and Chongqing about 500,000 TEU per annum (Transport and Logistics in Chongqing and Sichuan, Consulate-General of Netherlands in Chongqing and Netherlands Business Support Office in Chengdu) September 2014. Kunming handled 393,132 TEU in 2014 (CRIntermodal Information brochure).
3.1 **Progress with establishment of inland ports under MoT supervision**

Seventeen (17) inland ports within six corridors are being planned for operation and management by “enterprises”. These may offer scope for PPP contracts, but so far PPP has not been embraced in China, although the Chinese Government has a policy to promote PPP as a means of mobilizing resources from the private sector *(see notes on Ownership and Financing below)*. It was reported that most of the 17 inland ports had been completed and are in operation.

3.2 **Truck load limits**

Current load limit is a Gross Vehicle Weight of 55 tonnes (which is generous as compared with other countries visited during the course of this project). It was claimed that this limit will be reviewed for the desirability of reducing it to 45 tonnes. The objective would be to attract more heavy duty cargo to rail and to reduce damage to highways.

3.3 **Taxation and pricing incentives**

Incentives are provided to investors in inland port projects in the form of:

- Taxation waivers
- Concessional loans

These incentives are given to investors both to *establish* and *operate* inland ports. Such incentives are mostly provided by provincial governments. Emphasis of central government policy is on provision of subsidized infrastructure to boost cross border transport (road and rail, but mostly rail).

3.4 **Harmonization of cross border rail and road links**

Central government is evaluating opportunities for sharing of rights of way by cross border road and rail infrastructure

3.5 **Profitability of inland ports**

Reported to be good as result of:

- Strong market prospects
- Effective financial incentives
- Locations close to borders benefitting from opening up of China’s trade
3.6 Customs and border crossing procedures

Central government is attempting to eliminate border crossing delays as part of Silk Road-One Belt initiative, specifically by introducing single window and advanced clearance procedures, with only minimal physical checking of consignments at borders. However activities of different inspection agencies operating at the same location have yet to be harmonized.

Average dwell times for export containers in inland ports reported as only 4 hours!! However, it was admitted that average dwell times for import containers are still long.

X-ray scanning of containers is available in inland ports and it was indicated that equipment for scanning full length container trains was now installed at three locations in China (Qingdao, Xian and one other).

In principle, each box is scanned, but shippers/consignees with good clearance history will have reduced scanning requirement.

3.7 Trade enhancement

Central government through Ministry of Commerce is trying to increase trade by offering export and import incentives, as well as by locating export/import companies around inland ports. Ministry of Commerce is requesting MoT to reduce transport fees and handling charges.

3.8 Tax incentives

These include waiver of turnover tax for first three years and application of half tax subsequently.

3.9 Land

In China, land is classified into 3 categories: industrial, commercial and property (or residential). For inland ports, land is industrial and therefore cheaper. Land prices are determined by provincial and local governments. Government can provide land as part of a PPP agreement.
3.10 Ownership and financing

BOT and BOO not yet offered in transport sector. National Development Commission and Ministry of Finance are jointly promoting the application of PPP throughout the economy in order to mobilize resources from the private sector.

Government participation in PPPs for inland ports expected to include:

- Land provision
- Provision of utilities (water and electricity)
- Rail and road accesses

Private sector participation expected to include provision of terminal infrastructure and handling equipment, as well as terminal operation.

4. Meeting with Yunnan Department of Transport in Kunming

Meeting held in Yunnan Department of Transport office in Kunming at 0900 hours on 20 August 2015. Present at the meeting were: Ms Zhuang Li Ying, Deputy Director of Yunnan Department of Transport and her colleagues; a representative of the Yunnan Gallops Investment Company; interpreter Mr Li Guoliang; and the ESCAP consultant (P J Hodgkinson). The purpose of the meeting was to discuss policy issues associated with Dry Port establishment and development in Yunnan Province.

4.1 Development of inland ports in Yunnan Province

Transport Department is responsible for Highways and Waterways. Railways and Aviation are covered by other government authorities. However, the Transport Department collected information on dry port development in order to assist the ESCAP study.

As observed in Section 2.1 (above), three major inland ports are in operation or under development in the vicinity of Kunming. They are:

(i) Yunnan Tengjun International Dry Port being developed by Yunnan Gallops will

(ii) West Wangjiaying International Railroad Terminal operated by CR Intermodal joint venture (in operation, handling about 400,000 TEU per year); and
(iii) South Asia Dry Port being developed by Kunming Transport Investment Group in Anning District (not yet in full operation)

All inland ports are or will be rail served and indeed the West Wangjiaying terminal is a major hub in the Pan Asia Rail Network.

(i) Seaports closest to Kunming

Nearest seaport is Haiphong, Viet Nam (855 Km from Kunming). Although a new standard gauge railway has been built up to the border at Hekou, it has yet to be connected to a line within Viet Nam. Also while China has a bilateral transit agreement with Viet Nam on road transport, there is as yet no agreement on rail transport.

Within China, the closest seaport is at Fangcheng in Guangxi Province (1,000 Km from Kunming). Some 60% of Kunming’s international trade volume is transported by road – mainly to/from Thailand, Lao PDR and Viet Nam. This includes a large volume of frozen food which is transported from Thailand along Highway 3A.

Most international containers are transported from Kunming to Shenzhen and Guangzhou ports (more than 1500 km from Kunming).

The nearest IWT port to Kunming is located at Guanlei on the Lacang (Mekong) River – distance from Kunming about 450 km. China is now building a container port on the Mekong at Menghan, south of Jinghong.

(ii) Double stack rail services

Double stack services do not yet operate within Yunnan Province, owing mainly to the mountainous terrain and extensive tunnelling. Northern landbridge routes can accept double stack trains, but southern routes will require extensive adaptation.

4.4 Road weight limits

Weight load limit for trucks throughout China is 55 tonnes. At this level it is possible that trucks could carry two heavy 20ft containers and thus would continue to pose a competitive threat for rail. Information given in Beijing is that the Central Government is considering reducing the limit to 45 tonnes, which would remove this threat.

Some roads, such as 135 km of the highway from Kunming to Hekou, have more stringent weight limits imposed on them due to their poor condition.
4.5 Road-rail competition

Rail is taking action to improve its competitive position vs. road, by:

- Reducing cost of transporting by container and allowing more time for delivery of consignments prior to train departure, and
- Reducing delivery times (from origin to destination).

Currently no forwarders operate at the inland ports of Kunming. While shippers can save costs by not having to pay forwarders, they lack the comprehensive services available from forwarders, especially cargo consolidation.

Table 1 shows the comparative rail and road freight rates and travel times for freight transport between Kunming and Dali. It indicates that rail has a strong competitive advantage in terms of freight charges but is competitively disadvantaged in terms of delivery time.

**Table 1: Comparative rail and road freight charges and delivery times, Kunming - Dali**

<table>
<thead>
<tr>
<th></th>
<th>Rail</th>
<th>Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance (Km)</td>
<td>358</td>
<td>332</td>
</tr>
<tr>
<td>Delivery time (days)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Charge per tonne (Yuan)</td>
<td>60-70</td>
<td>200</td>
</tr>
<tr>
<td>Charge per tonne-km (Yuan)</td>
<td>0.1675-0.1955</td>
<td>0.6024</td>
</tr>
<tr>
<td>Road/rail charge ratio</td>
<td>1.0</td>
<td>3.08-3.59</td>
</tr>
</tbody>
</table>

Source: Yunnan Department of Transport, August 2015

Dali is an important trade source, since it is the location of the Li Fang agricultural equipment manufacturing company (a major exporter of agricultural tractors).

4.6 Truck licence fees and toll charges

Provincial government levies licence and registration fees payable by truck operators, but these only amount to 20 Yuan for first time registration. Apart from the licence fee, truck operators have no other fees to pay.
The provincial government has only one policy related to toll charges. This is that fresh and live agricultural produce is exempt from payment of road toll charges.

4.7 Proximity of inland ports to trade sources

Typically the inland ports are located very close to export processing industries. The Gallops Company reports that its terminal is earning substantial warehousing revenue from nearby industries.

4.8 Minimization of transport and handling costs

Although the Transport Department has a cargo pricing department it does not regulate road transport and cargo handling charges, which are market-determined. However, the new Governor of Yunnan Province has directed the Transport Department to undertake research into transport and handling charges borne by local shippers and consignees.

4.9 Customs and border crossing issues

For exports, detailed quarantine inspection is done in the terminals, with only minor inspections carried out at borders. For imports, all formalities are undertaken at border checkpoints.

Delays to trade consignments due to customs and other border crossing formalities are rated as “moderate”.

Customs are trying to reduce formalities at border checkpoints. The single window principle applies only to the common location of individual inspection authorities. These authorities have not yet harmonized their procedures and hence do not exchange information.

Customs do have X-ray scanning equipment in inland ports. Pre-clearance of cargo has been introduced, as has a system of risk management. However, decisions about physical inspection of cargo are still made by people.

4.10 Financial incentives provided for establishment and operation of inland ports

The provincial government provides a subsidy for construction of infrastructure. For example, the Gallops company has received a subsidy for the infrastructure it has built within its terminal.
In addition, tax waivers and reductions are applied by the provincial government to the operation of inland ports. If the CY area of a terminal is more than 60,000 square metres, the operator will receive a 50% reduction in land tax (i.e. payments for land rent from the state).

The PPP system has not yet been introduced to the transport sector, although this is being encouraged by the Central Government.

5. **Visit to West Wangjiaying Inland Port of CR Intermodal**

Meeting held at 0930 hours on 21 August 2015 with officials of China Railway subsidiaries, followed by inspection of the terminal and its facilities. Principal officers attending the meeting were: Deng Jialiang, Vice-GM, China Railway Container Transport Corporation Ltd (Kunming Branch); Wu Bin, Vice-GM, China Railway Intermodal (Kunming Branch), and Mr Ching, GM China Railway Special Cargo Services (Kunming Branch).

Matters related to the establishment and operation of the West Wangjiaying terminal were discussed as below

5.1 **Ownership and management**

- Established 04 November 2006 (first of 18 railway container hub terminals)
- Total infrastructure investment: RMB 457.7 million (US$ 69.98 million)
- Financed and owned by joint venture comprising CR Intermodal (37%), NWS Holdings Ltd of Hong Kong (30%), China Shipping Corporation (10%), Lucky Glory International Ltd of Hong Kong (15%), and DB (Deutsche Bahn) International (8%)
- Managed and operated by CR Intermodal

5.2 **Services**

- Container and cargo despatch and receipt
- Container and cargo handling and intermodal transfer
- Container and cargo storage
- Customs clearance
- Warehousing services
- Container repair
- Comprehensive information service
5.3 Facilities and capacity

- Overall area: 826,000 m²; CY area: 310,000 m²; warehousing area: 26,407 m².
- Railway loading/unloading tracks: 11; 6,800 metres
- Handling equipment: reachstackers, 4; 3-7 tonne forklifts, 10-15
- No. of TEU ground-slots in CY: 4,980; average stacking height, 2
- Annual handling capacity: 1.6 million TEU

5.4 Throughput trend

Figure 3 shows the trend in the container throughput of the terminal since commencement of operation in 2006.

**Figure 3: Container throughput, West Wangjiaying Inland Port, 2007-2014**

Throughput growth between 2010 and 2014 averaged 5.8 per cent per annum, which exceeded the container throughput growth of Chinese ports over the same period of 4 per cent per annum. However the throughput of the terminal in 2014 was slightly lower than that in 2013, which perhaps reflects an on-going slow-down in the Chinese economy.

Only 25% of the terminal's design throughput capacity is presently utilized. With the exception of a small volume of containers originating, or destined for, locations
without a rail connection, all of the terminal’s container throughput volume is transported by rail.

5.5 Railway operation

The terminal is connected to the trunk-line electrified network of China Railways. Block container trains comprising a single electric locomotive and 50 flat wagons, each loaded with two 20ft or a single 40ft container, haul containers to/from the major seaports (mainly Shenzhen and Guangzhou). Approximately 5 trains per day operate in each direction between the terminal and the seaports.

The container loading/unloading area is accessed by three 850 metre long railway sidings, comprising one loading/unloading track either side of a central engine release track. The central track is electrified for its entire length, but the outside tracks are electrified only for the first few metres, so as not to interfere with the working of reach-stackers (See Photo 1) in the container loading/unloading areas.

Photo 1: Three sidings in the rail loading/unloading area of West Wangjiaying terminal

Although the siding tracks are long enough to accommodate entire trains, in fact trains are broken up and assembled in a nearby marshalling yard and short rakes are placed or extracted by diesel shunting locomotives. This was not always the case as
moveable catenaries were evidence in the container loading/unloading area (see Photo 2).

These are no longer in service, but when they were it was for the purpose of moving a wire across the track to allow an electric locomotive to place or extract full length trains without the need for the costly break-up, shunting and assembly of wagons. In future the extra costs of train marshalling could be avoided if longer sections of the outer track could be electrified. If this were done, electric locomotives could be used to push arriving trains into, and pull departing trains out of the loading/unloading tracks.

**Photo 2:** Out-of-service moveable catenaries in the container loading/unloading area
3. **India**

1. **Introduction**

Missions to New Delhi and Bengaluru were conducted by staff of the UNESCAP Transport Division for the express purpose of collecting information on the development and operation of inland intermodal freight terminals of international significance in China.

The mission to New Delhi was conducted from 19-20 October 2015, during which period meetings were held with: the Chairman and Managing Director, Container Corporation of India (CONCOR); the Joint Secretary (Customs), Department of Revenue, Ministry of Finance; and the Joint Secretary, Department of Commerce, Ministry of Commerce and Industry. Also during this period, the Dadri Inland Container Depot was visited.

The mission to Bengaluru was conducted from 21-22 October 2015, during which period the Whitefield Inland Container Depot was visited.

This report describes the current status of inland port development in India and documents matters discussed with officials at the various meetings in New Delhi and Bengaluru.

2. **Status of inland port development**

The development of inland ports in India has, until comparatively recently, been the sole preserve of the Container Corporation of India Ltd (CONCOR) which was established in 1988 as a subsidiary of the Indian Railways to take over operation of a rail served ICD network, then numbering only 7 terminals. As from 2006, the Indian Government approved the licensing of private container train operators (CTOs) and several logistics companies have since established inland ports which operate in competition with CONCOR. Nevertheless, CONCOR continues to command a dominant position in the market for inland distribution of container trade.

As shown in Figure 1, the total volume of containers, both international and domestic containers, moving through the seaports of India in 2014 amounted to 11.53 million TEU, reflecting an increase of 10.3 per cent over the 2013 volume.
It has been estimated that 19 per cent of this volume, or 2.19 million TEU, moves between the ports and inland locations.\textsuperscript{55}

By comparison, the share of the Container Corporation of India (CONCOR) in this volume is about 23 per cent, but this includes throughputs of CONCOR terminals located near to ports. Thus, it may be concluded that the CONCOR \textit{share of all inland container volume} is significantly more than 90%.

\textbf{Figure 1: CONCOR share of port container throughput in India}

![Chart showing CONCOR share of port container throughput in India]

\textit{Source: Container Corporation of India Ltd, Annual Report 2014-15}

Currently, within India, some 52 Inland Container Terminals (ICDs) are licensed to handle international containers: 36 under the management of CONCOR\textsuperscript{56} and 16 under the management of private operators.

Their principal function is to provide a conduit for the transport of containers between the seaports and their hinterland in such a way that total logistics costs, comprising line-haul transport, handling, storage and local transport costs will be minimized. Some of these facilities, especially those operated by CONCOR, handle domestic containers in addition to their primary function of handling international containers. Across the CONCOR network, domestic containers account for an average of 16 per cent of total TEU throughput.

\textsuperscript{55} Container Corporation of India Ltd, \textit{Annual Report 2014-15}

\textsuperscript{56} CONCOR, \textit{List of dry ports operated}, October 2015.
A majority of the 52 licensed ICDs are rail served – that is, they are accessed by rail, and receive and dispatch container trains into/from dedicated sidings located within the terminal boundaries. A majority is in fact located along the electrified mainline network, and is served by container trains hauled by electric locomotives.

Containers are hauled in trains comprising standard rakes of 45 container flat wagons, each carrying 2 TEU (90 TEU per train).

With the commencement of operations on the western section of the Dedicated Freight Corridor (DFC), Double Stack container trains have begun operation as from mid October 2015. These trains, carrying up to 180 TEU each, are initially linking a new Multimodal Terminal at Khatuwas in Rajasthan State with Mumbai area ports. The trains originate in Dadri ICD but since this terminal currently lacks the facilities to load double stack wagons, they run as single tier trains from Dadri to Khatuwas, where a second tier is added for the journey to the ports.57

The locations of the CONCOR terminals are shown in Figure 2.

For many ICDs in the north of India, haulage distances to the seaports are of the order of 1,000-1,500 km. For example, the Dadri ICD near New Delhi is 1,536 km by road and 1,493 by rail from Mumbai area ports. By contrast, ICDs in the south tend to be located closer to the seaports (e.g. the CONCOR Whitefield terminal is 350 km by road and 346 km by rail from Chennai Port), and while rail served, are much more vulnerable to competition from road transport.

Among the ICDs operated by CONCOR, those near New Delhi have the largest annual container throughputs. Tughlakabad with 463,163 TEU and Dadri with 289,787 TEU accounted for nearly one quarter of CONCOR’s entire throughput of international and domestic containers in 2014/15. By contrast, there are several inland terminals, which handle less than 30,000 TEU per year.

CONCOR has a forward development plan to construct another 16 dry ports (not including the recently commissioned multimodal terminal at Khatuwas), mostly in inland locations.

57 Information provided at meeting with Shri M K Nabi, Chief Manager of ICD Dadri, Noida, 19 October 2015.
As an indication of the land intensity of container terminal development, a total area of 105 hectares (1,050,000 m²) was initially acquired for the development of the Dadri ICD, which opened in January 2004.58 Currently only half of this area has been utilized for the CY, CFS’s, truck parking, rail sidings and warehousing, and the balance remains available for future development. More recently, 113 hectares was acquired for development of the Khatuwas Multimodal Terminal, of which only 48 hectares has so far been taken up for development (16 hectares for an ICD and 32 hectares for a domestic terminal), with the balance being available for warehousing.

58 Dry Port questionnaire completed for Dadri ICD (October 2015)
and future development. Land acquisition in India often requires a long lead time and has become so fraught with speculation in price determination that CONCOR has been forced to secure the assistance of State Government authorities in securing land parcels at values which will make terminal development viable.

Significantly, CONCOR is not solely a terminal developer and operator, but is also licensed as a container train operator (CTO) and owns a rolling stock fleet of 13,111 wagons, of which high speed wagons number 11,754. As a condition of their license, private sector CTOs are also required to invest in a fleet of container wagons, since the Indian Railways is in effect a “hook and haul” operator which provides the infrastructure and the motive power to haul container trains on behalf of the CTOs. The private sector fleet of container wagons currently numbers about 6,000 (or 134 rakes).

CONCOR is highly profitable, with a profit after tax in 2014/15 of INR 1,047.5 crore (US$ 157.8 million), representing nearly 19 per cent of its operating income in that year. It is likely that the private CTOs are also trading profitably.

3. Visit to Dadri ICD

Meeting held at 1030 hours on 19 October 2015 with management of Dadri ICD Greater Noida District, northeast of New Delhi in Uttar Pradesh state, followed by inspection of the terminal and its facilities. Present were: M.K. Nabi, Chief Manager, Inland Container Depot Dadri; Srinivas Subramanian, AGM Operations, APM Terminals, ICD Dadri; S Kumra and P.J. Hodgkinson (representing UNESCAP)

Matters related to the establishment and operation of the Dadri ICD were discussed as below:

3.1 Location in relation to seaports

- Mundra Port: 1,162 km by rail; 1,209 km by road
- Pipava Port: 1,234 km by rail; 1,291 km by road
- Jawaharlal Nehru Port: 1,493 km by rail; 1,536 by road

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59 Motilal Oswal, Container Corporation of India – On High Ground, 15 October 2012
60 Meeting with Shri Anil Kumar Gupta, Chairman and Managing Director, CONCOR. New Delhi 20 October 2015.
61 Ibid (Motilal Oswal October 2012)
62 CONCOR, Annual Report 2014/15
Road access to the seaports is provided by National Highways 8 and 24. Rail access is currently provided by the electrified double track Delhi-Howrah mainline, but will in future be provided by the western section of the Dedicated Freight Corridor.

The average distance to trade sources/destinations is 150 km.

3.2 Ownership and management

- Established 26 January 2004
- Total infrastructure investment: Rs.163.81 crore, or about US$ 27 million
- Investment in handling equipment: RTG’s, Rs.15 crore, or US$ 2.2 million, per unit; Reach-stackers, Rs.2.8 crore, or US$ 413,000, per unit
- Infrastructure and CY handling equipment financed and owned by the public sector (CONCOR)
- Four (4) Container Freight Stations (CFSs) for the stuffing and de-stuffing of containers operated by joint venture between CONCOR (49%) and individual CFS operating companies (51%), which also invest in CFS handling equipment.
- CY and rail terminal managed and operated by CONCOR
- CFS’s managed and operated by 4 private sector companies

3.3 Services

- Container and cargo despatch and receipt
- Container and cargo handling and intermodal transfer
- Reefer container service
- Container and cargo storage
- Customs clearance (with EDI facility)
- Banking and financial facilitation services (including customs duty payment)
- Warehousing services
- Transport booking/arrangement
- Container repair
- Comprehensive information service (including on-line tracking and tracing of containers)
3.4 Facilities and capacity

- Overall area: 1,050,000 m²; CY area: 365,600 m²; warehousing area: 11,000 m²;
- Railway loading/unloading tracks: 4 in number (each 825.66 metres long);
- Handling equipment: RTGs, 4; reachstackers, 5; 3-5 tonne forklifts, 4
- High speed container wagons (BLCA), no. of rakes: 38 (1,710 wagons)
- No. of TEU ground-slots in CY: 3,710; average stacking height, 3
- Annual handling capacity: See Table 1
- Reefer storage capacity (TEU): 412 (Annual reefer handling capacity, 49,440 TEU)

Table 1: Annual TEU throughput capacity of Dadri ICD

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. ground slots in CY</td>
<td>3,710</td>
<td>Given in questionnaire for Dadri ICD</td>
</tr>
<tr>
<td>Average stacking height</td>
<td>3</td>
<td>Given in questionnaire for Dadri ICD</td>
</tr>
<tr>
<td>Capacity of CY (TEU)</td>
<td>11,130</td>
<td>Calculated by consultant</td>
</tr>
<tr>
<td>Av. Container dwell time (days)</td>
<td>7.87</td>
<td>Given in questionnaire for Dadri ICD*</td>
</tr>
<tr>
<td>No. stock turns in year (365 days)</td>
<td>46.41</td>
<td>Calculated by consultant</td>
</tr>
<tr>
<td>Annual TEU throughput capacity</td>
<td>516,509</td>
<td>Calculated by consultant</td>
</tr>
</tbody>
</table>

* Inbound empty 5 days; inbound loaded 9 days; outbound empty 30 days; outbound loaded 3 days

3.5 Throughput trend

Figure 3 shows the trend in the container throughput of the terminal since commencement of operation in 2005-06.

Throughput growth between 2005-06 and 2014-15 averaged 13.0 per cent per annum, which was more than double the container throughput growth of Indian ports over the same period of about 6 per cent per annum.

About 56% of the terminal's estimated annual throughput capacity is presently utilized.

3.6 Modal shares of Dadri throughput

With the exception of a leakage to road transport of light 40 ft containers loaded with ready-made garments for export, all containers are received at and despatched from Dadri ICD by rail. This leakage is estimated to amount to about 100 TEU per day.
The loss of garment containers to road transport occurred despite the fact that Mumbai area ports are more than 1,500 km by road from Dadri ICD, a haul for which rail would normally have a strong advantage over road. However, this loss was due largely to uncompetitive rail haulage charges. Recently, the CONCOR charge for the haulage of these containers was INR 45,000 per FEU (40 ft equivalent unit) which compared unfavourably with the road haulage charge of INR 32-35,000 per FEU (of up to 20 tonnes in weight).

**Figure 3:** Container throughput, Dadri ICD, 2005-06 - 2014-15

![Graph showing container throughput](image)

Source: CONCOR October 2015

In an effort to re-capture this traffic, a plan was devised to move export containers in single tier container trains to the new Khatuwas multi-modal terminal where another tier of containers would be added for the journey to Mumbai, as a double stack train. Since the unit operating cost of a double stack train will only be slightly more than half that of a single tier train, the savings could be used to offset the additional costs of hauling trains to, and handling containers at, Khatuwas. In this way it was possible for CONCOR to match the haulage charge of road (at INR 35,000 per FEU) and (it was hoped) recover about 80 per cent of the lost traffic.

3.7 **Railway operation**

The terminal is connected to the electrified trunk-line network of Indian Railways and electric traction is used to haul all container trains between Dadri and the ports. IR block container trains comprise a single electric locomotive and 45 flat (BLCA)
wagons, each loaded with two 20ft or a single 40ft container. Five (5) trains inbound and 5 outbound operate per day between the terminal and the seaports.

The container loading/unloading area is accessed by four 825.7 metre long railway sidings, the first few metres of which are electrified to allow complete rakes (of 45 wagons) to be pushed in under the RTGs by the electric locomotive. (See Photos 1 and 2, below). Similarly this layout enables complete rakes to be pulled out once they have been reloaded, thereby avoiding the need for any shunting activity.

By placing complete rakes under the Rubber Tyred Gantry cranes, lifting of containers from rail to road or rail to stack (utilizing yard trailers) can be easily undertaken, without the need for shunting or re-positioning of rakes.

Reach-stackers supplement the operation of RTG’s in the rail loading/unloading area, but they are also used to lift generator packs (of indigenous design), for reefer container power supply, to and from wagons, as shown in Photo 3, below.

**Photo 1:** Dadri rail sidings showing complete rakes of container wagons positioned under the RTGs
Photo 2: Rail access to Dadri terminal showing electrification of the first few metres of rail loading/unloading sidings to enable push/pull loco operation

Photo 3: Reach-stacker moving reefer generator sets in Dadri terminal
3.8 Profitability of Dadri ICD

Financial data provided in the questionnaire for Dadri ICD indicate that the terminal is highly profitable, at least for CONCOR.

The financial results for CONCOR’s activities at the Dadri ICD in 2014-15 are given in Table 2. These results do not include those of the CFS joint ventures.

Table 2: Financial results for Dadri ICD, 2014-15 (CONCOR only)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rs. Crore</th>
<th>US$ million</th>
<th>Share %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue by source:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container handling (Lift on/lift off)</td>
<td>30.66</td>
<td>4.72</td>
<td>8.3%</td>
</tr>
<tr>
<td>Container stuffing/unstuffing</td>
<td>0.00</td>
<td>0.00</td>
<td>0.0%</td>
</tr>
<tr>
<td>Container storage</td>
<td>2.27</td>
<td>0.35</td>
<td>0.6%</td>
</tr>
<tr>
<td>Cargo storage</td>
<td>0.19</td>
<td>0.03</td>
<td>0.1%</td>
</tr>
<tr>
<td>Other (mostly rail haulage)</td>
<td>337.61</td>
<td>51.98</td>
<td>91.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>370.73</td>
<td>57.08</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Less Operating and Maintenance costs</strong></td>
<td>277.66</td>
<td>42.75</td>
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<tr>
<td><strong>Equals:</strong> Operating margin</td>
<td>93.07</td>
<td>14.33</td>
<td>25.1%</td>
</tr>
<tr>
<td>Operating ratio (O&amp;M costs/Revenue)</td>
<td>0.75</td>
<td>0.75</td>
<td></td>
</tr>
</tbody>
</table>

Source: CONCOR, questionnaire for Dadri ICD
Applicable exchange rate INR:USD 64.95

Of the revenue earned by CONCOR at the Dadri ICD, only 9 per cent was from the handling and storage of containers. The balance (91 per cent) was mostly from the rail haulage of containers to and from the ports, since this is a service offered by CONCOR as a Container Train Operator (CTO). In providing this service, CONCOR incurs the costs of owning and maintaining a fleet of container wagons, as well as the haulage charges it pays to IR for “hook and haul” services.

4. Meeting with CONCOR Chairman/MD in New Delhi

Meeting held in CONCOR offices in New Delhi at 0930 hours on 20 October 2015. Present at the meeting were: Sri Anil K Gupta, Chairman and Managing Director, CONCOR; Sanjay Swarup IRTS, Group General Manager (International Marketing) CONCOR; Rajeev Mukhija, Manager (International Marketing) CONCOR; S Kumra and P.J.Hodgkinson (UN ESCAP). The purpose of the meeting was to discuss policy issues associated with Dry Port establishment and development in India.
4.1 CONCOR history and current status

CONCOR was floated by Indian Railways in 1989 to take over operation of Indian Railways' ICD's then numbering only 7. Registered capital was 2,000 million Rupees, 61.8 per cent of which was owned by IR and 38.2 per cent by private sector investors. Out of this private investment, 29 per cent is foreign institutional investors (superannuation funds, and the like).

CONCOR Board comprises 14 directors: 5 company employees; 2 nominees from Central Government; and 7 independent directors.

CONCOR is a Navratna Company, meaning that it has a certain level of financial autonomy not granted to other public sector enterprises. In particular, Navratna status allows joint venture contracts of up to Rs. 7500 crore to be decided by the Board.

Of the 36 ICDs now operated by CONCOR, a majority can be categorized as public sector owned and operated facilities. This category includes the Tughlakabad ICD near New Delhi with the highest throughput volume of any ICD in India as well as the Whitefield ICD near Bengaluru, which was visited during the course of the UNESCAP fact finding mission to India in October 2015.

Up until 2006/07, CONCOR provided all investment in ICD projects, but starting in that year the Board decided to encourage competition in the provision of services within ICD's and the first joint ventures with the private sector were established for operation of CFS's at Dadri.

The Dadri model has since been applied at several of the other 35 ICD's established by CONCOR.

(i) Container Train Operator licences

As from January 2006, the Ministry of Railways has permitted private and public sector operators to obtain licences to run container trains on the IR network. Two types of licence are issued:

- Category A, which enables operators to operate between any origin and any destination (i.e. no restriction on operated route. The cost of this licence is Rs. 500 million.
• Category B, which allows operators to run trains on any route other than New Delhi-Mumbai

To date, 16 private operators and one public operator have been licensed as CTO’s. Of these five have Category B licences and the remainder Category A licences.

CTO licences are additional requirements to the approvals which must be issued by the Inter Ministerial Committee to allow establishment of ICD’s.

Some shipping lines, e.g. APL and MSC, have entered joint ventures with local companies to establish ICDs and operate container trains.

Under CTO licence conditions, licencees must begin to operate within 3 years.

The Indian Government allows tax refunds on the purchase of container wagons and capital expenditure on ICD development.

(ii) CONCOR container throughput trend

Developed ICD capacity is 3 million TEU, but last year CONCOR handled 3.1 million TEU. About 84 per cent of this throughput comprises export/import containers, and this share has been growing at the expense of domestic containers, as shown in Figure 4, below.

4.4 Capacity expansion plans

Work is proceeding on the development of 15 new terminals now. These will all be in operation by 2017, when capacity is expected to reach 6 million TEU. With the completion of the Dedicated Freight Corridor project, CONCOR’s throughput capacity is expected to grow to 12 million TEU by 2022.

4.5 Problem of land acquisition

Land acquisition is the public sector’s (and CONCOR’s) biggest challenge. Up to 2006, CONCOR was not permitted to acquire any new land. IR then acquired land at CONCOR’s cost.

In 2009, CONCOR started to acquire land directly, but encountered problems of private profiteering and speculation. After 2011, CONCOR began acquiring land through state governments. State governments are also able to become joint venture
partners with CONCOR. There are one or two precedents for this, e.g. Punjab state government has become a partner in the development of an ICD.

Figure 4: Relative shares of export/import and domestic containers in CONCOR’s overall throughput

4.6 Problems associated with development of ICD’s

(i) Seaports – multiple handling issues

It was claimed that triple handling in seaports is not so much of a problem, as is traffic congestion at road vehicle entrances. At JN port, there are three terminals: DP World, APL and Maersk Moller. CONCOR participates as a joint venture partner in the latter – is able to resolve issues associated with rail access to this terminal (???)

(ii) Customs

Considered to be a major challenge. Customs approval of new terminals takes a long time and they have a lot of requirements (office space etc). Dadri terminal was
delayed by one year because the customs superintendent’s office did not have a toilet attached.

(iii) IMC approvals

Similarly, approvals of new terminals by the Inter Ministerial Committee are considered to take too much time, and it was claimed that the IMC concerned itself with issues outside of its mandate, such as an applicant’s land use plans.

5. Meeting with Joint Secretary Customs, New Delhi

Meeting held in Ministry of Finance offices, North Block, New Delhi at 1210 hours on 20 October 2015. Present at the meeting were: L. Satya Srivinas, Joint Secretary (Customs), Department of Revenue, Ministry of Finance; Rajeev Mukhija, Manager (International Marketing) CONCOR; ?? Regional Office, UNESCAP, New Delhi; S Kumra and P.J.Hodgkinson (UNESCAP). The purpose of the meeting was to discuss customs issues associated with the approval, establishment and operation of dry ports in India.

5.1 New ICD approval process

(i) Initial approvals by IMC which gives permission under Section 7 of the Customs Act India to operate.

(ii) Customs needs to be convinced that all necessary infrastructure and systems for connectivity will be in place

(iii) Arrangements have to be made for Customs staffing of new facilities – initially involving re-deployment of existing staff and afterwards regularization of employment. For first 2 years of operation ICD operators have to pay costs of customs staff. After 2 years, ICD operators exempted from payment of these costs.

(iv) Customs field office will issue permission for actual commencement of ICD operations.

(v) New ICDs must commence operation within 1 year of approval by Customs and the IMC.

(i) EDI

Customs declarations are now made on-line. Import declarations and shipping manifests are now transferred on-line between gateway ports and ICD’s, as are permissions for transfer of containers from gateway ports to destination ICD’s.
(ii) **Risk management**

Risk assessments are carried out as a basis for deciding whether consignments will be physically inspected. Currently these assessments are done manually. Inspection targets for air cargo are that 20% of consignments will be inspected, but for sea cargo through ICD’s that 40% of consignments will be inspected. Scanners are now installed at gateway ports.

5.4 **Move to single window**

The single window does not yet operate in India. Some 9 separate authorities are involved in border control. Action is being taken to harmonize the procedures and IT systems of these authorities with a view to implementing the single window by 16 March 2016 (!!! ambitious target).

(iii) **Performance monitoring**

The Indian Customs Service is monitoring its own performance in terms of processing times and their effect on detention of cargo. The intention is to put up data on cargo processing and dwell times by location on the website.

**Meeting with Joint Secretary Department of Commerce, Ministry of Commerce and Industry**

Meeting held in Ministry of Commerce offices, Udyog Bhavan, New Delhi at 1340 hours on 20 October 2015. Present at the meeting were: Sanjay Chadha, Joint Secretary, Department of Commerce, Ministry of Commerce and Industry; Rajeev Mukhija, Manager (International Marketing) CONCOR; ?? Regional Office, UNESCAP, New Delhi; S Kumra and P.J.Hodgkinson (UNESCAP). The purpose of the meeting was to discuss policies and procedures related to the establishment of dry ports in India.

6.1 **Functions and procedures of Inter-Ministerial Committee (IMC) on ICD’s**

The Joint Secretary co-ordinates the activities of the IMC, which comprises representatives of the following authorities:

- Department of Revenue (Customs);
- Ministry of Surface Transport;
- Ministry of Railways; and
Ministry of Commerce.

The function of the Committee is to consider proposals submitted by Public Sector and Private Sector investors to set up new ICDs or CFSs at different centres throughout the country and to monitor their progress.

Guidelines for setting up ICDs and CFSs are given on the Ministry of Commerce website:

http://commerce.nic.in/trade/national_tpa_guidelines.asp

The following requirements have to be met for an ICD/CFS proposal to be approved by the IMC:

(i) Submission of a feasibility study report indicating that the proposed facility will be financially viable, that user needs will be satisfied and that the railways and other service providers will be able to serve the facility economically;

(ii) Facilities must attain minimum container volumes – ICDs, 6,000 TEU per annum and CFSs, 1,000 TEU per annum;

(iii) Minimum land area specified for ICDs or CFSs to be established outside urban areas is 3 acres (13,500 sq. metres) and for facilities to be established within urban areas 1 acre (4,500 sq. metres);

(iv) Design and layout of ICDs and CFSs should be state of the art, allowing for the smooth flow of cargo, containers and vehicles through the facility and taking into account future container and cargo volumes;

(v) Facilities should incorporate most modern handling equipment for loading, unloading, stacking and stuffing/unstuffing of containers;

(vi) Parties wanting to set up a rail based ICD have to provide at their own cost all infrastructure facilities including land, track, handling equipment for containers, maintenance of assets including track, rolling stock, etc. as per exiting railway rules applicable to private sidings;

(vii) Tariff structure and costing to be identified in the feasibility study; and

(viii) ICDs/CFSs should be equipped with up-to-date inventory control and tracking systems to enable rapid location of cargo and containers.

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63 www.taxindiaonline.com/RC2/pdfdocs/cm/cm23.pdf
The application and approval process is as follows:\(^{64}\):

(i) Submission of application (8 copies) in prescribed form, together with feasibility study, to Infrastructure Division, Ministry of Commerce;

(ii) Submission of separate copy of application plus feasibility study to the Commissioner of Customs with jurisdiction for the proposed ICD/CFS;

(iii) Commissioner of Customs is expected to examine the proposal on the basis of the guidelines and send comments to the Central Board of Excise and Customs, New Delhi, within 30 days;

(iv) Receipt of documents by individual IMC members and discussion of proposal at IMC meeting -;

(v) IMC considers merits of proposal on basis of prescribed guidelines;

(vi) On acceptance of a proposal by the IMC, a letter of intent is issued to the applicant by the Ministry of Commerce;

(vii) An applicant is required to set up infrastructure within one year from date of approval, but an extension of six months can be approved by the Ministry of Commerce. An extension beyond six months needs approval of IMC;

(viii) After issuance of letter of intent, the facility is notified as an ICD under section 7 (aa) of the Customs Act, 1962 by the Department of Revenue. In case of CFSs which are considered as extension of ports/ICDs/air-cargo complexes, notification under section 7(aa) is not required.

(ix) Once required infrastructure for an ICD/CFS is developed, a notification under section 8 of the Customs Act declaring the facility as a customs area is issued by the jurisdictional Commissioner of Customs.

(x) The operators of the ICDs/CFSs are appointed custodians under section 45 of the Customs Act, 1962, provided they satisfy the conditions relating to development of infrastructure & facilities and furnish bonds and securities as laid down for such purpose in the CBEC Circular No.128/95-Cus., dated 14.12.95. Custodians are responsible for safety and security of the goods stored in their ICD/CFS.

(iv) Observations on the ICD/CFS approvals process

The approvals process is regarded as a facilitation process whereby the IMC coordinates the approval mechanisms of the individual regulatory agencies. It is not a licensing process, as no actual licence is issued.

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\(^{64}\) Ibid.
The IMC does not undertake any analysis of the justification for individual ICD/CFS proposals, as it is assumed that applicants have performed their own due diligence and have demonstrated the financial viability of their proposals to their shareholders.

6. Visit to Whitefield ICD, Bengaluru

Meeting held at 1000 hours on 21 October 2015 with management of Whitefield ICD, 20 km east of Bengaluru City in Karnataka State, followed by inspection of the terminal and its facilities. Present were: Dr Anup Dayanand Sadhu, Group General Manager, Inland Container Depot Whitefield; Vijay Kumar M.P., Manager Commercial and Operations, ICD Whitefield; P. Gopakumar IRS (C&CE), Deputy Commissioner of Customs, ICD Whitefield; S Kumra and P.J. Hodgkinson (representing UNESCAP)

Matters related to the establishment and operation of the Whitefield ICD were discussed, as below.

7.1 Location in relation to seaports

- Chennai Port: 346 km by rail; 350 km by road
- Cochin (Vallarpadam) Port: 601 km by rail; 635 km by road
- Krishnapatnam Port: 478 km by rail; 430 by road

Road access to the Chennai Port is provided by National Highway 4 (Chennai-Mumbai) of 4-6 lanes. Road access to Krishnapatnam Port is provided by National Highway 7, also of 4-6 lanes. Rail access is currently provided by the electrified multiple track Bengaluru-Chennai mainline.

The average distance to trade sources/destinations is 60-70 km.

7.2 Ownership and management

- Established 01 April 1993 (Whitefield was the second CONCOR facility to be established after Tughlakabad)
- Total infrastructure investment: Rs.45.5 crore, or about US$ 7 million
- Investment in handling equipment: Indian manufactured Hyster TIL reachstackers operate in rail loading/unloading sidings. Their unit capital cost is Rs. 2.5-3.0 crore, or US$ 417,000 – 500,000. This compares with about US$ 800,000 for a Kalmar reach stacker imported new.
All infrastructure and handling equipment financed and owned by the public sector (CONCOR)

7.3 Services

- Container and cargo despatch and receipt
- Container and cargo handling and intermodal transfer
- Reefer container service
- Container and cargo storage
- Customs clearance (with EDI facility)
- Banking and financial facilitation services (including customs duty payment)
- Warehousing services
- Transport booking/arrangement
- Container repair
- Comprehensive information service (including on-line tracking and tracing of containers)

7.4 Facilities and capacity

- Overall area: 480,000 m²; CY area: 130,000 m²; warehousing area: 39,000 m²;
- Railway loading/unloading tracks: 4 in number (each 900 metres long);
- Reach-stackers, 5; empty handling reach-stackers, 2; heavy top-lifters, 1; 3-5 tonne forklifts, 14; 2 tonne forklifts, 2.
- High speed container wagons (BLCA), no. of rakes: 13 (585 wagons)
- No. of TEU ground-slots in CY: 8,000; average stacking height, 3
- Annual handling capacity: See Table 3
- Reefer storage capacity (TEU): 24 (Annual reefer handling capacity, 1,200 TEU)

The land occupied by the ICD is leased for 30 years from the Southwestern Railway. The total area leased is 192 acres (or 777,000 square metres) and the leasing charge is Rs. 6 crore per year (equivalent to Rs. 77.22, or US$ 1.14, per square metre).
Table 3: Annual container throughput capacity (TEU), Whitefield ICD

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. ground slots in CY</td>
<td>2,667</td>
<td>Derived from questionnaire for Whitefield ICD</td>
</tr>
<tr>
<td>Average stacking height</td>
<td>3</td>
<td>Given in questionnaire for Whitefield ICD</td>
</tr>
<tr>
<td>Capacity of CY (TEU)</td>
<td>8,000</td>
<td>Calculated by consultant</td>
</tr>
<tr>
<td>Av. Container dwell time (days)</td>
<td>12.60</td>
<td>Given in questionnaire for Whitefield ICD*</td>
</tr>
<tr>
<td>No. stock turns in year (365 days)</td>
<td>28.96</td>
<td>Calculated by consultant</td>
</tr>
<tr>
<td>Annual TEU throughput capacity</td>
<td>231,699</td>
<td>Calculated by consultant</td>
</tr>
</tbody>
</table>

* Inbound empty 22.5 days; inbound loaded 10.8 days; outbound empty 30.8 days; outbound loaded 4.5 days

7.5 Throughput trend

Figure 5 shows the trend in the container throughput of the terminal, and in the relative shares of export/import and domestic containers in this throughput for the 7 year period 2007/08-2014/15.

Figure 5: Container throughput, Whitefield ICD, 2007/08 – 2014/15

Throughput growth between 2007-08 and 2014-15 averaged 4.3 per cent per annum, which was slightly less than the container throughput growth of Chennai Port over the same period of about 6.4 per cent per annum. The share of domestic containers in the terminal’s overall throughput over this period was estimated to have remained constant at 6.8 per cent.
Just over 50 per cent of the terminal’s estimated annual throughput capacity is presently utilized.

Major export commodities transported in containers from Whitefield include: granite to the Gulf countries; coffee beans and gherkins, to Europe; and pharmaceutical and electrical products to the United States. Major import commodities include: wood pulp from Australia (for paper manufacture); and machinery from various countries.

7.6 Modal shares of Whitefield throughput

Approximately 90% of the containerized export/import volume handled at Whitefield moves through Chennai Port. It is understood that this is also true of the total volume of container trade generated within the Bengaluru region.

*With the exception of about 1-2 per cent of the terminal’s container throughput which moves by road to/from Chennai Port, all containers are transported to/from Whitefield by rail.*

Overall, Whitefield handles about 80 per cent of the volume of containerized export/import trade generated within the Bengaluru region. The balance of 20 per cent (about 27,000 TEU per year) is transported directly between Chennai Port and Bengaluru by road transport.

Unlike northern India where trade generating areas are located more than 1,000 km from the ports, those in Bengaluru are located only 350 km from the nearest port, Chennai, which can be reached by road transport in about 7 hours. However, the competitiveness of road transport has been diminished by the increasing road traffic congestion within and outside Chennai Port which has resulted in truck queues extending 3-4 km from the port and truck waiting times of 34-36 hours.

It is unlikely that the competitive position of rail can be improved in the foreseeable future by the development of a Dedicated Freight Corridor between Chennai and Bengaluru. A pre-feasibility study of this project recently conducted by RITES (Railways of India Technical and Economic Services) concluded that a DFC would not generate sufficient traffic to justify the substantial investment required for its construction (estimated at Rs 11,200 crore, or US$ 1.65 billion). Further, a DFC

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65 Pre-feasibility study of Chennai-Bangalore Dedicated Freight Corridor, November 2013
would pose engineering challenges in terms of providing adequate height clearances within the numerous railway cuttings between Chennai and Bengaluru.

When it was suggested that unit railway costs could be reduced by the alternative of introducing single tier three slot (3 TEU) container wagons in the Chennai-Bengaluru corridor, it was argued that such an initiative would have to be supported by a design from RDSO (Railway Design and Standards Organization), and thus far such a design has not been forthcoming.

7.7 Railway operation

The terminal is connected to the electrified mainline between Chennai and Bengaluru and electric traction is used to haul all container trains between Whitefield and Chennai Port. IR block container trains comprise a single electric locomotive and 45 flat (BLCA) wagons, each loaded with two 20ft or a single 40ft container. Two (2) trains inbound and 2 outbound operate per day between the terminal and Chennai Port.

A weekly rail service is now operated in each direction between Whitefield and Cochin (Vallarpardam Port) using diesel traction, since there is as yet no electrification west of Bengaluru. In June 2015, services to Krishnapatnam Port were commenced, but were stopped after 4-5 trains were run, owing to lack of demand.

Rail services will soon commence between a new ICD being developed near Mysore and New Mangalore Port.

The container loading/unloading area at Whitefield is accessed by four 900 metre long railway sidings, the first few metres of which are electrified to allow complete rakes (of 45 wagons) to be pushed into the loading/unloading tracks by the electric locomotive. (See Photo 4). Similarly this layout enables complete rakes to be pulled out once they have been reloaded, thereby avoiding the need for any shunting activity.

Container stacks are located close to the loading/unloading tracks, thereby allowing reach-stackers to transfer containers between wagons and container stacks (see Photo 5).
Photo 4: Electrification of first few metres of loading/unloading tracks to allow push-pull operation of electric locomotives

Photo 5: Reach-stacker transferring containers between wagons and container stacks in Whitefield CY
7.8 Warehouse operation

Most cargo in warehouses and the CFS is palletized, allowing rapid mechanized handling and transfer to/from trucks (see Photo 6 below).

Photo 6: Palletized cargo in warehouse, Whitefield ICD

7.9 Customs issues

An Additional (or Deputy) Commissioner and 3 Assistant Commissioners of Customs are based at Whitefield.

Customs inspections are carried out on site. There is currently no on-site quarantine inspection, but this is coming. Food items must be sent off-site for examination at a laboratory.

Since 2006, risk assessment has been used as a basis for deciding which consignments are to be inspected, but the assessment is essentially a manual process. Approximately 60 per cent of all import consignments are cleared on-line and 40 per cent are inspected. Second hand machinery is a major import item, which has had a history of false declaration as a means of avoiding payment of duty. For this reason, and given the absence of X-ray scanners at Whitefield, all machinery consignments have been subject to rigorous physical inspection.

The Customs Service comprehensively monitors its own performance in terms of the dwell time of import containers in the Whitefield terminal, from "entry inward" to "out of charge" including the time taken for assessment and payment of excise. Data for the month of September 2015 show that the average dwell time for import containers
was 10.25 days. This reflects a slight improvement as compared with the year ended 31 March 2015 when the average dwell time was 10.89 days. It was advised that Customs had set a target of only 3 days for import containers. This may well prove to be an over-optimistic target.

More than 80 per cent of export containers are not examined. In the case of these containers, inspection is limited to an inspection of seals, following which they may be despatched from the terminal.

The Customs Service has taken, and is planning, initiatives for acceleration of the clearance process. For example, the Accredited Client Program (ACP) has been introduced for accelerated clearance of the import consignments of clients who have established a good record and the On-site Post Audit Clearance (OSPAC) scheme involves random visits to importers’ premises after to conduct audits of consignment clearance after the event. The single window is coming (to date it has been applied only at the airport).

7.10 Profitability of Whitefield ICD

Financial data provided in the questionnaire for the Whitefield ICD indicate that the terminal is highly profitable.

The financial results for the Whitefield terminal in 2014-15 are given in Table 4.

**Table 4: Financial results for Whitefield ICD, 2014-15**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rs. Crore</th>
<th>US$ million</th>
<th>Share %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue by source:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container handling (Lift on/lift off)</td>
<td>19.55</td>
<td>3.01</td>
<td>14.3%</td>
</tr>
<tr>
<td>Container stuffing/unstuffing</td>
<td>6.50</td>
<td>1.00</td>
<td>4.7%</td>
</tr>
<tr>
<td>Container storage</td>
<td>12.99</td>
<td>2.00</td>
<td>9.5%</td>
</tr>
<tr>
<td>Cargo storage</td>
<td>6.37</td>
<td>0.98</td>
<td>4.7%</td>
</tr>
<tr>
<td>Other (mostly rail haulage)</td>
<td>91.38</td>
<td>14.07</td>
<td>66.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>136.78</strong></td>
<td><strong>21.06</strong></td>
<td><strong>100.0%</strong></td>
</tr>
<tr>
<td><strong>Less Operating and Maintenance costs</strong></td>
<td><strong>100.28</strong></td>
<td><strong>15.44</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Equals: Operating margin</strong></td>
<td><strong>36.50</strong></td>
<td><strong>5.62</strong></td>
<td><strong>26.7%</strong></td>
</tr>
<tr>
<td><strong>Operating ratio (O&amp;M costs/Revenue)</strong></td>
<td>0.73</td>
<td>0.73</td>
<td></td>
</tr>
</tbody>
</table>

Source: CONCOR, questionnaire for Whitefield ICD

Applicable exchange rate INR:USD 64.95
Of the revenue earned by CONCOR at the Whitefield ICD, approximately one third was from the handling and storage of containers and cargo. The balance (two thirds) was mostly from the rail haulage of containers to and from the ports, since this is a service offered by CONCOR as a Container Train Operator (CTO). In providing this service, CONCOR incurs the costs of owning and maintaining a fleet of container wagons, as well as the haulage charges it pays to IR for “hook and haul” services.
4. Republic of Korea

1. Introduction

A mission to the Republic of Korea was conducted by staff of the UNESCAP Transport Division for the express purpose of collecting information on the development and operation of inland intermodal freight terminals of international significance in the ROK.

The mission was conducted from 10-13 August 2015, during which period the Uiwang ICD outside Seoul and the Ministry of Land Infrastructure and Transport in Sejong City (about 121 km south of Seoul) were visited.

This report describes the current status of dry port development in the Republic of Korea and documents matters discussed with the management and advisors of the Uiwang ICD and with officials of the Ministry of Land Infrastructure and Transport.

2. Status of inland intermodal freight terminal development

Inland intermodal freight terminals are currently operating at five locations throughout the Republic of Korea. They are referred to as “Inland Logistics Depots” and have the dual functions of an ICD (Inland Container Depot), which handles foreign trade containers and cargo, and an Integrated Freight Terminal (IFT), which handles domestic cargo.

In addition, one terminal is still under construction and another is in the late stages of planning.

Locations of the five current terminals – at Uiwang, Yangsan, Sejong, Chilgok, and Jangseong - are shown in Figure 1. The terminal which is under construction is a second terminal at Jangseong, while the terminal in planning is at Paju, north of Seoul.

The first ICD was constructed at Uiwang, 25 km southwest of Seoul over the period 1992-1996. The remaining four facilities were constructed over the period 2003-2012. While all five facilities are connected to both the major highway and railway networks, only the Uiwang ICD receives and despatches significant volumes of containers by rail.
All five facilities operate under Public Private Partnership contracts involving minority public and majority private shareholding. In the case of the Uiwang Logistics facility, private investment is provided under a BOT (Build-Operate-Transfer) contract, while in the case of the other 4 facilities, private investments are provided under BOO (Build-Own-Operate) contracts. In the case of Uiwang, ownership of the land area occupied by the logistics facility is vested in the Korean Rail Network Authority.

Figure 1: Locations of Inland Container Depots, Republic of Korea

![Diagram of Inland Container Depots]

Source: Seung B Ahn, Inland logistics system in Korea – Experiences and lessons, Graduate School of Logistics, Incheon National University, 2012

It is understood that at best these facilities cover their costs with revenue. None makes a significant profit and at least one (Jangseon) is understood to make a loss. The reasons for this are largely related to the competition posed by direct movement of containers by road to and from trade sources (factories or warehouses).

In 2014, only 5.8 per cent of the combined TEU throughput of Busan and Gwangyang international ports was received and despatched by the five inland port facilities, suggesting that:

(iii) A large proportion of import and export containers are handled within, or close to, the ports; and

(iv) Some proportion of import and export containers is moved inland directly to or from factories and warehouses by road transport.

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66 1.22 million out of a total of 21.02 million TEU (Source: Ministry of Land Infrastructure and Transport, November 2015)
While all five facilities are connected to both the major highway and railway networks, only the Uiwang ICD receives and despatches significant volumes of containers by rail. Rail is at a disadvantage as compared with road transport to serve these facilities mainly as a result of their proximity to the ports. For example, Uiwang is located furthest from both Busan and Gwangyang Ports, but is still only 380 road km and 410 rail km from the former, and 320 road km and 386 rail km from the latter.

As may be observed in Figure 2 below, no ICD with the exception of Uiwang, achieves more than 20% utilization of its capacity. At Uiwang, capacity utilization in 2014 was estimated at 74%.

**Figure 2: Capacity utilization of ICD facilities in Republic of Korea**

![Bar chart showing capacity utilization of ICD facilities in Republic of Korea]

The enabling legislation under which the logistics facilities are established and operate is the *Distribution Facilities Development and Operation Act*. The main provisions of this Act are:

- Specifications of a general plan for the development of distribution facilities in the Republic of Korea (plan is the responsibility of the Ministry of Land Infrastructure and Transport)
• Regulations governing the establishment and management of logistics facilities
• Conditions governing private investment in logistics facilities (either BOO\textsuperscript{67} or BOT contract

3. Visit to Uiwang ICD

Meeting held at Uiwang ICD 0900 hours 11 August 2015. Uiwang is about 25 km west of Seoul and about 400 kms northwest of Busan. Meeting organized by Cho, Deog-Hee, General Manager of Planning Division,Uiwang ICD. Representatives of Uiwang ICD management and Korea Transport Institute were present. Matters discussed included:

Trucking system in ROK

System in ROK is unique. Only 10 per cent of trucks are company owned. Logistics companies pay owner/drivers US$ 300 per month to transport cargo between Seoul and Busan.

Truck drivers receive discounted toll fees for movement between hours of 2100 and 0600. Following major trucking strikes in 2003 and again in 2008, commercial truckers received a fuel subsidy amounting to an average of US 30 cents per litre of diesel (now represents 25% of current price of 1400 Won or US$ 1.20 per litre). Subsidy is provided as a monthly rebate to drivers. Maximum rebates depend on size of trucks. Despite the recent fall in global oil prices, this rebate has not been removed.

Overall weight limit for trucks in ROK is 40 tonnes. Given 20ft container gross loads in excess of 20 tonnes, on average trucks may carry only a single 20 ft container on a 40 foot trailer.

It was claimed that truck tariffs are cheaper than those of rail.

In 2014, some 56 per cent of the Uiwang throughput volume of 1.01 million TEU was transported by road, but trucks carry about 90 per cent of the container throughput of Busan Port (and rail only 10 per cent).

\textsuperscript{67} With BOT contract, facility has to be transferred to government ownership after 30 years; with BOO contract facility does not have to be transferred.
Uiwang ownership structure

Uiwang ICD was established under a BOT contract in 1996. Land ownership is vested in The Korean Railway Network Authority, which is the public sector partner in the PPP. Shares in the partnership are: public, 25 per cent; private, 75%. The private share in the partnership is held by 16 logistics companies.

The ICD is divided into 2 rail served terminals and approximately 6 CYs and CFSs. One CY is operated by a government enterprise and the others by the private sector.

It is the responsibility of the public partner to:

(i) Provide and lease land to the private partners
(ii) Provide at its cost all rail and road accesses to the ICD

It is the responsibility of the private partners to operate the ICD and provide at their cost all infrastructure and container/cargo handling equipment within the boundaries of the ICD, including:

(i) Railway sidings for container loading/unloading
(ii) Internal roads
(iii) Paved container yards, for the handling and short term storage of containers
(iv) CFS and other warehouses
(v) Rubber tyred gantry cranes, reachstackers, heavy duty and light forklifts

Facilities and operations at Uiwang

(i) Overall area of ICD: 754,807 m²; total CY area (2 terminals): 419,050 m²; warehousing area: 10,712 m².
(ii) Railway loading/unloading tracks: 11, 6,212 metres
(iii) Handling equipment: Rubber tyred gantry cranes, 3; reachstackers, 43; 3-5 tonne forklifts, 7
(iv) No. of TEU ground-slots in CY: 10,214; average stacking height, 4.45 (3 full, 5 empty)
(v) Annual handling capacity: 1.37 million TEU
(vi) Trend in throughput and modal shares
- Throughput growth (2010-2014) : 2.8 per cent p.a.
- Road hauled volume (TEU) : 4.2 per cent p.a.
- Rail hauled volume (TEU) : 1.1 per cent p.a.
- Road share increased from 52.8% in 2010 to 55.9% in 2014
- Rail share declined from 47.2% in 2010 to 44.1% in 2014

On average, 12 trains per day carrying containers operate in each direction between Uiwang ICD and Busan port. Typically, each train is a block formation, comprising 30 container flat wagons, each carrying 2 TEU (a total of 60 TEU per train).

**Railway operation**

Three slot (3 TEU) container wagons were observed in the loading/unloading tracks at Uiwang ICD – see Photos 1A and 1B below. When these wagons are assigned to traffic, their number can be reduced to 20 per train for an equivalent train length to 2 TEU wagons (20 x 20 metres = 400 metres, as compared with 30 x 14 metres = 420 metres). Use of three slot wagons can potentially reduce operating costs by nearly one third.
Figure 4: Road and rail TEU volume shares of Uiwang throughput

![Graph showing road and rail TEU volume shares of Uiwang throughput from 2010 to 2014.]

<table>
<thead>
<tr>
<th>Year</th>
<th>Road Transport</th>
<th>Railway</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>477,132</td>
<td>425,769</td>
</tr>
<tr>
<td>2011</td>
<td>493,368</td>
<td>502,366</td>
</tr>
<tr>
<td>2012</td>
<td>481,044</td>
<td>527,732</td>
</tr>
<tr>
<td>2013</td>
<td>583,659</td>
<td>495,464</td>
</tr>
<tr>
<td>2014</td>
<td>563,072</td>
<td>444,583</td>
</tr>
</tbody>
</table>

Total throughput (TEU) 902,901 995,734 1,079,123 1,007,655

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Throughput (TEU)</th>
<th>Road Transport</th>
<th>Railway</th>
<th>% Rail</th>
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<tr>
<td>2010</td>
<td>902,901</td>
<td>477,132</td>
<td>425,769</td>
<td>47.2%</td>
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<tr>
<td>2011</td>
<td>995,734</td>
<td>493,368</td>
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<td>50.5%</td>
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<td>2012</td>
<td>1,008,776</td>
<td>481,044</td>
<td>527,732</td>
<td>52.3%</td>
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<tr>
<td>2013</td>
<td>1,079,123</td>
<td>583,659</td>
<td>495,464</td>
<td>45.9%</td>
</tr>
<tr>
<td>2014</td>
<td>1,007,655</td>
<td>563,072</td>
<td>444,583</td>
<td>44.1%</td>
</tr>
</tbody>
</table>

Source: Presentation materials: Development and Operation of Uiwang ICD, August 2015

Photo 1A/B: Three slot (3 TEU) wagon (20 metre length) in loading/unloading tracks at Uiwang ICD

Container trains are hauled between Uiwang and Busan Port by single high powered electric locomotives. Marshalling of rakes between the railway yard (located north of the ICD) and the loading/unloading tracks is, however, carried out by diesel shunting locomotives since not even the approach sections of track are electrified. If, say, the first 30 metres of approach track could be electrified, the mainline electric locomotives could be used to push full length trains into loading/unloading sidings.
and to pull them out when loaded. In this case, there would be no need to split up and reassemble trains in the marshalling sidings and the saving in operating costs could be substantial.

Trains are mostly unloaded and loaded by rubber tyred gantry cranes, hence loading/unloading time is fast, at 1-1.5 hours per train.

**Road and rail competition for container haulage**

Although no actual tariff rates were provided, it was claimed that road rates were lower than those of rail. It was claimed further that the high level and structure of rail costs put it at a significant advantage to compete with road for container haulage.

While the railway does suffer from high labour costs as a result of labour union pressure, the fact is that each train received or despatched at Uiwang can carry 60 TEU, whereas on average the typical road trailer will carry fewer than 2 TEU, probably no more than 1.5 TEU. Since one train will replace 40 trucks, it cannot be comprehended why railway charges should exceed those of road, even with the higher labour costs of rail.

Other factors do, however, operate to provide road with a competitive advantage. These factors include the relatively short distance between the ICD and the port, as well as the fact that, in some cases, trucks can haul containers directly to and from a customer’s premises (whether it be a factory, a warehouse or a retail store).

**Profitability of Uiwang ICD and potential for improvement**

The single CY/CFS complex which is operated by the government owned Uiwang ICD company is understood to be only barely covering its costs, although there has recently been a gradual improvement in its profitability. It was claimed that the PPP was developed as a “social overhead capital” project, aimed at giving the private sector access to relatively inexpensive land close to the Seoul metropolitan area.

Railway services to and from the ICD are understood to be loss-making. One reason for this is the low share of rail in the haulage of containers to and from the ICD. This share currently stands at 44% and it was reported that rail would need to achieve a 70% share in order to breakeven financially on these services.

Several options for the improvement of the ICD’s profitability are being assessed, including:
• Improving the economics of block train operation by signing long term rail haulage contracts with major shippers;
• Improving the profitability of inland logistics terminals by encouraging more domestic traffic. The recent experience of the JR Freight company in achieving the growth of high value domestic cargo through the operation of 12 foot domestic containers was cited as an example of what is also possible in the ROK.

4. Meeting with MOLIT in Sejong

Meeting held in MOLIT office in Sejong (about 150 km southeast of Seoul) at 1000 hours on 12 August 2015. Present at the meeting were officers of MOLIT and the two ESCAP representatives (S Kumra and P Hodgkinson). Discussion of policy issues associated with Dry Port establishment and development were led by Mr Lee Seong Hoon, Director, Logistics Facilities and Information Division, MOLIT.

4.1 Problems associated with establishing ICD's in ROK

Of the five ICDs already established in ROK, only one (Uiwang) receives or despatches significant volumes of containers by rail, and it is understood that few are profitable.

Although a feasibility study is conducted for every serious proposal to establish a logistics facility (usually carried out by KTI for MOLIT), very often politics intervenes to frustrate the outcome of the approvals process.

As an example of this, although a feasibility study of logistics complex to be established at Jangseong in the southwestern region of ROK, indicated that the project would not be financially or economically feasible, it nevertheless had strong political support and was approved for development. While it has an acceptable rail connection to Gwangyang Port, Jangseong is without a good rail connection to Busan Port, which is the country’s international container gateway. In 2014, the Jangseong ICD handled a negligible volume of containers.

(i) Government policies and incentives for establishment of dry ports

Government prefers to establish dry ports under BOT contracts, with ownership reverting to government after 30 years, but private investors prefer BOO contracts.

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under which ownership is retained by the private sector. It can be noted that of the five dry port facilities currently operating in ROK, only one (Uiwang) was established under a BOT contract, the others being established under BOO contracts.

Four types of incentives are available to potential private investors who want to establish logistics facilities, whether BOT or BOO arrangements apply:

(i) Access to low cost land through rental agreements under BOT or BOO contracts;
(ii) Tax breaks, specifically a 50% reduction in land acquisition tax;
(iii) External infrastructure (road and rail accesses, water and electricity supply) provided by government; and
(iv) Subsidized interest rates on infrastructure loans (2-3% lower than commercial rates) – does not apply to equipment purchases.

The handling charges of inland logistics facilities are not regulated, but in the case of land rental at the Uiwang facility, a ceiling rate is imposed.

Government initiatives to attract manufacturers and warehouse operators to the precincts surrounding the inland logistics facilities are expected to improve their prospects for profitability.

(ii) Border crossing/customs issues

It was reported that there are no excessive delays to cargo/container despatch as a result of customs inspection at the Uiwang Terminal.

A customs office at Uiwang accommodates the three functions of customs inspection, plant and quarantine inspection and food inspection, but each of these functions operates independently without any sort of information exchange. The customs function emphasizes checking of documentation, but some 2-3 per cent of consignments are physically inspected in the terminal. One stop service has been introduced in airports, but has yet to be introduced at seaports at inland logistics facilities. Consignees have to pay duty before transporting import cargo out of the terminal. Little or no duty applies to export cargo. There is no X-ray scanning of cargo in ICDs, but scanners now operate at Busan Port.

On line processing of documentation applies to cargo regularly imported — otherwise physical documents have to be presented. Customs office wants reporting of consignment details 24 hours before arrival.
(iii) Government promotion of rail

No differential taxes on road vs. rail. Indeed, road still benefits from a fuel subsidy at a time when world oil prices are rock bottom (less than $40 per barrel).

Direct rail to ship transfer of containers might be possible at Busan new port. Otherwise, government is trying to make ports more rail friendly.
5. Thailand

1. Introduction

A visit to the ICD of TIFFA (Thai International Freight Forwarders Association) was conducted by staff of the UNESCAP Transport Division for the express purpose of collecting information on the development and operation of inland intermodal freight terminals of international significance in Thailand. The TIFFA ICD is one of six modules forming the ICD complex at Lard Krabang, 27 km east of Bangkok.

The visit to the TIFFA ICD was conducted on 29 October 2015, during which a meeting was held with TIFFA ICD management.

This report describes the current status of inland port development in Thailand and documents matters discussed at the meeting with the TIFFA ICD Co., Ltd management.

2. Status of inland port development

About 80 per cent of Thailand’s throughput of international containers is handled by Laem Chabang International Port, located on the Eastern Seaboard 132 km southeast of Bangkok.

The growth in inbound and outbound container volumes through Laem Chabang Port has been strongly positive for all but one of the past 13 years. Only in the year of the global financial crisis (2009) did container trade record negative growth.

Overall, the port’s container throughput grew at a rate averaging nearly 9 per cent per year for the period 2001-2014. In 2014, it reached 6.6 million TEU.

Since 1996, Laem Chabang Port has been connected to a road and rail served ICD at Lard Krabang, about 27 km east of Bangkok and 118km by rail from Laem Chabang Port. This facility is owned by the Government and administered by the State Railway of Thailand (SRT). It comprises 6 independent modules, each with its own CY and warehouses and operated independently under an operating concession. Each operator has common access to centrally located rail loading and unloading sidings.

The Lard Krabang ICD was established in order to free up landside capacity and accelerate vessel turnarounds within the Port of Laem Chabang, by transferring the
customs clearance, as well as the stuffing/unstuffing processes, of containers outside of the port.

It is likely that the requirement for a proportion of the transferred containers to be moved by rail was a secondary goal, designed to eliminate vehicular congestion at the port entrance/exit and along the arterial roads providing access to the port from Bangkok.

In this sense, the Lard Krabang ICD has a somewhat different function from most of those in China and India which are located well into the hinterland and are primarily intended to provide a seamless connection with ports and ultimately with ICD’s in the interior of other countries.

In practice, during the past 11 years, the Lard Krabang ICD has handled a declining proportion of the total container throughput of Laem Chabang Port. As shown in Figure 1, the proportion of total throughput by-passing Lard Krabang has increased from 63 per cent in 2001 to 79 per cent in 2014. Stated inversely, the proportion handled at Lard Krabang has fallen from 37 per cent to 21 per cent over the same period. All of the container volume which by-passes the Lard Krabang terminal is transported to and from the port by road.

A major factor in the declining role of Lard Krabang in the handling of Laem Chabang’s container throughput has been the relocation of several major exporters and some importers from areas in and around Bangkok to areas closer to the port. In addition some larger factories have recently acquired customs inspection facilities, with the result that export consignments are transported directly by road to the port.

Although the State Railway of Thailand has recently invested in 20 new 3,500 HP diesel electric locomotives and some 370 new container wagons, specifically to reduce unit operating costs by increasing train size, these new assets have yet to be fully mobilized.\(^69\)

While it was originally intended that a major proportion of the ICD’s throughput would move in and out by rail, in fact the proportion moved by rail has never exceeded 34 per cent.

\(^69\) The deployment of higher horsepower locomotives will allow container train lengths to be increased from 30 wagons as at present to 40 wagons in future, with a potential 25 per cent saving in operating costs, which could be passed on to shippers in the form of reduced container haulage charges (Consultant’s estimate).
The operation of all ICD modules is understood to be profitable, but it is unlikely that railway haulage revenue covers train operating costs between Laem Chabang and Lard Krabang.

Currently, the Lard Krabang ICD is the only facility in Thailand which may properly be described as an inland, or dry, port. However, the Thai Government has approved the development of two other inland port projects, which are now in the advanced stages of planning. These are:

- An intermodal terminal, which is to be constructed at Chiang Khong in Chiang Rai Province, near to the 4th Mekong Bridge, opposite Huay Xay in Lao PDR. The first phase of this facility, construction of which is scheduled for 2017-18, will involve development of a CFS and area for trailer exchange. The second phase will involve construction of a CY and customs

Source: Bangkok Ship-owners’ and Agents’ Association
warehouse, as well as connection to a new railway line, *yet to be built*\(^{10}\), between Chiang Khong and Denchai, on the Bangkok-Chiang Mai mainline. The facility will have a capacity of 270,000 TEU per year with a main function of transferring containers and cargo to/from China, via Route 3A across the 4th Mekong River Bridge, to rail.

- **A Container Freight Station (named the Natha CFS) which is to be constructed at Nong Khai, opposite Vientiane in Lao PDR.** The first phase of this facility, to be developed at a cost estimated at THB 668 million (or US$ 19.1 million), will have a capacity of 80,000 TEU per year. The facility will be connected to a new double track standard gauge railway line being proposed for development by the Thai Government with technical and financial assistance from the Chinese Government. The second phase development of this facility will lift its capacity to 240,000 TEU per year.

In the longer term, inland port projects may be developed between Kanchanaburi and Dawei, Myanmar (where the Thai Government is involved with the Myanmar and Japanese Governments in a major port development project), and at Mukdahan which is at the eastern extremity of an East-West transport corridor linked to the new port.

### 3. Visit to TIFFA ICD

Meeting held at 1000 hours on 29 October 2015 with management of TIFFA ICD Co., Ltd, 33/4 Moo 1 Chao Khun Taharn Road, Lard Krabang District, Bangkok 10520.

Present were: Suvit Perapate, Managing Director and Jinda Jatuwong, General Manager, TIFFA Co., Ltd; S Kumra and P.J.Hodgkinson (representing UNESCAP).

The meeting was followed by an inspection of the terminal and its facilities.

Matters related to the establishment and operation of the TIFFA ICD were discussed as below

#### 3.1 Location in relation to seaports and industrial estates

- **Laem Chabang Port:** 118 km by rail; 85 km by road
- **Bangkok Port:** 38 km by rail; 30 km by road

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\(^{10}\) The Thai Government has yet to announce a budget and schedule for the construction of this railway line.
Road access to the Laem Chabang Port is provided by the multi-lane Bangkok-Chon Buri Motorway (Route 7). Rail access is provided by the double track non-electrified Bangkok-Laem Chabang mainline.

The TIFFA terminal is located close to two major industrial estates: Navanakorn (61 km by road) and Bang Chan (20 km by road).

3.2 Ownership and management

- ICD Complex established 1996; TIFFA ICD established 1999.
- Total infrastructure investment: Thus far only Phase 1 of the ICD development project has been built. The total infrastructure investment cost of Phase 1 was US$ 73.9 million, the project being funded jointly by a World Bank loan, the Thai Government and institutional investors.
- Investment in handling equipment (by TIFFA ICD Co., Ltd): Reach-stackers (Chinese manufacture), THB 18 million, or US$ 512,000, per unit; 2.5-3 tonne forklifts, THB 3 million, or US$ 85,000 per unit; trailers, THB 1 million, or US $ 28,000, per unit; prime movers, or US$ 56,000, per unit

The Lard Krabang ICD complex is financed and managed as a type of PPP (Public Private Partnership) scheme in which the government provides the land and finances the infrastructure and the private sector operators finance, provide and operate the container handling equipment.

Initially the six ICD modules were offered through a public bidding process for operation during a concession period of 10 years with an option of extension for another 5 years. The 15 year concession period ended in 2012, but the operating concessions remained in place, pending a decision by the Thai Government as to the renegotiation and re-letting of contracts. In 2015, the Thai Government eventually announced a proposal to combine the six concessions into a single contract, thereby creating a monopoly to operate the ICD complex. This proposal has been challenged in the courts by existing operators, including TIFFA, and at the time of writing, the matter is pending.

3.3 Services

- Container and cargo despatch and receipt
- Container and cargo handling and intermodal transfer
- Reefer container service
- Container and cargo storage
- Customs clearance (with EDI facility)
- Banking and financial facilitation services (including customs duty payment)
- Warehousing services
- Transport booking/arrangement
- Container repair

3.4 Facilities and capacity

- TIFFA CY area: 96,000 m²; TIFFA warehousing area: 4,800 m²;
- Railway loading/unloading tracks (ICD complex): 3 in number (each 1,000 metres long) – two for loading/unloading, one for engine release;
- TIFFA handling equipment: reach-stackers, 6; 2.5-3 tonne forklifts, 12; trailers, 6; prime movers, 2;
- No. of TEU ground-slots in TIFFA CY: Not known; stacking height, up to 5 for empties, 3 for loaded containers
- No. of reefer plugs in TIFFA CY: 90
- Annual handling capacity: *TIFFA terminal understood to be operating near full capacity currently*

3.5 TIFFA vs Lard Krabang complex throughput

Figure 2 shows the trend in the container throughput of the TIFFA terminal and the Lard Krabang ICD complex for the seven year period 2007-2014.

Overall, the throughput of the Lard Krabang ICD complex has been declining at the rate of about 1.5 per cent per annum, whereas that of the TIFFA terminal has been declining at about double this rate.

These trends reflect the rapid growth in the volume of containers which by-passes Lard Krabang.

3.6 Modal shares of Lard Krabang throughput

If the road and rail shares of the Lard Krabang container throughput only are assessed, there is little change over the 13 year period from 2001 to 2014, as indicated in Figure 3 below. In 2001, the road and rail shares were respectively 70.1 and 29.9 per cent, while in 2014 they were 66.9 and 33.1 per cent respectively.
Although no data were provided it is likely that the road and rail shares of TIFFA container volume follow a similar pattern.

**Figure 2: Container throughput, TIFFA vs. Lard Krabang complex, 2007-2014**

![Bar chart showing container throughput comparison between TIFFA and Lard Krabang complex from 2007 to 2014.](image)

*Source: Bangkok Ship-owners’ and Agents’ Association*

3.7 Policies and strategies affecting the modal split of container transport

Apart from the by-passing of the Lard Krabang terminal by an increasing proportion of Laem Chabang’s container throughput, other factors which have had a strong negative impact on the rail haulage of containers include:

- The necessity for multiple-handling of containers between the rail receival and dispatch sidings, and the berthside container stacks at Laem Chabang Port;
- Inadequate container handling capacity and delayed terminal development at Lard Krabang;
- The practice of awarding operating concessions at Lard Krabang to shipping lines, most of which have trucking subsidiaries;
- Under-investment by the State Railway of Thailand in motive power and rolling stock (this has now been rectified with the purchase by SRT of new...
3,500 HP locomotives and light weight container wagons, but these assets have yet to be fully deployed in traffic;

- Strong government investment in high quality multi-lane road accesses to Laem Chabang Port; and
- Inadequate recovery of road costs through taxes and charges.

**Figure 3:** Relative road and rail TEU volumes transported between Laem Chabang Port and Lard Krabang ICD complex

![Graph showing relative TEU volumes](image)

*Source: Bangkok Ship-owners’ and Agents’ Association*

On the other hand, factors which have a positive impact on the rail share of container haulage include:

- Commercial freedom for the railway to set haulage rates at competitive levels (covering only incremental costs); and
- Enforcement of truck weight limits which restrict the efficiency of road transport for the haulage of 20 ft containers.

**3.8 Railway operation**

As shown in Photo 1 below, the ICD complex has a favourable rail layout in that the access track comes off the main line just to the south of the motorway under which it passes to enter the rail loading and unloading tracks which bisect the ICD, between
banks of three modules on either side. The loading and unloading tracks can receive entire trains each consisting of a diesel electric locomotive and 30 wagons. The integrity of the train can be maintained and there is a shunting neck which may be used by locomotives to run around their trains. Reach-stackers supplied by module operators may load and unload trains on either side.

In 2014, with each train conveying 60 TEU, 12 trains per day in and 12 out were operated. Loading/unloading time per train (utilizing reach-stackers) was reported as 1 hour, meaning that a train can be turned round in a little over 2 hours (1 hour for discharge and 1 hour for re-loading plus some time for locomotive re-positioning and brake-testing). Rail running time to Laem Chabang Port is about 3 hours, as compared with 2 hours by truck.

When the SRT is eventually able to utilize its new locomotives and wagons efficiently, it will be able to increase train size to 40 wagons, instead of 30 as at present, and to reduce train frequency to 18 in and out per day, as the longer trains will carry 80 TEU. In this way also, it will be able to reduce its unit operating costs by at least 25 per cent and to pass on the saving in reduced haulage charges to ICD customers. This should result in an increased rail share of the overall throughput of the complex, but will be at the expense of road transport, since the complex is already operating at full container throughput capacity.
3.9 Warehouse operation

Cargo handling in the TIFFA CFS and warehouses is completely mechanized, with 2.5-3 tonne forklifts moving palletized cargo between loading bays and trucks, as well as loading or unloading palletized cargo into or from containers. (see Photo 2).

It is understood that the standard of these facilities would be replicated in all of the other 5 modules in the Lard Krabang ICD complex.

3.10 Customs issues

A fully staffed Customs Office is located on the second floor of the TIFFA Administration Building.

Customs now employ a paperless system which allows pre-clearance of consignments and payment of duties online. The average dwell time in the TIFFA ICD, for both import and export containers, is only 3 days.

A single window system is to be introduced, but the process of its introduction is very slow, as it must eventually accommodate 40 separate organizations in Thailand with an interest in border control and clearance. To date only 12 such organizations have joined.

Photo 2: Cargo handling in CFS warehouse, TIFFA ICD, Lard Krabang
3.11 Profitability of Lard Krabang ICD complex.

All of the six ICD modules are understood to be profitable. In the case of the SRT, the ICD is understood to be covering its costs. However, it is doubtful that SRT container haulage services are fully cost-covering. Deployment of new operating assets and the introduction of longer trains hauled by more powerful locomotives is likely to improve the profitability of these services significantly.