Chapter 4

Logistics-related Facilities and Operation: Land Transport

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4.1 Introduction

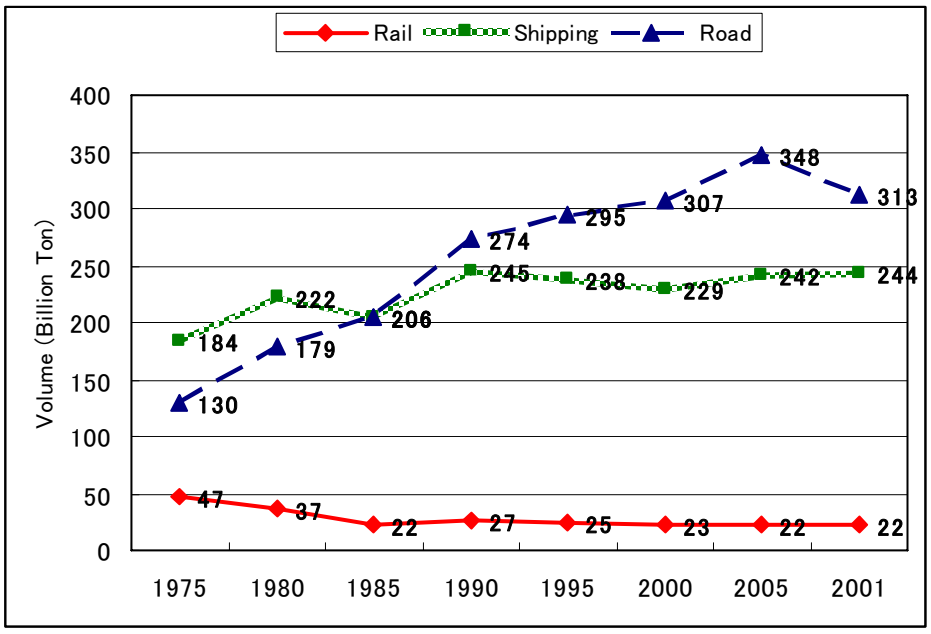
This chapter explores the current conditions of land transportation modes and facilities. Transport modes including roads, railways, and inland waterways in Egypt are assessed, focusing on their roles in the logistics system. Inland transport facilities including dry ports (facilities adopted primarily to decongest sea ports from containers) and to less extent, border crossing ports, are also investigated based on the data available.

In order to enhance the logistics system, the role of private stakeholders and the main governmental organizations whose functions have impact on logistics are considered. Finally, the bottlenecks are identified and countermeasures are recommended to realize an efficient logistics system.

4.1.1 Current Trend of Different Transport Modes Sharing

The trends and developments shaping the freight transport industry have great impact on the assigned freight volumes carried on the different inland transport modes. A trend that can be commonly observed in several countries around the world is the continuous increase in the share of road freight transport rather than other modes. Such a trend creates tremendous pressure on the road network.

Japan for instance faces a situation where road freight's share is increasing while the share of the other two modes including coastal shipping and railway transport modes are declining as illustrated in Figure 4.1.1.



Source: Ministry of Land, Infrastructure and Transport (MLIT) Japan,
Data available at www.mlit.go.jp with the filename y1204000.xls

Figure 4.1.1 Share of Freight Transport Modes in Japan

Although, Figure 4.1.1 shows the situation in Japan, this trend is true in many other countries including Egypt. For instance, in Europe, the growth rate of freight transport overtook the growth rate of the European Union's GDP and in the United State, the rail and IWT's share continues declining while the share of road freight transport rises every year.

Ideally, there is a need to transfer some of the freight transport by roads to other modes to reduce reliance on the road network, and in turn mitigate road traffic congestion.

However, this transfer is very difficult to realize because the road network provides door-to-door connections that cannot be provided by other modes. In response to customer demand and due to other factors, road transport normally has preference in terms of development over the other modes due to the issues of inter-connectivity and infrastructure required for other modes. For instance, IWT and railway transport require among others, well functioning inter-modal stations in order to have a chance to compete with road transport.

In Egypt, recent data shows (just like in Japan) that road transport overwhelmingly dominates the market. For instance, the share of road transport for freight in 2003 reached as high as 97% when expressed in tons as shown in Table 4.1.1.

The Government, represented by the Ministry of Transport, is aiming to shift some freight volume to railway transport and IWT. To achieve this target, the key strategy is the introduction of a multimodal transportation concept that integrates rail and truck or river and truck. This trend is reflected in the last 'Five-Year Plan for Socio-Economic Development, 2002-2007" where LE 8.2 billion out of the LE 11 billion budget for the transport sector is allocated for railway development.

Table 4.1.1 Mode Share of Freight Transport in Egypt

Mode	Transported Volume of Freight in 2003	
	Million Ton year	% of Total
Road	312.0	96.9 %
Railway	12.0	2.8 %
IWT	2.3	0.3 %
Total	326.3	100.0 %

Source: Survey of Transport & Logistics System in Egypt, ENIT, 2004

4.1.2 Logistics Stakeholders

Generally, there are four (4) stakeholders involved in the logistics system: shippers, residents, logistics service providers and governmental authorities as shown in Table 4.1.2. Functionally, each stakeholder has a fundamental role to play in the logistics system. Moreover, there is a continuous interaction among these stakeholders responding to the needs of each one of them.

The governmental authorities are the regulators whose role is to ensure that the market is equitable for all the stakeholders. It is also expected that the governmental authorities provide a platform (for instance provision of infrastructure such as port, distribution center, etc) for each sector to operate.

Shippers are the most important stakeholders for logistics service providers. They want their goods to arrive on time with the cheapest cost and in the best condition. Residents become one of the logistics stakeholders when their community is affected by the negative impact of trucks or other modes transporting freight.

On the other hand, the logistics service providers want to maximize their profits for every transaction they have. Therefore, they are applying several strategies to attain their objectives such as consolidation of cargoes, utilization of information and communication technology (ICT). The list of possible members composing each group of stakeholders is shown in Table 4.1.2:

Table 4.1.2 Major Stakeholders and Members in the Logistics System

Stakeholders	Members
1. Shippers	• Raw Material Suppliers, • Distributors, • Manufacturers, • Wholesalers and Retailers, and • Others.
2. Residents	• Residents.
3. Logistic Service Providers	• Railway Companies, • Trucking Companies, • Freight forwarders, • Maritime Transport Companies, • Air Transport Companies, • Terminal Companies, • Warehouse Companies, and • Others.
4. Governmental Authorities	• Ministry of Transport, • Ministry of Finance, • Ministry of Trade and Industry, • Ministry of Health, • Ministry of Agriculture, and • Ministry of Investment.

Source: JICA Study Team

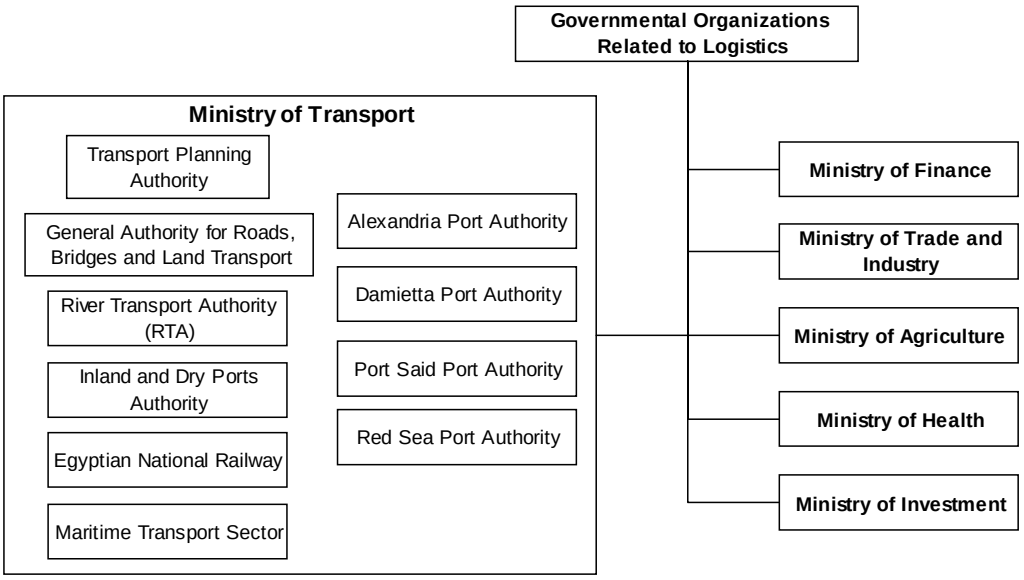
4.1.3 Governmental Organization Related to Logistics

The Ministry of Transport (MOT) is responsible for planning, constructing, maintaining, and operating the national road, railway, and the inland waterway networks through its affiliated agencies (Figure 4.1.2).

The main institutions in the inland freight transport belonging to the Ministry of Transportation (MOT) are the Transport Planning Authority (TPA), General Authority for Roads, Bridges and Land Transport (GARBLT), Egyptian National Railway (ENR), River Transport Authority (RTA), Inland and Dry Ports Authority, Maritime Transport Sector, and Port Authorities.

Other governmental organizations that are related to the logistics system are the Customs Authority under the Ministry of Finance, General Organization for Export and Import under the Ministry of Trade and Industry, and some other agencies concerned with quarantine under the Ministries of Agriculture and Health.

Details about the functions of the authorities under the MOT are provided in Chapter 7 of this report, where policy related issues to enhance the freight forwarding industry are discussed. The succeeding sections discuss further the current situation of road transport, railway transport and IWT with focus on logistics issues in Egypt.



Source: JICA Study Team based on MOT data

Figure 4.1.2 Principal Related Inland Transport Logistic Organizations

4.2 Road System

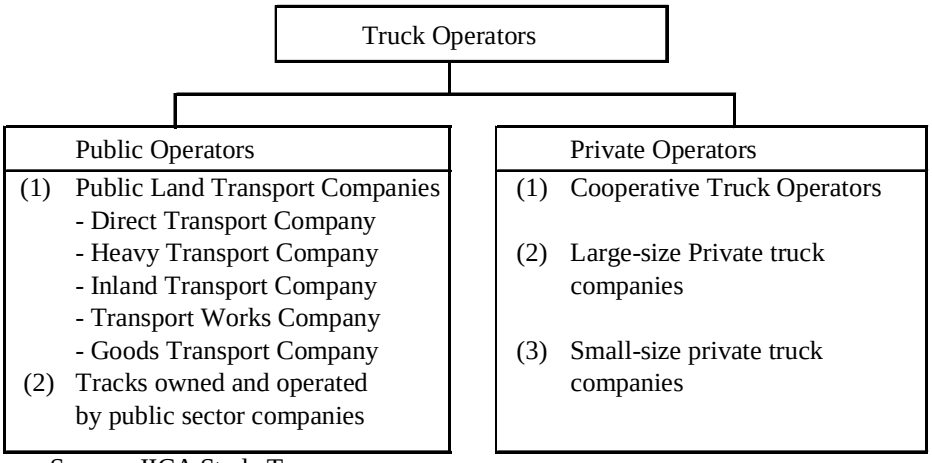
This section reviews the situation of the road logistics system in Egypt. The review focuses on structure and performance of truck operation in relation to freight movements. Firstly, existing issues are assessed to highlight the bottlenecks and shortcomings in existing facilities. Thereafter, the recommended potential countermeasures are presented and evaluated.

4.2.1 Truck Operators

Truck transport in Egypt is operated by two main sectors, which are the public and private operators as presented in Figure 4.2.1.

Public operators consist of two (2) major groups. The first group includes public land transport companies and the second group consists of trucks owned by public sector companies (e.g. trucks-owned by large sugar, cement, iron, etc. companies).

The private truck operator sector consists of three (3) groups, which are cooperative truck operators, large private truck companies and small private truck companies.



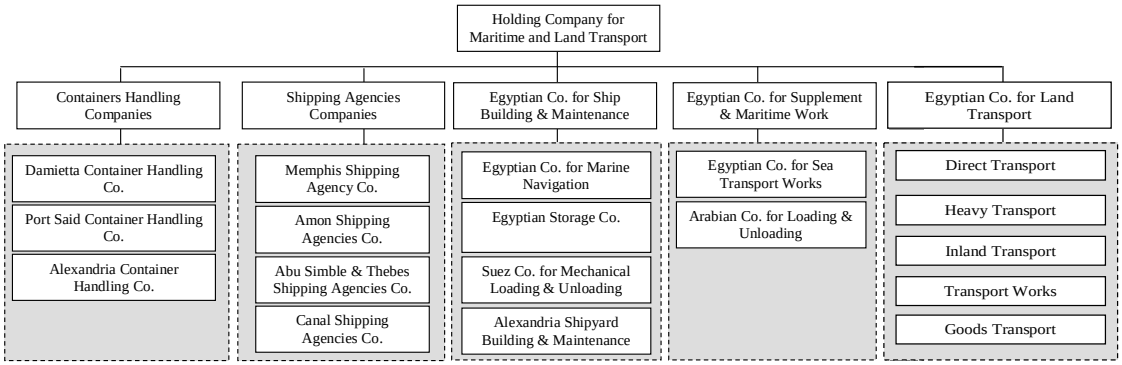
Source: JICA Study Team

Figure 4.2.1 Classification of Truck Operators

(1) Public Trucking Operators

The first group of public truck operators is the five (5) companies under the Holding Company for Maritime and Land Transport, which in turn is under the Ministry of Investment. The objective of establishing the Holding Companies (HCs) is to lead the privatization of the previous mentioned public companies, which were under the direct control and ownership of different ministries.

In Egypt, the Holding Companies are independent public status companies with budgetary and managerial autonomy (own accounting). There are seventeen (17) HCs under the control of the Ministry of Investment. Figure 4.2.2 shows the organization chart of the Holding Company for Maritime and Land Transport. As shown, under this HC there are many companies that are related to logistics. The five public trucking companies are just one of the groups under this HC.



Source: Maritime and Transport Holding Company

Figure 4.2.2 Organization Chart of the Holding Company for Maritime and Land Transport

The second group of public truck operators is the one included under the large public industrial companies. However, these trucks are operated only for certain activities of the owner's company.

(2) Private Trucking Operators

a) Private Large-Size Trucking Companies

According to the ongoing Euro-Med Transport Project, there are about fifteen (15) large trucking companies in Egypt, owning 25 to 30 trucks each. These companies also act as freight forwarders, which means they have established a system for customs clearance and handling other documents required for international freight. Their target customers are mostly the governmental infrastructure projects and their service rates are rather higher than those charged by the public truck companies. Their marketing advantage is their ability, which they mastered over many years of professional business and experience, to provide a better level of service i.e. they deliver on schedule, they have higher capacity, their freight is insured, etc.

b) Private (Cooperative) Trucking Operators

Cooperative trucking operators are organized under the jurisdiction of each governorate. The members of the cooperatives are individual operators who have voluntarily joined together. Each cooperative has a committee handling the requests of customers. Client makes a call and the committee in turn distributes the call order to one of its members. Payments by client are made to the committee, which retains a charge fee of 5% of the payment amount.

Before an individual operator is admitted to the cooperative there are requirements to be met, like for instance, ownership of not less than five (5) trucks. Table 4.2.1 shows the number of trucks owned by the members of each Cooperative Society. The Cairo Cooperative Society has the highest number of trucks while the Red Sea Cooperative Society has the least number. The number of trucks belonging to each governorate gives an indication of its economic activities. For instance, regional centers like Cairo and port areas like Dakahlia and Damietta registered high numbers of trucks.

Table 4.2.1 Numbers of Trucks Belonging to Each Cooperative Society

Cooperative Society	Number of Vehicles					
	Lorry	Half Trailer	Tank	Trailer	Turn Over	Total
1. Cairo	2,861	932	10	400	154	4,357
2. Giza	70	120		120	10	320
3. Gharbia	610			500		1,110
4. Red Sea	32			32	3	67
5. New Valley	46			46		92
6. Alexandria	250		15	250		515
7. Fayoum	300			240		540
8. Ismailiya	101					101
9. Suez	165		100			265
10. Kafr El-Sheikh	381			251		632
11. Dakahlia	1,000	10	10	1,000		2,020
12. Suhag	150	500		500		1,150
13. El-Behera	400			175		575
14. Kalyoubia	190			150		340
15. Damietta	600	200		400		1,200
16. Sharkia	170	120		260		550
17. Minya	790		10	150	50	1,000
18. Menoufia	100	200		200		500
19. Qena	393			282	30	705
20. Port Said	250					250
21. Aswan	163					163
22. Asyut	1,225					1,225
23. Beni Suef	400					400
24. Matruh	120					120

Source: CAPMAS, 2004

c) Private Small-Size Trucking Companies

The small trucking companies operate directly at freight-generating facilities such as ports and airports. Furthermore, it is common that the driver of the truck is also the owner as well. When the owner has two trucks, it is probable that he will drive one himself and rent out the other truck. The truck driver waits until client requests freight transportation. Briefly, the truck operates like a taxi where there is no contract made before leaving the garage. The level of service of this type of truck operation is rather low at least in the sense that freight insurance does not exist. It can be concluded that:

- The services provided by the large private companies are ranked first because their services are secured and often done on time,
- The cost of transportation by the large private companies is the highest,
- The cost of transportation by small private companies is the lowest but the risk is the highest,
- For the public sector, the trucks owned by large industrial companies seem to be in good condition since these companies can frequently update models of their

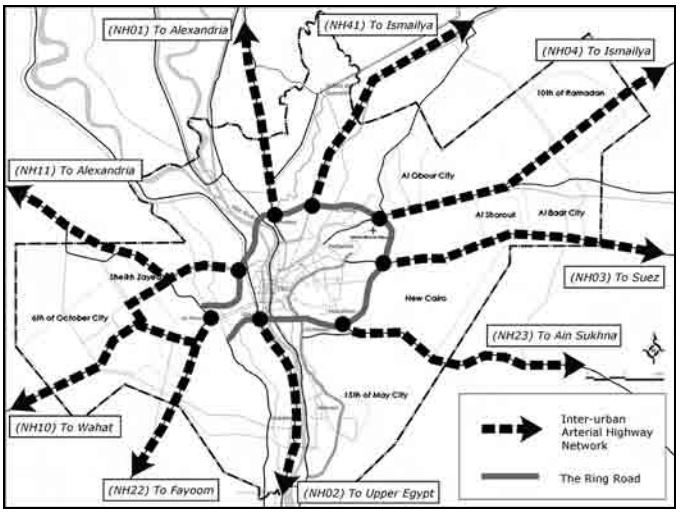
trucks,

- In the case of the holding company, the fleet of trucks seems to suffer from a high percentage of old models. The efficiency of the holding company truck fleet is recognizably limited due to the high maintenance cost of the old trucks, and
- In future, encouragement of large private truck operators companies could have a significant effect on the improvement of facilities. Due to the competition among those companies, the high transportation cost mentioned is one disadvantage that this sector will need to rectify.

4.2.2 Major Freight Routes and Current Facilities

(1) Road Network Condition

Cairo is the Capital of Egypt and the Greater Cairo Region is the heart and core of all socioeconomic activities in Egypt. Success of any logistic facilities will be governed by how well a given facility is connected to the Capital. Around Greater Cairo Region (GCR), the road network has formed a radial-circumferential pattern, typical of an inter-urban road network, as can be recognized in Figure 4.2.3. This network represents the major arterial road network connecting not only the major Egyptian ports like Alexandria, Damietta, Port Said, and Suez but also border crossings, river ports, dry ports and major railway stations and terminals.



Source: Transportation Master Plan and Feasibility Study of Urban Transport Projects in Greater Cairo Region in the Arab Republic of Egypt (CREATS), Phase I, Vol.3 (JICA, 2002)

Figure 4.2.3 Major Arterial Highways around Cairo

Future traffic demands estimated by the "Transportation Master Plan and Feasibility Study of Urban Transport Projects in Greater Cairo Region in the Arab Republic of Egypt (CREATS), (JICA, 2002)" show that the road capacities will be insufficient mainly in the East Area of GCR, i.e. Ismailiya Desert Road and Suez Road over the next 20 years. The widening of these two regional roads will be of high priority for connecting Al Abour, Al Shorook, 10th of Ramadan, New Cairo and Badr cities with inner-Ring Road urban areas. After the CREATS, the new developments are very recognizable in the East Wing of GCR

especially in New Cairo area.

The Cairo-Alexandria Desert Road has been almost completely widened to 4-lanes in each direction except some sections especially at bridge crossings. This road is classified as a toll road with a maximum allowable speed of 100 km/hr for passenger cars and where the user has to pay fee to use the road, as shown hereunder. It may be difficult to implement any further widening of this road in future due to existing adjacent land uses. The ADT count in year 2006 along this road was 27,551 veh/day. It was announced by the General Authority for Roads, Bridges and Land Transport (GARBLT) in the beginning of July 2007 that this road would be upgraded to become free highway with 120 km/hr maximum speed limit.

The second access between Cairo and Alexandria is the agriculture road. This road has also reached the maximum widening that can be implemented and no extra widening can be considered due to the existence of rich agricultural land and population communities along both sides of this road. The road looks now like an urban road with a maximum allowable speed limit of 60 km/hr in several sections. The road has the highest ADT volume recorded over all Egyptian national roads (104,835 veh/day in the Cairo-Benha section in year 2006). Table 4.2.2 shows the ADT on the Main Road Network based on recent collected data. Table 4.2.3 shows the ADT based on the previous CREATS, which have been updated by new data obtained from GARBLT. A new bypass Defrah-Kafr Al Zayat including new Kafr Al-Zayat Bridge was constructed having a 27 km length to shift through traffic outside Tanta as shown in Figure 4.2.4. Toll fees are currently collected at this bypass.

Source: Google Earth

Figure 4.2.4 New Bypass and Kafr Al-Zayat Bridge along Cairo-Alexandria Agricultural Highway

Table 4.2.2 Average Daily Traffic (ADT) on Main Road Network

(Unit: vehicle/day)

Station	2001	2002	2003	2004	2005	2006
Cairo- Ismailiya	35,026	39,147	41,451	43,582	45,405	49,236
Tanta-Damanhour	30,327	31,600	32,486	32,105	32,105	34,320
Giza-Beni Suef	12,192	31,600	32,486	32,105	32,475	12,312
Cairo-Suez Desert Road	12,170	13,043	13,499	12,846	12,206	15,941
Abou Hamad-Ismailiya	9,194	9,763	10,209	10,000	10,406	11,376
Tanta-Quesna	34,716	39,959	38,286	39,570	42,413	46,507
Moustrad-Belbeis	14,204	15,453	14,938	14,470	14,548	14,292
Cairo-Benha	80,358	88,688	92,010	93,648	97,304	104,835
Meet Ghamar- Agah	21,909	23,607	25,260	25,370	26,264	27,850
Cairo-Alexandria Desert Road	23,736	24,588	25,237	25,483	26,726	27,551
Cairo-Fayoum Desert Road	9,187	10,830	10,575	11,958	12,737	13,831
Minya-Asyut	4,555	4,855	4,880	5,613	6,584	7,183
Damanhour-Alexandria	43,332	31,389	34,160	35,830	36,018	39,182

Source: GARBLT data issued for years 2005-2006.

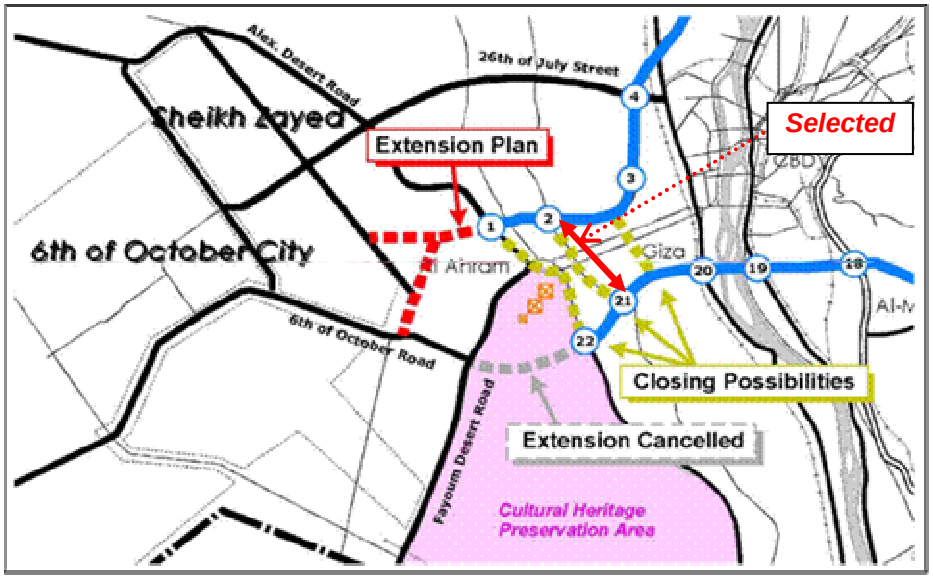
Table 4.2.3 ADT of Major Arterial Highways

No.	Road Name	1991 Volume (veh./day)	2000 Volume (veh./day)	2000/ 1991	Annual Growth %	2006* Volume (veh/day)
NH11	Alexandria Desert Road	8,821	17,886	2.03	7.32	27,551
NH01	Alexandria Agriculture Road	38,919	55,163	1.42	3.55	104,835
NH04	Ismailiya Desert Road	8,961	32,772	3.66	13.83	49,236
NH41	Ismailiya Agriculture Road	5,724	10,109	1.68	5.35	11,376
NH03	Suez Desert Road	4,907	10,962	2.23	8.37	15,941
NH21	Upper Egypt Desert Road	8,604	10,349	1.20	1.86	12,312
NH22	Fayoum Desert Road	4,846	10,792	2.08	8.34	13,831

Source: General Authority for Roads, Bridges and Land Transport and CREATS, Phase I, Vol. 3.
*: Volumes of Year 2006 are added by JICA Study Team based on GARBLT Year 2006 Data.

A classical type of ribbon development has taken place in several radial roads in the GCR. However, the Ring Road, for which the construction started in year 1985, has created a new urbanization pattern that could result in a more structured and strategic development pattern, thereby extending urban planning wider to include locations of major urban economic activities such as industrial and cargo distribution facilities as well as new commercial facilities along the south arc.

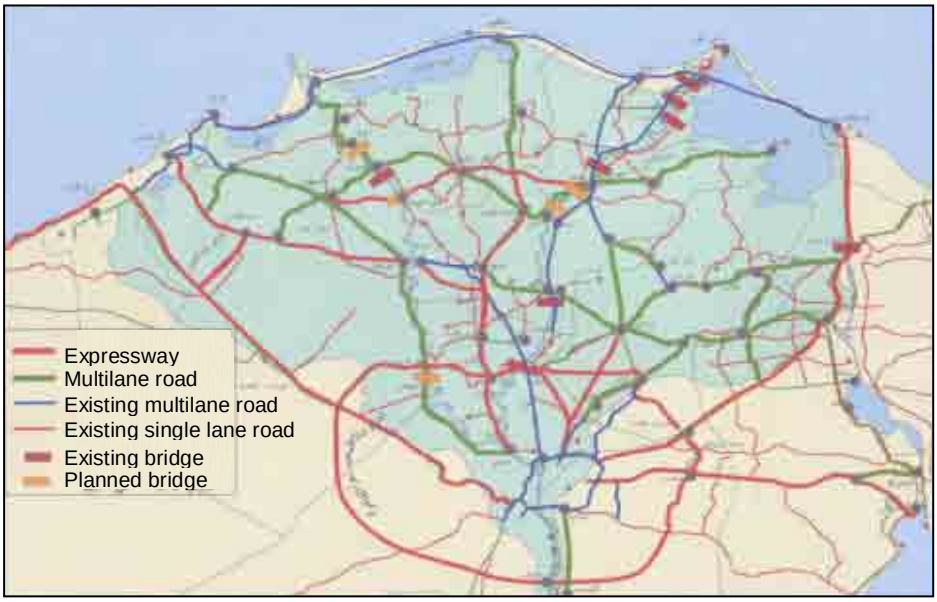
Currently, three (3) projects should be considered. One is concerned with the completion (closing the arc near to the pyramids area) of the Greater Cairo Ring Road and its connection with the Alexandria desert road for complete formulation of a regional network. The completion of the Ring Road is an urgent issue. This plan is now underway to close the ring with Maryotia St. (IC02-IC21) as shown in Figure 4.2.5.



Source: JICA Study Team based on CREATS Phase I Final Report Vol. III: Transport MP

Figure 4.2.5 The Ring Road Closing Plans

The second is the Regional Ring Road, as presented in Figure 4.2.6, which has a radius of about 100 km around GCR. Based on review of previous studies, the General Organization for Physical Planning (GOPP) gives a priority to the southern part of this Regional Ring Road to integrate suburban economic agglomerations into a wider metropolitan region, and to provide functional linkages between the GCR and the other regional economies.



Source: JICA Study Team based on TPA data.

Figure 4.2.6 General Concept of the Regional Ring Road

The third project presented is the proposed expressway network based on "Public-Private Partnership (PPP) Program for Cairo Urban Toll Expressway Network Development (JICA, 2006)".

The road network of Egypt is well developed and reaches both the Lower and the Upper Egypt regions. The total length of paved road is about 46,000 km. Of this, the length of the roads under the responsibility of MOT is about 22,875 km, representing about 50%, the other 50% is under the responsibility of the governorates. The current length of toll roads is about 915 km. Table 4.2.4 presents a summary of the current network condition.

Generally, it can be recognized that the major regional roads are divided highways that have high design speeds (80 ~ 100 km/hr). Some of the roads are provided with tollgates where road users pay the toll fee. The major roads provided with tollgates are presented in Table 4.2.5.

Table 4.2.4 Length and Ratio of Roads by Locations under GARBLT

Location	Length (km)	Ratio (%)
Lower Egypt Region	9,297	40.0
Upper Egypt Region	10,723	47.5
Sinai	2,855	12.5
Total	22,875	100.0

Source: GARBLT, 2007

Table 4.2.5 List of Toll Roads in Egypt

Road	Length (km)	Toll Rate (LE)			
		Type I	Type II	Type III	Type IV
Cairo - Alexandria (Desert) Road	228	4	6	10	20
Cairo - Ismailiya - Port Said Road	(139 + 85 =) 224	4	6	10	20
Cairo - Sokhna Road	135	5	10	15	25
Cairo - Fayoum Road	105	2	5	10	15
Cairo - Belbis Road	52	2	3	6	9
Wadi Natrun - Alamein Road	135	2	5	10	15
Kafr Zayat - Defrah Road	27	3	5	10	15
Suez Canal Bridge	9	2	3	5	10

Note: Type I: Passenger Car, Type II: Mini Bus and Small Truck, Type III: Large Bus and Large Truck and Type 4: Trailer
Source: Toll rates are obtained from GARBLET as of July 2007.

(2) Implemented Projects from CREATS and New Projects Out of MP

A summary, based on information from GOPP representatives in 2007, has been obtained about the implemented projects from the CREATS. This meeting also clarified that due to changes that occurred since the completion of the CREATS in 2002, some other projects have been implemented outside the CREATS recommended plan. These changes include as examples the new Hykstep City, the fast development in New Cairo City and also 6th of October City, the start of construction of New Heliopolis City, and the plan for relocation

of some ministries outside the Cairo Central Business District (CBD). The CREATS implemented projects are highlighted in the Table 4.2.6 and the new added projects are listed hereunder:

a) Arterial Roads

- An interchange to connect Badr City with the Cairo-Ismailiya Primary Arterial Highway. This Project has been approved by the Cabinet of Ministries.
- An interchange to connect Al Shoruq City with the Cairo-Ismailiya Arterial Highway. This Project has been approved by the Cabinet of Ministries.
- An interchange to connect the Ring Road with (Ismailiya, Balbis and El-Salam City). This project is in the bidding stage.

b) Primary Roads

GOPP recommended extending HP-6 to connect Balibs, Ring Road, Tarat, El-Ismailiya, Corniche El Nil.

c) Railway Sector

- GOPP recommended extending Subway line 2 to Kalyoubia and this project is within the CREATS Project PTM3.
- Construct of Subway Line 4 from King Fisal Street to Imbabah.
- GOPP is supporting the quick implementation of a railway line connecting Cairo University with Zayed and 6th of October Cities with a length of about 41 km. This project is included in the CREATS.
- GOPP is supporting the quick implementation of a railway line connecting Ain Shams Station to 10th of Ramadan City. This project is included in the CREATS.
- GOPP recommended out of the CREATS a new railway line to connect 6th of October/Al Rimyah Squar/El-Fayoum and Al Wahat highway with a length of about 34 km.

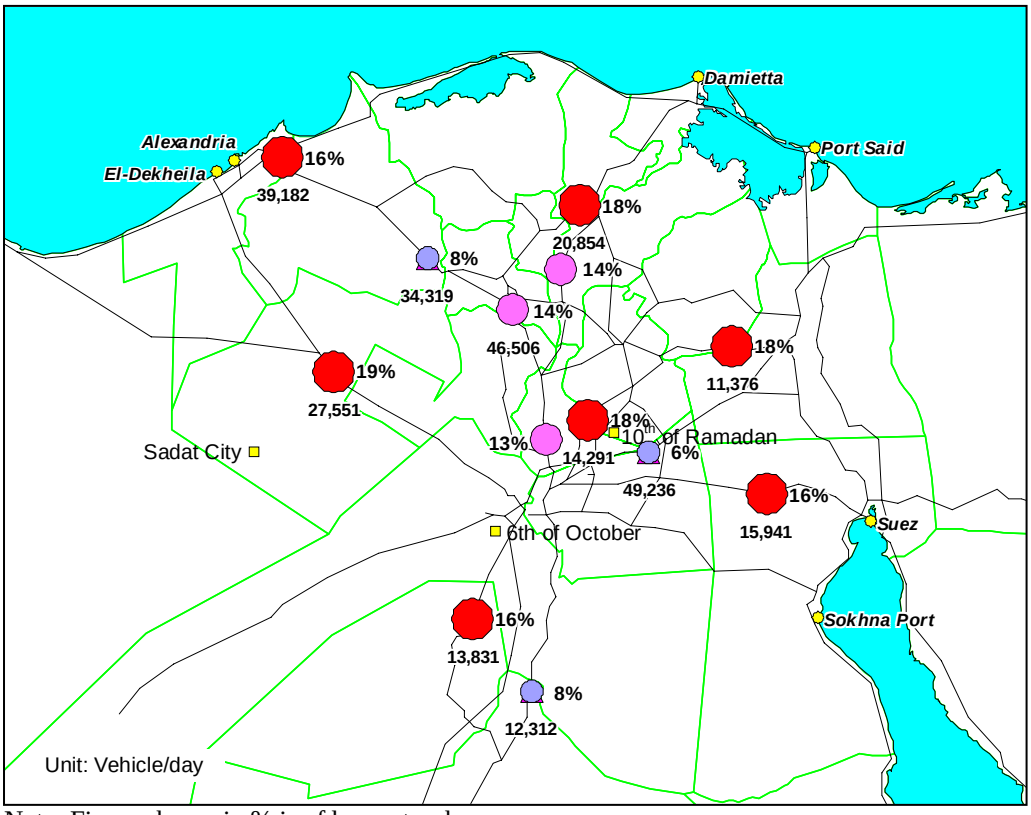
Table 4.2.6 Programs of CREATS

Project Code	Project Name	Implementation Period				Execution Agency
		02-07	08-12	13-17	18-22	
Regional Primary Highway Improvements MHUUC						
HR9	Ring Road (on Maryooteya Road)	○				MHUUC
HR10	Ismailiya Desert Rd.			○		MHUUC
HR11	Suez Desert Rd.		○			MHUUC
Primary Arterial Street Improvements Governorates						
HP2	Saft El Laban Axis	○				Giza Gov.
HP3	Rod El Farag Axis	○				Giza Gov.
HP4	15th May St. Ext.	○				Qalyobeya Gov.
HP5	Ahmed Oraby St.		○			Qalyobeya Gov.
HP6	Moasaset El Zakah St.		○			Cairo Gov.
HP7	Ain Sokhna-Nasr City Rd. Ext.		○			Cairo Gov.
Secondary Arterial Street Improvements Governorates						
HS1	New Masala St.	○				Cairo Gov.
HS2	Tereat El Gabal St.	○				Cairo Gov.
HS4	Tereat Tirsa St.		○			Giza Gov.
HS5	Khafra St.		○			Giza Gov.
HS6	Tereat El Zumur St.	○				Giza Gov.
HS7	Imbaba Br. Reconstruction	○				Cairo/Giza Gov.
Intersection Grade Separation Projects Governorates						
HG15	Alex. Dst. Rd. / 15th May Ext.			○		
HG16	15th May Ext. / Ahmed Oraby				○	Qalyobeya Gov.
HG17	Ring Road / Ahmed Oraby				○	MOT
HG18	Moasasat El Zakah / Talaat El Gabal			○		Cairo Gov.
HG19	Saad Sleam / Shobra			○		Cairo Gov.
HG20	Madrasit El Mamaleek / Shobra	○				Cairo Gov.
HG21	Thawra / Nozha		○			Cairo Gov.
HG22	Autostrad / Ismailiya El Fangary		○			Cairo Gov.
HG23	Autostrad / Nozha-Abbas El Aqad		○			Cairo Gov.
HG24	Dr. Abdallah El Araby / Dr. Zaker Hussein				○	Cairo Gov.
HG25	A. Mohamed El Zumur / Hassan El Mamoun			○		Cairo Gov.
HG26	Gaish / Port Said	○				Cairo Gov.
HG27	Salah Salem / Tareq Magra El Ayon-Ain El Hayah	○				Cairo Gov.
HG28	Malek Feisal / Maryooteya		○			Giza Gov.
HG29	Haram / Maryooteya	○				Giza Gov.
Metro Implementation/Improvement Projects MOT						
PTM1	Line 1 improvement (Fleet increase)	○	○	○	○	
PTM2	Line 2 extension to Moneeb	○				
PTM3	Line 2 extension to Qaylob			○		
PTM4	Line 3 (Giza – Airport)	○	○	○		
PTM5	Line 4 (Pyramid – Port Said St.)			○	○	

Note: Completed and under construction projects are highlighted.
Source: GOPP

(3) Major Freight Routes

Roads connecting a port with an industrial city or connecting one port to another have heavy truck traffic. Figure 4.2.7 shows the share of heavy trucks on most of the major roads. It can be seen that there is a heavy concentration of trucks on the roads leading to Alexandria (and El-Dekheila) port, Damietta port, Port Said port (West) and Suez port. Although no data is found regarding heavy trucks on the road between Cairo and Sokhna port, this road is also heavily used by trucks servicing the port. Important truck lines are discussed below. Table 4.2.7 presents the distances among the major cities in Egypt.



Note: Figure shown in % is of heavy trucks
Source: Worked out by JICA Study Team based on the AADT data of GARBLT of MOT (2006)

Figure 4.2.7 Share of Heavy Trucks to Total Traffic

Table 4.2.7 Distances among Major Cities

(Unit: km)

	Alex	Aswan	Asyut	Cairo	Damietta	Ismailiya	Port Said	Suez	Tanta
Alex	-------								
Aswan	1,128	-------							
Asyut	604	524	-------						
Cairo	228	904	380	-------					
Damietta	229	1095	591	191	-------				
Ismailiya	272	1043	519	129	125	-------			
Port Said	257	1128	604	224	50	85	-------		
Suez	264	1044	520	124	274	89	174	-------	
Tanta	120	998	474	94	120	142	175	231	-------

Source: GARBLT Road Network Map 2007

Sokhna – Alexandria (via Sokhna Road –Cairo Ring Road –Alexandria Desert Road)

This route connects two important ports in Egypt – Sokhna port and Alexandria port. Aside from trucks, the railway service is also available between these two ports.

Cairo - Suez Road

This road stretches to 124 km with 2 lanes per direction. The road is serving freight

between Suez and Sokhna ports and several industrial cities such as 10th of Ramadan, 6th of October and also GCR.

Port Said – Ismailiya Road

The length of this road is 85 km with 2 lanes per direction. This road is absorbing truck traffic coming from both Damietta port and Port Said port moving into the direction of 10th of Ramadan and GCR. Trucks coming from Damietta port are observed to prefer to use this road to avoid being caught by local traffic along the Damietta-Tanta-Cairo route.

Port Said – Damietta Road

This road connects Port Said port (West) located at the mouth of Suez Canal and the Damietta port. The length of the road is just 50 km with 2 lanes per direction. Due to the closeness of the two ports, shippers sometimes request to have their containers at Damietta port even though the ship docked at Port Said port. The opposite can also happen where containers are moved to Port Said after they arrived at Damietta port. The reason for such shipper behavior is that they want to have their container where they have an established system for easy clearance through their business relationships.

Cairo-Damietta – Road

This road has a length of 191 km and some sections are 2 lanes and others are 3 lanes. Freight is destined for GCR and mostly follows the agricultural road that connects Damietta- Mahalla-Tanta-Cairo. For freight that has its destination in 10th of Ramadan, most trucks are reported to prefer the Damietta-Port Said-Ismailiya-10th of Ramadan to avoid local traffic of towns along the Damietta-Mahalla-Zagazig-10th of Ramadan route. This road has many road humps aimed to enforce speed reduction because the road passes through populated areas. Such humps have significant effect on truck speed.

Cairo – Alexandria through Desert Road

This road provides a strong connection between the two key cities of Egypt. The road has a length of 220 km with 3 lanes (some sections have 2 lanes) per direction. Traffic in this road is smooth although traffic congestion is experienced on the approach road at both ends of the road.

Cairo - Alexandria through Agricultural Road

The agricultural road is another alternative road linking Cairo and Alexandria. This road has a total length of 228 km with some sections having 2 lanes and some having 3 lanes per direction. There are several cities along this road, making it one of the roads with the heaviest traffic flow.

Cairo - Upper Egypt Agricultural Road

This road is traditionally the most important road link to Upper Egypt although the long-term development strategy of the government is to divert traffic to the desert part to protect the arable land along the River Nile.

Cairo - Upper Egypt Desert Road

This road passes Fayoum Governorate and runs parallel to Upper Egypt Agricultural Road. These two roads are serving highly productive agricultural land producing crops such as

onion, vegetables, rice, maize, sugar cane, banana, and apples among others.

4.2.3 Operation Performance and Efficiency

(1) Number of Registered Trucks

The growth of freight vehicle numbers is rather moderate and hasn't exceeded 2% since 2001. Table 4.2.8 shows the total registered number of vehicles in year 2006. It is apparent that the economic hubs of the country such as Cairo, Alexandria, and Giza governorates have the highest number of registered trucks.

Table 4.2.8 Total Number of Registered Heavy Vehicles in Year 2006

Unit: vehicle

Governorate	Trucks	Trailer
Cairo	99,418	8,871
Alexandria	75,163	15,314
Port Said	5,010	936
Suez	5,342	709
Al Ismailiya	13,854	735
Damietta	12,887	1,034
Al-Sharkia	50,843	3,930
Dekheila	50,013	6,162
Behera	46,171	4,984
El Gharbia	41,762	4,125
El Menoufia	23,239	1,472
Kafr El-Shiekh	26,970	970
Al Qalyubiyah	29,750	1,200
Giza	61,851	3,906
Fayoum	12,929	1,975
Beni Suef	17,446	330
Minya	22,408	826
Asyut	25,327	1,203
Suhag	16,718	1,003
Qena	12,473	676
Aswan	9,424	166
Matrouh	9,338	319
Red Sea	5,148	437
El-Wadi El-Gaded	1,992	198
North Sinai	6,609	197
South Sinai	3,547	70
Luxor	1,990	16
Total	687,622	61,764

Note : Total figures for Truck and Trailer in an original sheet provided by GARBLT were 685,273 and 60,857 respectively. These are revised by the JICA Study Team.
Source: GARBLT, MOT

The total number of trucks owned by the five trucking companies under the Holding Company for Maritime and Land Transport is 1,238. Breakdown of this number among the companies is given in Table 4.2.9. These companies are responsible for 1.2% (5 million tons) of freight via road transport.

Table 4.2.9 Truck Fleet of the Maritime and Land Transport Holding Company

Company name	No. of Trucks
1. Nile Company for Goods	230
2. Nile Company for Land Transport	235
3. Nile Company for Direct Transport	277
4. Nile Company for Transport Works	258
5. Nile Company for Heavy Transport	238

Source : JICA Study Team Interview

(2) Volume of Freight Transported by Trucks

As earlier indicated, road transport is dominating the market and in 2002, trucks captured 97% leaving just 3% for the other two modes of railway and inland water transport. The 24 cooperative societies transported around 6% while the public trucking companies managed about 1.2% as shown in Table 4.2.10. The remaining is captured by private companies. Even though this data is not so recent, this trend is still applicable especially under the reported shortage in the number of ENR locomotives as will be shown hereafter.

Table 4.2.10 Volume of Freight Handled by Trucks (2002)

Item	Freight Carried	
	Million ton per year	% of total
5 Public Trucking Companies	5.0	1.2
24 Cooperative Societies	24.4	5.8
Other Private companies	392.0	93.0
Total	421.4	100

Source: Sustainable Transport (Project Document), UNDP (2006)

(3) Freight Volume at International Border Crossings

Egypt has five (5) international border crossings one with Palestine, one with Israel, one with Libya and two with Sudan as shown in Table 4.2.11.

Table 4.2.11 Type of Services at International Border Crossings

Country	Type of Service	No. of Border
Libya	Passengers and freight	1
Palestine	Passengers and freight	1
Israel	Passengers and freight	1
Sudan	Passengers and freight	2

Source: Inland and Dry Ports Authority, MOT

The volume of freight recorded at the border between Egypt and Libya at El-Saloum is presented in Table 4.2.12. The freight from Egypt to Libya is significantly larger than incoming freight to Egypt. At the other borders, the volume of handled freights could not be obtained since at these borders data are accumulated about the financial issues rather than the freight volumes.

Table 4.2.12 Import & Export Freight Volumes at El-Saloum Port

Month	Export (Ton)	Import (Ton)	
		Food	Industrial Materials
Jan	7,043	0.1	45.3
Feb	9,932	1.1	132.0
March	7,870	1.7	130.0
April	7,887	2.0	45.0
May	7,899	4.6	31.0
June	10,930	13.3	128.0
Total	51,561	22.5	511.3

Source: Inland and Dry Ports Authority, MOT, 2006.

4.2.4 Ongoing Road Projects

There are many ongoing and committed projects by the government aimed at improving traffic flow as well as making strong linkages between regional centers. The central factor for this effort has been improvement of the road network through widening and promotion of traffic safety. The ongoing and committed projects are compiled in Chapter 10.

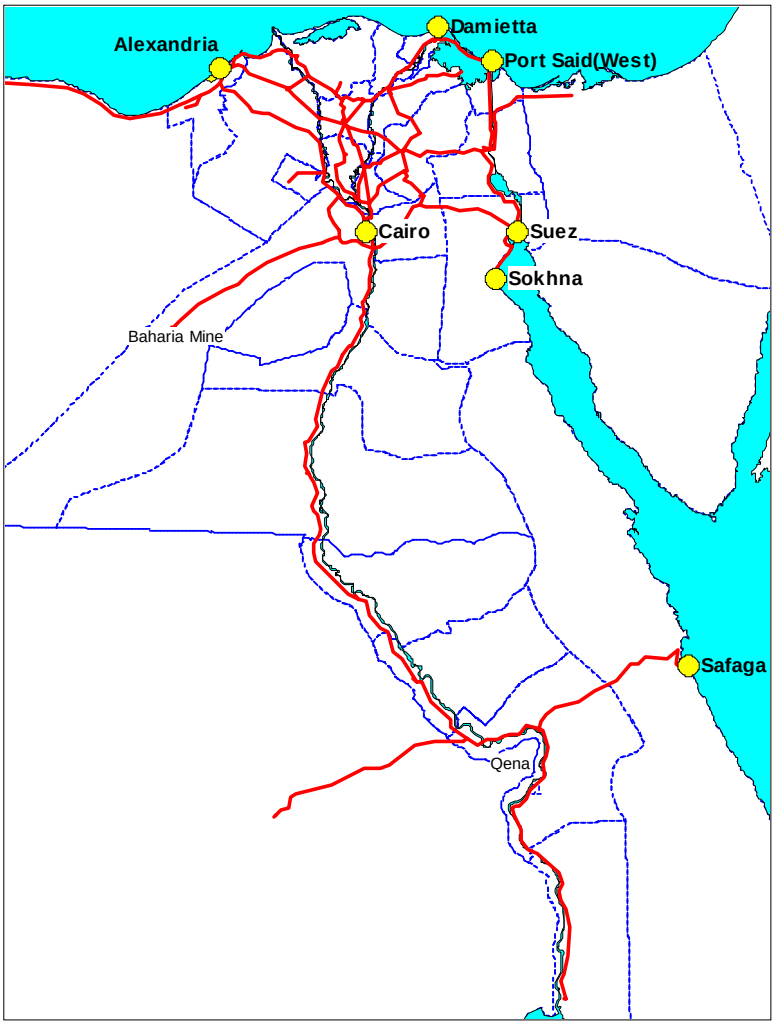
4.3 Railway System

This section assesses the existing conditions of the railway transport sector focusing on its role within logistic facilities. Most of the information was collected from several discussions with concerned officials in ENR and other governmental organizations. Information received from these interviews is complemented by other available data from previous studies and Statistical Yearbooks.

4.3.1 Major Freight Routes and Current Facilities

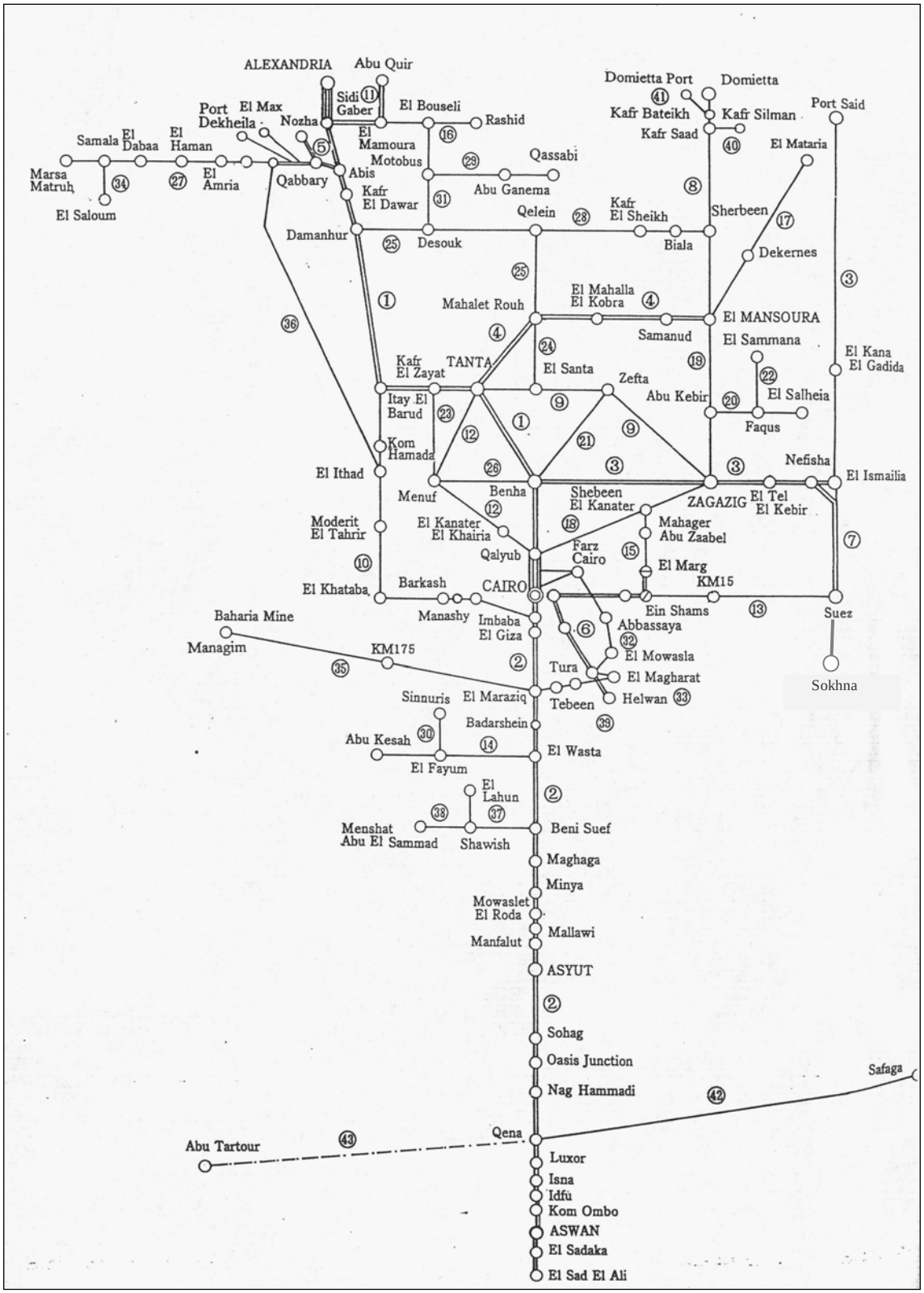
(1) Railway Network

The length of the Egyptian National Railway network is about 4,914 km covering almost all of Egypt including a small part of Sinai as shown in Figure 4.3.1. Based on economic feasibility studies, the railway network can be expanded to cover all of North and South Sinai, Toshky and El Owainat. 1% of the rail network lines have 4 tracks, 28% have double tracks and 71% have a single track as presented in Figure 4.3.2. There are 705 stations scattered all over the network and 224 of them serve freight transportation.



Source: World Educational Map, Egypt (1996)

Figure 4.3.1 Railway Network in Egypt



Source: The latest version was provided by ENR, Line between Suez and Sokhna is drown by JICA Study Team

Figure 4.3.2 General Layout of ENR Network Showing Double and Single Tracks

(2) Major Railway Freight Lines

Although the freight rail network covers a substantial part of Egypt, only a few lines are of high importance in terms of the volume carried. These lines are described below:

Main Freight Lines

The main freight lines depend on train speed and/or volume of freight carry over a particular line. The main freight lines of ENR are presented in Figure 4.3.3 and include:

- Cairo – Ismailiya – Port Said Port (West) Line,
- Cairo – Asyut – Luxor – Aswan – High Dam Line,
- Alexandria Port - Al-Ittihad –Imbaba Line (freight line), and
- El Wahat – El Tebeen Line.

Alexandria Port - Al-Ittihad –Imbaba Line is a freight line that starts from the port of Alexandria and runs to Giza. It has a single-track line between Alexandria Port and Al-Ittihad station with a length of 122 kilometers. This line is connected at All-Ittihad station to the double-track line from Ityai El-Barud to Imbaba. It goes next to Cairo and Helwan. The line handles about 2.5 million ton/year of coal from Dekheila Port (near Alexandria) to El-Tebeen (near Helwan). On the way back, it transports the coke produced at the El-Tebin Plant.

The line has a maximum daily capacity of 40 freight trains, while it has a schedule for 24 trains. The actual number of freight trains using the line at present is only eight freight trains for coal and coke either loaded or unloaded. Each train is composed on average of 30 freight wagons. In addition, there are 2 trains for petroleum products and one train for basalt transport every week.

At present, the line has a mechanical signaling system that can be electrified to double the capacity of the line from 40 to 80 freight trains per day.

Origin and Destination of Freight Transportation

Table 4.3.1 shows the gate ports and the domestic origins and destinations of major export/import commodities that use railway services at these ports. It is clear that wheat delivered to Cairo mostly comes from Damietta port with participation of Alexandria, Port Said (West), and Suez ports. For Upper Egypt (i.e. from zone 18-24; refer to Appendix 3 for the zoning system), the incoming wheat is mainly transported by railway from Damietta port and Port Said port (West) while gasoline for export is delivered to Alexandria port.

The large volumes of railway freight moving between Alexandria port and Port Said port (West)/Sokhna port are mostly transit containers. These railway services are more convenient than shipping services via Suez Canal for some transit freights that go to the final destination ports in/around the Mediterranean Sea. This is because Alexandria port offers the more frequent shipping services to those foreign ports. It is estimated that this kind of frequent services can shorten the total transportation time and can offset a higher cost of domestic railway transport between the ports in Egypt than the transportation cost

via Suez Canal.

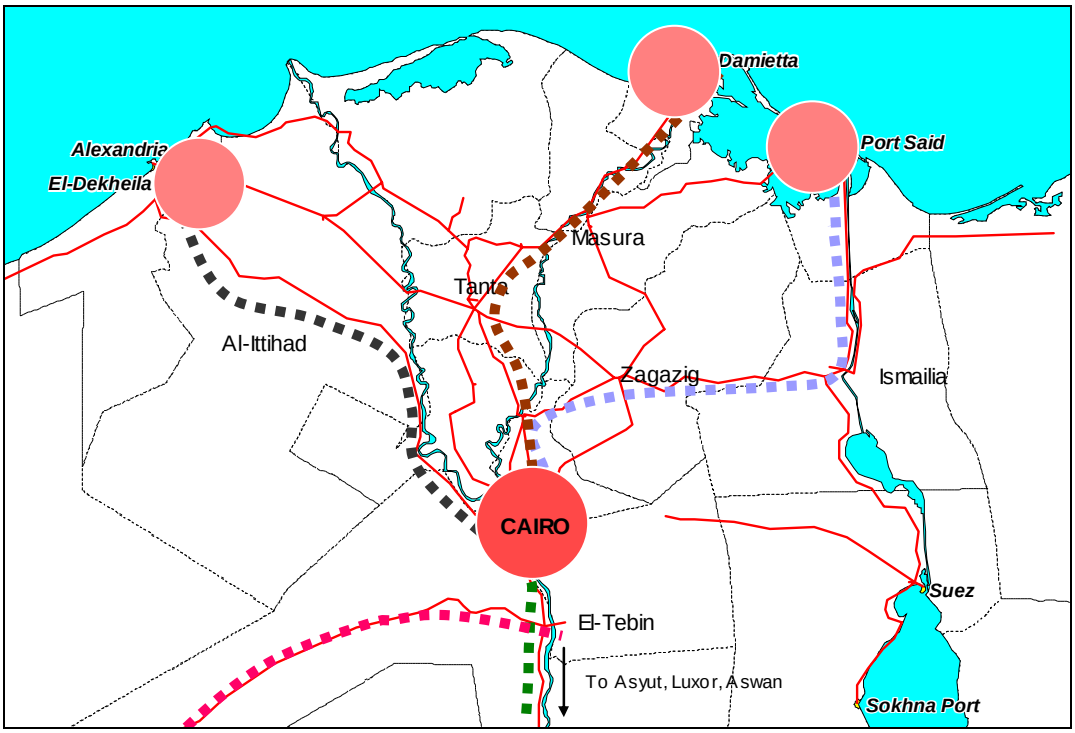
Table 4.3.1 Major Railway Freight Flows to Major Ports by Commodity

Unit: (1000 ton/year)

From \ To	Commodities	Alexandria Port	Damietta Port	Port Said Port	Suez Port	Sokhna Port
Cairo	Gasoline	2	0	0	0	0
	Wheat	63	479	64	74	0
	Others	127	0	2	2	0
Upper Egypt	Phosphates	0	5	0	0	0
	Gasoline	134	0	0	95	0
	Wheat	65	118	119	53	0
	Wood sleeper	0	0	0	0	0
	Iron ore	13	0	0	0	0
	Others*	2,241*	0	0	244*	0
Other Area	Cement	0	2	0	0	0
	Gasoline	29	0	0	9	0
	Stones	0	0	0	42	0
	Wheat	45	85	87	62	0
	Wood sleeper	0	0	0	0	0
	Others	140	20	3	104	0
Alexandria Port	Stones	0	0	0	12	0
	Wheat	0	0	1	0	0
	Others	0	9	223	0	313
Damietta Port	Stones	0	0	0	28	0
	Others	0	0	20	0	2
Port Said Port	Others	0	0	0	0	161
Total	Cement	0	2	0	0	0
	Phosphates	0	5	0	0	0
	Gasoline	165	0	0	105	0
	Stones	0	0	0	83	0
	Wheat	173	682	272	189	0
	Wood sleeper	1	0	0	0	0
	Iron ore	13	0	0	0	0
	Others	2,508	30	248	351	477
	Total	2,858	718	520	727	477

Note: * Railway freight of "Others" from Upper Egypt occupies about 78% of total railway freight to Alexandria (2,241/2,858 = 78%). These figure are compiled based on all the data available in Egypt i.e. CAPMAS, Maritime Data Bank, ENR. JICA Study Team identified during the field trip to there that the commodities of "Others" from Upper Egypt are mainly heavy commodities such as phosphate, cement, stones and so on: however, the shares of each commodity can not be estimated. Further clarification of the commodity items and their volume are beyond the scope of the JICA Study.

Source: Worked out by JICA Study Team



Source: JICA Study Team

Figure 4.3.3 Freight Railway of Egypt Showing Main Freight Lines

Port-to-port Freight Lines

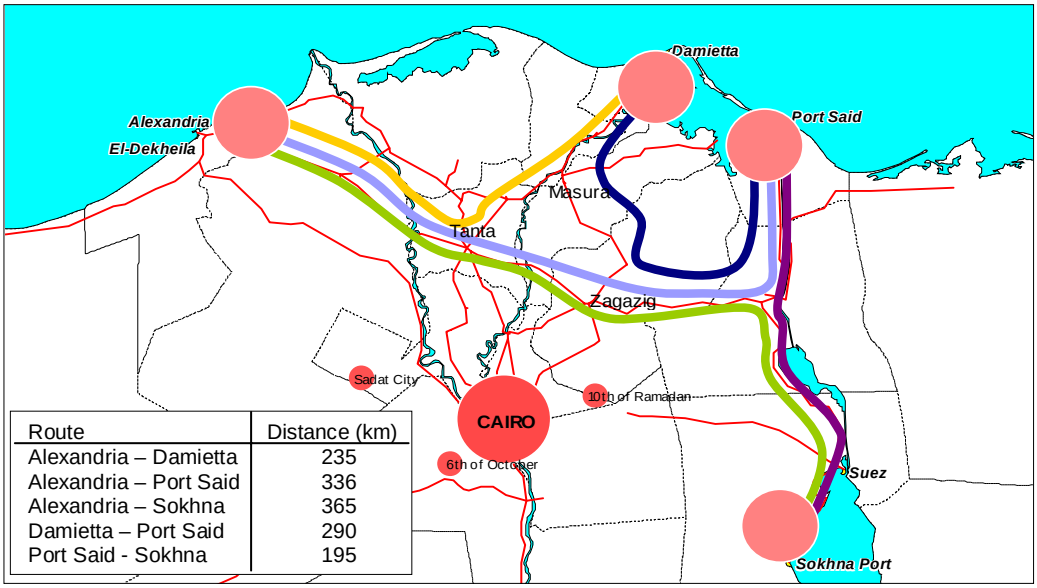
The recorded container movements via railway between the major ports result from of customers' requests to have their containers released to a particular port. For instance, a customer might request that the shipping agent releases his containers at Alexandria port even though the ship arrived at Port Said port. This arrangement is requested by customers because they have established a good working relationship with that particular port.

This volume is expected to decline however as the modernization of all major ports accelerates. The single window system in particular will erase the advantage of one port over another in terms of formalities, which has been a strong factor for the customers when deciding where to have their containers released.

This part of the report examines the performance of the railway sector as far as servicing container cargo is concern. Containers are mostly moving among the four (4) major ports of Egypt, i.e. Alexandria (El-Dekheila), Damietta, Port Said and Sokhna as shown in Figure 4.3.4. ENR allows 6 hours for customers to load/unload their freight to the train wagons. The train normally consists of 20 wagons. There are two types of wagon; the first type is a large one that can be loaded with one 20-TEU container and one 40-TEU container or with three 20-TEU containers. The second type of container wagon is a small one that can be loaded by one 40-TEU or by two 20-TEU containers. In essence, a company requesting train service needs to have at least forty (40) 40-TEU containers or the equivalent of sixty (60) 20-TEU containers for full utilization of the train. According to an ENR official, the freight train operating on the line to Sokhna port requires two

locomotives due to the gradient of the line. This further reduces the serviceability of the limited locomotives.

A penalty is imposed by ENR when the customers cannot complete loading/unloading of freight within the designated six (6) hours. Despite this penalty, records show that most customers have to endure this fine as shown in Table 4.3.2. The main reasons why such activity is taking so much time are the shortages of locomotives and handling equipment (i.e. cranes and/or reach stackers) that have to be reserved by the company that requested the freight train.



Route	Distance (km)
Alexandria – Damietta	235
Alexandria – Port Said	336
Alexandria – Sokhna	365
Damietta – Port Said	290
Port Said - Sokhna	195

Source: JICA Study Team

Figure 4.3.4 Railway Network Showing Major Port-to-Port Routes for Containers

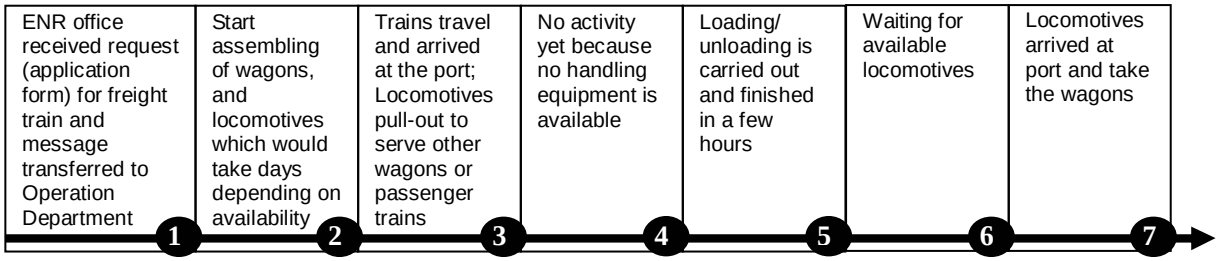
Table 4.3.2 Time of Loading and Unloading Containers to Trains at Major Ports

Port	Loading Time (hour)	Unloading Time (hour)
El Sokhna	12	12
Damietta	6	6
Port said	9	12
El-Dekheila (Alexandria)	9	6

Note: Data includes waiting time of train for containers at the port, waiting time for the return of locomotives because they are being used to service other wagons or passenger trains.
Source: Operation Department, ENR

The containers actually suffer several delays as shown in Figure 4.3.5 before a successful transfer to another port is achieved. Even the assembling of wagons and locomotives takes time due to the limited numbers of locomotives. Compounding the problem is the shortage of handling equipment at some ports, so that even once the wagons have been delivered to the port no activity will take place until the container handling equipment becomes available. It should be noted that the handling equipment is also used for loading/unloading of containers for trucks and other container movements inside the port. After successful loading/unloading of containers, the search for a locomotive begins once

the ENR staff are informed. Depending on the availability of locomotives and their distances from the port, it may take additional time for their arrival.



Source: JICA Study Team based on ENR data

Figure 4.3.5 Delay Experienced by Containers via Railway

It should be noted that actual loading/unloading does not take that much time. For instance, information received by the JICA Study Team from the Sokhna port officials stated that normally it takes only 1.5 hours to load/unload containers onto a freight train. Except in the case of major disturbances that affect the rail tracks, the freight train is expected to reach any of destination ports in about 20 hrs as shown in Table 4.3.3. In the same table, it is clear that the arrival of the train within the same route varies significantly, which makes it difficult to predict the train arrival.

Assuming that there is no delay in any step of the container movement chain, the train from Sokhna to El Dekheila is expected to complete the trip in just 22 hours (6 hrs for loading, 10 hours for traveling, 6 hours for unloading). But actual data in Table 4.3.4 shows that it takes 120 hours on average to complete the train trip along this route due to several bottlenecks as shown in Figure 4.3.5.

Addressing this issue is an important step to fully utilize the limited number of wagons and locomotives. It appears that the problem is not just the shortage of locomotives but also the coordination. There is a need for instance to reconcile time availability of handling equipment and arrival of trains to reduce delay. If loading/unloading activities could be done upon the arrival of the train, the delay would be reduced significantly. Also, if indeed Sokhna port has the ability to mount the 60 TEU containers in less than two hours, it is strongly suggested that the locomotives are held until all works are completed so it can immediately take the wagons to the destination port. It should be noted that ENR is utilizing the return trip of trains to carry empty containers to maximize the productivity of wagons and locomotives.

Table 4.3.3 Example of Actual Travel Time of Freight Train (May 2007)

Trip No.	Origin	Route	Destination	Travel Time (hr)
1	Damietta	Talkha-Tanta	Qabarri (Alexandria)	9 ~ 11
2	Port Said (West)	Ismailiya-Zagazig-Mansoura	Damietta	12
3	Qabarri (Alexandria)	Tanta-Talkha	Damietta	11
4	Port Said (West)	Ismailiya-Zagazig-Zefta-Tanta	El-Dekheila	14
5	Sokhna	Nafisha-Zagazig-Zefta-Tanta	El-Dekheila	10 ~ 30
6	Damietta	Mansoura-Zagazig-Ismailiya	Port Said (West)	12
7	El-Dekheila	Tanta-Zefta-Zagazig-Ismailiya	Port Said (West)	8 ~ 11
8	Sokhna	Suez-Ismailiya	Port Said (West)	13
9	Port Said (West)	Ismailiya-Suez	Sokhna	10
10	El-Dekheila	Tanta-Zefta-Zagazig-Nafisha	Sokhna	11 ~ 21

Source: Operation Department, ENR

Table 4.3.4 Port to Port Routes (May 2007)

Port-to-port Routes	Distance (km)	*No. of Days to Complete 1 Freight Train Trip (average)	No. of Trips (Jan-Dec 2006)
Adabia - El-Dekheila (Alexandria)	377	5 days	0
Port Said - El-Dekheila (Alexandria)	360	5 days	47
Qabarri (Alexandria) - Damietta	235	2.5 days	70
Qabarri (Alexandria) - Port Said	336	5 days	0
Sokhna - El-Dekheila (Alexandria)	365	5 days	86
Sokhna - Port said	195	4 days	34
Damietta - Port said	290	4 days	11
Sokhna - Qabarri (Alexandria)	345	5 days	4
El-Dekheila (Alexandria) - Port Said	360	5 days	54
Damietta - Qabarri (Alexandria)	235	2.5 days	85
Port Said - Sokhna	195	4 days	21
El-Dekheila (Alexandria) - Sokhna	365	5 days	71
Port Said - Damietta	290	4 days	13
Port Said - Qabarri (Alexandria)	336	5 days	0

Note: * - includes loading/unloading time, traveling time, waiting time for locomotives, shunting time and other necessary preparation for train to complete delivery of containers from one port to another.

Source: Operation Department, ENR

(3) Locomotives

The most recent data about the operating status of the locomotives of ENR is shown in Table 4.3.5. As shown in the table, 44% of the locomotives for passengers are under maintenance, either in major repair (overhaul) or undergoing minor (short) maintenance. For freight, the locomotives under maintenance are much higher at 78%.

Taking into account the total number of operating locomotives, 11% are assigned for freight and 89% for passengers. On the other hand, the locomotives operating on the Baharia line are exclusive for mining. The same line is passing the industrial city of 6th of October. Therefore, this line has the potential for use by the dry port located in the city if an access line is constructed from the main line to the dry port.

Table 4.3.5 Number of Locomotives (September 2006)

Service Type	Total No. of Locomotives		Total
	Operating	Under Maintenance	
Passenger	271	215	486
Freight	34	118	152
Baharia line (Iron Ore)	10	21	31

Source: Rolling Stock Department and Operation Department, ENR

(4) Freight Wagons

Table 4.3.6 shows that ENR has a total of 10,660 wagons of different types to serve wide variations of freight. Out of this number, 28% are under maintenance. It is worth noting that aside from the wagons under maintenance, ENR has a total of 1,318 wagons taken out of service due to the severity of damage incurred on them.

Table 4.3.6 Characteristics of Freight Wagons (October 2006)

Model	Total No. of Wagons	No. of Operating Wagons	No. of Under Maintenance Wagons	% of Operating Wagons	Capacity (ton)
Box Wagons	2,059	1,333	726	64.7	40~65
Open Wagons	1,735	1,223	512	70.5	40~50
Flat Wagons	2,267	1,969	298	86.6	50~60
Tanks	1,820	1,287	533	70.7	40
Iron Ore Wagons	764	272	492	35.6	65
Others	2,015	1,621	394	80.0	10~65
Total	10,660	7,705	2,955	72.0	

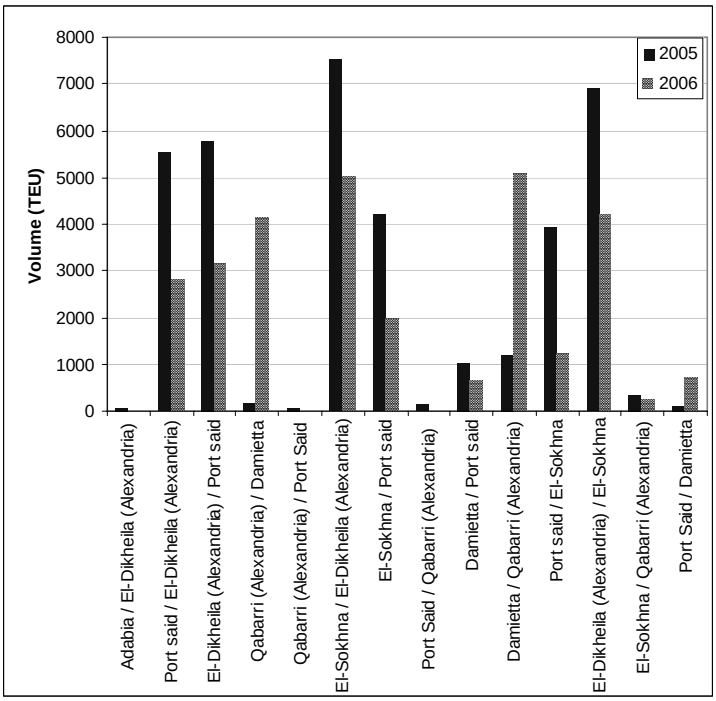
Source: Operation Department, ENR

4.3.2 Operation Performance and Efficiency

(1) Freight Transported by Railway

a) Container Volumes

When it comes to port-to-port container movements, the Sokhna – Alexandria line is becoming the most important link carrying some 14,424 TEU (both ways) in 2005 although it decreased to 9,249 in 2006, as shown in Figure 4.3.6, due to shortage in locomotives. It should be noted that container movements from these two ports is dependent on the frequency of shipping services at Alexandria port and also reflect the fact that the freight owners prefer to do the formalities to another port due to established good working relationship to that port management as explained earlier.

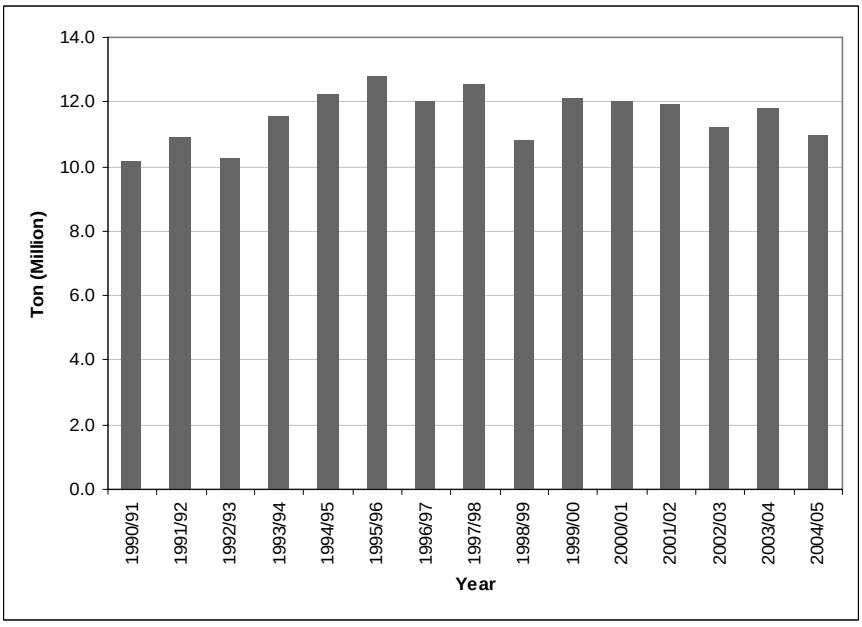


Source: Commercial Department, ENR

Figure 4.3.6 Railway Port-to-Port Container Volumes

b) Freight Volume

There is a very little change to the yearly volume of freight transported by railway as shown in Figure 4.3.7. This is due to several reasons including where customer demand cannot be met because of the shortage of locomotives and wagons.



Source: Commercial Department, ENR

Figure 4.3.7 Volume of Freight Transported by Railway (1990-2005)

The plan of ENR to modernize the railway infrastructure as well as operation is expected to increase the railway's freight capacity. For more than 10 years, the total freight volume transported by the railway has been between 10 ~ 13 million ton. (deleted one sentence)

4.3.3 Ongoing Railway Projects

As mentioned, in the five (5) year development plan of the country, a total of LE 11.2 billion is allocated to the transport sector of which 8.2 billion is allocated to the railways. This budget allotment is reflected in the current modernization project as shown below:

(1) Improve the Power of Locomotives

- Rehabilitation of 120 locomotives, and
- Buying 120 locomotives.

(2) Modernization of Signaling on Some Lines

- Damietta – Mansoura Line, and
- Beni Suef – Alminia – Asyut Line.

(3) Construct new Lines to Connect Industrial Cities

- Manuf – Sadat,
- Al-Robeki – Al-Asher, and
- Alexandria – Burg El-Arab.

4.4 Inland Waterway Transport System

This section assesses the role of the River Nile in the transport system of Egypt. Information was mainly gathered through site visits and interviews by the JICA Study Team with concerned officials from the public and private sectors. After the analysis of the current situation of the Inland Water Transport (IWT), some recommendations were introduced.

4.4.1 Major Freight Waterways and Current Facilities

(1) Inland Waterway Network

River Transport Authority (RTA) classifies the inland waterway network into three classes as shown in Table 4.4.1. It should be noted that the mentioned minimum water depth of 2.5 m is adopted for barges.

Table 4.4.1 Classification of Inland Waterways

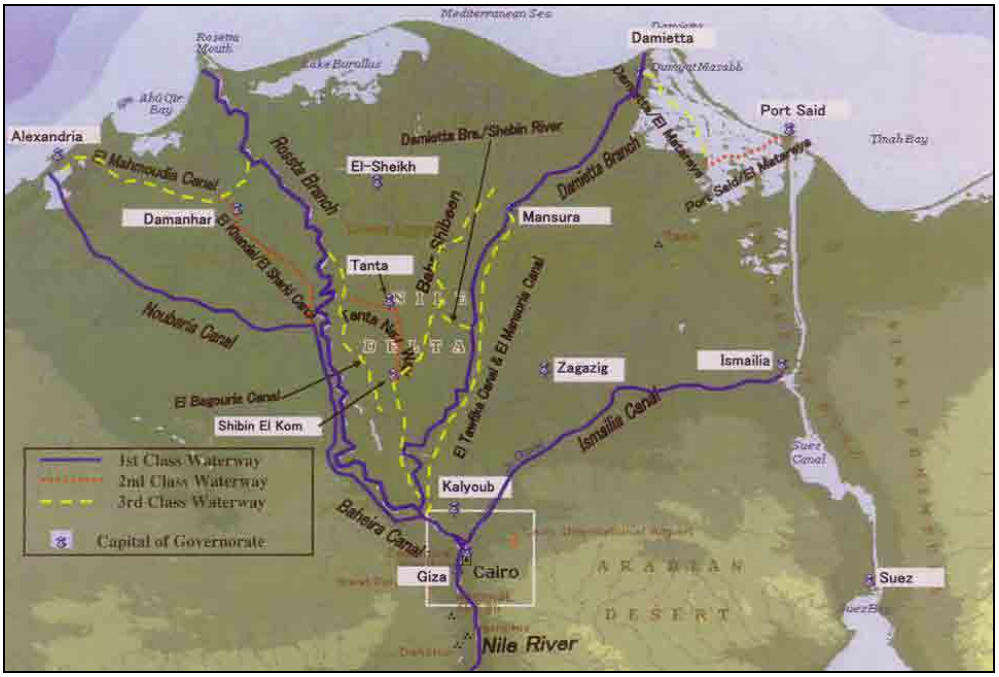
Class	Waterway	Air Clearness (m)	Min. Width (m)	Max. Draft (m)	Min. Water Depth (m)
1	(1) The River Nile mainstream and its Damietta branch	≥ 13.0	≥ 35 two-way ≥ 12 one-way	1.80	2.50
	(2) The navigational waterways El Beheiry/El Nobaria Canal (Cairo to Alexandria)	≥ 6.0 (excluding movable bridges)			
2		≥ 3.5	≥ 12.0	1.50	1.50
3		≥ 3.5	≥ 8.0	1.00	1.25

Source: The Development Study on the Inland Waterway System in the Arab Republic of Egypt (JICA, 2003) and confirmed by JICA Study Team in meeting with RTA Official.

The lengths of the first class waterway in the Nile Delta and Nile Valley are about 852 km and 980 km, respectively, a total of 1,832 km. In addition, a 350-km long waterway exists along the Naser Lake making the total length approximately 2,182 km. However, only 1,562 km are navigable for commercial twin-type vessels, comprising of the Nile mainstream (Sudan/Aswan and Aswan/Cairo) and the Beheiry/Nobaria Canal (Cairo/Alexandria). The remainder - consisting of the Damietta Branch, Rosetta Branch and Ismailiya Canal - is almost never used because of its unsuitability for navigation, although RTA classifies it as 1st class. Figure 4.4.1 and Figure 4.4.2 presents the Inland Waterway Network as confirmed by the RTA Officials.

(2) River Ports Location

River ports have been developed to serve the factories located near the River Nile. RTA reports that there are 44 ports along the River Nile and canals in the Nile Delta as shown in Table 4.4.2. Thirty five (35) ports are owned by industrial companies involved in sugar, cement, fertilizer, aluminum, iron/steel, coke and petroleum products. Thirty one (31) of these ports are located in Upper Egypt and only four (4) are located in the Nile Delta. Since the number of ports in the Nile Delta is too small and the existing ports belong to factories, there is a plan to construct or upgrade the river ports. The candidate locations are Athar El-Nabi and/or El-Tebeen as shown in Figure 4.4.3.



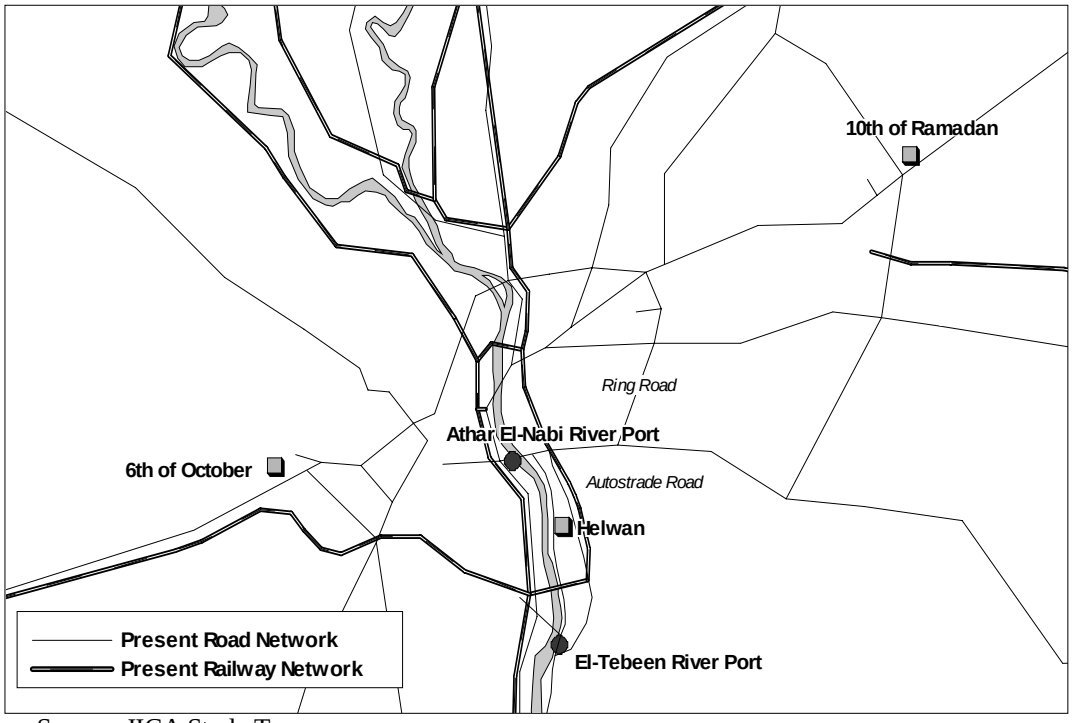
Source: The Development Study on the Inland Waterway System in the Arab Republic of Egypt (JICA, 2003) and confirmed by JICA Study Team in meeting with RTA Official.

Figure 4.4.1 RTA Waterways in Lower Egypt

Source: The Development Study on the Inland Waterway System in the Arab Republic of Egypt (JICA, 2003) and confirmed by JICA Study Team in meeting with RTA Official.

Figure 4.4.2 RTA Waterways in Upper Egypt

From the point of view of connection to major roads, Athar El-Nabi is located just to the South of the ring road and therefore it is rather easy to provide an access road that will connect the port to the ring road. Trucks with container loads will then access the ring road all the way to 6th of October or to other destinations. On the other hand, truck services at El-Tebeen would use the Autostrade or the Agricultural road that first leads them to Helwan before reaching the ring road on the way to the 6th of October or other destinations.



Source: JICA Study Team

Figure 4.4.3 Plan of River Port Locations

In total, RTA owns three (3) river ports (i.e. El Hadid and El Solb; Athar El Nabi; and El Nahda) for public use but they are rarely utilized for IWT.

El Hadid and El Solb Port were developed by the Iron and Steel Company in 1960 primarily for transportation of iron ore from Aswan to Tebeen, south of Cairo. After transportation of iron was stopped, the ownership was transferred to RTA. Currently, small volume of stones and petroleum are handled at this port.

Athar El Nabi Port, which was constructed in 1962, is primarily used by feluccas and barges carrying stones. However, part of the area is now occupied by public market and by illegal settlers. There is a plan to rebuild the port and a concession agreement with a private company has been reached where the government's role is to build the port infrastructure and the private company will provide handling equipment and barges. The re-settlement of the illegal settlers is the main obstacle to the realization of this project.

El Nahda Port, which has ceased operation, is being developed primarily to encourage factories to use IWT in transporting their product to/from Alexandria Port.

Table 4.4.2 Major River Ports in Egypt

No.	Port Name	Owner	Quays (number)	Quays (length)	Quays (structure)	Equipment	Storing Capacity (ton)
1	El Hadid and El Solb (Iron & Steel)	RTA	2	140	Concrete	River crane/ Belt conveyors	3,000
2	Abu Zaabal Fertilizers	Abu Zaabal Mines	1	60	Concrete	Loader/ Belt conveyors	15,000
3	Kima	Kima Company	1	111	Concrete	20 ton crane	2,000
4	El Nasrr Phosphate (Tanash)	El Nasrr Phosphate Co.	1	50	Concrete	Belt conveyor	2,000
5	El Gizera	El Nasrr Phosphate Co.	1	160	Concrete	Crane/1 Loader	3,000
6	El Shima	El Masraya	1	100	Concrete	2 Cranes	1,000
7	El Nasrab	El Nasrr Phosphate Co.	1	150	Concrete	Belt conveyors	1,500
8	El Akaba	El Nasrr Calories Co.	1	100	Concrete	1 Transpotation gutter	2,000
9	El Akaba	High Dam Civil Enterprises Co.	1	150	Concrete	1 Crane/1 Loader	3,000
10	El Biyara	Public sector	3	500	Stone	***	15,000
11	Edfu Sugar	Public sector	1	600	Stone	Fixed crane	2,000
12	El Morada	El Nasrr Phosphate Co.	1	148	Concrete	Dredging machine	180
13	Firocilicon Factory	El Masraya Company for Iron Ingot	1	50	Concrete	2 Cranes (10 ton)	500
14	El Sibaaya	Private	1	103	Concrete	Belt conveyors/ Loader	30,000
15	Armant Sugar	Sugar Co.	4	60	Soil	2 Fixed cranes	30,000
16	Koss Sugar	Sugar Co.	1	200	Stone	Freight terminal/ 2 Cranes	50,000
17	Dishna Sugar	Sugar Co.	1	154	Concrete	2 Cranes	10,000
18	Nagaa Hammady Sugar	Sugar Co.	1	786	Concrete	2 Cranes	50,000
19	River Aluminum	Aluminum Factory	2	207 143	Concrete	1 Crane bridge/ 2 Dredging	60,000
20	El Balina	Private	2	20	Stone	45 ton Ferry	10,000
21	Gerga Sugar	Sugar Co.	2 buoys	***	Soil	2 Cranes	500
22	Asyut Calories Station	Public Sector	1	200	Concrete	2 Suction pumps/ 8 ton Crane	35,000
23	Petrol Port	Egypt Petrol Co.	1	150	Concrete	Pumping pipes/ Cistanks/ Loading terminal	Warehouse
24	Asyut Cement in Menkbad Petrol	Asyut Cement Co.	1	150	Concrete	E vehicle elevators/ 2 Cranes/ 4 Pumps	20,000
25	Asyut Cement in Menkbad Cement	Asyut Cement Co.	1	450	Concrete	1 Crane/ 1 packing unit/ 4 Transportation gutters	60,000
26	Fertilizer Factory in Menkbad	Financial and Industrial Co.	1	150	Concrete	2 cranes	50,000
27	El Nil Cotton Ginning Co.	Nefertiti Co.	1	60	Soil	1 crane	7,000
28	Bany Khaled in Samllot	Iron and Steel Co.	2	12.5	Concrete	Belt conveyors	10,000
29	Limestone in El Tebbin	Iron and Steel Co.	1	200	Concrete	3 overhead 16 ton Cranes/ 1 Land 16 ton crane	70,000
30	El Tebbin El Nahree	River Nile Transport Co.	4	877	Concrete	4 Cranes	17,750
31	Coke Factory in El Tebbin	El Nasser Coke Industry Co.	2	250 150	Steel	4 Gantry cranes	125,000
32	El Kawmiya Cement	El Kawmiya Cement Co.	1	70	Concrete	Cement loading machine	7,000
33	Cement Packing on Nile	Portland Cement Co.	4 outside 2 inside	4.10 2.30	Concrete	1 Crane/ 2 Packing machines/ 4 Belt conveyors	9,000
34	Samloot Cement Receive	Portland Cement Co.	1	30	Concrete	Immovable crane	7,000
35	Sugar Factory in El Hawmdiay	Sugar Co.	6	52:04:00	2 Soil 1 Concrete	Immovable crane	1,0000
36	Equipments Factories	Sugar Co.	1	60	Concrete	Belt conveyors	-7,000
37	El Masara	Egypt Aluminum Co.	1	110	Concrete	Bridge crane/ Movable crane	4,000
38	Tora	Tora Cement Co.	1	100	Concrete	Cement tankers/ Belt	5,000
39	Athar El Nabi	RTA	1	1000	Concrete	1 Crane	200,000
40	Ambaba Tankers	Tankers Co.	1	90	Concrete	2 Sanction machines	60,000
41	Sauulft	Abu Zabal Fertilizers	1	100	Soil	Crane	40,000
42	Phospgate (Ismailiya canal)	Abu Zabal Fertiliers	1	115	Concrete	Suction drilling machine/ belt conveyors	60,000
43	El Nahda (El Nobaria canal)	RTA	1	100	Concrete	1 Crane	80,000
44	El Metras (El Nobaria canal)	Iron and Steel Co.	2	12	Concrete	Bridge crane/ Wheel movable crane	5,000

Note: The recently constructed Damietta River Port is not in the table due to incomplete information.
Source: The Development Study on the Inland Waterway System in the Arab Republic of Egypt (JICA, 2003) and confirmed by the JICA Study Team in meeting with RTA Official.

(3) Vessels Operating the IWT

"The Development Study on the Inland Waterway System in the Arab Republic of Egypt (JICA, 2003)" reported that the total number of barges operating in the River Nile is 2,530. However; the latest RTA data of year 2006 shows that this number declined to 1,344 which implies that a total of 1,186 barges were taken out of service as shown in Table 4.4.3. Comparing the number of barges in 2003 and 2006 reveals the following:

- General Nile Company for River Transport's barges decreased by 46%,
- Barges of Public Business decreased by 75%,
- Barges of Sugar Company decreased by 19%,
- Barges of Private Companies decreased by 44%, and
- Barges of Government Companies decreased by 86%.

Based on discussions the JICA Study Team had with several officials who are familiar with operation of barges on the River Nile, there are two reasons for the decreasing number of barges. First is due to demand declining due to the attraction of other transport modes and the second is due to the high cost required to repair the old barges, some of which have been operating for more than 30 years.

Table 4.4.3 Number of Barges Operating in the River Nile (2006)

Item	Propeller Barge	Twin	Total
1. General Nile Company for River Transport (Public Sector)	133	109	242
2. Public Business	59	-	59
3. Sugar Company	146	-	146
4. Private Sector	883	2	885
5. Government	2	10	12
Total	1223	121	1344

Source: River Transport Authority, MOT

(4) Major Freight Waterways

In Figure 4.4.4, the locations of planned river ports such as Nobariya, El Tebeen, Athar El-Nabi and Qena are indicated. Except for Qena port whose main purpose is to serve shipping lines for tourists, these ports are designed mainly for freight transport. If and when those river ports are developed, there is a high chance that IWT will become a major player in logistics.

The currently navigable waterways as well future waterways for operation are discussed below and summarized in Table 4.4.4. It is noted that services for container freight are not active at the River Nile. This is because there is no river port that has handling equipment for containers and current barges are not suitable for containers. However, the RTA is working on making the River Nile capable of handling containers through the development of new river ports and dredging of sections of the river that have shallow depths.

Table 4.4.4 Summary of Waterway Conditions

Waterway	Condition	Common Issues
a) Cairo - Alexandria	Currently used for navigation and improvement activities were just completed in 2006.	▪ Lack of river ports with handling equipment at GCR ▪ No navigation aid for night navigation (A project is undergoing) ▪ No existing barges designed for container transport
b) Cairo - Damietta	Work is ongoing and the waterway will be ready for navigation in September or October 2007s	
c) Cairo – Asyut – Aswan	Currently used for navigation and further improvement is being conducted with assistance from Dutch Government.	
d) Cairo – Ismailiya	This waterway is not ready for navigation but considered for development.	

Source: JICA Study Team based on data from River Transport Authority, MOT

Cairo - Alexandria Waterway

The distance from Alexandria Port and Cairo (Athar El Nabi river port) is 220 km, which is navigable within 2 days. The waterway in this waterway follows the Marriot Lake, the Nobaria Canal and the Beheiry Canal before reaching the River Nile. Many factories with their own ports are currently using IWT. There are 7 locks that barges have to pass in this waterway. The waterway is currently open for navigation and being used by several companies to transport their freight to Alexandria port.

Cairo – Damietta Waterway

Taking Athar El Nabi as a reference point, the distance from Damietta River Port to Cairo is about 240 km, which would be navigable within 2 days once all necessary improvement of the waterway is done. Construction of Damietta river port is finalized, however it is not in operation yet. The RTA is currently working on the development of the waterway by dredging to achieve necessary depths and improvement of water locks. The RTA is also currently conducting navigation trials in the section from Cairo to Zefta Lock. From Zefta Lock to Damietta river port, work is ongoing and expected to be completed within 2 to 3 months (September or October 2007). Once this activity is completed, barges will be able to operate the entire length of the Cairo – Damietta waterway.

Cairo – Asyut – Aswan Waterway

The Cairo – Asyut - Aswan waterway reaches about 980 km. At present, barges and tourist vessels are operating on this waterway. The RTA with assistance from the Dutch Government is conducting survey of the navigation channel, hydrographic survey, dredging, and other necessary works to clear the river for navigation. Based on the interviews conducted by the JICA Study Team with a member of the Dutch Consultant Team and a RTA official, their work is in advanced stage and expected to be completed in a few months. RTA is working on making this waterway operational for 24 hours per day by installing navigational aids that will allow barges to operate at night. Trial installations of this equipment were abandoned after some of the components went missing. An electronic navigational chart (ENC) is being considered as an alternative to ensure safe navigation.

Source: General Authority for Foreign Investment (GAFI, MOI) for information; Google for map

Figure 4.4.4 IWT and Locations of Planned Ports

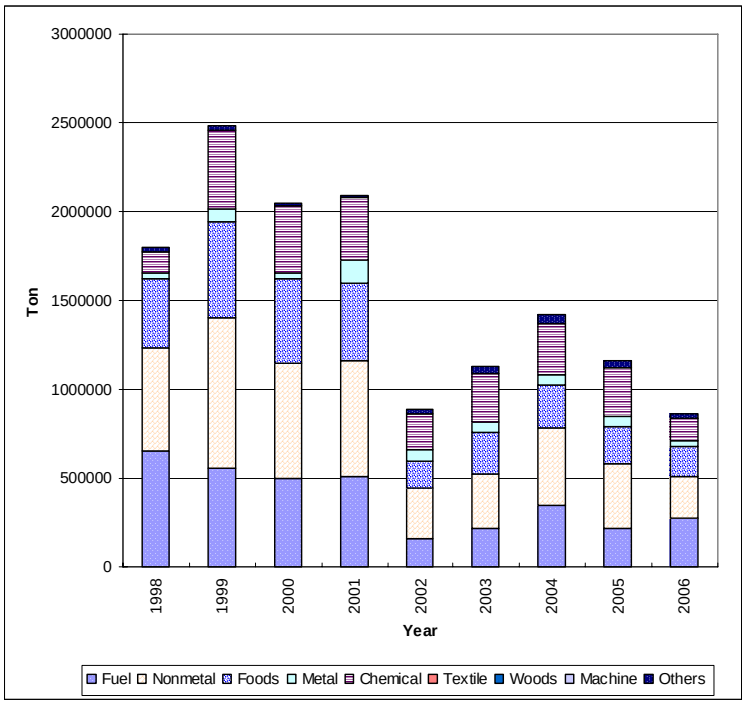
Other Potential Waterway (Cairo – Ismailiya)

Cairo and Ismailiya can be connected by IWT in future through the existing 128 km waterway. However, dredging and development of locks are necessary. This waterway could reach both Port Said port (West) on the Northern Suez Canal and Suez Port on the South. As far as RTA is concerned, this project falls into their long-term plan.

4.4.2 Operation Performance and Efficiency

(1) Freight Volume Transported by IWT

As the number of barges decreases, the volume of freight carried by IWT is also declining. The highest recorded volume of freight in the past nine years was achieved in 1999 as shown in Figure 4.4.5. A total of 2,487,373 tons was transported via River Nile during that year, mostly on Alexandria-Cairo-Aswan line. Comparing the market captured by IWT in 1999 and in 2006 reveals that a decline of 35% (1,621,229 ton) took place during the span of only seven years.



Source: TPA, Ministry of Transport

Figure 4.4.5 Historical Trend of Volume of Freight Transported by IWT (1998-2006)

4.4.3 Ongoing Projects

The RTA is currently implementing many projects and most of them were covered by the recommended projects of the "The Development Study on the Inland Waterway System in the Arab Republic of Egypt (JICA, 2003)". Completion of these projects is expected to attract additional traffic to IWT.

(1) Cairo/Damietta Waterway

The Cairo/Damietta Waterway Development Project was started in 2005 and work is ongoing. This project involves the clearing of a 228 km length of waterway for navigation and the construction of Zefta and Delta locks.

(2) Port Said / Ismailiya / Suez Waterway along Suez Canal

The waterway covered by the project stretches 195 km. This project has not started yet.

(3) Ismailiya Canal

This project aims to develop Ismailiya Canal for navigation to link both Suez and Port Said ports by an inland waterway along the Suez Canal having a 3 meter depth. This project has not started yet.

(4) Cairo/Aswan Waterway

The project aims at revitalizing the IWT and to extend the length suited for navigation to 960 km. It is hoped that once the project is completed, the IWT can be operated for 24-hours per day. The following steps are being taken to meet the above objectives:

- Dredging a length of some 518 km,
- Installation of navigation aids (suspended after some components went missing),
- Development of para-symmetric maps to identify navigational waterway depths,
- Development of navigation maps from Kanater Khaireya to Aswan, and

At present, work is ongoing and dredging is almost completed.

(5) Cairo / Alexandria Waterway

This project started in 2005 and was completed in 2006. The major works involved improvement of the canal locks, which was recommended by "The Development Study on the Inland Waterway System in the Arab Republic of Egypt (JICA, 2003)". Installation of navigation aids to allow night navigation is also being considered.

(6) Aswan / Wady Halpha Waterway

The project aims at securing the navigational waterway and installation of navigational aids so that it is suitable for navigation.

4.5 Dry Ports

This section deals with the current situation of dry ports in Egypt. The information in this section is mainly based on the site visits and interviews conducted by the JICA Study Team. Three dry ports have been visited and interviews held with the dry port operators, customs authority, and GOEIC officials. Only the interviews with the users were conducted at 10th of Ramadan Dry Port due to limited time. Based on these site visits, the conclusions made about the general condition and operation of the dry ports are as follows:

4.5.1 Dry Ports in Egypt

Egypt has a plan to construct about 20 dry ports to facilitate freight (container) movements from ports as listed in Table 4.5.1. The idea is that when containers arrived at a busy port they will be directed to a dry port facility where similar port activities are available. This action can substantially reduce the container storage time at the port and eventually increase the port handling capacity.

(1) Existing Dry Ports

Currently, there are six (6) dry ports in operation in Egypt and one depot with customs clearance services (El-Nobariya). These dry ports include one in 10th of Ramadan city, two in 6th of October city, one in Alexandria and two along the Ismailiya road near to the Ring Road (Figure 4.5.1). Out of these six dry ports, five are owned and managed by the private sector. Only, P.S.C.C.H Co. (Port Said Containers & Cargo Handling Co.) in 10th of Ramadan city is owned and supervised by the Holding Company for Maritime and Land Transport.

(2) Transportation Laws Related to Dry Ports

The Inland and Dry Ports Authority under the Ministry of Transport (MOT) was established primarily to facilitate the development of dry ports. This authority evolved from the original Inland Port Authority established in 1996 as the governmental body in-charge of the international border crossing ports of the country.

The current procedure for establishing a dry port requires the approval of the Inland and Dry Ports Authority. Customs clearance procedures are managed by the Customs Authority under the authority of the Ministry of Finance. The construction of facilities is subject to the approval of the local government.

Currently, there is ongoing effort exerted by the government to draft the Unified Transportation Law. The law will specifically state the establishment and functions of dry ports, which should be similar to the functions and services provided by seaports. The same amendment will also enable the Customs Authority to recognize dry ports as facilities that provide customs clearance services.

Source: Development of Container Transport to Support Freight Trade of Egypt, TPA, 2001

Figure 4.5.1 Locations of Operating Dry Ports

Table 4.5.1 List of Dry Ports in Egypt

No.	Dry Port Name	Location	Status	Transport Mode
1	Bashtel	Bashtel railway triangle	Under construction	Railway/Road
2	Km 48	El-Wahat railway line	Plan	Railway/Road
3	Athar El Nabi	Old Cairo	Plan	River/Road
4	Abu Zaabal	Ismailiya	Plan	River/Road
5	Sakr	Suez Desert Road	Under construction	Road
6	El-Asher	10th of Ramadan city	Operating	Road/Railway (future)
7	North West Cairo	Cairo-Alexandria Desert Road	Plan	Road
8	Suwesdi (SOSDI)	6th of October City	Operating	Road
9	6th of October Dry Port	6th of October City	Operating	Road
10	El-Obour	El-Obour city desert	Partly operating	Road
11	Ragab	El-Amireya	Operating	Road
12	El-Nobariya	El-Nubariya	Operating	Road
13	El-Max	El-Max	Plan	Railway/Road
14	El-Sharkiya	Zagazig	Plan	Road
15	Dakahliya	Mansoura	Plan	Road
16	Damietta Free Zone	Damietta	Plan	Road
17	Ismailiya	Technology Valley at Ismailiya	Plan	Road
18	Al-Sadat	Sadat City	Plan	Road
19	Gharbiya	Tanta	Plan	Road
20	Matbous	Matbous Area	Plan	Road
21	El-Zahraa	Km. 14 Cairo – Ismailiya Desert Road	Operating	Road
22	El-Bida	Kafr El-Dawar Agricultural Road	Plan	Road

Source: Development of Container Transport to Support Freight Trade of Egypt, TPA, 2001 and confirmed by JICA Study Team in meeting with MOT Officials.

(3) SOSDI Dry Port at 6th of October City

a) Dry Port Area

The SOSDI Dry Port is located at the industrial city of 6th of October City and it started operation in 2001. It has a total land area of 120,000 m^2 (12 Hectares). It is a private sector initiative conceived to capture import and export goods produced at manufacturing industries in the 6th of October industrial area. The port's truck gates as well as the container storage area are shown in the following photo.


Photo SOSDI Dry Port (Gate and Container Storage)

b) Access

The facility has good road connections to most of the ports in Egypt. It is also supposed to be accessible by railway but due to the lack of a track connecting between the existing nearby railway track and the dry port, the railway service has not yet been realized. The nearest station is on the Al Wahat line at Km. 48 and less than one kilometer from the dry port.

c) Services and Facilities (Equipment)

The dry port possesses two reach stackers and two forklifts. It has also storage for both of bonded and non-bonded containers. Also available are reefers, which are a type of container that includes a built-in refrigeration unit to keep perishable goods cold or frozen. Also, customers are able to check the status of their containers through an online tracking system. The same system makes it possible for customers to trace the location of containers at any time, day or night. The following photo shows one of the reach stackers at the dry port as well as the office of the relevant government agencies.


Photo Handling Equipment , Office of Customs Authority and GOEIC

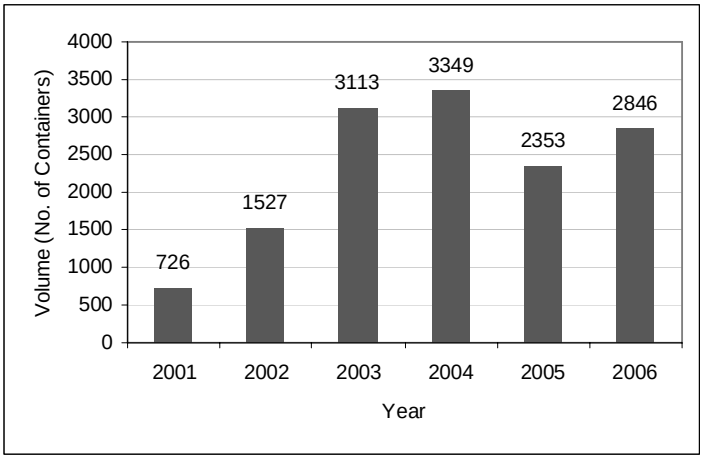
d) Control Agencies

All control agencies related to export and import products (customs authority and GOEIC) are represented and manage their work responsibilities inside the dry port.

e) Volume of Containers Handled

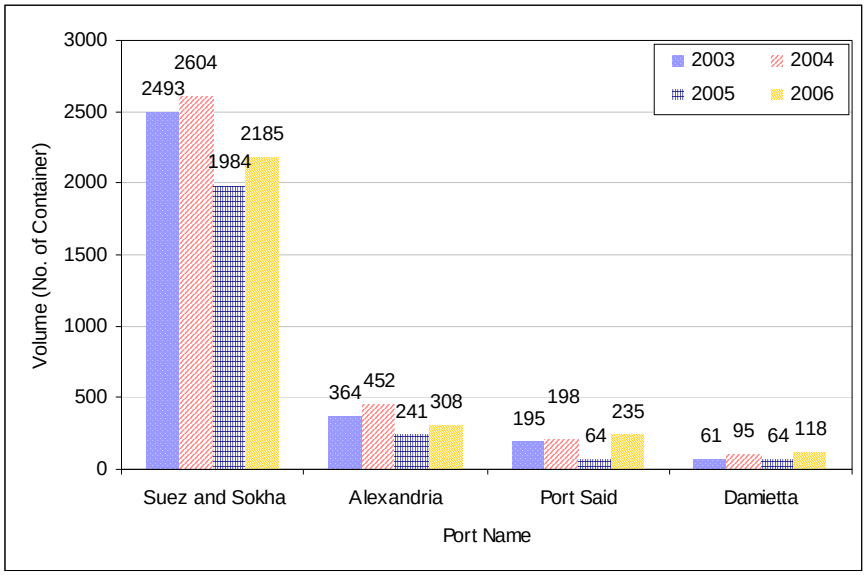
During the first year of operation, the port attracted 726 containers and this number was doubled in the second year as shown in Figure 4.5.2. The peak volume was achieved by the dry port in 2004 when 3,349 containers were processed. A decline of container numbers was experience in 2005 due to two factors as mentioned by the dry port administrator: (i) Decrease of the volume of imports into Egypt during that year and (ii) A new group of customs officials took over and needed time to familiarize themselves with the procedures. Therefore clients, who were affected by the slow performance of the new customs officials, are believed to have transferred to other dry ports or perhaps to seaports.

Most of the containers originated from Suez and Sokhna ports followed by Alexandria port as shown in Figure 4.5.3. There is a possibility to utilize the railway line from Sokhna port to the dry port however due to the lack of an access line from Al Wahat Line to the dry port; this has not materialized yet. The same is true for the containers from Alexandria port; containers can get to the dry port through the combination of the Al-Ithed Line and Al Wahat Line.



Note: Both 20 and 40-feet containers are counted as one unit
Source: SOSDI Dry Port

Figure 4.5.2 Annual Volume of Container Throughput at SOSDI Dry Port



Note: Both 20 and 40-feet containers are counted as one unit
Source: SOSDI Dry Port

Figure 4.5.3 Number of Containers Handled at SOSDI Dry Port according to the Port of Origin

(3) 6th of October Customs Storage Company (6th of October Dry Port)

a) Dry Port Area

The 6th of October Customs Storage Company (herein referred to as 6th of October Dry Port) was established through a private sector initiative in 1999 with the aim of assisting industry in the area, particularly those directed at the international market. It has a total land area of 40 feddan. Photographs of trucks at the port gate and trucks loaded with containers are shown in the following photos.

Photo 6th of October Dry Port (gate and trucks loaded with containers)

b) Access

The road leading to the dry port is in good condition. Containers from/to Sokhna port and Alexandria port have easy access, for the former through Sokhna-Cairo, Ring Road, and 6th of October, and for the latter through Alexandria desert road and 6th of October. Like the SOSDI dry port however, there is no access line to the Km. 48 train station from the Al Wahat railway line.

c) Services and Facilities (Equipment)

The dry port has two reach stackers and five fork lifts. It has also storage for both bonded and non-bonded containers. Reefers are also available, a type of container that include a built in refrigeration unit to keep perishable goods cold or frozen. As shown in the following photo, the dry port has a number of warehouses for lease just beside the weigh bridge. The following facilities are available in this dry port:

- Shipping agency services,
- Receiving full containers and storing them in designated yards,
- Storing imports and exports in warehouses, and
- Storing general cargo in warehouses for stuffing containers.

Photo Weigh Bridge and Warehouses

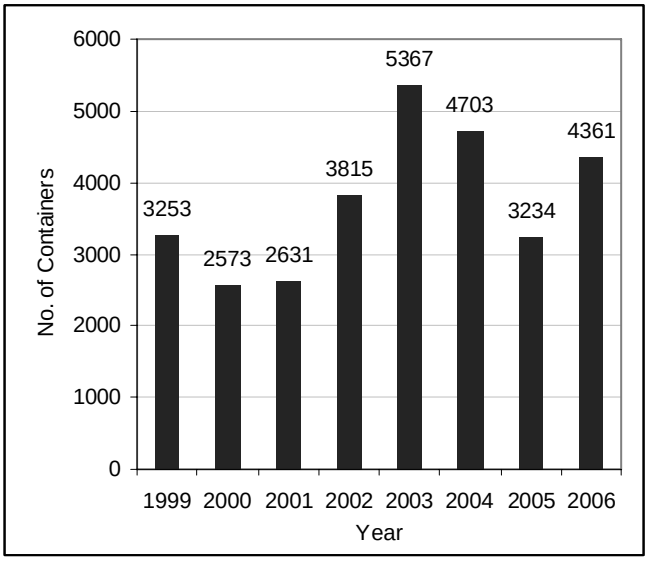
d) Control Agencies

There are about 45 staff working for Customs Authority and around 20 staff working for the GOEIC.

e) Volume of Containers Handled

During first year of operation, the dry port has attracted 3,253 containers and a sharp decline was observed in the following year and also in year 2001 as shown in Figure 4.5.4. The decline in 2001 can be attributed to the opening of the rival dry port, SOSDI, located just hundred meters away. The highest recorded volume of containers is achieved in 2003.

Like SOSDI dry port, there is the possibility to utilize the railway line from/to Sokhna port though Al Wahat Line but this facility has not been realized yet due to lack of access track. Plan to connect the dry port to railway is assessed as positive scheme by dry port operators.



Note: Both 20 and 40-foot containers are counted as one unit
Source: 6th of October Dry Port

Figure 4.5.4 Annual Volume of Containers at 6th of October Dry Port

(4) 10th of Ramadan Dry Port (Port Said Containers & Cargo Handling Co.)

The dry port in 10th of Ramadan City was deliberately constructed at the heart of the industrial zone of 10th of Ramadan City to facilitate speedy procedures for import and export products. The facility started operation in 1996. The following photo shows the container storage as well as the main gate of the dry port.

Photo 10th of Ramadan Dry Port

a) Dry Port Area

The dry port occupies a total land area of 50,000 m^2, which is considered the first phase of the project. The target for the second phase is to expand the port area up to 250,000 m^2, which is a reasonable size for a dry port offering comprehensive services.

b) Access

The main access road to the dry port is Cairo-Ismailiya Road. The railway network is not yet available although there is a plan by ENR to build an access link that would connect the industrial zone to the Suez-Ain Shams railway line. Al Robeki railway station is located very near to the dry port area.

c) Services and Facilities (Equipment)

The dry port possesses reach stackers and fork lifts as shown in the following photo. The following are the services available:

- Shipping agency services,
- Receiving full containers and storing them in designated yards,
- Receiving empty containers and storing them in designated yards,
- Loading empty containers with Egyptian exports in the dry port or transporting them to the factories for stuffing and transporting to all Egyptians seaports,
- Storing imports and exports in warehouses. Warehouses for storing general cargo, to be containerized, before being stuffed into the containers, and
- Storing and release of cargo; fully or partially.


Photo Handling Facility and Warehouse of 10th of Ramadan Dry Port

d) Control Agencies

All the controlling agencies related to export and import (customs authority and GOEIC) have their offices at the ground floor in the administration building to facilitate faster release of containers.

4.5.2 Operation Performance and Efficiency

(1) SOSDI Dry Port

The maximum number of containers that can be handled annually by the facility is 5,000. In terms of target, the SOSDI operator has a target of handling 3,000 containers a year, which was achieved after just three (3) years in operation. This is remarkable performance because normally a target is not that easy to achieve during a short period of time.

For instance, the Virginia Inland Dry Port in the United States had a long start up period before reaching the target volume of containers. It took around 10 years before they achieve their target of 20,000 containers and at the beginning; their annual throughput was just around 8,000 containers, less than half of their target.

(2) 6th of October Dry Port

One of the obstacles for speedy procedures in the dry port is the lack of use ICT. The port procedures such as processing of documents for export/import containers are done manual. These slow procedures are compounded by the manual procedure of the

Customs Authority and the lack of a GOEIC laboratory. The nearest laboratory is located at Cairo International Airport. Checking at the laboratory normally takes from days up to a week depending on the number of customers.

With regard to the access road, heavy traffic congestion is not presently observed. However, as industrial production increases in future, the need for an alternative transport mode may become an important issue.

The dry port authority is very keen on the idea of railway services although there are some aspects that need to be understood better. These include: Does the train leave even if the number of containers is less than the train capacity? Who will provide the handling equipment at the train station?

(3) 10th of Ramadan Dry Port (Port Said Containers & Cargo Handling Co.)

The JICA Study Team requested information on the volume of containers handled by the dry port but it had not been obtained by the time of finalizing this report. This data would be useful to assess the gap between the target number of containers and the current number of containers handled by the dry port.

Based on interviews with the users (shippers) of the dry port, some necessary improvements were identified as shown in Table 4.5.2.

Table 4.5.2 Recommended Improvements for 10th of Ramadan Dry Port Users

Improvement	Reason
Providing Railway Service	At present, only trucks have an access to the dry port due to the lack of railway lines. Aside from the transportation fee, shippers are required to pay the customs authority and the personal wages of the private guards that guard the containers from the dry port to the seaport. They believe that railway can offer lower transportation cost than the existing system and number of personnel from authorities for securing the containers will be reduced as the train carries a large number of containers (e.g. 40 containers per train).
Adopt EDI Application	At present, every step of the procedures to clear the containers is done manually. Users believed that adopting EDI will reduce the processing time and this procedure will be more convenient to them.
Capacity Building and Increased Number of staff Working at the Dry Port	Increasing the number of working personnel at the dry port was also mentioned as one measure to improve its efficiency. Users believed that each staff member is overloaded resulting in longer times needed to process their documents. This implies that the customers wish to expedite the procedure at the dry port, which could be addressed by adopting ICT.
Increase the Area of Dry Port	There was a recommendation that increasing the area of the dry port is necessary. Observation of the JICA Study Team shows that the current area seems enough for present demand and what is needed is the proper management of the dry port including truck circulation and parking management.

Source: JICA Study Team

4.6 Logistics Issues

In the previous sections, the infrastructure and operation of the three major modes of transport and dry ports were assessed. In the succeeding sections, the issues that need to be addressed for improvement of the logistics system in Egypt are enumerated.

4.6.1 Issues related to the Road System

(1) Lack of Distribution Center for GCR

The truck ban prohibits large trucks from having access to several major links within GCR except at nighttime from 11 PM to 6 AM. Under this truck ban regulation system, it becomes difficult for large trucks to deliver freight inside the city. A helpful way to organize freight traffic flow into the city would be to have a distribution center, which could serve as an area for large trucks to unload their freight enabling small trucks to make deliveries to the city after consolidation.

(2) Overloading by Trucks

Highway regulations such as maximum allowable gross vehicle weight/axle weight, width, wheel base arrangement, etc. of vehicles are well defined in Egypt. These regulations are primarily aimed to protect roads from premature damage. Efforts by road authorities are made to ensure that drivers observe these regulations to protect the large investments allocated to construct important infrastructures such as roads and bridges.

(3) Road Network Upgrading/Improvement

Generally, the arterial road network in Egypt seems in reasonable condition. However, some major bottlenecks are recognized and some links have been identified where upgrading or improvement is recommended to improve the road related transport facilities. Through the investigation of the existing road network there are four main routes where future upgrading/improvement should be considered. These four routes are:

i) Cairo – Alexandria,

ii) Cairo – Ismailiya,

iii) Cairo – Suez, and

iv) Cairo - Upper Egypt.

Attention should be paid to the connection between these four routes. In this regard the ongoing plan for closing of existing Ring Road will bring great improvement in the land logistics facilities. Construction of the Regional Ring Road is another good plan for improvement of inland facilities.

4.6.2 Issues related to the Railway System

This section provides issues that need to be addressed to make railway a major component of the logistics system.

(1) Infrastructure Related Issues

a) Shortage of Locomotives

The shortage of locomotives often causes delay to the customers' freight as mentioned by both ENR officials and users. Sometimes, when passenger trains are short of locomotives, freight locomotives are pulled-out and used for passenger trains.

b) Shortage of Some Types of Freight Wagons

According to the government officials interviewed by the JICA Study Team, the demand for some types of wagons is high while there is surplus for other types of wagons. This condition creates a situation where sometimes ENR has to reject a request due to shortage of particular wagons. Consequently, this situation creates an unnecessary impression among the customers that the ENR service is unreliable.

c) Shortage of Handling Equipment at Stations Inside and Outside the Ports

Freight stations inside the ports are served by the available handling equipment at the port. Therefore, as the volume of arriving containers increases, shortages of equipment occur and freight handling becomes difficult. This problem is serious and concern about it from both ENR officials and private companies is reported in the interviews done by the JICA Study Team. The shortage of handling equipment like cranes and reach stackers is becoming a source of delay. Based on the assessment of the results of the interviews undertaken by the JICA Study Team, it seems that the reservation of handling equipments should be done at least one week prior to the actual date of loading/unloading of containers on the train.

Regarding the freight stations that are located outside the ports, ENR has the policy of not handling freight and this responsibility is given to customers. Therefore, no handling facilities are made available at stations and customers tend to load/unload their freight without proper handling facilities. This practice has some implications: first, it damages the freight due to improper handling; second, sometimes it causes delay to freight train due to inefficiency of handling equipment.

d) Wagons without Brakes

The lack of brakes on each wagon limits the speed of the train, which significantly affects line capacity and safety. If all wagons are equipped with breaks, the train can achieve higher speed thus increasing the number of trains that can be served by the line. Currently, there are ongoing efforts by ENR to install brakes to all wagons and 40% of wagons now have been equipped with brakes.

(2) Operational Issues

There are operational issues that have to be addressed by ENR to improve its performance and marketing appeal to customers. For instance, the practice that locomotives for

freight trains are withdrawn to drive passenger trains has significant impact on the time-schedule of freight and creates dissatisfaction among customers. Other operational problems that compound the delay to freight involves the situation where the freight train has to wait at an junction until a passenger train has passed. This can be avoided with regular schedules of all trains.

(3) Missing Railway Connections to Major Industrial/Port Areas like Sadat, 10th of Ramadan and Port Said Port (East)

Industrial cities are expected to receive/discharge significant volume of freight. In the absence of freight train services, all freight will be transported by trucks which will increase pressure on the road network. Therefore, it is important for industrial areas located in new urban communities to be served by freight trains to reduce reliance on the truck services. In this regard, 6th of October City is located close to the railway station along Al Wahat line. Also, 10th of Ramadan City is located close to Al-Robeki railway station.

(4) Potential Services for Upper Egypt Development

Economic development of the Upper Egypt region is now a pressing matter and the agricultural development has been in the spotlight. In considering a long distance to the potential markets, the reefer container services can be a possible solution to this constrain, and an commencement of reefer container transport service should be fully investigated in its cost and feasibility. If the reefer container can be exported from Safaga Port to the Middle East and Asia, it can be worth gaining new market since new agricultural project has already commenced by foreign company and it proves the financial feasibility of this project. Support of this economic development effort is required in terms of logistics improvement in this region.

4.6.3 Issues related to the IWT System

This section clarified some of the critical issues that have to be addressed in order to increase the attractiveness of IWT.

(1) Lack of River Ports in the Greater Cairo Region

The GCR is the main destination of freight arriving at the ports of Egypt. However no ideal port is available to serve arriving barges from Alexandria and Damietta ports. The waterway linking the GCR and Damietta is being cleared so that it can be opened for navigation. However, utilization of this link will mainly depend on the capability of river ports in the GCR. Therefore, continuous efforts to construct practical river ports within the GCR are highly recommended. In this regard two locations are under consideration, which are Athar El-Nabi and El-Tebeen.

(2) Lack of Navigation Aid Equipment

At present, barges are operating only during daytime and they have to stop sailing by the nighttime. The travel time can be reduced if barges can travel at night. If this level of operation is achieved, this will increase the attractiveness of IWT as an inland mode of transport. It can be concluded that night sailing is impossible due to the absence of

navigational aid equipment. Recently, RTA has undertaken a large project to improve navigation from Cairo to Upper Egypt and it is expected to finish this project in very near future. The system will utilize GPS and guiding through connection with satellites in place of permanent guiding equipment as they are subjected to stealing.

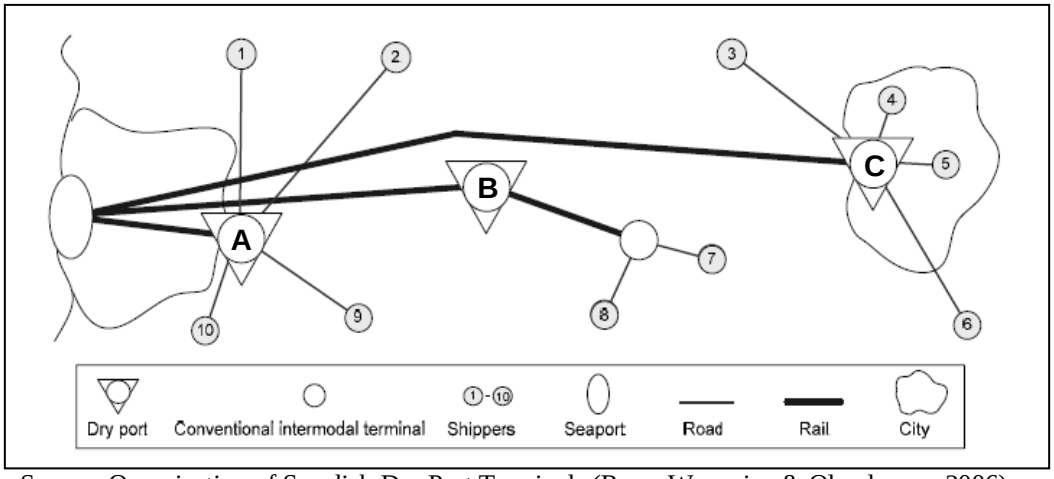
4.6.4 Issues on Dry Port

This section of the report raises issues that need to be addressed to improve the performance of the dry ports in Egypt. The findings are first presented and then experience from other countries is used as reference to identify gaps and inefficiencies.

(1) Lack of Connectivity to Different Transport Modes

All the containers leaving and entering both the dry ports of the industrial cities of 10th of Ramadan and 6th of October are carried by trucks. The dry ports of 6th of October are close to the Oasis Railway line however lack of an access link prevents the use of this existing line. On the other hand, the dry port of 10th of Ramadan is also located near to Al Robeki station and needs an access link that will connect to the Suez – Ain Shams Line. As can be seen in the diagram below, a dry port needs a high capacity transport mode that can be in the form of railway or IWT. In the diagram shown in Figure 4.6.1, shippers 1, 2, 9, and 10 bring their freight by trucks to Dry Port A; shippers 7 and 8 to Dry Port B; and shippers 3, 4, 5 and 6 to Dry Port C. After consolidation and undergoing regular inspection and clearance procedure, the freight is carried by railway to the seaport.

It should be noted that aside from the benefits of decongesting the sea port and bringing the facility close to customers, a dry port is supposed to play a role in improving the environment through the diversion of container flow from trucks to railway or IWT.



Source: Organization of Swedish Dry Port Terminals (Roso, Woxenius & Olanderson, 2006)

Figure 4.6.1 Dry Port Concept

In the United States, one of the cited factors to the success of the Virginia Inland Dry Port is its longstanding partnership with the Norfolk Southern railway company, which was committed to running the train and absorbing the train operating cost during the long start up period. This dry port only achieved its target volume of 20,000 containers after 10 years in operation. Today, the dry port is handling 35,000 containers annually.

(2) Limited Function and Use of ICT

Except for the tracing (tracking) system of containers available at SOSDI dry port, no other ICT application was observed. Inspection and clearance procedure are done manually, which increases the dwell time of containers at the dry port. This procedure does not conform to international standards where the usual practice is to do things electronically (payment, booking of carrier, customs clearance, etc.).

It is apparent that the current services offered by the dry ports fall under the "minimum" category as shown in Table 4.6.1. Such a dry port merely serves as an extension of the seaport. However, a dry port that has wider logistical functions (for instance providing the following services: storage, consolidation, depot-storage of empty containers, maintenance and repair for containers, customs clearance) might need a business center, rail terminal, truck terminal, container depot, handling facilities, computer tracing system, and other essentials as shown in the same table.

Table 4.6.1 Dry Port Facilities and Services

Minimum facilities/services	Comprehensive facilities/services
▪ Customs control and clearance, ▪ Temporary storage during customs inspection, ▪ Container-handling equipment for 20-TEU and 40-TEU containers, ▪ Offices of an operator, either the site owner, lesser or contractor, ▪ Offices of clearing and forwarding agents, ▪ Complete enclosure, fencing and a security system, ▪ Reliable and efficient communication facilities, and ▪ Container freight station with stuffing and un-stuffing (packing and unpacking) services.	▪ Offices of shipping line agents, ▪ Railway goods office, ▪ Road haulage brokerage, ▪ Cargo packing services, ▪ Consignment consolidation services, ▪ Unit train assembly and booking services, ▪ Container clearing service, ▪ Computerized cargo-tracking services, ▪ Container repair facilities, ▪ Clearing and fumigation services (atmospheric and vacuum), ▪ Reefer facilities, and ▪ Weigh bridges.

Source: Handbook on the Management and Operation of Dry Ports, UNCTAD, 1991
Note: Comprehensive facilities/services includes facilities/services offered at minimum facilities/services

4.7 Countermeasures and Recommendations

The analyses have revealed bottlenecks of the three transport modes that having significant negative impact in the logistics flow. The levels of development of the three modes are at varying degrees and the seamless flow of freight from one mode to another is not yet realized. The development advantages of road transport resulted in a higher captured market for trucks while the presence of the other two modes is barely felt. With that consideration, the following general principles are recommended:

Development of Logistics Centers to assist Logistics Activities

This strategy aims to supply logistics centers that combine the function of dry port and distribution center at different strategic locations. These facilities are indispensable to advance Egypt's logistics system, which currently is experiencing several bottlenecks. Each Logistics Centre will serve as a hub where all the activities relating to transport, logistics and goods distribution – both for local and international transit – will be undertaken by various operators.

Reduce the Infrastructure Development gap among the three Modes of Transport

This strategy calls for reducing the development gap among the modes of transport by bringing the development level of railway and IWT up to that of road transport. It is recommended to balance the attractiveness of all modes by supplying necessary infrastructure to the other two modes of transport. In this way, promotion of modal shift can be realistically introduced.

Focus on Operational/Institutional Management of Road Transport

Except for the construction and upgrading of some crucial sections there are no immediate needs to heavily invest in a particular road project. Instead, attention should focus on road management issues such as protection of roads through discouragement of overloading; promotion of safe driving through looking after drivers' welfare; restructuring of small trucking companies by provision of incentives; and other soft measures to enhance the efficiency of road transport. Refer to Chapter 7 for the recommended strategies to enhance the freight forwarding industry.

4.7.1 Development of Logistics Centers

(1) Introduction

Logistics Centers (LC) should be established at different strategic locations to enhance import/export promotion and to support the logistics system as a whole. These facilities would have value-added services such as repacking, labeling, bar-coding, light assembly and other high-value activities.

To get acquainted with concept of this logistics facility, a list of the common features that define this facility is provided. According to the paper "Analysis of Institutional and Organizational Solutions in the Development of Transport and Logistics Centers (the European Commission, April 2007)", the most common characteristics of a logistics center are the following:

- Usually logistics centers are built on a private-public partnership basis, initiated by national and/or local authorities. The reason for this is that experience shows that

the Logistics Centers make a significant contribution to the territorial and economic development of the area where they are located.

- Logistics Centers unite all activities related to transport and logistics.
- Based on competition principles, logistics centers are open for private and public transport as well as enterprises and companies.
- Consolidation of different companies serving and/or using transport services through synergy effects increases the economic and productive performance of the companies and at the same time increases their economy of scale.
- Logistics Centers supply with the most advanced IT infrastructure and solutions, which usually are exorbitant barriers for an individual company. A logistics center utilizes intelligent transport systems, where services are provided based on advanced technologies, i.e. EDI, communication and information system.
- Normally, logistics centers are located in a 100-150 ha area, however, depending on the activities the size can reach 400-500 ha.
- An important feature is the tendency for logistics centers to cooperate nationally and internationally, and thereby create efficient transport chains and network solutions for optimum cargo flow and distribution.

From the above, it can be noted that a vast area of undeveloped land is necessary to build the infrastructure requirements for a logistics center and sophisticated IT applications are indispensable to facilitate seamless flow of information.

(2) Different Types of Freight Terminals

There are several types of freight terminals and different terminologies are used to mean them. In this report, some freight terminals will be defined for clarity.

- Logistics Center – there is no standard definition of a logistics center, for instance, in Europe; this may be called freight village, interporto, logistics park, etc. Europlatform (2004) define it as a hub where all the activities relating to transport, logistics and goods distribution – both for national and international transit – are carried-out, on a commercial basis, by various operations.
- Distribution Center – this is sometimes referred to as a city terminal, urban consolidation center thus its focus is on distribution efficiency. This facility normally serves as a place of transhipment from long distance traffic to short distance (urban) traffic where the consignments can be sorted and bundled. It can be a stand-alone platform as a single forwarder or an element in the logistics chain of a huge company. More common however is the integration into urban logistics network – this means that it is connected to a logistics center in the outskirts wherein it is used as a central urban, multi-company consolidation center.
- Truck Terminal – a truck terminal is a facility where goods are transferred between trucks, or trucks and railroads.

- Dry Port – bonded inland logistics facility site (with customs office) distant from seaports and borders (in some countries including Japan, it is called an inland depot).
- Depot – is mostly a private warehouse or facility where commodities are stored and distributed from.

(3) Rationalization in Location of Logistics Centers

Location is a key factor for all the transport operators whose main activity is moving freight from one place to another using different modes of transport. Therefore, selecting the location is very crucial indeed. It should be noted also that assuring fluidity between all the transport connections and coordinating all the transport modes are some of the tasks of a logistics center.

In Egypt, the industrial areas of 6th of October and 10th of Ramadan are two good candidates for location of logistics centers. The existence of industrial area in both cities is guaranteed to generate freight traffic. In addition, these industrial areas are close to the GCR, which means that a LC in these areas could serve the incoming/outgoing freight.

The demand forecast in Chapter 3 illustrates that the most important routes in the future will be (i) Alexandria – Cairo – Upper Egypt and (ii) Damietta – Cairo – Upper Egypt. In addition, the GCR, which includes 6th of October City and 10th of Ramadan City is the central attraction of freight and the success of logistics facilities will largely depend on how they will be useful for moving freight to/from the capital. Normally, the logistics center is put at the heart of main freight traffic and 6th of October is an ideal location to capture the Alexandra – Cairo – Upper Egypt freight traffic while 10th of Ramadan is a good candidate to serve Damietta – Cairo – Upper Egypt and other freight traffic coming from other major ports on the east delta. Table 4.7.1 summarizes the advantages of the two candidate locations.

Table 4.7.1 Major advantages of 6th of October and 10th of Ramadan as Location of LC

Location	Advantages
1. 6th of October	(i) existing industry in the area or in close proximity of existing market
	(ii) close to GCR
	(iii) strategic location where freight traffic cross from Upper to Lower Egypt (west delta) and vice versa
	(iv) good access to all ports particularly Alexandria port
2. 10th of Ramadan	(i) existing industry in the area or in close proximity of existing market
	(ii) close to GCR
	(iii) strategic location where freight traffic cross from Upper to Lower Egypt (east delta) and vice versa
	(iv) strategic location being close to major ports such as Sokhna Port, Port Said Port and Damietta Port

Source: JICA Study Team

To prepare the ports of Egypt for the emerging changes in port operation and in order to further generate port traffic, logistic centers should also be considered at hub ports. These days, the commercial success of a port could stem from a productivity advantage in traditional cargo-handling service, from value-added services, or from combination of the

two. Shippers and carriers select individual ports not only based on their cargo handling service capabilities, but also on the benefits they are capable of "delivering". It is believed that the most successful ports are those that not only have productivity in cargo-handling services, but that also offer value-added services, which can be achieved by the logistics center.

Port Said Port is the strategic location for manufacturers, forwarders and other logistics service providers because of the zero deviation from the international trade route. However, Port Said Port (West) does not have enough space for a logistics center. Port Said Port (East) has the necessary space to accommodate such facility. Also, Port Said Port (East) has a good business environment because it has been designed to be a Special Economic Zone. The idea of a logistics center in this port is to prepare a space where all companies involved in logistics related business could be located. The concept of the logistics center of the Port of Barcelona (called Logistics Activity Zone) might be adopted wherein sophisticated logistics warehouses with easy access to different transport modes are constructed for rental. Of course, it should also be promoted that companies can build their own LC within the designated area.

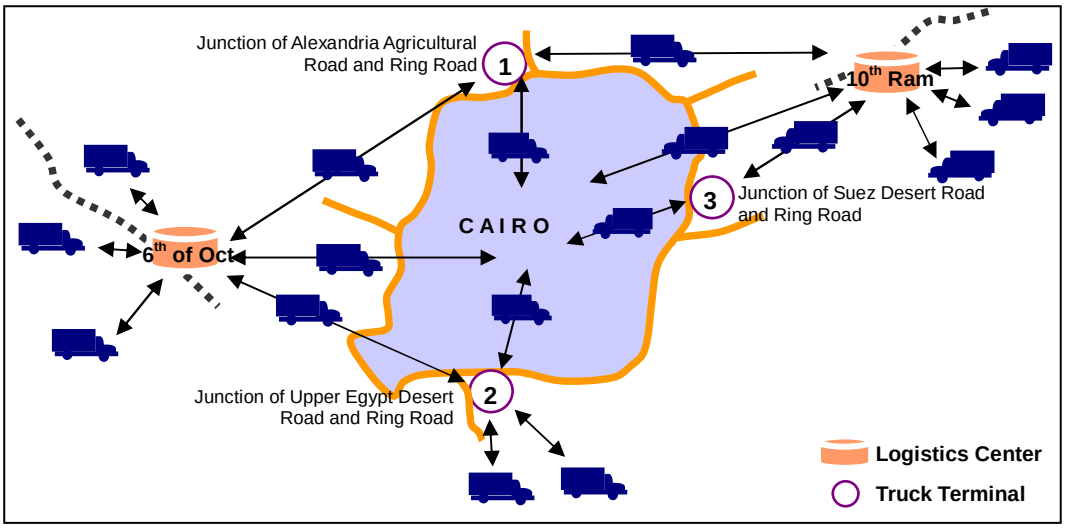
(4) Relationships of Dry Port, Logistics Center and Truck Terminal

It is necessary to distinguish the functions of the different logistics terminals recommended by other studies. For the purpose of review, the CREATS has recommended the construction of three (3) truck terminals near the ring road as shown in Figure 4.7.1. The first location is near Alexandria Agricultural Road. This terminal targets heavy trucks from Alexandria Agricultural Road and the road to Qanater. The second is near Upper Egypt Desert Road to service heavy trucks from that road and from Upper Egypt Agricultural Road, which could access the terminal via the regional secondary road. The third and final terminal is proposed near Suez Desert Road to accommodate the large number of heavy trucks on that road. Moreover, the CREATS recommended that detailed studies should be conducted to identify the optimal locations in terms of maximizing access possibilities and minimizing the negative impact on the environment.

The immediate purpose of the terminal is to serve as a simple *truck-stop* to accommodate heavy trucks that wait to access central Cairo. Most of these vehicles at present are parked randomly along the inter-city access roads, which creates a nuisance to other traffic. However, it is recommended that the function of each terminal should evolve to handle a cargo transfer function where cargo is transferred between heavy trucks and light trucks. The terminals would target domestic freight to the GCR.

The dry ports, as well as three (3) truck terminals around the ring road, planned by the CREATS have different functions to fulfill to improve the logistics efficiency in Egypt. Dry ports for instance are of prime importance to promotion of import and export by absorbing some containers that would otherwise be processed at the seaports. On the other hand, the truck terminals are designed to assist trucks having difficulty accessing inner Cairo due to the truck ban.

As shown in Figure 4.7.1, the different logistics terminals can complement the functions of each other thus enhance their role in the logistics system. Value added logistics activities and customs formalities for instance would be administered at the logistics center. Released containers from the LC can then be directed to the truck terminals for delivering and transfer to smaller trucks. Other companies might perform their consolidation at the logistics center and then trucks exempted from the ban might deliver the freight straight to Cairo.



Source: JICA Study Team

Figure 4.7.1 Movement of Trucks between Freight Terminals

(5) Containerized Cargoes in 2022

The 23 or so planned dry ports in Egypt scattered all over the country are primarily designed to support the foreign trade of Egypt. At present, only a few are operating and once all start to operate, they will be capable of handling more than 2 million TEU of containers for export and import.

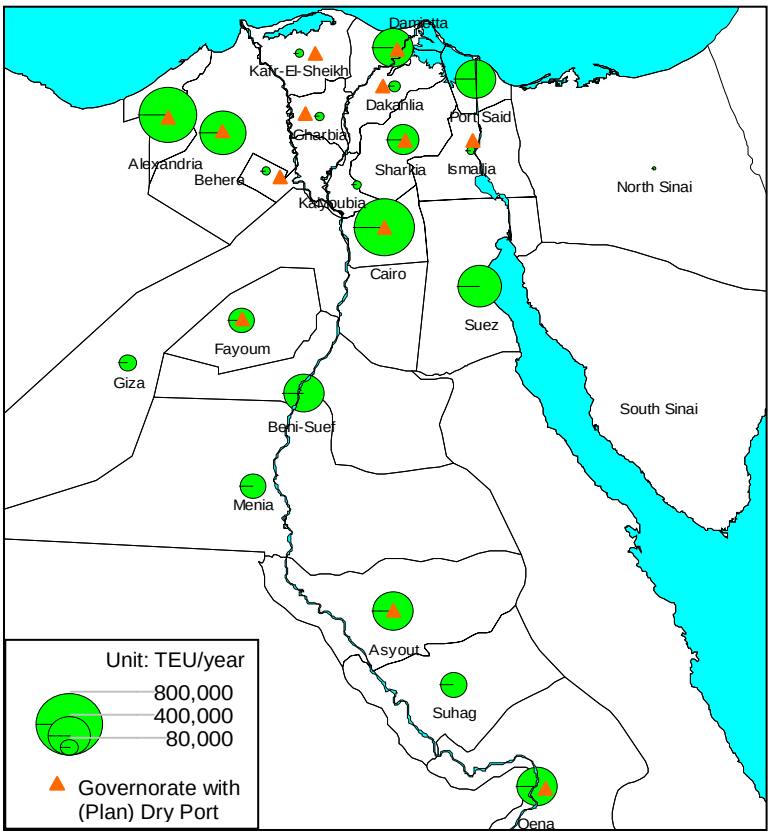
Locations of containers for export and import can be determined using the future OD matrix in Chapter 3. Moreover, it is possible to calculate the volume of containers per zone (governorate) by converting the future transport volume in the demand forecast into TEU. There is around 66 million tons of containerized cargo projected in 2022 for export and import to move inside the country. Roughly assuming that the weight of 1 TEU is equal to 10 tons, there will be more than 6.6 million TEU of containers to be transported by road, railway and IWT in 2022.

The Greater Cairo Region will remain the prime origin and destination of such containers and will be followed closely by Alexandria. In “Development of Container Transport to Support the Foreign Trade of Egypt (Civil Engineering Studies and Researches Center, Faculty of Engineering, Cairo University, 2001)”; nine (9) dry ports were identified within the GCR for future development (until 2020) with a total handling capacity of 1.2 million TEU. The JICA Study Team projected that around eight hundred thousands TEU will have its origin/destination in the GCR by 2022. As such, it can be said that the GCR will

be over supplied with dry port infrastructures. Moreover, these eight hundred thousands TEU are not all expected to be handled at the dry ports since some customers will still prefer to use the seaports. Ability to attract containers by each dry port will largely be determined by the level of service available at the facility and its connectivity to major ports.

All planned dry ports should have the end-objective of evolving them into logistics centers in different sizes based on the demand of the area. Thus, land area, available transport modes and other important factors required to such facility should be considered from the beginning. Since LCs should be served by at least two modes of transport (i.e. road and rail, road and IWT), dry port construction should not be promoted when the area is out of reach by these different transport modes. Of course exemption is made when it is judged that the facility is extremely beneficial or future transport plans will somehow reach the dry port location.

Construction of several dry ports within one industrial area is against the concept of LC where one of the objectives is to promote synergy by bringing together the flow of freight into a single area and concentrating all logistics activities. It should be noted that concentration of transport and logistics activities in a larger area is more convenient and efficient than several smaller logistics facility (dry port) scattered over the territory. With that policy, some dry port plans will fade out.



Source: JICA Study Team

Figure 4.7.2 Container Volume for Export and Import per Governorate (2022)

From the figure above, it is obvious that in the future there will be some governorates that need to have dry port because of growing volume of freight and to assist logistics activities. These governorates are Beni Suef and Aswan. Table 4.7.2 shows the list of governorates with plans to build dry ports as well as a list of governorates where dry ports are deemed necessary.

Table 4.7.2 Governorates with Dry Port Plans

(Unit: TEU)

No.	Governorate Name	Dry Port Capacity (2020)
Governorate with Dry Port Plan		
1	Greater Cairo (Cairo,Giza,Kalyoubia)	1,238,010
2	Alexandria and Matrouh	1,373,239
3	Sharkia	65,908
4	Dakahlia	83,890
5	Damietta	30,418
6	Ismailiya	61,318
7	Menoufia	48,402
8	Gharbia	89,440
9	Kafr-El-Sheikh	33,192
10	Behera (South)	53,472
11	Fayoum	55,768
12	Asyut	91,731
13	Qena	58,451
Governorate needing a dry port in the future		
14	Beni-Suef	367,000*
15	Aswan	183,000*

Note* Total generation/attraction of the two governorates based on JICA Study Team's estimate for year 2022

Source: Dry port capacity is based on the "Development of Container Transport to Support Freight Trade of Egypt, TPA, 2001

(6) Functions of 6th of October Logistics Center and 10th of Ramadan Logistics Center

As mentioned, the 6th of October City is a good candidate location for a LC and its size will be determined by demand. Currently there are two existing dry ports, SOSDI and the 6th of October Dry Ports. Both are of medium size with the former having a size of 12 hectares while the later a size of 29.4 hectares. LCs in Europe for instance have an average of 100 hectares according to a study entitled "State of Freight (the UK Department of Transport, 2003)". This vast land is occupied by customs infrastructure, postal/bank/insurance services, offices, multimodal terminals and different types of warehouses. These warehouses can be general warehouses for storage, large warehouses for logistics activities, warehouses with railroad interchange, warehouses with raised docking bays, and air-conditioned warehouses.

The 10th of Ramadan city also has a dry port and unlike the two dry ports of 6th of October, space is available for expansion. Therefore, expanding the existing one into a logistics center is preferable so that the existing infrastructure can be used to reduce the cost of building.

The envisioned function of the LC in both cities is shown in Table 4.7.3. Complete functions of an LC depending on the categories which are based on the scope and

extension of logistics activities is shown in Table 4.7.4.

Table 4.7.3 Proposed Function of Logistics Centers

Item	Logistics Center	
	(1) Distribution Center	(2) Dry Port
Objectives	Optimization of logistics operation, traffic reduction of GCR	Modal shift, decongestion of containers at sea ports
Function	Warehousing, distribution, truck terminal	Customs clearance, import/export control

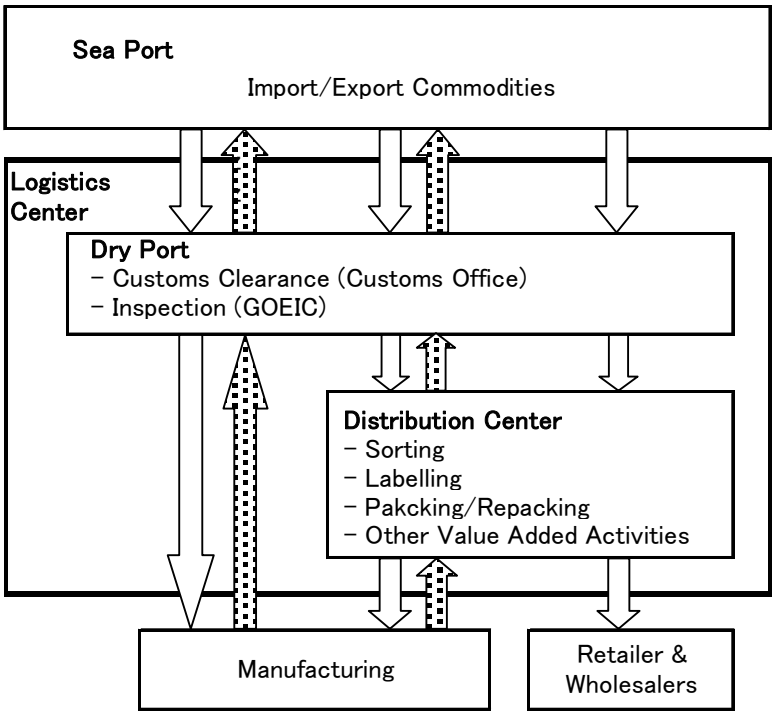
Source: JICA Study Team

Table 4.7.4 Logistics Center Evolution

1960s-1970s	1980s-early 1990s	Mid 1990s –present
		Materials management, Distribution Services, and (national/global).
	Bonding	Import clearance, Bonding, and Inbound transportation.
Receiving	Receiving Cross-docking	Receiving, and Cross-docking,
Storage	Storage	Storage, Inventory management and control, and Shipment scheduling.
Order processing Reporting Picking	Order processing EDI Reporting Picking	Orders processing, EDI Reporting, and Picking.
Order assembly (Re)packaging	Order assembly (Re)packaging Stretch-shrink-wrapping	(Product)subassembly, Order assembly, (Re)packaging, and Stretch-shrink-wrapping.
Palletizing/unitizing Label/mark/stencil	Palletizing/unitizing Label/mark/stencil	Palletizing/unitizing, and Label/mark/stencil.
Shipping Documentation	Shipping Documentation Outbound transportation	Shipping, Documentation, Outbound transportation, Export documentation, FTZ operation, JIT/ECR/QR services, Freight rate negotiation, Carriers/route selection, Freight claims handling, Freight audit/payment, Safety audits/reviews, Regulatory compliance review, Performance measurement, Returns from customers, and Customer invoicing.

Source: Ernst F. Bolten, Managing time and space in the modern warehousing, Amacom, 1997

The logistics center will receive containers coming from any port via the proposed railway line. Containers cleared at the seaports will be directly admitted to the distribution center while containers that need clearance will be detained at the dry port area of the logistics center. Figure 4.7.3 illustrates the trucks and containers movement inside the LC. As can be recognized from import procedure there are two types of flow. The first type is to deliver commodities direct to the factory after the customs clearance declaration such as is the case now with the Nissan Factory in Egypt. The second type is to deliver the commodities, after customs clearance, to the distribution center where sorting, labeling, etc. are undertaken. Then, commodities are delivered to retailer stores, wholesalers, factories, etc., such as delivering to a series of supermarket stores. On the other hand, Figure 4.7.4 shows the dry port plan that can be constructed to function as a dry port only or can be expanded to become a LC with more comprehensive functions.



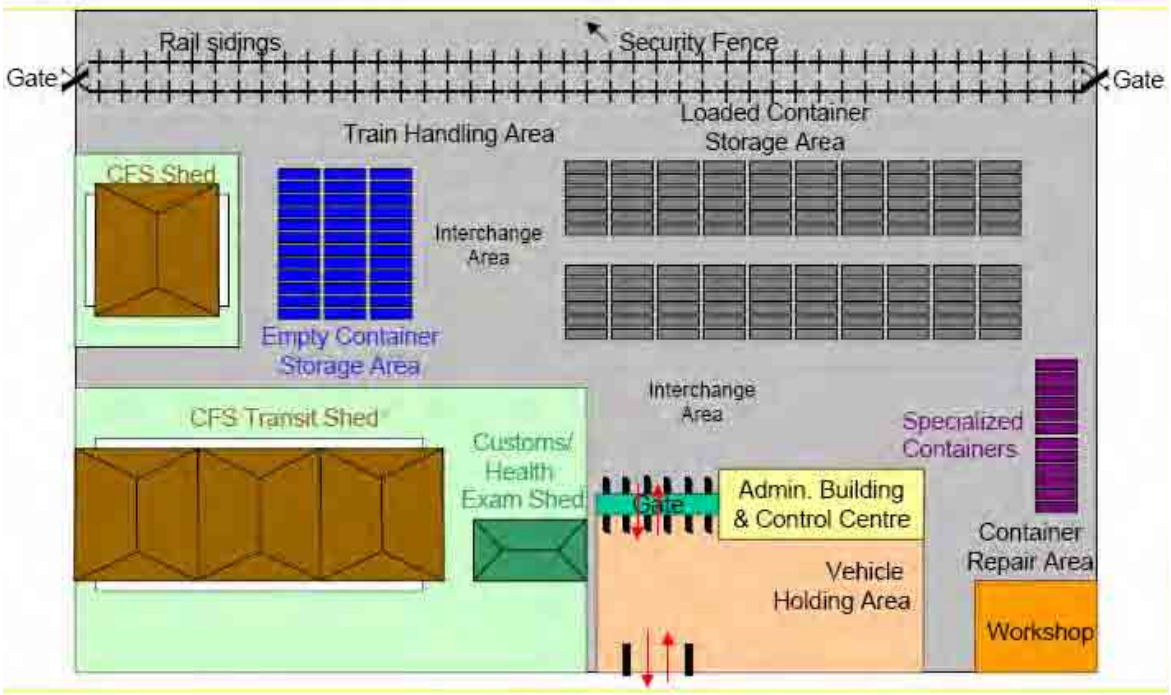
Source: JICA Study Team

Figure 4.7.3 Trucks and Containers Flow at the Logistics Center

Role of Inland and Dry Ports Authority

To activate this important sector within the inland logistic facilities, cooperation of several government agencies as well as private sector is indispensable. The Inland and Dry Ports Authority should lead the promotion of this sector. The authority's main functions would include:

- Land acquisition,
- Legal arrangement,
- Mechanism for fund allocation,
- Assignment of Customs Authority and GOEIC personnel, and
- Selection of company to operate the dry port.



Source: Handbook on the Management and Operation of Dry Ports, UNCTAD, 1991.
Note: This can be a model layout of the logistics center in Egypt.

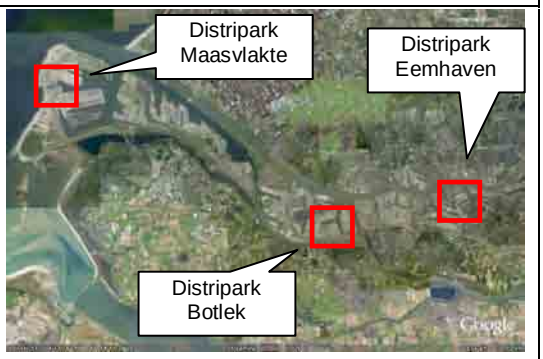
Figure 4.7.4 Dry Port Layout That Can Be a Part of a Logistics Center or a Stand Alone Facility

Source: www.big-bremen.de

Photo Example of a Logistics Center (Bremen Logistics Centre)

(7) Functions of Port Said Port (East) Logistics Center

Nowadays, ports around the world compete severely with each other to attract more containers. The advanced ports continuously emphasize the function of logistics centers mainly due to the high degree of global production and the need for value added logistics (VAL) services. Some ports, especially hub ports, provide customers with additional services such as logistics centers in order to increase the number of containers. For example, Port of Rotterdam has three logistics areas, namely, Maasvlakte (125 ha), Botlek (86 ha), and Eemhaven (35 ha). Port of Barcelona on the other hand has a Logistics Activity Zone (ZAL) where all logistics services providers are located in one designated area. Layouts and brief descriptions of these logistics centers are provided below.

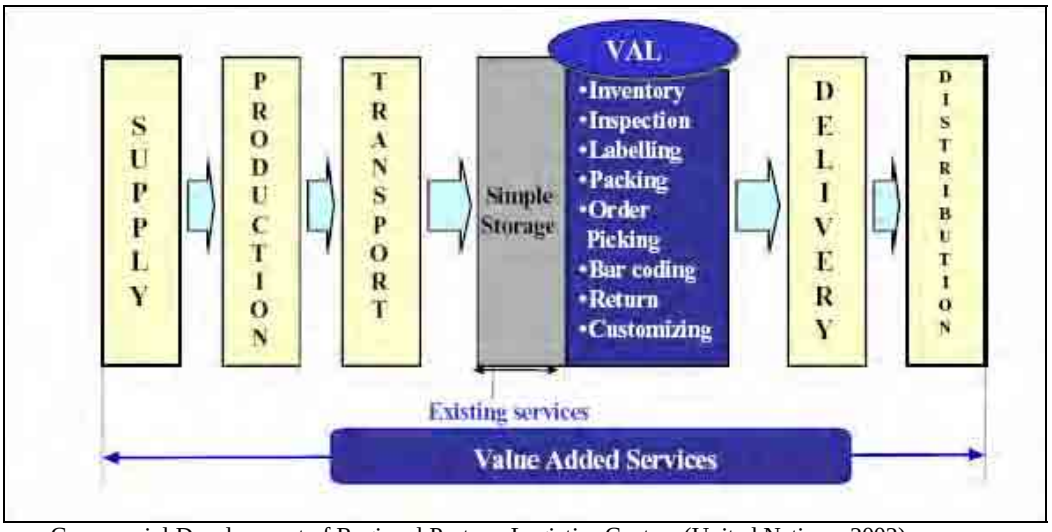
Port of Barcelona ZAL	Port of Rotterdam Distripark
	
The Port of Barcelona Logistics Activities Zone (66 ha) is the intermodal logistics platform of the Barcelona port area, and its mission is to help the port to generate more maritime traffic by offering value added logistics services for goods. The ZAL is the home of the best Spanish and international freight forwarders, logistics companies and businesses related to foreign trade. Because of its mission to help the port of Barcelona to grow and to become the Euro-Mediterranean's leading logistics hub, all these companies must generate maritime traffic. The total activity of these clients generates movement of two million and a half million tonnes of goods annually. The ZAL offers rented logistics warehouses with a high quality design and finish, located in an intermodal environment. It does not only deal with this real estate management, but also provides services aimed at warehouses, companies and especially at the people who work in them.	Distripark Maasvlakte (125 ha), Distripark Botlek (86 ha), and Distripark Eemhaven (35 ha) is designed to centralize large-scale distribution activities. Frequent trains, lorries and barges connect the port with all the continent's important economic centers. Several world-class logistics service providers are already established here. Customers are mostly manufacturers wishing to set up their own European Distribution Centers; mega-carriers wishing to further penetrate the logistic chain; mega-distributors that want to set up a maritime hub for their European operations; other (global) logistics service providers and European exporters seeking to create a maritime export hub.

It is important therefore to provide logistics centers at hub ports in Egypt. The JICA Study Team understands that Sokhna Port included a logistics center in their master plan. This is a very clever move to increase the attractiveness of the port for the customers and it will solidify its position among the leading ports in the Red Sea.

Port Said Port (East) should therefore also be equipped with a logistics center to provide comprehensive services to customers. As mentioned earlier, it is important to shift the

function of the port from merely cargo handling and storage into a variety of services. Figure 4.7.5 shows the VAL services expected by the customers at the logistics center in port area and therefore must be consciously provided at the logistics center in Port Said Port (East). The main VAL activities are:

- Receiving goods, breaking shipments, preparing for shipment, returning empty packaging,
- Simple storage, distribution, order picking,
- Customizing, adding parts and manuals,
- Assembly, repair, reverse logistics,
- Quality control, testing of products,
- Installing and instruction, and
- Product training on customer's premises.



Source: Commercial Development of Regional Ports as Logistics Centres (United Nations, 2002)

Figure 4.7.5 Value-Added Logistics (VAL) Services of a Logistics Center in a Port Area

4.7.2 Development of Railway and IWT Logistics System

(1) Railway Logistics System

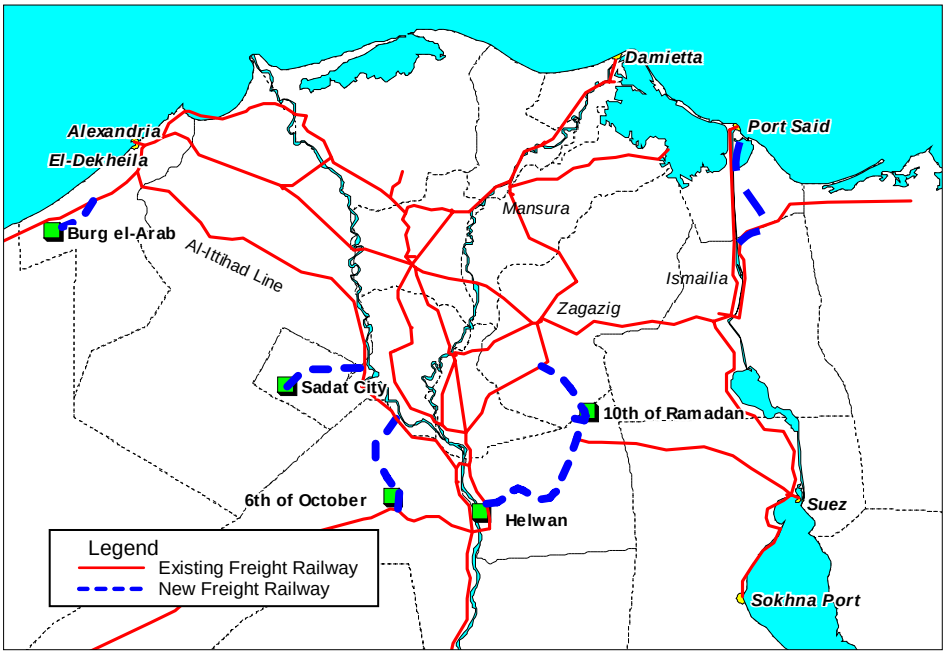
It is recommended that a freight railway network that connects major ports and industrial areas be developed as shown in Figure 4.7.6. This network would enhance the function of the logistics centers and the transit containers. Table 4.7.5 shows the preliminary judged priority levels of the proposed freight railway network. The two access links to 6th of October and 10th of Ramadan are of highest priority to support the future development plans of the two industrial zones in these new communities, especially with both of them provided with dry port facilities.

Table 4.7.5 New Sections and Access Links of the Freight Railway

Railway Development	Priority Level
(i) Introduce Service	
a. Bilbeis – 10th of Ramadan	Medium
b. 10th of Ramadan – Helwan (Maraziq Bridge)	Medium
(ii) Access Link to Industrial/Port Areas	
a. Burg el-Arab Access Link	Medium
b. Sadat City Access Link	Medium
c. 6th of October Access Link	High
d. 10th of Ramadan Access Link	High
e. Port Said Port (East) Access Link	High

Source: JICA Study Team

In a later stage of the plan, the industrial zones in cities of Sadat and Burg el-Arab shall be connected to the railway network. Details of each section and links to the freight railway lines are discussed in the succeeding section.



Source: JICA Study Team

Figure 4.7.6 Recommended New Sections and Access Links for Freight Railway Network

a) Newly Proposed Sections

The newly proposed major sections that compose important links in the network to increase its freight transportation function are presented in the following sections.

Bilbeis – 10th of Ramadan

For the direct access from Damietta Port to 10th of Ramadan industrial area, and then to other industrial areas south and west of Cairo, connecting the main railway line of Damietta – Bilbeis to 10th of Ramadan is an efficient option.

ENR has a preliminary plan in this regard to construct this section with a length of about 22 km to the city and another 8 km to the industrial area. A bridge over Ismailiya Canal is required in addition to a grade-separation structure at Cairo – Ismailiya Desert Highway.

10th of Ramadan – Helwan (Maraziq Bridge)

Providing this railway section will give easy movement for freight from East to West providing a major section in the proposed railway lines. Western areas of the River Nile include the major ports of Alexandria and Dekheila in addition to the industrial areas of Burg el-Arab, Sadat and 6th of October.

On the east of the River Nile, the freight railway serves mainly the Sokhna Port and the industrial area at 10th of Ramadan. It may serve also the freight movement from the Port Said and Damietta ports.

The alignment of this line is adjacent to the Regional Ring Road (some sections are under construction). Crossing the River Nile is achieved through the existing single-track line on Maraziq Bridge.

b) Newly Proposed Access Links to Industrial Areas and Port

Burg el-Arab Access Link

In order to integrate the existing and new urban, industrial and agricultural areas in the national socioeconomic infrastructure, ENR has a preliminary conceptual plan to connect the industrial area of Burg el-Arab to the national railway network for passengers. This new link has the objective of connecting the city of Burg el-Arab to Alexandria through the Matrouh Line.

This single-track section will be dualized for a length of 7.5 km; and extended for another 22.5 km to the industrial area south of New Burg El-Arab City. In addition, the signalization and communication system of the line will be developed, and the maximum speed will be 120 km/hr. The total preliminary cost is estimated about LE 750 million.

Sadat City Access Link

Being an industrial area, services of railway is indispensable to support the industrial production and easy movement of materials. To connect the industrial area of Sadat City to the railway network, ENR has a preliminary conceptual plan for a 35 kilometer railway access link that branches from Eitai El-Baroud – Imbaba Line at KM 66+700. It will cost about LE 120 million excluding the cost of land acquisition (mostly desert land). It may be extended, for another 13 km in agricultural land, in the future to cross the River Nile to Minuf City in Delta.

6th of October Access Link

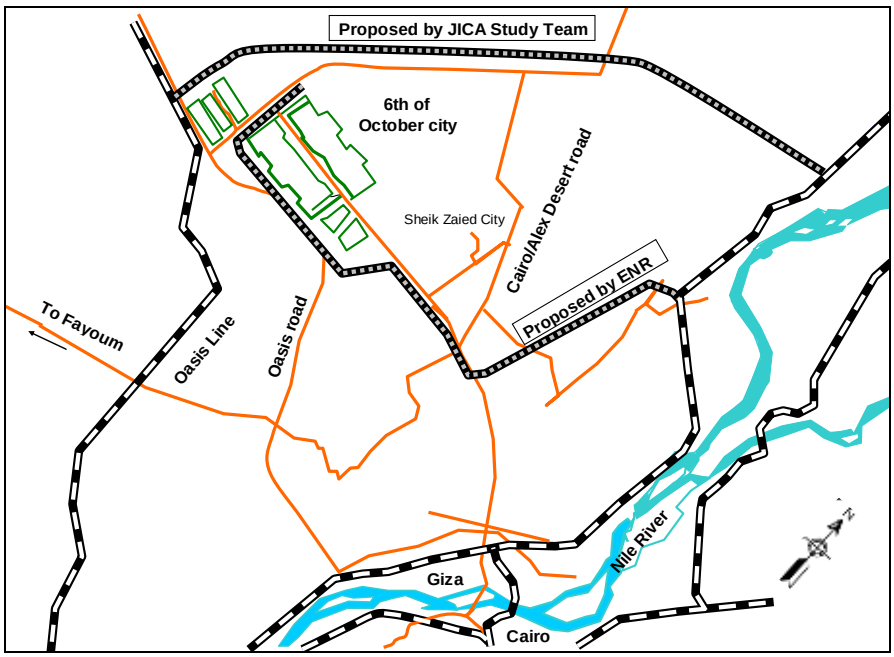
The industrial area of 6th of October City is located on the northern side of the Oasis Highway, while the Oasis Railway line is running on the other side of the highway without direct access. Oasis Railway may provide good access to major ports and industrial areas East of Cairo after the construction of the section between 10th of

Ramadan and Helwan. On the western side, the connection with Alexandria Port can be achieved indirectly through a long trip via the Oasis Line.

To provide a shorter trip with direct access from Alexandria Port to 6th of October, ENR has a draft plan for passenger and freight link branches from Eitai El-Baroud – Imbaba Line at KM 27+100 to Sheikh Zaid City first, then to 6th of October. This link passes through agricultural lands and built-up areas that require a high land acquisition cost and mitigating measures to mitigate the expected negative social impacts. This line has a total length of about 38 km with an estimated cost of about LE 388 million including about LE 200 million as land acquisition cost.

For a better, direct and smooth access it is recommended to start this branch link at Barkash to 6th of October. The total length of this recommended link is about 24 km that runs mostly in desert land.

Figure 4.7.7 shows both lines proposed by ENR and by the JICA Study Team to give freight direct accessibility to the industrial area of 6th of October City.



Source: JICA Study Team

Figure 4.7.7 Access Link to 6th of October Industrial Area

10th of Ramadan Access Link

The nearest railway station to the industrial area of 10th of Ramadan City is Al-Robeki Station on the Suez – Ain Shams Line. ENR has a preliminary plan for this access link between Robeki to the industrial area with a length of about 12 km, mostly through desert land. This access link will directly connect this industrial area not only to Sokhna Port via Suez, but also to Port Said Port (West) via Suez and Ismailiya. At the industrial area, this link can be connected to the proposed section coming from Bilbeis that provides direct access to Damietta Port.

Port Said Port (East) Access Link

Lately, Port Said Port (East) container handling volume has been increasing significantly (7,000 TEU in 2005 and 1.6 million TEU in 2006) and therefore there is an increasing need to provide an efficient rail connection from the port to the main railway network.

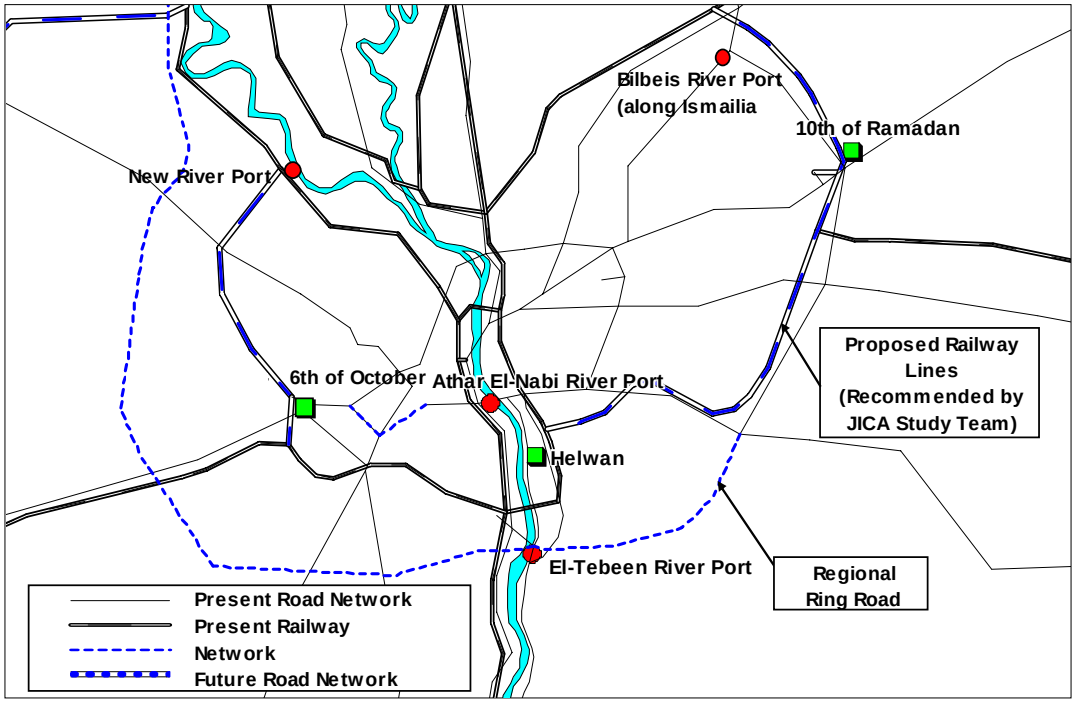
ENR has made initial efforts to connect this port by constructing a new railway line. This line is not yet operational due to some remaining works such as installation of the communication system. Moreover the line assumes to use the Ferdan Swing Bridge, which is maintained and controlled by the Suez Canal Authority, and therefore prior arrangement between ENR and the said authority is necessary to harmonize operation. At present, the bridge is open daily, once in the morning and once in the evening with three hours for each opening.

Due to its increasing importance Port Said Port (East) should be provided with a railway service and the line should be extended from Balooza station up to the port yard. As mentioned the line, which would cost around LE 900 million and would run mostly on a desert land, would have a total length of 60 km.

(2) IWT Logistics System

Currently, the RTA is working on developing the river transport infrastructure which includes improving the efficiency of navigable waterways, connecting river ports with sea ports, improving canal locks, and making the river transport navigable for 24-hrs per day. Promotion of the construction of river ports through participation of the private sector is also being introduced as a policy to make IWT an active logistics player. Two locations as shown in Figure 4.7.8 are being endorsed for construction of river ports.

As far as containerized freight cargo is concerned, the GCR remains the ultimate destination of most of containers arriving at the seaports and it is also the main origin of containerized export freight. However, at present, there is no practical river port along the River Nile with the ability to handle container cargo. Therefore, it is necessary to provide such a logistics facility within the GCR to shift some freight traffic from trucks. Based on this background, the following recommendations are considered:



Source: JICA Study Team

Figure 4.7.8 Location of Proposed River Ports for Construction

a) Athar El-Nabi River Port

Construction of this river port is an important step to realize container transport in the River Nile. This port can serve as an opportunity to demonstrate successful container operation using the River Nile.

The location of Athar El-Nabi has many advantages. First, it is very close to the regional ring road thus trucks will not be affected by the truck ban in accessing the port. The ring road will serve as the artery to distribute/collect containers. Second, it is close enough to the industrial areas of Helwan, El-Tebeen, 6th of October city and even 10th of Ramadan city. Therefore, with complete facilities and efficient management, the port can serve as a distribution hub for these industrial areas. Third, it is located at the border of the GCR and therefore it can also serve as a distribution center for freight coming/going to the GCR if the current space will allow developing a warehouse where value-added logistics activities can be done.

Source: Worked out by JICA Study Team based on Google Map

Figure 4.7.9 Location of Athar El-Nabi River Port

b) El-Tebeen River Port

This port is located at the southern part of Cairo on the upper stream of River Nile as shown in Figure 4.7.8. At present, the port is serving as refueling station for barges owned by the General River Nile Company (Figure 4.7.10). If this port is developed to handle container cargo, this can serve the industrial areas of El-Tebeen and Helwan. To expand its function and make it accessible to containers coming/going to the 6th of October city, it is recommended to construct the regional ring road, which was identified by GOPP as an important future project. Effectiveness of El-Tebeen River Port will largely depend on the completion of this important artery.

Source: Worked out by JICA Study Team based on Google Map

Figure 4.7.10 Location of El-Tebeen River Port

c) New River Port (near 6th of October)

This port is to be located at the northern part of Cairo on the lower stream of the Baharia Canal as shown in Figure 4.7.8. The exact location of the port should be made with respect to the alignment of the Regional Ring Road or other major arterials to support multimodal transfer of containers from IWT to road transport.

d) Bilbeis River Port (along Ismailiya Canal)

This river port is located along the Ismailiya Canal and has potential to serve Port Said Port (West) and Suez Port as well as freight coming from Upper Egypt and going/coming to/from 10th of Ramadan City. The Ismailiya Canal however is currently not suited for navigation and dredging and development of locks are necessary to make it operational.

4.7.3 Recommended Project List

Table 4.7.6 shows the recommended projects below:

Table 4.7.6 Summary of Recommended Projects & Programs/Studies

Sector	Recommended Project
Railway	- 6th of October Direct Access Line Construction Project, - Burg El-Arab Access Line Construction Project, - Sadat City Access Line Construction Project, - 10th of Ramadan Direct Access Line Construction Project (Bilbeis - 10th of Ramadan), - 10th of Ramadan – Helwan (Maraziq Bridge), - Railway Improvement Project (Ferdan – Port Said Port (East), and - Installation of Reefer Container Project.
River	- New River Port Construction Project near 6th of October.
Logistics Center	- Logistics Center Development Project (6th of October), - Logistics Center Development Project (10th of Ramadan), and - Logistics Center Development Project (Port Said East).
Dry Port	- Dry Port Development Project (17 location).

Source: JICA Study Team