Lattakia Port General Company

Tender for the Management and Operation of the Container Terminal at Lattakia Port

Background Information

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1 Background

Programme No. SYR/05/019 “Modernizing of Syrian Seaports (Lattakia)” of UNDP United Nations Development Programme intends to support the ongoing efforts of the Ministry of Transport to develop and modernize seaports including streamlining the related work process, to improve maritime safety/security and marine environment protection by further strengthening its Maritime Administration, to conduct a study on the expansion of Lattakia port, to facilitate maritime trade, and to upgrade its maritime training and education system **(Development Objective)**. These activities will be initiated through the Preparatory Assistance Phase which will concentrate on most urgent steps. These can be summarized around five lines of action:

I. To carry out a thorough assessment study for the development and modernization of Lattakia Port, as pilot port, aiming at identifying the activities and policies that need to be taken in order to upgrade the capacities of the port and enhance the efficiency of its management, operations, and functions in order to match the international standards and facilitate trade including transit and trans-shipment;
II. To plan and prepare specific training for the Maritime Administration on specific issues related to Maritime Safety and Security and Marine Environment Protection;
III. To support in the revision of the legal framework for issues related to the Facilitation of Maritime Trade (Customs regulations, Import regulations and Investment incentives);
IV. To conduct a study on the expansion of Lattakia Port;
V. To plan and prepare for the development of an enhanced “maritime transport education and training system”.

This Background Information is understood as integrated part of the Tender for the Management and Operation of the Container Terminal at Lattakia Port. The **specific objective** of this information is to give a concise background on the existing container handling activities at the Port of Lattakia as important component and first step of the preparation of tender documents for a management contract with revenue sharing. The information is intended to give an up-to-date overview on the situation of the Port with focus on container traffic so as to facilitate the understanding of interested bidders and stake holders involved and to speed up the process of tendering, tender evaluation and award.

2 The Port of Lattakia

2.1 Location and Importance

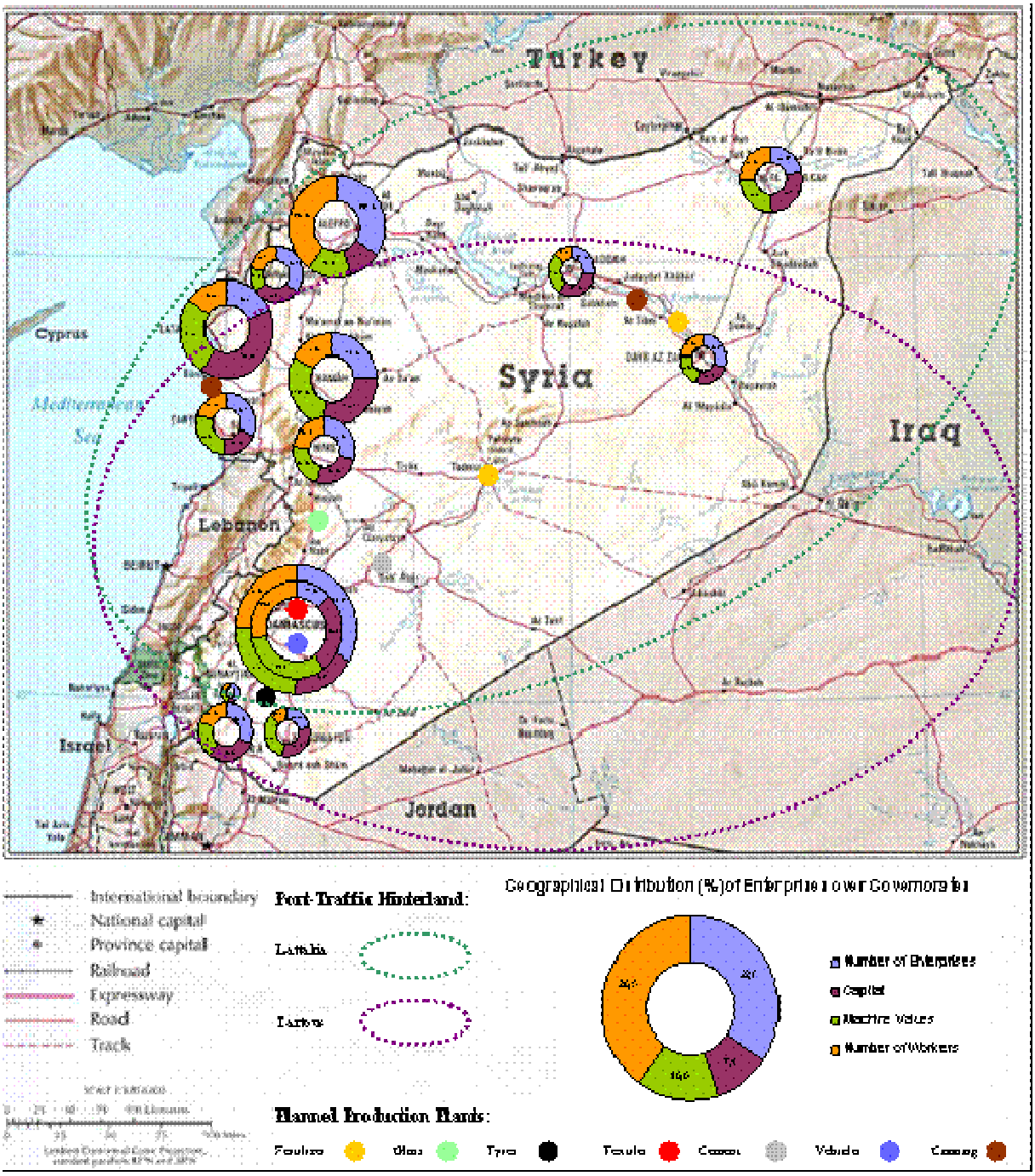
2.1.1 Location

Lattakia Port is located where the East meets the West at the Mediterranean coast at Lat. 35° 45’ East and Long. 35° 31’ North about 183 km S outh-West from Aleppo, the second largest city in Syria. The port is known since the Phoenician time, has a very long tradition and is the most important Syrian container port and one of the leading ports in the Region.
Because of its ideal location it has the potential not only to fully meet the National demand for imports and exports but also to serve as a hub for transit cargo to Jordan, Iraq and perhaps also to Central Asian countries.

Comparing total port throughput, the Port of Lattakia with about 8 million tonnes of cargo per year is the second largest port of Syria following the Port of Tartous with a total volume of about 12 million tonnes. However, at Lattakia about 90 % of the throughput is general cargo mainly containers, whereas in Tartous mainly dry bulk cargo is handled.

At Lattakia geographic, meteorological, oceanographic, hydrological and geological conditions are ideal for a port and do not imply any impeding factor on existing port operations or future development. The port has ample spare area for future expansion in Northerly direction.

Lattakia Port is operated by the Lattakia Port General Company, a commercially oriented enterprise with a reasonable degree of autonomy, reporting to the Ministry of Transport (MoT)



Source: Ministry of Industry, Damascus; LPGC Statistics Department, Lattakia, January 2007

Figure 2-1: Existing and planned enterprises in the hinterland of Syria's seaports

Judging by surface distance, Lattakia Port would reach a larger number of enterprises (see **Annex 2.1-1**) in its hinterland compared to Tartous Port. However, insufficient or incomplete transport connections (see **Figure 4-1**) at present favour Tartous Port. Similarly, production plants are planned to be located in closer reach to Tartous Port. Those plants earmarked to produce containerisable cargo (see **Annex 2.1-2**) will be established in and around Damascus, for which Tartous Port will keep its location advantage even after construction of

planned logistical infrastructure.

For the Syrian economy, transit trade has always been an important factor. Almost all ocean cargo arriving across the Mediterranean Sea and moving into Iraq is moving via overland trucking from the discharge ports of Mersin / Turkey; Lattakia and Tartous / Syria, Beirut / Lebanon; and Aqaba / Jordan. Shipments to Iraq utilize three transit corridors: Shipments with northern destinations go through Turkey, central destinations go through Syria or Lebanon-Syria, and southern destinations go through Jordan.

Ocean bound vessels with freight bound for Iraqi northern destinations call at the port of Mersin. Transshipment trucking from Adana is one day, plus 3 - 7 days trucking to final destination. Ocean shipments for Iraqi central destinations arrive into Aqaba and are sent through to Amman for distribution into Iraq. Transshipment trucking from Aqaba is one day, plus 4 – 6 days trucking to final destination.

As to passenger traffic, Syria is aiming to double its number of tourist visits by 2010: a Qatari company will develop a large holiday complex on the Syrian coast at Lattakia, including a large five-star hotel, villas, shops, a fishing area, and a handicrafts market, According to the Ministry of Tourism "this project is the first in a series in Syria and a second one will follow shortly." (Source: Middle East Times, Damascus, 19 February 2007)

2.1.2 Hinterland

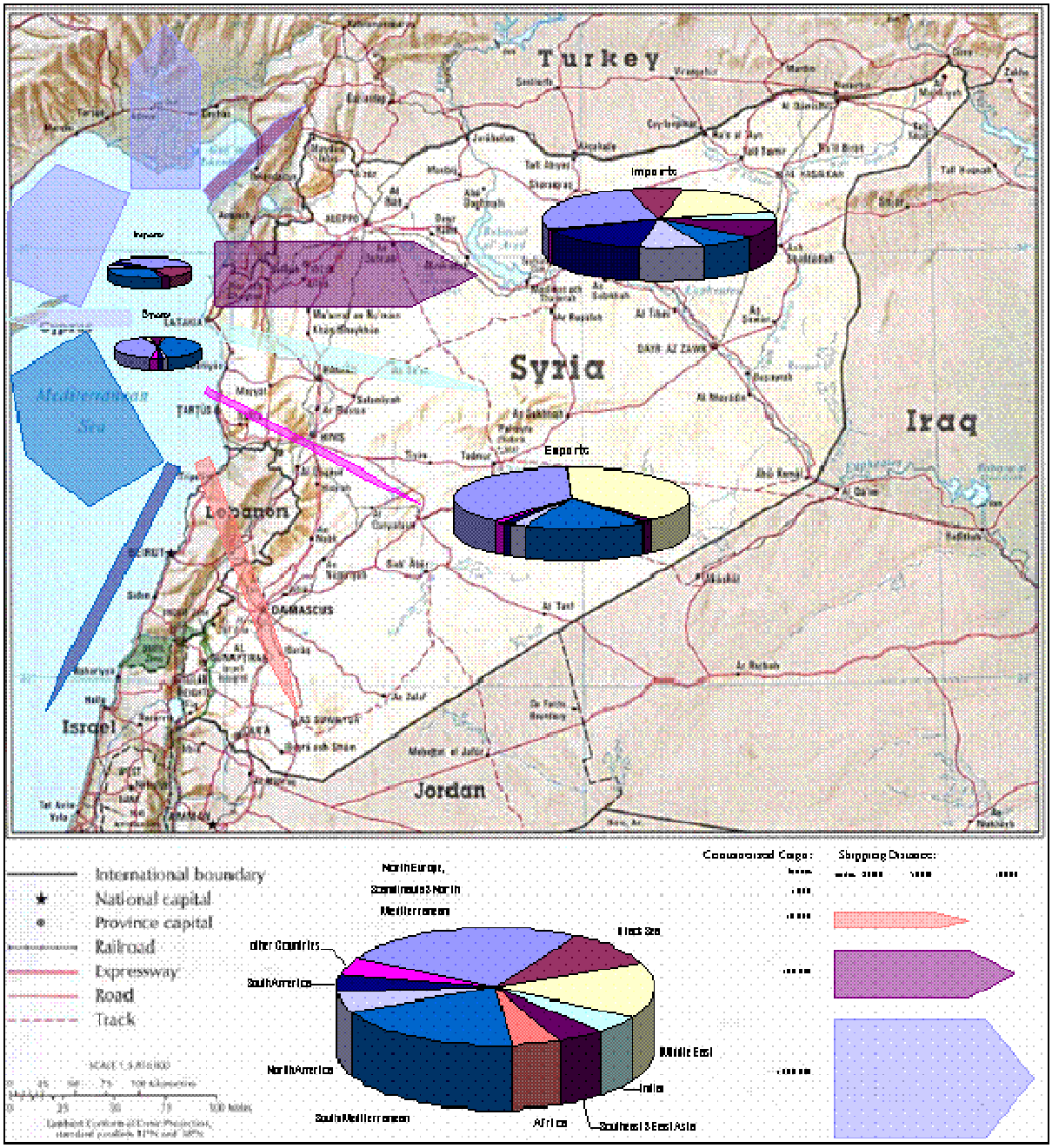
The major hinterlands of the ports of Lattakia and Tartous are the northern and the southern parts of Syria respectively, although there is overlap, particularly in the Damascus area which is a major hinterland of both ports, Lattakia and Tartous. Aleppo, Lattakia, Idleb, Al-Hassakeh and Al-Raqqa are principal local cities in the northern part. On the other hand, Homs, Hama, Dara'a, Tartous and Palmyra are principal local cities in the southern part.

Following graph indicates the geographical distribution and importance of Syria’s major industrial centres – as most important points of demand and supply - and the hinterland of the two ports.

2.2 Port Traffic

Syria’s economy relies heavily on commodities imported as bulk cargoes, and similarly exports products mainly in the form of bulk cargoes. The historical trend of nationwide trade volumes through Lattakia Port is shown in **Annex 2.2-2**. Remarkable are the fluctuations in transit trade through Syria, whose levels strongly depend on political and security developments. **Annex 2.2-3** indicates the regions of origin for Syrian imports and of destination for the country’s exports. It appears that the proportion of cargoes handled in Syria’s ports (trade with EU countries, other European countries, American, African and other countries) is on

the decline on account of increasing trade relations with Arabian and Asian countries. Finally, **Annex 2.2-4** illustrates Syria's exports from other Arab countries whose proportion handled in Syria's ports fluctuated heavily during the investigated years 2003 to 2006.



Source: Ministry of Transport, Damascus; LPGC Statistics Department, Lattakia, January 2007

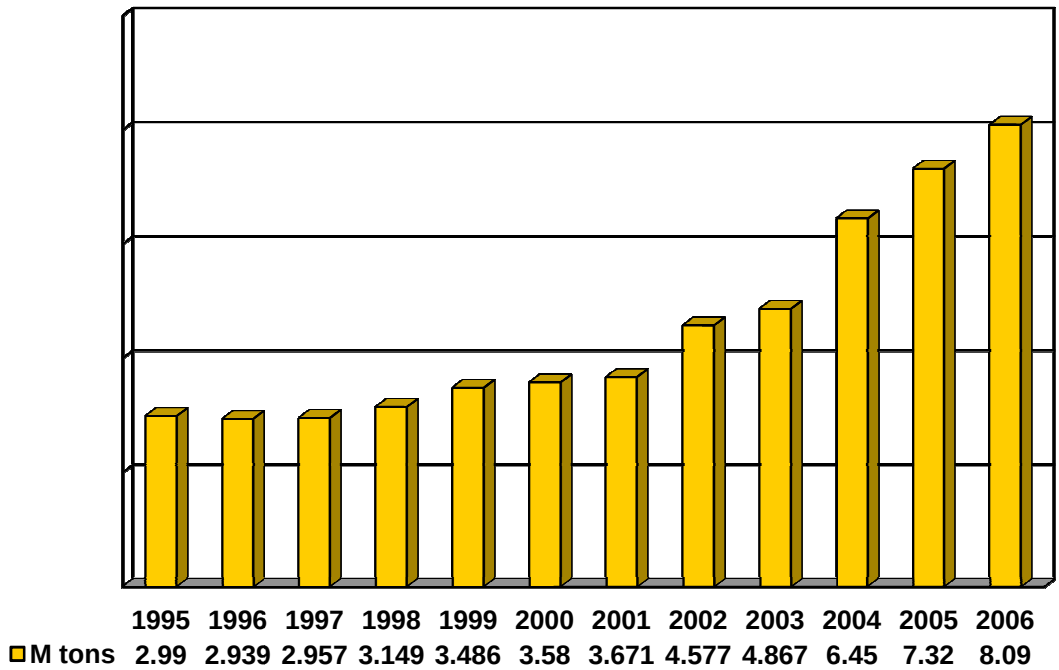
Figure 2-2: National against maritime trade, by origin and destination 2005

Phosphate rock, cotton and other agricultural products such as barley are major export commodities. Phosphate rock produced mainly in and around the Palmyra district is exported

through Tartous Port. Fertile farm lands are predominantly located in the districts of Aleppo, Al-Hassakeh and Al-Raqqa in the northern part of Syria, and crops produced there - including cotton - are exported mainly through Lattakia Port.

Both ports are used to discharge mainly general cargo. A major portion of steel products passes through Tartous Port including intermediate products such as billets which are delivered to the iron and steel making factory in Hama. On contrast, a great portion of containers passes through Lattakia Port (see **Annex 2.2-5 and 2.2-6**). However, the containerization rate has not yet risen above 60% for all cargoes, and has just reached some 85% for containerisable cargoes. Hence, the containerization rate for the year 2016 is estimated to reach 63% for all cargoes (90% for containerisable cargoes), for the year 2026 it is projected to remain below 70% for all cargoes (below 95% for containerisable cargoes).

As to be seen from **Figure 2-3** and **Figure 2-4** the Port experienced a steady growth in container throughput over recent years. A further future growth detailed in **Section 4.2** is now challenged by the new concession granted for the container terminal at Tartous Port that becomes operational on 01. 04. 2007.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
M tons	2.99	2.939	2.957	3.149	3.486	3.58	3.671	4.577	4.867	6.45	7.32	8.09

Figure 2-3: Overall Cargo Throughput 1995 - 2006

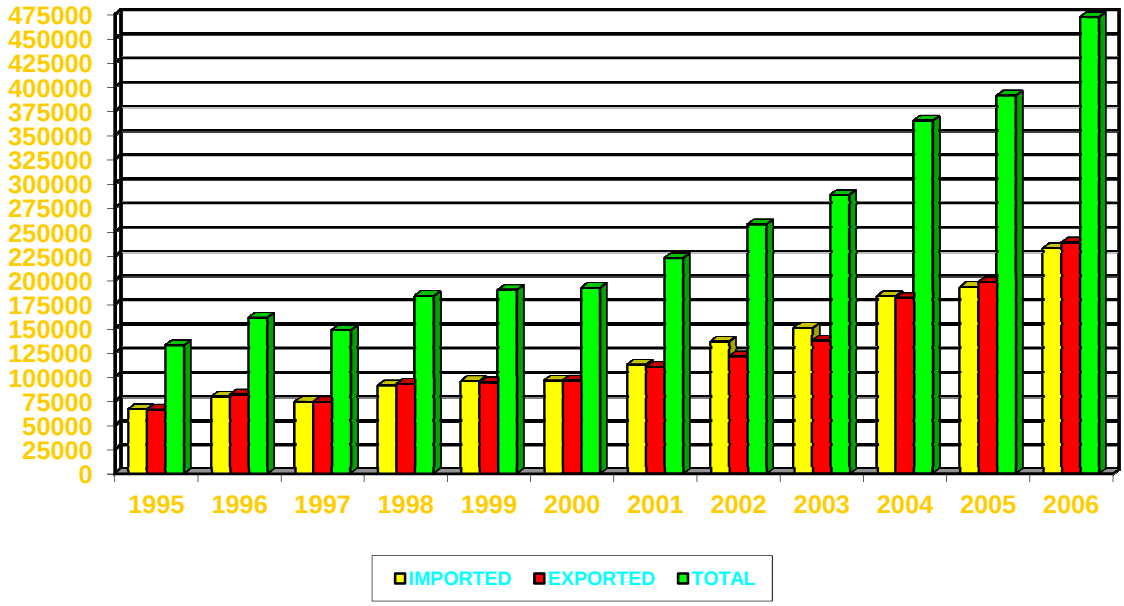


Figure 2-4: Container Throughput per 1995 – 2006

In 2006 the container throughput per berth was as listed in **Table 2-1** below. After the concession or management contract for the terminal becomes operational, container handling will be concentrated at Berth Nos. 12, 12A, 14 and 15, provided that the terminal operator is granted the exclusive right to handle full container vessels.

Table 2-1: Container Throughput per Berth 2006

Berth No.	Thoughput in TEU	%
6	69,000	15
12	30,000	6
12 A	45,000	9
14	160,000	33
15	166,000	35
Others	8,800	2
Total	478,800	100

In 2005 overall port traffic was as follows:

Table 2-2: Total Port Traffic 2005

Type of Vessel	Number	Total Cargo ('000 t)
Container	649	3,530
RoRo	131	360
Conventional	836	3,432
Total	1,616	7,322

In 2006 there was a further increase in container traffic, as detailed in **Section 4.2**.

Port performance indicators such
- Throughput per berth,
- Ship waiting time / service time ratio,
- Berth occupancy and
- Ship and gang output per shift and day

do not exist, but are in preparation as part of the Port Operating System. Port users report that there are no longer waiting times for vessels and the Port arranges for prompt dispatch of vessels.

During the missions it could not be verified whether cargo handling norms as set up for the Ports of Tartous and Lattakia by a Government committee in 2000 as per **Annex 2.2-1** are fully applied. However, the impression from own random observations of cargo handling operations was that these norms are in general exceeded.

About 28 % of total imports mainly conventional cargo are delivered directly to truck. More than 95 % of the cargo is leaving the port by road. Rail cargo mainly consists of containers destined to Aleppo and steel cargo destined to Homs and other locations.

Based on the throughput during January to October 2007 the **total throughput in 2007** is estimated to be about **520.000 TEU**.

2.3 Port Infrastructure and Access

The layout of the present port facilities is annexed to this Report (**Annex 4.5-1**) As to be seen from this drawing Lattakia Port consists of an Inner Port Area, Old Port Area constructed between 1950 and 1970 and a new Port (named as 1st Stage Area) constructed 1979 – 1990).

The main port facilities are listed in **Table 2-3** below:

Table 2-3: Main Port Facilities at Lattakia Port

	Facilities	Inner Port	Old Port	New Port
1	Breakwater	-	1,400 m	1,730 m
2	Quays			
2.1	> General Cargo	270 m	630 m	-
2.2	> Grain (silo out of order)	-	185 m	-
2.3	> Container & RoRo	-	-	584 m
2.4	> Passenger (also containers)	-	240 m	-
2.5	> Small boats	805 m	-	-
3	Tansit Shed & Warehouses	22,000 m²	74,000 m²	34,000 m²
4	Open areas / container area	41,000 m²	96,000 m²	240,000 m²

A detailed list of existing berthing facilities is attached to this Report (**Annex 2.3-1**).

Due to the present congestion of the container terminal also in the Old Port containers are handled and stored.

Sea access to the Port and thus to the container terminal is excellent. Due to its location and the configuration of the breakwater, seaside access is one of the easiest in the Region. The approach channel with a leading light at 270° is ab out 1 nm in length and about 250 m wide. It allows two-way traffic and night navigation. Vessel manoeuvring is assisted by experienced pilots and tugmasters and takes only one hour each in and out.

In line with international practice berth allocation is done on a first-come / first served basis. Vessels with passengers, perishable cargo, RoRo and containers get berth priority as agreed upon in the daily berthing meeting with the participation of all stake holders involved.

Road traffic is directed through Gates No. 1 in the Old Port and No 4 in the New Port. When using Gate No. 1 port traffic accumulates with city traffic reaching critical traffic loads during rush hours. Therefore, a new 8 km two lane port access road is under construction enabling to by-pass the city and to direct link with the near-by high-way. It is also planned to construct a 400 m new road link to a fly-over near the Port Free Zone in order to separate the port traffic from the city traffic near Gate No. 4.

Lattakia is linked to the grid of National high-ways. A new road to Aleppo is under construction and due to be completed 2008. Typical road distances from Lattakia are:

Homs	183 km
Aleppo (new road)	178 km
Damaskus	340 km
Border to Iraq (Abukamal)	645 km
Border to Jordan (Der'a / Jabir)	450 km

The container terminal is linked to the network of Syrian **Railways** via a single line that extends from a marshalling yard behind the terminal to the old port, by-passes the Inner Harbour and exits near Gate No. 1. The distance to the nearest marshalling yard with about 6 km sidings is about 4.5 km.

At the terminal there is a rail inter-change with 1 siding that ends with 3 tracks directly at the terminal. This enables very short transport distances and fast turn-round of trains. Block trains arriving at the railway station are split into two units that are then shunted to the container terminal. After unlaoding and loading the units are again shunted to the railway station for onward transport.

Although the portion of rail transport is very small (less than 10 % of the total containerized cargo) it can be generally expected that the modal split will change in favour of rail transport in future. This would perhaps make it necessary to increase the rail inter-change capacity on the longer run. Rail distance to

- Aleppo is about 220 km and to
- Damascus is about 440 km.

Typical round-trip time is between 24 hours and 36 hours.

2.4 Terminal Superstructure and Installations

The following yards are used at present for the handling and storage of containers **(Table 2-4)**. Due to the lack of space and interference between ships and gate traffic as well as customs inspection and stripping and stuffing all areas are heavily congested. Therefore, also conventional open areas are used for temporary storage of containers.

It is pertinent to note that the areas listed in the Table are gross areas and that the net area that can be used for the stacking of containers will become smaller after the installation of the four ship-to-shore gantry cranes at Berths 14 and 15 and after the use of Harbour Mobile Cranes at Berths 12 and 12 A due to the change of terminal configuration and traffic flow. For details it is referred to **Section 4.4** below.

Table 2-4: Container Yards

Berth No.	Approx. Area ha	Throughput 2006 Container
Old Harbour		
5	4	70,700
Ist Extension		
13	2	27,000
14 A	3	99,700
14 B	7	123,400
14 C	5	33,600
Total	**21**	**354,400**

The construction of a new area at the former tank farm area of about 4.0 ha was almost completed during the survey and one area near the grain silo of about 2.6 ha was under re-construction.

Details on existing **covered storage** (CFS, transit sheds and warehouses) are listed in **Table 2-5** with a total area of about 42,000 m², whereas **Table 2-6** shows the **open areas** for conventional cargo and containers with a total occupied area of about 50 ha.

Table 2-5: Warehouses at Lattakia Port

No.	Typical Cargo	Floors	Length (m)	Width (m)	Area (sqm)
Old Port					
1	General	1	91	41	3,700
2	General	3	91	40	10,500
3	General	3	91	40	10,500
4	General	1	90	39	3,500
5	LCL cargo	3	96	32	10,100
6	LCL cargo	3	94	32	9,600
7	LCL cargo	1	92	32	2,600

No.	Typical Cargo	Floors	Length (m)	Width (m)	Area (sqm)
8	Unclaimed	1	100	32	3,200
9	LCL cargo	1	100	31	3,100
10	General store	1	103	31	3,200
11	Dangerous goods	1	80	21	1,700
12	LCL cargo	3	95	32	11,300
16	Reefer cargo	4	26	25	700
18	LCL cargo	1	111	25	2,800
21	General	1	42	20	800
23	LCL cargo	1	100	40	4,000
Covered	General	-	50	30	1,500
Ist Extension					
24	General	1	144	61	8,800
25	General	1	144	60	8,700
26	General	1	144	60	8,700
27	General	1	138	64	9,000
Covered	General	1	50	30	1,500

Table 2-6: Open Areas at Lattakia Port

Square No.	Typical Goods	Length (m)	Width (m)	Area (sqm)
Old Port				
Square (1)	Containers	275	94,5	26,000
Inflammable Sq.	Dangerous materials	165	70	11,500
Sq. (2)	Containers	125	38	4,750
Sq. (3)	Gen. Cargo	90	82	7,400
Sq. (4)	Scrap iron	100	68,65	6,865
Sq. (5) A	Containers	128	76,5	8,646
Sq. (5) B	Containers	185	172	31,837

Square No.	Typical Goods	Length (m)	Width (m)	Area (sqm)
Sq. (6)	Containers	296	95	28,302
Sq. (8)	Garage	105	62	6,495
Sq. (9)	Containers	212	61	13,000
Ist Extension				
Square (10)	Gen. cargo	155	108	16,800
Square (11)	Gen. cargo	163	121	19,500
Square (12)	Metal - equipment	163	121	19,500
Square (13)	Wood	163	121	19,500
Square behind quay (12) A	Containers	230	125	28,800
Square (14) A B C	Containers	850	295	250,913

There is also a grain silo complex with rail and truck receipt and ship loading facility. This facility, built in 1930, cannot be used at the moment due to severe damages of the head house and the silo by an explosion.

2.5 Terminal Equipment

The existing container handling and transport **equipment** is listed in **Table 2-7**, whereas shows planned additional **equipment budgeted for 2007/2008**.

In March 2007 the Letter of Credits (LCs) for the gantry cranes and harbour mobile cranes (Items 1 of Table 2-8) were opened by LPGC, whereas financing of the other equipment depends on Government approval and has not yet been secured.

Table 2-7: Present Equipment

Pos.	Type	Year of Pur-chase	Capacity	Units	Condi-tion
1	Straddle Carrier Kalmar 3high	2002	42t	4	Good
2	Straddle Carrier Kalmar	2005	45t	4	Good

Pos.	Type	Year of Pur-chase	Capacity	Units	Condi-tion
	4high				
3	Straddle Carrier Sisu 3high	1997	42t	4	Fair
4	Straddle Carrier Valmet 3high	1991	40t	3	Fair / bad
5	Straddle Carrier Ferranti	1980	35t	2	Bad, for sale
7	Reachstacker Ferranti-CVS	2002	42t	2	Good
8	Reachstacker Kalmar	2004	45t	4	Good
9	Forklift Ferranti-CVS	2004	20t	5	Good
10	Forklift Ferranti-CVS	2006	12t	6	Good
11	Forklift Kalmar	1993	42t	1	Medium and less
12	Forklift Kalmar	1992	10t	5	Medium and less
13	Forklift Kalmar	1995	10t	5	Medium and less
14	Forklift Kalmar	1991	32t	2	Medium and less
15	Forklift Kalmar	1991	42t	1	Medium and less
16	Forklift Kalmar	1995	32t	1	Good
17	Forklift Kalmar	2000	32t	2	Good
18	Head Truck Ottawa	1992	25t	9	Medium
19	Head Truck Kalmar	2006	45t	8	Good
20	Head Truck Plan Ro-Ro	1981	25t	2	Medium
21	Head Truck CVS Ro-Ro	2006	45t	2	Good
22	Chassis Iveco, 1axle	1998	25t	15	Medium

Pos.	Type	Year of Pur-chase	Capacity	Units	Condi-tion
23	Chassis Iveco, 2 axle	1998	50t	30	Medium
24	Harbour Mobile Crane Gottwald	2007	30 t under spreader at 40 m	2	Excellent
25	Harbour Mobile Crane Liebherr	2007	40 t under hook at 25 m	2	Excellent

Table 2-8: Additional Equipment Planned for 2008

Pos.	Type	Year of Purchase	Capacity	Units	Condition
1	Gantry Cranes		50t-41m	4	
2	Straddle Carrier		45 t	4	
3	Forklifts, empty cont., long forks		15 t	5	
4	Reach Stacker		45 t	2	
5	Tractor-trailer units		50 t	20	

As detailed under **section 4.7** below with further increase in container throughput and also driven by the investments in ship-to-shore gantry cranes additional handling and transport equipment is needed.

The Port operates a larger fleet of tugs, pilot launches, floating cranes and other marine craft. It is also planned to purchase one larger tug with 3,000 HP to easily assist the manoeuvring of larger vessels as complement to the existing fleet.

2.6 Terminal Organisation and Personnel

The organisation of LPGC should be reviewed as it is not in line with modern port management. Main weaknesses are:

- The span of control for the General Manager is by far too large (he cannot effective control 11 line functions and 9 off-line or advisory functions);

- Vital departments are missing e.g. Human Resources (under which Training is a sub-function) and Commercial / Marketing Department (now part of Operations Department);
- The structure is too much centralised so that modern management principles such as management by delegation or exception cannot be applied.

The management structure of the Operations Department is shown in the following **Figure 2-5**. As to be seen from this figure there is no separate organisation for the container terminal. In fact, **there is no integrated container terminal organisation** at all.

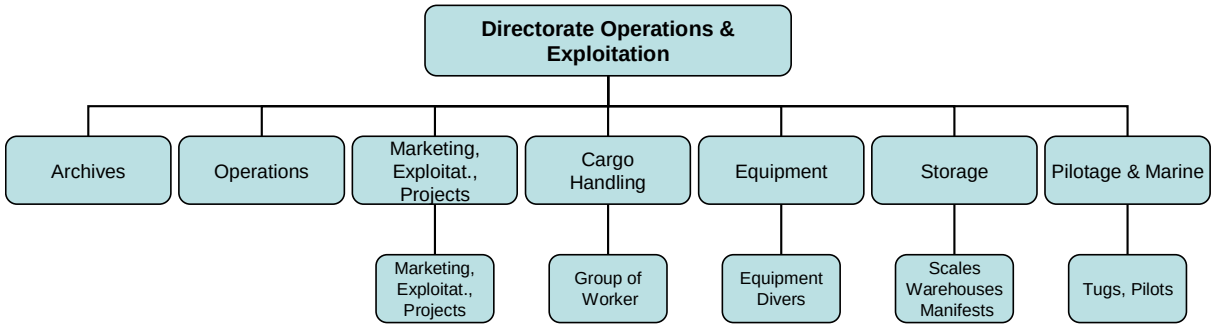


Figure 2-5: Management Structure Operations Department

Containers are still treated as general cargo and only thanks to the excellent cooperation with the shipping lines and their high commitment on operations planning, monitoring and performance review the overall level of service is still acceptable to the trade. Past attempts also with external assistance to set-up a container control centre so as to upgrade supervision and control were not successful. Therefore, as explained below **(Section 4.8)**, the new terminal operator will have so set up a new organisation.

On 24. 01. 2007 LPGC employed the following staff:

Table 2-9: LPGC Staff as of 24. 01. 2007

Pos.	Class	Number	
1	Class I	360	13 %
2	Class II	372	13 %
3	Class III	188	7 %
4	Class IV	888	32 %
5	Class V – dock workers	681	24 %

Pos.	Class	Number	
6	Class V – other staff	306	11 %
7	**Total**	**2,795**	**100 %**

The following **Table 2-10** gives the age structure of the staff:

Table 2-10: Age Structure of LPGC Staff

Pos.	Age	Number	
1	21 – 30 years	163	5 %
2	31 – 40 years	1,176	42 %
3	41 – 50 years	831	30 %
4	51 – 60 years	625	23 %
5	**Total**	**2,795**	**100 %**

During the 1st mission the following total number of LPGC staff working in the container terminal was reported:

Table 2-11: LPGC Container Terminal Staff

Pos.	Class	Number	
1	Superintendents (in-door)	10	2 %
2	Supervisors	50	13 %
3	Yard keepers	20	5 %
4	Workers	120	30 %
5	Equipment drivers	200	50 %
7	**Total**	**400**	**100 %**

In general qualification of management and staff was very encouraging. However, taking a modern terminal as a standard management personnel need to be familiarized with modern management techniques, while supervisors and equipment operators have to get training and advance training in cargo handling operations and use of modern cargo handling gear and lifting appliances. Details would have to studied through a TNA (Training Need Assessment) followed by tailoring training programmes in-house and outside.

Remuneration of LPGC personnel follows the labour laws and employment conditions for public sector. Monthly salaries for the management vary between about SYP 18,000.00 for the General Manager and about SYP 9,000.00 for the Administration Manager. Based upon a Government decree No. 75 from 1970 dock workers enjoy very generous incentive payments of about SYP 32,000.00 in addition to their basic salary of about SYP 4,500.00 per month. This compares with SYP 13 to 15,000 per month for supervisors and equipment drivers.

Because of the unrest among employees about unequal treatment of personnel and in furtherance to an instruction given by the government the present system is under revision. The target is to introduce a system from which the whole staff can take advantage of.

3 Key Problems and Proposed Development Objectives

Most of the problems listed in the Tables below are **not only related to the Container Terminal but also relevant to whole Port managed by LPGC**. The discussions with the Port Management revealed that most of the weaknesses are already known and that the GoS is fully aware that in the envisaged process of modernization, commercialization and strengthening of the port sector accompanied by UNDP experts these issues will have to be duly addressed – independent from, as accompanying measure and in furtherance to the envisaged concession or management contract of the container terminal.

3.1 Institutional Framework and Organisation

Main weaknesses related to the institutional environment and organisation of LPGC include:

Table 3-1: Main Institutional and Organisational Weaknesses

a)	Lack of clearly defined and up-to-date National ports policy and programme;
b)	Outdated port legislation and port regulations;
c)	Outdated Port Master Plan;
d)	Lack of sufficient autonomy of LPGC;
e)	Government interference in day-to-day port management;
f)	Lack of corporate planning including clearly defined departmental objectives and performance targets;
g)	Management structure of LPGC not in line with modern port organisation;

h)	Profit centre accounting not yet existing for all operation centres;
i)	Lack of human resources (development) plan; redundant employees; no early or voluntary retirement scheme; contracting of highly qualified equipment operators difficult due to in-attractive remuneration;
j)	Lack of performance oriented remuneration system; in relation to other employees of LPGC unjustified high piece-rate system for dock workers;
k)	Lack of commercial orientation / port marketing<>port user responsiveness;
l)	Lack of integrated management information system (TOS under installation appears to be a stand-alone solution);
m)	Lack of EDI system (or common data base) among port community (port, terminals, shippers/receivers, shipping and forwarding agents, Customs)
n)	Inadequate control of private companies working inside the Port.

The following development objectives that should be understood as a complement to the concession or management contract for of the container terminal will help to overcome these weaknesses.

Table 3-2: Proposed Institutional and Organisational Development Objectives

a)	Define National ports policy and programme with particular regard to PPP (as proposed in the **Analysis of Management Options for the Container Terminal** <separate document>;
b)	Update port legislation, port regulations and dangerous goods regulations;
c)	Update Port Master Plan prepared by JICA in 1997 under due consideration of the Lattakia Port Construction and Development concept (2010-2015) 12/2006;
d)	Secure sufficient autonomy of LPGC in day-to-day port management and limit Government role to strategic port planning;
e)	Introduce corporate or business planning on a sustained, rolling basis (e. g. for 3 years) including clearly defined departmental objectives and performance targets;
f)	Set-up a management structure of LPGC well in line with a modern port organisation and management principles;
g)	Enhance management and cost accounting system;
h)	Introduce human resources planning including - identification of redundant employees,

	- introduction and securing financing of an early / voluntary retirement scheme, - proposal for attractive remuneration system for contracting of highly qualified personnel, - career planning and - policy and programme for training, re-training and orientation abroad;
i)	Introduce port users council as advisory body for port management and development;
j)	Introduce integrated management information system based upon re-engineering processes or systems research studies as part of the IT system under development;
k)	Enhance the development of an EDI system (or common data base) among port community (port, terminals, shippers/receivers, shipping and forwarding agents, Customs);
l)	Introduce a registration, monitoring and licensing system for private contractors working inside the Port enclosure;

Problems related to the Container Handling Facilities and Operations are listed in **Table 3-3**: While most of these problems related to **container handling** are expected to be solved after the concession or a management contract for the terminal has become effectives, they **also apply to conventional cargo handling** and it is, therefore, strongly recommended to duly address these issues based upon the development objectives as listed in **Table 3-4**.

Table 3-3: Existing problems on Container and Conventional Cargo Operations

a)	Lack of integrated container terminal and terminal management;
b)	Whole port area is heavily congested with containers;
c)	Customs inspection and stripping of containers is done in import stack; no separation between import/export containers, MT containers and customs inspection / stripping and stuffing;
d)	Container storage, stripping and stuffing of containers is split into various plots allocated to and managed by private companies;
e)	Areas blocked with unclaimed cargo and old equipment not discarded (although actions in this respects were initiated);
f)	Completely inadequate safety standards;
g)	Roads and areas congested with trucks due to - Lack of adequate truck holding areas;

	- Lack of vehicle appointment / booking system; - Convoy system (only one per day); - Limited number and wrong location of weigh bridges; - Ineffective enforcement of traffic rules;
h)	Obvious shortage of tractor-trailer units for transfer of containers; shortage of harbour mobile cranes; lack of modern cargo handling gear and forklift attachments;
i)	Operations planning, supervision and control as well as performance review less than optimal;
j)	High portion of idle time at berth (no work between 05.00 h to 07.00 h and 14.00 h to 15.00 h); late arrival and early finish of gangs;
k)	Lack of skills and motivation of equipment operators (no incentive system, literacy problem, no training);
l)	Inadequate maintenance of quays, roads, areas, CFS/LCL-shed and other port facilities;
m)	Insufficient documentation and communications.
n)	High portion of equipment downtimes / non-availability / low equipment utilization also due to - Long lead time for procurement of spare parts; - Lack of preventive maintenance system and - Lack of clearly defined discard system for old equipment.

Table 3-4: Objectives for Improvement of Cargo Handling Operations

a)	Set-up separate control centre for container terminal and perhaps also for the conventional port;
b)	Provide additional container storage areas and de-congest existing storage and quay transfer areas;
c)	Separate between import/export containers, MT containers and customs inspection / stripping and stuffing;
d)	Container storage, stripping and stuffing of containers should be managed by the company operating the container terminal, use of private personnel and equipment should be under the control of this company;
e)	Initiate in co-operation with Customs the removal of unclaimed cargo from all sheds

	and areas; Initiate the discard of all old equipment in coordination with Ministry of Finance or a committee set-up for this purpose;
f)	Initiate clean-up campaign, conduct safety audit and substantially enhance safety standards;
g)	Conduct road traffic survey and substantially improve port passage procedures in order to de-congest roads and gates also under consideration of - Provision of sufficient truck holding areas inside and outside the Port, - Introduction of vehicle appointment / booking system; - Improvement of convoy system (as needed); - Provision of adequate number and location of weigh bridges; - More effective enforcement of traffic rules;
h)	Enhancement of security standards towards ISPS certification including stricter gate controls, reduced traffic with private vehicles and perhaps re-location of access to single-window outside the Port;
i)	Provision of sufficient handling and transfer equipment, modern cargo handling gear and forklift attachments as well as communication and personnel transport equipment;
j)	Optimization of operations planning, supervision and control as well as performance review;
k)	Study and introduce new shift system focused on reduction of idle time at berth (continuation of work between 05.00 h to 07.00 h and 14.00 h to 15.00 h); reduction of late arrival and early finish of gangs;
l)	Train supervisors and equipment operators to substantially improve their qualifications, skills and motivation;
m)	Enhance standards for regular maintenance of quays, roads, areas and other port facilities;
n)	Introduce port performance indicators and substantially improve documentation and communications.
o)	Introduce modern equipment maintenance and materials management systems and practices,

4 Proposed Container Terminal Development

4.1 Allocation of Main Port Sector Functions

In order to facilitate the understanding of the role of LPGC and the future role and responsibility of the concessionaire the principal port sector functions are allocated to the three levels:

- Government of Syria (through Ministry of Transport);
- LPGC (as port management & operating company and future conceding authority) and
- Container Terminal Operator (as company to be newly established)

as per **Annex 4.1–1**. As far as necessary the remarks listed under the last column "Observation" should be taken up in the interest of further clarification of future responsibilities and jurisdiction. For the sake of completeness also the ancillary port sector functions are listed as per **Annex 4.1–2**.

4.2 Traffic, Container and Shipping Forecast

In this report, two methods have been applied to forecast the cargo volume handled at Lattakia Port: One is a macro projection as a method to estimate Syria's trade volume as a group including various commodities, regardless of the volume of each commodity. The share of Lattakia Port in this nationwide trade is then deduced from available demand variables. The other is a micro projection as a method to estimate the cargo volume of each commodity individually in Lattakia Port. The development of cargo throughput is then varied according to available logistics variables. Due to some considerable uncertainties as to the future political and hence economic development both in Syria and its neighbouring countries, both projections are distinguished into a medium-term forecast (with rather certain input variables applied) and a long-term trend (where the projected traffic volumes are estimated to grow within the limits of a best-case and a worst-case scenario).

In the following **Section 4.2.1**, a medium-term development of Syria's economy and its logistics infrastructure is provided, both being the best applicable determinants for the port-traffic projections. In **Section 4.2.2**, the total future cargo volume crossing Syrian borders and moved through Syrian ports is projected and, after considering the function and role of both ports Lattakia and Tartous, future cargo volume in the port of Lattakia is determined and future container-cargo volume is deduced. This macro projection is then compared with the container cargo projected to be moved through Lattakia Port (micro projection). In **Section 4.2.3**, the projected cargo volumes are translated into numbers and sizes of vessels expected at Lattakia Port, taking into consideration the development in the business and technology environment. Finally, **Section 4.2.4** provides a sensitivity and risk analysis of the most probable scenario.

4.2.1 Development of Determinants for Lattakia Port Traffic Projections Macro-Economic Development

Unlike many of its Arab neighbours, Syria has a diversified economy that is not overly dependent on oil. However, economic development has been hampered by a number of internal and external factors and has not kept pace with population growth. Modest reforms are beginning to have a positive impact, and some sectors that were exclusively state-operated have opened to private-sector participation and foreign investment. New investment laws have encouraged private-sector growth by gradually expanding the list of goods that the private sector may produce or import and have permitted private competition with the government in some areas, such as textile and pharmaceutical manufacturing. However, the government continues to control strategic industries, such as oil production and refining, telecommunications, air transport, power generation and distribution, and water distribution, as well as the price of key agricultural goods.

There have been some positive developments in Syria. The reform program has picked up, and Syria is trying to pass from a centralized state-run economy to a market economy, including through investments in tourism and free-trade zones. Apart from domestic needs to provide jobs, economic liberalization is seen as a way of limiting political isolation and attracting FDI from the region. Importantly, the recent reforms have focused on vital areas such as fiscal consolidation, exchange rate unification, and trade and financial reforms. Importantly, the trade reforms have already helped to boost non-oil exports. The economy is benefiting from strong oil prices[1] and the non-oil sector is performing strongly[2]. The IMF estimates that real GDP growth accelerated to 2.9% in 2005, compared with an average of 1.8% between 1999 and 2004 (see **Annex 4.2-1**). Economic expansion might have accelerated marginally in 2006 to 3,1%. Notably, although the economy still remains dependant on the oil sector, which is benefiting from the strong global prices, there have been strong performances in the wider economy. The non-oil sector is estimated to be realizing strong growth of over 5%. The agricultural sector has performed well[3], which is important for boosting private consumption as around one-third of the population is employed in the sector. Furthermore, private spending is being supported by stronger credit growth and wage increases since mid-2004. As with the wider region, the Syrian economy is also benefiting from the strong performance and

[1] Although Syria is not a major oil exporter by Middle Eastern standards, oil is a major pillar of the economy. The oil sector of the economy faces many challenges, such as a decline in output and production resulting from technological problems and a depletion of oil reserves. Since older fields have reached maturity, oil production is expected to continue its decline. Meanwhile, consumption is rising, which means that Syria could become a net oil importer within a decade.

[2] Syria has deposits of petroleum; natural gas; phosphates; chrome, iron, and manganese ores; asphalt; rock salt; marble; and gypsum. Phosphates are the major minerals exploited in Syria. Marble, gypsum, stone, salt, gravel, and sands are also produced but generally not for export. The main industrial products are petroleum, textiles, processed food, beverages, tobacco, and phosphates. Syria's manufacturing sector was largely state dominated until the 1990s, when economic reforms allowed greater local and foreign private-sector participation.

[3] "Strategic" products, such as wheat, barley, and sugar beets, must be sold to state marketing boards at fixed prices, often above world prices in order to support farmers, but at a significant cost to the state budget. The most widely grown arable crop is wheat, but the most important cash crop is cotton; cotton was the largest single export before the development of the oil sector. Nevertheless, the total area planted with cotton has declined because of an increasing problem of water shortage coupled with old and inefficient irrigation techniques. The output of grains like wheat is often underutilized because of poor storage facilities. Less than 3% of Syria's land area is forested, and only a portion of that is commercially useful.

liquidity in the GCC. Remittance inflows have been increasing and have boosted both private consumption and investment levels, while direct investment from the GCC is also increasing (including in areas such as real estate, tourism, finance and telecommunications).

Despite these positive developments, deep challenges remain. These positive developments have occurred in a backdrop of deep political and economic challenges. The economy continues to under perform and substantial reform is still required. While real GDP growth has accelerated over the last two years, the growth rate was still relatively weak, especially given the performance of other regional oil (and non-oil) exporting countries and the domestic needs of the economy. A stronger growth rate is required for increasing job opportunities. Moreover, given the state of the Syrian economy, deeper and broader reforms are required if higher levels of growth are to be achieved and sustained. The need for reform is accelerated by the fact that oil reserves are falling and the oil import bill is increasing - Syria is set to become a net oil importer in 2010. Declining oil output will continue to constrain economic growth, which will remain weak in 2007-08 at just under 3%. The loss of oil income will add serious challenges to the fiscal and current accounts, let alone maintaining living standards. Negatively, the reform program will likely remain slower than required as the authorities continue to face capacity constraints and the absence of social safety nets to mitigate the impact of the reform measures.

The population growth rate during 2000-2003 was stable at 2.45%.

Logistics Infrastructure Development

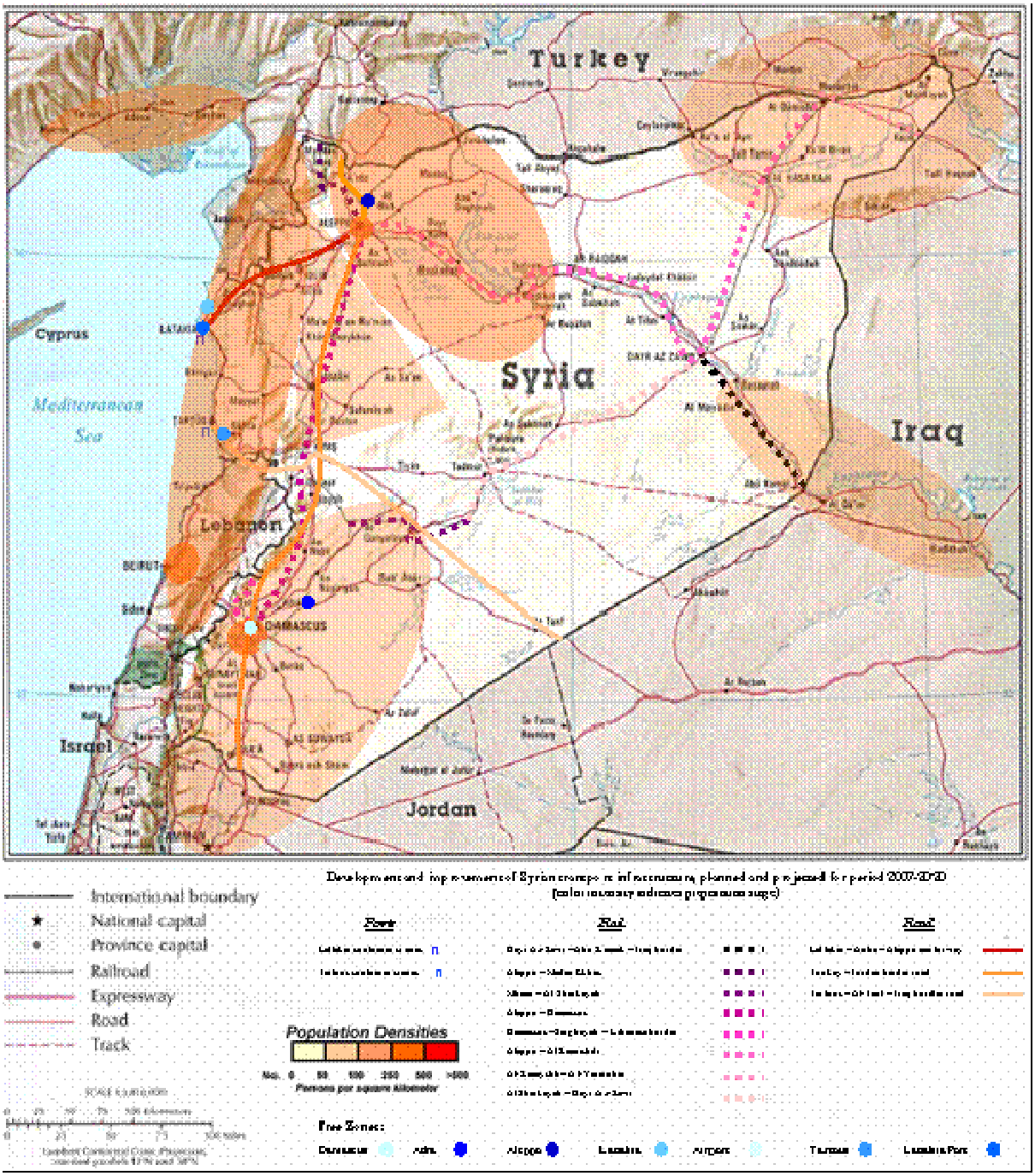
As to transit cargo, the Arabic countries neighbouring Syria are the hinterlands of the ports of Lattakia and Tartous. Iraq is considered to be the potential hinterland in the future as it was until 1981. A recent consulting study estimated Iraq's total import needs at some 80 million tones per year after the country's pacification, of which 20 million tones per year could be routed through Syria.

Syria has an extensive and reasonably well-maintained network of 23,400 kilometres of main roads and 18,400 kilometres of secondary roads connecting major cities and linking to neighbouring countries. As of 1999, about 10,000 kilometres of roads were reported to be paved, including almost 900 kilometres of expressways. A Kuwaiti company has undertaken a major road improvement project of upgrading the roadway between Lattakia and Aleppo. This expansion in road transport comes at the expense of the rail network, however.

Syria's 2,425-kilometer rail network (standard-gauge) is generally adequate for transport needs. A recently initiated project is designed to upgrade the overall rail system and to improve links with neighbouring countries, but the effort has been hampered between Damascus and Amman / Jordan, because a portion of the track in that area is narrow gauge. There is a steady increase in freight use, especially for bulk commodities such as petroleum prod-

ucts, phosphates, cereals, and cement. In 1998, the last year for which statistics are available, Syrian trains carried about 5 million tons of freight (see **Annex 4.2-2**).

To meet an increasing demand for the ports of Lattakia and Tartous along with the anticipated future economic growth in their hinterlands, the Syrian Government initiated or planned the development, rehabilitation or modernization of a number of road and rail (see **Annex 4.2-3**) transport links. These links will further connect the ports of Lattakia and Tartous not only with Syria's population centres, but also with its neighbouring countries (see below **Figure 4-1**).



Source: Ministry of Transport, Damascus, January 2007

Figure 4-1: Existing and planned logistic infrastructure serving Syrian population centers

These corridors will cross through Syria's most populated regions and – presently in Syria's most north-eastern corner close to the Tigris River and in future also along the Euphrates River – also connect a greater part of Iraq's 27 million inhabitants. Additionally, commodities produced in – and shipped from – Far East could be distributed along those corridors pass-

ing through Kuwait, Iraq, Syria, Jordan, Lebanon and the southeast of Turkey. Most importantly, transport costs between Iraq and Europe or the US east coast could be reduced between 40% and 60% if the trade was routed through Syria's Mediterranean ports instead of Persian Gulf ports. Also, Syria is presently negotiating about preferential treatment with Iran and the OIC (Organization of Islamic Countries). Finally, Syria will serve as one important location for EU-re-exports once Turkey has acceded to the EU.

Free zones, located in Syria's western part close to its Mediterranean coast (see **Figure 4-1**) – and thus to the country's two seaports – serve as important nodes not only for eventual distribution within Syria, but mainly for re-export via its ports of Lattakia and Tartous or across its borders with Turkey, Iraq, Jordan and Lebanon. The largest free zones are located close to Aleppo (in Lattakia's hinterland) and Adra (in Tartous' hinterland), with other medium-sized free zones situated close to the two ports themselves (see **Table 4-1**).

Table 4-1: Free Zones inside Syria

Free Zone	Total Area (m²)	Location
Damascus	70,000	Damascus centre
Adra	780,000	Damascus - Baghdad highway about 35 km northeast of Damascus
Aleppo	1,145,661	18 km north of Aleppo
Lattakia	273,000	7 km north of Lattakia Port
Airport	24,000	Western side of Damascus International Airport
Tartous	436,000	Damascus - Tartous highway
Lattakia Port	650,000	Inside Lattakia Port

Source: Ministry of Transport, Damascus, January 2007

The General Establishment for Free Zones (GEFZ) is presently preparing primary studies for establishing new free zones. These studies include:

- Coastal free zone in Lattakia will be operated at the beginning of next year;
- Free zone in Tartous: the primary studies and inviting the international offers are prepared based on the BOT-system;
- Free zones in the eastern provinces: A committee for preparing the feasibility study for establishing a free zone in Alhsaka or Dayr Al Zawr has been formed; and
- Free zone in the central area between Homs and Hama.

Above-described macro-economic and logistics-infrastructure developments serve as major variables for the following two projection scenarios.

4.2.2 Macro and Micro Projections

The following subsection projects trade volumes in Syria to cross Syrian borders, and thereafter deduces Lattakia Port's proportion in national imports, exports and transit trades. Cargo volumes greatly depend on the macro-economic development and future production plans described above (macro projection). The second subsection calculates a trend analysis, which applies mainly to strategic commodities moved through Lattakia Port, varied by the timing and extends of those logistics-infrastructure projects described above (micro projection). The horizon for the projection is 20 years, considering after 2010 both a negative and a positive scenario for Lattakia Port's decreasing respectively growing proportion in the nationwide trade volumes, and additionally for a stabilized security situation in Iraq in the best-case scenario.

Worst-Case Scenario

In this scenario, Lattakia Port is timely refurbished and adapted both to the rising consumer demand of Syria's fast growing national population and to the expected additional production by its industrial development projects. However

- superior services by the concessionaire operating the container terminal at Tartous Port succeed in deviating the calls of two major shipping lines towards Tartous Port;
- important transit corridors linking Lattakia with Iraq and other neighbouring countries are being developed or rehabilitated only shortly before Tartous is being linked to its hinterland;
- plants producing containerisable cargo will be established closer to Tartous Port ahead of the development or rehabilitation of such logistical infrastructure and
- no active marketing of the logistical services by the ports take place.

Following **Table 4-2** gives an estimate of the worst timing ("Year") and impacts ("Impact") of logistics Infrastructure projects ("Milestones") expected to compete with the expansion of the container terminal at Lattakia Port. The rightmost column "AAGR" lines out the annual average growth rate of traffic volumes that could be expected without any impacts.

Table 4-2: Time schedule and impact of developing rail and road links, Worst Case

Year	Milestones	Impact	AAGR
2007	*04-2007: Tartous Port: container-terminal concession*	-50%	
2008	07-2008: Lattakia Port: container-quay cranes	10%	

Year	Milestones	Impact	AAGR
	10-2008: M4 highway Lattakia - Anah - Aleppo	40%	7,0%
	11-2008: Tartous Port: container-quay cranes	-20%	6,8%
2009	01-2009: Lattakia Port: container-terminal concession	20%	6,6%
	02-2009: Rail Dair-es-Zor - Abu Kamak / Iraq	150%	6,4%
2011	Road Turkey – Jordan border	10%	6,2%
2012	Rail Aleppo – Medan Ekbes	50%	6,0%
2013	*Tollroad Tartous - Iraq (via Al-Bosayri, Al-Tanf)*	-60%	5,8%
2014	*Rail Maheen to Al-Sharkeia*	-10%	5,6%
2015	*Rail Aleppo – Damascus*	-5%	5,4%
2016	*Rail Damascus –Sarghayah – Libanese border*	-5%	5,2%
2017	*Tollroad Damascus - Iraq (via Al-Bosayri, Al-Tanf)*	-20%	5,0%
2018	Rail Aleppo – Al Kamishili	5%	4,8%
2019	Rail Al-Kamyshli – Al-Yaroubia	5%	4,6%
2020	*Rail Al-Sharkeia - Dair-es-Zor or Kacm*	-60%	4,4%
2021			4,2%
2022			4,0%
2023			3,8%
2024			3,6%
2025			3,4%
2026			3,2%

Source: Ministry of Transport, Damascus, January 2007

Note: Positive Impact *Negative Impact*

As a result, the port's share in nationwide trade is expected to remain stagnant on the year 2006 levels equally for import, export and transit trade. **Annex 4.2-4** depicts the projection of foreign trade through Syria and the share of Lattakia Port.

Annex 4.2-5 consequently projects the containerized weight and, based on the container loads to be expected, the number of containers distinguished between import, export and transit boxes.

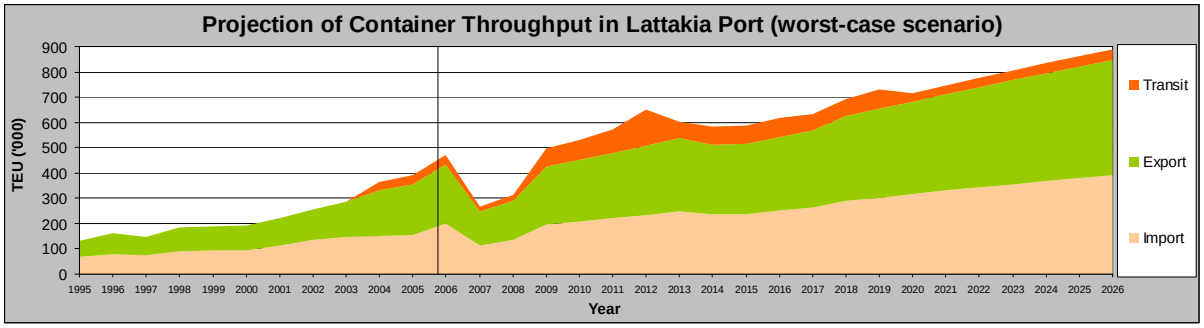
In contrast, **Annex 4.2-6** directly projects the number of containers as a trend analysis based on Lattakia Port's historic throughput volumes, but also modified by the "Milestones" as depicted in above **Table 4-2**. Since the results of both projection methods are very similar, and the historic figures provided by Lattakia Port also allow a distinction between TEU (20' boxes) and FEU (40' boxes) and between the various routes of transit trades (national statistics are incomplete for 1996-2004 transit routes), the latter projection is summarized in below **Table 4-3**.

Table 4-3: Projection of Container Traffic through Lattakia Port - Worst-Case

Year	Import			Export			Transit				Total	
	20'	40'	TEU	20'	40'	TEU	Exter-nal	Free Zone	Internal	TEU	Weight (tonnes)	TEU
2006	79,461	60,845	201,152	96,480	68,226	232,932	8,111	22,695	7,225	38,030	4,059,430	472,114
2011	87,634	67,104	221,841	106,403	75,243	256,890	19,802	55,407	17,638	92,846	5,360,124	571,577
2016	99,236	75,988	251,212	120,491	85,205	290,901	15,778	44,149	14,054	73,982	5,529,238	616,096
2021	130,185	99,687	329,558	158,069	111,778	381,626	7,467	20,893	6,651	35,011	6,177,228	746,195
2026	155,365	118,967	393,299	188,641	133,398	455,437	8,911	24,934	7,938	41,783	7,371,983	890,519

Source: Consultant

From below **Figure 4-2**, the severely negative consequences of an overly strong competition from Tartous Port during the next three years become very obvious, before any logistics-infrastructure projects benefiting Lattakia Port come on stream. However, even under this assumption Lattakia Port would not become successful as a transit node - particularly not for Iraq trades.



Source: Consultant

Figure 4-2: Projection of Container Throughput – worst-case

Best-Case Scenario

Similarly to the first scenario, Lattakia Port is timely refurbished. Additionally to serving the national consumer and industrial demand, however

- Lattakia Port will be capable of countering any operational advantage provided by the Tartous-Port concessionaire by erecting its own container-quay cranes ahead of Tartous Port and by operating its newly furbished container terminal very efficiently;
- the port will be connected to Syria's neighbouring countries – particularly to a stabilized Iraq – more than five years ahead of Tartous Port;
- development or rehabilitation of logistical infrastructure connecting Lattakia Port will be finalized before plants producing containerisable cargo are being established; and
- Lattakia Port will extend an active marketing of its logistical services into practically the whole Middle East.

In contrast to the scenario described above, following **Table 4-4** gives an estimate of the best expectable timing ("Year") and impacts ("Impact") of logistics-infrastructure projects ("Milestones") to compete with Lattakia Port's container terminal. Also, the rightmost column "AAGR" lines out the best impact that the expected GDP growth could have on traffic volumes through Lattakia Port.

Table 4-4: Time schedule and impact of developing rail and road links, Best Case

Year	Milestones	Impact	AAGR
2005	*04-2007: Tartous Port: container-terminal concession*	-25%	
2006	07-2008: Lattakia Port: container-quay cranes	20%	
2007	10-2008: M4 highway Lattakia - Anah - Aleppo	50%	9,0%
2008	*11-2008: Tartous Port: container-quay cranes*	-20%	8,7%
2009	01-2009: Lattakia Port: container-terminal concession	40%	8,4%
2010	02-2009: Rail Dair-es-Zor - Abu Kamak / Iraq	300%	8,1%
2011	Road Turkey – Jordan border	10%	7,8%
2012	Rail Aleppo – Medan Ekbes	100%	7,5%
2013			7,2%
2014			6,9%
2015			6,6%
2016			6,3%
2017			6,0%
2018			5,7%
2019	*Tollroad Tartous - Iraq (via Al-Bosayri, Al-Tanf)*	-40%	5,4%
2020	*Rail Maheen to Al-Sharkeia*	-10%	5,1%
2021	*Rail Aleppo – Damascus*	-5%	4,8%
2022	*Rail Damascus –Sarghayah – Libanese border*	-5%	4,5%
2023	*Tollroad Damascus - Iraq (via Al-Bosayri, Al-Tanf)*	-20%	4,2%
2024	Rail Aleppo – Al Kamishili	5%	3,9%
2025	Rail Al-Kamyshli – Al-Yaroubia	5%	3,6%
2026	*Rail Al-Sharkeia - Dair-es-Zor or Kacm*	-40%	3,3%

Source: Ministry of Transport, Damascus, January 2007

Note: Positive Impact *Negative Impact*

As a result, the port's share nationwide trade is expected to increase - particularly in Syria's transit trade by 8% annually (see **Annex 4.2-7**). Lattakia Port could practically be connected to the transport network of the whole Middle East.

In its projection of containerized weight and number of containers, **Annex 4.2-8** applies as an upper limit the 20 million tons per year potentially transited through Syria into Iraq after the latter country's pacification, as mentioned in Section 4.2.1.

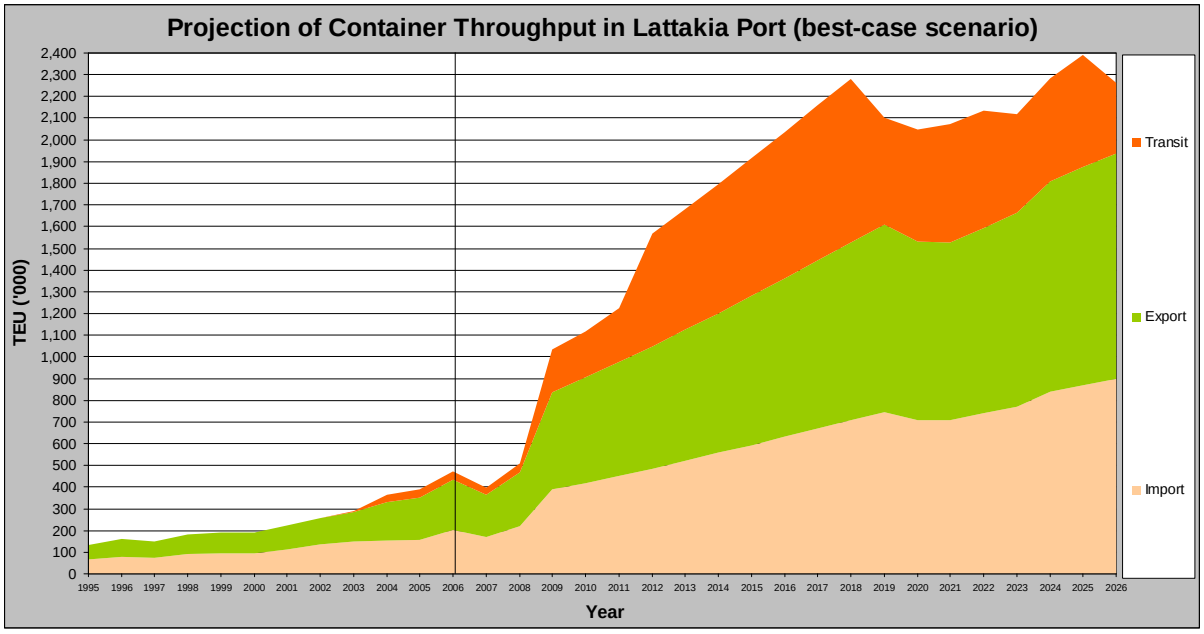
Below **Table 4-5** is a summary of **Annex 4.2-9** which, similar to the above subsection, directly projects the number of containers as a trend analysis based on above **Table 4-4**.

Table 4-5: Projection of Container Traffic through Lattakia Port - Best-Case

Year	Import			Export			Transit				Total	
	20'	40'	TEU	20'	40'	TEU	External	Free Zone	Internal	TEU	Weight (tonnes)	TEU
2006	79,461	60,845	201,152	96,480	68,226	232,932	8,111	22,695	7,225	38,030	4,059,430	472,114
2011	178,587	136,749	452,086	216,838	153,337	523,512	53,418	149,467	47,581	250,465	11,986,060	1,226,063
2016	249,300	190,896	631,092	302,695	214,052	730,799	143,935	402,741	128,207	674,883	22,374,829	2,036,774
2021	279,418	213,958	707,335	339,264	239,911	819,087	116,169	325,048	103,475	544,692	21,404,654	2,071,115
2026	354,590	271,520	897,630	430,537	304,455	1,039,447	69,514	194,506	61,918	325,938	20,825,517	2,263,015

Source: Consultant

Below **Figure 4-3** clearly indicates the delayed negative impact of late logistics-infrastructure projects benefiting Tartous Port and thus competing with Lattakia Port. Under this assumption Lattakia Port would be able to expand its hinterland relations both in providing for necessary imports and exports and serving as transit node for Iraq trades.



Source: Consultant

Figure 4-3: Projection of Container Throughput – best-case

4.2.3 Numbers and sizes of vessels expected at Lattakia Port

Development of vessel traffic follows the trade growth, in that the vessel capacities grow according to the cargo carried by those vessels. However, this capacity growth will take place in two dimensions:

Firstly, the size of vessels will grow in line with increasing economies-of-scale. The Consultant particularly foresees container-volume handlings through Lattakia Port to grow from an average of 6,350 tons per container vessel during 2006 to 9,000 tons by the year 2020. Handling levels per ro-ro vessel are estimated to grow at a slower pace from an average of 2,600 tons per vessel during 2006 to almost 2,900 tons by the year 2011. Handling levels per general-cargo vessel are expected to decrease, since these commodities will not be discharged for transit as much as will be containers and since general-cargo vessels will increasingly serve specialized niche markets. Berth depth at the quay constitutes the main limiting perimeter for vessel-size growth; but should not pose any constraint to 3rd-generation-vessel calls at the container terminal.

Secondly, the number of vessels will grow in line with cargo throughput. Growth in vessel traffic will compensate the port's limitation to growth potential in vessel size by an increase in the number of vessels calling at this port. Consequently, the number of vessels is required to grow only moderately under a lower growth of cargo traffic.

Worst-Case Scenario

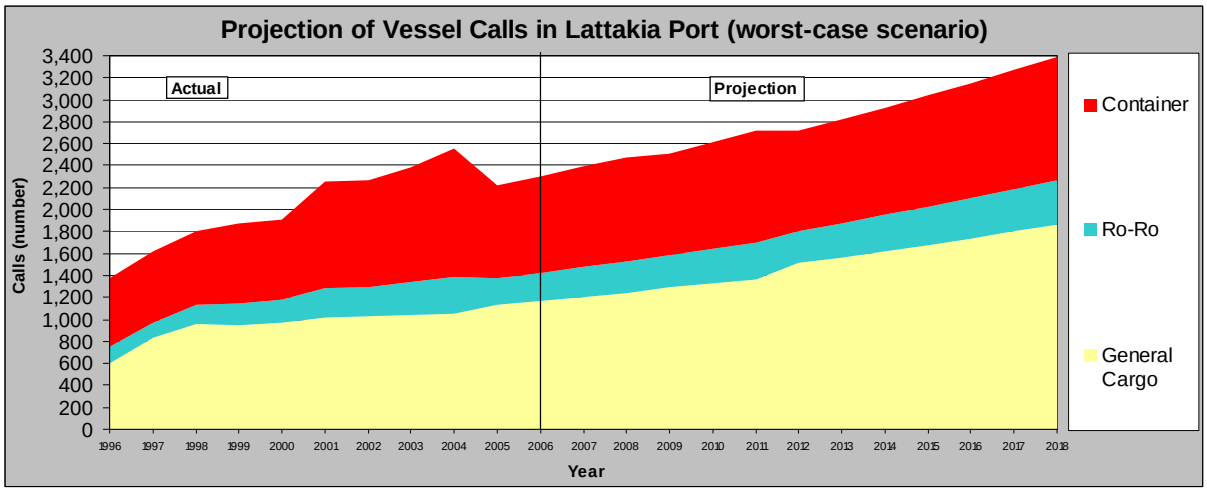
In this scenario, the number of general-cargo and ro-ro vessels is projected to grow faster than the number of container vessels (see below **Table 4-6**), particularly since the transit traffic in eastward direction would not develop as the political and security situation in Iraq remained volatile. This situation in Iraq would also pose limitations onto the economic development in Syria's eastern regions, and thus have negative effects on container traffic with this area, since those more remote regions constitute a major destination of containerized (as against bulk and general-cargo) traffic (for a year-to-year projection of vessel calls see **Annex 4.2-11**).

Table 4-6: Vessel Call Numbers, projection 2007-2026 - Worst Case

Year	Vessels (no)	Vessel Types		
		container	ro-ro	general cargo
2006	1,805	670	178	957
2011	2,384	1,043	298	1,043
2016	2,470	942	290	1,239
2021	2,818	941	312	1,566
2026	3,387	1,121	400	1,866

Source: Consultant

The effects of above-described stagnation in containerized trade – and even a distinct drop from the year 2012 to 2013 – on the vessel traffic in Lattakia Port in the worst-case scenario is well visible on below **Figure 4-4.**



Source: Consultant

Figure 4-4: Projection of Vessel Traffic – worst-case

However, also in this scenario, the Consultant foresees the shipping community to still compensate low increases in vessel calls to some extent by increases in vessel size (**Table 4-7**, for detailed figures see **Annex 4.2-12**).

Table 4-7: Vessel Sizes, projection 2007-2026 - by GRT categories (numbers) – worst case

Year	Less 1000	More than											Total
		1000	2000	3000	1000	5000	6000	1000	8000	9000	10000	11000	
2006	101	364	147	227	64	63	95	56	82	106	49	451	1,805
2011	130	467	189	291	82	81	122	74	113	146	68	622	2,384
2016	135	487	197	303	86	84	127	77	116	150	69	639	2,470
2021	155	557	225	347	98	96	145	87	132	170	79	725	2,818
2026	186	671	271	419	118	116	175	105	158	204	94	869	3,387

Source: Consultant

Overall, in this worst-case scenario, within the next 20 years the number of vessels is projected to less than double with a stronger focus on smaller vessels.

Best-Case Scenario

With the overall number of ship calls almost reaching 6 000 by the year 2026, the Consultant in this scenario estimates the number of vessels to more than triple within the next 20 years even under the expected growth in vessel sizes **(Table 4-8)**.

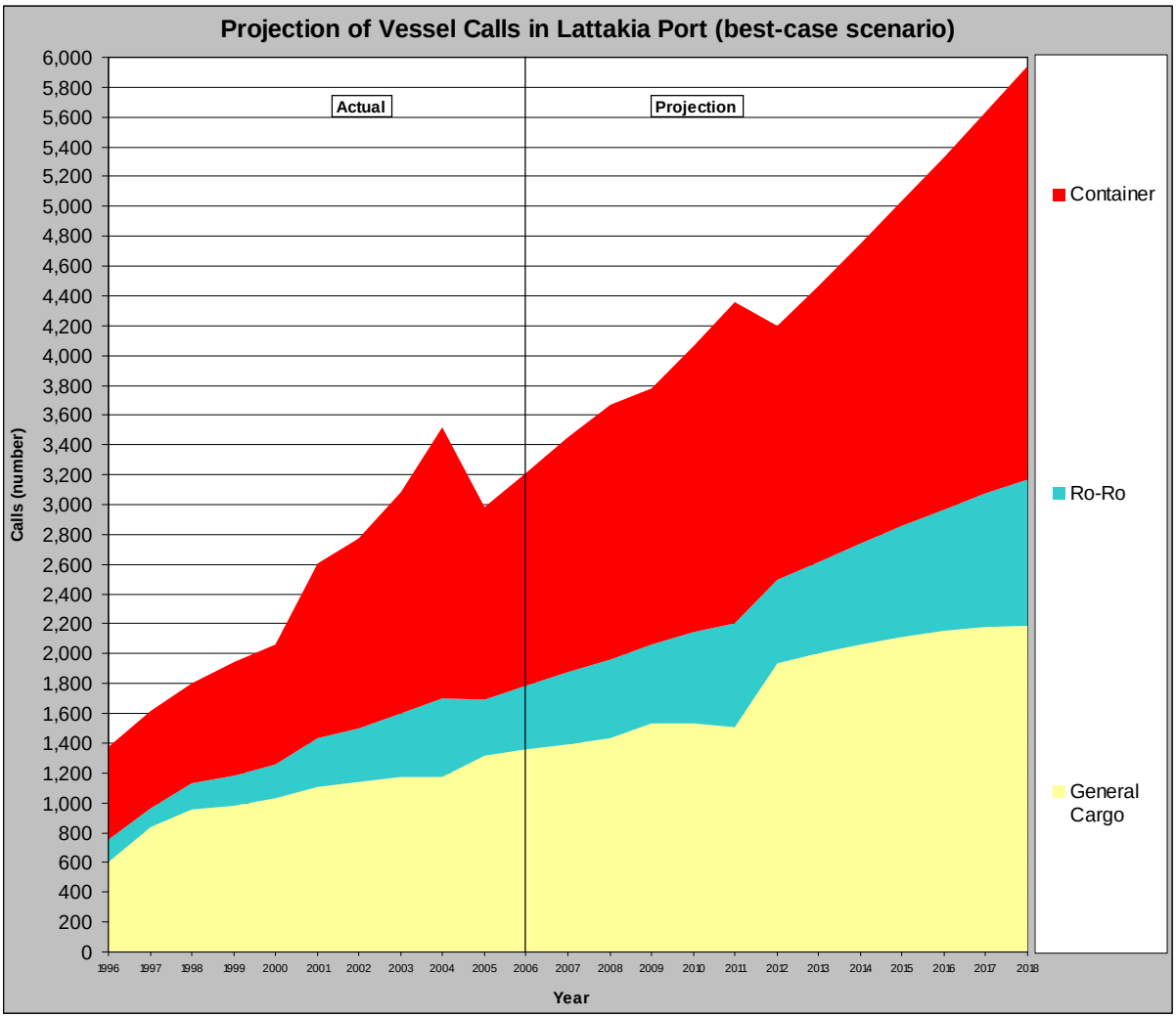
Table 4-8: Vessel Call Numbers, projection 2007-2026 - best case

Year	Vessels (no)	Vessel Types		
		container	ro-ro	general cargo
2006	1,805	670	178	957
2011	3,087	1,488	426	1,173
2016	3,669	1,708	526	1,435
2021	4,469	1,851	613	2,005
2026	5,938	2,766	987	2,185

Source: Consultant

Note: No more detailed statistics were readily available

This growth in the number of vessel calls will be highest (400%) with container-carrying vessel types (cellular and ro-ro vessels), whereas the number conventional general-cargo vessel calls will just more than double. The number of container-carrying vessels to call at Lattakia Port is expected to consequently surpass the combined number of all other vessel types by the year 2011 (see **Annex 4.2-13**).



Source: Consultant

Figure 4-5: Projection of Vessel Traffic – best-case

If the most optimistic assumption under the best-case scenario – the political and security situation in Iraq stabilizes by latest the year 2010 – can be verified, then container vessels will significantly grow in size. In this case, the number of largest vessels calling at Lattakia Port will more than triple, whereas the call number of smaller-sized vessels will not even double (see **Table 4-9** and **Annex 4.2-14**).

Table 4-9: Vessel Sizes, projection 2007-2026 - by GRT categories (numbers) – best case

Year	Less 1000	More than											Total
		1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	
2006	101	364	147	227	64	63	95	56	82	106	49	451	1,805
2011	168	605	244	377	106	105	158	96	146	189	87	805	3,087
2016	201	723	292	451	127	125	189	114	173	223	103	949	3,669
2021	245	884	357	551	155	153	231	139	209	270	125	1,151	4,469
2026	327	1,177	475	734	207	204	307	184	277	358	165	1,523	5,938

Source: Consultant

Note: No more detailed statistics were readily available

Overall, in this best-case scenario, within the next 20 years the number of vessels is projected to more than triple with a very strong focus an larger vessels.

4.2.4 Sensitivity and risk analysis

The two scenarios, as described above, only constitute the extent of a wide range of potential developments (the lower and upper limit of an amplitude of possibilities). Following analysis investigates the most potential development within this wide range (a fixed graph between the amplitude's limits).

The potential traffic growth in Lattakia Port strongly depends on future transit trade. Potential transit traffic is most sensitive to the upper four project variables on below table. This kind of traffic strongly depends on a healthy regulative and security basis (international level), on the timely and adequate provision of transport infrastructure in the port's hinterland (national level) and on the timely and adequate construction of physical infrastructure (sector level). Unfortunately, as **Table 4-10** indicates, the risk (probability) is also highest with these first three sensitivity variables.

Future import and export traffic through Lattakia Port is more dependent on the productivity of the terminal operator. Again, the risk of the foreign concessionaire in Tartous Port's container terminal to perform better than his counterpart in Lattakia Port, at least in the short to medium-term future, is high.

Table 4-10: Project Sensitivities and Risks

Sensitivity	Risk Degree	International Level	National Level	Sector Level
Strong	High	Security situation in Iraq stabilizes later than 2010, limiting demand and discontinuing reconstruction works	Government's pro-privatization attitude reverses, inhibiting longer term growth of the economy	No adequately nor timely adaptation of Lattakia Port to rising demand of opening and fast growing hinterland
Strong	High-Medium	Trade embargo and other economic sanctions by United States and collaborators (political risk)	Delayed construction of port-unrelated projects is, important Syrian industrial projects come on stream too late	Delayed commencement of container-terminal concession in Lattakia Port
Strong	Medium	Trade agreements are not signed nor strictly adhered to	Trade-diversion effects by national transport-infrastructure projects (see Subsection 4.2.1)	Trade-diversion effects towards Tartous Port due to higher productivity of its container-terminal concessionaire
Strong-Medium	Medium-Low	Trade-diversion effects by regional port projects, i.e. Mersin and Beirut container terminals	Demand decreases for capital goods, in the form of machine, equipment and transportation equipment	No adequately nor timely adaptation of Lattakia Port to rising consumer demand of fast growing national population
Medium-Strong	Low	International shipping lines develop trade and supply pattern that disfavour traffic through Lattakia Port	Stalled per capita income and consequent negative propensity to invest in capital markets	No adequately nor timely adaptation of Lattakia Port to expected additional production by industrial development projects

Sensitivity	Risk Degree	International Level	National Level	Sector Level
Medium	Low	Decrease in liquidity lacking a sustained growth in credit off-take or in exports (banking-sector risk)	Government spending and private-sector activity weaken	Provision or time lag in the international supply chain of a specific project component
Weak	Low	Constraints on oil output grow tighter as from 2006 (sovereign risk)	Insufficient or delayed domestic and foreign investment into infra-structure projects which would support Lattakia Port traffic	

Source: Consultant

From above comparison of factors to which future container traffic through Lattakia Port is sensitive, and from the investigation into the probabilities (risks) of these factors to occur, it can be deduced that the probability is much higher that future container traffic through Lattakia Port will materialize towards the lower limit of the amplitude.[4]

4.2.5 Most-probable scenario

To arrive at this scenario, the Consultant has estimated the growth of container traffic (AAGR) to follow the worst-case (since probability is high for security situation in Iraq to stabilize later than 2010) and the chronological establishment of transport connections within Syria and linking to its neighbouring countries to follow the best case (since probability is low for insufficient or delayed domestic and foreign investment into infrastructure projects). Finally, the Consultant has estimated the negative effects of trade-diversion towards Tartous Port to follow the best-case and its positive impacts to follow the worst-case scenario, since above sensitivity & risk analysis estimates the probability of those impacts to be medium (see below **Table 4-11**).

[4] LPGC should, however, observe the markets and note whether any of the above-described factors do not materialize. In this case, the risk of low container traffic decreases and the probability for future higher container throughput increases. LPGC must then act accordingly and swiftly

Table 4-11: Time schedule and impact of developing rail and road links, most probable

Year	Milestones			Impact	AAGR
2005	04-2007: Tartous Port: container-terminal concession			-25%	
2006	07-2008: Lattakia Port: container-quay cranes			10%	
2007	10-2008: M4 highway Lattakia - Anah - Aleppo			40%	7.0%
2008	*11-2008: Tartous Port: container-quay cranes*			-20%	6.8%
2009	01-2009: Lattakia Port: container-terminal concession			20%	6.6%
2010	02-2009: Rail Dair-es-Zor - Abu Kamak / Iraq			150%	6.4%
2011	Road Turkey – Jordan border		10%	6.2%	7.8%
2012	Rail Aleppo – Medan Ekbes	50%	6.0%	100%	7.5%
2013		5.8%			7.2%
2014		5.6%			6.9%
2015		5.4%			6.6%
2016		5.2%			6.3%
2017		5.0%			6.0%
2018		4.8%			5.7%
2019	*Tollroad Tartous - Iraq (via Al-Bosayri, Al-Tanf)*			-40%	4.6%
2020	*Rail Maheen to Al-Sharkeia*	*-10%*	*4.4%*	-10%	5.1%
2021	*Rail Aleppo – Damascus*	*-5%*	*4.2%*	-5%	4.8%
2022	*Rail Damascus –Sarghayah – Libanese border*			-5%	4.0%
2023	*Tollroad Damascus - Iraq (via Al-Bosayri, Al-Tanf)*			-20%	3.8%
2024	Rail Aleppo – Al Kamishili	5%	3.6%	5%	3.9%
2025	Rail Al-Kamyshli – Al-Yaroubia		5%	3.4%	3.6%
2026	Rail Al-Sharkeia - Dair-es-Zor or Kacm		-40%	3.2%	3.3%

Source: Ministry of Transport, Damascus, January 2007

Note: Positive Impact *Negative Impact*

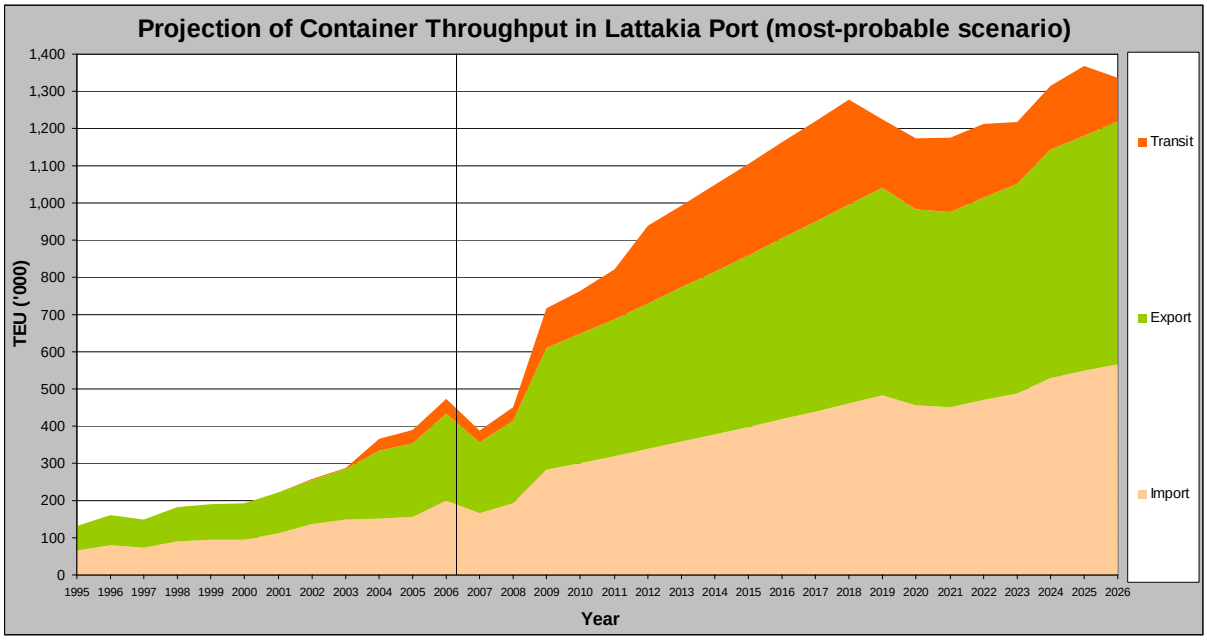
Considering above sensitivity & risk analysis, the most probable development within the wide range between the worst and the best cases has been summarized in below **Table 4-12** (for a detailed breakdown please see **Annex 4.2-10**). Container throughput would almost triple within the 20 years between 2006 and 2026 and would reach the capacity of the proposed container terminal during the year 2011.

Table 4-12: Projection of Container Traffic through Lattakia Port – Most-Probable Case

Year	Import			Export			Transit				Total	
	20'	40'	TEU	20'	40'	TEU	External	Free Zone	Internal	TEU	Weight (tonnes)	TEU
2006	79,461	60,845	201,152	96,480	68,226	232,932	8,111	22,695	7,225	38,030	4,059,430	472,114
2011	126,070	96,535	319,140	153,071	108,245	369,561	28,487	79,708	25,374	133,568	7,711,056	822,269
2016	165,547	126,764	419,076	201,005	142,141	485,286	55,052	154,039	49,036	258,127	11,561,089	1,162,489
2021	178,438	136,635	451,709	216,657	153,209	523,075	42,572	119,119	37,920	199,611	11,097,392	1,174,395
2026	223,228	170,932	565,092	271,040	191,666	654,372	25,067	70,140	22,328	117,536	11,589,697	1,337,000

Source: Consultant

Below **Figure 4-6** additionally indicates that the number of containers on transit through Lattakia Port would diminish following a peak in the year 2018. After this date, transport infrastructure would be established or rehabilitated in the hinterland of Tartous, which would give its port the opportunity to attract containerized cargo for transit to Syria's neighbouring countries. The share of full containers is expected to remain at about two-thirds of the total number, calculated from the tendency between the years 2000 to 2006.



Source: Consultant

Figure 4-6: Projection of Container Throughput – most probable

As a consequence, the number of vessels to call at Lattakia Port is estimated to grow accordingly (see below **Figure 4-7**).

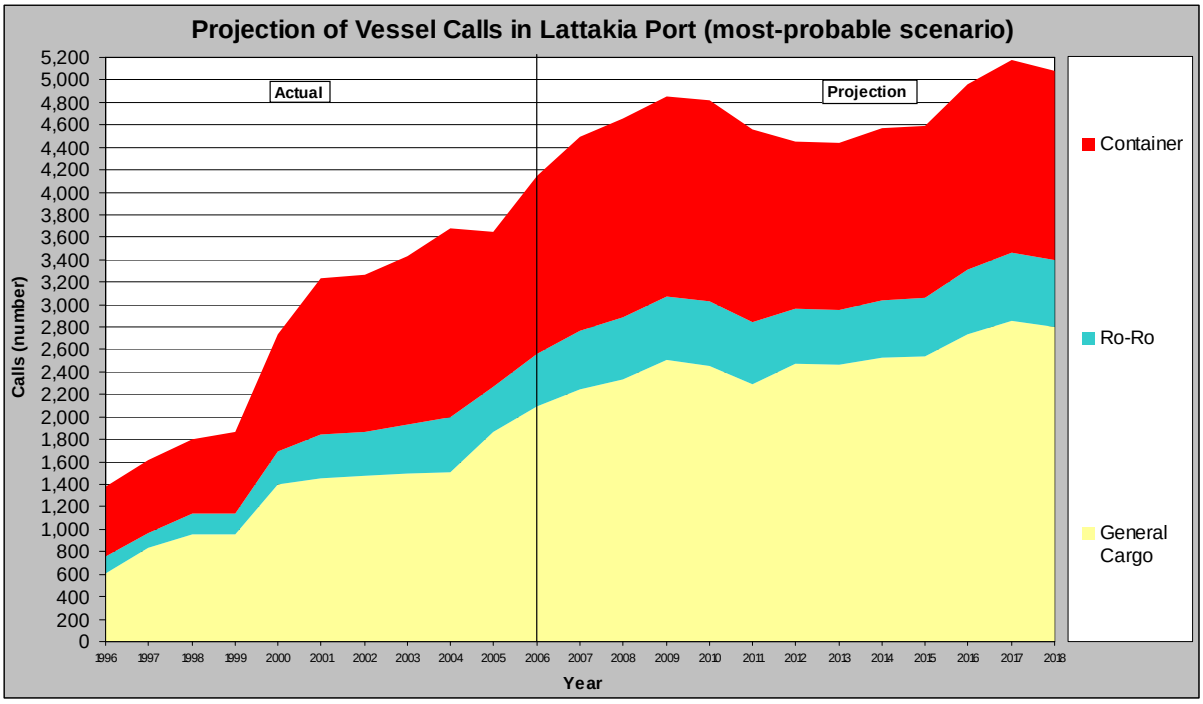
With the overall number of ship calls almost reaching 5,000 by the year 2026 (see below Table 4-13), the Consultant in this most-probable scenario estimates the number of vessels to almost triple within the next 20 years even under the expected growth in vessel sizes (for a detailed breakdown please see **Annex 4.2-15**).

Table 4-13: Vessel-Call Numbers, projection 2007-2026 - most probable

Year	Vessels (no)	Vessel Types		
		container	ro-ro	general cargo
2006	1,805	670	178	957
2011	3,430	1,501	429	1,500
2016	4,661	1,776	547	2,338
2021	4,435	1,480	491	2,464
2026	5,086	1,684	601	2,802

Source: Consultant

This growth in the number of vessel calls would be evenly distributed among the various vessel types, with the proportion of calls by conventional general-cargo vessels slightly exceeding calls by container-carrying (cellular and ro-ro) vessels. (see below **Figure 4-7**).



Source: Consultant

Figure 4-7: Projection of Vessel Traffic – most-probable

In this most-probable scenario, the size of vessels calling at Lattakia Port is expected to remain fairly constant. However, the Consultant expects that container vessels will have a significant share in the number of larger vessels and will thus grow in size (see below **Table 4-14** and **Annex 4.2-16**).

Table 4-14: Vessel Sizes, projection 2007-2026 - by GRT categories (numbers) – most probable

Year	Less 1000	More than											Total
		1000	2000	3000	1000	5000	6000	1000	8000	9000	10000	11000	
2006	101	364	147	227	64	63	95	56	82	106	49	451	1,805
2011	187	672	271	419	118	116	175	106	163	210	97	894	3,430
2016	255	918	371	573	161	159	240	145	219	283	131	1206	4,661
2021	243	877	354	547	154	152	229	138	208	268	124	1142	4,435
2026	280	1008	407	629	177	174	263	158	237	307	142	1304	5,086

Source: Consultant

4.3 Operating Concept and Traffic Flow

Annex 4.3-1 compares different container stacking systems with its strengths and weaknesses. The key question on the determination of container storage area requirements is: *"What is the most appropriate stacking system for the container terminal to be concessioned?"* For medium to large terminals only straddle carriers (SC) or rubber-tired-gantry cranes (RTGs) are in use world wide. Reach stacker, forklift trucks or chassis systems are the exception. For any new terminal a RTG system is recommended for the following reasons:

- The configuration of the terminal in general and the substantial distance between quay and the container yard in particular requires an indirect handling system using terminal tractors and chassis for transporting containers between quay and stacking area during quay transfer operation;
- Straddle carriers are designed for stacking, but not for long haul of containers;
- Straddle carriers are higher in maintenance cost;
- RTGs have a better space utilisation.

There are different models of RTGs in operation world wide between larger machines with a span over seven container rows plus one truck lane within the portal and with a lift of one container over five containers high (7 + 1 / 1 over 5), medium ones with a span over six rows and a lift over five (6 + 1 / 1 over 5) and smaller machines with 5 + 1 / 1 over 4. The cranes have either two or four wheels per corner. The latter type offers a smoother operation and a better load distribution / less wear of the travelling beams.

For the block stacking of empty containers (MTs) reach stackers or forklift trucks could be used so as to economise on investment and operating cost. As the future portion of MTs cannot be ascertained exactly at this stage, details on the combined use of RTGs and reach

stackers would be studied by the potential concessionaires / management contractor based on a detailed traffic forecast and business plan. The same holds for the design of the stack for reefer containers.

A typical RTG stack for 6 x 20 TEU = 120 TEU including space for long and cross travel for the RTG, truck lane for loading, discharging and by-pass / overtaking would have about 150 x 30 m = about 4,500 m². This is equivalent to 37.5 m² per ground slot.

However, to introduce an RTG system at an existing yard that is not designed for this purpose cannot be recommended, as substantial reconstruction works would be required during which terminal operations would have to be continued and as the RTG system is not ideal for stripping and stuffing of containers (in the first and second tier) and would lead to an excessive number of re-stowages within the stack. Also, the straddle carriers newly purchased would have to be discarded or sold most probably at substantial financial loss.

For the **expansion of an existing container yard** as is the case in Lattakia it is **recommended to continue with the present mixed operating systems consisting of straddle carriers, reach stackers and forklift trucks**, although the straddle carrier system, with which the existing operating and maintenance personnel is familiar, requires more area as shown in **Table 4-15**.

Table 4-15: Comparison of Required Holding Area for a Typical Medium Sized Container Terminal - Straddle Carrier versus RTG

Design Parameter	Straddle Carrier	RTG
Berth throughput (example)	700,000 TEU	700,000 TEU
Assumed percentage of indirect operation	100 %	100 %
Assumed portion of imports (50 %)	350,000 TEU	350,000 TEU
Average dwell time	10 days	10 days
Turnover of stock per year	36 x	36 x
Average stock	9,700 TEU	9,700 TEU
Approximate peak ratio	1.25	1.25
Maximum stock	12,100 TEU	12,100 TEU
Ratio ground slot to storage slot	1 : 2.5	1 : 3.5
Number of ground slots required net	4,840 TEU	3,450 TEU

Design Parameter	**Straddle Carrier**	**RTG**
Effective use ratio	0.90	0.80
No. of ground slots required gross	5,400 TEU	4,300 TEU
Area demand per ground-slot RTG system including operational areas	50.0 m²/TEU	37.5 m²/TEU
Required net stacking area	270,200 m²	161,300 m²
Contingency	9,800 m²	18,700 m²
Required gross stacking area	**280,000 m²**	**180,000 m²**
Proposed arrangement of blocks/ ground-slots	**4 x 6 x 240 / 5,760 TEU**	**6 x 6 x 120 / 4,320 TEU**

The roadways between the RTG lanes should be designed for two way traffic. This is to eliminate road traffic congestion and to maximise productivity during ship operation. All road traffic in the RTG stacks will travel from right to left. This means that vessel traffic (terminal tractor) will travel in an anti-clockwise direction and yard traffic (road trucks delivering and receiving containers) will travel in clockwise direction.

A reefer block (a stacking area for the storage of refrigerated / temperature controlled containers should be located closest to workshop and gates, so as to facilitate prompt plugging, unplugging and monitoring of reefer containers. Light towers would have to be located around the perimeter of the RTG stack area that means that the existing towers would have to be removed.

It should be clear that, no matter what stacking system will be decided upon, three separate areas should be provided for

(a) import and full export containers,

(b) custom´s inspection, un-stuffing (stripping) and stuffing of containers and

(c) storage of MT containers,

to overcome the existing unsafe, congested and cost ineffective practices and interference.

4.4 Updated Terminal Capacities and Area Demand

The following **Table 4-16** gives the updated berth throughput capacity for the terminal, which basically complies with the Lattakia Port Construction and Development Concept (PDC) dated December 2006.

Table 4-16: Potential Berth Throughput Capacity of Container Terminal

Berth No.	WWD (a)	Cont.p. gang-hour (b)	Working Hours per Day	Av. No. of Gangs (c)	Berth Occu-pancy Rate (d)	Berth Through put Ca-pacity (Con-tainer)	Berth Through-put Capac-ity (TEU) (e)
12	350	18	20	1-2	60 %	113,000	158,000
12 A	350	18	20	1-2	60 %	113,000	158,000
14	350	24	20	3	50 %	252,000	353,000
15	350	24	20	1	60 %	100,000	140,000
Total						**578,000**	**(f) 809,000**
Total Capacity rounded figures						**580,000**	**800,000**
Throughput at 75 % capacity						**440,000**	**600,000**

Key

(a) WWD = weather working days; holidays excluded;

(b) cont.p.g-h. = Estimated output in containers per gang-hour (Net Appliance Hour);

(c) Berths Nos. 12 and 12A with 1 or 2 ship cranes or 1 mobile crane, berth No. 14 with 3 and berth No. 15 with 1 STS-crane (gantry);

(d) Max. practicable berth occupancy rate (BOR) rates between 50 % (single berth) and 0.60 % for semi-scheduled arrivals for the a. m. group of berths at a multi-user terminal (please also refer to Annex 4.4-1); Rates can be higher for single-user terminals / berthing windows;

(e) 1 container = 1.4 TEU (based on statistics 2006);

(f) should be down-rated for Option A (see 4.5 below) to 700,000 TEU;

The capacity estimated for berths Nos. 14 and 15 of about 1,095 TEU per meter quay may be considered somewhat on the high side compared with international standards of about 750 TEU/m, but should be acceptable as target.

The demand for container storage areas based upon the maximum practicable quay capacity is calculated in **Table 4-17**.

Table 4-17: Estimation of Required Terminal Area for Import/Export Containers, Customs Inspection Area and MTs*

Design Parameter	**Import & Export Stacks / Straddle Carrier RTG**	**Customs Inspection / Stripping & Stuffing**/ Reach Stacker**	**MTs* / Reach Stacker & FLT*** **
Planned berth throughput	809,000 TEU	809,000 TEU	809,000 TEU
Assumed percentage of indirect operation	100 %	100 %	100 %
Assumed portion of containers	520,000 TEU	405,500 TEU	289,000 TEU
Average dwell time; import 10 days, export 5 days = average:	8 days	0.5 day	20 days
Turnover of stock per year	45 x	600 x	18 x
Average stock	11,500 TEU	675 TEU	16,000 TEU
Approximate peak ratio	+ 25 %	+ 25 %	---
Maximum stock	14,400 TEU	850 TEU	16,000 TEU
Ratio ground slot to storage slot	1 : 2.5	1 : 1	1 : 4
Number of ground slots required net	5,760 TEU	850 TEU	4,000 TEU
Effective use ratio	0.90	0.90	1.00
No. of ground slots required gross	6,400 TEU	950 TEU	4,000 TEU
Area demand per ground-slot SC	25 m²/TEU	60 m²/TEU	20 m²/TEU
Required net stacking area (Sub-Total)	160,000 m²	57,000 m²	80,000 m²
Contingency	10,000 m²	3,000 m²	---
Required net stacking area (Total)	**170,000 m²**	**60,000 m²**	**80,000 m²**

*/ MT = empty containers (mainly export);

**/ CFS = container freight station not included (already existing);;
***/ FLT = forklift trucks;
****/ for Berth Nos. 14 and 15 only;
****/ interchange areas and roads not included;
*****/ average; min. 45 m² side-by-side stacking 40ft and 130 m² for 20 ft with over next utilization of storage slot;
******/ mainly block stack, full selectivity 50 m²/TEU;

The terminal areas available at present (total gross area and net stacking area) based on the proposed layout as per **Annex 4.5-2** are listed in **Table 4-18**.
A comparison of the total area required for a throughput of about
800,000 TEU as per **Table 4-17** of **31 ha**
with the available area as per **Table 4-18** of **22 ha**
results in a deficit of about **9 ha**

Through the use of the existing container yards in the Old Harbour also in future (please refer to **Table 2-6**) this deficit could be further reduced by **5 ha**
(total area about 9 ha x about 60 % factor for net stacking area = 5.4 ha)
the remaining deficit would be in the order of **4 ha**

Table 4-18: Proposed Utilization of Areas within the Perimeter of the Terminal

Area No.	Utilization	Total Area			Stacking Area			Stacking System	Max. No. of Ground Slots TEU
		Length m	Width m	Size m²	Length m	Width m	Size m²		
1	Import/ Export	710	204	145,000	340	125	42,500	Straddle C.	1,700
					280	125	35,000	Straddle C.	1,400
2	Import/ Export	340	170	57,000	280	125	35,000	Straddle C.	1,400
3	Import/ Export	410	53	21,700	370	20	7,400	Reach St.	140
4	Import/ Export	435	95	41,400	330	90	29,700	Reach St.	630
					80	50	4,000	Reach St.	incl.

Area No.	Utilization	Total Area			Stacking Area			Stacking System	Max. No. of Ground Slots TEU
		Length m	Width m	Size m²	Length m	Width m	Size m²		
1-4	Sub-Total			265,700			153,600		5,270
5	Empties	310	45	13,900	350	25	8,700	Forklift Tr.	435
6	Empties	330	300 : 2	*49,800	440	25	11,000	Forklift Tr.	550
7	Empties	195	5	16,600	180	80	14,400	Forklift Tr.	720
4-7	Sub-Total			80,300			34,100		1,705
8	Customs Insp. Stripping & Stuffing	380	105	40,000	350	40	14,000	Reach St.	840
9	Customs Insp. Stripping & Stuffing	320	20	6,400	300	13	3,900	Reach St.	240
8-9	Sub-Total			46,400			35,000		1,080
Total				**392,400**			**222,700**		**8,055**

*/ including CFS about 7,000 and operational areas/roads 10,000 m²;

As the demand for stacking import and export containers behind the quays of about 17 ha can almost be fulfilled (available15 ha) and some stripping and stuffing of containers (as overflow of Areas 8 and 9 as per **Table 4-18**) can be done in the conventional harbour, this remaining small deficit appears to be acceptable at this stage of planning.

This option would lead to substantial savings in investment cost for terminal area expansion but would lead – compared with a more integrated or compact area - to higher operating cost as a consequence of longer transport distances, higher non-productive time for handling equipment and certain interference with conventional cargo traffic.

From the above calculation can be concluded that after installation of the gantry cranes at Berth Nos. 14 and 15 and the use of harbour mobile cranes at Berth Nos. 12 and 12 A the throughput capacity of the terminal without terminal area expansion and without the use of

existing areas in the conventional port will be limited to about 570,000 TEU (22 ha : 31 ha = about 71 % x 809,000 TEU), whereas with the use of the conventional port area it would be about 700,000 TEU (27 ha : 31 ha = about 87 % x 809,000 TEU) or with adequate terminal area expansion in line with above demand about 800,000 TEU.

The above assessment basically complies with the results of the PDC.
It should be noted that with a modal shift from lift-on/lift-off (lo-lo or conventional container handling) to roll-on/roll-off (ro-ro) operations more area than estimated above would be required. This question would have to be assessed through a more detailed feasibility study by the concessionaire or management contractor.

4.5 Terminal Layout, Areas and Facilities

Based upon the area requirements calculated above the total area demand for a green-field terminal would be in the order of 41 ha as detailed in **Table 4-19** below.

Table 4-19: Estimation of Total Terminal Area Demand

	Description of Area	Approximate Dimensions m	Approx. Area m²
1.	**Main Areas (1-6)**		**360,000**
1.	Container Yard (full containers)	See Table	170,000
2.	Stripping and stuffing, customs inspection	See Table	100,000
3.	MT stack	See Table	60,000
4.	Quay area berths 14 and 15	40 x 450	18,000
5.	Terminal road around the container yard (depending on final layout)	2,500 x 12	30,000
6.	Contingency		2,000
7.	**Ancillary Areas**		**50,000**
7.1	Container Freight Station (CFS)	50 x 125	existing
7.2	Parking area for terminal equipment	90 x 125	11,250
7.3	Access road in front of the Gate	100 x 20	2,000

	Description of Area	Approximate Dimensions m	Approx. Area m²
7.4	Maintenance, repair and cleaning area, fuel station, rubbish skip, reefer wash, container repair	80 x 140 20 x 40	11,200 800
7.5	Vehicle park near Administration Building	50 x 30	1,500
7.6	Gate (canopy)	20 x 50	1,000
7.7	Truck holding area in front of gate	150 x 100	15,000
7.8	Mechanical workshop (two storeys)	20 x 60	1,200
7.9	Area in front of workshop	20 x 60	1,200
7.10	Service / Social building (ground floor only)	35 x 20	700
7.11	Administration building (5 storeys)	30 x 20	600
7.12	Annex to Admin. Building for container dispatch	15 x 10	150
7.13	Contingency also for light towers, fire brigade/ambulance and landscaping		3,300
	Total Area Required (1-7)		**410,000**

The team, after thorough in-depth study of all relevant aspects, concluded that the areas behind Berths 10 – 11 would. Therefore, additional back-up areas were to be identified by the team, for which two alternative layouts were developed (reclaimed area and tank farm area) and discussed with the Port.

From the existing port layout as per **Annex 4.5-1**

- the above Table;
- the List of Open Storage Areas as per **Table 2-6**,
- own observation during the fist mission and
- various subsequent discussions with port management

it became evident that the conversion of the back-up areas behind berths 10 – 12 A into container yards as proposed in the PDC (yellow area) would not be adequate by location, size and configuration to become potential areas within the perimeter of a concession / management contract. Contrary to the assumptions in the PDC, during the recent discussions with the Team the Port found it necessary to continue the handling of dry bulk cargo vessels at Berths 10 to 12 mainly because of severe draft restrictions for handy sized bulk carriers at

other berths. Thus respective areas are insufficient to cope with future demand and would interfere with the discharge of dry bulk cargo.

For the proposed layout existing structures such as workshop and administrative buildings already existing can be used for the container terminal which leads to a reduction of the a. m. total area demand. Area 14 A and B occupy about 900 m (CFS area included) x 200 m = 18 ha, whereas Area 14 C has about 170 x 250 m = about 5 ha, so that the **total available terminal area is about 23 ha**. Compared with a demand as listed above of about **41 ha**, there would be a deficit in area supply of about **18 ha**.

This **deficit could be reduced** through the limitation of design throughput to 500,000 TEU and change of stacking system from straddle carrier to RTG. However, at this stage, this possibility should not be taken into account as experience shows that space planned for container traffic is eaten up very rapidly by the actual growth, so that one should plan for additional terminal area ideally within the perimeter of the concession.

Under consideration of the above the following options for expansion of the existing container yards were developed:

Table 4-20: Options for Container Yard Expansion

Option	**A**	**B**	**C**
Description	Back-up Area Berths 10-12A *	Area of Oil Tank Farm	Reclaimed from the Sea
Location (**Annex 4.5-2**)	Yellow area	Green area	Blue area

*/ as proposed in the PDC, but with additional new yards at the tank farm area;

It appears that based upon the site selection criteria listed in **Table 4-21** below **Option A** should be the **preferred option** as it is a low cost solution, can be implemented relatively easily and does interfere neither with the future use of the tank farm area or future port expansion works. For this option a more detailed layout is attached as proposal for the perimeter of the terminal area and also as basis for the rehabilitation and investment cost (see **Annex 4.5-3**).

Table 4-21: Container Yard Expansion Site Selection Criteria

	Criteria	**Option A**	**Option B**	**Option C**
1.	Location	See map	See map	See map

	Criteria	Option A	Option B	Option C
2.	Description	Back-up area berths 10-12A	Old tank farm,	Water area 5 - 10 m deep
3.	Approximate additional area available	4 ha (tank farm area) + 9 ha (old harbour)	24 ha	23 ha
4.	Storage throughput capacity	700,000 TEU p.a.	800,000 TEU p.a.	800,000 TEU p.a.
5.	Mean approx. distance from yards to berths Nos. 14 & 15	1,200 - 3,000 m	1,500 m	800 m
6.	Mean distance from yard to Gate 4 and Main Road	300 - 4,500 m	1,000 m	900 m
7.	Owners	GoS managed by LPGC	GoS managed by LPGC	GoS managed by LPGC
8.	State of development	Developed for container storage	Partly developed for cont. storage	Not developed
9.	Availability	Yes	4.4 ha only, complete area not before 2010	Yes
10.	Seaside access	Excellent	Excellent	Excellent
11.	Road access	Through existing gates	Possibly separate gate	Possibly separate gate
12.	Road traffic load inside Port enclosure	Sometimes congested	Not critical	Not critical
13.	Rail access	Single line through convent. port	Single line through convent. port	Single line through convent. port
14.	Impact on environment	Not significant	Less significant	More significant
15.	Possibility of expansion	No	Yes	Yes
16.	Limitations or restrictions in use	Certain interference with con-	Certain interference between	No

	Criteria	Option A	Option B	Option C
		vent. Cargo, but acceptable as intra-terminal transfer is not time critical; Interference with traffic to/from Economic Free Zone	shunting of wagons and quay transfer operation of containers; Interference with traffic to/from Economic Free Zone	
17.	Overall suitability and possible / perspective acceptance by trade	Acceptable, as system already practised now	Certain threat of delayed removal of structures	Obviously Acceptable
18.	Possible attractiveness for potential terminal operators	Attractive, but remote location of outside yards	Less attractive	More attractive
19.	Level of investment cost	Lowest possible	Relatively low	Substantial
20.	Level of operating & maintenance cost	Possible higher waiting times due to movement of conventional cargo at adjacent berths	Additional quay transfer equipment	Additional maintenance of seawall
21.	Interference with conventional cargo handling during re-construction	Not significant	No	No
22.	Interference with container handling during construction	Not significant	No	No
23.	Opportunity to expand EFZ to tank farm area	Yes	No	Yes
24.	Construction time (broad estimate)	1.5 years	2.0 years	3.0 years
	Suggested Ranking	**1**	**2**	**3**

4.6 Terminal Rehabilitation and Expansion Demand

It is recalled from the Introduction that main objectives for the rehabilitation and expansion of the existing facilities are:

- to cope with future short term demand,
- to provide separate areas for the stacking of import / exports and MTs (empty containers) as well as for customs inspection / stripping and stuffing of containers,
- to enable a very high level of container handling performance and productivity,
- to offer a sufficiently sized terminal area attractive for a private terminal operator and
- to implement all measures within a short period of time and at reasonable cost.

While the existing container storage areas 1 and 2 are in a quite good technical condition, it became obvious from the comparison between the existing port layout related to container traffic and the proposed layout - based upon the maximum throughput capacity of Berths Nos. 12, 12A, 14 and 15 – that the following rehabilitation and expansion measures are needed (number of areas as per **Annex 4.5-3**):

(a) Modernisation of **Areas 1 and 2** for straddle carrier operation (direct system to serve the four gantry cranes);

(b) Reconstruction of **Areas 3 and 4** behind Berths Nos. 12 and 12 A including removal of railway lines towards and on Berths Nos. 10 to 12 A and replenishment of pavement;

(c) Rehabilitation of Pavement of **Areas 5 to 7** and **Areas 9 to 11** incl. adjustment in elevation, replacement and securing of shaft covers;

(d) Completion of construction at **Area 8** (former tank farm area) as customs inspection, stripping and stuffing area, including truck holding area and terminal gate (e.g. illumination);

(e) Completion of rehabilitation of **container yards in the Old Harbour** (recently under construction);

(f) Development of the Workshop Complex at **Areas 5 and 11** including workshop extension for straddle carriers, store, washing bay, parking lots for equipment (see **subsection 4.7.2**);

(g) Construction of terminal roads between quay transfer **Areas 1-3** and **Area 8** including new traffic signs;

(h) Rehabilitation of railway **level crossings** (roads and within the Areas);

(i) Development and Rehabilitation of **illumination** of areas (incl. transformer) and traffic ways;

(j) Refurbishing resp. construction of additional **gates** to storage areas and renewal of **fencing** in line with modern security standards (ISPS), e. g. illumination and video surveillance;

(k) Repair of ro-ro-ramp (**Berth 13**) and refurbishing of **Berths 12, 12A, 14 and 15** with safety equipment (e. g. ladders and life-savers);

(l) Construction of **social building** (for approx. 150 persons) to meet the demand of approx. 400 to 450 workers during 3-shift operation.

(m) Repair and furnishing of **CFS / LCL-shed** resp. **administration building** accordingly.

No matter what solution is selected for future container yards, the planned new road access between Gate No. 4 and the Free Zone requires immediate attention and detailed study of the traffic flow to avoid any bottleneck or congestion at this area.

With further increase of container transport by rail it may well be the case that the existing rail siding and rail interchange complex needs to be expanded, but this issue should be treated with caution as at the moment about 70 % of the containers go to Aleppo and these containers will most probably be transported by road as soon as the new road has been completed. Therefore, a decision on any expansion of the existing sidings should be left in the discretion of the future operator. If needed, either more sidings could be provided at the existing rail interchange or an alternative or additional interchange could be provided in extension of the existing marshalling yard West of Area No. 8.

For the construction and rehabilitation of container stacking areas it is recommended to consider at least live loads of 55 kN/m² (full, 4 stacked high; according to PIANC-Bulletin No. 56, 1987).

4.7 Required Investments in Terminal Equipment

Terminal equipment shall comprise of:

- Container handling equipment for quay transfer operation and receipt/delivery operation;
- Container transport equipment mainly consisting of terminal-tractor-trailer units;
- Forklift trucks for stripping and stuffing of containers;
- Lifting appliances for cranes and forklifts;
- Installations and equipment for maintenance repair, cleaning and fuelling;
- Other terminal equipment (buses for personnel transport, private vehicles, office equipment, communication, IT equipment and equipment for traffic control and surveillance).

4.7.1 Terminal Handling and Transport Equipment

For the quay transfer operation at berths 14 and 15, straddle carriers are proposed that operate in a direct system. This means that the container are discharged onto the quay deck by the gantry cranes and transported from there to the designated place of rest in the import stack. During export the container would be taken from the place of rest and transported to

the quay and placed under the portal of the gantry crane.

In a relay-system <used for longer transport distances> transfer of containers between the crane and the stack would be done by tractor-trailer-units, where the straddle carrier is used for stacking and un-stacking only and thus additional tractor-trailers would have to be used. This would lead to an increase in operating cost and can, therefore, not be recommended.

As the stacking areas behind berths 12 and 12 A are comparatively small, reach stackers would be the more appropriate handling equipment for quay transfer operation to serve either mobile cranes or ship-board cranes.

For the transfer of containers between the import and export stacks at area 1 to 3 to the customs inspection and stripping and stuffing area terminal own tractors and trailers are suggested. As an alternative these could be hired from outside as is the case in other ports that have a large pool of suitable vehicles.

It is assumed that the additional equipment needed will be brand new and state of the art. However, it would also be feasible to use second-hand equipment in good working condition that is for example transferred from another port to the terminal in Lattakia.

Basis for the calculation of the demand for the container handling equipment is the number of movements to be performed expected from the design berth throughput as per **Table 4-16**. This means that with a lower or higher utilization of this capacity the number of equipment would have to be adjusted accordingly.

The type and number of container movements on the terminal can be identified as per **Table 4-22** below. This Table is an important basis for the calculation of the demand for terminal handling and transport equipment and for operations personnel.

Table 4-22: Expected Container Movements*

	Type of Move	Total	SC**	RS**	TT**
1	Vessel discharge Berths 14 & 15 to Areas 1 & 2 (70 % imports)	154,000	154,000	---	---
2	Vessel discharge Berths 12 & 12A to Area 3 and 4 (30 % of imports)	66,000	---	66,000	66,000
3	Transfer from Areas 1 & 2 to Area 8 etc.	154,000	154,000	---	---

	Type of Move	Total	SC**	RS**	TT**
4	Transfer from Areas 3 & 4 to Area 8 etc.	66,000	---	66,000	66,000
5	Unloading of trailers at Area 4	220,000	---	220,000	---
6	Loading of FCL containers to road truck of consignee (20 % of imports)	44,000	---	44,000	---
7	Transfer of MT containers from stripping, stuffing and customs inspection area to MT area at areas***	176,000	---	176,000	88,000 ****
8	Receipt of MT containers after delivery do consignee	44,000	---	44,000	---
9	Transfer of MT containers from MT stack to Berths Nos. 12 to 15 (75% of exports)	165,000	---	165,000	165,000
10	Loading of MT containers directly from tractor-trailer units	165,000	---	---	---
11	Receiving of full containers at Areas Nos. 1 & 2	40,000	40,000	---	---
12	Receiving of full containers at Areas 3 & 4 (Item 10+11 = 25% of exports)	15,000	15,000	---	---
13	Vessel loading full containers Berths 14 & 15 from Areas 1 & 2	40,000	40,000	---	---
14	Vessel loading full containers Berths 12 and 12A from Areas 3 & 4	15,000	---	15,000	15,000
15	Sub-Total	1,199,000	403,000	796,000	400,000
16	Re-stowages (about 15 % of Item 14) and contingency	201,000	77,000	124,000	60,000
17	**Total Movements In and Out**	**1,325,000**	**475,000**	**850,000**	**465,000**

*/ throughput 440,000 containers = 600,000 TEU, rounded figures based on **Table 4-16** second last column;

**/ SC = straddle carrier; RS = reach stacker; TT = tractor-trailer unit;
***/ Stacking and unstacking of MT containers by forklift truck;
****/ About 50 % direct operation and 50 % indirect operation;

The total number of moves divided by the number of containers results in 3.2 average moves per container (1,400,000 : 440,000 boxes).

The **demand for straddle carriers** is calculated as follows: 250 d x 15 h = 5,250 h x 0.7 utilization factor = 3,675 h/year x 12 average moves = 44,100 moves. 480,000 total moves: 44,100 possible moves per machine = 10.9 machines + 1.1 machines as contingency for M&R = 12 **machines**.

Similarly, the **demand for reach stackers** is estimated: 3,675 h per year x 15 moves (mainly indirect system that means unloading and loading trailers) = 55,000 moves per machine and year. 920,000 moves per year: 55,000 = 16.7 machines + 2.3 spare for M&R = **19 machines**. With continuous operation a higher utilization than 3,675 h/year is possible, but one has to consider that the reach stackers have to be shifted from one yard to another which causes non-productive time, also relatively low utilization during night time and the inter-arrival time between container vessels.

The demand for tractor trailer units is calculated in **Table 4-23**.

Table 4-23: Estimation of Required Tractor-Trailer Units

Pos.	Movement	Average Distance 1.000 m	Average Distance 2.000 m
1.	Loading of truck at Area 1 to 3	2.0 min	2.0 min
2.	Average speed of truck with container	20 km/h = 5,6 m/sec	20 km/h = 5,6 m/sec
3.	Driving of truck with container from Quay Area to Area 8 and MT yards	3.0 min	6.0 min
4.	Unloading of truck under RS	1.0 min	1.0 min
5.	Average speed of truck with empty trailer	30 km/h = 8.3 m/sec	30 km/h = 8.3 m/sec
6.	Driving of truck with empty trailer from Area 8		

Pos.	Movement	Average Distance 1.000 m	Average Distance 2.000 m
	and MT yards to Quay Areas	2.0 min	4.0 min
7.	Sub-Total	8.0 min	13.0 min
8.	Contingency for unforeseen stops	2.0 min	2.0 min
9.	Total per round-trip	10.0 min	15.0 min
10.	Number of round-trips per hour	6 x	4 x
11.	Potential working hours per year (as above)	3,675 h	3,675 h
12.	Number of round-trips per year and machine	22,050	14,700
13.	Total number of moves per year	460,000	460,000
14.	Number of TT-Units Required (Net)	21	32
15.	Contingency for maintenance and repair	4	6
16.	**Total Demand for TT-units**	25	38

As the prevailing distance between the quays and areas for customs inspection, stripping and stuffing as well as MT storage will be about 1.5 km it is recommended to employ in total 32 tractor-trailer units in total.

The demand for forklift trucks for the stripping and stuffing of containers is estimated as follows: 220,000 full moves in and out ./. about 50,000 export containers mainly cotton = 170,000 import containers, hereof 113,000 containers p. a. (67 %) manual unloading = 33 % = 57,000 containers p. a. for **mechanical unloading**: 300 working days = 190 containers per day : 8 containers per FLT and day (4 containers per shift) x 2 shifts) = 23.8 FLTs + 6.2 FLTs contingency for peaks and downtimes = **30 FLTs in total**.

In furtherance to the operational concept for terminal operations explained in **Section 4.3** and the calculations above the demand for terminal handling and transport equipment is summarized in Table 4-24 below.

Table 4-24: Terminal Handling and Transport Equipment

Item	Description	Capacity	Total Demand	Existing Number and on Order	Additional Demand
1.	STS gantry crane *	45 t	4	4*	-
2.	Harbour mobile crane	45 t	4	4	-
3.	Straddle carrier	45 t	12	12	-
4.	Reach stacker	45 t	16	16	-
5.	Terminal tractor	45 t	32***	32	- **
6.	Terminal trailer	45 t	40***	20	20
7.	Forklift truck for MTs	12/15 t	6	6	-
8.	Forklift for stripping/stuffing	3.0 t	30	-	30
9.	Equipment for LCL-Shed (such as storage racks / shelves for storage of break bulk, stevedoring pallets, hand pallet trucks <hydraulic jacks>)	-	1 set	-	1 set
10.	Equipment for Dangerous Goods (DG) Shed	-	1 set	-	1 set

*/ ship-to-shore cranes; these are on order for delivery in August 2008;
**/ 20 new machines for replacement in budget for 2008;
***/ existing fleet to be refurbished.

4.7.2 Workshop & Stores Requirements and Equipment

A) Parking and refuelling of equipment

The triangular area opposite of the maritime school keeps as a part of it an area (Area 10) for a refuelling station with 5 diesel tanks and a supply station, one semi covered washing bay, parking area for equipment and an administrative building.

The area of approximately 8,500m² is for the time being not used but is also not sufficient to cope as a parking area for the above handling equipment.

B) Central Workshop

Close to the southern fence of the tank area, the area for the workshops with approx 20,900m² is located (part of Area 11). The area contains the workshop building with shops, offices and rooms for personnel.

The present workshop contains mainly three parts of different height like:

Table 4-25: Workshop Sections

Workshop	**Total Height**	**Dimension**	
Straddle Carrier	16.4 m	18 m x 24 m	One level
Various equipment and machinery	9.2 m	54 m x 24 m	One and two level
Offices and other rooms	9.2 m	32 m x 24 m	One to three level
Total		**104 m x 24 m** **2500m² at ground floor level**	

For the time being the complete facilities are not used and are not in an operational status. Due to the limited entrance width of 6 m width and 11 m height the present workshop can not be used for maintenance and repair (M&R) of 3-high nor 4-high stacking Straddle Carrier (SC). Other parts of the workshop can be used after some rehabilitation works for M & R of the remaining container handling equipment and could also cover the remaining equipment and vehicles.

For proper M & R of Straddle Carrier and Mobile Harbour Cranes additional workshop area

will be necessary, covered and uncovered. An additional cleaning area for SC will be also necessary but could be arranged at the present parking/refuelling area.

C) Store

As a necessary support for sufficient M & R a store for spare parts and material is indispensable. The store shall contain:

- Receipt and Issue Section;
- Multiflex two tier system, mobile store;
- Long shelf system, pallet storage, long material storage;
- Electrical forklift;
- Offices for 3 shift system;
- The store should be connected with the workshop and has a service desk to the SC workshop.

D) Location of Workshop and Service Areas

Figure 4-8: Location of Workshop and Service Areas

Key:

Present Refuelling, washing and parking area		**Dimensions**	**Comments**
1	Present washing bay		Not sufficient for SC and heavy equipment
2	Required extension of washing bay	10 m x 18 m	Concrete paved area
3	Present admin building		
4	Present fuel tanks and supply station	50,000 litre diesel	
Present M&R area			
5	M&R area Harbour cranes and parking of equipment	48 m x 30 m	Concrete paved area
6	Parking of equipment	50 m x 160 m	Concrete paved area
7	Present workshop building	24 m x 104 m	
8	Workshop extension for SC	24 m x 18 m 15.5 m+5 m= approx. 21 m high	For 4 high SC, Covered, with 2 sliding doors.
9	Store	24 m x30 m 8 m high	Covered, With doors to both ends

E) Workshop equipment and tools

The central workshop is mainly equipped with machinery for the various shop sections. They are not used and most are not in an operational condition or outdated. Some lathes, boring machines, chappings, milling machines, saws, cutter etc. can be with minor efforts and costs back in operation. The overhead cranes are also useful and could be back in operation.

Following a modern maintenance strategy not all machines are again necessary in particular for outsourced activities like tire repair or general overhauling of gears and diesel engines. On the other hand important electrical-, water- and compressed air installations and sufficient illumination are completely missing. Sufficient offices and rooms for the workshop management and personnel is available but without any furniture our outfit. In the following Table a first estimate for necessary workshop installations, equipment and tools is listed.

Table 4-26: Proposed Additional Workshop Installations, Equipment & Tools

	Workshop Sections	**Thousand EUR**
1	**Workshop installations**	100
2	**M & R STS and MHC cranes**	
	2 different Diesel Service Cars	40
	Special measuring devices and workshop outfit	27
	1 vertical lift, self- propelled, type Haulette HA 260 PX, working height 226 m,horizontal outreach 16 m, platform capacity 230 kg	110
3	**Section cleaning of equipment**	
	2 powerful hot - water high pressure cleaner	10
	2 used 40ft container and some tools	7
	1 vertical lift type PB 65(V)	180
	2 stages with two tiers and ladders	8
4	**Section Tire change**	
	Miscellaneous tools and equipment to ease tire maintenance and change of tires, tire lever, liftmaster, tire racks, tire mounting levers for twin tires, etc.	35
5	**Mobile field service for rolling equipment**	
	2 different Diesel Service Cars	40
	2 pick-ups	35
6	**Section Tool store**	
	Shelve arrangement, lockable heavy cabinets, benches, special mechanical and electrical tools	20
7	**Maintenance and repair rolling equipment and vehicles**	
	Greasing equipment, welding equipment, several jacks, battery charger and equipment, Shelve, workbenches, cabinets, cleaning devices, 4 column grinder, and special tools.	50

F) Equipment and Outfit for Spare Parts Store

1	Various shelve arrangements for spares and material and lifting equipment.	150

4.7.3 Other Terminal Equipment

For the sake of completeness also a set of miscellaneous equipment is included in **Table 4-27**. It is felt that at this planning stage a broad estimate is sufficient as the future operator will do the related technical specifications and detailed engineering based on his experience.

Table 4-27: Other Terminal Equipment

Item	Description	Total Demand	Existing Number	Additional Demand
1.	Lashing cages 20 ft	4	-	4
2.	Hook beam 65 t for heavy lift	1	-	1
3.	Over-height (=/H) lifting gear	2	-	2
4.	Skeleton trailers / low beds for transport and storage of spreaders and lashing cages	12	-	12
6.	Tank truck for re-fuelling of straddle carriers and reach stackers	2	-	2
7.	Road sweeping and cleaning machine	1	-	1
8.	Communication equipment including portable VHF radios (walkie-talkies)	1 set	-	1 set
9.	Computerized container terminal management system and EDI-System including PCs on board main equipment and hand-held terminals for tallyclerks	1 set	-	1 set
10.	Office equipment	1 set	-	1 set
11.	Garbage containers	1 set	-	1 set
12.	Protective clothing (safety helmets, overalls, gloves etc.)	1 set	-	1 set
13.	Buses for personnel transport	2	-	2
14.	Private vehicles for terminal management	5	-	5

4.8 Proposed Terminal Organisation

It is generally accepted that dealing with organisations are rather complex issues which require in depth studies through a team or working group usually applying a scientific bottom-up approach, that means that based on interviews all functions in the organisation are identified and then combined to units - also under consideration of:

- corporate objectives of the organisation and each division or department;
- management system (e.g. by delegation, objectives, exception);
- existing and future proposed profit centres and cost centres and
- the extent of sub-contracting of functions and services.

General principles such as unity of command, span of control and distinction between advisory (off-line) functions and line functions should be observed. The structure has to be functional and should not be based on the importance or payment level of employees.

The terminal organisation and the TOS (terminal operating system) will be planned in detail by the concessionaire. It is assumed that the successful bidder agrees to establish a fully fledged local terminal management and operating company but not only a small local office as a branch from a foreign headquarters. A lean organisational structure for a newly set up terminal operating company could be as follows:

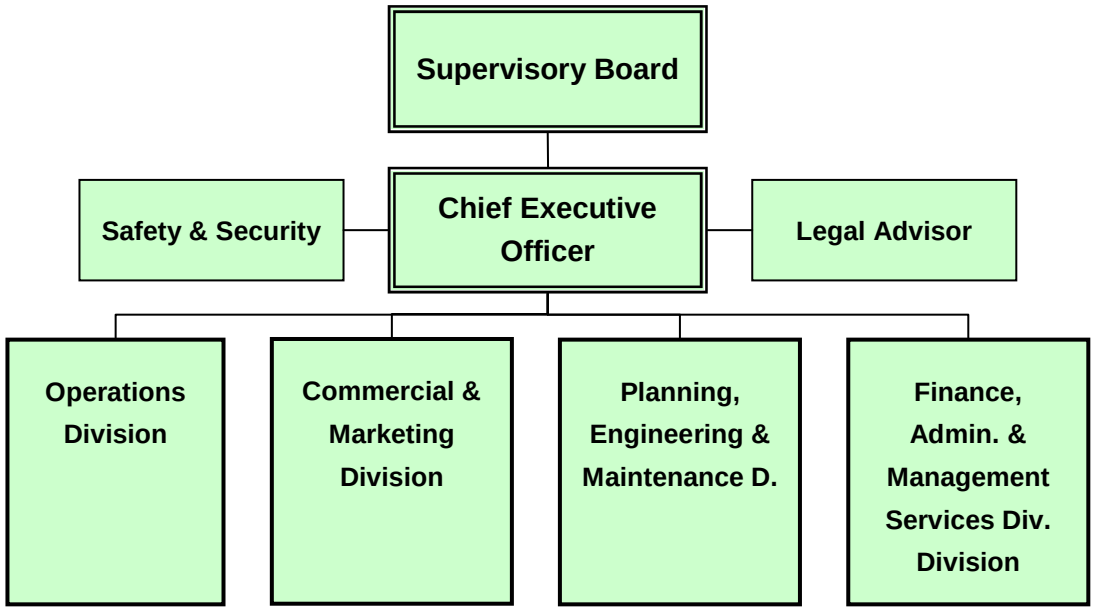


Figure 4-9: Proposed Management Structure (for new Terminal Operating Company)

At this stage the experts like to outline the required management personnel to be assigned to the above divisions as per **Table 4-28** below.

Table 4-28: Management Personnel

Item	Department / Section	Number
1.	Managing & Commercial Director	1
2.	Marketing & PR Director	1
3.	Administration Director (Finance & Procurement)	2
4.	Human Resources and Training	2
5.	Planning & Development	1
6.	Director IT, MIS and EDI	1
7.	Technical Director (Mechanical and Electrical)	1
8.	Director Civil Engineering (should be outsourced)	-
9.	Accountants	2
10.	Secretaries	2
11.	Office clerk	1
12.	Office boys	2
13.	Drivers / messengers	2
14.	Contingency	2
1.-14.	**Total**	**20**

It is expected that in the interest of excellent know-how transfer and training an adequate number of expatriates is contracted by the operating company to be appointed to the key posts. Details will have to be indicated by interested bidders in their Business Plan as part of the tender documents to be presented later on.

4.9 Human Resources Demand

When setting up the human resources and training plan the terminal operator will have to answer two important questions:

I. What is the maximum number and qualification of operations personnel to cover working peaks?
II. What average number of operations personnel he can afford to make terminal operations financially viable?

As the actual number also depends to a large extent on the possibility to employ and train for multi-skill jobs the actual number can only be determined by the future concessionaire /

management contractor later on. Notwithstanding the aforementioned, in the following an outline is given on the future demand also as a perspective input to the financial evaluation.

Table 4-29 shows the estimated demand for **container terminal management personnel**. It is assumed that quay transfer, that means discharging and loading of vessels is done around the clock in three shifts, whereas gate traffic, that means receiving and delivering of containers and of general cargo is organized on a two-shift basis, notwithstanding the possibility to work overtime during night shift if needed to cover working peaks.

The typical gang structure and demand for operations **personnel** during dispatch of **one main line vessel** is estimated in **Table 4-30.** The Table is split between the demand for vessel discharging and loading operations (Item 1), transfer operation between import/export stack and the yard No. 4 (Item 2) as well as operation at yard No. 4 (Item 3). It is assumed that personnel for stripping and stuffing of containers is not permanently employed but done by daily paid or casual labour - as practised now.

Table 4-29: Demand for Container Terminal Management Personnel

Position / Function	I. Shift	II. Shift	III. Shift	Total I.-III. Shift
1. CT Management				
Terminal Manager	1	-	-	1
Secretary	1	1	-	2
Ship planner	1	1	-	2
Shift manager	1	1	-	2
Ass. shift manager	-	-	1	1
Superintendent documentation	1	1	1	3
Gate controller	2	2	2	6
Yard controller Areas 1-3	2	2	2	6
Yard controller Area 4	2	2	-	4
IT / EDI clerk	2	2	1	5
Commercial clerk	2	2	-	4
Contingency	1	1	2	4
Total	**16**	**15**	**9**	**40**

Table 4-30: Typical Demand for Terminal Operations Personnel during Dispatch of Main Line Vessel (with 3 STS gantries)

Position / Function	I. Shift	II. Shift	III. Shift	Total I.-III. Shift
1. Ship Operation				
Crane driver	5 *			
Tally clerk	3			
Ship supervisor	1			
Lasher on board	6			
Quay supervisor	1			
Lasher ashore	4			
Straddle carrier driver	9			
Reach stacker driver	-			
Sub-Total 1	**29**	**29**	**29**	**87**
Total no. of man-shifts				87
Total no. of moves				1,440
Productivity				16**
2. Transfer				
Straddle carrier driver	2			
Tractor driver	10			
Reach stacker driver	2			
Tally clerk	2			
Traffic supervisor	1			
Sub-Total 2	**17**	**17**	**17**	**51**
Total no. of man-shifts				51
Total no. of moves				800
Productivity				16***

Position / Function	I. Shift	II. Shift	III. Shift	Total I.-III. Shift
3. Receipt / Delivery Operation * **				
Supervisor	2			
Reach stacker driver	4			
Forklift driver	16			
Tractor driver	2			
Tally clerk	8			
Warehouse worker for stripping & stuffing ****	-			
Sub-Total 3	**32**	**32**	**32**	**96**
Total no. of man-shifts				24*****
Total no. of moves				800
Productivity				33***
4. Contingency	**2**	**2**	**2**	**6**
1-4. Total	**80**	**80**	**80**	**240**

*/ including 2 relief drivers;
**/ no. of moves = container per man-shift
***/ including CFS, LCL, customs inspection and MT operation;
****/ contract labour from outside;
*****/ forklift drivers and tally clerks for stripping and stuffing not included;

It is obvious that during discharging and loading of a feeder vessel the demand for personnel is less than listed above. An example for ship operation is given in **Table 4-31** below. As to be seen from the Table it is assumed that the vessel is dispatched with two ship cranes or one mobile shore crane within one shift plus overtime.

The personnel demand for transfer operation and receipt / delivery is expected to be in the same ratio as listed in **Table 4-30** (Demand Item 1 = about 40 % and Items 2 and 3 about 60 %). During working peaks, that means when all berths are occupied, allocation of personnel for dispatch of vessels will have to get priority over all other activities.

Table 4-31: Typical Demand for Terminal Operations Personnel during Dispatch of Feeder Vessel

Position / Function	I. Shift	II. Shift	III. Shift	Total I.-III. Shift
1. Quay Transfer				
Crane driver	3*	3*	overtime	
Tally clerk	2	2		
Ship supervisor	1	1		
Lasher on board	4**	4**		
Quay supervisor	1	1		
Lasher ashore	2	2		
Truck driver	2	2		
Reach stacker driver	4	4		
Sub-Total 1	**15**	**15**	**-**	**30**
Total no. of man-shifts				30
Total no. of moves				540
Productivity				18

*/ including 1 relief driver;

**/ it is assumed that lashing on board is done by the crew of the vessel;

Based on these two Tables the maximum or peak demand for operations personnel is estimated as follows:

Table 4-32: Peak Demand for Terminal Operations Personnel per Day

	Operation	Total
1	Ship operation main line (1 vessel)	87
2	Ship operation feeder (3 vessels)	90
3	Transfer for main line vessel	51
4	Transfer for feeder vessels	51

	Operation	Total
5	Receipt/delivery for main line vessel	96
6	Receipt/delivery for feeder vessels	96
7	For shifting, contingency also for training and sick leave	129
8	**Total 1 - 7**	**500**

The above maximum number of 500 is substantially higher than the 400 recommended permanent number as per **Table 4-33** below. As is the case with other container terminals it will be a challenge for the terminal operator to cover working peaks without an excessive spare number of personnel. This will be achieved through

- Scheduling of vessel arrivals (berthing windows);
- Multi-skill and multi-functional jobs;
- Overtime work and
- Casual labour.

Based upon the output during ship operation as per **Table 4-16**, the expected container movements as per **Table 4-22** and the above gang structures the average number of **permanently employed personnel** is given in **Table 4-33**. With this number all key functions would have to recruited from own sources, whereas for secondary functions, that means for jobs that require less skills, such as tractor or forklift drivers could be filled by casual labour from outside.

Table 4-33: Proposed Permanent Operations Personnel (Design Throughput 440,000 Container = 600,000 TEU)

	Parameter	Ship Operation	Transfer	Receipt/ Delivery	Total
1.	Total Movements In and Out including about 15 % re-stowages	500,000	500,000	500,000	
2.	Productivity (moves per man-shift)	15 *	16	33 **	
3.	No. of man-shifts required	29,400	31,300	15,200	
4.	Potential number of shifts per man/year ***	300	300	300	

	Parameter	Ship Operation	Transfer	Receipt/ Delivery	Total
5.	Total demand net for container moves	98	105	51	254
6.	Forklift drivers and tally clerks for stripping and stuffing (30 drivers + 15 tally clerks x 2 shifts)	-	-	90	90
7.	Forklift drivers and tally clerks for MT containers (10 drivers + 5 tally clerks x 2 shifts)	-	-	30	30
8.	Contingency	-	-	-	26
	Total 1 – 8				**400**

*/ average main line and feeder vessel;

**/ stripping and stuffing of containers and customs inspection not included;

***/ 12 months ./. 2 months non-productive time (leave, sick leave & training) = 10 months x (25 ordinary shifts + 5 overtime shifts =) 30 shifts;

After inspecting the existing workshop facilities and analysis of the future demand for terminal handling and transport equipment the manpower requirements for **maintenance and repair** (M&R) as well as **materials management** are estimated as per **Table 4-34.** The personnel will be allocated to three shifts to ensure terminal work around-the-clock as well as day-shift.

Table 4-34: Proposed Personnel for Workshop and Stores

	Function	Demand for M & R	Demand for Stores	Total
1	Technical / Materials Manager	1	1	2
2	Engineer	9	-	9
3	Assistant engineer	19	1	20
4	Mechanic, electrician, store keeper	35	4	39
5	Worker	19	4	23
6	Assistant	16	-	16

	Function	Demand for M & R	Demand for Stores	Total
7	Clerk	6	2	8
	Total	**105**	**12**	**117**

The total demand for personnel can be summarized as follows, general management of new company not included:

Table 4-35: Personnel Demand Summary

Table	Department / Divison	Total
Table 4-29	Terminal management	20
Table 4-33	Terminal operations	400
Table 4-34	Workshops and maintenance	117
-	Contingency	13
	Total	**450**

4.10 Estimation of Rehabilitation and Investment Cost

4.10.1 Rehabilitation and Expansion of Port Infra- and Superstructure

For the purpose of determining order-of-magnitude-costs it is being assumed that the typical construction measures employed in the port in the past would be applicable also for the new structures. This, of course, needs to be confirmed by proper field works and engineering and design inputs, (see **Subsection 4.6**).

The cost basis of estimates is year 2007; rates applicable for similar works have been collected from recent projects in similar countries. Currencies are valued at 1 US $ to 50 Syr£. A brief cost breakdown is presented in **Table 4-36**.

Table 4-36: Investment Cost Estimate for Rehabilitation and Construction of Port Infra- and Superstructure

	Demo-lition	Rehabili-tation	Construc-tion	Estimated Costs (approx. US$)
Port Areas				
- rehabilitation of pavement		x	x	2,330,00
- illumination		x	x	250,000
- gates, fence, video control	x	x	x	720,000
Roads and Railway				
- rehabilitation of roads		x	x	670,000
- level crossings, demolishing of tracks	x	x	x	1,090,000
Buildings				
- CFS/LCL-shed, gate buildings		x	x	110,000
- office building, social building		x	x	130,000
- workshop, store		x	x	745,000
Berths				
- safety devices, RoRo-ramp		x		115,000
Total				**6,160,000**

4.10.2 Rehabilitation and Expansion of Port Infra- and Superstructure

The investment costs for

- terminal handling and transport equipment;
- workshop equipment and
- other terminal equipment

is estimated in Table 4-37. The prices estimated include erection and commissioning, training of personnel and a basic stock of spare parts and consumables for the first two years of operation.

Table 4-37: Investment Cost Estimate for Terminal Equipment

Item	Description	Unit-Cost Mill. USD	Total De-mand	Total Cost Mill. USD	Add. De-mand	Add. Cost-Mill. USD
1.	**Handling and Transport**					
1.1	STS gantry crane	6.65	4	26.60	-	-
1.2	Harbour mobile crane	3.50	3	7	-	-
1.3	Straddle carrier	0.70	12	8.40	-	-
1.4	Reach stacker	0.45	16	7.20	-	-
1.5	Terminal tractor	0.10	32	3.20	-	-
1.6	Terminal trailer	0.05	40	1.40	20	1.00
1.7	Forklift 42 t for full containers	0.40	5	2.00	-	-
1.8	Forklift truck 15 t for MTs	0.20	6	1.20	-	-
1.9	Forklift 3 t for stripping/stuffing	0.05	30	1.50	30	1.50
1.10	Equipment for LCL-Shed	0.10	1 set	0.10	1 set	0.10
1.11	Equipment & material for Dan-gerous Goods (DG) Shed	0.05	1 set	0.05	1 set	0.05
1.12	Contingency for refurbishment of existing equipment fleet				1set	0.85
	Sub-total 1			**58.65**		**3.50**
2.	**Workshop and Maintenance**					
2.1	Workshop installations	0.10	1 set	0.10	1 set	0.10
2.2	Workshop equipment & tools	0.40	1 set	0.40	1 set	0.40
2.3	Equipment & installations for spare parts & material store	0.15	1 set	0.15	1 set	0.15
2.4	Contingency			0.05		0.05
	Sub-total 2	**0.65**		**0.70**		**0.70**
3.	**Other Terminal Equipment**					
3.1	Lashing cages, heavy lift	0.10	1 set	0.10	1 set	0.10

Item	Description	Unit-Cost Mill. USD	Total De-mand	Total Cost Mill. USD	Add. De-mand	Add. Cost-Mill. USD
	beam, over-height lifting gear					
3.2	Trailers for spreaders and gear	0.10	1 set	0.10	1 set	0.10
3.3	Tank truck for re-fueling of equipment	0.10	2	0.20	2	0.20
3.4	Road sweeping machine	0.15	1	0.15	1	0.15
3.5	Communication equipment	0.20	1 set	0.20	1 set	0.20
3.6	EDP based Terminal Operat-ing System	0.60	1 set	0.60	1 set	0.60
3.7	Office equipment	0.15	1 set	0.15	1 set	0.15
3.8	Garbage containers	0.10	1 set	0.10	1 set	0.10
3.9	Protective clothing	0.05	1 set	0.05	1 set	0.05
3.10	Buses and vehicles for per-sonnel transport	0.35	1 set	0.35	1 set	0.35
	Sub-total 3			**2.00**		**2.00**
	Total 1 - 3			**61.35**		**6.20**

Observation
1.1 on order for delivery end of 2008;
1.2 in addition there are also 2 new mobile cranes with a capacity of 40 t at 25 m Outreach for multi-purpose (hook operation and manual spreader);
1.3 Existing 17 machines ./. 9 to be discarded = 8 + 4 in budget 2008 = 12 machines;
1.4 Existing 6 machines for full and 6 for MT containers = 12 machines, Deficit of 4 machines can be covered by 5 forklift trucks (20 t 2006);
1.5 Existing 40 machines ./. 28 to be discarded = 12 machines + 20 machines in budget for 2008;
1.6 Existing 45 chassis ./. 25 to be discarded = 20 machines ./. 20 machines in budget for 2008.

It is pertinent to note that tractor-trailer units (Items 1.5 and 1.6) are rented from outside in many container ports with a large equipment and vehicle pool worldwide. At this stage of planning, however, necessary investment cost is included in the list in the interest of high availability and standardisation.

4.11 Estimation of Operating and Maintenance Cost

The operating and maintenance cost for the terminal based upon a throughput of about 440,000 container = about 600,000 TEU are estimated in **Table 4-38** as input to the Financial Evaluation.

Table 4-38: Terminal Operating and Maintenance Cost (Input to Financial Evaluation)

Item	Description	Cost p.a. Mill. USD
1.1	Terminal Management: 20 persons à USD 6,000	0.120
1.2	Operations personnel: 450 persons á USD 4,800	2.160
1.3	Casual labour for stripping and stuffing about 50,000 man-shifts x USD 10.00	0.500
1.4	Expenses for training, lumpsum	0.150
2.	Maintenance and Repair: Open areas & yards: 1 % of Investment / Re-investment cost Roads, rail tracks, buildings and facilities: 2 % of investment cost Gantry cranes, harbour mobile cranes: 2 % of investment cost Straddle carriers, reach stackers, forklift trucks and other vehicles and equipment: 10 % of investment cost .	See Financial Evaluation
3.1	Diesel fuel consumption: 34 heavy equipment x about 3,675 h x 30 l = 3.75 million litres x USD 0.14	0.525
3.2	Diesel fuel consumption: 100 smaller equipment and vehicles x about 3,675 h x 15 l = 5.51 million litres x USD 0.14	0.772
3.3	Power consumption gantry cranes: 4 x 1,000 KW x 60 % duty rating x 3,850 h = 9.24 million kwh x USD 0.05	0.460
3.4	Other power consumption for illumination, buildings, reefer slots	0.100

Item	Description	Cost p.a. Mill. USD
	etc.; lumpsum	
4.	Office and communication expenses, lumpsum	0.600
5.	Rent for tank farm area	---
6.	Other operating expenses (e. g. dues and fees for garbage collection and disposal)	0.100

Observation to:
1.1 (only terminal <operations> management; general management of newly established company not included;
1.2 workshop personnel not included;

4.12 Port Assets and Capital Investments

The 2005 Financial Statements indicate the value of port assets at the end of the fiscal year 2005. Original land prices, sea land and inner land, are also indicated in the Asset Register, but at much higher values. It appears that the fixed asset 'lands' is severely undervalued, considering the prime location of Lattakia Port in the midst of the city. This undervaluation could be the result of the calculation methods for depreciation applied by the Syrian Government, and should be considered in the next asset revaluation. These low depreciation costs might contribute to a higher return in the financial projections. Values of port breakwater, quay and yard structures, buildings and warehouses are also indicated in the Asset Register and support the Consultant's calculations.

The lack of ongoing major projects is striking and hence very worth mentioning: Apart from four container quay cranes (for which the Letter of Credit has been signed during the elaboration of this Background Document and which are contracted to be erected and operational by August 2008), no other major project has an influence on the calculation of below financial projections.

4.12.1 Operation Centres

Profit-centre accounting is an important and integral part of commercial accounting. Comparing revenues with expenditures of individual operations ("centres") enables the identification of profitable operations ("profit centres"). As a first and very good accounting measure, LPGC breaks down expenditures and revenues according to 18 'operation centres', of which seven centres directly contribute to operative revenues, three centres are utilities, four are supportive operations, and another four centres are administrative operations. LPGC commenced the laudable effort to single out container operations and general-cargo handling from the 'cargo-handling operation centre'. However, this measure was commenced only in the be-

ginning of the 2007 fiscal year and could thus not be considered for the financial projections; LPGC's Accounting Department provided rather aggregated figures. Therefore, the Consultant projected the revenues from container operations based on the income from provision of physical infrastructure and operational services, as charged by the actual tariff multiplied by the expected number of containers. The worst-case scenario was taken as basis, since the before-mentioned sensitivity & risk analysis considered this one as the most likely scenario.

4.12.2 Current Expenditures

For a summary of salaries and other current expenditures during the fiscal year 2001/2002 please refer to Table 4-39.

Salaries

Salaries of LPGC's employees constitute the strongest expenditure chapter. In below financial projections, the Consultant included the insurance of labourers (account no. 331) under the input for 'salaries & wages'. About two-thirds of these expenditures accrue to the operation centres, about 15% to the administrative centres.

Other current expenditures

Costs for maintenance, fuel, electricity and water constitute the greatest part of other current expenditures. The Consultant included the position 'stationary' (account no. 327) in the financial projections under 'administrative costs'. Naturally, the greatest part of these expenditures accrues to the operations and utilities centres.

Transferable expenditures

Taxes & duties and depreciation costs were entirely allocated within below calculations to the financial projections. The expenditure amounts carried forward from different utility, service and administrative centres are counter-balanced against costs accrued in these centres while servicing the revenue-generating operation centres, and are therefore not allocated within below calculations to the financial projections.

Table 4-39: Expenses for all Operation Centres on 31st December 2005 (SYP)

Account No.	Statement	Partial	Total
31	**Cash wages**		
311	Cash wages	612,188,760	718,099,272
312	Real wages	42,804,327	
314	Social security	63,106,185	
32	**Commodity needs**		
323	Fuel oil	26,948,457	30,298,455
327	Stationary	3,349,998	
33	**Service needs**		
331	Maintenance expenditures	76,630,427	115,377,330
	Insurance of labourers	19,130,561	
	Water & light expenses	19,616,342	
35	**Transferable needs**		
351	Taxes & duties	8,667,848	71,462,210
352	Depreciation	62,194,725	
	Mobile machine duties	599,637	
	Carried forward from different centres		
61	Electric power centre	41,630,626	
62	Dry dock centre	2,725,544	
63	Machines centre	129,612,698	
64	Health centre	12,421,555	514,882,142
65	Industrial security centre	64,492,403	
67	Maintenance workshops	134,966,763	
68	Operation centre	12,886,157	
81	Management & finance centre	116,146,397	
	To trading account	1,522,151,865	1,522,151,865
			2,972,271,274

Source: LPGC, Accounting Department, February 2007

4.12.3 Revenues

Cargo handling and storage

Revenues from goods-handling charges constitute the highest proportion of LPGC's operational revenues (see below **Table 4-40**), followed by operational income from yard & warehouse storage charges. As mentioned above, LPGC has so far not differentiated these revenues among their various cargo-type categories. In contrast, revenues from silo charges and cold-store rents are singled out, since these constitute operation centres on their own rights.

Table 4-40: Revenues from all Operation Centres on 31st December 2005 (SYP)

Acc. No.	Statement	Partial	Total
41	**Sources**		6,045,221
411	Anchorage fees	2,150,615	81,495,463
	Anchorage fees of decree 405 *	24,913,656	
412	Berthing fees	3,436,898	
	Berthing fees of decree 405 *	21,390,349	
413	Towage and pilotage charges	2,694,111	
	Towage and pilotage charges 405 *	26,909,834	
414	Goods handling charges	1,067,284 661	2,157,026,932
	Goods handling charges decree 405 *	338,743,576	
415	Yard & warehouse storage charges	518,008,285	
	Yard & warehouse storage charges 405 *	189,949,419	
416	Silo storage charges	32,353,539	
	Charges of shifting inside silos	3,430,052	
417	Charges of cold store rents	7,257,400	
	Mobile crane using charges	9,408,050	145,083,183
	Vehicle& truck using charges	1,000	
	Dry Dock charges	751,725	
	Charges of using floating crane	97,711,253	
	Charges of using floating crane 405 *	37,199,154	
	Charges of using boats+ lighters	12,000	
	Water & power supply charges	9,907,831	24,560,179
	Water & power supply charges 405 *	11,975,116	

Acc. No.	Statement	Partial	Total
	Various services	1,982,886	
	Various services 405 *	694,346	
	From trading account	12,203,420	12,203,420
			2 ,426,414,397

Source: LPGC, Accounting Department, February 2007

Note: * Revenues under Decree 405 constitute revenues earned after exchange rate increases during 2005

Equipment utilisation

Revenues from equipment utilisation constitute the second largest chapter. It is worth mentioning that - under the present operation conditions - the floating crane appears to be a 'money spinner', since its utilisation charges overshadow the totalled revenues generated by all other positions.

Other revenues

Waterside services and charges generate the third largest revenue proportions. The relatively high income from anchorage fees comes from a large number of vessel-days passed on anchorage and constitutes an indication of low productivity along the berths of Lattakia Port. Finally, utility supply and various services constitute the smallest proportion of LPGC's operational revenues.

The Balance – Profits and Losses

Due to the lack of an investment program and due to Lattakia Port's - so far uncontested - monopolistic position as Syria's seaward container hub, LPGC makes high financial profits, as indicated on below **Table 4-41** for the fiscal year 2005.

Table 4-41: Profits / Losses in all Operation Centres on 31 12 2005 (SYP)

Operation Centre	Profit / Loss	Operation Centre	Profit / Loss
Berthing 51-52 *	28,000,234	Machines 63	-109,699,091
Towage & Pilotage 53	13,100,070	Health 64	-12,591,492
Cargo handling 54	1,059,494,512	Industry Services 65	-3,716,146
Warehousing 55	661,866,124	Security 66	-47,533,089
Silos 57	18,341,095	Workshops 67	-83,533,570
Coldstore 58	6,506,328	Operations 68	-12,392,480

Operation Centre	Profit / Loss	Operation Centre	Profit / Loss
Different Services 59	149,681,738	Finance 81	-92,998,657
Electric Power Plant 61	-40,942,234	Construction 91	-18,970,811
Dry Dock 62	-2,470,208	Manufacturing 92	-20,965,194
Profit			**1,491,177,130**

Source: LPGC, Accounting Department, February 2007

Note: * Figures indicate numbers of chapters within financial statements

With LPGC being a public entity, all profits must by law be transferred to the Ministry of Finance. Significant proportions of LPGC's profits are periodically requested by MoF to be transferred to the Treasury. However, the Legislative Decree No. 54 dated 4/10/2006 grants more financial autonomy to LPGC in that it permits the company to retain those profits equivalent to the depreciation values of Lattakia Port's infrastructure and equipment.

But developing this point further in all consequences signifies that LPGC, acting as a financial contributor to the Syrian economy, functions as a commercial entity and thus must introduce commercial accounting systems. This move is supported by the two facts that LPGC during recent times has not received any budget financing from the MoF for capital investments, and that LPGC has to cover its own current and capital expenditures through in-house revenues by thinking and acting commercially.