



INTERNATIONAL FUTURES PROGRAMME

**TRANSCONTINENTAL INFRASTRUCTURE NEEDS TO 2030 / 2050**

**NORTH -WEST EUROPE GATEWAY AREA -**

**PORT OF ROTTERDAM CASE STUDY**

**ROTTERDAM WORKSHOP**

**FINAL REPORT**

The Rotterdam Workshop Final Report has been prepared by the OECD's IFP taking into account comments provided by the Workshop hosts and other participants.

OECD

IFP

November 2010



# **N-W EUROPE GATEWAY AREA - CASE STUDY**

## **ROTTERDAM WORKSHOP REPORT**

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# **N-W EUROPE GATEWAY AREA - CASE STUDY**

## **ROTTERDAM WORKSHOP REPORT**

### **1. INTRODUCTION**

#### **1.1 OECD's Infrastructure Needs to 2030 / 2050 Project**

The OECD's *Infrastructure Needs to 2030 / 2050 Project* is bringing together experts from the public and private sector to take stock of the long-term opportunities and challenges facing macro gateway and corridor infrastructure (ports, airports, rail corridors, oil and gas pipelines etc.).

The intention is to propose a set of policy options to enhance the contribution of these infrastructures to economic and social development at home and abroad in the years to come.

The Project follows on from the work undertaken in the OECD's *Infrastructure to 2030* Report and focuses on gateways, hubs and corridors which were not encompassed in the earlier report.

The objectives include identifying projections and scenarios to 2015 / 2030 / 2050, opportunities and challenges facing gateways and hubs, assessing future infrastructure needs and financing models, drawing conclusions and identifying policy options for improved gateway and corridor infrastructure in future.

The Project Description includes five work modules that outline the scope and content of the work in more detail.

The Steering Group and OECD International Futures Programme team are managing the project, which is being undertaken in consultation with the OECD / International Transport Forum and Joint Transport Research Centre and with the participation of OECD in-house and external experts as appropriate.

The Steering Group includes representatives from: OECD Ministries of transport, mobility and public works, environment and energy, sustainable development and the sea– as well as from other departments and agencies; non-OECD members (Chinese Taipei and India), international organisations (EC, EIB) and private enterprise.

The North West Europe Gateway Area work is exploring the future opportunities and challenges facing the key ports in this area – and the Port of Rotterdam in particular. The Port of Rotterdam was chosen as a principal target for a Case Study Workshop, following discussions with the Project Steering Group.

## 1.2 Rotterdam Workshop

The Rotterdam Workshop was organised jointly by the OECD, the Netherlands Ministry for Transport and the Port Authority of Rotterdam. The Workshop was held on 24 March 2010, hosted by the Port Authority on its premises and attended by around 15 participants. The draft Agenda and listing of participants are provided in [Annex 1](#).

The purpose of the Workshop was to allow the OECD project to focus on the:

- Current situation of the Port of Rotterdam itself as well as its inland connections.
- Extent of competition and potential competition from other port operations (e.g. other ports in the North-West Gateway Area, other European Gateways) as well as from other modes (e.g. air freight, short sea shipping and inland waterways and land transport).
- Planned growth and developments, including infrastructure and financing requirements.

An Outlook paper prepared by the OECD's International Futures Programme was circulated prior to the Workshop. This outlined the global outlook for economic growth, trade and development; the European Region outlook; and other important developments bearing on the Gateway area - including maritime developments such as possible new trade routes. The paper drew on reports prepared by: other responsible bodies – e.g. IMF, World Bank and International Energy agency on economic aspects; UNCTAD, IMO etc on maritime aspects ; and independent experts. These source documents were often prepared *before or during the Global Financial Crisis*. For this reason, their projections need to be treated with some caution.

### Workshop Report

The first part of the Report outlines the OECD project and expectations for the Workshop.

The second part of the Workshop Report provides some important insights on the Port Authority of Rotterdam's structure and responsibilities as well as the Port of Rotterdam's current situation.

The third part of the Workshop Report focuses on the Opportunities and Challenges facing the port.

The [Annexes](#) provide some further details on aspects of interest.

## 2. PORT OF ROTTERDAM

### Snapshot

‘Rotterdam, a world-class port’: Rotterdam is the largest logistic and industrial hub in Europe. The port and industrial complex stretches over a length of 40 kilometres and covers some 10,000 hectares (excluding Maasvlakte 2). With throughout of 387 million tonnes of goods in 2009, Rotterdam is by far the largest seaport in Europe. It enjoys this position thanks to its excellent accessibility from the sea, the hinterland connections and the many businesses and organisations active in and for the port and industrial area. Together they work on creating a world-class port.

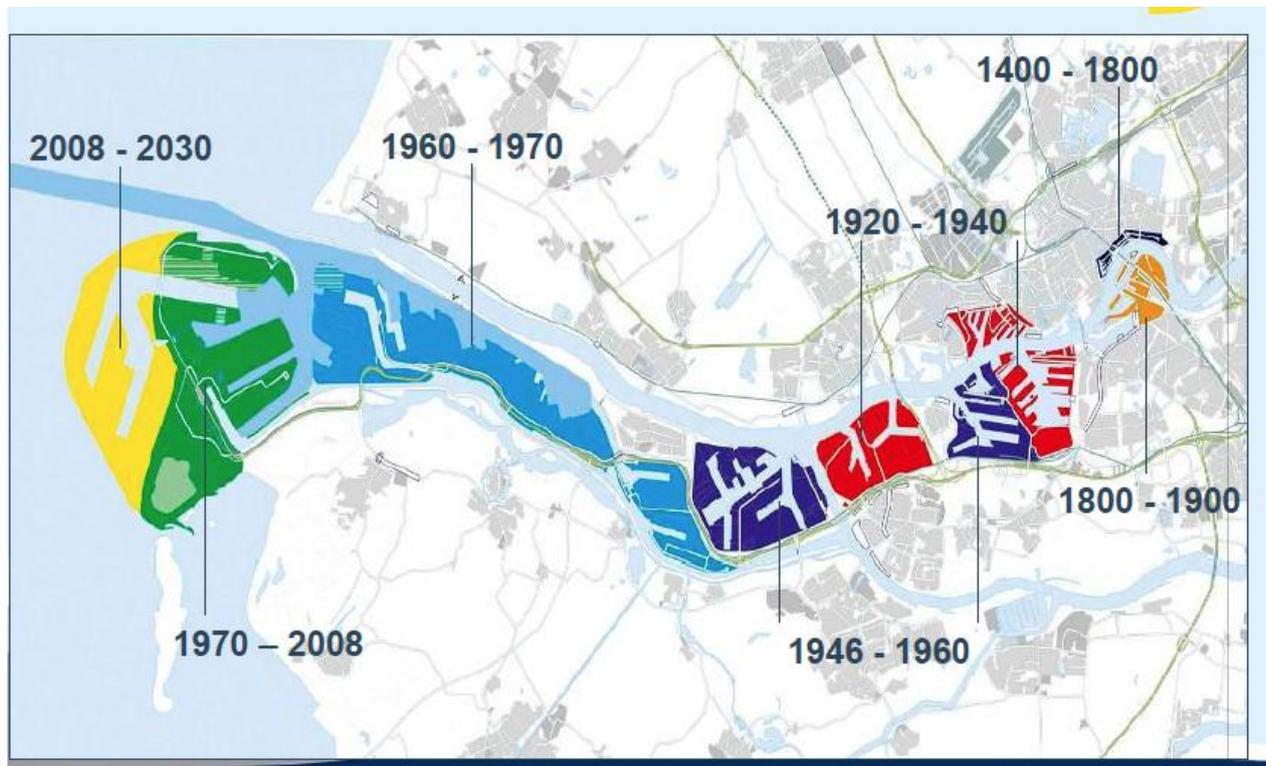
Source: Port of Rotterdam Authority Annual Report, 2009.

### 2.1 Port of Rotterdam – Overview

The Port area has been developed progressively downstream from the earliest port location close to the centre of Rotterdam. The extension of the port is underway; the reclamation of the land began in 2008. The first container terminal is expected to be operating in 2013 or shortly afterwards.

The overview map below shows the different port basins and the periods over which they have developed over time - and the Massvlakte 2 area currently under development (2008 - 2030).

Historical Development of the Port of Rotterdam



Source: M van Schuylenburg, Rotterdam Workshop, 24 March 2010

The port of Rotterdam is a hub for the international flow of goods, as well as an world-class industrial complex (see Appendix F of Rotterdam Annual Report 2008 for details).

Some important insights on the Port Authority of Rotterdam, its roles mission and strategy are provided below.

## 2.2 Port of Rotterdam Authority

The Port of Rotterdam's Annual Report 2008 provided some valuable insights on aims, objectives and roles of the Port of Rotterdam Authority, its missions and main tasks. Extracts are set out below.

The aim of the Port of Rotterdam Authority is to enhance the port of Rotterdam's competitive position as a logistics hub and world-class industrial complex. Not only in terms of size, but also quality. The core tasks of the Port Authority are to develop, manage and run the port in a sustainable way and to maintain a speedy and safe service for shipping.

### Facts and figures for the Port Authority and the Port of Rotterdam:

- Port of Rotterdam Authority: 1,200 employees, turnover approx. € 450 million.
- Port area: approx. 10,500 ha (5,000 ha of which commercial sites, 3,500 ha water and 2,000 ha rail lines, roads, service corridors and greenery). The length of the port area is approx. 40 km.
- Direct employment: over 70,000 jobs.
- Goods throughput: over 400 million tonnes of goods per annum.
- Shipping: approx. 34,000 sea-going vessels and 133,000 inland vessels per annum.

### Company Profile

The Port of Rotterdam Authority is manager, operator and developer of Rotterdam's port and industrial area. The Port Authority is a public limited company (N.V.) with two shareholders: the Municipality of Rotterdam and the Dutch State. As is apparent from the objects stated in the articles of association, the Authority operates in two domains: area management of the port area; and traffic management, to ensure secure handling of shipping.

#### Objects as stated in articles of association:

1. to promote the effective, safe and efficient handling of shipping in the port of Rotterdam and the approach area off the coast
2. the development, construction, management and operation of the port area .

### Roles of the Port of Rotterdam Authority

#### 1) Port Authority

As manager and developer with regard to nautical matters, the Port Authority ensures that the docks are maintained at the right depth, so that ships can enter the port and moor safely. Port Authority staff in traffic centres and on patrol vessels closely monitor and supervise all movements on the water. This is in order to maintain order from a nautical point of view.

#### 2) Port infrastructure

As developer and manager, the Port Authority ensures that sufficient space is available for companies in the port. It is for this reason that the Port of Rotterdam Authority supports the construction of Maasvlakte 2. The Port Authority also invests in the improvement and construction of new roads, rail, inland waterway connections and underground pipelines.

### 3) Port operator

As operator and developer of commercial activity in the port and industrial complex, the Port Authority encourages sustainable economic development. The Port Authority ensures, for instance, that there is an attractive climate for establishing business. To this end, we maintain plenty of contact with politicians and businesspeople both at home and abroad. The Port Authority also undertakes a variety of promotional and marketing activities (such as events and trade fairs) to interest companies in Rotterdam.

## Mission and strategy

The Port of Rotterdam Authority's Annual Report 2009 outlines its mission and strategy, as follows:

The Port of Rotterdam Authority has formulated the following mission in its business plan for 2006-10: *'The Port of Rotterdam Authority develops in partnership the leading European port of world stature.'*

The Port Authority is fully committed to keep developing the port and industrial complex of Rotterdam to be the most competitive, innovative and sustainable in the world. We create value for customers by developing chains, networks and clusters. In order to achieve this, the Port Authority distinguishes four strategic areas for special attention:

- *Customer.* We work as a partner with our existing customers, while at the same time attracting new activities and customers that will further strengthen the port and industrial complex.
- *Area and space.* We ensure an efficiently organised port area with a good public infrastructure. Furthermore we aim to provide space for growth by developing Maasvlakte 2 and structuring, restructuring and intensifying the use of the existing Rotterdam area. We also actively examine opportunities as they arise outside the Rotterdam area.
- *Traffic and accessibility.* We are responsible for the clean, smooth, safe and secure handling of shipping in the port. Together with our partners, we are also increasingly active in improving landside accessibility for the four modalities (rail, road, inland shipping and pipeline).
- *Environment and sustainability.* We invest with our partners in obtaining broad support in society and optimum preconditions for a port that has the ambition to develop. Sustainability, dialogue, work and innovation are important elements in this aim.

## Core Values

The Authority's Annual Report 2008 advised its core values as follows:

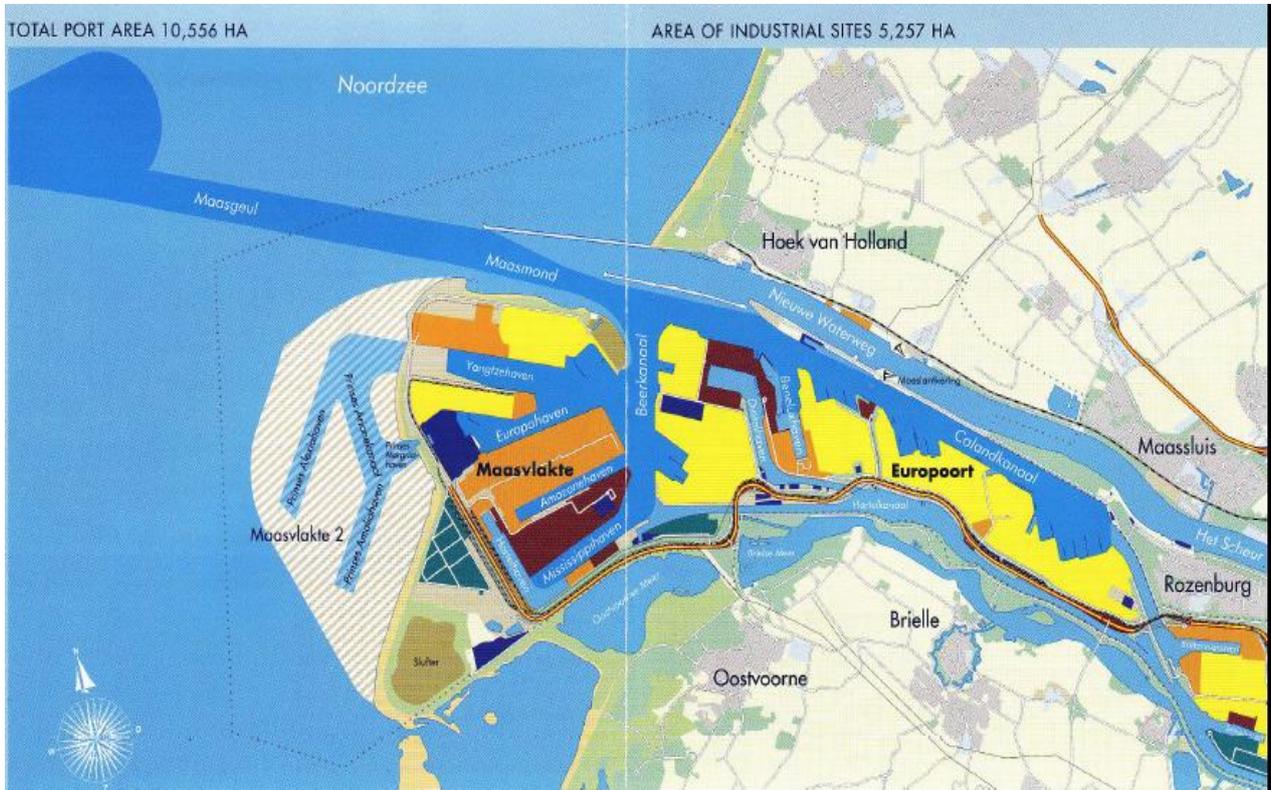
In order to professionally achieve its goals in a national and international setting, the Port of Rotterdam Authority and its employees are guided by the following core values:

<i>Reliability</i>	Sticking to agreements
<i>Enterprising</i>	Being proactive and conducting business within the set course and within the vision
<i>Customer orientation</i>	In the interest of the port and its customers
<i>Care</i>	Honesty and responsibility in dealing with interests and resources
<i>Sustainability</i>	Working on the definitive world-class European port with an eye to the future

The core values are also set out and reflected in the Code of Conduct of the Port of Rotterdam Authority.

### 2.3 Current Port Layout

The graphic below shows the Port layout in the western part of the Port in more detail - including the Massvlakte area. It also shows the planned layout of the Massvlakte 2 area currently being developed:



Source: Port of Rotterdam Annual Report, 2008

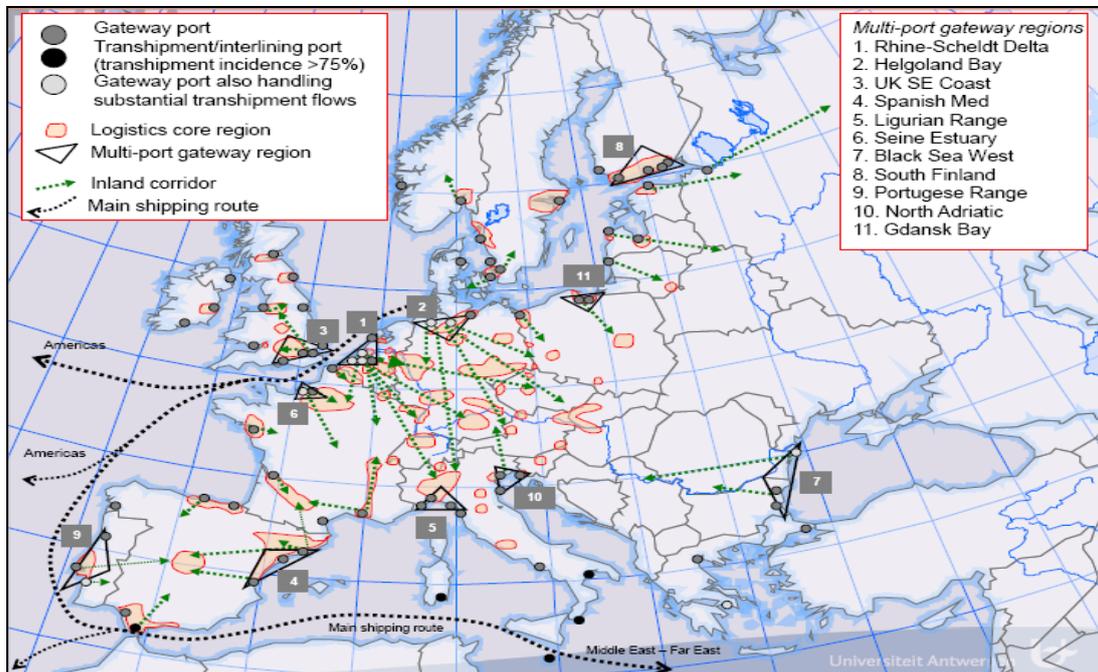
More detailed individual maps (scale 1:50.000) can be consulted on the Port of Rotterdam website (below) by clicking on one of the sub-regions (359kb).

See: Port of Rotterdam website: [http://www.portofrotterdam.com/en/about\\_port/port\\_maps/port\\_area/index.jsp](http://www.portofrotterdam.com/en/about_port/port_maps/port_area/index.jsp)

### 3. GATEWAY AREA - CURRENT SITUATION

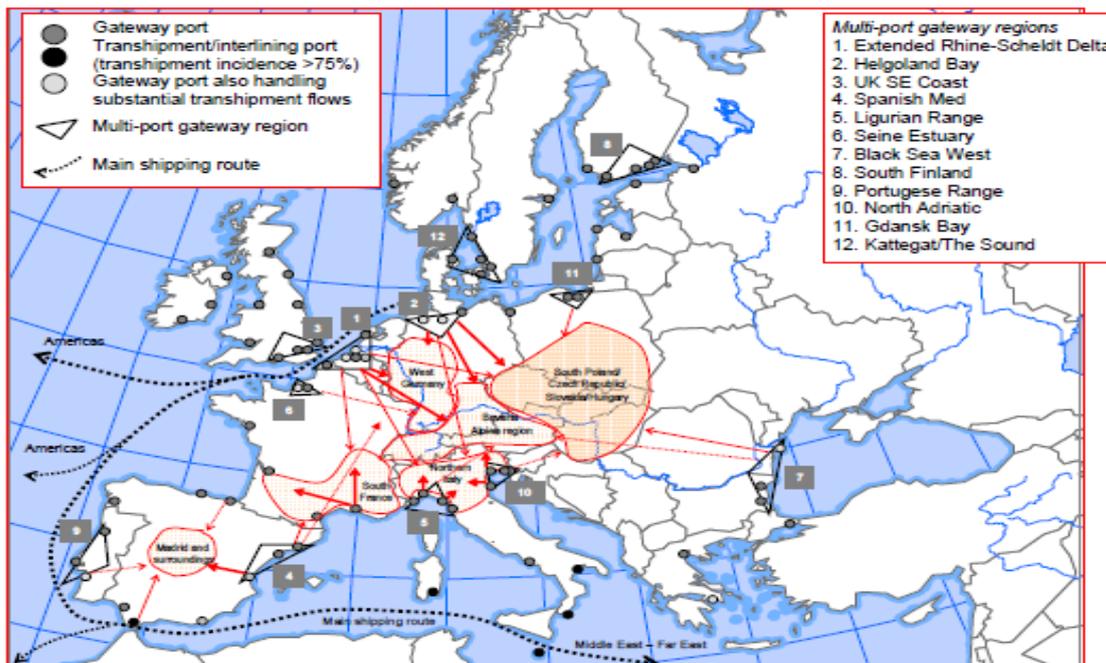
#### 3.1 North-West Europe Gateway Area

The North-West Europe Gateway area is shown in the graphic below. It highlights the different gateway port locations as well as the principal inland markets served from the gateway ports in this area.



Source: Theo Notteboom (TIMMA - Univ. of Antwerp and Antwerp Maritime Academy) presented at 'Seaport Competitions and Hinterland Connections', Round Table, OECD/ITF 2008.

The main inland routes to activity areas and the growth areas in Eastern Europe are shown below:

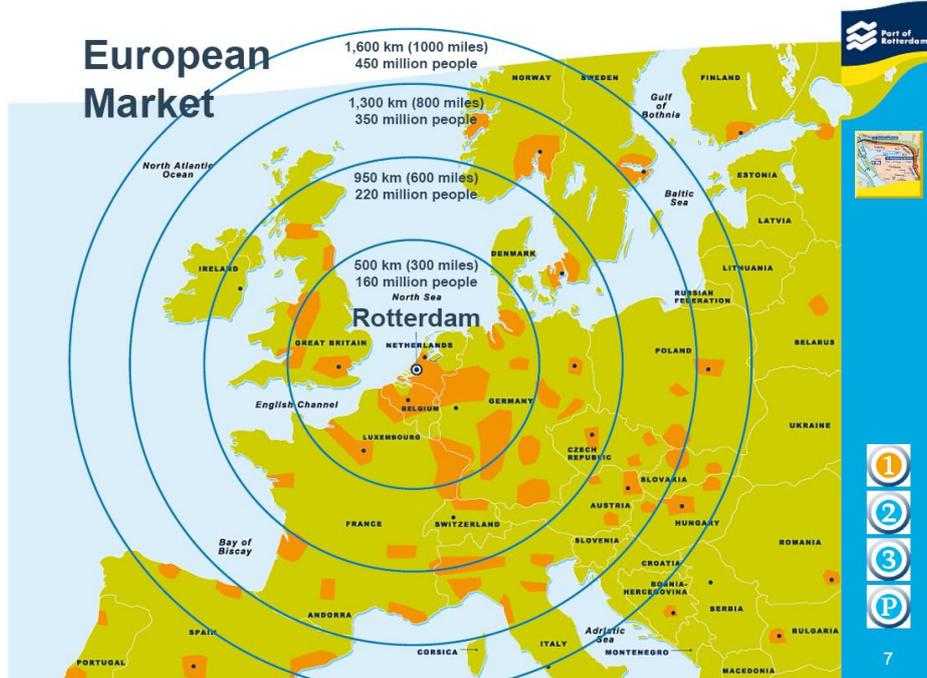


Source: Theo Notteboom (TIMMA - Univ. of Antwerp and Antwerp Maritime Academy).

### 3.2 Rotterdam's position in its European setting

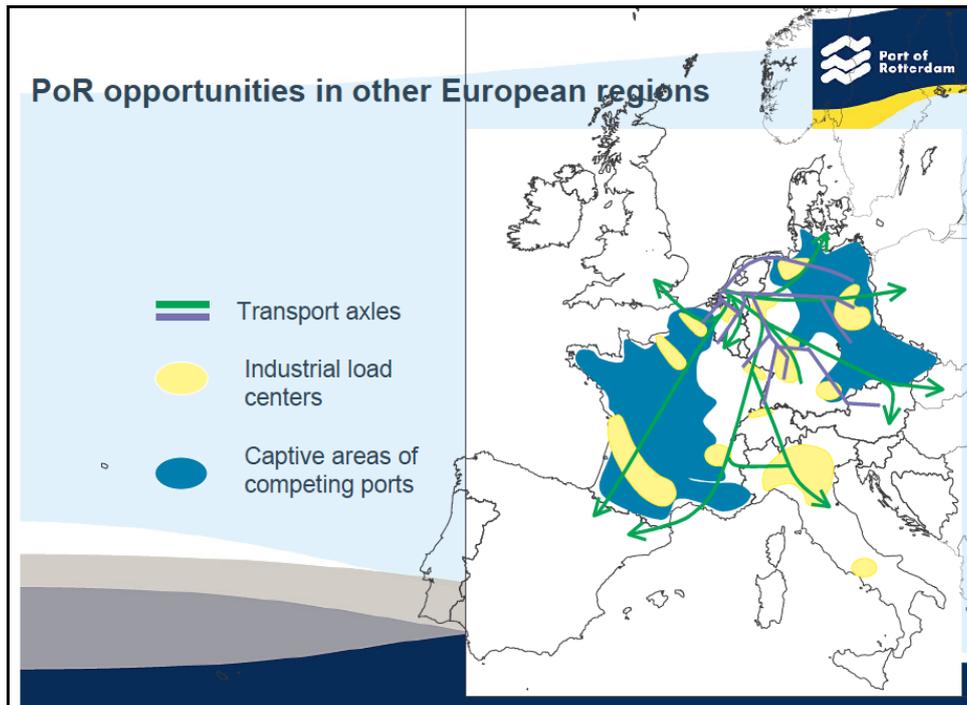
The Port of Rotterdam is centrally located in relation to Europe's largest population concentrations.

Rotterdam location in relation to the European market population



Source: M. van Schuylenburg, Rotterdam Workshop, 24 March 2010

The Port is also well placed to take advantage of opportunities in the large inland / hinterland areas not captive to competing ports.



Source: M van Schuylenburg, Rotterdam Workshop, 24 March 2010

## 4. RECENT DEVELOPMENTS

### 4.1 Port of Rotterdam Cargo Handling

The Port of Rotterdam handles a very large volume of cargo across all major cargo categories. The Authority's Annual Report 2009 provided the following advice on market developments.

#### Market developments 2009

Total throughput volume for the year was 387 million tonnes, a fall of 8.1% compared to the year 2008. The sharp downturn in world trade as a result of the financial and economic crisis that took hold in the third quarter of 2008 continued into the first quarter of 2009. During the second quarter the volumes stabilised somewhat, and from the third quarter onwards the first signs of a cautious recovery could be seen. The worldwide crisis also had an impact on the volume of most types of goods handled, and in the production volumes of a range of sectors of industry. This impact, however, varies considerably between type of goods and the various sectors of industry.

Throughput results for the four main segments are summarised in the table below.

Throughput of Port of Rotterdam (gross weight X 1,000 metric tonnes)

	2009	2008	Change in %
Dry bulk	66,628	94,935	-29.8
Liquid bulk	198,090	194,003	2.1
<b>Total bulk</b>	<b>264,718</b>	<b>288,938</b>	<b>-8.4</b>
Containers	100,280	106,999	-6.3
Breakbulk	21,959	25,199	-12.9
<b>Total containers and breakbulk</b>	<b>122,239</b>	<b>132,198</b>	<b>-7.5</b>
<b>TOTAL THROUGHPUT</b>	<b>386,957</b>	<b>421,136</b>	<b>-8.1</b>

Source: Port of Rotterdam Authority Annual Report 2009

The December 2009 Press Release advised that:

The general cargo sector had a poor year as a consequence of declining world trade, although the total fall of -7.5% to 122.2 million tonnes is a reasonable result in comparison with rival ports. This definitely also applies to the handling of containers, which was 6.3% down on last year, but managed to remain just above 100 million tonnes. As fewer empty containers were handled, the decline in units was -9.6% to 9,743,290 TEU. Rotterdam is doing well in the largest 'trade' in quantitative terms, that between Europe and Asia. Shipping lines combined services and deployed the biggest possible vessels to reduce costs. What Rotterdam has to offer (location, depth, hinterland transport, port tariffs) is tailored well to this and means that the port can benefit from the trend. Container traffic within Europe, mainly to the major destinations such as England, Ireland and Spain, was hit quite hard, however. The services to North and South America are sharing in the malaise. The Baltic trade, mostly involving feeder traffic linked to the Asia services, is really flourishing, however.

## 4.2 Port of Rotterdam - Cargo Volumes by Category 2009

All the North West gateway ports were adversely affected by the recession. The Port of Rotterdam was not immune and suffered a fall in total volumes of 8.1% in 2009. Throughput figures reported by category in 2009 as per the Port Authority's December 2009 press release are set out below.

### *Throughput in Port of Rotterdam shows signs of recovery, Press Release Dec 2009 (as updated)*

In 2009, goods throughput in the port of Rotterdam fell to 387 million tonnes. This is 8.1% down on 2008. Imports shrank by 12.7% to 273 million tonnes; exports increased by 5.1% to 114 million tonnes. Bulk was 8.4% down on the previous year; general cargo fell by 7.5%. There was less incoming and outgoing trade in agribulk (-20%), ores and scrap (-47.1%), coal (-15%), other dry bulk (-15%), crude oil (-4%), other liquid bulk (-15.8%), roll on/roll off (-10.6%), other general cargo (-18.4%) and containers (-6.3%). Only the handling of mineral oil products showed a positive trend (+23.2%), actually achieving the biggest absolute increase (13 million tonnes) ever.

#### *Dry bulk*

The total quantity of dry bulk handled was down by 29.8% to almost 67 million tonnes. The quantity of coal handled fell to 24.8 million tonnes. In the first few months of the year, coal imports remained reasonably stable due to the cold winter, ongoing contracts and the effects of trade. After the winter, energy consumption fell in both the Netherlands and Germany and coal's share declined more strongly than that of the other energy sources. Throughput of cokes coal, about 40% of coal imports into Rotterdam, reflected the plummeting steel production. With the recovering economy and a mine closure in Germany, modest growth in coal throughput is expected in 2010.

Ore and scrap throughput almost halved (-47.1%) to 23.3 million tonnes. Falling demand for steel led to the temporary closure of many blast furnaces in Northwest Europe and a dramatic decline in the handling of ore. Most of the blast furnaces have started operating again, but under capacity. In 2010, the utilisation rate can be increased to 80%. As a result, ore imports could increase to a possible 30 million tonnes.

Other dry bulk was 13% down, to 10.2 million tonnes. The main consumers in this sector, the chemical and metal industry, are suffering from the economic crisis. The decline is still being compensated for to some extent by the gradual export of a few million tonnes of asphalt from a storage facility in the port area. Without this incidental flow, but with slightly increasing demand for minerals, ores and concentrates, throughput figures for other dry bulk could end up at 9 million tonnes next year. The handling of agribulk (grains, oil seeds, derivatives) fell sharply: - 20% to 8.3 million tonnes. Europe had a good 2008-2009 harvest. As a result, fewer imports from overseas were necessary. In Rotterdam, the accent is on imports. In addition to this, imports were influenced negatively by a ban on genetically modified maize and reduced milk production. Due to the low milk prices, farmers used more grass and hay and less - imported - oil seeds.

#### *Liquid bulk*

The volume of liquid bulk handled rose by 2.1% to 198 million tonnes. Imports of crude oil fell by 4% to 96.4 million tonnes. Demand for oil products was down and refining margins fell, as a result of which it became unavoidable to limit production. In comparison with other regions, however, Rotterdam did noticeably better thanks to the strength of the petrochemical cluster. This and the anticipated increase in the refining margins counterbalance the high commodity stocks and the slow increase in demand in the OECD countries. In 2010, therefore, slightly higher throughput figures for crude oil are expected.

Imports of oil products increased by 16.5% to 42.2 million tonnes, exports by 34.1% to 29.9 million tonnes. In total, a record quantity of 72 million tonnes (+23%) was handled. Comparable growth percentages have already been seen four times since 2000, but the absolute growth of 13 million tonnes is the largest ever. This is attributable for about two-thirds to gas oil/diesel throughput. Forward prices for this commodity were higher throughout the year than the spot prices ('contango'), so that storage paid off. Up to the end of the summer, there was also good 'arbitrage' (price differential between two regions minus freight costs), which attracted cargo from Asia, Russia and America to Europe. Thirdly, extra jetty and tank capacity was created, as a result of which the port was able to handle more cargo. A little more fuel oil – in absolute terms the most important product – was handled: around 36 million tonnes. Naphtha throughput fell slightly and that of kerosene was up by about 10%.

There was a 15.8% decline in other liquid bulk throughput, to 29.5 million tonnes. The main cause of this is the 20-30% fall in production in the chemical industry. The handling of vegetable oils was up again, thanks to imports of crude palm oil for the refineries. However, there was a substantial decline in the handling of soybean oil, sunflower oil and rapeseed oil. Biofuels (biodiesel, ethanol and ETBE) were also down. The moderate sugar harvest put pressure on Brazilian exports of ethanol. This was compensated for partly by imports of ethanol from Spain and France via Rotterdam. Imports of biodiesel fell due to the European measures taken against the American B99 mix. This made way for the import of more biodiesel from Argentina, however.

#### *General cargo*

The general cargo sector had a poor year as a consequence of declining world trade, although the total fall of -7.5% to 122.2 million tonnes is a reasonable result in comparison with rival ports. This definitely also applies to the handling of containers, which was 6.3% down on last year, but managed to remain just above 100 million tonnes. As fewer empty containers were handled, the decline in units was -9.6% to 9,743.290 TEU. Rotterdam is doing well in the largest 'trade' in quantitative terms, that between Europe and Asia. Shipping lines combined services and deployed the biggest possible vessels to reduce costs. What Rotterdam has to offer (location, depth, hinterland transport, port tariffs) is tailored well to this and means that the port can benefit from the trend. Container traffic within Europe, mainly to the major destinations such as England, Ireland and Spain, was hit quite hard, however. The services to North and South America are sharing in the malaise. The Baltic trade, mostly involving feeder traffic linked to the Asia services, is really flourishing, however.

The roll-on / roll-off sector is geared virtually solely towards the British market. The crisis, which hit there early and hard, has not led to an earlier onset of recovery. This is further hampered by the value of the pound in relation to the euro. England and the Rotterdam services are focused very much on imports. In addition to the imbalance, the North Sea is characterised by the fierce competition between ferry services and with the container services and the Channel Tunnel. Taken together the handling of roro units declined 10.6% to 16 million tonnes. In the slightly longer term, the investments related to the Olympic Games offer positive prospects, which will buttress the investments in the expansion of capacity for Stena and Cobelfret, among other things.

Other general cargo, -18.4% to 6 million tonnes, was hit quite badly by the crisis. The handling of steel and non-ferrous metals accounts for around 70% of volume in the sector. Both depend heavily on those sectors hit hard by the crisis, such as the construction and automotive industry. The decline in non-ferrous metals remained limited, but steel throughput was down by a third. Storage is on the increase, however. The handling of paper products and fruit fell slightly and project cargo remained stable. The number of cars driven off the ships plummeted by about 70%.

Source: December Press Release, Port Authority of Rotterdam website, March 2010.

### 4.3 Goods Throughput at North-West European ports and Market Share Changes 2007 - 2008

An overview of total goods throughput (millions of tonnes) in 2008 for the main ports along the North-West coast of Europe (Hamburg – Le Havre range) is provided below:

GOODS THROUGHPUT HAMBURG-LE HAVRE RANGE		GROWTH 2007 - 2008		MARKETSHARE IN %		
2007-2008, in millions of tonnes						
	2008	2007	ABSOLUTE	IN %	2008	2007
Rotterdam	421.1	*409.1	12.0	2.9	35.1	35.0
Antwerp	189.5	182.9	6.6	3.6	15.8	15.7
Hamburg	140.4	140.4	0.0	0.0	11.7	12.0
Amsterdam	94.7	87.6	7.1	8.1	7.9	7.5
Le Havre	80.1	78.9	1.2	1.5	6.7	6.8
Bremen	74.6	69.2	5.4	7.8	6.2	5.9
Dunkirk	57.7	57.1	0.6	1.1	4.8	4.9
Zeebrugge	41.9	42.0	- 0.1	- 0.2	3.5	3.6
Wilhelmshaven	40.2	42.7	- 2.5	- 5.9	3.3	3.7
Zeeland Seaports	33.3	33.0	0.3	0.9	2.8	2.8
Ghent	27.0	25.1	1.9	7.6	2.2	2.1
<b>Total</b>	<b>1,200.5</b>	<b>1,168.0</b>	<b>32.5</b>	<b>2.8</b>	<b>100</b>	<b>100</b>

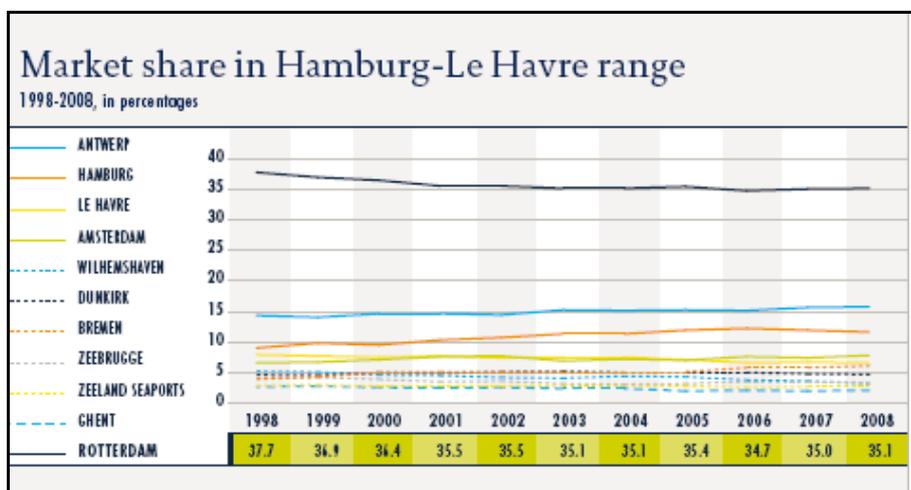
### 4.4 North-West European Ports - market share 1998 – 2008

The Port Authority’s advice on the changes in market shares over 1998 – 2008 is set out below:

**Market share.** After a long period of declining market share since 1998, based on total throughput in tonnes at the eleven most important ports in the Hamburg – Le Havre range, the port of Rotterdam’s share has gradually been increasing again since 2006. Our position has strengthened in the segments of crude oil, ore and scrap and Roll-on/Roll-off (RoRo), whereas the other segments have shown a slight fall in market share. A very slight rise in total throughput was achieved in 2008, reaching 35.1%.

Source: Port of Rotterdam Authority Annual Report, 2008

Trends in port market share for the same ports over the eleven years from 1998 to 2008 are set out in the Table below, based on total goods throughput (millions of tonnes)



Source: Port of Rotterdam Annual Report, 2009

Throughput volumes and associated market share of the Top 20 European ports for total goods and container handling - are provided in [Annex 2](#).

#### **4.5 Market share 2009**

Rotterdam strengthened its position as market leader in the throughput of goods in the Hamburg – Le Havre range (H-L-H) to 36.8%, an increase of 1.7% compared to 2008. Part of the reason is the impact of the crisis on throughput in the ports concerned. The port of Rotterdam has performed better compared to most other ports, partly by responding quickly and proactively to the consequences of the crisis together with the businesses in the port. In addition, the large variety of goods handled in the port of Rotterdam has enabled it to spread the risk across developments in specific market segments.

#### **4.6 Capacity Begins to Increase in 2010 as Steady Recovery Seen in Global Shipping**

A press release from HIS Global Insights dated 7 May 2010 provided the following forecasts for global cargo volumes for the short term as well as assessments of the prospects for the major routes and shipping operator capacity:

World trade by all modes of transportation will grow 8.5 percent in 2010, rebounding strongly from a deep dive during the global economic crisis, according to the latest forecast from IHS Global Insight's World Trade Service. Total world trade is expected to grow 7.8 percent in 2011.

Carriers are beginning to respond to an upturn in cargo volumes by increasing capacity, according to the First Quarter Trends in World Economy and Trade report from the IHS Global Insight World Trade Service.

Trade volumes on the Far East to Europe routes are forecast to rise 8.0 percent in 2010. The export trade from Europe to Asia grew in 2009 and is expected to grow in 2010. Trans-Pacific eastbound trade – from Asia to North America – began to recover in the third quarter 2009, though the downturn in 2009 was 18 percent, and is forecast to grow 10 percent in 2010. Solid growth is forecast for westbound trade after two years of decline. Eastbound trans-Atlantic trade from North America to Europe is forecast to return to 2007 levels by 2013. However, westbound trans- Atlantic traffic will not recover to 2007 levels until 2015.

Major container shipping operators recorded huge losses in 2009. However, in February and March 2010, the number of container ships in layup diminished and stood at 1.2 million TEUs, or 9.1 percent of the container fleet on March 1, the lowest level since July 2009. Additional capacity is expected to be taken back into service in the near future as new services are opened and vessels reduce their cruising speed.

Source: HIS Global Insight | May 07, 2010



## 5. OPPORTUNITIES AND CHALLENGES

### 5.1 GLOBAL AND REGIONAL OUTLOOK

**Global Projections** anticipate continued global population growth for the period to 2050, with growth rates decreasing over time. Global GDP is expected to increase 30% from 2007 to 2015 and could double over the period from 2007 to 2030. By 2050, global GDP could grow to over three times its 2007 level. GDP per capita is expected to increase around 15% from 2007 to 2015, close to 60% by 2030 and around 140% over the period to 2050. The largest absolute increases in GDP per capita are likely to be in OECD developed countries – but the fastest growth rates will be in developing countries.

**Projections for Asia.** By 2030, GDP in China could increase to well over 3 times its 2007 level – while in India it could increase to 3 times its 2007 level. By 2050, whereas global GDP could grow to over three times its 2007 level, GDP in China and India could increase to around eight times 2007 levels. GDP per capita could increase to levels over seven times higher in China and over 5.5 times higher in India, over the period 2005 – 2050.

**Projections for Europe** anticipate a slowing in population growth over the period to 2050. GDP is expected to grow, but more slowly than previously: i.e. less than 10% from 2007 to 2015; around 40% over the period from 2007 to 2030; and a little over 60% from 2007 to 2050. In combination, these trends will contribute to continuing increases in GDP and GDP per capita for Europe as a whole and in most European countries.

**Projections for other Regions.** Higher growth than historic trends is expected in Turkey and in developing countries in other Regions, including the Middle East, Latin America and Africa.

**Impacts on Trade and Transport.** The global and regional increases in population levels and economic activity are likely to be associated with increasing trade and trade-related transport requirements. The largest increases are expected in intra- Asia trade and transport and on the major trade routes Asia- US and Asia – Europe. Trade and trade-related transport growth is also expected in other regions, including the Middle East/Turkey, Latin America and Africa.

#### *Opportunities*

For the **European Union**, the expected growth is fragile and the outlook is patchy in the short term. However, the positive global growth in the short term and the stronger regional outlook in the medium to longer term can be expected to make positive contributions to the overall levels of trade and maritime transport to and from the EU – and to increasing growth in maritime volumes handled by the N-W European ports in particular.

#### *Challenges*

Despite the positive outlook, there are important risks and uncertainties. For example, there could be:

- considerable divergence in economic growth in the different countries and between eastern and western parts of the EU
- significant changes in the list of developing and developed countries which will be the EU's biggest trading partners
- changes in the traditionally high elasticity of trade and transport demand with respect to economic growth
- major policy changes and measures associated with key strategies such as low carbon economies, reducing CO<sub>2</sub> emissions and pursuing 'green growth' policies that could impact on demand.

There are also the ever-present risks of global shocks, conflicts and disasters that could affect the global and regional GDP projections, with unknown timings. Taken together, the risks and possible scenarios suggest there is heightened level of uncertainty in the global and regional outlook, with possible consequences for all the N-W European gateways.

### ***Implications for the Port of Rotterdam***

The outlook for the Port of Rotterdam is dependent in part on future developments likely to affect all or at least a number of the N-W European ports – including those outlined above - and in part on factors specific to the Port of Rotterdam itself.

The Port Authority is currently undertaking a scenario planning exercise (Havenvisie 2030) to identify a plausible range of possible future outcomes. The scenario work is being used with the aim of helping identify how to make the industry and port complex the most efficient and sustainable in the world.

The key global drivers identified for future maritime cargo volumes include GDP growth and sustainable energy futures. Continuation of recent trend growth would suggest GDP growth of around 3% per annum. Continuation of the European trend growth in container volumes in the longer term could see container growth of around 2% per annum above GDP growth. However, lower growth rates are possible, given the post-recession difficulties in the short term and the prospects of heightened financial, environmental and social risks in the medium term as well.

The Authority's scenarios are looking at wide possible variations in bulk freight and container volumes. Amongst bulk cargoes, oil volumes are quite important; uncertainties associated with oil cargoes include the possible impacts of oil refinery rationalisation and consolidation in Europe on oil volumes. In discussions at the Workshop, the Authority appeared to have no great concerns about any possible adverse impacts for the Port from a rationalization of refinery locations. Rather, the view was the refinery in the Rotterdam area is efficient and well served from a transport viewpoint and could be one of those retained.

The Authority's scenarios give consideration to high oil prices which assessments suggest could have an adverse impact on cargo volumes and as well may have significant implications for industry location decisions. For example, if oil prices were to rise to high enough levels [e.g. up to \$150 per barrel], the collateral effects could include some significant shifting of industry activity from Europe to developing countries – as well as a certain shift in cargoes handled by the port from raw materials to semi-finished products.

While the Authority's scenarios and related projections are still confidential, it seemed likely total cargo volumes under the most positive scenarios could increase significantly in future, over the period from 2008 – 2030 [from 421 MT in 2008 to over 700 MT in 2030]. Container volumes could increase even faster [132 MT in 2008 to over 300 MT in 2030]. However, on the least positive scenarios, overall and container volumes could be very much lower than these levels.

## 5.2 NEW TRADE ROUTES AND OTHER EXPECTED MARITIME DEVELOPMENTS

### Implications of possible new trade routes and expected infrastructure developments inside and outside Europe

The OECD presentations highlighted a number of possible changes in trade routes and other expected maritime developments raised in discussions. Significant changes in prospect in the short term include:

- European Union TEN-T rail, road and waterway projects to be completed by 2015.
- Panama Canal enlargement – expected to be complete by 2014
- Larger container vessels (10,000 – 12, 500 TEUs) currently being delivered – and on order
- Increasing liner shipping services from Asia/ Sth Asia to Europe / Nth America via the Suez Canal.

Possible important changes in the medium term to 2030 would include:

- TEN-T inland waterway projects (e.g. Danube River, Seine-Scheldt) completed by around 2020
- improved land transport connections between Asia and Europe, including possible upgrading of Russian, Trans-Siberian and Trans-Asian rail links (as proposed by UN ESCAP and other parties);

In the longer term (to 2050), possibilities could include:

- opening of the Northern Sea Passage for up to 3 months p.a. - and/or the Northwest passage
- a possible Behring Straits tunnel for rail and gas in the longer term, providing a direct connection between the Russian Federation on one side and Alaska / North America on the other.

#### *Opportunities*

The Port Authority did not seem unduly concerned about possible new trade routes – and is not expecting any of these trade route changes will affect the Port and its outlook much.

Discussions concentrated more on the larger container vessels entering liner fleets and whether these larger container vessels are likely to lead to new liner shipping service patterns. Recent literature speculates on the possibility of significant changes in container services / flows – with the prospects of increased circum-equatorial services via the Suez Canal and the enlarged Panama Canal linked to a possible increase in transshipment to destinations distant from the equatorial route. The Authority expected the Port of Rotterdam would be a beneficiary of a shift to higher capacity container vessels, which would be attracted by the higher container volume handling capabilities and inland freight connections at Rotterdam

#### *Challenges*

One of the possible challenges raised was the prospect of increasing air freight services between Asia and Europe – and in particular whether there could be any significant impacts on container volumes, as more high and medium value cargoes are shipped by air?

The Authority advised that air freight is not seen as important competitor. Schipol Airport currently handles 400,000 tonnes of air freight a year. By comparison, the Port of Rotterdam handles around 400 million tonnes a year (i.e. 1000 times more). As an example, the Workshop heard that LCD TVs are transported to Europe by maritime containers from China - not shipped by air freight. In fact, the Port is seeing a trend from aviation to sea freight – even in fresh produce such as fruit, vegetables and flowers (e.g. from Africa), thanks to innovations in refrigeration and preservation technologies.

The Port Authority did not perceive any major external challenges, other than those associated with the current recession – and expected any changes would be more likely to be favourable, from the Port's viewpoint.

### 5.3 PORT PLANNING AND DEVELOPMENT

#### Rotterdam Mainport Development Project - Maasvlakte 2

The Project Mainport Development Rotterdam (PMR) is based on a project decision, May 1998, of the Dutch Government as part of a “Coalition Agreement” of the new Government.

The Port Authority had investigated the space shortage at the Rotterdam Mainport, at the beginning of the ‘90s’. In 1998, the PMR appeared as an official spatial planning project - undertaken as a joint project of the Port, the government, the Rotterdam municipality and the South Holland Province. The study project explored the options: (1) the Existing Rotterdam Area, (2) Southwest Netherlands ; (3) land reclamation.

In 2002, the Authority completed a cost benefit analysis of the principal development options from the viewpoint of the Netherlands, which analysed the Port of Rotterdam with and without a major extension of the port area (that would require major land reclamation)<sup>1</sup>. The project being planned was a huge development with considerable challenges on both construction and financial fronts.

In May 2008 all the parties involved in the development of Maasvlakte 2 (environmental organizations, business umbrella organizations, ministries, the provincial, municipal and urban district authorities and the Port Authority) signed the agreement framework ‘Vision and Trust’ (‘Visie en vertrouwen’) in which it was agreed that during the development of Maasvlakte 2 they would together monitor compliance with the agreements made.

In its 2008 Annual Report, the Port Authority noted:

Space for growth is essential. That is why we are constructing Maasvlakte 2, but also intensifying the use of the existing Rotterdam port area and redeveloping outdated and other plots and buildings.

On 1 September 2008, immediately to the west of Maasvlakte 1, the Port Authority began with the construction of Maasvlakte 2, the land reclamation project which – after almost two decades of preparation – will increase the area of the port by 20% (2000 hectares, of which 1000 hectares will be lettable sites). .. In 2013 the very first container should be handled at Maasvlakte 2.

In its 2009 Annual Report, the Port Authority added:

Maasvlakte 2 has the ambition to become the most sustainable port area, setting new standards for the sustainable and economically successful development of port and industrial areas. The new area to be constructed and laid out offers plenty of space for sustainable development. For example, the most compact form has been chosen in the design, and the share of inland shipping and rail (modal shift) in the transport of containers is expected to increase substantially until the year 2033. By making firm agreements on this in contracts with customers, chemical companies will use each other’s residual heat, only clean goods vehicles (Euro V standard from 2013; Euro VI standard from 2016) will be permitted access (Environmental zone Maasvlakte 1 and Maasvlakte 2) and cleaner engines for inland vessels will be encouraged. In short, we believe this provides the optimum balance between the environment and economic development.

Maasvlakte 2 is one of the three elements of Rotterdam Mainport Development Project (PMR). The other two are the construction of a new 750-hectare nature reserve and recreation area around Rotterdam and a

<sup>1</sup> Eijgenraam, C.J.J. (2002), Welvaartseffecten van Maasvlakte 2, Aanvullende kosten-batenanalyse van uitbreiding van de Rotterdamse haven door landaanwinning, CPB, Den Haag.

series of projects entitled Existing Rotterdam Area (*Bestaand Rotterdams Gebied*). The purpose is to use the existing port area more intensively and improve the quality of the living environment.

### *Opportunities*

The Maasvlakte 2 project is one of pivotal importance for the Port of Rotterdam Authority. It will secure the port area and terminal locations needed to allow the Port of Rotterdam to expand and adapt to expected future needs. By ensuring the port is always well placed to anticipate and respond to market demand, the Maasvlakte 2 project can be expected to capture that market demand within the Port of Rotterdam complex. The new port area will be an extension of the existing port – which should reduce risks for all the parties involved – by comparison with a ‘greenfields’ location. Shipping lines and new terminal operators establishing in the Maasvlakte 2 area will be able to take advantage of the existing services at the established port. These include a high frequency of feeder, transshipment and inland transport services – as well as the high quality port and inland terminal infrastructure facilities that are already in place.

Other competing ports will need to be as well prepared, equally responsive and quick and able to satisfy terminal operator, shipper and industry needs as well. If they are not, the Maasvlakte 2 project is likely to attract some development opportunities to the Port of Rotterdam that might otherwise have chosen an alternative location.

The Port Landlord model provides the important capacity for the Authority to adjust the timing of its development and expenditures on the Maasvlakte 2 project to meet changing market circumstances. The Authority will still have some demand risk exposure when it decides to proceed with each further stage of development. However, once leases have been signed with new terminal operators, the terminal operators will be on the front line and will have to cope with the demand risks, whereas the Port Authority will be protected to some extent from the short term vagaries of the markets.

### *Challenges*

The initial timings for the Maasvlakte 2 project development were settled before the global financial crisis. Given reduced market demand in 2009 and the slower growth now expected over the next few years, there will probably need to be adjustments made to project schedules – as well as impacts on cash flows and financial performance. Nevertheless, the Port Authority seems to be well placed to manage the maritime shipping and port development needs and to fund the infrastructure and other investments required.

The Maasvlakte 2 development will represent a major step up in port handling volumes – and require additional capacity, service frequency and reliability of road transport, inland waterway and rail services. Dwell times for cargo in the port are higher than the Port Authority would like – and will need to be reduced. The customs processes and documentation handling required will also need to keep pace with demand. As well, there are already congestion difficulties on the roads and problems with rail services.

Some of these challenges will escalate by more than the 20% expansion of the port area might suggest, due to the additional complexity of the activities and the interactions required. Many challenges relate to land side activities – where the Port Authority has a clear interest and is taking on and discharging some additional responsibilities. However, other parties (e.g. road transport, rail and inland waterway operators) have greater and more direct responsibilities for the decisions and financing of the improvements required. The challenges in these areas also look set to increase.

## 5.4 PORT OF ROTTERDAM'S INLAND TRANSPORT CONNECTIONS

### Inland transport connections and services

The Port of Rotterdam generates very significant volumes of inland transport. The Port Authority recognises the importance of high quality, high frequency and reliable inland transport connections to the Port's overall performance. It has devoted very considerable resources over an extended period to ensuring the services provided meet users' needs and stakeholders' expectations.

The Authority's presentation highlighted that around 80% of total cargo throughput – i.e. across all cargo categories - is destined for or originates from countries outside the Netherlands. Of this, some 100 million tonnes is carried to and from Germany.

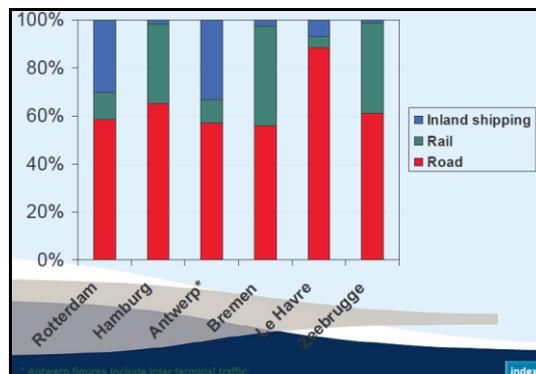
The position is different for the distribution of containers to the European hinterland, which in 2007 was:

Distribution of Containers to the European Hinterland

2007	Mln. TEU	%
Netherlands	4.7	58%
Germany	1.9	23%
Belgium	1.0	12%
Others	0.5	6%
<b>Total</b>	<b>8.1</b>	<b>100%</b>

Source: M van Schuylenburg, Rotterdam Workshop, 24 March 2010

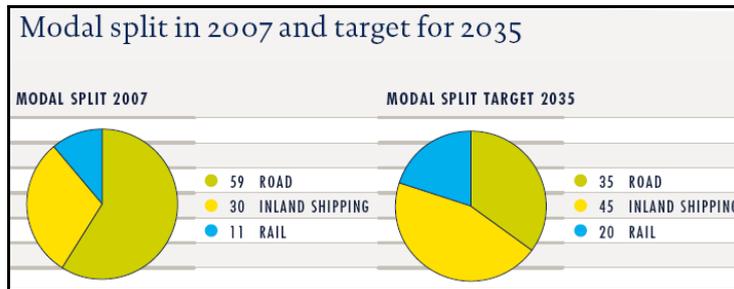
One of the important issues is that the Port of Rotterdam, like many other North-West Europe ports, is very reliant on road transport for inland transport services. In 2008, for example, around 57% of container throughput at Rotterdam was carried by road transport. Inland waterway transport carried around 30% of containers. Rail's share of containers in 2008 was 12.7%. The current mix as shown below has led to heightened concerns about both congestion in the short term and sustainability in the longer term.



Source: M van Schuylenburg, Rotterdam Workshop, 24 March 2010

Recently, as congestion became more pervasive, the Authority concluded that outcomes needed to be improved and has increased the intensity and scope of its efforts to improve the movement of goods to and from the port by inland transport services.

The Authority is now firmly focussed on increasing the shares on inland transport handled by the port that is carried on inland waterways and rail transport. Target shares for 2035 are: inland waterway **45%**; road **35%**; and rail **20%**. The modal split in 2007 and targets for 2035 are shown below:



Source: Port of Rotterdam Annual Report, 2008.

In its role as port landlord and port manager, the Port Authority has taken a number of important actions. One interesting example is that the Port Authority has negotiated contracts with terminal operators in the new Maasvlakte 2 project, under which they undertake to contribute to a raising of the inland waterway and rail market shares, by switching their cargoes from road transport. The Authority’s advice on this was:

Thanks to excellent access to the hinterland and the European market by inland shipping, rail, road and pipeline, Rotterdam is an important factor in the supply chain. With the present capacity of the infrastructure, the expected growth in throughput during the coming decades will lead to severe congestion in the arrival and departure of goods to the continental hinterland. That is why we are working with the business sector to invest in expanding the infrastructure, and in innovative transport concepts. **Objective:** more goods by water and rail, and less by road (modal shift). We have laid down agreements with our clients on this in the leases for Maasvlakte 2.

Source: Port of Rotterdam Annual Report, 2008

### Inland Shipping

There are extensive inland waterway connections between the Port and hinterlands in western Europe:



Recent developments in inland shipping include starting construction of the inland terminal at Alphen aan de Rijn in July 2009, a joint project of Van Uden (terminal operator), Heineken (supplier) and the Port Authority (lessor of the site). By mid- 2010 Heineken will no longer transport much of its export volume to the port by road, but by inland vessels. Carriers of fresh products using road transport are being encouraged through the ‘Fresh Corridor’ project to make use of inland shipping - involving refrigerated containers

being transported from the port area to the Venlo region by inland vessel. Given the positive results, the Authority is now exploring the possibility of other hinterland locations.

### Opportunities

The Port Authority considers inland shipping is ideal for cost-effective transport of large volumes to and from the European hinterland. There are good prospects of doing so by using *barges* on inland waterways. On the rivers, there is sufficient space for further growth. The Port Authority is aiming to make inland shipping denser and more attractive over short distances, with a target 45% share by 2035.

One of the important opportunities available has been to use inland waterways to transport cargo destined for Antwerp but delivered to the Port of Rotterdam and vice versa. A good inland waterway connection has ensured the significant volumes involved can be transported directly to Antwerp internally, by barges, rather than at sea, where re-entry to Europe would be required.

The Authority is seeking further opportunities to ensure that the container flows can arrive and depart safely, efficiently and sustainably. Fundamentally, to do so, the logistics process for container inland shipping needs to be improved. A set of handling agreements for Inland Container Shipping has been developed for use in the logistics chain, which are important starting points for the Inland Container Shipping Program.

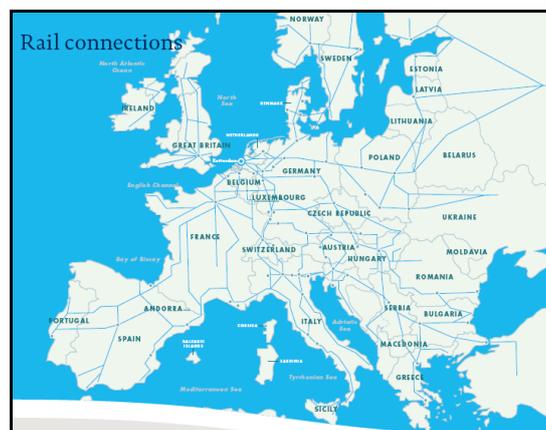
### Challenges

By 2030, the total volumes of cargo to be moved through the port are expected to increase two or three times. Over the intervening period, inland shipping's share of container movements to and from the port will need to increase steadily to reach the Authority's container modal share objectives for 2030. As a result, the volumes of cargoes that would need to be moved by inland waterways will increase greatly.

The changes required can be expected to engage many challenges and significant infrastructure expenditures as well. Improved waterway connections, terminals and handling equipment will be needed in the vicinity of the port, as well as better vessel management systems. Improved inland waterway terminals will no doubt be needed as well. Decisions may be required on the Authority's involvement in the inland facilities required - as is the case for the Container Transferium concept that the Port Authority is currently developing.

### Inland Rail

There is a good network of inland rail connections to the Port's hinterlands in western Europe and beyond:



### *Trans-European Network (TEN-T) projects*

There are several major European rail projects underway that can be expected to have very significant impacts on the European rail network operations once they are completed. Several of these can be expected to provide additional capacity and greatly improve travel times and reliability on inland connections between the Port of Rotterdam and the European hinterland. They include:

- the Rotterdam / Antwerp to Genoa via Alpine Crossing tunnels under Switzerland (TEN-T No 24). This links to the Betuwe line (TEN-T No 5) now completed in the Netherlands to provide access between the Port of Rotterdam and the German rail network. Estimated completion: 2010\*
- the Lyon HSR corridor spur from the Rotterdam to Genoa route, linking Lyon/ Dijon to the main rail route at Mulhouse (TEN-T No 24). Estimated completion: 2020\*
- the Netherlands – Belgium - Germany - Poland – Lithuania (TEN-T No 27 from Poland North).

\* Note: Timings as per TEN-T – Implementation of Priority Projects September 2009.

### *Opportunities*

The rail modal share of port cargo volumes is very low. The Port Authority has recognised it needs to be increased, along with planned increases in inland waterway transport and has already taken a number of steps to improve rail's mode share towards the 20% target in 2035. Some of them go beyond the normal sphere of operations of a Port authority. It invested in Keyrail, a rail operator providing services on the important *Betuwe route* between the port and its hinterland in Europe. It has required clauses in contracts with terminal operators that set targets for increasing use of non-road (rail and inland waterway) modes over time. The Authority is also investing in the inland Container Transferium - as first pilot of its type - intended to facilitate "pushing" of containers off the port rather than waiting for hauliers to come and "pull" them away.

The *Betuwe route* provides one of the most important opportunities for improving the efficiency, reliability and modal share of inland rail connections along the important trans-European corridor between Rotterdam and Genoa. The Authority advised:

With its links to the Betuweroute, Rotterdam now has the ambition to become a genuine 'rail port' in the coming years. Maasvlakte 2 will mean a sizeable growth in rail freight transport to and from the port. This fact, in combination with the autonomous development of the existing port area and a more active use of the Betuweroute is expected to lead to a fourfold increase in rail freight transport along the Port Railway in 2033 compared to 2008. In order to reduce traffic congestion and environmental pollution, we want to increase the proportion of rail transport in the modal split for container transport to and from the Maasvlakte, from 16% in 2008 to 20% in 2033.

Source: Port of Rotterdam Annual Report, 2009

In conjunction with other TEN-T projects due for completion by around 2020, the improved rail services should provide a boost to rail freight between the Port of Rotterdam and inland activity centres.

### *Challenges*

The Workshop heard there are many challenges to confront in attempting to improve inland rail transport services to the Port and to increase rail's modal share. These include, in summary:

- Rail services are operationally difficult to manage, the length of track is limited and the length of trains as well
- Rail services operate at different speeds and there are scheduling issues
- Many kinds of investments are needed e.g. large investments are needed in marshalling yards

- Rail's operational capacity is often determined by other infrastructure and its operational limitations. For example, rail rolling stock could be double stacked in existing tunnels but bridges and electricity portals prevent double stacking of trains along the line
- Demand and congestion on mixed rail passenger/freight lines expected to increase.

Nevertheless, the Betuweroute freight-only line is a critical rail freight link. Unfortunately, there were substantial cost overruns during its construction, due in part to increased mitigation costs incurred to reduce levels of public opposition and due to regulations to protect the environment and safety. As well, the dedicated Betuweroute rail freight line still ends at the German border, in spite of agreements on extending the line in Germany. The capacity of the line was expected to be around 200 trains per day. At present, the line is handling only around 200 – 300 trains per week. Current restrictions are due in part to signalling problems and other difficulties. These operational problems will need to be resolved quickly.

In the longer term, a further serious challenge is that by 2030 there are likely to be rail freight capacity problems on the Betuweroute line. The anticipated capacity limitations will be difficult to resolve, given the limited measures likely to be available at that time and the likelihood they would involve very large [and possibly prohibitive] expenditures. So the Port Authority's strategy of increasing rail's market share as port volumes increase could run into difficulties and physical constraints in the longer term.

## **Roads**

### *Opportunities*

The primary road link to the Port is the A15 highway and it has been developed to a high standard. Traffic congestion has been building up. The Authority's 2008 Report advised of options being explored:

The A15 corridor is a crucial traffic artery in the port of Rotterdam. Congestion has become an urgent problem. That is why we worked hard in 2008 to improve accessibility along this corridor. An unorthodox solution was needed. At our initiative, a major step was taken with the formation of the Traffic Management Company on 9 July 2008... The Traffic Management Company is a small, effective management organization whose aim is to reduce traffic on the A15 by 20% during the rush hours. This is particularly relevant too, as major road-widening work will be carried out during the period from 2010 to 2015. The Traffic Management Company brings together all those parties who can exert influence on the supply (of infrastructure, public transport, traffic lights etc.) and demand (for mobility, certainly as regards commuting traffic) in a single organization.

The Workshop highlighted recent trials that had proven to be successful including encouraging previous road users to not use the A15 corridor in peak periods, by offering a small cash payment each week as compensation. This innovatory approach has proven able to reduce demand by around 7% in peak periods. Further consideration is being given to whether it should be adopted for regular use.

The Authority's 2009 Report advised a significant new initiative to develop a new western cross river connection, which could help address anticipated problems and improve future traffic access:

We foresee that the construction of a new cross-river connection in the very short term is important for the port area in order to guarantee good traffic flow along the orbital road around Rotterdam, and that is why we contributed to the study 'Rotterdam Vooruit' in which the national government, province and urban region are working together on a strategic master plan for an accessible Rotterdam region. This has resulted in a widely supported recommendation for the swift construction of a new western cross-river connection.

In October 2009 the Minister of Transport, Public Works and Water Management also confirmed the need for the new western cross-river connection. During the first half of 2010, two possible routes will

be developed in close consultation with the surrounding area; in mid-2010 a preference will be decided on in order to proceed with the planning phase for one of the variants (Blankenburg route or Oranje route). At the end of 2009, in a letter to the Minister we proposed working with other partners to take the initiative in speeding up the construction of the connection, where we would like to take on the management of this process from the planning phase onwards. We also proposed examining jointly how the Port of Rotterdam Authority can contribute to speeding up the construction of the new western cross-river connection.

Source: Port of Rotterdam Annual Report, 2009

### *Challenges*

One of the major challenges of existing arrangements is that the A15 is the one main artery serving the port. The Workshop heard that there has been a major incident on this route every few days recently. This means that road access to and from the port is currently not as reliable as it needs to be – and in future is likely to be more vulnerable.

A further challenge is the limitation of road transport capacity imposed by EU rules on the maximum length of containers that can be hauled by road transport – which in effect leads to more truck movements to transport a given volume of cargo than would otherwise be the case.

### **Terminals**

Congestion has also increased in the container terminals. Cargo dwell time at ports currently averages 6-7 days and will need to be reduced. This will require reducing times in operators' transfer terminals.

### *Opportunities and Challenges*

In future, as volumes increase, the Authority favours terminal operators adopting a new strategy: quickly “pushing” delivered cargo out of the port (on barges where possible or shuttle trains) to purpose built inland terminal locations - rather than letting them wait in the port to be collected and “pulled” out (e.g. by road) at a times that suit road transport operators. This is an important shift in strategy, in an area that was previously seen as the domain of the private sector operators and hauliers involved.

There are still different views on what the ‘driving philosophies’ underlying this new strategy should be. One view is that forwarders are the strategic actors within the private sector and it should be left to the competitive free markets to take the necessary decisions. The other view is that Port Authority has wider responsibilities to other parties – e.g. for the sustainability of operations on which the port depends. With many small enterprises involved, the lead can't really come from the market. On this basis, the Port should be taking more of a lead, given the Authority is able to influence or set down how things should happen.

### *Container Transferium*

In its Annual Report 2009, the Authority advised that:

In 2009 we took some important steps towards the development of a Container Transferium. This concept entails grouping container flows and transporting them by inland vessel between the ocean terminals at Maasvlakte and a location in the immediate hinterland of Rotterdam. The aim is to improve accessibility of the container terminals and to reduce the volume of traffic on the A15 motorway in the port area. This will in turn improve air quality. Our specific ambition is to achieve a structural reduction of 200,000 TEU (a unit of measurement for containers) transported along the A15.

In June we signed an administrative agreement with the Ministry of Transport, Public Works and Water Management, the Province of Zuid-Holland, the Municipality of Rotterdam and the Drecht Towns

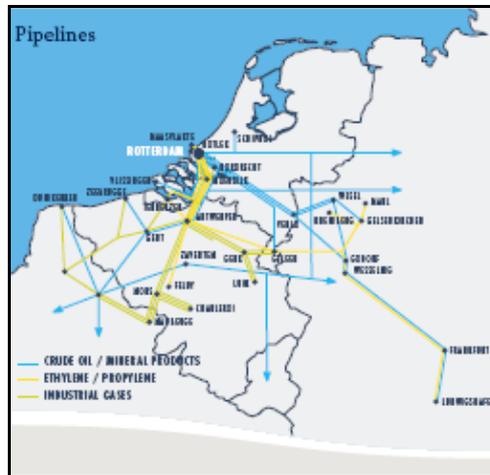
Executive (Drechtstedenbestuur) on the siting of the Container Transferium in Alblasterdam. At the same meeting a Memorandum of Understanding was signed with BCTN (Binnenlandse Container Terminals Nederland - Inland Container Terminals Netherlands) on the intended operation of the Container Transferium and a Letter of Support by the market parties involved.

Source: Port of Rotterdam Annual Report, 2009

In summary, improvements have been made to inland transport connections by road, inland waterway and rail. However, *there are problems with efficiency and capacity on all modes*. Further improvements are required now to ensure congested terminals and roads in particular do not unduly delay the cargo volumes currently being handled. More substantial improvements will be required in future to ensure there is sufficient capacity and the ability to carry increasing shares of cargo (particularly containers) by inland waterway and rail services - and to ensure the increasing volumes do not lead to unacceptable congestion and delays. [Note: Some further graphics on land transport aspects are at [Annex 3](#)]

### Cables and Pipelines

The Port of Rotterdam has extensive pipelines that are well connected into broader pipeline networks. Transport through pipelines is environmentally friendly and safe. It can proceed without interruption, strengthens cluster-forming between businesses and reduces traffic volumes and CO2 emissions. The Authority advised these are important considerations in investing in pipelines.



The Port Authority advised, in its Annual Report 2009 that:

The underground cable and pipeline network forms the link between the businesses themselves within the port area, and the petrochemical clusters in the Southern Netherlands, Belgium and Germany. As a result, both regional and international co-siting is possible: the use of each other's raw materials, residual materials, semi-finished and finished products.

With about 1,500 kilometres of oil and chemical pipelines, 800 km of mains pipes, 2,300 high-tension cables and many kilometres of data connections, the underground infrastructure is a major transport modality. Pipelines account for 33% of cross-border transport from the port of Rotterdam (2008: 54 million tonnes, source CBS). The national government recognises this importance. In the Structural Vision for Pipelines, future pipeline strips for the transport of products such as natural gas, CO2, oil and chemicals were established in 2009, and this must now be translated into local Zoning Plans.

In 2009, a technologically advanced project commissioned by us was completed in the Yangtze haven: six drill holes, varying in diameter from 300 to 900 mm and with a length of 1,200 to 1,450 metres. For 2010 two cooling water pipes are planned to use cooling water heated at E.ON to heat the LNG at Gate, after which the cooled water will be returned again to E.ON.

## 5.5 SUPPLY CHAIN ORIGIN TO DESTINATION PERFORMANCE

### Port of Rotterdam operations and spread of origins and destinations

The Port Authority advised at the Workshop that around 80% of *total cargo* (by tonnes) handled by the port is destined for / originated from other countries (ie outside the Netherlands). As noted earlier, around 100 million tonnes is cargo to and from Germany. For *containers only*, the proportions carried to/from different countries are: Netherlands 58%; Germany 23%; Belgium 12%; others 6%.

Most shippers and other users are now far removed from the port environment. A majority of origins and final destinations are in other European countries, in other countries outside Europe and in other regions of the world. Given the high level of the overall cargo destined for / originating from other countries and distribution of origins / destinations of container traffic, the adequacy of “Origin to Destination” performance as seen by users is clearly important.

From the viewpoint of logistics operators, the port and its inland transport connections are only intermediate stages in origin to destination movements. Origin to destination performance will have a greater impact on the choice of shipper or logistic operator and on the shipper or logistics operator’s choice of supply chain route than the performance of the port and its inland connections alone.

### Sources of Data on Origin to Destination Supply Chains

The Workshop discussions did not consider any current time – cost - distance supply chain data. However, subsequent exchanges after the Workshop unearthed some quite extensive container modelling work undertaken for the Port Authority in 2004 on the North-West European Ports and their Hinterland Connections. The first container modelling was undertaken on behalf of Project Mainport Rotterdam and used for the cost benefit analyses Maasvlakte 2. The 2004 model was made on behalf of ProSes, the Scheldt project, as input for the cost benefit analyses of deepening the Scheldt<sup>2</sup>. Data was collected for two years, 2001 and 1997, and included container TEU volumes as well as time, cost and distance between six main N-W Europe ports in the Le Havre – Hamburg range and 28 principal activity regions inland in Germany (16), Netherlands (5), Belgium (3) and France (4).

As the write up of the model noted, the routing phase includes at least the following chain of choices: modal choice in the region of origin; choice of seaport in the region of origin; choice of ocean shipping service; choice of seaport in the region of destination; and modal choice in the region of destination. The model developed used the above data along with other inputs including the frequency of shipping services to the different ports as a basis for calibration. Using the resulting coefficients, modelling forecasts were made of expected container traffic distributions amongst the six N-W European ports in future.

From the feedback provided after the Workshop, it seems that the modelling was only partially successful in predicting the changes that have since occurred. Other factors not modelled – including shipper preferences / decisions - also appear to have had an important bearing on the actual results.

### Lack of information

Supply chain origin to destination performance via the port and via competing ports would seem to be a very important subject for any main port operation. Work in this area is consistent with the Authority’s strategic responsibilities for research and planning. However, although commendable efforts have been made in the past, the Port Authority appeared to lack current information on this at present.

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<sup>2</sup> For details, see <http://www.ontwikkelingsschets2010.nl> Capelle aan den IJssel, june 2010.

## Supply Chain Improvements in Prospect

A better understanding of supply chain performance as it affects origin – final destination traffic via the port would seem likely to be very useful, given the impact that supply chain decisions could have on the demand for the Port's services. The Authority cautioned that many other factors are involved, resulting in all kinds of transportation that doesn't seem logical by only looking at time and distance. However, even if the factors modelled previously are not the only important ones, they can be expected to influence the allocation of demand between the Port of Rotterdam and other N-W European ports in future.

### *Opportunities*

Rather than letting the work lapse, as markets improve, there could be a valuable opportunity to update and further improve the models developed in the light of experience. Changes are likely as a result of improved inland connections, following the completion of the current batch of TEN-T projects. As well, it is likely that Europe's Mediterranean ports will have greater roles and reach, following the improvements in inland services expected along the major European land transport corridors. Given the broader changes in prospect, it could be valuable to extend the scope of the modelling in future beyond the 6 main N-W ports and their connections to the main inland activity centres.

Further modelling work along these lines could be expected to provide a better understanding of the allocation of demand amongst a broader list of competing ports than the 6 main N-W Europe ports studied previously. This could well provide a sounder basis on which to take future decisions, not only on port investments but also on the inland transport improvements that are becoming increasingly important to the Port Authority and demanding increasing management time.

An increase in vessel size will be one of the first important developments that will influence future outcomes. The Port Authority advised that the move from 8500 to 12500 TEU vessels can be expected to save 20-30% of costs for the maritime part of the journey. Of course, this cost saving will only be available for ocean shipping services via those ports at which the new large container vessels call.

Possible ICT improvements could make a valuable contribution, particularly in reducing documentation and cargo clearance delays, overall cargo dwell time and inland transport costs.

A further opportunity lies in the area of improving contract documentation. One single contract is needed on which all parties involved can rely. The Workshop heard that there are new UN Trade and Transport (Rotterdam) Rules on how best to organize the paperwork involved. A new type of governance structure is needed to effectively implement the changes.

The Workshop heard the new UN Rotterdam Rules are the first rules governing the carriage of goods both by sea and connecting or previous transport by land. This land leg used to require separate contracts. Responsibility and liability during the whole transport process are clearly demarcated. Furthermore, the Rotterdam Rules put in place the infrastructure for the development of e-commerce in maritime transport. This will lead to less paperwork. The shorter turnaround times will reduce the chance of errors.

The application of the new UN Rotterdam Rules will make doing business easier and lead to a reduction in costs. The Workshop heard the new Rotterdam Rules are expected to give world trade a boost considering that 80% of world trade is conducted by sea. Applying the same law all over the world would facilitate international trade by making its underlying contracts and documentation more efficient and clearer.

## *Challenges*

The Authority recognises that cost savings are more difficult to achieve in inland transport. However, it considers that making the right improvements (eg to reduce ‘friction’ costs) could reduce inland costs by around 10%.

One of the greatest challenges will be to improve the reliability of inland transport connections as cargo volumes increase. This will be a priority issue for container traffic, given that larger vessel sizes will mean an increase of up to 50% in the number of containers arriving at one of the port terminals each time a 12,500 TEU vessel docks.

A further challenge is to resolve the debate over the Port Authority’s roles - and make choices on orchestrating or managing the various inland transport investment and operational improvements needed.

The main questions remaining unanswered on supply chain performance include:

- Improvements needed in the short term to ensure internationally competitive supply chain services?
- How changing service quality / reliability via port and inland corridors affect future freight volumes?  
How will the planned introduction of road pricing throughout the Netherlands affect the Port?
- Whether more direct / shorter routes from the Mediterranean and other European ports could be used more in future to serve developing inland European markets that are currently within the hinterland range of the Port of Rotterdam?
- At the end of the day, taking all the planned improvements into account, are future supply chain services via the port going to be good enough to protect its existing markets?

## 5.6 INFRASTRUCTURE FUNDING AND FINANCING

In the midst of a major port expansion at the same time as the worst global recession in 80 years, the Port of Rotterdam Authority seems to be rather well placed in terms of infrastructure funding and financing. The Authority advised in its 2008 Annual Report that, since being corporatized in January 2004:

The Port Authority has met its external financing needs primarily through long-term subordinated loans given by the Municipality of Rotterdam. These municipal facilities are gradually being repaid and refinanced on the private market. In January 2008 long-term credit facilities were agreed with the European Investment Bank, the Bank Nederlandse Gemeenten, ING, Rabo and Fortis for an amount of € 1.8 billion. This sum will be used both for investment in the existing port and to finance the construction of the first part of Maasvlakte 2.

In 2009 the second tranche of the entry of the State as shareholder in the Port Authority was implemented. This is linked to a deposit of share capital by the State of the Netherlands and a deposit of a paid-in surplus by the Municipality of Rotterdam for a total sum of € 450 million. In anticipation of this, the need for finance during the course of 2008 was met increasingly with short-term debt. As a result, compared to 2007 € 102 million less was taken out as long-term debt. In addition, there was a one-off positive entry in 2007 of € 50 million included in the financing cash flow, namely the first tranche of the entry of the State. The final payment was made in 2008 to the municipality based on the earn-out scheme (€ 50 million, the same as in 2007).

Source: Annual Report, 2008

The Authority's *Key Figures* at the end of 2009 and comparison with 2008 are as follows:

	2009	2008
<b>Interest coverage rate</b>	<b>4.1</b>	<b>3.7</b>
<b>Net Debt / EBITDA</b>	<b>2.6</b>	<b>3.7</b>
<b>Solvancy (in %)</b>	<b>66.0</b>	<b>59.0</b>
<b>Return on capital employment (in %)</b>	<b>7.8</b>	<b>9.2</b>

Source: Port of Rotterdam Annual Report, 2009

Some further advice on the Port authority's financial position is provided in [Annex 4](#).

### *Slight rise in throughput and efficiency*

At the end of 2009, because of the economic crisis, the Port Authority decided to award a one-off crisis discount for 2010. After correction for inflation, this is equivalent to a reduction in harbour dues of 5% for 2010. This adjustment was made in consultation with market parties, represented by Deltalinqs.

Operating expenses are expected not to grow in 2010 compared to 2009. Just as in 2009, inflationary increases in costs and the wage bill based on CAO agreements will be offset by a restrictive acquisition policy and focus on cost control.

Source: Port of Rotterdam Annual Report, 2009

### *Importance of becoming a Corporation*

The Workshop discussions highlighted the importance of the Port Authority having been transformed into a Corporation. At the time the Maasvlakte 2 project was under consideration, the Authority did not have the cash reserves or financing capacity to assume responsibility of the project funding. Separately, consideration was being given to transforming the Authority into a fully government owned corporation.

The final decision was to establish the Port Authority as a corporation whose shares were owned 2/3 by the municipal government and 1/3 by the central government. As a corporation, the Authority had the cash flow and financial capacity to borrow up to the level of its existing equity (i.e. a capital structure with a 50:50 debt / equity ratio). This level of equity and borrowings was sufficient to allow the Authority to assume financial responsibility for the Maasvlakte 2 project.

The Port Authority has been affected to some extent by the downturn. However, it still expects to be able to rely on internally generated funds – without any further recourse to additional borrowings – to be able to fund its capital investment programme, including the Maasvlakte 2 project.

Given the national significance of the infrastructure, it is clearly important to have a business model that can assure current port operations, undertake a major expansion and ensure the port's efficiency safety security and environmental requirements are met, during a major economic crisis.

### *Opportunities*

In relation to future expenditures, the Port Authority advised in its 2009 Report:

The Port Authority will continue in 2010 to invest intensively in the port of Rotterdam. The construction of Maasvlakte 2 is proceeding according to plan and will ensure that from 2013 onwards there will once again be sufficient deep-water handling capacity.

The speed at which we proceed with investments will partly be determined by developments among our customers. Major investments are being made in particular in the container (infraplus for Delta peninsula, APMT quay wall), break-bulk (steel slab terminal site), chemical and biobased industrial (Neste) and Gas & Power (Gate, Electrabel), Dry Bulk (EMO) and real estate (Port City) sectors.

Large non-customer related projects are the traffic guidance system for shipping and maintenance of quay walls.

In order to improve the accessibility of the port, land will be bought to enable the Container Transferium to be built. In addition, the Traffic Management Company will undertake even more activities in 2010 to improve accessibility, and our organisation plans to play a prominent role in pushing forward plans for a new western cross river connection.

The available credit facilities and operational cash flows are sufficient to provide for the associated finance requirements.

### *Challenges*

The recent downturn caused a significant reduction in port throughput volumes. While the shippers and terminal operators were most directly affected, the Port Authority was also affected by lower number of ships calling at the Port and other Port revenues related to volumes. Recent developments suggest the recovery in Europe will be more hesitant and drawn out than first expected. The slower the recovery, the more difficult financially will be each stage of the Maasvlakte 2 development.

At the same time as revenues are depressed, the Port is keen to improve its 'green' credentials even further with investments in inland waterway and rail facilities that provide improved connections to inland terminals and final destinations across Europe.

Having a secure capital structure and relatively robust sources of revenues mean the Port is better placed than many – probably most - other infrastructure owners and managers, particularly in the currently adverse economic times. However, given the depth and complexity of the recession and recovery, there will no doubt be some difficult financial challenges ahead.

## 5.7 POLICY AND REGULATORY FRAMEWORKS

### Organisational Structures

The Netherlands has no Law on ports; port activity is regulated by municipal regulation. However, at the national level, various laws regulate port activity and development in relation to e.g.: safe and secure shipping; transport safety (including external safety; working conditions; and environment and nature).

The Port of Rotterdam has well designed organisational structures well adapted to its roles. Governance arrangements have been chosen carefully to ensure a continuous focus on economic, commercial and environmental goals. Following reforms made in 2004, the Port Authority is a Public Corporation; its shares are currently owned by the municipal government (70%) and the national government (30%).

The Port of Rotterdam is also a ‘*Landlord Port*’. All the necessary powers and responsibilities are vested in the Port Authority, to allow it to plan, develop and manage the port land and sea areas under its responsibility - as well as the common user infrastructure within the port’s jurisdiction. The Port Authority will exercise similar functions inland, at the inland Container Transferium.

The Corporation structure combined with a *Landlord Port* model means the organisation is publicly owned but commercially driven. Adopting a corporation structure was very important in terms of funding and financing. It transformed the Port Authority into a fully commercial organisation, while retaining the authority and powers necessary to be a fully effective ports manager. It allows the Authority to focus on operations without undue day to day political involvement. The Authority is not as dependent on local politics as it was and there is no need now for locals to approve port expenditures.

The Workshop heard that its corporate structure also provided the Authority with greater commercial freedom, including the ability to invest elsewhere. The Authority has investments overseas (e.g. a 50% shareholding in Oman), undertakes consultant studies on a commercial basis etc. Importantly, it is required to meet Corporations law requirements for transparency, information disclosure and public reporting.

### National Seaports Policy 2005-2010

The Regulatory Framework includes a supportive Netherlands’ Seaports policy, which notes that:

In the field of tension that occurs between the major economic stakes involved in the Dutch seaports and the stringent, sometimes conflicting requirements that exist for their functioning, the Cabinet has opted to strengthen the added value of the seaports to the Dutch economy. The Cabinet wants to achieve this by improving the international competitive strength of the Dutch seaports, within the constraints imposed by human environment and safety. To this end, the central government will pursue a three track policy in the 2005 - 2010 period: Market mechanisms: improve the market conditions for port-based companies; Constraints: regulate and promote safety and human environment; Capacity: maintain and improve the accessibility of seaports and create physical space for growth.

Source: The Netherlands National Seaports Policy 2005-2010

### European Union policies and oversight

The Port of Rotterdam also operates within the framework of the European Union’s transport policies and programmes. The EC has focussed on ports in their roles as sustainable hubs and has made a number of recommendations on European port policy. The Port of Rotterdam has submitted its views on these recommendations and is seeking early action by the EC to quickly publish the results.

## 5.8 STAKEHOLDER INVOLVEMENT AND COORDINATION

### Stakeholders

There was considerable discussion at the Workshop on the importance of adequate consultation and involvement of stakeholders.

The Netherlands has well developed ‘Open Plan’ processes which have been refined over many years. These have to be good to be able to manage the complexity of the Open Plan processes and needs for stakeholder consultation and involvement created by them. Policy processes also need to be well developed and adapted to stakeholder involvement. Policy processes in the Netherlands are generally regarded as reasonably efficient. There is often a shared vision for the future for important policy areas.

Stakeholder involvement is generally crucial to the future of strategic infrastructure - and the Authority recognises the Port of Rotterdam is no exception to this general rule. Within the broader Netherlands arrangements, the Port of Rotterdam has spent many years polishing its arrangements, which seem to be working well. In respect of the policy priorities, there is general recognition of the need for improved freight handling via inland connections from the port to final destinations. The Authority noted that, within the private sector, there is a willingness to embrace the changes required and a willingness to innovate, which are also important for good stakeholder relations.

### *Opportunities*

The Port of Rotterdam’s Innovation Strategy provides a good example of the way in which the Port Authority reaches out to its stakeholders:

### **Vision of Knowledge Development and Innovation**

Our ambition is to make Rotterdam the centre of port innovation worldwide. The Port of Rotterdam Authority sets the tone by carrying out research and development projects itself more intensively, and particularly in partnership.

With the R&D agenda, in which the innovation strategy of the Port Authority has been detailed out, we will in the coming years provide more innovation and adopt a more dynamic approach. Investment in knowledge and innovation is a top priority for the Executive Board. We must now start working actively towards ‘tomorrow’. We are serious about this and are structurally making additional budget available for it. With this the long term is being explored and the concrete opportunities in the short term are being seized. The R&D agenda shows the way to a more intensive research programming.

The R&D agenda is an open invitation to all parties involved to work together. Together with our clients and knowledge partners we want to research things in greater depth, introduce new subjects onto the agenda and make (better) choices. We have a great deal of knowledge in house, but can and must also learn a great deal from others. As Port Authority we must learn to adopt more outside-in thinking. Together we will make Rotterdam the smartest port in the world.

Source: R&D AGENDA The innovation strategy of the Port of Rotterdam Authority, 2007

### *Challenges*

The Workshop heard, in the context of stakeholders that the biggest innovation challenge is organisational. Organisation changes such as a “traffic company” could help bring involved parties together. More commercial approaches with incentive systems are required to optimise rail and highway use.

## 5.9 NEW POLICY ENVIRONMENTS – GREEN GROWTH

### What is Green Growth?

Growing concerns about the environmental unsustainability of past economic growth patterns and increased awareness of a potential future climate crisis have made it clear that the environment and the economy can no longer be considered in isolation. At the same time, the financial and economic crisis has provided the opportunity for policy interventions aimed at encouraging recovery and renewed growth on more environmentally and socially sustainable grounds.

Within this context, green growth is gaining support as a way to pursue economic growth and development, while preventing environmental degradation, biodiversity loss and unsustainable natural resource use. It builds on existing sustainable development initiatives in many countries and aims at identifying cleaner sources of growth, including seizing the opportunities to develop new green industries, jobs and technologies, while also managing the structural changes associated with the transition to a greener economy.

At the OECD Ministerial Meeting in 2009, Ministers of 34 countries decided to develop a Green Growth Strategy. The mandate was clear: *growth* can – and should – go hand-in-hand with *green*.

In this context, central questions for the project’s case study work are: How are ‘climate change’, ‘low carbon’ and ‘green growth’-related policy objectives and measures likely to affect key gateways hubs? How can infrastructure investment best contribute to “green growth” in particular?

### Contributions to Green growth

The Port of Rotterdam’s experience in the area of environmental protection is first rate. The Maasvlakte 2 development project offers a ‘best practice’ example of how integrated planning of the major port development involved can facilitate *growth* that will go hand in hand with *green*. The actions that the Port Authority is taking also highlight the ways in which infrastructure investment can best contribute to “green growth”. Clearly, there are two different aspects.

#### 1. *Planning and Development Stages*

The first is the way in which the Port’s infrastructure investment can contribute to Green Growth during planning and development stages. The proponents need to ensure that the investments are well chosen in the context of new policy settings that seek cleaner sources of growth. They also need to ensure that the developments are undertaken in ways that minimise adverse environmental impacts and promote new green industries, jobs and technologies.

The Maasvlakte 2 port investments that are in prospect will facilitate international trade - one of the key drivers of economic growth in the 21<sup>st</sup> century – and greater reliance on maritime transport, the transport mode that has the lowest environmental impacts. Great care has been taken by the project partners (central, regional and local governments and the Port authority) to ensure that adverse environmental impacts associated with the port construction are minimised and the intensive use of the port area is balanced by increased open space (new 750-hectare nature reserve and recreation area). Moreover, the Port Authority is promoting and in some cases imposing requirements during planning stages for use of cleaner sources of energy in port operations as well as future targets for land transport modal shares.

#### 2. *Contributions during operations and use*

The second way in which infrastructure can be expected to contribute to green growth relates to the contributions it will make during the infrastructure's operations and use. Given the long expected life of most infrastructure, there may be scope for users - and their use of the infrastructure - to make very significant contributions to the greener outcomes required. The Authority has been active on these aspects.

### *Opportunities*

The Port of Rotterdam Authority's ambition is for its business operations to be CO<sub>2</sub>-neutral with effect from 1 January 2012. This would require a reduction of at least 35% and compensation for the remaining emissions. The annual footprint is an important monitoring tool and input for selecting potential and additional reduction measures. In 2009, the Authority drew up its CO<sub>2</sub> emissions report on the activities in 2008, taking as our starting point the ISO 14064 standard from the Greenhouse Gas (GHG) protocol.

The Port Authority has focussed on many ways in which energy efficiency can be increased during the port's operations and use by its customers. One of the priorities has been to reduce energy use and CO<sub>2</sub> emissions of the vessels and vehicles using the port. The Port Authority is bringing in new 'low emissions' requirements for ships seeking to dock in the port. A proposed Municipal Port By-Law will make it illegal to use a ship's generators to generate electricity at those locations where shore-based power is available – meaning it will no longer be 'voluntary' and air quality will improve.

In relation to inland transport, the Authority is promoting greater use of more environmentally friendly modes by way of contracts with operators. The intention is to increase the use of inland water and rail modes, which offer the prospect of reduced CO<sub>2</sub> emissions (given currently available technologies) by comparison with road transport. This could result in significant contributions to 'green growth' strategies.

The importance of these examples is that they demonstrate the potential influence the Port Authority could have over the environmental standards of ships and transport vehicles using the port – via measures such as 'low emissions' requirements. There could also be opportunities for similar action via measures focussed on technologies that minimise CO<sub>2</sub> emissions and other environmental impacts (noise, local pollutants).

Undoubtedly, there will be opportunities in future for port-related industry associations and industrial activities to play a more important role in contributing to improved environmental as well as commercial outcomes. It will be interesting to see, given the concentration of industrial activities related to the port, whether there are opportunities for new green industries, jobs and technologies to be developed that could broaden the scope of main port contributions in Rotterdam – and elsewhere.

### *Challenges*

The main immediate challenges in this area are to communicate expectations effectively and to manage the processes carefully to achieve the improvements required. However, there could be greater challenges in the longer term, despite all the efforts that are being made by the Port of Rotterdam to reduce CO<sub>2</sub> emissions, protect the environment and make valuable contributions to green growth.

Given the current policy focus on reducing CO<sub>2</sub> emissions and moving to low carbon economies, new policy settings and paradigms might apply in future, including for example more effective emissions trading schemes and carbon tax regimes that apply to all transport modes. As an example of the longer term possibilities, for some origin and final destinations of cargo in Europe, alternative port and inland transport supply chain combinations could offer greater CO<sub>2</sub> reductions, by comparison with supply chains via the Port of Rotterdam. In such cases, the significant reductions in inland transport costs via alternative ports and supply chains could lead to cargo being diverted to such routes and locations. Some of Europe's Mediterranean ports are already expecting future maritime and inland transport outcomes will be shaped more by developments such as these in future – and spurred on by 'Green Growth' priorities.

## 5.10. PORT OF ROTTERDAM'S COMPETITIVE POSITION

Years ago, key ports were government owned, developed and operated. A port's competitive position was most likely assessed by comparing its performance with other ports in terms of frequency of liner services, productivity of the port's terminal operations in terms of cargo handling rates (e.g. containers lifted per operator per day) and other such productivity measures.

More recently, it became clear that a port's competitive position is influenced strongly by additional factors such as

- the quality, frequency and reliability of road, rail and inland waterway transport connections
- the efficiency and reliability of intermodal transfers at port and inland terminal facilities.

The Port of Rotterdam experience shows that there are additional, qualitative factors that are also crucially important to a port's competitiveness, particularly those related to:

- the port authority's structure and its governance arrangements;
- the quality of its interactions with its key stakeholders and the local and wider community;
- the nature and level of support it enjoys from its key stakeholders and the wider community;
- the efficiency of governmental interventions (customs, inspections etc).

### *Opportunities*

The *Port of Rotterdam* can be expected to continue to perform well, if all aspects of its port and hinterland operations are managed well. It is currently well placed compared to its competitors and will have an opportunity to retain its competitive advantage over other ports in the N-W European region.

While risks abound, given the current economic climate, the medium to longer term projections for overall levels of port handling of freight cargo by the N-W European gateway ports are relatively positive. Most cargo categories are expected to follow a higher growth trajectory in future, with container traffic leading the way and oil products remaining important financially.

If the *Port of Rotterdam* is able to retain its current market share in the major cargo markets, overall demand and port throughput volumes are also likely to increase substantially over the next ten years – and even more so over the period to 2030 and 2050.

If competitive positions don't change, the outlook for the *Port of Rotterdam* would therefore appear to be quite positive, subject to a number of provisos, including:

- the necessary trade and transport infrastructure is developed and available at the time required and used in an optimal way
- the necessary maritime and inland transport services are provided securely, efficiently and reliably.

### *Challenges*

In the short term, the outlook for Rotterdam is not as positive as it was before the recession – in keeping with other ports in North-West Europe. The economic outlook for Europe is more subdued than previously, which will affect both import and export volumes. Indications are that it will take some time for port handling of containers to return to pre-recession levels. Modest growth rates can be expected over the short term to 2015. More positive growth is likely over the medium term to 2030.

Over the same time period, the *Port of Rotterdam* could face increasing competition from other N-W ports. The port market shares over the period from 1998 to 2008 provided evidence of a gradually increasing

competitiveness of supply chain routings via other N-W Europe ports. As well, an evaluation of the scenarios prepared 5-6 years ago show Rotterdam volumes are within the forecast range but major differences are evident in Antwerp's actual results (40-50% more than expected). The same applied to Hamburg before the downturn in container volumes there during the recession.

The Port of Rotterdam could also face some limited competition from other European ports (e.g. Le Havre, Genoa, Venice, and Trieste), as well as from ports elsewhere. Improvements are in prospect at a number of Baltic ports in Sweden (Gothenburg), Finland (Kemi), Russia (Ust Luga), Poland (Gdansk) and Germany. If coupled with improved inland transport, they could attract some more shipping services.

Such ports are closer to some established European markets – and they are likely to have a locational advantage in respect of newly developing markets in Eastern Europe, as the European economy tilts to the east. These locational advantages will be accentuated by the TEN-T and other projects that improve inland transport connections within Europe.

With its inland river location, it seems Antwerp will remain a strong competitor and it has a locational advantage in respect of some important inland markets. Hamburg and other ports, including Le Havre, can be expected to perform better in the future. However, apart from Antwerp, other ports are not seen to be major competitors or a major concern. Hamburg is very constrained for space and would be forced to move to higher container stacking with greater volumes.

The frequency of container shipping calls at most ports could also increase, as overall trade volumes and liner services increase – which would improve average travel times as port frequencies improve towards daily services.

If any of these ports could take advantage of all these possibilities, there could be real opportunities for them to improve their service offers sufficiently to attract significantly increased shipping volumes.

**In summary**, the Port of Rotterdam is well poised to continue its current role as a leading world port and the largest European port. However, there are enough 'chinks in its armour' and possible changes in prospect to conclude that its competitive position will need to be kept under constant surveillance.

## 6. FINAL REMARKS

The Port of Rotterdam is the largest port in Europe and one of the leading ports in the world. It highlighted many good practices that will be valuable for inclusion on the final Project report. The Workshop also identified a number of Opportunities and Challenges that will need to be kept under review.

The Port of Rotterdam has clearly built up a strong competitive position vis-à-vis other ports over many years. This has been reinforced by:

- the high frequency of services now underpinning the port's operations
- the high quality port and inland terminal facilities that have been developed
- the relatively high quality road, rail and inland waterway transport connections
- good corporate structure and sound governance arrangements
- well developed stakeholder relations and extensive consultation with its stakeholders.

The Workshop also highlighted that the Port of Rotterdam's competitiveness depends on important additional factors, such as:

- the strength of the industries, commercial activities and operational services (including logistics in particular) co-located with the port, within the City of Rotterdam
- the focus and successful performance of the local government functions crucial to the port's current operations and future need
- support from the local community for the port's continuing operations and expansion.
- the Netherlands ports policy and legislative / regulatory frameworks relating to port governance, operations and environmental, safety and security performance; and
- European Union policy in respect of port reform and port operations.

All of the above aspects – and particularly the qualitative aspects – take very many years to develop. They cannot be matched easily by a start-up operator or a port that does not perform significantly better on at least some of these essential elements of a port's performance.

As well, the Port Authority is operating under very well developed regulatory frameworks and supportive policy environments that have been refined over many years. Importantly, it also enjoys strong support from the Rotterdam Municipality. The Gateway policy frameworks seem well adapted and adequate.

Careful development and management of all aspects of EU and NL government regulatory frameworks, port governance, port and terminal operations, inland transport connections, port industry development, logistics operations, environment, safety and security have helped entrench the benefits that the port is able to offer to users, by comparison with alternative actual and potentially competitive ports.

This reflects the current position - but it is not the end of the story.

In looking ahead, what the Workshop highlighted were the port's ambitious plans for additional capacity and further improvement of already good performance.

While these were impressive, they also exposed some weaknesses, such as the capacity, reliability and environmental sustainability of the Port of Rotterdam's inland transport connections in the medium term.

The Workshop also highlighted that, while there is a focus on improvement, there did not seem to be an equal focus on whether the planned improvements will be good enough.

The evidence available did not provide real insights into whether these improvements would be sufficient to fully protect and preserve the Port of Rotterdam's competitive position in the medium to longer term. The areas of uncertainty included:

- The changes in world economic geography expected in the next twenty years as the Asia region grows rapidly and gradually overtakes the US and European Union as the leading centre of economic activity
- The changes in European economic geography expected in the next ten years which will see the economy of Europe tilting eastwards, as economic growth in new EU member states in Eastern Europe outpaces economic growth in the older EU member countries in Western Europe.
- The locational advantage which the Port of Rotterdam has enjoyed losing some of its shine by comparison with other European ports located closer to the new centres of activity in Asia and Eastern Europe.

Nevertheless, the Port of Rotterdam can expect to handle increasing volumes of maritime freight generated by global economic growth and trade between European and other regions – and carried on larger ships operating along the major trade routes to and from north-west Europe. The inevitable consequence will be greatly increased volumes being carried on inland transport services over long distances between the port and major origin and destination activity centres in Europe.

In future, when the world is likely to place greater weight on reducing carbon intensity, fossil fuel use and CO2 emissions, there is likely to be some further questioning of the appropriate balance between efficiency, environmental impacts and sustainability - and related to this, some doubt about whether the outcomes will favour the Port of Rotterdam to the same extent in future.

For these strategic reasons, it seems the jury is still out on whether the Port of Rotterdam's future is already written – or whether the changing times, circumstances and port-city competitiveness on a broader scale will mean greater challenges, different market shares and the need for sails to be trimmed accordingly.

**TRANSCONTINENTAL INFRASTRUCTURE TO 2030 -  
NORTH WEST EUROPE GATEWAY AREA CASE STUDY  
ROTTERDAM WORKSHOP 24 MARCH 2010**

**DRAFT AGENDA**

- 1. WELCOME AND INTRODUCTIONS**
- 2. CASE STUDY PROGRAMME – IFP STATUS REPORT & WORKSHOP OBJECTIVES**
- 3. SHORT PRESENTATION BY THE HOSTS**
- 4. OPPORTUNITIES AND CHALLENGES FOR ROTTERDAM GATEWAY**  
**Presentations and Discussions:**
  - 4.1 Global and regional projections and scenarios*
  - 4.2 Possible new trade routes, expected infrastructure developments and their effects*
  - 4.3 Supply chain performance and possible improvements*
  - 4.4 Infrastructure investment needs to 2015 and 2030 for gateways and corridors*
  - 4.5 Improvements in policy frameworks and organisational structures*
  - 4.6 Involvement, cooperation and coordination of Gateway stakeholders*
  - 4.7 Infrastructure contributions to ‘Green Growth’.*
- 5. GATEWAY STRATEGIES – ASPECTS FOR FURTHER CONSIDERATION**
- 6. FINAL REMARKS**

**ROTTERDAM WORKSHOP 24 MARCH 2010**

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**MARKET SHARES AT EUROPE’S TOP 20 PORTS 2005-2008**

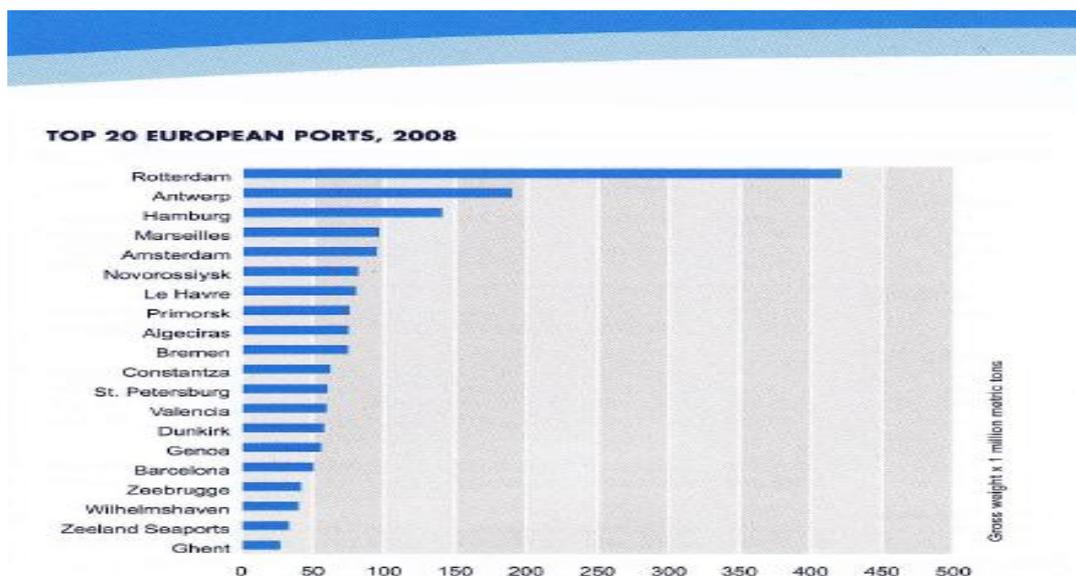
Total Throughput at Top 20 European ports, 2005-2008 (Million Tonnes per annum)

TOP 20 EUROPEAN PORTS, 2008 - 2005		2008	2007	2006	2005
Rotterdam	Netherlands	421.1	409.1	381.8	370.3
Antwerp	Belgium	189.5	182.9	167.4	160.1
Hamburg	Germany	140.4	140.4	134.9	125.7
Marseilles	France	96.0	96.3	100.0	96.6
Amsterdam	Netherlands	94.7	87.6	84.4	74.8
Novorossiysk	Russia	81.6	80.9	82.4	70.8
Le Havre	France	80.1	78.9	73.9	74.9
Primorsk	Russia	75.6	74.2	65.9	58.8
Algeciras	Spain	74.8	71.8	63.5	65.7
Bremen	Germany	74.6	69.2	65.1	54.3
Constantza	Romania	61.8	57.1	46.5	38.9
St. Petersburg	Russia	60.2	59.5	54.2	50.7
Valencia	Spain	59.7	53.6	47.5	40.9
Dunkirk	France	57.7	57.1	56.6	53.5
Genoa	Italy	55.7	58.6	55.0	56.5
Barcelona	Spain	50.5	50.0	46.4	43.8
Zeebrugge	Belgium	41.9	42.0	39.5	34.5
Wilhelmshaven	Germany	40.2	42.7	43.1	45.9
Zeeland Seaports	Netherlands	33.3	33.0	30.2	30.4
Ghent	Belgium	27.0	25.1	24.1	22.2

Unit : Gross weight x 1 million metric tons  
Source : Other Port Authorities

Source: Port of Rotterdam: Port Statistics brochure

The 2008 throughputs are shown graphically in the chart below, which highlights the very large lead which the Port of Rotterdam enjoys over other European ports, in terms of total cargo throughput



Source: Port of Rotterdam: Port Statistics brochure

The Container throughputs (in 000s of TEUs) at the top 20 European Container Ports over the period 2005-2008 are set out below:

TOP 20 EUROPEAN CONTAINER PORTS, 2008 - 2005		2008	2007	2006	2005
Rotterdam	Netherlands	10,784	10,791	9,653	9,288
Hamburg	Germany	9,737	9,890	8,862	8,088
Antwerp	Belgium	8,663	8,176	7,018	6,488
Bremen	Germany	5,529	4,912	4,450	3,735
Valencia	Spain	3,602	3,043	2,612	2,410
Gioia Tauro	Italy	3,468	3,445	2,938	3,209
Algeciras	Spain	3,324	3,414	3,257	3,179
Felixstowe	United Kingdom	3,200	3,300	3,000	2,700
Barcelona	Spain	2,570	2,610	2,318	2,071
Le Havre	France	2,450	2,638	2,137	2,058
Marsaxlokk	Malta	2,300	1,887	1,485	1,321
Ambarli	Turkey	2,262	1,940	1,446	1,186
Zeebrugge	Belgium	2,210	2,020	1,653	1,408
St. Petersburg	Russia	1,983	1,970	1,450	1,121
Genoa	Italy	1,767	1,855	1,657	1,625
Southampton	United Kingdom	1,710	1,900	1,500	1,374
Constantza	Romania	1,381	1,411	1,018	771
Piraeus	Greece	1,360	1,373	1,403	1,395
La Spezia	Italy	1,246	1,187	1,137	1,024
London	United Kingdom	1,167	844	743	735

Unit : Number x 1,000 TEU's (Twenty-Foot Equivalent Units) Source : Other Port Authorities

Source: Port of Rotterdam: Port Statistics brochure

The locations of these ports are shown below:

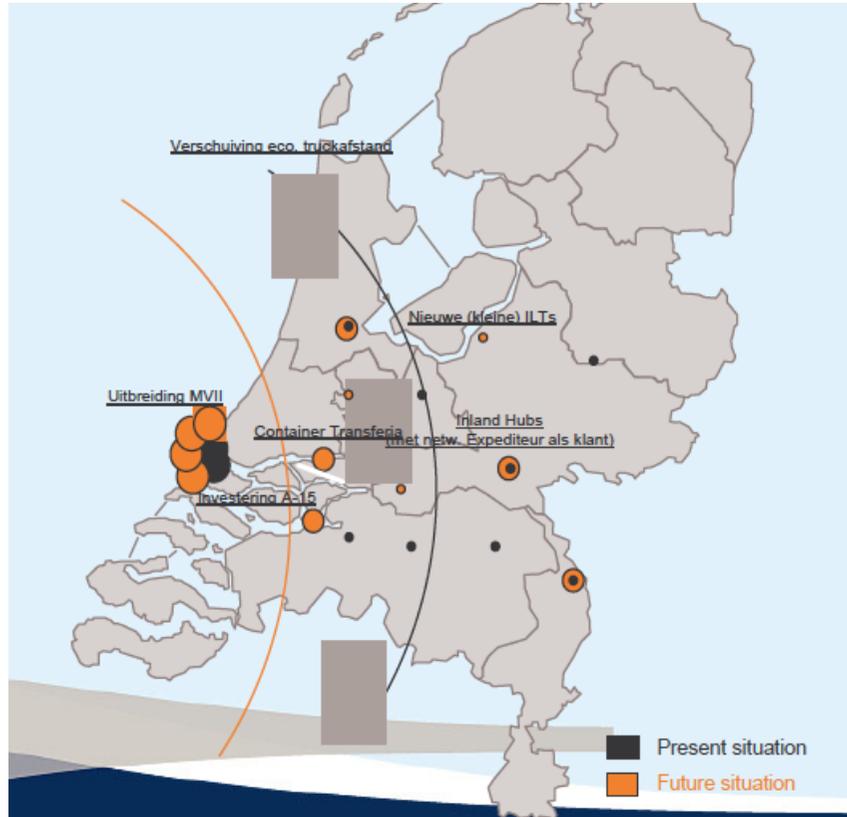


Source: Port of Rotterdam: Port Statistics brochure

# INLAND CONNECTIONS - FURTHER INSIGHTS

Annex 3

Break-even point Barge vs Truck is moving towards the Port



Source: M van Schuylenburg, Rotterdam Workshop, 24 March 2010

Inland Barge Terminals in the Netherlands



Source: M van Schuylenburg, Rotterdam Workshop, 24 March 2010

Location of Inland Container Barge Terminals N-W Europe



Source: M van Schuylenburg, Rotterdam Workshop, 24 March 2010

Intermodal Train Services: Frequencies per week



Source: M van Schuylenburg, Rotterdam Workshop, 24 March 2010

## PORT AUTHORITY OF ROTTERDAM – FURTHER INSIGHTS ON FINANCIAL POSITION

The following extracts are taken from the Port Authority's Annual Report 2009. First, the Balance sheet.

		<b>Balance sheet</b>	
		(before appropriation of income, amounts x € 1,000)	
	REF.	31/12/2009	31/12/2008
<b>Assets</b>			
<b>Fixed assets</b>			
Tangible fixed assets	1	2,779,858	2,535,648
Financial fixed assets	2	24,914	29,940
		<b>2,804,772</b>	<b>2,565,588</b>
<b>Current assets</b>			
Inventories		574	532
Accounts receivable	3	107,193	106,810
Cash and cash equivalents	4	175,158	4,235
		282,925	111,577
<b>TOTAL ASSETS</b>		<b>3,087,697</b>	<b>2,677,165</b>
<b>Liabilities and shareholders' equity</b>			
<b>Shareholders' equity</b>			
Subscribed capital stock	5	900,000	650,000
Paid-in surplus	5	391,200	191,200
Statutory reserves	5	3,435	1,566
Other reserves	5	213,945	108,709
Income to be appropriated	5	136,163	128,971
		1,644,743	1,080,446
<b>Provisions</b>			
	6	80,579	63,288
<b>Long-term debt</b>			
	7	1,058,564	1,102,076
<b>Short-term debt</b>			
	8	303,811	411,355
<b>TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY</b>		<b>3,087,697</b>	<b>2,677,165</b>

Financial Performance (Amounts x €1 Million)

	Change in %	2009	2008
<b>Harbour dues</b>	-	<b>274.1</b>	<b>293.2</b>
<b>Contract income</b>	-	<b>232.4</b>	<b>214.3</b>
<b>Other income</b>	-	<b>12.9</b>	<b>15.1</b>
<b>Operating income</b>	<b>-0.6</b>	<b>519.4</b>	<b>522.6</b>
<b>Wages, salaries, social charges</b>	-	<b>95.1</b>	<b>86.4</b>
<b>Other operating expenses</b>	-	<b>127.2</b>	<b>134.9</b>
<b>Operating expenses</b>	<b>0.5</b>	<b>222.3</b>	<b>221.3</b>
<b>Earnings before interest and depreciation and amortisation (EBITDA)</b>	<b>-1.4</b>	<b>297.1</b>	<b>301.3</b>
<b>Depreciation and amortization</b>	-	<b>100.8</b>	<b>93.2</b>
<b>Income from normal operations (EBIT)</b>	<b>-5.7</b>	<b>196.3</b>	<b>208.1</b>
<b>Financial income and expense</b>	-	<b>-51.8</b>	<b>-56.5</b>
<b>Income from participating interests</b>	-	<b>-0.3</b>	<b>-0.7</b>
<b>INCOME EXCLUDING EXCEPTIONAL ITEMS</b>	<b>-4.4</b>	<b>144.2</b>	<b>150.9</b>
<b>Proceeds from sale of participating interest</b>		<b>23.2</b>	<b>0.0</b>
<b>NET INCOME</b>	<b>10.9</b>	<b>167.4</b>	<b>150.9</b>

The crisis led to lower throughput volumes in 2009 compared to 2008 (34 million tonnes / -8.1%) and related harbour dues. Contract income rose by € 18.1 million (+ 8.5%) as a result of the increase in the number of sites let out and indexation of the prices. Rents and ground rents usually keep in line with inflation.

Operating expenses (€ 222.3 million) were virtually the same as in 2008. The main developments were: • an increase in salaries, wages and social charges (€ 8.7 million): higher pension contributions, a rise in wages under the collective agreement (CAO) (3%), and an increase in the average number of employees • a reduction in other operating expenses (€ 7.8 million): resulting from fewer external personnel being hired (€ 5 million) and other efficiency measures.

The completion of a number of investment projects in 2009 has led to an increase in depreciation costs (€ 7.6 million). Partly because of the increase in the net credit position that was created in the beginning of 2009 due to a capital contribution by the shareholders, the balance of financial income and expense fell by € 4.7 million.

## Cash Flow

<b>Cash flow statement</b>			
(amounts x € 1.000)			
REF.	2009	2008	
<b>Income from normal operations</b>	<b>196,314</b>	<b>208,158</b>	
<b>Adjustments for:</b>			
Amortisation and depreciation	1 100,813	93,093	
Changes in provisions	6 358	-9,071	
Withdrawal of equalisation ground-lease buy-off	-9,786	-9,619	
Impairment of financial fixed assets	708	4,000	
	<b>92,093</b>	<b>78,403</b>	
<b>Changes in working capital</b>			
-Accounts receivable	3 -383	-34,326	
-Inventories	-42	-54	
-Short-term debt	-104,550	126,255	
	<b>-104,975</b>	<b>91,875</b>	
<b>Cash flow from ordinary activities</b>	<b>183,432</b>	<b>378,436</b>	
Interest income	3,318	-111	
Interest expenses	-50,548	-60,369	
	<b>-47,230</b>	<b>-60,480</b>	
<b>Cash flow from operating activities</b>	<b>136,202</b>	<b>317,956</b>	
Investments	-345,913	-185,064	
Disposals	25,245	2,004	
	<b>-320,668</b>	<b>-183,060</b>	
<b>Cash flow before financing</b>	<b>-184,466</b>	<b>134,896</b>	
Repayments on long-term debt	-102,579	-88,974	
Loans contracted	61,081	53,791	
Paid-in capital	5 450,000	0	
Dividend	5 -53,113	-103,273	
	<b>355,389</b>	<b>-138,456</b>	
<b>NET CASH FLOW</b>	<b>170,923</b>	<b>-3,560</b>	
Cash balance at beginning of year	4 4,235	7,795	
Cash balance at end of year	4 175,158	4,235	
<b>MOVEMENT IN CASH</b>	<b>170,923</b>	<b>-3,560</b>	

Source: Port of Rotterdam Authority Annual Report, 2009.