

Humber Container Port Development Study

Interim Paper 2: Port development

June 2011

North Lincolnshire Council

Mott MacDonald

Humber Container Port Development Study

Interim Paper 2: Port development

June 2011

North Lincolnshire Council

Pittwood House, Ashby Road, Scunthorpe, DN16 1AB

Mott MacDonald, Mott MacDonald House, 8-10 Sydenham Road, Croydon CR0 2EE, United Kingdom
T +44(0) 20 8774 2000 F +44 (0) 20 8681 5706, W www.mottmac.com

Mott MacDonald

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	2/06/2011	D Hunter P Mallin	P Mallin D Hunter	R Stephens	First draft

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Mott MacDonald, Mott MacDonald House, 8-10 Sydenham Road, Croydon CR0 2EE, United Kingdom
T +44(0) 20 8774 2000 F +44 (0) 20 8681 5706, W www.mottmac.com

Content

Figures

Tables

Executive Summary

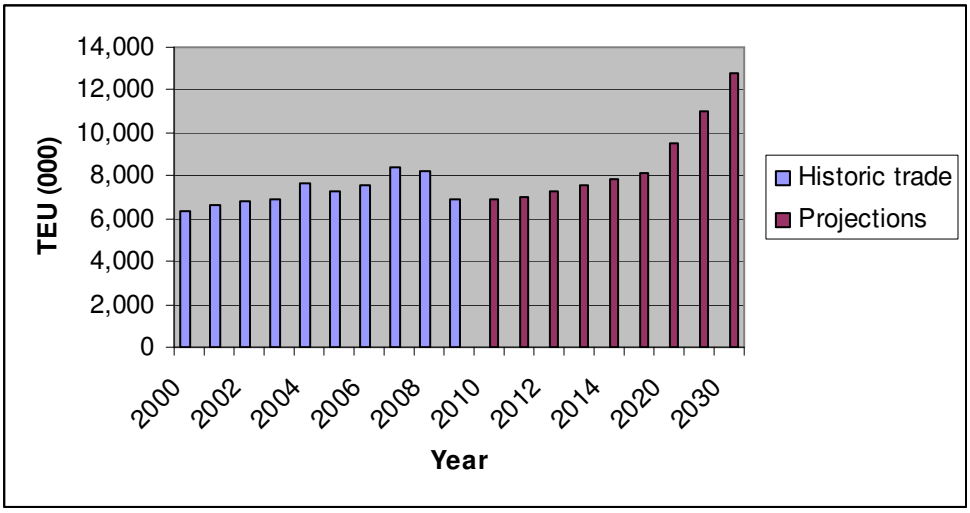
This Interim Report is issued by Mott MacDonald Limited (MML) to North Lincolnshire Council (NLC) with regard to the "Scoping Study for Container Development on the River Humber" (NLC19612SPJ). MML having been appointed by NLC through their letter dated 17th December 2010, and subsequent Form of Agreement signed by both parties in February 2011. This Agreement falling under the Consultancy Services Agreement using ESPO Framework 664 Schedule Conditions.

The remit for this Study was to evaluate the viability of establishing a container terminal within the confines of the SHG zone, thereby providing the region with an alternative to its current dependency upon southern UK gateway ports. The primary conclusion of the Study is that such a prospect appears to be a valid concept given the current structure of UK international trade and the competitive environment. However, it is strongly dependent upon achieving the appropriate market orientation and operational efficiencies to deliver a valued product service to targeted clients.

UK market prospects

The prospects for the UK container port industry are viewed as being more conservative then those presented in the Department for Transport's "UK Port Demand Forecasts to 2030" issued in 2007, issued just prior to the peak trade throughput recorded in that year, and subsequent economic contraction through to 2011. Despite this, as depicted in the figure below the Study predicts that the marine container trade will recover, expanding from 7 million TEU in 2010 to reach 10 million TEU by 2020 and 12.8 million TEU by 2030. This equates to an annual growth of 3.1 percent over the period, versus the 4.1 percent annual growth from 2000 to the recent peak throughput in 2007.

UK Container Trade: 2000 through to 2030 (TEU 000)



Reflective of trade trends over recent decades this expansion will be driven by the strong on-going presence of Asian generated shipments. Such shipments being targeted at a broader European market, of which the UK forms a defined part. Decisions over global transportation will be influenced by the need to optimise sailing schedules that minimise the impact upon the dominant European market, while satisfying UK clients. This is likely to support continued preference for schedules that utilise a single UK call within a broader North European port rotation; minimising sailing deviation costs where possible.

UK competitive port structure

Pressure on transportation costs and advancing ship design technology has enabled the major shipping lines to deploy ever larger vessels. Current Asia to Europe operations are now being based around vessels of up to 15,500 TEU being deployed, with 18,000 TEU on order. The physical size of such vessels limiting their ability to access the majority of ports, further promoting the case for concentration of the shipping market and ports around a limited number of carriers, and their preferred deep water terminal locations.

The Nation's deep water gateway container handling capacity, which was severely strained to address the peak year throughputs, is now adequate to address immediate growth. While future growth may be expected to be covered through the development of new capacity. Some of which, such as Felixstowe South and London Gateway, is already open or being developed; whilst other ports have approved plans to enhance capacity should market conditions indicate an opportunity. Thus the Nation's container port sector appears to be adequately prepared to address prospective change.

SHG Project market focus

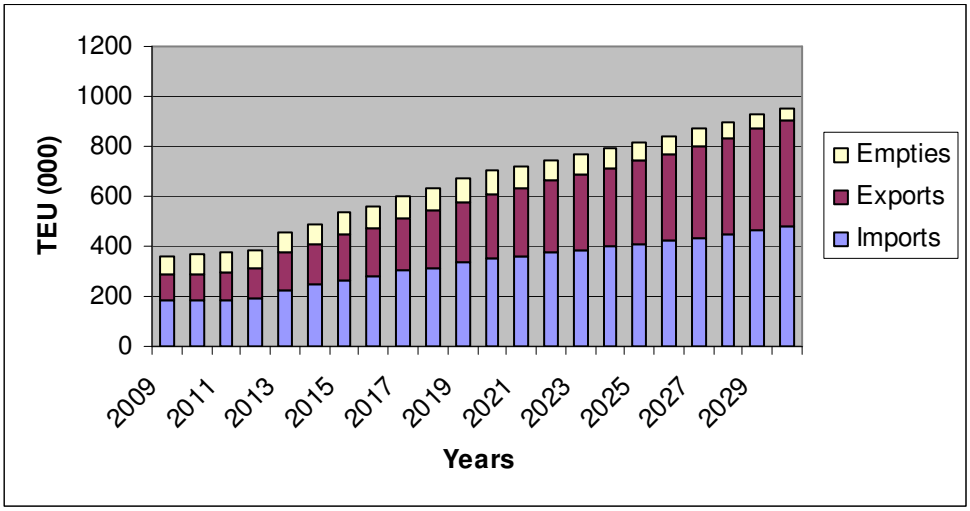
Given the above, the scope for the SHG Project is not one of addressing a shortfall in capacity. Rather, one of seeking to provide an improved market offering to a defined region, thereby shifting market share from established players to a new entrant. Under such circumstance the key question is whether a distinctive offering can be provided that is attractive to enough shippers to provide the critical mass to support the Project.

The geographical region that needs to be targeted is defined by the scale of economic activity primarily within the Humber, the North East and North West regions. Prospective clients within the immediate Humber and Humber Port City Region are likely to be most favourable to the SHG Project offering, but are inadequate in terms of demand to support the Project. Consequently, it must seek to extend its offering to a broader range of clients

in more distant regional markets, though by doing so it will face increased competition from established alternative supply routes via southern UK ports.

In terms of GVA, the Study estimates that the SHG Project may compete for around 40 percent of the UK market, the balance being deemed to be outside its scope. In demand terms, as depicted in the figure below this is estimated to be equivalent to 362,000 TEU in 2009 (current market), rising to 454,000 in 2013 (planned SHG Project opening), and rising thereafter to 702,000 TEU by 2020 and 953,000 TEU in 2030. Such figures represent around 13 percent to 18 percent of the targeted hinterland estimated trade demand over the Project period, or 5.3 percent to 7.5 percent of National container trade.

Humber Ports Regional Container Throughput Projection (TEU 000)



SHG Project product offering

This Study recommends in the first instance, that the SHG Project recognises that competing for deep-water global trade is not a viable option. Or at least not an option that is worthy of the high capital investment plans to achieve, with consequential risks. Instead the SHG Project should seek to maximise its short-sea shipping connections, either in terms of intra-European trade or global trade via major northern European and southern UK transhipment hub ports. In particular, it needs to build relationships with the Ports of Rotterdam and Antwerp, offering an alternative supply route for their international carriers to address the northern UK market.

- The SHG Project's product offering must provide an appropriate balance of service quality and competitive through transportation costs versus other southern UK gateway ports. With regard to the former, the SHG Project needs to ensure the following
- Minimal delay in the shipment of containers from the transhipment ports, through the promotion of multiple frequent feeder and intra-European sailing schedules. Such

schedules by their nature utilising smaller vessels that are consistent with the SHG Project's maintained channel depth of 8.8m. This avoids the need for any extensive and costly capital dredging programmes;

- Adequate quay length for these vessels to support berthing on arrival, or with minimum delays, for vessels up to 900 TEU. Occasional larger vessel may be slightly delayed awaiting tidal windows. This is to be achieved through providing some 600m of berth with a depth alongside of 11 to 12 metres;
- Efficient cargo exchange is to be provided through the provision of up to five Ship to Shore gantry cranes, enabling two cranes to be deployed on the majority of ships, thereby providing for a rapid exchange of containers within the shortest possible berthing period;

Landside handling of the containers should be equally effective through the combination of a low density yard storage area, thereby minimising the need for multiple box lifts and the deployment of a flexible straddle carrier system; and

Efficient operating system based upon the appropriate balance of flexible skilled staff, and application of IT systems.

The provision of the above technical features would promote the efficient handling of container, and in turn support a drive to lower cost operations. However, on their own they are likely to be inadequate to establish a sustainable port project.

The SHG Project needs to build on the experience of other successful regional UK ports, promoting the provision of value added services that will enhance its offering. Thereby reducing the focus upon unit cost competition with the larger southern gateway ports, with their advantages in terms of economies of scale, and shifting towards a differentiated product offering. It is envisaged that this may be promoted in two ways:

- Establishment of a co-located Port Centric Logistics operation based around an integrated logistics zone wherein logistics, light manufacturing and distribution value added activities can be promoted; and
- Effective integration of the SHG Project marine areas and logistics zone through a common intermodal terminal for the provision of dedicated rail based distribution to the targeted hinterland.

Humber Estuary port facilities

The ability of existing Humber Estuary ports to compete for the prospective market offering remains limited. For while Immingham and Hull are both significant multi-purpose ports in their own rights; their technical orientation could be considered inappropriate for higher throughputs of maritime containers via a dedicated terminal. Immingham being

highly focussed upon the handling of both dry bulk and liquid bulk cargoes, together with a strong presence in the cross-North Sea unitised RoRo ferry services. Container handling at this port, together with Hull and Goole remains limited, with general cargo operations largely comprising a range of break-bulk cargo operations.

This is not to say that the existing ports could not be reconfigured to address the prospective new container market opportunity. However, such a process, given the fragmented spatial distribution of existing activities within the ports would be difficult to achieve; and disruptive to other operations. In addition, the general lack of suitable vacant land immediately adjacent to the ports would hinder the prospects for establishing the logistics zone, a key factor in the product offering.

Able UK's strong presence within the region, and its control over a number of alternative coastal sites would provide it with the scope to establish the SHG Project. Its existing plans for marine energy and logistics park development being consistent with the concept of new port development. The container offering could therefore form part of its integrated development plan.

Whether the SHG Project is developed on an existing Brownfield site or new Greenfield location, the presence of an extensive maritime port sector culture would be a strong factor in its success. Such a historic presence providing for the ready available supply of suitable human resources, skill training, and facilitating trade and transportation agencies and operational companies.

1. Introduction

1.1 Appointment

This Draft Final Report is issued by Mott MacDonald Limited (MML) to North Lincolnshire Council (NLC) with regard to the "Scoping Study for Container Development on the River Humber" (NLC19612SPJ). MML having been appointed by NLC by their letter dated 17th December 2010, and the subsequent Form of Agreement signed by both parties in February 2011. This Agreement falling under the Consultancy Services Agreement using ESPO Framework 664 Schedule Conditions.

1.2 Background

The Humber and Yorkshire regional economies are currently heavily dependent upon the utilisation of southern UK gateway container ports to gain access to international markets. It is postulated that this dependency creates constraints within national and regional industrial supply chains thereby inhibiting their commercial competitiveness.

The establishment and promotion of a new container terminal on the Humber Estuary (the Project) would provide an alternative supply chain route for the Humber and Yorkshire regional's commercial activities. Such a facility providing the means through which the Region can connect to international markets, primarily through short-sea feeder linkages via North European and southern UK gateway ports. Such a facility building upon strengths of integration with other commercial sectors within the Region, and promotion of shorter, more sustainable, road and rail transport options. The latter offering the potential for significant carriage cost saving given the high transportation costs related to inland distribution.

The South Humber Gateway Board (SHGB), representing North Lincolnshire and North East Lincolnshire Councils, plus the Regional Development Agency, Yorkshire Forward, private developers and local industry seek to support this port development initiative. They have consequently commissioned this Study to evaluate the best means through which such a facility could be promoted; in particular, building upon the presence and availability of the Southern Humber Gateway (SHG), a key development zone providing some 15km of deep-water marine access along the Humber Estuary. This site being supported by a prospective development site encompassing almost 10km^2 of partially developed commercial, industrial, and agricultural land.

The Study's Phase 1 Interim Report provided an overview of the national container market prospects, and its relative balance versus existing and prospective port container handling capacity. Its primary conclusion, highlighted the prospect of a medium term over-capacity within the national container port system; reflecting weaker economic and trade conditions, and the development plans of existing and new port operations. However, the Report also recognised that current national port policy provides the freedom for alternative facilities to be promoted, with the project's sponsors taking commercial risk.

Given the prospective national port capacity in-balance, it is deemed essential that the prospective SHG container terminal has the appropriate market and technical focus. In setting this orientation, due consideration needs to be given to the broader structural changes occurring within the global container trade and shipping markets. In particular, the expected ongoing orientation of UK deep-sea trade towards Asian sourced imports, and consequently the shift towards larger capacity vessels. Only a limited number of major carriers or shipping consortiums will be able to operate such ships effectively, leading to a growing concentration around key shipping lines, and in turn limited European port calls. Significant barriers to entry

are thus deemed to exist to new market entrants wishing to establish alternative deep-sea gateway ports. Such a market structure supports SHG container port's orientation towards intra-European and feeder services, with possible reception of secondary deep-sea services.

Promotion of the SHG container facilities is therefore presumed to be targeted at shipping integration with the northern European and southern UK gateway ports. Its marine facilities being of the appropriate scale and capacity to enable regular berth access, largely independent of tide, by a range of intra-European size vessels, with onward road and rail linkages to a defined Humber and Yorkshire market hinterland.

2. UK international container market

2.1 Introduction

The proposed SHG Project will form part of an alternative supply chain network transporting unitised goods to/from the Humber and Yorkshire market hinterland. As such it needs establish a market presence that is both competitive and complementary of existing, and prospective, UK and European container terminals, and their associated deep-sea and intra-regional shipping services.

This Chapter sets out the background position for the Project with regard to the competitive environment which is faced in terms of: UK national container trade and projections; the present and future capacity of UK ports; and the means through which SHG can integrate with North European hub ports. These findings build upon the market study analysis presented in the Study's Phase 1 Interim Report.

2.2 European container market

After three decades of "globalisation" processes, the UK is now perceived to represent one element of a broader European market. Major Trans-National Corporations (TNC) addressing this market through complex international production networks, integrated through extensive supply chains, with the majority of products destined for European Distribution Centres (EDC) or national Regional Distribution Centres (RDC). Such locations being used to customise products through Value Added Logistics (VAL) processes, to address specific national European market needs.

The Far East, and China in particular, has gained market dominance in supporting the European market for a broad range of Intermediate and consumer products. This trade route generating some 11.4 million Twenty Foot Equivalent (TEU) container movements in 2009, representing around 53 percent of North Europe's deep-sea container flows. Other significant trade relationships being 3.4 million TEU with the Middle East and Indian Subcontinent, and 3.4 million TEU with North America. Other growing global trade linkages exist with South America and Africa.

Extended trade distances have driven shipping carrier market consolidation, and their deployment of larger container vessels. Thus international container carriage which is dominated by three lines, the Maersk Group, MSC, and CMA CGM; each offering independent integrated shipping networks, with multiple weekly connections to all major global markets. These leading lines being supported by a limited number of medium size lines, whose scale of individual operations tends to require them to operate within shipping consortiums to gain the necessary economy of scale.

Deployed tonnage across all the global shipping routes has witnessed a rapid expansion in vessel size over recent years. This largely reflecting the entry of new larger ships on key routes, notably Asia/Europe, and the consequential cascade down of replaced ships to other routes. Thus the average size of the Asia/Europe route is close to 8,000 TEU, with the current largest vessels being 15,500 TEU; whilst other routes average size tends to be in the 3,000 to 5,000 TEU. However, even on these latter routes there is regular deployment of vessels of around 7,000 TEU.

The combination of international supply chains and EDC, carrier concentration and the shifting scale of container vessels has re-enforced the dominance of a limited range of North European ports. Thus nearly all deep-sea container services will call at a combination of Rotterdam, Antwerp; and Hamburg. These calls being supported by a single port call to a major UK gateway port, thereby providing direct service connection.

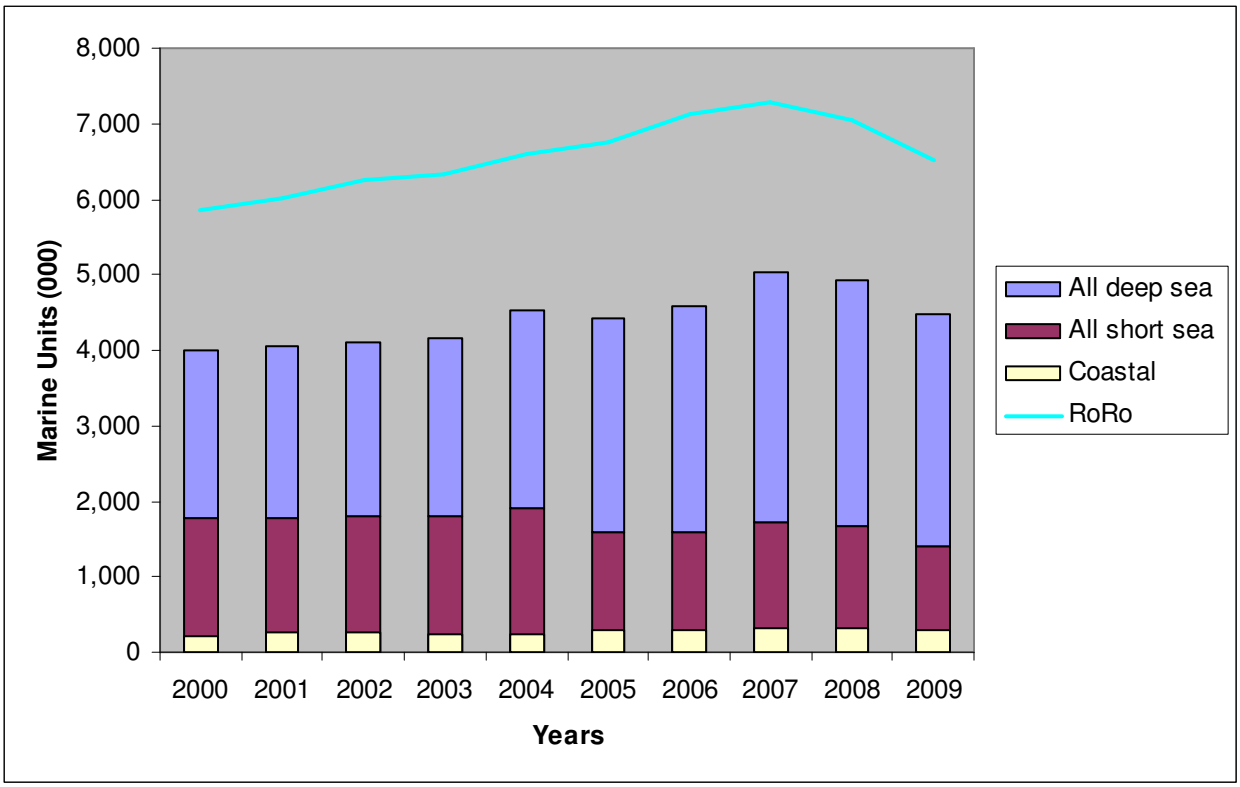
2.3 UK unitised market

2.3.1 Historic throughput

From a global perspective the UK represents both a distinctive national market, and a component of the European region. Consequently, TNC shippers and shipping lines need to provide transportation solutions that provide both direct calls to the UK, and integration with the European market. The latter covering both global manufactured goods held at EDC's, typically in Belgium and the Netherlands, and European generated trade. The distribution of these products being transported either in maritime containers or utilising RoRo freight trailer services.

The overall structure of the UK unitised market is presented in Figure 2.1. This figure highlighting the combination of deep-sea traffic, short-sea intra European, coastal; plus the presence of RoRo freight trailer market. In total this unitised trade has expanded from 9.8 million units in 2000 to a peak of 12.6 million units in 2008, declining thereafter to 10.9 million units in 2010. In terms of underlying commodity volumes these unitised boxes handled 114 million tonnes in 2000, increasing to 144 million tonnes by 2009, equating to an annual growth rate of 2.6 percent.

Figure 2.1: UK Unitised Throughput (000 Units)



Source: DfT Maritime Statistics

It is worthy to draw a distinction between deep-sea and short-sea traffic. For whilst the former gains many headlines with regard to globalisation and Asian trade presence, it is short sea movement that predominates traffic volumes. The combined short-sea container and RoRo operations representing 70 percent of the overall unitised traffic volume in recent years, versus 27 percent for deep-sea. However, it

must be recognised that both these forms of short-sea traffic may be fuelled by deep-sea inbound trade, held or processed in Europe, prior to final market delivery.

Direct national deep-sea container trade has expanded from 3.6 million TEU in 2000 to a peak of 5.4 million TEU in 2007, equating to an annual growth of six percent. Subsequent to this date the volumes have declined to 4.5 million in 2009 reflecting the global economic downturn. Within this trade growth there has been a significant expansion of Asian related trade, its share rising from 45 percent in 2000 to 60 percent in recent years. This shift being reflected in the rapid deployment of larger capacity container tonnage to gain the necessary economies of scale.

The proportion of short-sea traffic that relates to North European transhipment, rather than intra-European flows, is hard to distinguish. This being reflective of the common nature of many feeder and intra-European shipping services. However, the container flows between the UK and the primary transhipment ports in the Netherlands, Belgium and Germany has risen from around 1.3 million TEU in 2000 to 1.8 million TEU by 2008. It is estimated that around three quarters of this trade is feeder related, notably at the peak years when UK gateway port capacity was constrained.

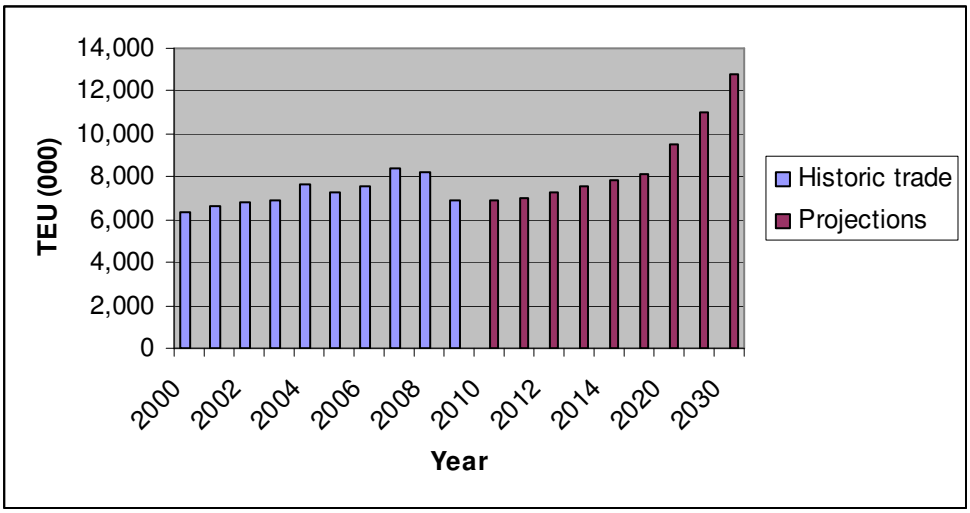
2.3.2 UK national container trade projections

The overall prospects for the UK national container trade through to 2030 is expected to be linked to UK, European and global economic growth. The former acting as the primary driver for imports, whilst short-sea and deep-sea expansion are linked to their respective regions. Details of this growth projection are presented in Figure 2.1, with trade expanding from 7 million TEU in 2010 through to 8.2 million TEU by 2015, 10 million by 2020 and 12.8 million by 2030.

This national trade projection is viewed as being more conservative than the Department of Transport's "UK Port Demand Forecast to 2030" issued in 2007. The latter projecting trade expansion to 10 million TEU by 2010, 14.2 million TEU by 2020 and 19.7 million TEU by 2030. Variances to this national projection are deemed to incorporate the 2009 economic downturn, plus consideration of:

- Constrained economic growth within the UK and other western economies, reflective of the restructuring of State and individual financial positions;
- Strong presence of the UK's service sector as the primary driver of economic growth, with a limited linkage to physical trade;
- Maturity in container penetration of the general cargo market. This standing at around 85 percent within the UK, and therefore offers limited upside potential consequential break;
- Promotion of a greater diversity in the UK's productive sector, seeking to redress the balance between manufacturing and the service sectors; and
- Increased deployment of high cube (HC) forty foot containers that provide higher unit volume capacity that traditional boxes.

Figure 2.2: UK Container Trade: 2000 through to 2030 (TEU 000)



Source: DfT Maritime Statistics and Consultants estimates

Within this projection deep-sea imports are presumed to retain a steady share of around 40 percent, whilst the corresponding exports are projected to increase from 22 percent to 38 percent. Short-sea trade is predicted to retain stable shares of around 10 percent for imports and 6 percent for exports. The primary change is a predicted decline in the number of empty movements, 24 percent to around 6 percent, reflective of the greater balance between UK import and export loaded TEU volumes.

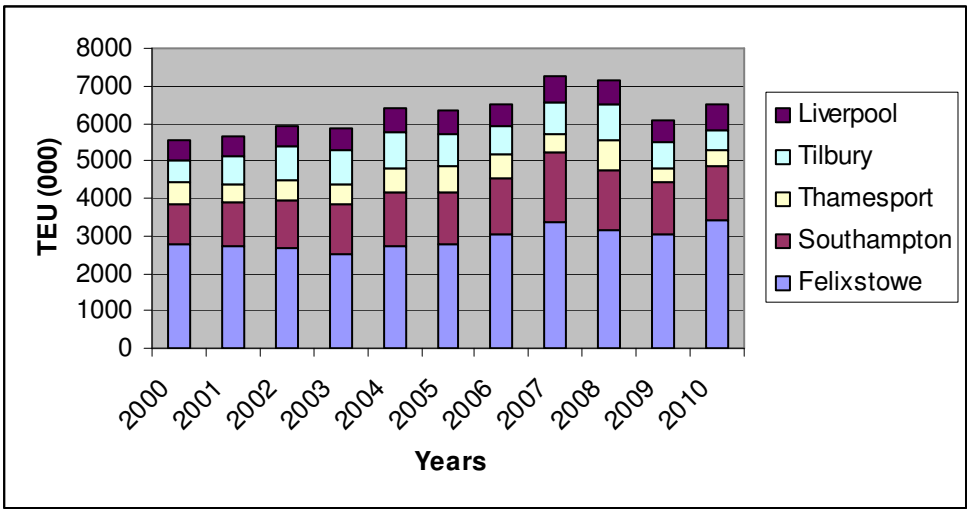
2.4 UK container port structure

2.4.1 UK Gateway ports

The UK has five principal container gateway ports: Felixstowe; Southampton; Tilbury; Thamesport (Medway); and Liverpool. These facilities specifically handling a steady 80 percent of the Nation's maritime container trade, this figure rising to 98 percent when related to deep-sea container trades.

Overall container throughput within the gateway ports has risen from 5.5 million TEU in 2000 to a peak of 7.3 million TEU in 2007, and 6.1 million TEU in 2010. The distribution of this trade between the major gateway ports over the last decade is presented in Figure 2.3, whilst the technical and operational characteristics of the ports are presented in Table 2.1.

Figure 2.3: UK National Gateway Ports Throughput (TEU 000)



Source: CI-Online

Felixstowe is the predominant gateway port handling just over half of the National container throughput. Its share of the overall trade having increased slightly over the last decade, though for a number of years berth capacity has been a severe constraint. The port has extensive international coverage, being a nominated port of call for some 72 regular carrier services, of which three quarters are related to Asia. It has therefore benefited significantly with the strength in this trade, attracting multiple services from a number of leading carriers. These services being handled across a 3.4km deep water quay, that provides alongside berth clearance of up to 16m depth.

Southampton is the second major gateway port handling just over twenty percent of the National container volumes. It has the widest international connectivity of any UK port, being served by 85 carrier services, of which almost half are related to Asia. The ports primary strengths relate to its geographical position within the English Channel, and the provision of extended deep-water berthing window due to its double tide characteristics. The port offers some 1,450m of quay with alongside depth of up to 15m, enabling it to handle the current largest vessels in service.

Thamesport on the Medway is a relatively small terminal, though with facilities appropriate for handling larger vessels. It handles around seven percent of the National trade, though its throughput has declined in recent years due to the re-orientation of major services to either Felixstowe or Southampton. However the port continues to attract 35 carrier services, of which almost half are Asian related. Its facilities comprise 449m of berth, with alongside water depth of 15.5m.

Tilbury is an established multi-purpose port located on the lower stretches of the River Thames. Its container facilities being divided between deepwater river side berths, and in-dock coastal facilities for smaller intra-European services. Historically the port has handled around eight percent of National container trade, though this has weakened over recent years. This partly reflects its strong orientation to traditional refrigerated cargo, rather than Asian trade, plus restrictions on marine side access for larger vessels. However, the port still hosts 58 carrier services, of which four are Asian orientated. Its river side berths handle approximately half the port's container throughput based around 600m of quays and up to 13.5m of alongside water.

Liverpool is the only gateway port not orientated towards the South Coast. It has handled a steady ten percent of National trade over recent years, with slightly above average growth. This trade being equally divided between deep-sea and short-sea throughput, the former largely relating to Trans-Atlantic calls. The latter point is reflected in terms of 16 carrier services offered, none relate to Asian orientated trade. Such trade being transhipped from European hubs by feeder services. The port offers 707m of quay with alongside depth of 12.7m of water.

Table 2.1: UK Gateway Container Ports (TEU 000)

Port	2010 Throughput (TEU)	Quay Length (m)	Quay Depth (m)	2010 Market Share (Percent)	2000 to 2010 Growth (Percent)	Deep-sea Market Share (Percent)	Total Number of Service Connections	Asian Service Connections (Percent)
Felixstowe	3,400	3,638	9.7-16	52	21	67	72	74
Southampton	1,450	1,350	13.6-15	22	36	88	85	41
Thamesport	576	655	15.5	7	-17	86	35	46
Tilbury	456 [(a)]	600	10.5-13.5	8	-12	49	58	7
Liverpool	681	707	12.7	10	26	50	16	-
Total	6,530	6,950	-	100	17	69	266	-

Note: (a) Plus 120,000 TEU short-sea on 585m inner basin berths.

Source: CI-Online

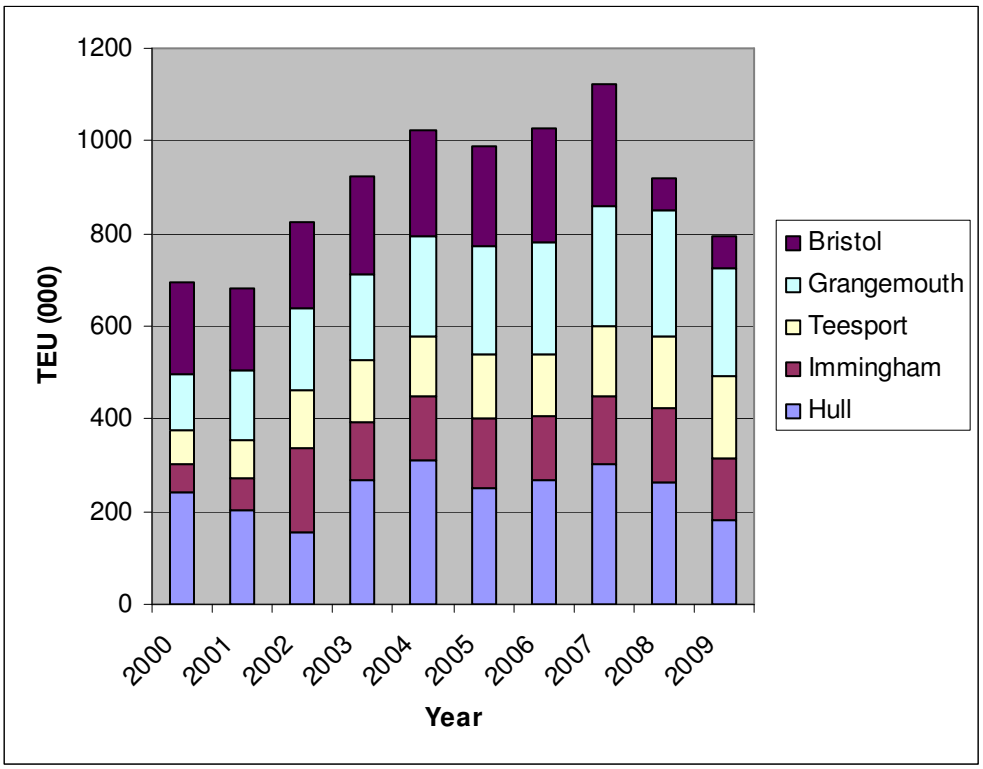
2.4.2 UK primary regional ports

The National gateway ports provide the means for direct trade connections with international markets, outside of Europe. An alternative supply route to gain access to these markets is through transhipment across major North European hub ports, with onward connection either by feeder or intra-regional container services. With regard to the prospective SHG regional target market, this provides the opportunity to utilise a range of regional ports, notably: the Humber ports of Hull and Immingham; Teesport; Tyne; Bristol; and Grangemouth for Scotland. It should be noted that both Tilbury and Liverpool, though classified as gateway ports, also play significant roles with regard to regional shipping services.

A common theme across the majority of these ports, including Tilbury and Liverpool, is the promotion of Port Centric Logistics (PCL) services. Developing co-located marine and logistics parks within the port zone to provide integrated service to shippers and receivers. Such processes developing a stronger common bond between the port and its related hinterland. This may be contrasted with Felixstowe and Southampton where there is a greater emphasis upon transferring cargo through to centralised RDC in the West Midlands.

The overall container throughput of the principal regional port was 800,000 TEU in 2010. This being broadly in line with the level a decade previously. However, this overall stability hides a strong peaking during the mid years of the last decade when up to 1.1 million TEU were handled, partly driven by capacity constraints at the major gateway ports. The distribution of throughput by the key regional ports is presented Figure 2.4.

Figure 2.4: UK Regional Port Throughput (TEU 000)



Source: CI-Online

The technical characteristic of the regional port's infrastructure has tended to reflect their historic user requirements. Thus stability in the size of intra-regional vessels deployed has enabled existing quays to be utilised, enhanced where required by minor infrastructure improvements. This situation is beginning to change due to pressure from larger mother ship throughputs, necessitating the deployment of larger intra-regional ships, whose characteristics are beyond the scope of existing facilities. The technical characteristics of the primary regional ports are presented in Table 2.2.

Table 2.2: UK Primary Regional Ports

Port	2009 Throughput (TEU 000)	Quay Length (m)	Quay Depth (m)
Humber (Hull, Immingham)	371	656 [(a)]	9-10.4
Teesport	414 (600 in 2010)	660	10.9
Tyne	37	514	10.5
Grangemouth (Edinburgh)	231	305	7.9
Bristol (Avonmouth)	80	450 [(b)]	10.5

Notes: (a) Hull Container Terminal 300m and 10.4m depth, ABP Exxtor Terminal 356m and 9m depth.

(b) In addition Royal Portbury dock provides 575m of quay at 14.5m, but no container services.

Source: CI-Online

Between them Hull and Immingham, plus the upper estuary port of Goole, represent a major regional port cluster on the East Coast. Their combined throughput fluctuating between 400,000 TEU and 500,000 TEU per annum over the past decade. Of this total Immingham handles around half the throughput, Hull 35

percent and Goole the balance. Nearly all this trade is related to intra EU shipments, with limited general cargo linkages to more distant regions. The two main port facilities comprise quays of 300m and 356m respectively with a depth range alongside of 9m to 10.4m.

Teesport has established a strong East Coast presence related to feeder and intra-European trades. Over the last decade it has typically handled between around 300,000 TEU per annum. However, post an extended marketing initiative this has subsequently increased to 600,000 TEU in 2010. This promotion being based around the expansion of Port-Centric Logistics (PLC) initiatives, notably the establishment of key port based import facilities for Tesco and Asda retail groups.

Grangemouth on the Forth Estuary extends its hinterland coverage over Scotland and the North East. It has recorded steady growth over the last decade to reach 231,000 TEU throughput in 2009. Its marine connections are based around feeder and short-sea connections to the North European ports, plus regional connections to Nordic regions. Its facilities comprise a 305m quay with alongside depth of 7.9m. The latter depth restriction imposing vessel size constraints on both Grangemouth and other East Coast ports that share a common sailing schedule.

Finally, Bristol represents the major regional port covering the South West of the UK and Wales. Its container throughput has declined over the last decade from around 200,000 TEU in 2000 to 72,000 in 2009. This trade being one third deep-sea, notably a link to southern Africa, and two thirds intra-European trade, notably with Iberia and the Mediterranean. The port has extensive facilities with an aggregate quay length of 1km, divided between Avonmouth and Royal Portbury Dock, offering depths of between 10.5m and 14.5m alongside.

2.5 Short-sea container operations

The development of alternative regional based supply routes is dependent upon the provision of adequate feeder and intra-regional shipping services. Such services providing the connections between North European and southern UK gateway ports and the regional ports. In this context the key North European ports comprise: Rotterdam; Antwerp, Zeebrugge; and Hamburg.

The primary relevant shipping lines are presented in Table 2.3, highlighting their service schedules, sailing frequency, range of ships deployed, and the overall capacity of the fleets utilised. The shipping services may be divided into three categories:

- Common feeder operations: notably, Team Lines, Unifeeder, and X-Press providing third party carriage for all main lines to selective UK ports;
- Dedicated feeder operations: notably, KKK, MSA, and CMA CGM handling primarily their own main line trade requirements; and
- Intra-regional shipping operations: notably, Samskip, Eimskip, and MacAndrews operating inter-connecting services between gateway and regional ports across northern European waters.

The services are normally offered on a weekly or even a daily service, with an emphasis on higher frequency schedules. Such services mitigating claims of extended delays in northern European ports whilst awaiting transhipment. A consequence of this frequency is that smaller ships tend to be deployed, typically 500 to 900 TEU; a size suitable for the depth constrained regional ports.

Service schedules have a high orientation towards connections with Rotterdam, recognised as the leading hub port within northern Europe. Most services call at this port, with potentially a second hub port added in order to gain service connections.

Table 2.3: UK Short-Sea Feeder Operations

Shipping Line	Routes	Service frequency	Vessel Size Deployed (TEU)	Fleet Capacity (TEU)
Team Lines	Antwerp-Rotterdam to Southampton	Weekly	2 x 698	1,396
Unifeeder	Hamburg-Rotterdam to Felixstowe, Humber, Teesport, Tyne, Grangemouth	Daily	5 x 398 to 750	3,251
X-Press Containers	Rotterdam to Southampton (3 services)	Weekly	3 x 515 to 698	1,911
BG Freight	Rotterdam-Antwerp to Teesport and Grangemouth	Weekly	3 x 340 to 523	1,203
Samskip	Rotterdam to Tilbury (5 voyages); Hull (5 voyages); Grangemouth (1 voyage); Zeebrugge to Teesport (1 voyage)	12 voyages per week	3 x 205 to 803	1,348
Samskip	Rotterdam to Immingham	2 x weekly	4 x 435 to 908	2,918
Eimskip	Rotterdam to Immingham	Weekly	2 x 724	1,448
Tschdi	Rotterdam to Immingham	Weekly	1 x 510	510
MacAndrews	Rotterdam to Liverpool	Weekly	2 x 822 to 900	1,722
MacAndrews	Rotterdam to Tilbury	Weekly	2 x 750	1,500
KKK	Rotterdam-Hamburg to Felixstowe, Teesport	Weekly	2 x 681 to 686	1,397
CMA CGM	Rotterdam-Zeebrugge to Immingham, Teesport, Grangemouth	Weekly	1 x 767	767
MSC	Antwerp to Bristol	Weekly	1 x 930	930

Source: CI-Online

2.6 UK container port development plans

The UK port system's capacity was severely strained during the peak demand years of 2007 and 2008. In particular, the main gateway ports reached their technical capacity limits, a key feature in promoting the expansion of feeder services from North European ports. This capacity limit also severely constrained the ability of leading ports to promote their own transhipment operations to the Baltic and Irish Sea ports.

This capacity constraint was not-unforeseen by the port industry, with planning applications for additional facilities being submitted by ports from 2000 onwards. However, uncertainty over the cross-impact of multiple schemes resulted in extensive delay in the formal planning processes, with the majority going to public consultation. Formal approval for many of these plans was granted in 2006 and 2007, leading to the expectation that a significant expansion in national port capacity would be brought forward. The implementation of many of these plans has however been severely delayed or differed due to the change in economic conditions, and resulting reduction in pressure on existing port facilities. As a consequence only the expansion of Felixstowe South and London Gateway development have moved forward towards implementation; other plans such as for Bristol, Liverpool, and Bathside Bay, near Harwich have been put on hold.

The nature of these port development schemes, their timing and impact upon National port capacity are presented in Table 2.4. The future capacity reflecting the planning assumption that quay productivity would range from 1,200 to 1,400 TEU/m for large deep-sea ports, versus 300 to 1,000 TEU/m for small and medium size ports.

Table 2.4: UK Port Capacity Development Plans

Port	Current Quay Length (m)	Current Capacity (TEU 000) (2010)	Development Plans	Prospective Capacity (TEU 000)
Felixstowe	3,638	3,400	Felixstowe South Development: HRO (2006) [(a)] adding 1.5 million TEU deep-sea capacity by 2016	5,600
Southampton	1,500 (1,350 deep-sea and 150m feeder berth)	1,900	Productivity improvements to raise existing terminal to 2.7 million TEU deep-sea capacity (2020). Longer term re-establishment of Dibden Bay Proposal adding 1 million TEU [(b)]	3,700
London (Tilbury)	1,185 (600m deep-sea)	950	London Gateway Development: HRO (2007). Initial three berths by 2016 providing 1.8 million TEU deep-sea capacity. Second phase three further berths and 1.8 million TEU deep-sea capacity	4,700
Thamesport	655	620	Productivity improvements	780
Liverpool	707	700	New container terminal: HRO (2007) Adding 700,000 TEU deep-sea capacity	1,500
Bathside Bay, Harwich	-	-	Controlled by HPH (as is Felixstowe): HRO (2006): Development plans for new container terminal 2 million TEU deep-sea capacity. Schedule likely to be post Felixstowe South development	2,000
Bristol	450	150	New container terminal: HRO (2010) provision for 1.5 million TEU deep-water capacity.	1,800
Teesport	660	235	Dropped major container terminal development (1.5 million TEU). Improvement and investment in regional terminal.	450

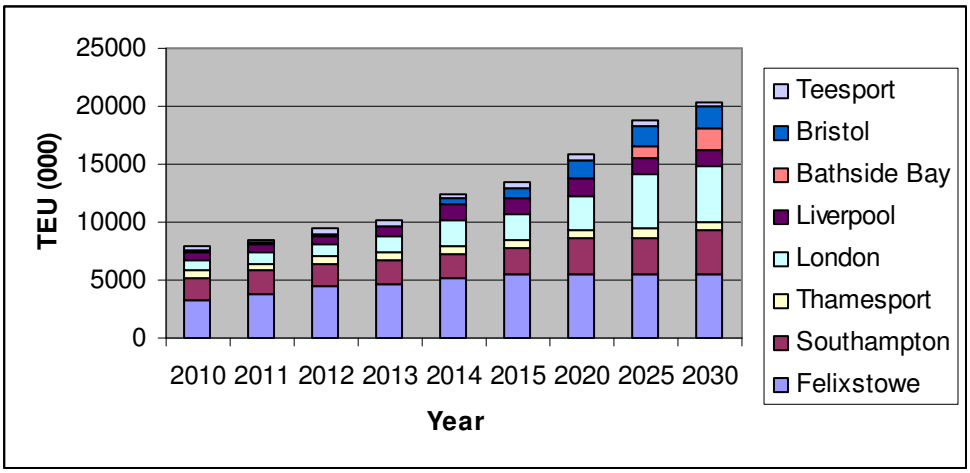
Notes: (a) Harbour Revision Order (HRO)

(b) ABP Port of Southampton Master Plan 2009

Source: Industrial sources and Consultants estimates

The overall impact of these development plans would increase the UK container capacity from 7.8 million TEU in 2010, 13.4 million TEU by 2015, and 20.4 million TEU by 2030. Approximately 18.8 million TEU or 92 percent of the eventual capacity being deep-sea berth provision. A break down of the key ports' throughputs is presented in Figure 2.5.

Figure 2.5: UK Primary Container Port Handling Capacity (TEU 000)

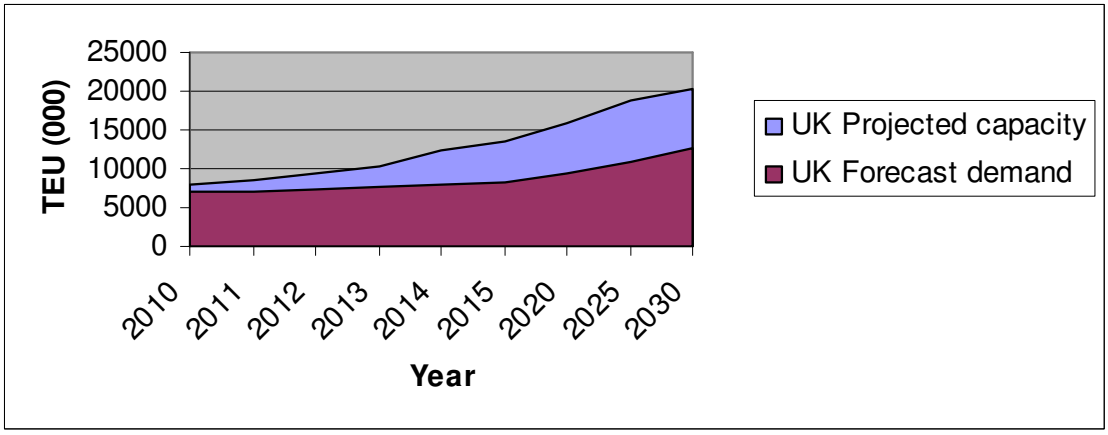


Source: Industry sources and Consultants estimates

2.7 UK container demand versus supply balance

Integrating this Study's container demand forecasts and planned terminal capacity expansion schemes presents the case of over-capacity within the sector. This is presented in Figure 2.6, where the situation moves from being in-balance at present through to a significant over capacity by 2030. However, it should be noted that the longer term developments of London Gateway Phase 2 (approximately 1.8 million TEU) and Bathside Bay (approximately 2 million TEU) have no definite time schedule. The overall capacity provision from 2025 may therefore be reduced by almost four million TEU reducing the apparent overcapacity from 40 percent to 25 percent.

Figure 2.6: UK Container Capacity and Demand Balance (TEU 000)



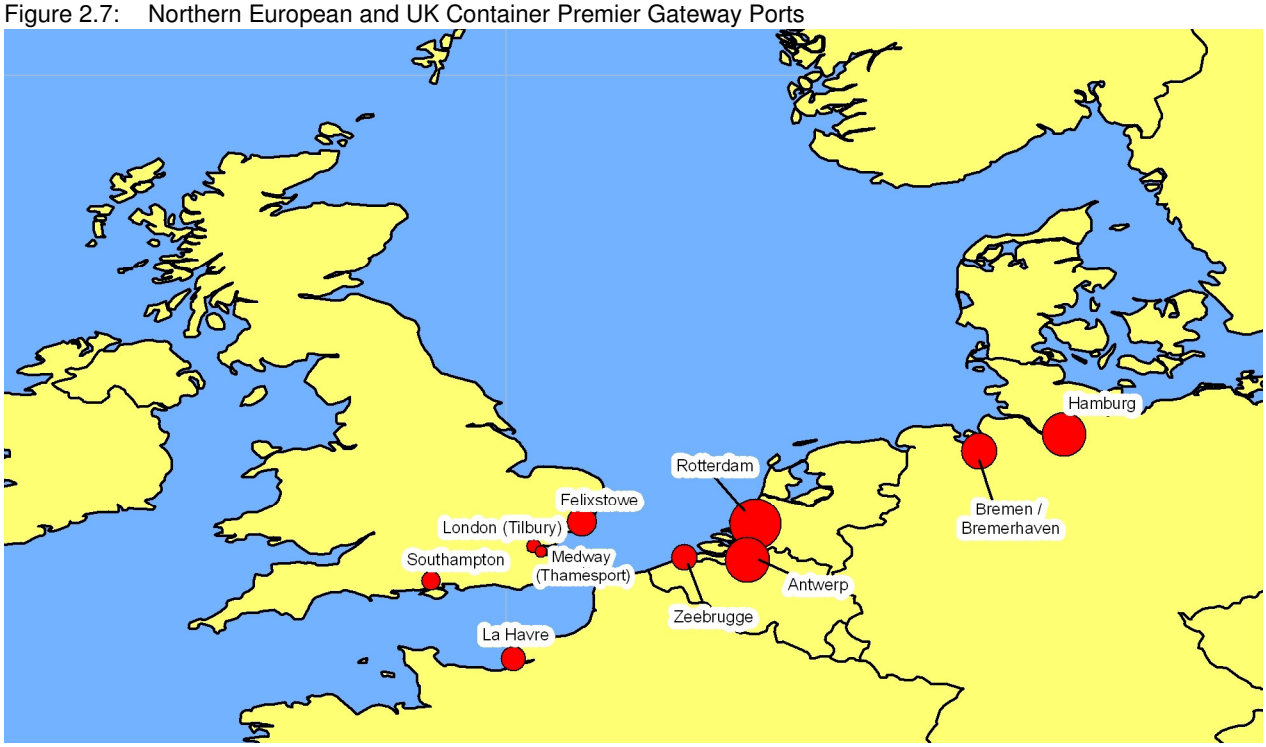
Source: Industry data and Consultants estimates

2.8 North European ports

2.8.1 Northern European port range

The Northern European container market is centred around a defined range of major continental gateway ports, notably: Rotterdam; Antwerp; Zeebrugge; Hamburg; and Bremen-Bremerhaven. Other major ports include Amsterdam and Dunkirk, though having significant container facilities play only a limited role in the regional throughput. While Le Havre focuses primarily upon France, and to a limited extent Eire. The geographical location and relative scale of these ports, together with their UK gateway ports are presented in Figure 2.7.

Figure 2.7: Northern European and UK Container Premier Gateway Ports



Source: CI-Online

2.8.2 North European port throughput

Between 2000 and 2010 the aggregate container throughput of these Northern European ports increased from 18.9 million TEU to a peak of 36.9 million TEU in 2008; reflective of an annual growth rate of almost nine percent. The impact of the global economic downturn resulted in a sharp decline of 16 percent in these ports' throughput in the following year, with overall handling down to 30.9 million TEU. Subsequently, a sharp recovery has occurred within the majority of the ports, their aggregate throughput rising to 34.9 million TEU in 2010.

Trade growth is expected to return to the region, driven by the gradual recovery of the underlying economies. However, the distribution of trade between the major ports may change due to the emerging presence of Ultra Large Container Vessels (ULCC) of up to 18,000 TEU, a size of ship recently ordered by Maersk Line. The size of such ships creates technical barriers to entry for many of the existing ports due to marine channel restrictions, leading to the prospect of changes in their schedule deployment. At present

Rotterdam and Zeebrugge have the necessary channel provision, whilst ports such as Antwerp and Hamburg are vulnerable due to their up-river locations.

Table 2.5: Northern European Container Throughput (TEU 000)

Port	Country	2000	2008	2009	2010	2000-2010 Annual Growth (Percent)
Antwerp	Belgium	4,218	8,663	7,309	8,468	7.2
Zeebrugge	Belgium	876	2,210	2,328	2,500	11.1
Rotterdam	Netherlands	6,102	10,784	9,743	11,145	6.2
Hamburg	Germany	4,689	9,743	7,008	7.900	5.4
Bremen-Bremerhaven	Germany	2,973	5,501	4,536	4,871	5.1
Total		18,858	36,901	30,924	34,884	6.3

Source: CI-Online, Port Statistics

2.8.3 North European port operating strategies

Historically, container shipping lines' port strategy has been based upon three to four port calls within the North European range; typically a single call in the UK, Netherlands and or Belgium; Germany, and northern France. The selection and scheduling of the rotation typically being reflective of their specific client's focus, adjusted if necessary to take into account individual port berth availability. The latter point becoming a serious scheduling constraint in the high growth period through to 2008; with vessels being forced to drop calls at key ports due to berth congestion. The affected containers being fed back either by other ships or by land transfer.

Within the context of the Northern European markets, direct calls to the UK are generally deemed to be preferred, rather than dependence upon feeder services from another continental port. This is largely reflective of extended dwell time at the transhipment port, typically four to five days, and the consequential extension of overall transit times. However, during the peak demand years of 2007-2008 capacity restrictions within the major UK gateway ports inhibited their ability to take direct calls, thereby encouraging the expansion of feeder services from the continent.

Contrary arguments in support of transhipment tend to be based upon their ability to provide greater port to port connectivity, sailing frequency, and the economies of scale arising from the deployment of larger vessels. There are also advantages to shippers in organising their product inventory on a European scale, rather than a single national market; thereby reducing risks and costs in the broader supply chain.

2.8.4 North European port technical features

The North European ports represent significantly larger commercial and technical operations than their UK counterparts. This is highlighted in Table 2.6 in terms of their container throughputs, number of carrier services, terminal numbers and quay lengths. Individually, Rotterdam, Antwerp and Hamburg providing greater capacity and service coverage then the aggregate UK gateway ports offering.

Table 2.6: North European Ports Technical Features

Ports	Throughput (000 TEU) (2010)	Total Service Calls (Number)	Asian Related Service Calls (Percent)	Container Terminals (Number)	Total Quay Length (m)	Quay Depth Range (m)
Rotterdam	11,145	355	37	11	16,890	12-20
Antwerp	8,468	270	21	12	19,095	9-17
Hamburg	7,900	264	48	8	9,998	12-17
Bremen-Bremerhaven	4,871	118	14	4	5,260	10-15
Zeebrugge	2,500	59	56	5	6,330	10-16

Source: CI-Online

2.8.5 North European ports institutional structure

The majority of European ports operate under a different institutional arrangement than UK ports. The latter being based largely on private port ownership, with the responsibility for the funding of infrastructure development and operations. In contrast the European institutional model is centred around State provision of port infrastructure, including channel provision, entrance locks and quays. Thus the respective City Governments of Rotterdam, Antwerp and Hamburg fund the dredging programmes for their respective estuaries, with expenditure being recovered through long term marine charges to users.

Operating terminals and cargo handling equipment lies under the responsibility of private sector operators, notably major stevedore companies or shipping lines. These facilities being provided under long term financial leasing-concession arrangements with City or State governments. This arrangement has enabled a range of major carriers to establish their own dedicated terminals, thereby providing closer integration with their shipping schedules. This includes: AP Moller Group (Maersk Line) with terminals in Rotterdam, Bremerhaven, and Zeebrugge; MSC operations in Antwerp and Bremerhaven; and CMA CGM with Rotterdam and Zeebrugge facilities.

2.8.6 North European port development plans

Despite the scale of the North European gateway ports, capacity pressure was reached during the peak years of 2007 and 2008. This resulted in a combination of extended berthing delays or vessels dropping ports of call. In seeking to address this, the major ports have instigated major port development or enhancement schemes.

This includes the provision of new infrastructure, such as Maasvlakte 2 in Rotterdam; which when completed in 2013 provides for the phased provision of 16 million TEU additional capacity through private terminal development schemes. The on-going expansion of Deurganck Dock area in Antwerp, where a range of new terminals are being developed; and the new Jade-Weser port, near Bremen due to open in 2012 providing 2.7 million TEU capacity. Longer term Hamburg is predicted to develop the new Steinwerder Terminal by 2020 adding an additional 3.5 million TEU.

Outside these major schemes the majority of the ports have on-going incremental development plans. Dredging rivers and improving dock entrances to improve operational window access at all stages of the tide or to enable larger ships to be accommodated.

The overall prospect is therefore one of significant additional capacity coming on stream over the next two decades. The majority of this capacity facilitating the ability of specific ports to address the requirement to

handle both higher throughput volumes and larger vessels. It may therefore be expected that their will be a rise in intra-port competition between key gateway facilities, with increased attention to broadening the prospective catchment areas for their trade. This has already been witnessed within the intra-European waterway system, where ports such as Rotterdam and Antwerp are establishing inland container centres linked by barge operations.

3. National container distribution

3.1 Introduction

The previous Chapter's evaluation of the UK and European container port sector highlights the presence of adequate terminal capacity to address current market national demand, and significant new port development prospects. The justification for the SHG Project on a simple national macro-economic perspective may therefore be difficult to justify. However, the operational performance of the UK port system, notably during the peak demand years around 2008, highlighted significant concerns related to capacity constraints, notably with regard to the inland distribution of containers to regional markets. The SHG Project's strategic goal should therefore be viewed as a competitive offering, providing targeted UK regions with an alternative supply chain option to improve the quality of services received.

This Chapter examines the structure of inland distribution related to road and rail systems, plus the establishment of inland container depots. The latter being evaluated in term of the prospects for Value Added Logistics (VAL).

3.1.1 Inland distribution strategies

The UK's inland container distribution system places a high emphasis upon the transfer of boxes from gateway ports through to Regional Distribution Centres (RDC). With onward subsequent secondary distribution of sorted reconsolidated goods from the RDC through to the wholesale-retail and/or industrial markets. Exceptions to this general rule exist, most notably related to full container assignments that are part of closely integrated production supply chains, with limited delivery to storage or inventory.

A major consequence of this supply chain structure is the high concentration of dedicated and common third party RDC in the West Midland. Most notably within an area defined as the Golden Triangle, lying between Northampton, Coventry and Leicester. This location having well established strategic road connections, the M1, M6, M69, and A14, plus wide gauge rail service access. These linkages providing relatively effective primary haulage links between the major southern gateway ports, the RDC and onward final market destinations. It is estimated that three quarters of the country's population can be served by road in a one-day return trip from the golden triangle, and around 90 percent can be accessed within a four hour drive.

Outside of the Golden Triangle the key destinations for the inland containers are within the M25, to service London, plus Liverpool-Manchester axis, Leeds-Bradford and Sheffield, Bristol and a limited capability near Teesmouth. Limited warehousing reception facilities have developed outside these core areas, with no notable locations in Scotland, Wales or the North of England. This primarily reflecting the ability to service markets in these areas from the core RDC centres in terms of secondary distribution.

Road and rail inland distribution is currently dominated by the connections to the primary southern gateway ports of Felixstowe, Southampton, and London-Medway areas. The primary routings of these transport corridors through to the prospective market hinterland, and Inland Container Depots (ICD), being presented in Figure 3.1. In addition the relative positions of Bristol, Liverpool, Teesport and the Humber Ports are highlighted.

Figure 3.1: UK Inland Road and Rail Transport Corridors

Source: DfT

3.1.2 Value added logistics

One key element within the trade globalisation process has related to the concept of manufacturing postponement, thereby enabling deferred customisation of goods to address specific client needs. Thus generic consumer goods may be manufactured in Asia, as the centre of low cost production, but customised in Europe or the UK, once clarity is gained on the nature of the final customer demand. This process reducing the percent of waste within the supply chain due to in-appropriate production schedules.

This deferment in the customisation of goods necessitates semi-manufacturing processes being completed away from the traditional factory site. RDC have become common areas where such VAL operation can be located, the processing taking various forms. This includes: re-packaging; labelling, quality control checking and relatively minor manufacturing assembly jobs. Such changes have in turn altered the employment profile of many RDC, away from traditional reception and inventory storage, to light manufacturing, with a comparable increase in skill requirements. These operations either being completed in-house by the shipping company or logistics provider or through the co-location of other related industries, thereby promoting the case for economic clusters.

3.1.3 Port Centric Logistics

Whilst the current inland distribution business model is firmly based around centralised national RDC, pressure for sustainable distribution solutions has brought about pressure to change. In particular, the concept of Port Centric Logistics (PCL) or economic clusters, with manufacturing and VAL distribution centres being co-located at the port. Such concepts having gained popularity both in the UK and in North Europe.

PCL build upon the concepts of supply chain deferment and customisation. Allowing primary and intermediate products to be shipped to the port, for subsequent customisation. The latter may be reflective of the presence of industrial refining processes or building upon a natural break-point in the supply chain routing, where customisation occurs prior to goods being shipped to separate distinctive markets. One of the key advantages of this being the ability to ship products in heavier or out-of-gauge containers that would be prohibited from using national roads, but can move within the port defined zone.

The promotion of PCL also builds upon traditional strengths of many port communities. These being established range of common productive skills, extended land areas within reasonable proximity to working quays, and trade-transport facilitation services. The historic promotion of containers has in many ways weakened this traditional link, removing port related cargo processing through its unitised handling processes. PCL therefore is an action that can re-instate a port's inter-linkages with their local industries and communities.

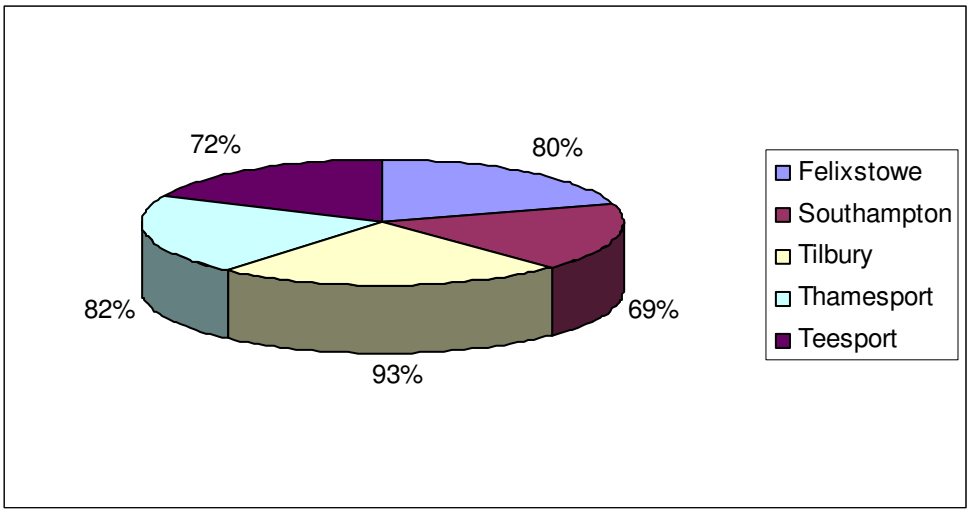
The promotion of PCL is currently strongest within traditional ports, where historic general cargo activities are still maintained. Thus both Liverpool and Tilbury have a strong presence, as does Teesport in the North East. The latter gaining significant publicity through the recent co-location of two major RDC related to Tesco and Asda retail groups. These Companies deeming it to be advantageous to serve the regional market from this northern port, based upon transhipment from southern UK or North European ports. Conversely, Felixstowe and Southampton, the primary southern gateway ports, have limited PCL presence, focusing more upon access to central UK RDC. The new London Gateway Container Terminal is planned to be co-located to a new extensive logistics zone.

Within North Europe the presence of major Distriparks is an established procedure. Both Rotterdam and Antwerp having major facilities, adjacent to both container terminals and other dry and liquid bulk facilities. The latter in particular being linked to the strong cluster promotion of heavy refining capacity within the chemical or other industrial processing sectors.

3.1.4 UK Road distribution

Historically road haulage has dominated the transfer of maritime containers from gateway ports through to either RDC or final market destinations. The share of containers leaving-arriving in key ports in 2007 by road is presented in Figure 3.2. This highlights the predominance of road distribution at the key gateway ports, 80 percent for Felixstowe and close to 70 percent for Southampton. Other smaller regional ports are almost exclusively operated around road based connections, though many have existing rail access or tracks that may be re-opened.

Figure 3.2: Road Based Inland Container Distribution (Percent) 2007



Source: The Container Freight End to End Journey, DfT

The future of road haulage is constrained by a range of factors. This includes pressure from shippers and the government to address sustainable transportation options, plus rising fuel costs, highway congestion and HGV driver shortages. As a consequence the overall share of containers handled by road is gradually expected to decline from around 75 percent at present to 70 percent in the near future. The balance being shifted towards rail, inland waterways or coastal shipping.

The 2006 Eddington Report into transport constraints on the UK economy highlighted the growing impact of congestion on key highways. His recommendations being to focus on relieving such congestion at key points related to urban centres, gateway ports and airports and along key urban-transit corridors. His work confirmed the general acknowledgement that constrained highway access around urban ports, plus key arterial road junctions were creating significant disruption and additional costs within supply chains.

The ability of individual ports to utilise the strategic trunk road network to serve the Project's prospective geographical market varies by port. The primary trunk roads and constraints points for individual ports are highlighted in Table 3.1. This highlights that the primary constraints are around the port's immediate urban areas, and the southern trunk road leading through to the Golden Triangle. Container freight traffic flows

within Yorkshire, Humberside and the North West are relatively modest in comparison with their southern counterparts; though key routes such as the M60 may be constrained at peak times.

It must also be recognised that inland distribution moves are reflections of multiple individual shippers transport decisions. Their control over the shipping line carrier selection and thus the port of entry may be limited, with consequential extended inland distribution haulage to the final destination. Thus inland movements occur between Felixstowe to Hampshire and Southampton to Suffolk, despite the destinations being in close proximity to another gateway port.

Table 3.1: Primary UK Trunk Road Connections to Yorkshire and Humber

Port	Route	Traffic Flows
Felixstowe	A14 eastward to the M1/A1 and M6 junctions within the Golden Triangle (130 miles). Latter roads linking northward to Yorkshire and Humber, plus the North West.	A14 high level of congestion through to Birmingham (M6) A1 through to Sheffield and Leeds modest congestion.
Southampton	M3/A34 leading North to connect with M40/M43 to access to Golden Triangle. M69 North from Birmingham to Sheffield and Leeds.	High level of urban traffic congestion on southern M3 and M34 through to M40 junction. Modest level of congestion on M69 through to Nottingham.
London Ports (Tilbury and Thamesport)	Links to M25 London ring road, and then M1 to Golden Triangle and M11 East Coast route to Yorkshire and Humber.	High congestion on eastern section of M25 and southern M1.
Liverpool	Local connections through to M57-58 leading through to M62 transit to Manchester, Leeds and Hull. Alternative M6 southward to the Golden Triangle.	Heavy congestion in immediate Liverpool urban area and western M62.
Humber Ports (Hull & Immingham)	A63/M62 to connect Hull, A180-M180 for Immingham leading through to Yorkshire and North West.	Moderately heavy traffic flows along M62.
Teesport	A66 connection to A1 (M) providing linkages through to the M62.	Modest heavy goods traffic flows.

Source: The Container Freight End to End Journey, DfT (2008)

3.1.5 Rail infrastructure and operations

As indicated above the proportion of containers handled by rail from the primary gateway ports remains modest. However, the promotion of intermodal shift away from roads, rail, and marine, are key components of the Government's transportation policy, promoting the case for a gradual increase. Such an expansion being promoted through the improvement in rail access gauge to carry larger boxes, and the promotion of ICD linkages.

Over recent decades a shift has occurred in the composition of cargo structure. This has been reflected in an increase in the proportion of lighter higher volume merchandise, which has impacted upon container handling. Shippers have responded by promoting the use of High Cube (HC) containers, which are one foot higher than the standard box characteristics, thereby imposing constraints on their landside carriage due to bridge constraints. Within the UK these HC boxes have traditionally required special wagons for their carriage, constraining their use. It is the Governments intention to gradually improve the standard gauge

wagon envelope limits (defined as W8) to HC (W10) thereby allowing these containers to be handled by standard wagon flatbeds.

Rail based container movements within the UK is provided by three private haulier companies, linking the ports to inland depots, either on scheduled common user trains or services dedicated to specific shipping lines or shippers. The leading freight haulier, Freightliner, maintains a market share of around 70 percent, and handled 980,000 TEU in 2008, providing 90 odd daily train movements through to 14 depots across the country. Other carriers are DB Schenker (ex EWS) and GB Freight.

These freight carriers provide connections through to a range rail connected ICD's within the UK. Within the Project's prospective region, these include terminals at Doncaster, Leeds, Selby and Wakefield within Yorkshire and Humber; Trafford Park and Barton Dock (both Manchester), Liverpool and Ditton in the North West; and Wilton near Teesside. In addition the Golden Triangle has four primary depots located at: Hams Hall (Birmingham), Birmingham; Birch Coppice and Daventry, providing dedicated linkages to primary southern Gateway ports.

The comparative linkages of the primary gateway ports through to different national regions is presented in Table 3.2. This identifies 104 daily trains, with an overall capacity of almost 6,200 TEU departing from the ports, of which 46 percent relate to Felixstowe, 30 percent to Southampton, and 23 percent to the London ports. In terms of their destination 40 trains are destined for the North West and 20 trains to the North East, providing an overall daily capacity of 3,650 TEU per day or 1.3 million TEU annual flow to the Project region. An additional 26 trains with 1,650 TEU capacity are routed to the Golden Triangle area in the Midlands.

Table 3.2: UK Ports Rail Based Distribution (Daily Trains and TEU Capacity)

Port	Item	South	West	Midlands	North East	North West	Scotland	Total
Felixstowe	Trains	2	2	12	10	20	2	48
	TEU	132	58	756	616	1,284	96	2,942
Southampton	Trains		2	8	6	12	2	30
	TEU		104	612	352	840	72	1,980
Tilbury	Trains	2	2	4	2	6	2	18
	TEU	132	116	156	100	192	120	816
Thamesport	Trains		2	2	2	2		8
	TEU		28	132	132	132		424
Total	Trains	4	8	26	20	40	6	104
	TEU	264	306	1,656	1,200	2,448	288	6,162

Source: CI-Journal, 2011

The competitive position of the rail freight system is dependent upon the specific linkages available from the key ports. Thus Felixstowe has the option of a W10 cleared line westward towards Nuneaton, where it can join the West Coast Mainline through to a range of ICD's in Yorkshire and Humberside. It can also route HC units through to the North West, via the North London Line, to link through to the East Coast Mainline. The upgrade through to Nuneaton has only recently been completed, funded through a £5 per load inbound box levy by Felixstowe Port; an example of a port operator funding improvements to its hinterland connections.

Southampton's competitive position has also been greatly improved this year through the completion of W10 clearance through to Reading, and from there to the Golden Triangle and the North West. These

being its primary market areas, with only limited connectivity through to Leeds in Yorkshire. The upgrade in the gauge clearance though completed by Network Rail is being funded through a £3 per TEU levy raised by the port operator on loaded imports transported by rail.

The existing London terminals of Tilbury and Thamesport, plus London Gateway in 2012 require rail freight to be routed on the Gospel Oak route around the North of London, prior to connecting to either West or East Coast Mainline. These connections allowing them to serve ICD's in Yorkshire and Humber, plus the North West. The necessary gauge and signalling improvements on the Gospel Oak route are planned to be completed by 2014, allowing it to handle HC units.

Smaller regional ports are also improving their rail connectivity. This includes improvements at Teesport where the current W8 constraint limits its access to the West Coast Mainline, and new access linkages for Bristol. The majority of these planned rail connection improvements being scheduled to be completed by 2014. As a consequence the Humber Ports, Hull on the North Bank and Immingham on the South Bank, will stand out as the only primary ports with no W10 linkages to the strategic rail network.

4. Regional market hinterland

4.1 Introduction

The SHG Project needs to establish a clear definition of its market prospects. This being defined in terms of regional markets in which it may seek to compete, their respective trade generating capabilities, and the presence and competitive positions of alternative supply chains to/from these markets. This Chapter sets out an overview of overall scale of the National UK container market, and thereafter provides economic analysis of regions where the SHG Project would be viewed to have a competitive position.

It concludes through evaluating the prospective market demand for the SHG Project based around the alternative regional markets.

4.2 Regional market definition

4.2.1 Regional definition

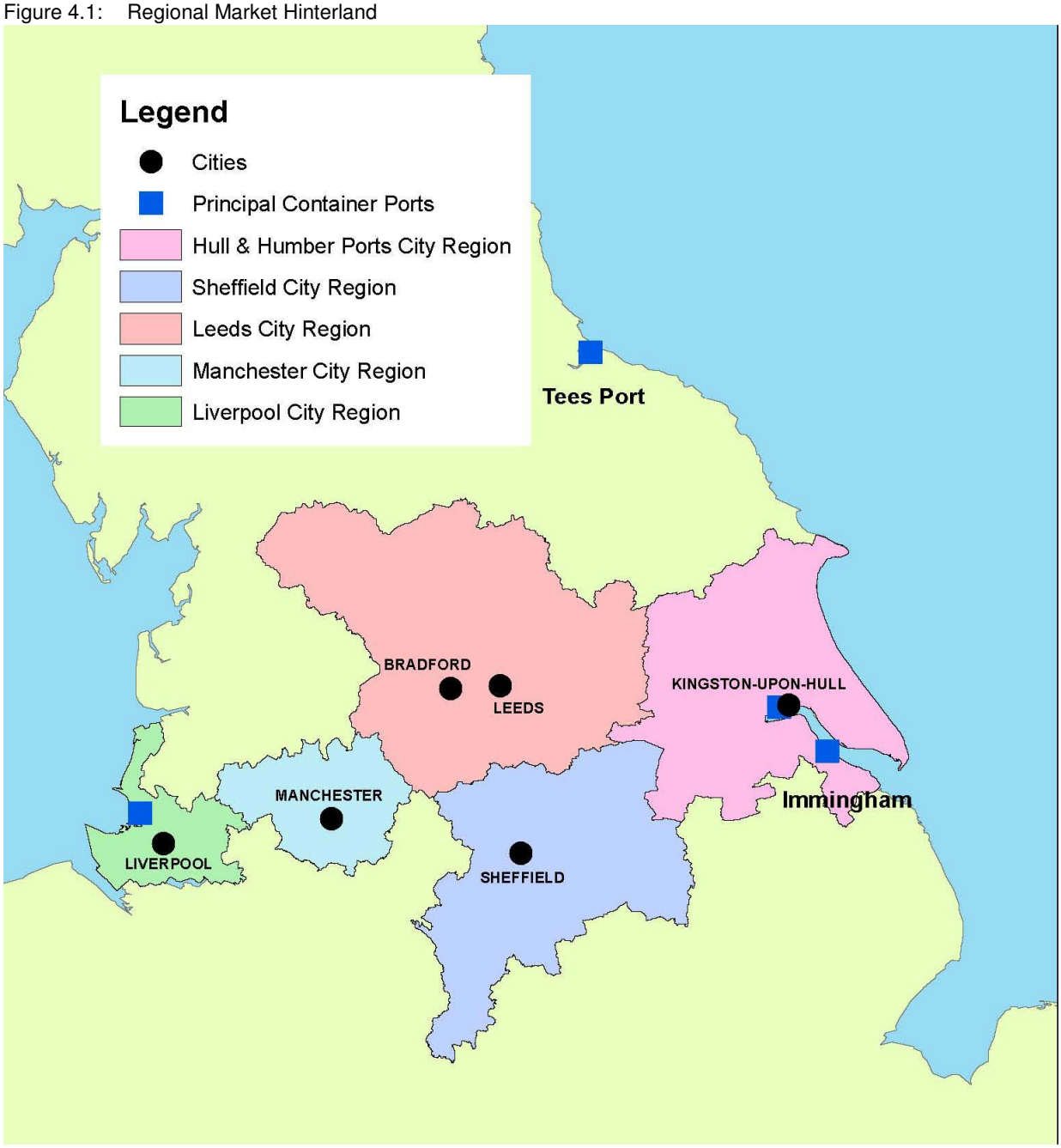
The geographical scope of the SHG Project's prospective market hinterland may be defined by the competitive offerings of alternative international supply chains competing within the UK. The comparative strengths and weaknesses of these transportation operations influencing key decision makers on their options for freight routing. Such decision makers comprising a combination of shippers, receivers and independent logistics firms.

Current supply chain options available for international freight container solutions reflect the southern gateway ports of Felixstowe, Southampton and London, plus regional access via the Humber, Liverpool, Teesport, Bristol, and Grangemouth. Alternative supply options also include RoRo unitised freight connections from North Europe via a range of ports, and the Channel Tunnel.

In broad terms a port's hinterland is defined by individual shippers' needs to balance delivery service quality versus the overall carriage costs. Thus individual firms will take different perspectives on the presence and adequacy of port and inland road and rail infrastructure, the ability to aggregate and consolidate cargo to gain economies of scale, and pressure for "Just in Time" delivery. The SHG Project needs to evaluate whether adequate numbers of shippers believe that its service and value offering is more advantageous than other supply chain options.

The Study addresses this market issue based upon an assumption that geographical proximity to the Project will provide a competitive advantage. Taking into account both the presence of other existing supply chain options, and prospective service constrains that may exist due to congestion. Consequently, prospective market areas are presumed to radiate outwards from the Humber; the closest regions being primary targets, whilst those more distant face greater competition. The distinction between the prospective markets, the presence of key urban metropolitan areas, and regional ports is presented on Figure 4.1.

Figure 4.1: Regional Market Hinterland



Source: Consultants estimates

4.3 Market potential

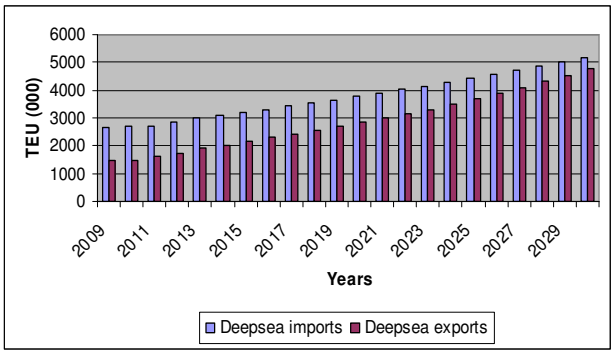
4.3.1 Overview

The SHG Project needs to compete with other port related supply chains for a proportion of the UK National market. The scale of its market opportunity being reflective of a range of factors, including: the geographical distribution of economic activity within the country, and the comparative competitiveness of other port's supply chains in supporting different regions. This division may be further complicated by the

division of the UK overall market into deep-sea and short sea services. The former having a high orientation towards distant Asian related trade, handled on larger ships via deep water ports; whilst the latter has a greater focus upon regional trade and transportation connections with northern and central Europe.

The relative scale of the UK's deep and short sea trade prospects, based upon the Phase 1 Interim Report, are presented in Figure 4.2. Within these projections deep sea's share is projected to increase from around 60 percent to 70 percent by 2030, short sea remains constant at 16 percent, and the balance equates to empty container movements.

Figure 4.2: UK National Deep-Sea and Short-Sea Trade (TEU 000)



Source: DfT Data, Consultants estimates

4.3.2 Humber and Humber Ports

The core target market for the SHG Project would be the immediate areas bordering the Humber Estuary. In geographical terms this would be described as the East Riding of Yorkshire, Kingston upon Hull, extending southward to North and North East Lincolnshire. This area would also be described in political boundaries as the Humber and Humber Port City Region (HHPCR). Its primary economic characteristics are presented in Table 4.1, together with its contribution towards the broader Yorkshire and Humber region.

Table 4.1: Regional Economic Activity

Table Heading Left	Unit	Humber & Humber Ports	Yorkshire & Humber	H&HP Share of Yorkshire and Humber (Percent)
Population	000	912	5,300	17
Gross Value Added (GVA)	£ (Billion)	14.5	89.5	16.2
GVA per head	£	15,835	16,670	95
GVA sector contribution: (2009)	Percent			
Agriculture		1.8	1.1	29
Production		27.7	18.0	26
Construction		11.2	7.0	27
Distribution, transportation		21.4	22.6	16
Business services & finance		15.2	26.6	10
Other services		22.3	24.7	16

Source: NSO

The relative size of the HHPRC's population and GVA are unlikely to be able to provide the critical economic mass to be able to sustain the SHG Project its own right. Its resident inhabitants of 0.9 million and GVA of £14.5 billion representing approximately only 1.5 percent of National population and GVA respectively, with a GVA per head lower than the broader regional mean. However, it makes a significant contribution towards the broader Yorkshire and Humber Regional economy.

The economic contribution of HHPCR is further weakened due to the physical presence of the Humber Estuary. This natural barrier dividing the region into a North and South Bank components, with restricted trade and work migration between the areas. As a consequence the more dominant North Bank, centred around Kingston upon Hull, and accounting for two thirds of the population and GVA, is isolated away from the SHG location.

With regard to the South Bank, Grimsby and Scunthorpe, the two primary urban centres, generate limited economic activity, both in terms of scale or sector diversity. Their aggregate population of just over 0.2 million being largely orientated towards local employment, typically in traditional lower value adding sectors. This includes fishery processing related to the former town, and the strong presence of Corus Steel, and associated metal manufacturing based upon Scunthorpe.

Looking to the future the historic strong presence of Humber ports, and associated logistics clusters, provides a recognised focus for regional economic development. In particular their presence is highly supportive of the traditional manufacturing sectors, which have an above average presence in the region. An estimated 60,000 jobs existing within this sector, with notable presence across metal and engineering, chemicals, food processing, construction and refining. These sectors' focus upon intermediate products may provide a greater support for integrated intra-European supply chains processes. Details of companies and employment are presented in Table 4.2.

Conversely, weakness related to distribution (retail and wholesale) and business services, including the financial sector, may limit the case for consumer based import demand. It may be speculated that this may hinder the attractiveness of the region as centre for consumer based products; these being sourced from central UK RDC.

Table 4.2: Hull and Hull Port Region – Primary Industries

Sector	Companies (Number)	Employment (Staff number)
Metals and engineering	200	14,000
Chemical	88	9,000
Food and beverages	600	12,500
Construction	550	9,000
Energy & refineries	119	4,000
Total	1,557	48,500

Source: HHP data

4.3.3 Regional Yorkshire Market

The SHG Project needs to extend its market hinterland beyond the immediate HHPRC area. The regional Yorkshire market provides the first obvious extension, covering North, South and West Yorkshire, extending from York through to Sheffield. Details of the primary economic characteristics of this region are presented in Table 4.3.

This market comprises some 4.2 million residents, representing 7 percent of the UK's population; including the presence of significant urban centres: Leeds and Bradford with 1.3 million combined inhabitants and Sheffield with 0.5 million people. These centres being supported by a range of smaller towns, including Doncaster, Rotherham, and Barnsley, each with around 250,000 residents.

The combined regional GVA equates to £75 billion, equivalent to almost 6 percent of National economic activity, though the GVA per head remains significantly below the UK mean. Key economic drivers relate to the two primary urban conurbations: Leeds City Region, and Sheffield City Region.

- **Leeds City Region** – an urban centre accommodating 2.9 million residents, maintaining 1.3 million jobs within 100,000 local businesses, and creating £50 billion GVA. The latter being almost 60 percent of the Yorkshire and Humber's regional GVA, reflective of strong presence of business services and finance, plus retail distribution, and historic presence in non-metallic metals, food and beverages, chemicals, pulp and paper, and timber; and
- **Sheffield City Region -** a southern economic hub, accommodating almost 1.8 million residents, with 52,000 businesses, generating £25 billion GVA. As a region it maintains a higher orientation towards manufacturing, 13 percent of GVA, notably advanced engineering and materials, transport equipment, plastics, plus strong retail distribution centres upon the Meadowhall Centre.

Table 4.3: Yorkshire Regional Market – Economic Activity

Table Heading Left	Unit	North Yorkshire	South Yorkshire	West Yorkshire
Population	000	797	1,300	2,100
Population share of UK	Percent	1.3	2.1	3.4
GVA	£ Billion	14.4	20.4	40.2
GVA share of UK		1.1	1.6	3.1
GVA per head	£	18,248	15,590	18,223
GVA per head/UK	Percent	86	74	86
GVA Sector Distribution (2009)	Percent			
Agriculture		3.1	0.4	0.4
Production		15.2	15.6	16.3
Construction		6.8	8.5	6.3
Distribution and Transport		25.2	27.3	21.9
Business services & finance		25.7	24.9	31.6
Others		23.9	27.9	23.5

Source: NSO

4.3.4 North West and North East Regions

Westward extension of the SHG Project's market hinterland would promote a presence in the North West Region, notably: Greater Manchester City Region; and Liverpool City Region. However, the geographical extension of these regions in terms of the relative distance from the Humber Estuary, versus alternative supply chain gateways, including Liverpool, would be a greater challenge. Details of the economic characteristics of the North West are provided in Table 4.4.

The North West regional market offers access to 6.9 million people, around eleven percent of the UK population. Its economic activities generate a GVA of £121 billion, equivalent to almost ten percent of the UK, a third of which is accounted for by the Greater Manchester City Region. This region being characterised by significant, though weakening presence in manufacturing, notably historic strengths in

textiles, food and beverages, and logistics. The service sector, related to business and financial, retail, heath and education are of increasing importance.

Liverpool City Region represents a market of around 1.4 million residents, generating a GVA of almost £20 billion. The latter retaining strong links to traditional engineering, notably automotive components, aerospace, chemicals, and food and beverage manufacturing.

The North East Region offers a target market of 2.6 million residents and a GVA of £41 billion, representing four percent and three percent of UK total respectively. Whilst it offers a potential target market having a geographical advantage versus southern gateway access, it lies within the hinterland of competing Teesport.

Table 4.4: North West and North East Regional Economic Activity

Item	Unit	Greater Manchester	Merseyside	North West	North West Share of UK (Percentage)	North East
Population	000	2,600	1,400	6,900	11.1	2,600
GVA	£ Million	47,722	19,846	121,015	9.6	40,988
GVA per head	£	18,847	14,698	17,604	83	15,945
GVA Sector Distribution (2009)	Percent					
Agriculture		0.2	0.3	0.6	8.0	0.7
Production		12.9	13.0	17.5	12.0	19.4
Construction		7.3	6.5	6.8	10.2	7.3
Distribution & transportation		23.7	21.3	22.5	9.9	20.0
Business services & finance		32.7	27.2	28.5	8.2	24.5
Others		23.3	31.7	24.1	9.7	28.1

Source: NSO

4.3.5 Peripheral regions

The above regions are markets for which the Project is viewed as having a prospective competitive position versus alternative supply chain options. Beyond these markets there are UK regions where significant economic activity occurs, most notably within the East and West Midlands, plus Scotland, where the Project's offering is viewed as being constrained by competing supply chains or distance. This is not to say that targeted opportunities may not arise, notably niche services to selected key shipping accounts.

In overall terms the West and East Midlands represent a significant regional market of around 9.8 million inhabitants, equating to almost 16 percent of the UK total. It has a diverse economic base that generates a GVA of £173 billion or 13 percent of the UK total, largely centred around a very strong presence in manufacturing, notably engineering, retail and distribution, and the business sector.

The Scottish market has a regional population of 5.2 million people, or eight percent of the UK population. Its regional GVA stands at £102 billion or eight percent of the national market, centred largely around Glasgow, Edinburgh, and Aberdeen. Its GVA per head is around 98 percent of the national average, though this is distorted by the presence of the offshore energy sector's contribution.

Other regions of the UK, notably London, the South East, South West, Eastern England, Wales and Northern Island are not viewed as perspective target markets. This is reflective of their relative geographical locations with regard to existing and prospective southern UK gateway ports. As a consequence approximately 60 percent of the UK National market, in GVA terms, is deemed to be outside the competitive scope of the SHG Project.

Table 4.5: Peripheral Regions

Item	Unit	East Midlands	West Midlands	Midlands Regions Share of UK	Scotland
Population	000	4,500	5,300	16	5,200
GVA	£ Billion	79.3	93.8	13	102.6
GVA per head	£	17,914	17,335	-	19,977
GVA Sector Contribution	Percent				
Agriculture		1.3	1.0	20	1.1
Production		20.0	17.1	18	17.3
Construction		7.4	7.0	15	7.2
Distribution & transportation		23.6	23.3	15	20.3
Business services & finance		25.2	27.4	11	28.6
Others		22.7	24.2	14	26.4

Source: NSO

4.4 Humber Estuary container trade prospect

The SHG Project's prospective container throughput will depend upon the overall trade demand within the defined market areas, and its ability of Humber Ports to compete in these regions with alternative supply chains. In developing the trade forecast a range of assumptions have been incorporated; these assumptions are presented below, whilst the specific data inputs and outputs are shown in Table 4.6:

- SHG Project is presumed to open in 2013;
- The region's share of UK national trade is reflective of it GVA proportion of the national economy;
- Imports are adjusted to reflect regional economies perceived over or under weighting with regard to personal consumption. This adjustment being reflective of variance in GVA per head versus the national average;
- Exports are adjusted to reflect over or under weighting with regard to regional GVA productive sectors contribution versus the service sectors;
- Empty container movements are presumed to reflect the balance of the regional import and export flows; and
- Humber Port trade share factor, reflecting the perceived competitiveness of this route versus alternative supply chain options.

Table 4.6: Humber Port's Regional Competitiveness

Item	Unit	2009	2013	2020	2030
Humber and Humber Ports					
Share of UK GVA	Percent	1.2	1.2	1.2	1.2
Import adjustment	Percent	-3	-3	-3	-3
Export adjustment	Percent	+5	+5	+5	+5
Gross regional trade	TEU (000)	78	87	109	148
Humber Ports share	Percent	50	53	65	65
Humber Ports trade	TEU (000)	39	46	71	96
Yorkshire Region					
Share of IK GVA	Percent	6	6	6	6
Import adjustment	Percent	-2	-2	-2	-2
Export adjustment	Percent	+5	+5	+5	+5
Gross regional trade	TEU (000)	393	439	550	746
Humber Ports share	Percent	30	33	40	40
Humber Ports trade	TEU (000)	118	145	220	299
North West					
Share of UK GVA	Percent	9.6	9.6	9.6	9.6
Import adjustment	Percent	+2	+2	+2	+2
Export adjustment	Percent	-3	-3	-3	-3
Gross regional trade	TEU (000)	654	731	915	1,243
Humber Port share	Percent	10	12	15	15
Humber Port trade	TEU (000)	65	88	137	186
North East					
Share of UK GVA	3.3	3.3	3.3	3.3	3.3
Import adjustment	-3	-3	-3	-3	-3
Export adjustment	+5	+5	+5	+5	+5
Gross regional trade	TEU (000)	214	239	299	406
Humber Port share	Percent	30	31	35	35
Humber Port trade	TEU(000)	64	74	104	142
Peripheral areas					
Share of UK GVA	22	22	22	22	22
Import adjustment	+3	+3	+3	+3	+3
Export adjustment	+3	+3	+3	+3	+3
Gross regional trade	TEU (000)	1,514	1,620	2.118	2,876
Humber Port share	Percent	76	102	169	230

Source: Consultants estimates

The overall outcome of the above trade projection process is presented in Table 4.7; plus graphic images of Humber Estuary throughput in Figure 4.3, and SHG Project's throughput in Figure 4.4. In overall terms the region's container throughput is presumed to rise from 362,000 TEU in 2009 to 454,000 TEU in 2013, the presumed opening date for the SHG Project. Thereafter the trade throughput rises to 702,000 TEU in 2020 and 953,000 TEU by 2030. These projections equate the Humber Ports increasing their share of the

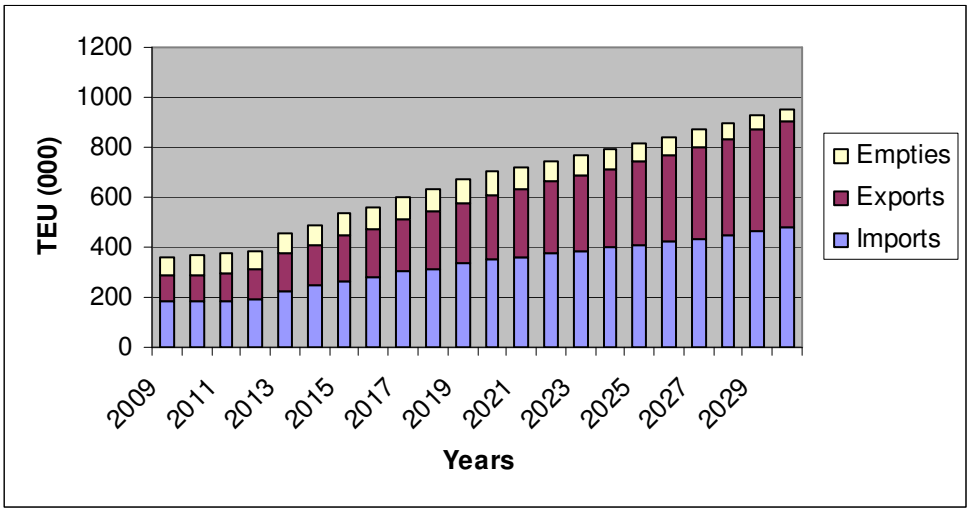
targeted hinterland's trade from 13 percent at present to 18 percent by 2020 and beyond. From a national perspective the Humber Ports are presumed to raise their share of total container trade from 5.3 percent at present to 6 percent in 2013, and around 7.5 percent from 2020 onwards. These projections therefore presume that the SHG will become a medium size player within its defined regional markets; however, the desire for direct UK calls and minimal trade deviation will continue to maintain the dominance of southern gateway ports.

Table 4.7: Humber Ports and SHG Project Container Throughput Projections

Table Heading Left	Units	2009	2013	2020	2030
Humber Ports	TEU (000)	362	454	702	953
Defined market region	TEU (000)	2,852	3,188	3,991	5,420
Humber port market share	Percent	13	14	18	18
SHG Project - Humber market	Percent	-	30	70	70
SHG Project - Trade	TEU (000)	-	136	491	667

Source: Consultants estimates

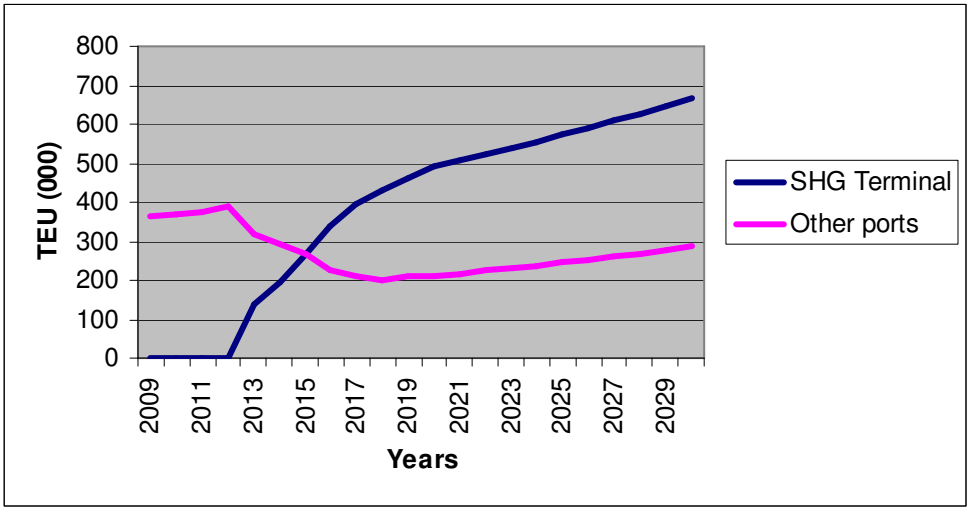
Figure 4.3: Humber Ports Regional Container Throughput Projection (TEU 000)



Source: Consultants estimates

A range of existing container terminals exist on the Humber Estuary, notably in Hull and Immingham. Their primary physical characteristics constraining their ability to handle the introduction of larger regional container vessels; thereby providing the opportunity for the SHG Project to establish a presence. It is presumed that the SHG Project will gain an initial market share of around 30 percent of the Humber Estuary regional traffic on its opening in 2013, building up to 70 percent by 2020 and beyond. These percentages being reflected in container volumes of 136,000 TEU in 2013, 491,000 TEU by 2020 and 667,000 TEU by 2030.

Figure 4.4: SHG Project Container Throughput Projection (TEU 000)



Source: Consultants estimates

5. Regional container port requirements

5.1 Introduction

The SHG Project rests upon the premise that a new regional container terminal would provide a competitive offering for shippers and receivers located in its defined market hinterland. This Chapter sets outs the primary requirements that these client groups would be looking for within a new facility, followed by an analysis of the existing technical port service offerings within Humber Ports. It concludes by providing an analysis of the suitability of the current offering versus user requirements, and thus the prospective justification for the SHG Project.

5.2 Prospective market requirements

5.2.1 Regional shippers and receiver's goals

Chapter 4's evaluation of the prospective market indicates that the immediate Humber and Humber Port hinterland is unlikely to provide adequate demand on its own to sustain the SHG Project. Therefore the SHG Project needs to extend its geographical coverage into the Yorkshire, North West, and North East regions, plus peripheral areas beyond this core area.

Within its prospective hinterland the SHG Project needs to support inbound and outbound supply chains, promoting the competitiveness of shipped products to key intermediate or final consumers. Such competitiveness being measured in terms of various attributes:

- Service delivery reliability;
- Flexibility and adaptation to changing market circumstances;
- Through transport costs;
- Security and safety; and
- Broader sustainability issues.

The relative importance of different attributes varies between the individual shippers, receivers and transport service providers within the supply chains. Thus those involved in direct delivery to the point of sale or production line may rank service reliability the highest; their alternative being an out of stock position. Others that are shipping to inventory or buffer stock may be more concerned with the overall unit cost of delivery.

5.2.2 Key user requirements

Building upon the perceived primary shippers and receivers goals, the SHG Project needs to address the following service requirements:

- Minimise through transport time between ARA or southern UK transhipment ports and the final point of destination or origin within the defined hinterland;
- Minimise the risks of variability in the delivery and service times, thereby supporting reliability within the overall transport system; and
- Provide competitive through transport costs between ARA or southern UK transhipment ports and the final point of destination or origin.

Achieving the above primary requirements is likely to require attention to the integration of the overall supply chain in terms of:

- 24 hour seven day a week operation;

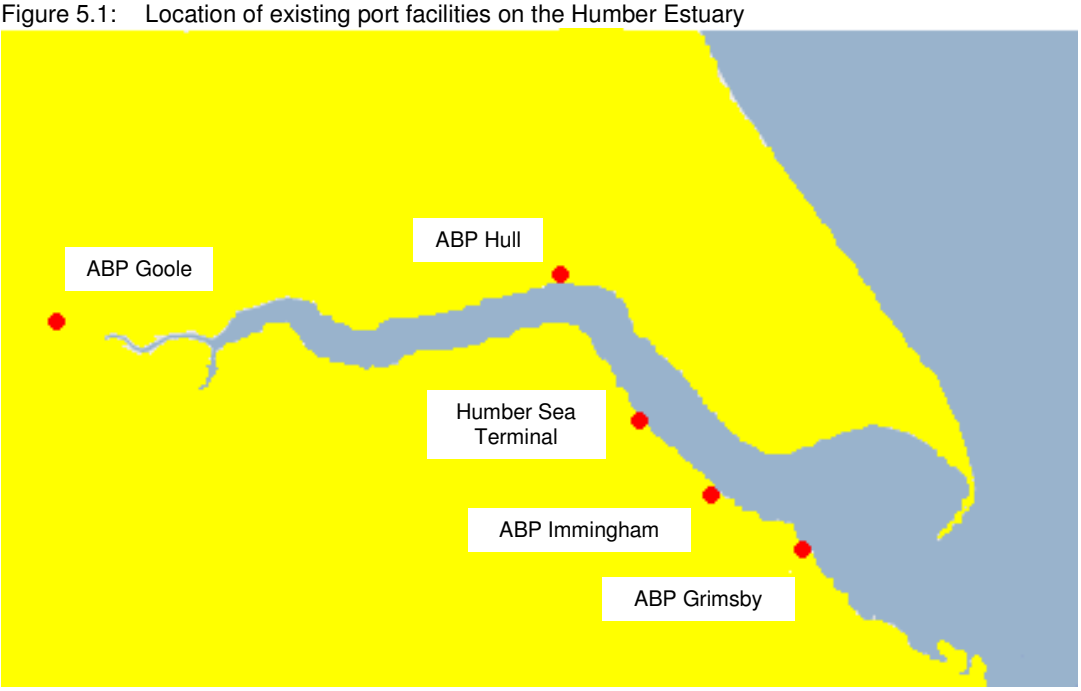
- Marine access channels to provide all-state of the tide depth provision to support regular scheduled feeder vessel arrival patterns, plus an ability to handle larger vessels with the support of tidal windows;
- Multiple berth provision to enable a range of alternative northern European and UK shipping services to be accommodated simultaneously;
- High container quay handling productivity, with equipment appropriate to the size and number of ships;
- Container yard configuration and equipment that is conducive to rapid box throughput, rather than extended storage periods;
- Close integration with established rail and prospective barge intermodal services in a manner that provides effective exchange;
- Effective landside access gate configuration to minimise arrival-departure road haulage delays;
- Integrated transportation communication system to provide appropriate terminal management control, and inter-linkage of internal and external stakeholders;
- Established management and labour force, with the appropriate skills and experience to deliver operational requirements;
- Co-ordinated linkage with logistics centre, thereby enabling the provision of value added logistics services; and
- Integration of external private and public stakeholders responsible for the provision of third party marine, agency, haulage and storage services; plus UK border agency responsibilities.

5.3 Current Humber port offering

5.3.1 Existing port technical facilities

At present there are five major ports operating within the River Humber as shown on Figure 5.1. Each of the facilities is briefly described in the following paragraphs.

Figure 5.1: Location of existing port facilities on the Humber Estuary

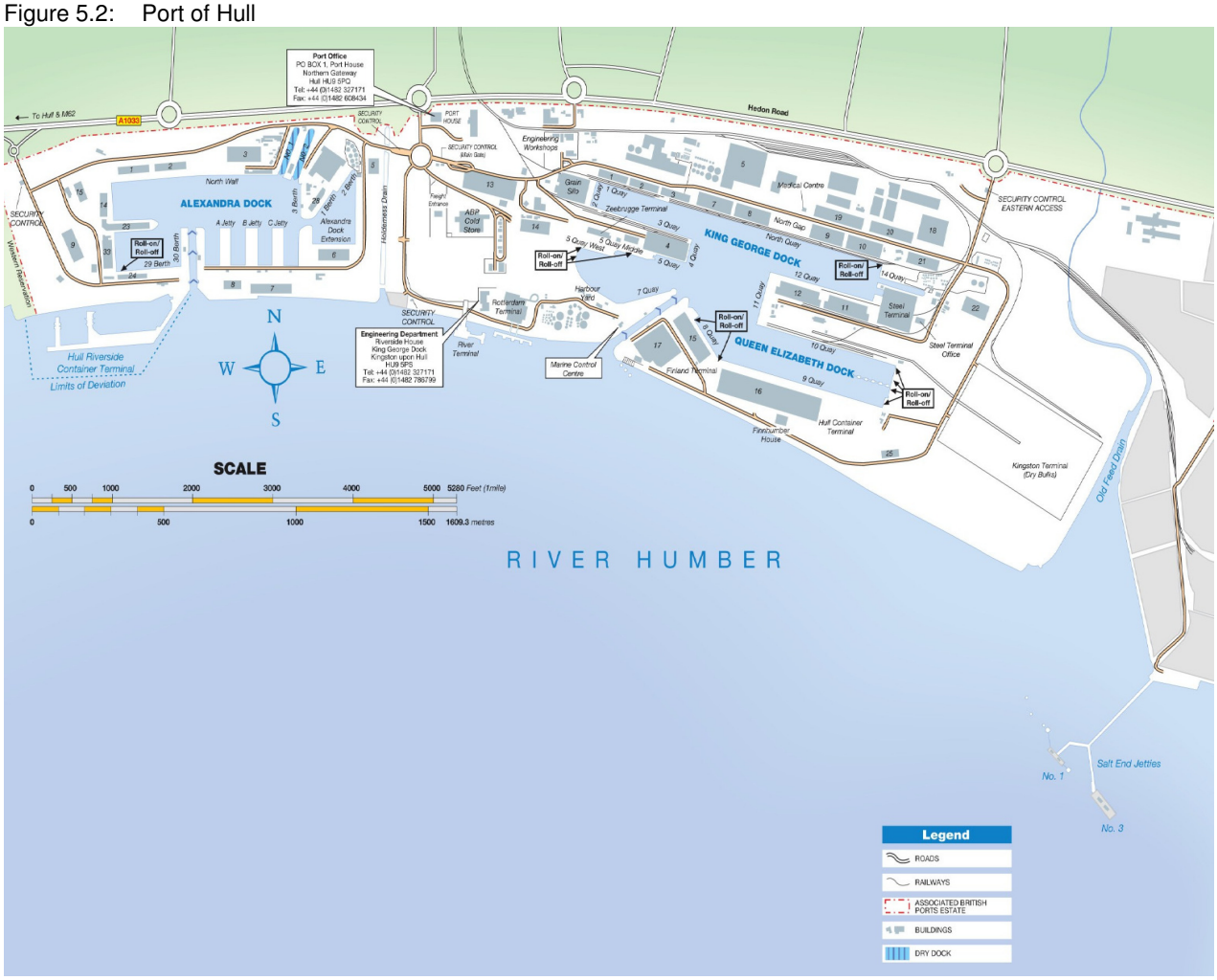


5.3.1.1 ABP Hull

Overview and Location

The Port of Hull is owned and operated by Associated British Ports. It is located on the north bank of the River Humber estuary, where it meets the River Hull, approximately 35 kilometres from the North Sea. It is one of the UK's main foreign-trading ports with regular short-sea connections to main land Europe, Scandinavia and the Baltic states. The layout of the port is shown in Figure 5.2.

Figure 5.2: Port of Hull



Source: www.abports.co.uk

Connectivity

The Port of Hull is a port facility with good intermodal links, as demonstrated by:

- Provision of deepwater berths for vessels of up to 10.4 metres draught;
- Located within 35 kilometres from the North Sea;
- Good road links to the UK motorway network (M62, M18, M1);
- Good connections to the UK waterway network at Goole; and
- Located close (30 minutes drive) to Humberside International Airport.

However, there are recognised weaknesses related to the immediate urban road system surrounding the port reflected in traffic conflicts between port freight movements and the local community.

Markets

The following markets are currently serviced by the Port of Hull:

- Containers: Container traffic is primarily handled at Queen Elizabeth Dock by Hull Container Terminal, which handles around 260,000 TEU per year. Containers are also handled in Alexandra Dock;
- Dry bulks: Including aggregates, agribulks, cement, chemicals, coal, coal products, cocoa, grain and scrap metal;
- Steel and other metals;
- Paper and forest products;
- Fresh produce and perishables, including fish handling facilities;
- General cargo;
- Liquid bulks: Including acetic acid, edible oils, petroleum products and molasses;
- Passengers and cruises, including daily sailing to Rotterdam and Zeebrugge; and
- Ro-Ro.

Quayside facilities

The Port of Hull has approximately 13 kilometres of quay, including 12 RoRo berths. 11 of these RoRo berths are within the enclosed dock system; 1 at Alexandra Dock and 10 at the King George and Queen Elizabeth Docks. The remaining RoRo berth is located on the riverfront.

The impounded berths vary in depth from 6.5m to 11.3m, with the tidal berths varying from 4.8m to 9.8m. Full details of the berths and the corresponding maximum allowable vessels are provided in Table 5.1.

Table 5.1: Berthing Information: Port of Hull

Dock/Quay	Quay Details		Maximum Size of Vessel			
	Length (m)	Water Depth (m)	Length (m)	Beam (m)	Draught (m)	DWT
Saltend Jetty No.1	-	9.8 (tidal)	214	40.0	10.4	45,000
Saltend Jetty No.3	-	9.8 (tidal)	214	40.0	10.4	40,000
King George & Queen Elizabeth Docks	5,069	11.3 (impounded)	199	25.5	10.4	34,000
River Terminal 1	-	7.0 (tidal)	215	32.0	6.5	12,000
Alexandra Dock	4,082	8.3	153	23.7	7.9	9,000
Alexandra Dock extension	-	8.3	122	19.7	7.9	6,000
Riverside Quay	325	4.8 (tidal)		30.0	4.5	4,500
Albert & Wm Wright Docks	3,453	6.5	122	22.0	7.0	5,000

Source: ABP Handbook 2009/2010

Landside Infrastructure

The Port of Hull's landside facilities include:

- A secure 17 acre container terminal with storage for all types of container, including refrigerated units and hazardous goods containers, and facilities for container repair;
- 17 hectares of storage for coal and other mineral bulks linked to the quayside via a covered conveyor;
- A 40,000 tonne storage facility for animal feed and other dry bulks linked by a direct conveyor;
- A 60,000 tonne capacity grain silo;
- 20,000 tonne storage capacity for cement;
- 70,000 square metres of covered storage for paper and forest products;
- A 24,000 cubic metre high-specification cold-storage facility for fresh produce and perishables, equipped with 9,000 pallet capacity as well as a further 56,000 cubic metre cold storage facility capable of handling over 1,000 pallets per day; and
- Storage facilities for general cargo incorporating over 40 transit sheds covering 230,000 square metres and 65 hectares of open storage.

Equipment

In addition to craneage available from private companies, the Port of Hull has a range of cargo handling equipment available, including:

- Hull Container Terminal: 3 - 45 tonne (under hook) ship-to-shore gantry cranes; 5 - 45 tonne reach stackers; and 2 - 35 tonne top lifters;
- King George and Queen Elizabeth Docks: 9 cranes varying in capacity from 6 to 15 tonnes; and 2 100tonne mobile harbour cranes;
- Alexandra Dock: 8 cranes varying in capacity from 6 to 10 tonnes; and
- Saltend Jetty: 4 hose handling cranes; 1 ammonia loading arm; 1 ETAC VAM hard arm; and 2 LDF / methanol hard arms.

Services

The port has a wide range of support industries, including stevedoring, marine engineering, waste reception facilities and ship repair, with both dry docking and wet berths available. Details of the dry docks are provided in Table 5.2.

Table 5.2: Dry Dock Facilities: Port of Hull

Dry Dock Facilities	Net Length (m)	Width of Dock at Cope (m)	Width of Entrance (m)	Depth of Water on Sill at MHWS (m)	Depth of Water on Sill at MHWN (m)
Alexandra Dock 1	139	24.6	17.2	5.4	3.9
Alexandra Dock 2	153	27.1	18.6	6.1	4.6
William Wright Dock	137	25.9	15.2	6.5	5.0

Source: ABP Handbook 2009/2010

Towage services are provided through Switzer Humber Ltd, John Dean Barge and Tug Services and SMS Towage Ltd.

Current Throughput

The main annual throughputs for the Port of Hull are summarised in Table 5.3.

Table 5.3: 2009 Cargo Volumes: Port of Hull (million tonnes)

Liquid Bulk	Dry Bulk	Other General Cargo	LoLo Containers	Roll-on Roll-off	Total
1.82	2.58	0.90	1.06	3.41	9.77

Source: www.dft.gov.uk

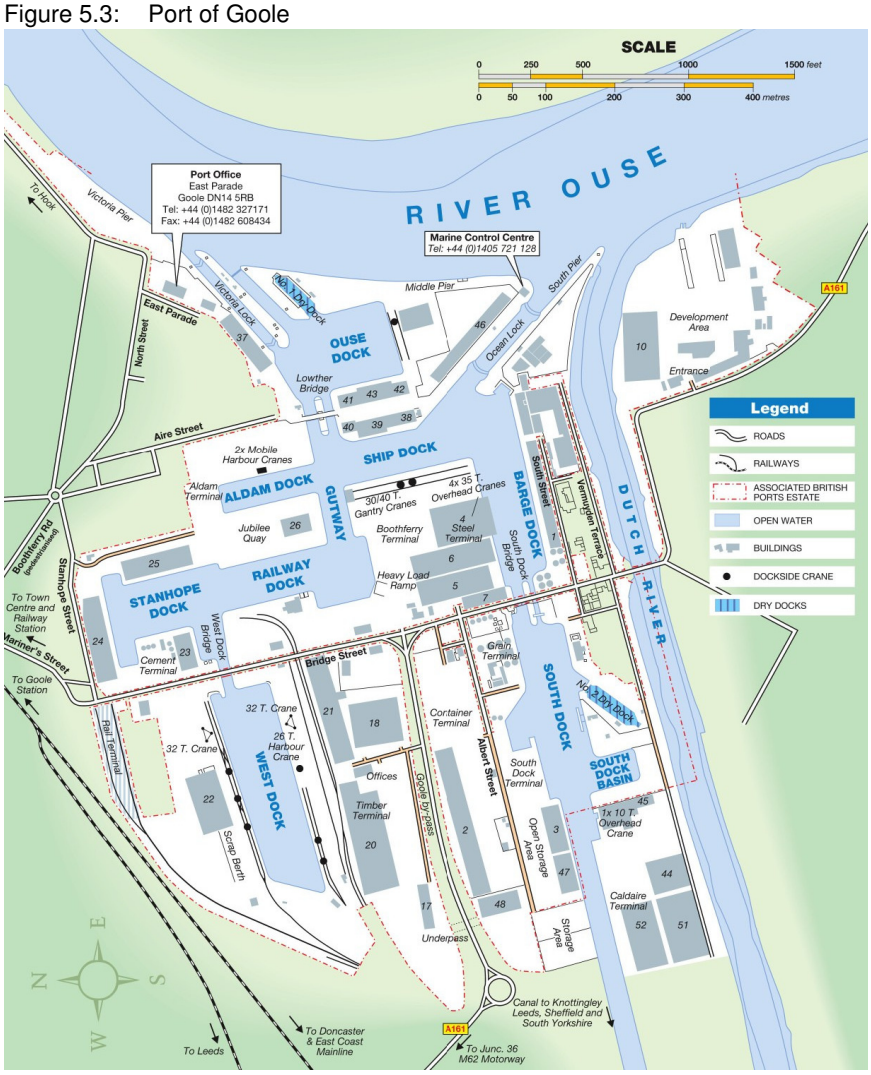
The port handled 93,000 containers (182,000 TEU) as LoLo freight and a further 215,000 units as RoRo freight in 2009 according to the Department of Transport's maritime statistics. In addition, the port handled 936,000 international short sea passenger movements in 2009.

5.3.1.2 ABP Goole

Overview and Location

The Port of Goole is owned and operated by Associated British Ports. It is located on the River Ouse, approximately 80 kilometres from the sea. It is one of the UK's main inland ports with good connections to the sea, road and rail network. The layout of the port is shown in Figure 5.3.

Figure 5.3: Port of Goole



Source: www.abports.co.uk

Connectivity

The Port of Goole is a port facility with good intermodal links, as demonstrated by:

- Sea access for vessels of up to 5.5 metres draught and 4,500 DWT;
- Located within 80 kilometres from the sea;
- Good road links to the UK motorway network (M62, M18, M1);
- Good connections to the UK waterway network; and
- Good rail connections.

Markets

The following markets are serviced by the Port of Goole:

- Containers;
- Dry bulks: Including agribulks, solid fuel, animal feed, timber, biomass, grain, cereals, fertilisers, construction materials, timber, clay products, cement, chemicals, and scrap metal;
- Forest products;
- General cargo;
- Liquid bulks; and
- Steel and other metals.

Quayside facilities

The Port of Goole has a large number of general and specialised cargo berths in 8 Nr basins within an impounded dock system, which is fed from the Aire and Calder canal, giving a constant dock water level. Details of the maximum allowable vessels are provided in Table 5.4.

Table 5.4: Berthing Information: Port of Goole

Dock/Quay	Maximum Size of Vessel			
	Length (m)	Beam (m)	Draught (m)	DWT
All	100	24.0	5.5	4,500

Source: ABP Handbook 2009/2010

Landside Infrastructure

The Port of Goole's landside facilities include:

- A 7 hectare site for handling containers, including a 3,850 square metre warehouse, 25,000 square metres of quayside open storage and a similar area of open storage, as well as other general cargo areas;
- A 3,000 square metre specialist bulk storage shed divided into permanent separate bays and a 1,900 square metre shed with an overhead crane for the handling and storage of steel and general cargo;
- Bulk storage sheds with 3,500 square metre and 3,200 square metre storage capacity;
- Grain and animal-feed silos with an overall capacity of 14,000 tonnes, with a bulk cargo storage shed of 6,000 square metres;
- A 1,300 square metre warehouse with a silo and weighbridge, for bulk chemicals and agribulks;
- A bulk cement silo with a capacity of 10,000 tonnes;
- A number of storage shed are available for forest products;
- 2 tank storage facilities for imported vegetable oils;

- A 6,000 square metre covered steel facility that allows ships to load and discharge in all weather conditions; and
- A dedicated rail freight terminal.

Equipment

In addition to craneage available from private companies, the Port of Goole has a range of cargo handling equipment available, including:

- 5 quayside cranes with a capacity varying from 7.5 to 8 tonnes;
- 2 gantry cranes with capacities of 30 and 40 tonnes;
- 3 mobile harbour cranes with capacities varying from 26 to 100 tonnes; and
- 1 - 32 tonne capacity Scotch Derrick crane.

Services

The port has a wide range of support industries, including stevedoring, marine engineering, waste reception facilities and dry docking.

The Port of Goole has two dry docks, the larger of which is 91m long by 15.2m wide. It also has specialised RoRo facilities capable of accommodating loads of up to 450 tonnes.

Towage services are provided through Acasters Water Transport.

Current Throughput

The main annual throughputs for the Port of Goole are provided in Table 5.5.

Table 5.5: 2009 Cargo Volumes: Port of Goole

Liquid Bulk	Dry Bulk	Other General Cargo	LoLo Containers	Roll-on Roll-off	Total
0.03	0.30	0.89	0.42	-	1.64

Notes: Million tonnes

Source: www.dft.gov.uk

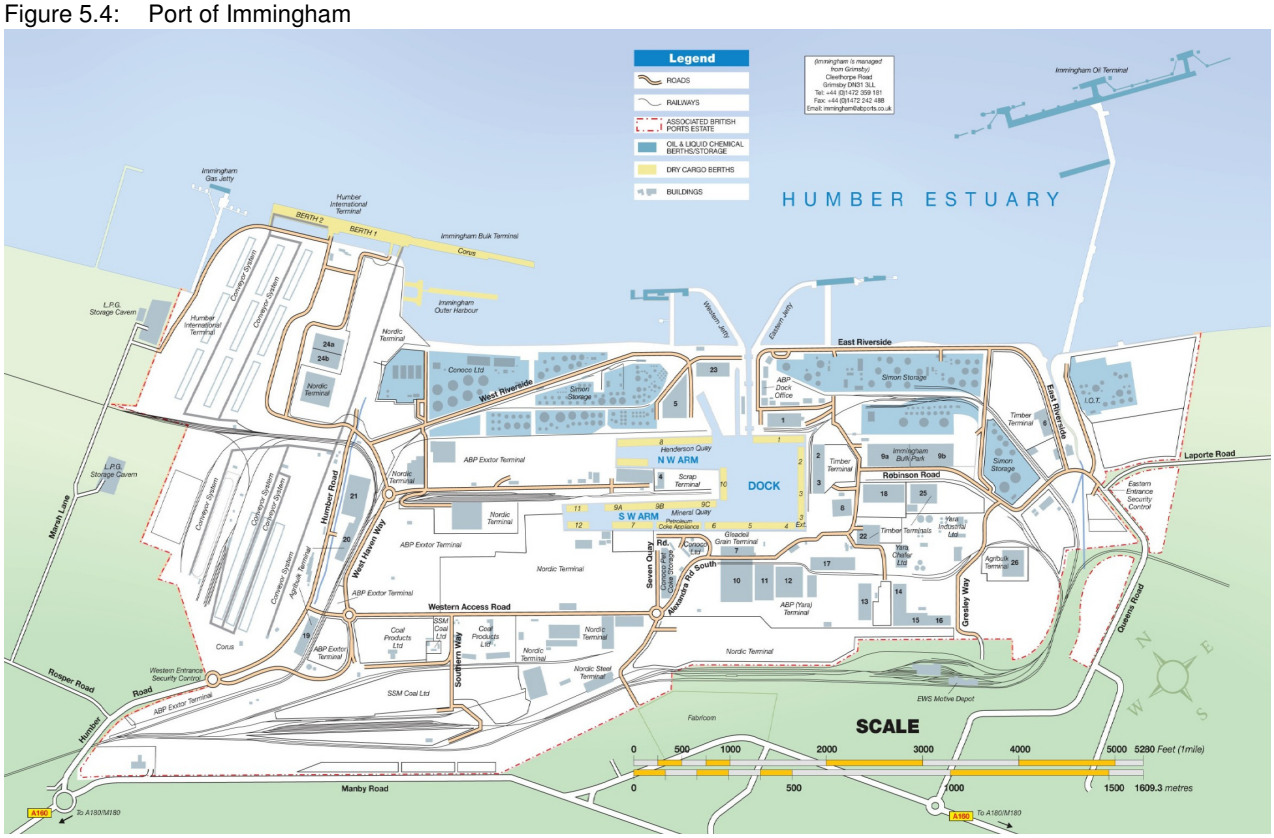
The port handled 28,000 containers (56,000 TEU) in 2009 according to the Department of Transport's maritime statistics.

5.3.1.3 ABP Immingham

Overview and Location

The Port of Immingham is owned and operated by Associated British Ports. It is located on the South bank of the River Humber and has extensive facilities located within an enclosed dock system as well as on specialised riverside berths. It is one of the UK's main ports with good connections to the sea, road and rail network. The layout of the port is shown in Figure 5.4.

Figure 5.4: Port of Immingham



Source: www.abports.co.uk

Connectivity

The Port of Immingham is a port facility with good intermodal links, as demonstrated by:

- Deep sea access;
- Good road links to the UK motorway network (M62, M18, M1, M180);
- Good rail connections; and
- Located close (20 minutes drive) to Humberside International Airport.

Markets

The following markets are serviced by the Port of Immingham:

- Containers;
- Dry bulks: Including coal, ilmenite, petroleum coke, titanium slag, ferrous alloys, pig iron and pyrites, iron ore, agribulks, animal feed, grain, biomass fuels;
- Forest products;
- Fresh produce and perishables;
- Steel;
- General cargo;
- Liquid bulks;
- Dry bulk mineral and ores; and
- RoRo.

Quayside facilities

The Port of Immingham has a large number of riverside berths and berths within an enclosed dock system. Details of the maximum allowable vessels are provided in Table 5.6.

Table 5.6: Berthing Information: Port of Immingham

Dock/Quay	Maximum Size of Vessel			
	Length (m)	Beam (m)	Draught (m)	DWT
Enclosed dock	198	26.2	10.4	38,000
Humber International Terminal	289	45.0	12.8 to 14.2	200,000
Eastern and Western Jetties	213	No restriction	10.4	50,000
Immingham Oil Terminal	366	No restriction	13.1	290,000
Immingham Bulk Terminal	303	45.0	14.0	200,000
Immingham Gas Jetty	280	No restriction	11.0	50,000
Immingham Outer Harbour	240	35.0	11.0	18,500

Source: ABP Handbook 2009/2010

Landside Infrastructure

The Port of Immingham's landside facilities include:

- The Nordic Terminal and the ABP Exxtor Terminal for handling dry and tank containers, including LoLo. Ro o berths and rail connections;
- Immingham Bulk Park, a dedicated bulk store complex close to the quayside, offering a range of value-added services, including specialist warehousing, bagging, blending, and 'rip and tip'. The facility includes 20,000 square metres of bulk warehousing and associated open storage areas;
- Extensive open and covered timber storage, timber-treatment facilities and specialist cargo-handling equipment;
- Facilities catering for heavy lift and out-of-gauge cargoes, supported by a range of purpose-built equipment, services and distribution options;
- 21 hectare RoRo terminal with three berths on the River Humber outside the Immingham Lock.
- In-dock RoRo facilities including two 4-berth terminals capable of handling up to eight vessels simultaneously. Both terminals are equipped with high-quality handling equipment and have extensive storage and reception areas;
- Humber International Terminal, which has over 10,000 square metres of general purpose warehousing and extensive open storage. Other facilities include:
  - Humber International Terminal 1, with vessels serviced by the terminal's 3 Nr 100 tonne capacity mobile harbour cranes. The terminal has good rail freight infrastructure and rail connections;
  - Humber International Terminal 2, which is a dedicated bulk-discharging facility with a capacity to handle over nine million tonnes annually. The terminal equipment includes two rail-mounted slewing cranes capable of free-digging in excess of 1,500 tonnes per hour and fully automated landside operations, including two stacker reclaimers, conveyor systems and rapid-loading rail bunkers;
- Immingham Bulk Terminal, which is leased to Corus and handles iron ore and coal for its Scunthorpe works;
- Immingham Oil Terminal, which is leased to Humber Oil Terminals Trustee Ltd, the terminal handles oils and spirits for local refineries;
- Eastern & Western Jetties, which handle oils, spirits and liquid chemicals and provide shore-based tank storage; and

- Immingham Gas Jetty, which handles primarily propane and butane via an underground storage cavern for Calor Gas and Conoco Phillips.

Equipment

In addition to craneage available from private companies, the Port of Immingham has a range of cargo handling equipment available, including:

- 14 - 100 tonne capacity mobile harbour cranes (one privately owned);
- 2 - 15 tonne electric grabbing cranes;
- 2 - 10 tonne electric cranes;
- 2 - 40 to 45 tonne ship-to-shore container gantry cranes;
- 2 - 40 to 60 tonne capacity mobile harbour cranes;
- One privately owned mobile grain loader; and
- Privately owned mobile cranes with a capacity in excess of 100 tonnes are available.

Services

The port has a wide range of support industries, including stevedoring, marine engineering, waste reception facilities and dry docking.

Towage services are provided through Svitzer and Specialist Marine Services Ltd.

Current Throughput

The main annual throughputs for the Ports of Grimsby and Immingham are reported together. These are provided in Table 5.7.

Table 5.7: 2009 Cargo Volumes: Port of Grimsby and Immingham

Liquid Bulk	Dry Bulk	Other General Cargo	LoLo Containers	Roll-on Roll-off	Total
21.11	18.73	1.01	0.98	12.88	54.71

Notes: Million tonnes

Source: www.dft.gov.uk

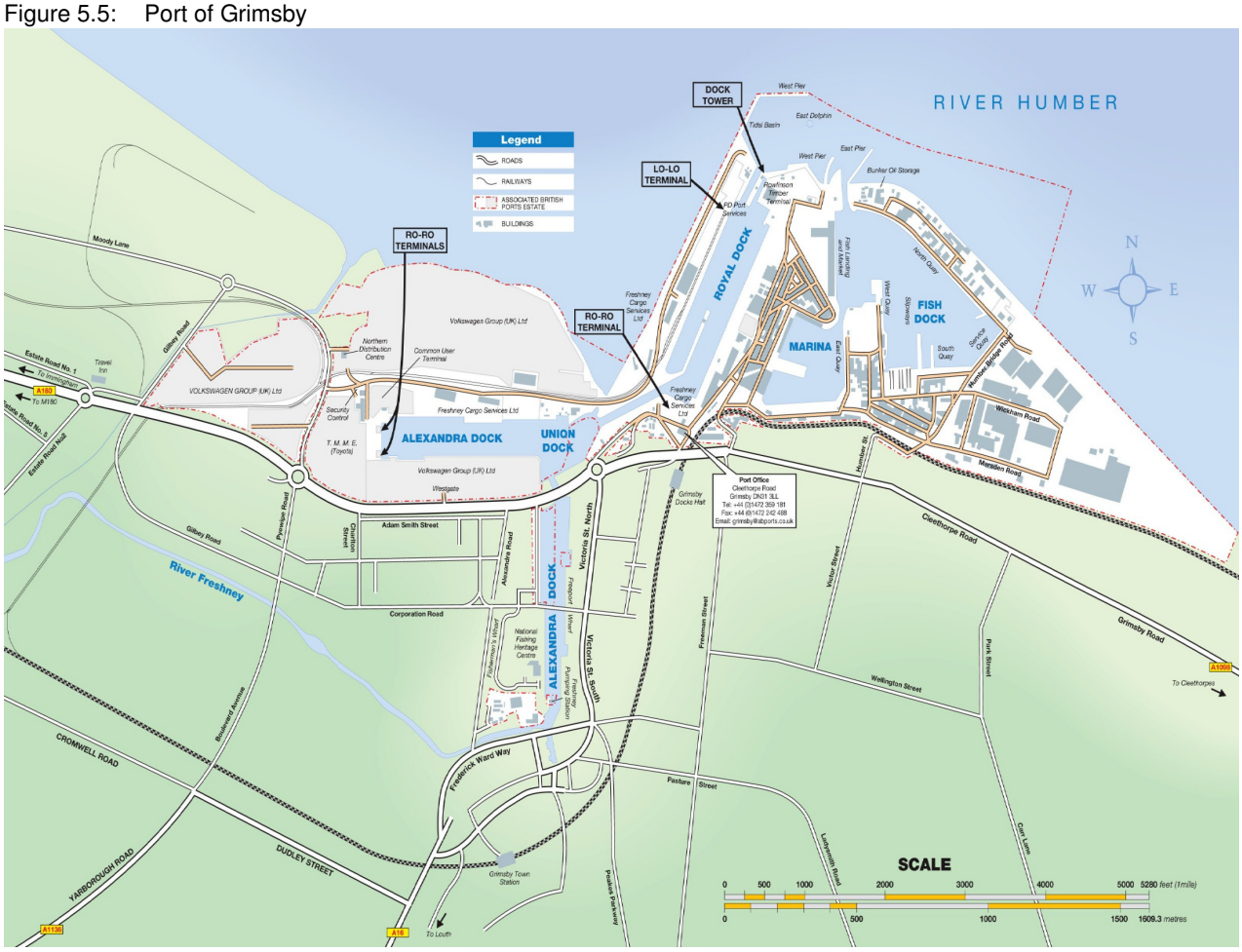
The port handled 76,000 containers (133,000 TEU) as LoLo freight and a further 664,000 units as RoRo freight in 2009 according to the Department of Transport's maritime statistics.

5.3.1.4 ABP Grimsby

Overview and Location

The Port of Grimsby is owned and operated by Associated British Ports. It is located on the River Humber, approximately 10 kilometres from the sea, with good connections to the sea, road and rail network. The layout of the port is shown in Figure 5.5.

Figure 5.5: Port of Grimsby



Source: www.abports.co.uk

Connectivity

The Port of Grimsby is a port facility with good intermodal links, as demonstrated by:

- Access for vessels of up to 5.8 metres draught and 6,000 DWT;
- Located within 10 kilometres of the North Sea;
- Good road links to the UK motorway network (M62, M18, M1, M180); and
- Good rail connections.

Markets

The following markets are serviced by the Port of Grimsby:

- Vehicles;
- Fresh produce and perishables;
- Dry bulks: Including grain and cement;
- Forest products;
- Steel;
- General cargo;
- RoRo; and

- Minerals and ores.

Quayside facilities

The Port of Grimsby has a large number of general and specialised cargo berths in six basins within an impounded dock. Details of the maximum allowable vessels are provided in Table 5.8.

Table 5.8: Berthing Information: Port of Grimsby

Dock/Quay	Maximum Size of Vessel			
	Length (m)	Beam (m)	Draught (m)	DWT
Commercial Docks	145	20.5	5.8	6,000
Fish Docks	73	12.8	5.8	-

Source: ABP Handbook 2009/2010

Landside Infrastructure

As well as general cargo handling facilities, the Port of Grimsby's landside facilities include:

- A fully modernised fish market handling some 30,000 tonnes of fresh fish each year;
- A market-leading vehicle-handling facility handling almost 400,000 vehicles each year; and
- A state-of-the-art car terminal offering pre-delivery inspection and accessory-fitting services, supported by 2 RoRo berths.

Equipment

The Port of Grimsby has a range of privately owned cargo handling equipment available, including mobile cranes, forklift trucks and mechanical shovel cranes. Privately owned mobile grain elevators are also available.

Services

The port has a wide range of support industries, including stevedoring, marine engineering, waste reception facilities and dry docking. Dry docking is available at the Grimsby Fish Docks slipways for vessels of up to 1,200 tonnes.

Towage services are provided through Grimsby Tugs, Svitzer and Specialist Marine Services Ltd.

Current Throughput

The main annual throughputs for the Port of Grimsby are reported with the Port of Immingham and are provided previously in Table 5.7.

5.3.1.5 Humber Sea Terminal

Overview and Location

The Humber Sea Terminal is owned and operated by Simon Ports. It comprises six purpose-built river berths, which are located on the south bank of the River Humber, approximately 25 kilometres from the North Sea. The layout of the port is shown in Figure 5.6.

Figure 5.6: Humber Sea Terminal

Source: www.simonports.co.uk

Connectivity

The Humber Sea Terminal is a port facility with good intermodal links, as demonstrated by:

- Deep sea access;
- Good road links to the UK motorway network (M62, M18, M1, M180);
- Good rail connections; and
- Located close (20 minutes drive) to Humberside International Airport.

Markets

The following markets are serviced by the Humber Sea Terminal:

- RoRo; and
- Cars.

Quayside facilities

The Humber Sea Terminal has six berths. Details of the maximum allowable vessels are provided in Table 5.9.

Table 5.9: Berthing Information: Humber Sea Terminal

Dock/Quay	Maximum Size of Vessel			
	Length (m)	Beam (m)	Draught (m)	DWT
Berths 1 to 6	200	30.0	8.5m	35,000

Source: Various sources

Landside Infrastructure

The Humber Sea Terminal's landside facilities include:

- 265 acres of freehold port development land; and
- Dedicated freight compounds for the handling and transit of RoRo related traffic, including trailers, containers and project cargoes.

Current Throughput

No throughput statistics are publicly available for the Humber Sea Terminal.

5.3.2 Planned port technical facilities

5.3.2.1 ABP Hull: Green Port Hull

ABP plan to construct a facility within the Port of Hull for Siemens Wind Power, for the manufacture, assembly, testing and shipment of infrastructure for the offshore wind power industry. The proposed development is known as Green Port Hull. A memorandum of understanding has been signed between the parties. However, a formal contract is still to be agreed.

An artist's impression of the planned facilities is shown in Figure 5.7.

Figure 5.7: ABP Green Port Hull Planned Facilities

Source: www.greenporthull.co.uk

The proposed development, totalling approximately 65 hectares (including marine areas), will occupy part of the existing Alexandra Dock complex. This includes the approximately 7.5 hectares of reclaimed land, already consented as a LoLo container terminal under The Associated British Ports (Hull) Harbour Revision Order 2006 (Statutory Instrument 2006 No. 1135). It is also proposed to infill part of the Alexandra Dock complex in order to create additional port operational land in connection with the shipping of wind turbine components.

The key elements of the proposed development include:

- A 35,000 m^2 factory for the production of wind turbine equipment, together with component storage areas, and associated welfare facilities;
- Approximately 4,000 m^2 of office space;
- A 500 m^2 vessel crew facility;
- A 1,500 m^2 warehouse facility for the storage of equipment used in the production and assembly of wind turbines together with suitable areas for vehicle refuelling and maintenance;
- Open areas for the storage and/or assembly of wind turbine components prior to and in preparation for shipping. These areas will comprise:
  - Existing port-related cargo storage areas within Alexandra Dock;
  - Partial infill of Alexandra Dock to create additional port operational land in connection with the shipping of wind turbine components;
  - Reclamation of approximately 7.5 hectares of land from the Humber Estuary (already consented for development as a LoLo container terminal under the Associated British Ports (Hull) Harbour Revision Order 2006).
- A 640 metre long quay (already consented for development as a LoLo container terminal under the Associated British Ports (Hull) Harbour Revision Order 2006);
- A berth pocket dredged to a maximum depth of 11.5 metres. Suitable reinforcement of the berth pocket will be required to accommodate the legs of jack-up installation vessels;
- Car parking areas;
- Associated infrastructure including internal roads for the movement of cargo and personnel, lighting, together with security fencing, and holding areas to enable in-bound vehicles to meet appropriate arrival slots;
- A 6 MW on-site wind turbine; and
- A concrete apron to be designated as a Helicopter Landing Site.

The envisaged timelines are provided in Table 5.10.

Table 5.10: Green Port Hull Proposed Timelines

Activity	Planned Timeline
Spring 2011	Planning application scoping report submission & public consultation
Summer 2011	Planning application submission
Autumn 2011	Consent & commercial agreement to be secured
2012-2013	Site construction
2014	Operational

Source: www.greenporthull.co.uk

5.3.2.2 ABP Hull: Hull Riverside Bulk Terminal

In March 2010, ABP Hull submitted a planning consent application for the construction of a new riverside dry bulk terminal required to support the development of new biomass power generation facilities by DONG Energy at the Port of Hull. In October 2010, DONG Energy decided not to proceed with the development of the biomass facility, with the subsequent deferment of the Hull Riverside Bulk Terminal. It is assumed that this project will be on hold pending the interest of another developer.

The proposed development comprised:

- A 350 metre berth catering for vessels of up to 12.2 metres draught; and
- Development of 70 acres onshore.

An artist's impression of the planned facilities is shown in Figure 5.8.

Figure 5.8: ABP Hull: Hull Riverside Bulk Terminal Planned Facilities

Source: www.abports.co.uk

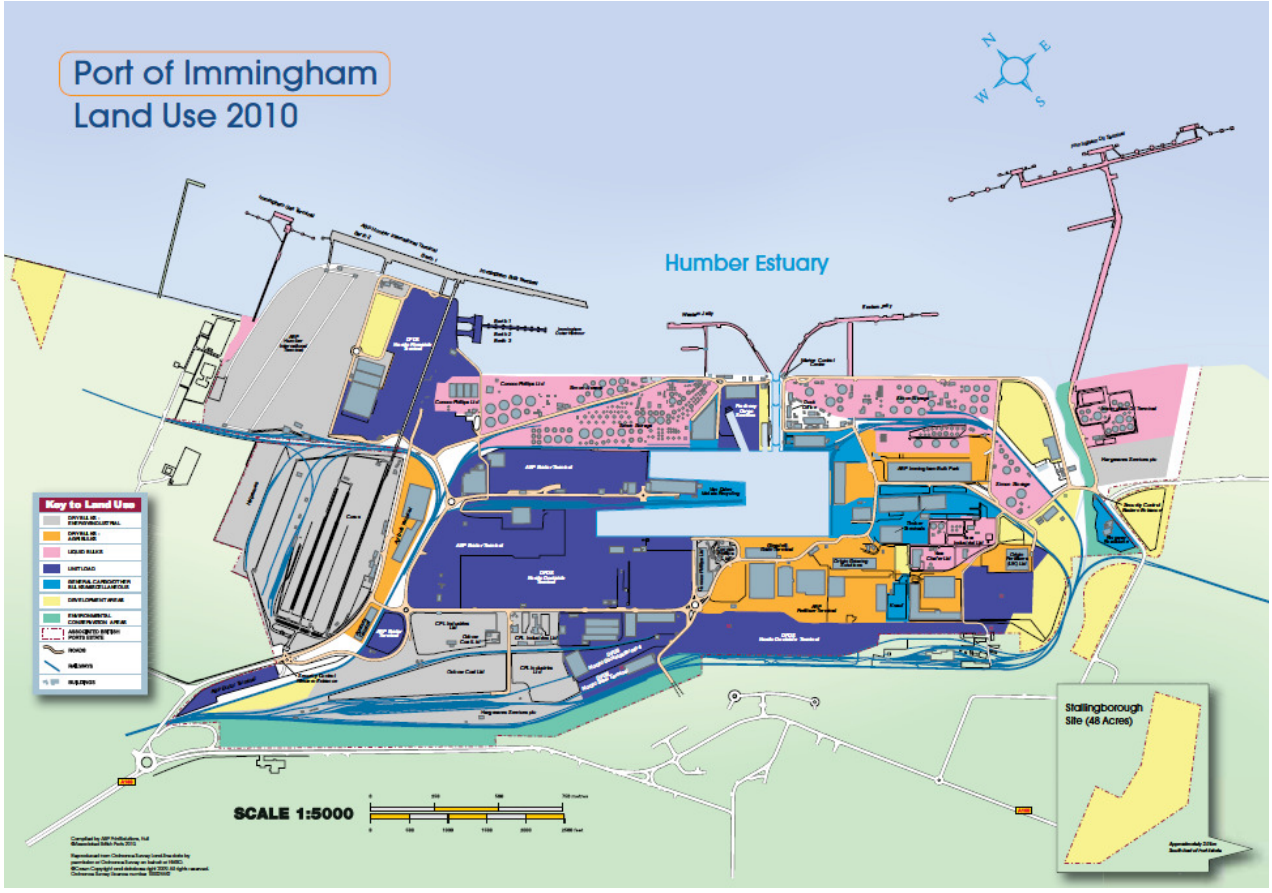
5.3.2.3 ABP Immingham: Master Plan

In 2010, ABP Immingham prepared a master plan for the Port of Immingham for the period 2010 to 2030. In brief, the objective of the master plan was to:

- Describe and explain the Port's strategic planning;
- Identify how land may be developed;
- Set out approximate timescales for development;
- Assist planning bodies and transport network providers in preparing development strategies; and
- Inform port users, employees and the local community.

The current land use for the Port of Immingham is shown in Figure 5.9.

Figure 5.9: ABP Immingham Current Land Use



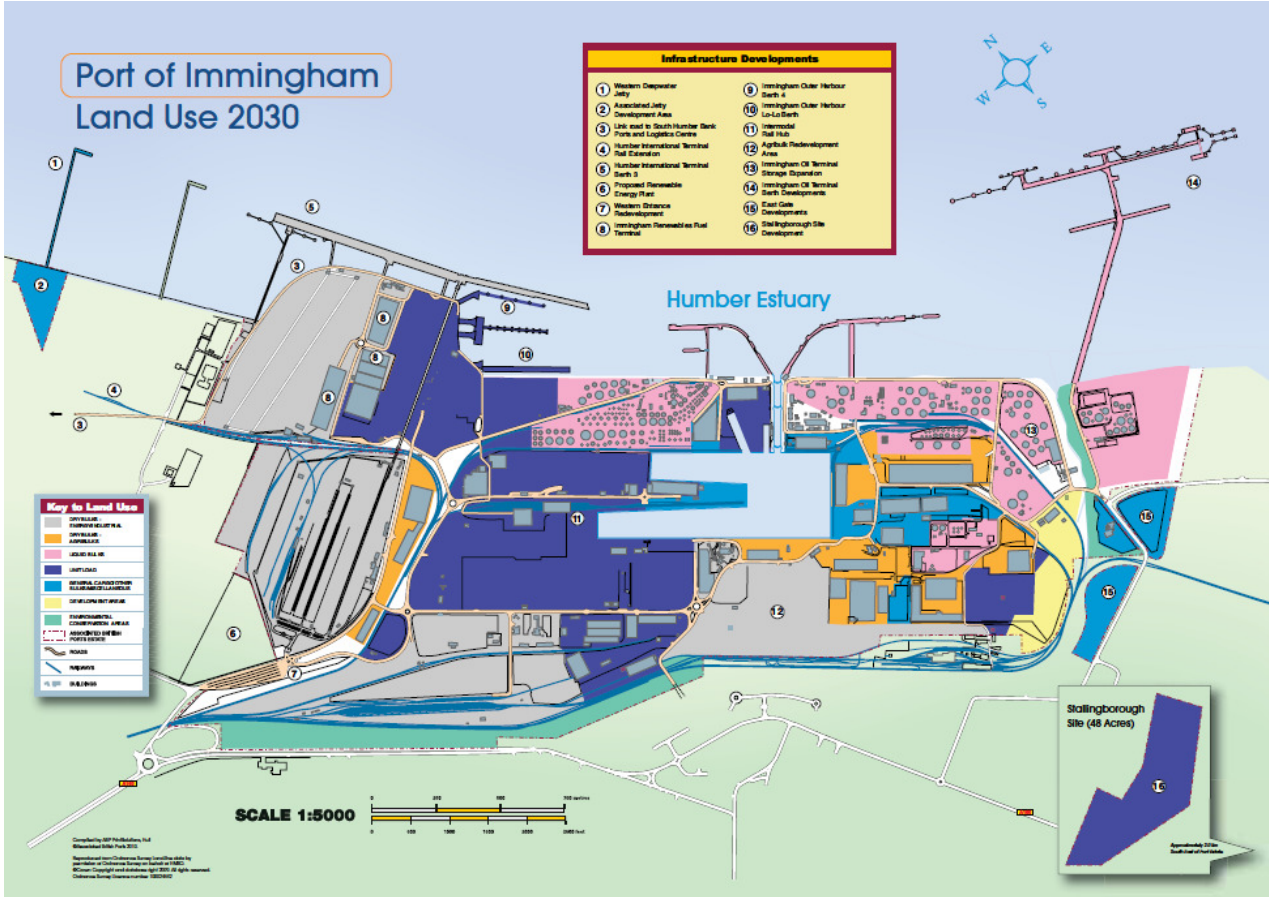
Source: www.abports.co.uk

The master plan states that the following major developments are likely to be taken forward at the Port during the period of the master plan:

- Immingham Renewable Fuels Terminal;
- ABP Humber International Terminal Rail Extension;
- ABP Humber International Terminal Berth 3;
- Agribulk Storage Developments – Expansion of Immingham Bulk Park;
- ABP Exxtor Terminal Redevelopment;
- Immingham Outer Harbour RoRo Berth 4;
- Sunk Dredged Channel Deepening;
- Immingham Oil Terminal Developments;
- Stallingborough Satellite Terminal;
- East Gate Development;
- West Gate Entrance Development;
- Immingham Outer Harbour LoLo Berth & Container Terminal; and
- Western Deepwater Jetty.

The potential land use for the Port of Immingham in 2030 is shown in Figure 5.9.

Figure 5.10: ABP Immingham Potential Land use in 2030



Source: www.abports.co.uk

5.3.2.4 ABP Grimsby: Riverside RoRo Berth

ABP Grimsby proposes to construct a RoRo berth on the River Humber outside the existing entrance to the Grimsby Docks to accommodate larger vessels, which are currently unable to enter the existing lock. Consent has recently been provided for the proposed works, which comprise:

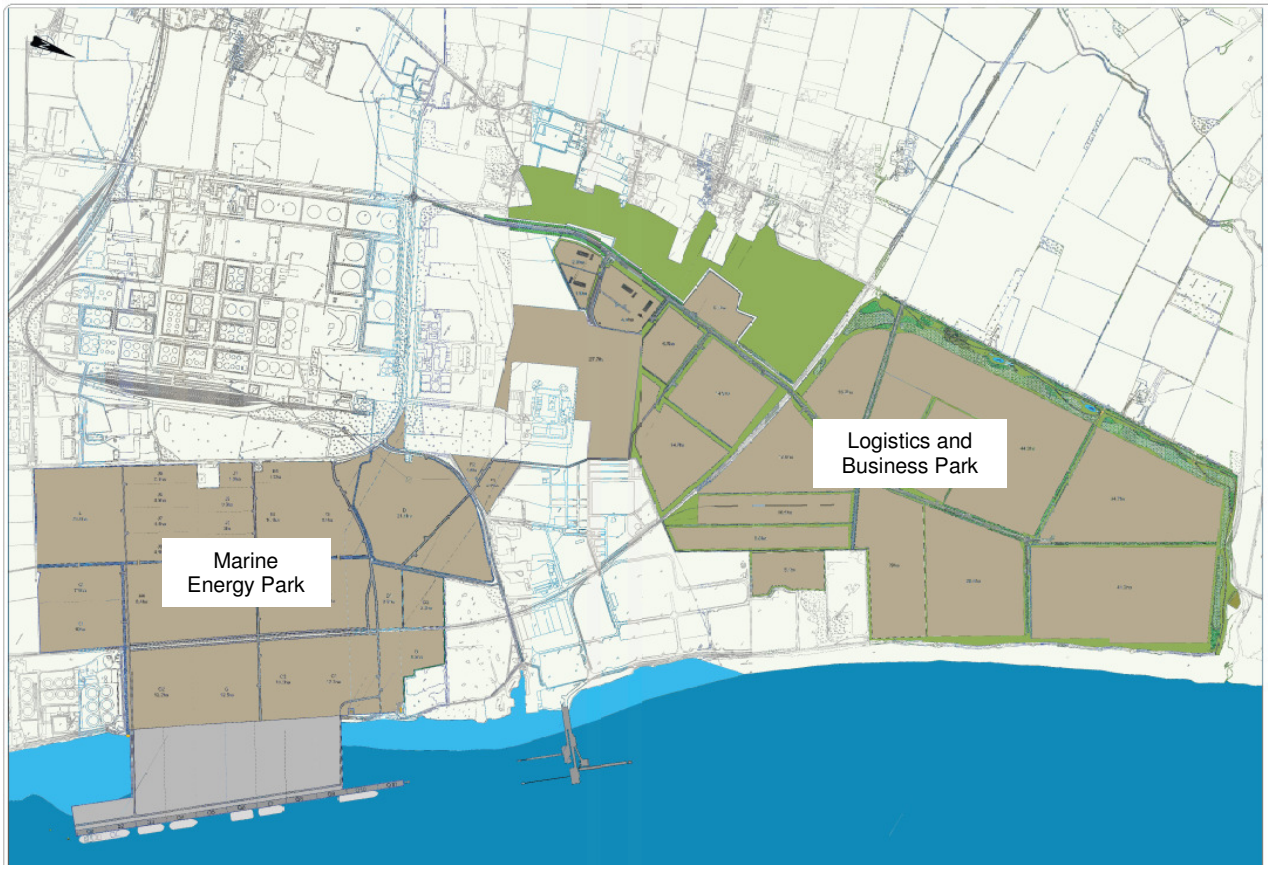
- A dredged berthing pocket to accommodate two vessels at any time, with a depth of -7.5m CD;
- Floating pontoon connected to the shore by a linkspan and roadway; and
- Access for vessels up to a draught of 7.1m.

5.3.2.5 ABLE Humber Port

ABLE UK is proposing to develop a combined Logistics and Business Park along with a Marine Energy Park on the south bank of the River Humber. The site of the proposed development is approximately 4 kilometres northwest of Immingham and approximately 11 kilometres northwest of Grimsby and comprises a total of 819 hectares and 4 kilometres of river frontage, with a proposed 1.6 km of quay.

The layout of the planned facilities is shown in Figure 5.11.

Figure 5.11: ABLE Humber Port Planned Facilities



Source: AMEP and Logistics Park Master plan (www.ablehumberport.com)

Marine Energy Park:

ABLE UK proposes to construct and operate a new quay with associated onshore facilities for the wind energy sector and a biomass power plant (collectively referred to as the ABLE Marine Energy Park or AMEP). The main components of the proposed development comprise:

- A new quay (approximately 1,630 metres long), generally accommodating vessels of up to 10 metres draught and a single berth for vessels of up to 13.5 metres draught;
- An approximate 55 hectares of reclamation within the Humber Estuary;
- Associated onshore facilities to accommodate wind turbine manufacture, assembly and installation; and
- A 299 MW biomass plant, with associated conveyors, fuel storage, cooling water system and an electricity substation.

The proposed development covers approximately 223 hectares and will comprise large industrial buildings for manufacturing and assembly of offshore wind turbines with extensive areas of open storage for component parts of the offshore turbine structures. Approximately 150,000 m^2 of manufacturing floor space is proposed as part of the development.

The currently envisaged timelines are provided in Table 5.11.

Table 5.11: ABLE Humber Port Timelines

Activity	Planned Timeline
Early 2012	Site construction
Early 2014	Operational

Source: Able UK Marine Energy Park (AMEP): South Humber Bank - Environmental Scoping Report

Logistics Park:
ABLE UK proposes to develop a 454 hectare logistics park as part of the ABLE Humber Port. Included in the proposals are:

- Warehousing, storage and distribution;
- Chilled and frozen logistics;
- Data centre and document storage;
- Commodities storage and distribution;
- New location vehicle storage; and
- Supporting services including a hotel and HGV park.

Business Park:
ABLE UK proposes to develop a new business park primarily catering for companies operating on the Marine Energy Park and the Logistics Park. The proposed development includes:

- 5 hectare site.
- 8,500 m^2 office space in 8 office blocks.

5.4 Adequacy of existing and future port offering

The discussion above described the array of existing and future ports and port developments on the Humber Estuary. Location options for a dedicated container port on the Humber could be at one of these existing facilities, part of a new facility currently in its planning or development phases, or a new facility in its own right.

Of the existing ports on the Humber, ABP Immingham, ABP Hull, and ABP Goole already cater for LoLo containerised trade with dedicated ship to shore and landside container handling facilities and equipment. The remaining ports of ABP Grimsby and the Humber Sea Terminal do not have such facilities, and therefore could be considered unsuitable locations for a dedicated container port meeting the prospective market and user requirements set out in Section 5.2.

Of the ports that currently handle LoLo containerised trade, they operate as multi-use facilities and in their present configuration are not ideally suited to a dedicated container terminal meeting the prospective market and user requirements set out earlier. This is primarily due to:

- The limited potential to consolidate and create adequate area within port confines for the proposed port offering;
- The constrained nature of the existing ports hinders the potential for developing an adjacent logistics zone with direct access to the container port;
- In the case of Goole there are additional marine access restrictions for vessels of the size required to support the proposed container port offering

Of the current plans for future port development, ABP Hull's developments for the Green Port and Biomass terminal relate to the renewable energy sector and therefore would not be suited for the proposed container port offering should they progress as proposed.

The master plan for future development of ABP's Immingham Port is largely focused toward rationalisation of the existing facility and expansion using adjacent ABP land to support natural growth and emerging modes of trade, commodities, and industry. The primary focus of the master plan is therefore to accommodate the following:

- Increase in dry bulk capacity due to the emergence of biomass and predicted growth in coal throughput;
- Increase in RoRo capacity to accommodate predicted growth;
- Increase in LoLo container capacity to accommodate predicted throughput growth, albeit form a relatively modest base line;
- Increase in vehicle capacity to accommodate predicted growth in throughput.
- Vessel access improvements to accommodate greater efficiency in shipping liquid bulk.

Although the primary Immingham improvements allow for increased container throughput, the capacity eventually provided does not match the prospects set out in Chapter 4 and therefore the SHG port requirements. This combined with the issues noted above limit the potential to develop a container port at this location.

Of the undeveloped areas within the South Humber region, the location of the proposed Able Marine Energy Park provides the most suitable container port development site. The primary elements making this site suitable are:

- Adequate area available to develop the full container port offering whilst retaining land and deep water frontage for other port uses such as marine energy;
- Relatively deep water access without the need for significant dredging initially, or in the future;
- Close proximity to the national rail network;
- Potential trade and supply opportunities with adjacent marine energy or alternative port uses depending on how the facility is developed.

Locating a container port at this location will require changes to the developer's current plans for a dedicated Marine Energy Park as it is currently presented. The proposed development would need to shift from a single purpose facility supporting offshore and renewable energy to a multi purpose facility catering also for the container port and associated logistics zone. However, given the scale of the energy park at 327ha, subject to further discussion with the Energy park developer, this could be a possibility. Land area and quay requirements for the proposed SHG container port offering are presented later in Chapter 6.

6. Technical planning specification

6.1 Introduction

This chapter sets out the specification for planning of the proposed SHG container port offering.

6.2 Terminal location

As discussed in the previous Chapter the Killingholme area with particular reference to Able UK's Marine Energy Park development provides the most suitable location for the proposed container port offering. In summary, the following factors support this:

- Technical factors
  - Sufficient land area to accommodate the proposed container port offering subject to a shift of focus to a multi purpose facility;
  - Deep water access relatively close to shore compared to other undeveloped areas on the Humber; and
  - Close proximity to national road and rail links.
- Planning issues
  - Planning procedures have already progressed on the basis of a new port and port related industry; and
  - It is understood the final use for the proposed development is yet to be confirmed.
- Other factors
  - Close proximity and therefore potential for integration with the Humber Sea Terminal or ABP's RoRo facilities at Immingham; and
  - Potential trade opportunities with the adjacent Marine Energy Park.

6.3 Proposed SHCT technical offering

6.3.1 Scope of development

The overall development concept proposed under the SHG Project would comprise a combined container port and neighbouring logistics zone. This linked integration providing a significant competitive advantage in terms of promoting logistics supply chain solutions.

It is anticipated that the overall project would be developed in a phased manner. Providing an initial capacity of around 450,000 TEU, thereby facilitating capital and operating economies of scale with a future expansion option of an additional 250,000 TEU. The conceptual layout arrangements of the Project would incorporate an intermodal rail terminal, able to support both the port area and logistics zone, plus effective direct road access between the two areas to facilitate cargo exchange.

6.3.2 Shipping service requirements

A central theme of the SHG Project's competitive strategy is to be able to leverage effective integration with the northern European ports, notably Rotterdam and Antwerp, plus southern UK gateway ports. The SHG Project therefore needs to be able to effectively integrate with the intra-European regional and feeder services that may originate from these ports.

The competitiveness of the SHG Project will reflect a combination of its through transport time and cost offering versus existing southern gateway ports. Consequently, for it to provide a competitive transit time

the shipping service schedules need to be of high frequency. Daily or multiple daily sailings from the key transit ports would be presumed with typical load factors of around 900 TEU. This equating to a design vessel that could access the Humber and the SHG Project at all states of the tide. A reduction in sailing frequency to weekly would provide for greater economy of scale in terms of shipping, potentially utilising a 6,000 TEU vessel, however it would have a significant detrimental impact upon transit times and would necessitate extra investment in quay infrastructure and craneage.

Whilst the majority of shipping services are presumed to be consistent with the all-tide access provision. An occasional arrival of vessels up to 2,500 TEU could be required. Such vessels being dependent upon an appropriate tidal window to provide the adequate depth of water in the channel. Once alongside the SHG Project the provision of a dredged pocket would facilitate their stay over a tidal cycle.

As highlighted above, vessels larger then those described above would require a significant capital and maintenance dredging programme to provide the necessary marine access. It is the Consultants opinion that the recovery of such capital expenditure across the possibility of a limited number of large ship calls would be reflected in uneconomic shipping rates.

6.3.3 Terminal service provision

The SHG Project needs to promote a combination of competitive performance and economic handling costs. Whilst this initially may appear to be conflicting goals it may be achieved through selected capital investment in features that directly support key value added services.

The SHG Project needs to deliver a rapid quay to port gate transit time in order to effectively compete with southern gateway ports direct import access. This objective to be achieved through the provision of adequate quays to support berthing on arrival, with no or minimal need for anchorage down time. Handling of containers across the quay needs to be facilitated through the provision of adequate dedicated ship to shore cranes to each vessel, with the flexibility to address multiple simultaneous box lifting. The size of the arrived vessels will avoid the requirement to over invest in taller and longer outreach post-panamax cranes.

Optimising the handling efficiency within the container yard should be a primary planning objective. The facility being viewed very much in line with neighbouring RoRo terminals in terms of rapid through transit, rather than a storage area. In support of this a low density container stacking strategy, based around two or three high boxes needs to be implemented. Such action minimising the number of handling moves to deposit and retrieve containers thereby lowering handling costs. The counter point to this is that the yard area will need to be more extensive then under a more intensive handling system.

Close integration of the container yard and the neighbouring logistics zone will be required. Such linkage, with the appropriate physical transit corridors and institutional arrangements, facilitating the rapid direct movement of containers from the quay and yard to the logistics zone for processing. This road linkage possibly being defined as a private road thereby enabling heavier containers to be handled then allowed on public highways. This providing a competitive advantage to the SHG Project.

6.3.4 Marine access

Due to the present vessel draft limitations on the Humber Estuary at low tides, it is initially proposed that vessels serving the terminal will typically be limited to a maximum draught in the order of 7.6m. This equates to vessels with a maximum capacity of 1,000TEU or less. However, with plans to deepen the depth of the Sunk Channel to -11m CD, vessel draughts and therefore capacity could increase whilst

maintaining unrestricted tidal access. Container vessels with a maximum capacity in the order of 2,500TEU or less will be able to navigate the channel after deepening. It is proposed that capital dredging works associated with the above vessels and access provision be phased as described below:

6.3.4.1 Initial marine access requirements

Capital dredging requirements limited to the container berth pocket only, which will allow unrestricted tidal access for vessels up to 1,000TEU. It will also provide tidal window access for vessels up to 2,5000TEU with unrestricted access whilst at berth.

6.3.4.2 Future marine access requirements

Upon deepening of the Sunk Channel, capital dredging will be required between the navigation channel and the container berth to provide unrestricted tidal access for vessels up to 2,500 TEU. This will necessitate dredging an access channel and manoeuvring basin to -11mCD matching the deepened Sunk Channel.

Container vessels of the sizes proposed above are within existing vessel limitations on the Humber Estuary. Therefore, subject to availability and the physical capacity to handle increased shipping volumes, these vessels can be served by existing towage services.

6.3.5 Logistics zone

A key element of the SHG Project is the need for a co-located logistics zone to promote PCL operations. The scale of this type of operation needs to be flexible to adapt to changing circumstances, and the prospective take-up of suitable logistics, light manufacturing and distribution companies. It would appear likely that the SHG Project would take responsibility for the provision of the basis zone infrastructure, whilst leaving the provision of specific infrastructure to prospective facility operators. This may be through an appropriate partnership with land development organisations.

In the initial planning consideration should be given to establishing a logistics zone with an area of up to 35 hectares, divided into parcels of up to 5 hectares. This upper limit being deemed suitable for the establishment of a major retail or industrial group warehouse or RDC. Other areas should be developed in a manner that is consistent with mixed use by Small Medium Enterprises (SME), including warehouses and office spaces.

The logistics zone will need to have appropriate provision of transport infrastructure, utilities, and security to enable it to operate effectively.

6.3.6 Intermodal integration

The SHG Project needs to provide effective integration between its marine operations and the logistics zone in order to facilitate PCL. The recent development at Teesport provides guidance on the nature of such integration with the Tesco and Asda warehouse complexes being co-located adjacent to the marine quay thereby allowing effective integration. However, a possible weakness of the Teesport approach is by granting these companies such preferential spatial treatment they hinder possible connectivity with other prospective land development arrangements. Therefore, there may be advantages in setting the logistics zone slightly back from the quay or in an appropriate alignment to allow a dedicated inter-connecting transit

corridor to be established. This route would be designed to handle heavier maritime containers, whose weight would restrict their normal despatch on public highways.

In all cases both the marine operation and the logistics zone need to be closely integrated with a rail intermodal terminal to promote non-road based distribution. Establishing a rail siding at right angles to the quay, along one boundary edge of the development, would provide this service. Such an alignment allowing direct exchange of containers from the marine yard and the logistics zone onto the same train. At this time it would be envisaged that the provision of two parallel sidings, each able to accommodate a 700m unit train would be appropriate. Future proofing of the site through the provision of room for an additional two sidings should also be considered. These sidings to be equipped with overhead gantries to facilitate the flexible exchange of containers.

The intermodal terminal effectiveness will be dependent upon its ability to access the national rail system. Therefore recommendations would be made that the existing line running from Immingham towards the East Coast mainline be upgraded from its current W8 status to W10 standard, as is currently planned, allowing HC containers to be handled.

Whilst promoting intermodal rail based distribution, recognition also needs to be given to the requirement to facilitate effective road based haulage distribution. Such distribution would be the primary means of transport between origins and destinations within an immediate Humber and Humber Port region, plus those areas that are poorly serviced by the rail network. This may need to include reaching agreement on changes in the current Humber Bridge toll tariffs to enable effective distribution to the more economic active northern bank of the Humber Estuary.

6.4 Port infrastructure provision

6.4.1 Planning parameters

The principal planning parameters used to establish the overall physical and operational requirements of the proposed SHG container port offering are listed in Table 6.1 below.

Table 6.1: Principal SHG container port planning parameters

Parameter	Value	Unit
Maximum annual throughput	700,000	TEU
TEU ratio	1.65	-
Average container dwell time	3	days
Peaking factor	120	%
Average container stack occupancy	70	%
Maximum stack height	2 high	containers
Stacking equipment	Straddle carrier	-
Average ship to shore crane productivity	25	Containers/hour
Operational days per year	365	days

Source: Consultants estimates

6.4.2 Quay

Based on the planning parameters above and design vessels in the region of 900 TEU and 2,500 TEU capacity, it is estimated that a 600m long quay is required. A depth alongside of -12mCD will provide unrestricted access for vessels up to 2,500 TEU capacity, maintaining a nominal underkeel clearance.

A 600m quay will allow berth occupancy to be maintained below 50% whilst achieving the maximum throughput, and will allow a range of multiple berthed vessel combinations. For example, three 900 TEU or two 2,500 TEU capacity vessels can berth simultaneously on a 600m long quay.

Five twin lift ship to shore gantry cranes are required to achieve the maximum throughput and allow working of multiple vessels simultaneously.

6.4.3 Container port areas

The container port will be divided into the following five primary operational areas:

- Quay area for the ship to shore cranes, container pick up and drop off, and crane back reach;
- Container stacking yard;
- Intermodal rail terminal;
- Gatehouse complex, and
- Support area for administration, operational, maintenance, staff welfare, and parking facilities.

To achieve the maximum annual throughput, it is estimated that a total area of 18 hectares is required based on a two high straddle carrier container handling operation.

6.4.4 Cargo handling

As mentioned previously an efficient container stacking yard is required to enable rapid transit of containers from quay to destination and vive versa. To achieve this, a low density yard arrangement is proposed comprising the primary items of terminal equipment set out in Table 6.2.

Table 6.2: Estimated primary handling equipment requirements (700,000TEU capacity terminal)

Equipment	Number
Ship to shore quay cranes (twin lift)	5
Straddle carriers (1 over 2 high)	25
Reach stackers	4
Empty container handlers	2

Source: Consultants estimates

6.4.5 Support facilities

The terminal will primarily be designated for container handling operations, with non operational terminal support buildings located within a dedicated area. Within this area provision needs to be made for the following facilities:

- Administration offices and associated parking for immediate port operations, customs and security, and support agencies.
- Worker amenity facilities.
- Workers mess.
- Workshop and yard equipment storage area.

- Re-fuelling station
- Container fumigation and wash down area

Other support facilities required are:
- Main gate complex for road freight;
- Intermodal rail terminal as described previously in section 6.3; and
- Quay operations office.

7. Conclusions

7.1 Overview

The remit for this Study was to evaluate the viability of establishing a container terminal within the confines of the SHG zone, thereby providing the region with an alternative to its current dependency upon southern UK gateway ports. The primary conclusion of the Study is that such a prospect appears to be a valid concept given the current structure of UK international trade and the competitive environment. However, it is strongly dependent upon achieving the appropriate market orientation and operational efficiencies to deliver a valued product service to targeted clients.

7.2 UK market prospects

The prospects for the UK container port industry are viewed as being more conservative then those presented in the Department for Transport's "UK Port Demand Forecasts to 2030" issued in 2007, issued just prior to the peak trade throughput recorded in that year, and subsequent economic contraction through to 2011. Despite this the Study predicts that the marine container trade will recover, expanding from 7 million TEU in 2010 to reach 10 million TEU by 2020 and 12.8 million TEU by 2030. This equates to an annual growth of 3.1 percent over the period, versus the 4.1 percent annual growth from 2000 to the recent peak throughput in 2007.

Reflective of trade trends over recent decades this expansion will be driven by the strong on-going presence of Asian generated shipments. Such shipments being targeted at a broader European market, of which the UK forms a defined part. Decisions over global transportation will be influenced by the need to optimise sailing schedules that minimise the impact upon the dominant European market, while satisfying UK clients. This is likely to support continued preference for schedules that utilise a single UK call within a broader North European port rotation; minimising sailing deviation costs where possible.

7.3 UK competitive port structure

Pressure on transportation costs and advancing ship design technology has enabled the major shipping lines to deploy ever larger vessels. Current Asia to Europe operations are now being based around vessels of up to 15,500 TEU being deployed, with 18,000 TEU on order. The physical size of such vessels limiting their ability to access the majority of ports, further promoting the case for concentration of the shipping market and ports around a limited number of carriers, and their preferred deep water terminal locations.

The Nation's deep water gateway container handling capacity, which was severely strained to address the peak year throughputs, is now adequate to address immediate growth. While future growth may be expected to be covered through the development of new capacity. Some of which, such as Felixstowe South and London Gateway, is already open or being developed; whilst other ports have approved plans to enhance capacity should market conditions indicate an opportunity. Thus the Nation's container port sector appears to be adequately prepared to address prospective change.

7.4 SHG Project market focus

Given the above, the scope for the SHG Project is not one of addressing a shortfall in capacity. Rather, one of seeking to provide an improved market offering to a defined region, thereby shifting market share from established players to a new entrant. Under such circumstance the key question is whether a distinctive

offering can be provided that is attractive to enough shippers to provide the critical mass to support the Project.

The geographical region that needs to be targeted is defined by the scale of economic activity primarily within the Humber, the North East and North West regions. Prospective clients within the immediate Humber and Humber Port City Region are likely to be most favourable to the SHG Project offering, but are inadequate in terms of demand to support the Project. Consequently, it must seek to extend its offering to a broader range of clients in more distant regional markets, though by doing so it will face increased competition from established alternative supply routes via southern UK ports.

In terms of GVA, the Study estimates that the SHG Project may compete for around 40 percent of the UK market, the balance being deemed to be outside its scope. In demand terms this is estimated to be equivalent to 362,000 TEU in 2009 (current market), rising to 454,000 in 2013 (planned SHG Project opening), and rising thereafter to 702,000 TEU by 2020 and 953,000 TEU in 2030. Such figures represent around 13 percent to 18 percent of the targeted hinterland estimated trade demand over the Project period, or 5.3 percent to 7.5 percent of National container trade.

7.5 SHG Project product offering

This Study recommends in the first instance, that the SHG Project recognises that competing for deep-water global trade is not a viable option. Or at least not an option that is worthy of the high capital investment plans to achieve, with consequential risks. Instead the SHG Project should seek to maximise its short-sea shipping connections, either in terms of intra-European trade or global trade via major northern European and southern UK transhipment hub ports. In particular, it needs to build relationships with the Ports of Rotterdam and Antwerp, offering an alternative supply route for their international carriers to address the northern UK market.

The SHG Project's product offering must provide an appropriate balance of service quality and competitive through transportation costs versus other southern UK gateway ports. With regard to the former, the SHG Project needs to ensure the following

- Minimal delay in the shipment of containers from the transhipment ports, through the promotion of multiple frequent feeder and intra-European sailing schedules. Such schedules by their nature utilising smaller vessels that are consistent with the SHG Project's maintained channel depth of 8.8m. This avoids the need for any extensive and costly capital dredging programmes;
- Adequate quay length for these vessels to support berthing on arrival, or with minimum delays, for vessels up to 900 TEU. Occasional larger vessel may be slightly delayed awaiting tidal windows. This is to be achieved through providing some 600m of berth with a depth alongside of 11 to 12 metres;
- Efficient cargo exchange is to be provided through the provision of up to five Ship to Shore gantry cranes, enabling two cranes to be deployed on the majority of ships, thereby providing for a rapid exchange of containers within the shortest possible berthing period;
- Landside handling of the containers should be equally effective through the combination of a low density yard storage area, thereby minimising the need for multiple box lifts and the deployment of a flexible straddle carrier system; and
- Efficient operating system based upon the appropriate balance of flexible skilled staff, and application of IT systems.

The provision of the above technical features would promote the efficient handling of container, and in turn support a drive to lower cost operations. However, on their own they are likely to be inadequate to establish a sustainable port project.

The SHG Project needs to build on the experience of other successful regional UK ports, promoting the provision of value added services that will enhance its offering. Thereby reducing the focus upon unit cost competition with the larger southern gateway ports, with their advantages in terms of economies of scale, and shifting towards a differentiated product offering. It is envisaged that this may be promoted in two ways:

- Establishment of a co-located Port Centric Logistics operation based around an integrated logistics zone wherein logistics, light manufacturing and distribution value added activities can be promoted; and
- Effective integration of the SHG Project marine areas and logistics zone through a common intermodal terminal for the provision of dedicated rail based distribution to the targeted hinterland.

7.6 Humber Estuary port facilities

The ability of existing Humber Estuary ports to compete for the prospective market offering remains limited. For while Immingham and Hull are both significant multi-purpose ports in their own rights; their technical orientation could be considered inappropriate for higher throughputs of maritime containers via a dedicated terminal. Immingham being highly focussed upon the handling of both dry bulk and liquid bulk cargoes, together with a strong presence in the cross-North Sea unitised RoRo ferry services. Container handling at this port, together with Hull and Goole remains limited, with general cargo operations largely comprising a range of break-bulk cargo operations.

This is not to say that the existing ports could not be reconfigured to address the prospective new container market opportunity. However, such a process, given the fragmented spatial distribution of existing activities within the ports would be difficult to achieve; and disruptive to other operations. In addition, the general lack of suitable vacant land immediately adjacent to the ports would hinder the prospects for establishing the logistics zone, a key factor in the product offering.

Able UK's strong presence within the region, and its control over a number of alternative coastal sites would provide it with the scope to establish the SHG Project. Its existing plans for marine energy and logistics park development being consistent with the concept of new port development. The container offering could therefore form part of its integrated development plan.

Whether the SHG Project is developed on an existing Brownfield site or new Greenfield location, the presence of an extensive maritime port sector culture would be a strong factor in its success. Such a historic presence providing for the ready available supply of suitable human resources, skill training, and facilitating trade and transportation agencies and operational companies.