

Hamburg is staying on Course

THE PORT DEVELOPMENT PLAN TO 2025





LEGAL NOTICE

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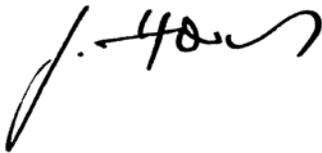
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master these duties and act in the overall interest of the Port of Hamburg with an eye to the future. This is imperative for a prospering port industry.

The Port of Hamburg will continue to be one of the world's leading ports, and the present Port Development Plan provides the strategic foundation to maintain this position. The aim of strategic planning is to actively participate in shaping the future, whereby we need to constantly adjust to changing framework conditions. Successful strategies go with the flow instead of being stiff and rigid. It is the only way to ensure and expand the Port of Hamburg's long-term competitive position for the benefit of the city. We focus our attention on all aspects that depend directly and indirectly on the success of the port. I would be delighted if you took an interest in the further development of our port and form your own opinion of its economic importance, its quality, potentials and our planning.



Senator of Hamburg Frank Horch,
President of the State Ministry of Economic Affairs,
Innovation and Transport



■ PORT DEVELOPMENT BASED ON DIALOGUE

Successful port policy and development needs to consider the many different parties involved. As far as possible, concepts and planning of the port industry have to be brought in line with the concepts and planning for general and user-specific infrastructure.

Therefore, the State Ministry of Economic Affairs, Innovation and Transport [Behörde für Wirtschaft, Innovation und Verkehr] and the Hamburg Port Authority have ventured into new territory with the present Port Development Plan. Within the scope of a dialogue process involving the relevant associations of the port and transport industry, environmental associations, trade unions as well as the chamber of commerce and Lower Elbe [Untere Elbe] ports, central topics of port development were discussed in the presence of experts. The aim was to identify the interests and requirements of businesses and associations early on and thus gather ideas to develop a market-oriented and future-oriented port strategy.

From August 22nd to September 29th, 2011 four rounds of port dialogue were held revolving around the subsequent topics:

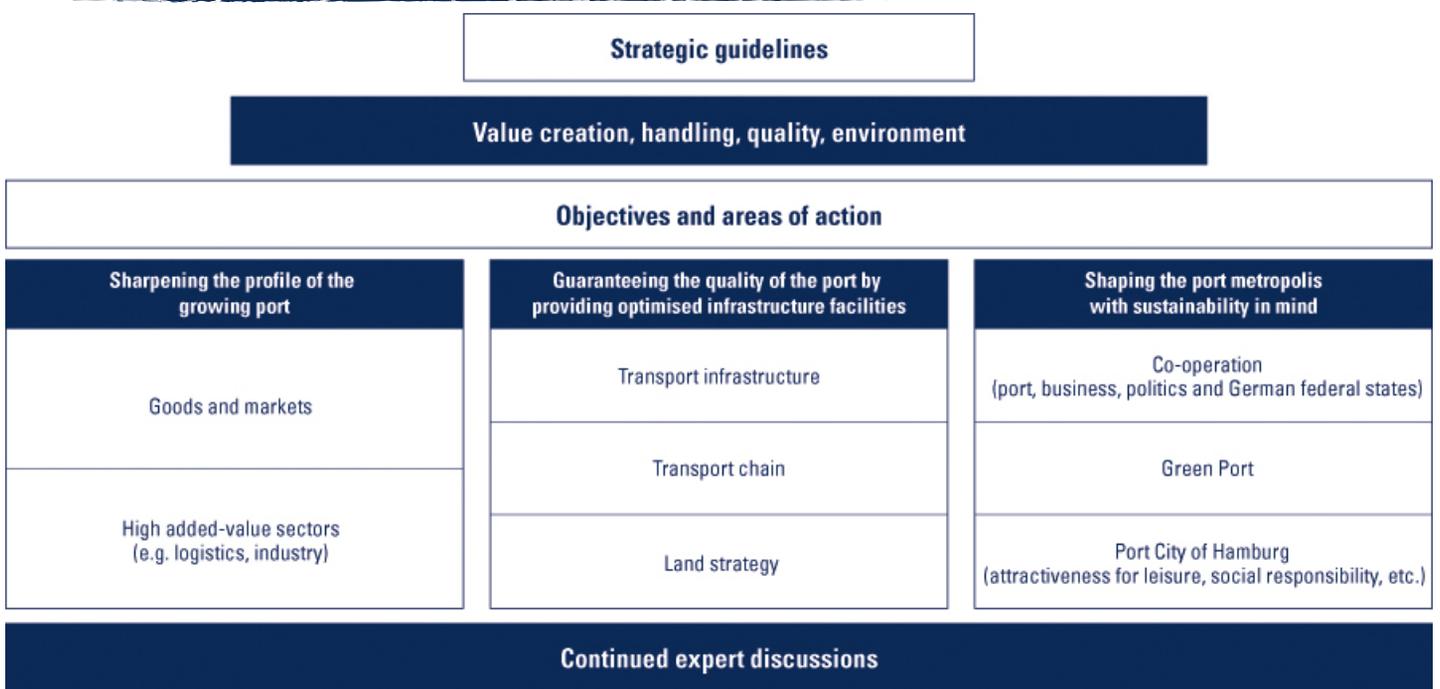
- Factors with an impact on successful port development
- Forecast of (handling) potential and its implication
- Land strategy and CTS
- Transport planning, hinterland connections and modal split.

Though not every topic could be unanimously agreed upon, the participation process was viewed favourably by all participants and will in future form the basis for the further development of the port strategy. Port development planning will have a more legitimate basis and benefit substantially from the additional expert competence available.

As a result of the dialogue, priorities for future measures were defined and solutions proposed, a summary of which was then presented to the associations involved in the form of a Port of Hamburg strategy house within the scope of a final event.

The strategy house depicts the principal strategic direction developed by port stakeholders within the framework of the dialogue process and has been incorporated in the present Port Development Plan. In addition, the workshop results are documented below in the respective chapters. Minority votes were also captured and made available to all dialogue participants.

Figure 1: Strategy house for the Port of Hamburg as a result of the port dialogue process 2011



The dialogue process clearly showed that, in order for port development planning to be effective, a strategic time horizon is needed. In view of the fact that infrastructure planning in particular involves long lead times, both the forecast of handling potential and individual aspects of port planning extend all the way to 2025.

Guidelines and port-political areas of action will be advanced beyond this Port Development Plan. If required, the State Ministry of Economic Affairs, Innovation and Transport will take up the dialogue with the associations. Furthermore, the Hamburg Port Authority will continue to pursue its strategy at the operative level and develop the respective networks of competence. In the medium term this includes, for instance, the preparation of new transport infrastructure master plans but also ad-hoc measures such as the establishment of a construction site management strategy, the abolition of the free port zone, empty-container management or the determination of vessel berth and waiting berth locations.

The Port of Hamburg forms an integral part of the city. Any measures carried out at port-city interfaces need to consider both port-strategic and urban development aspects. HPA, the State Ministry of Economic Affairs, Innovation and Transport, the State Ministry of Urban Development and Environment [Behörde für Stadtentwicklung und Umwelt] and the city districts affected therefore consult on a variety of topics. The professional and political exchange between the public parties involved is beneficial and should be continued and advanced, in particular with regard to spatial interfaces to the city, transport-political issues, aspects of land use and ecological aspects of the ports.

STRATEGIC GUIDELINES

In port development the Senate of Hamburg pursues the subsequent strategic guidelines:

Value Creation

Value creation in the Port of Hamburg will be consistently increased on efficiently used land based on the economic attractiveness, technical know-how and innovative spirit of the region. Strengthening existing and attracting new port-related and job-intensive sectors with high added value will benefit the entire metropolitan region.

Cargo Handling

As Europe's traditional 'Asia port' and gateway to central and eastern Europe as well as Scandinavia, the port seizes the chance to fully utilise existing handling potential. Increased trade with other growth regions will reinforce and expand Hamburg's market position as a container hub in the North Range. A long-term co-operation with the other North Range ports based on trust will lead to joint representation of interests and constructive co-operation. The regional co-operation along the Lower Elbe enables the distribution of tasks among ports based on expert knowledge and opens opportunities to present a more powerful front.

Quality Leadership

Bespoke, reliable infrastructure at the quay wall, in the port and hinterland as well as intermodal, optimised transport chains will ensure the success of the port. The holistic development of transport modes, increased transparency in information and goods flow management, and the efficient work of qualified and motivated staff will move the quality of the Port of Hamburg to the top of Europe's ports in terms of reliability and safety.

Environment

As a global port right in the heart of the metropolis the port faces up to its ecological responsibilities. By pursuing ambitious environmental and climate objectives and actively promoting and applying innovative technologies and ideas, the port strives to acquire a top profile among ports. Solutions and approaches will be developed to design the economic future of the port as a symbiosis of port, city and the environment with sustainability in mind.

The Port of Hamburg: Site Indicators

THE MACRO-ECONOMIC IMPORTANCE OF THE PORT OF HAMBURG

The Port of Hamburg is of outstanding macro-economic importance. It is the biggest and most significant German port and Europe's second largest container port. It generates jobs for the City of Hamburg and the metropolitan region and attracts industrial and logistics companies. As a modern and efficient transport hub for central, northern and eastern Europe it ensures the smooth international exchange of goods. In addition, the Port of Hamburg efficiently combines environmentally friendly modes of transport such as ship and railway. In the medium and long term, the aim is to utilise more fully the macro-economic added-value potential the port offers.

THE PORT AS THE HEART OF MARITIME TRADE

The Port of Hamburg is the centrepiece of a cluster structure with significant job-generating effects that has developed over centuries.

The port and its surrounding area are home to a broad mix of traditional and new economic sectors comprised of large, mid-sized and small businesses that contribute substantially to the stability and economic development of the metropolitan region and connect it to the world's high-growth regions. Benefitting from these positive effects are, on the one hand, sectors that are closely related to the port such as shipbuilding, transport and logistics, and on the other hand sectors like gastronomy or tourism. The maritime orientation of scientific institutions enables the speedy transfer of technologies and innovations to all cluster-relevant fields. Among these institutions are the state universities, Hamburgische Schiffsbau-Versuchsanstalt, Fraunhofer-Center für Maritime Logistik, Kühne Logistics University, Center of Maritime Technologies, Bundesanstalt für Wasserbau, Bundesamt für Seeschifffahrt und Hydrographie and the hospital for tropical diseases.

Figure 2: Metropolitan region of Hamburg



Source: Metropolregion Hamburg, HPA

Figure 3: Hamburg is Europe's largest port for coffee imports



Source: HPA

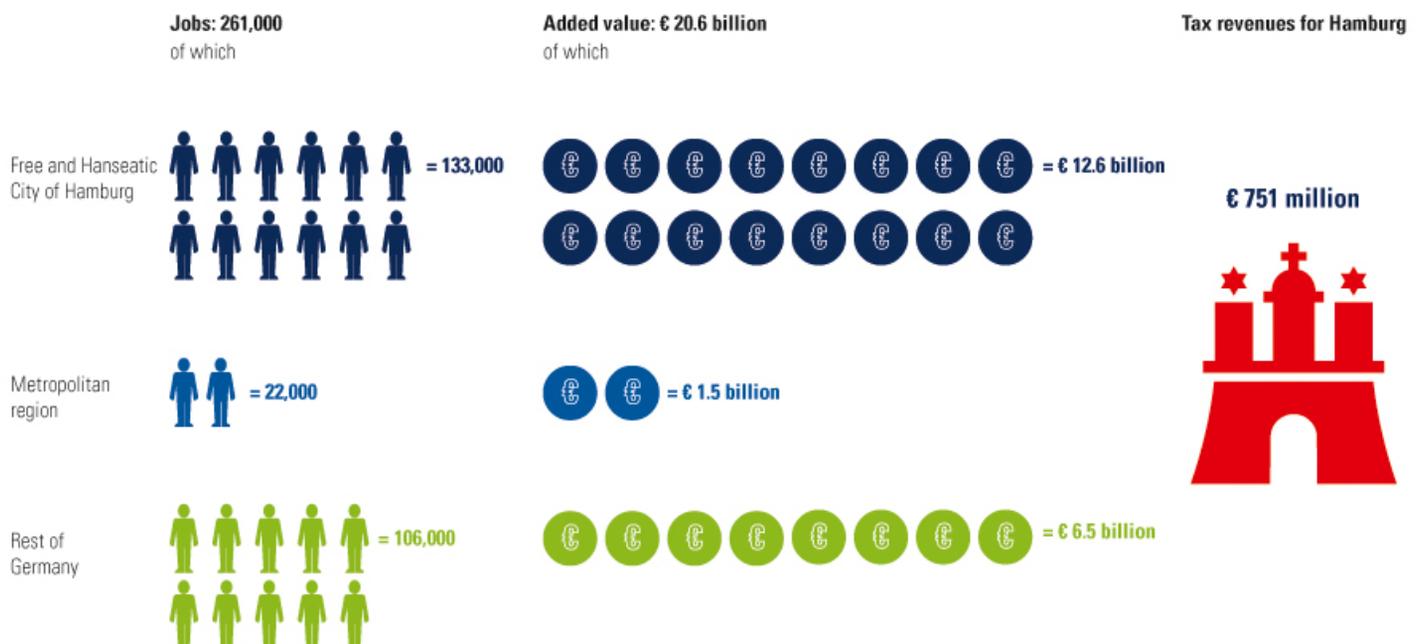
In 2010 the port supported 133,000 jobs in the Free and Hanseatic City of Hamburg and 155,000 jobs in the entire metropolitan region. This is equivalent to 11.8% of the labour force. Approximately every 8th job in Hamburg is generated by economic activities that are in some way related to the Port of Hamburg. Jobs supported by the Port of Hamburg employ about 261,000 people in all of Germany.

The macro-economic impact of the Port of Hamburg is closely linked to container handling both in terms of quality and quantity. Container handling shows the most dynamic growth of all cargo categories and has the biggest impact by far in terms of job and value creation.

Besides two large container handling operators, around 500 single companies are based in the Port of Hamburg. Other important businesses are renowned industrial firms from the energy, raw materials, drive technology, shipbuilding, mechanical engineering and fertiliser industry. To be added on to that are numerous service providers, e.g. ship chandlers, certification agencies, ship financing companies or insurers and lawyers that are based in the city or metropolitan region and whose turnover depends to a large degree on the Port of Hamburg. The manufacturing port industry and port-related trades provide a particularly high percentage of commercial

and industrial jobs. Activities span the entire range, from simple manual work all the way to highly specialised industrial work, allowing the rather service-orientated labour market of the metropolitan region to branch out into the commercial and industrial sector.

Figure 4: Economic impact of the Port of Hamburg in 2010



PORT-RELATED VALUE CREATION

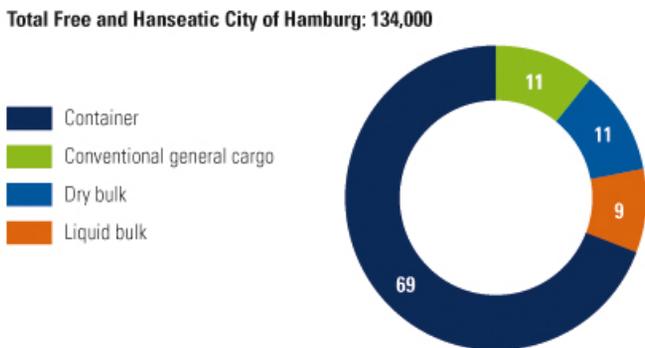
As an infrastructure hub the Port of Hamburg is of overarching macro-economic importance. In Hamburg maritime transport is closely interconnected with hinterland modes of transport such as road, railway and inland waterway thus offering perfect conditions not only for import and export businesses and the transport industry, but for the port industry too. The location decisions of these businesses are greatly influenced by factors such as transport costs, the quality of regional and cross-regional transport connections to suppliers and sales markets as well as the availability of labour.

A location in or near a port usually is of advantage to the energy industry, the food and agricultural industry, raw materials processing industries such as, for instance, petroleum industry, metal-producing and chemical industry. This is especially so because they depend on overseas deliveries of raw materials (bulk cargo). Moreover, shipping offers substantial cost advantages to the mechanical engineering sector in particular where heavy-duty industrial goods are produced. Logistics companies, too, use the port as a cargo hub, integrating partial industrial functions in the transport chain within the scope of in-house job division. In addition, ports are ideal sites, e.g. for the car industry, for finishing and final equipment of their products, in particular with regard to global import and export flows. Renewable energy and industrial recycling companies will in future require port land as well. Due to its excellent connections to global markets the metropolitan region of Hamburg with the Port of Hamburg may become even more attractive, in particular to export-oriented industrial businesses that have to cope with rising energy and transport costs.

In 2010 the port generated, directly and indirectly, a gross domestic product of € 12.6 billion which roughly equals 14% of overall gross value creation in Hamburg. Moreover, the port contributed about € 750 million in income tax and corporate tax to the budget of the Free and Hanseatic City of Hamburg in 2010.

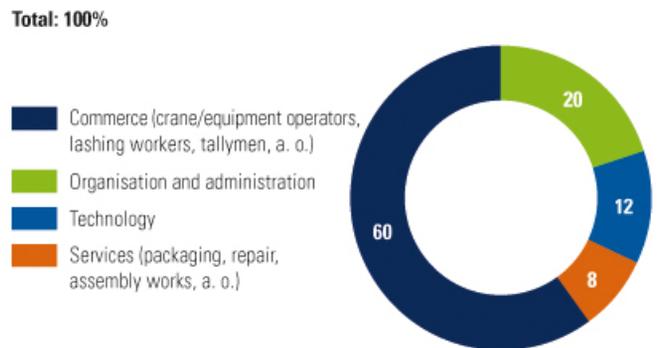
The estimated annual gross value creation of the Port of Hamburg is about € 1.5 billion for the metropolitan region, excluding Hamburg, and for the remaining federal territory about € 6.5 billion. In 2010 the port generated a total of € 20.6 billion in income. This underpins the national importance of the Port of Hamburg. Getting more port-related industry to settle in Hamburg could considerably increase value creation.

Figure 5: Jobs supported by the port in 2010 by cargo groups in %



Source: Planco (2011)

Figure 6: Job mix at a multi-purpose terminal in %



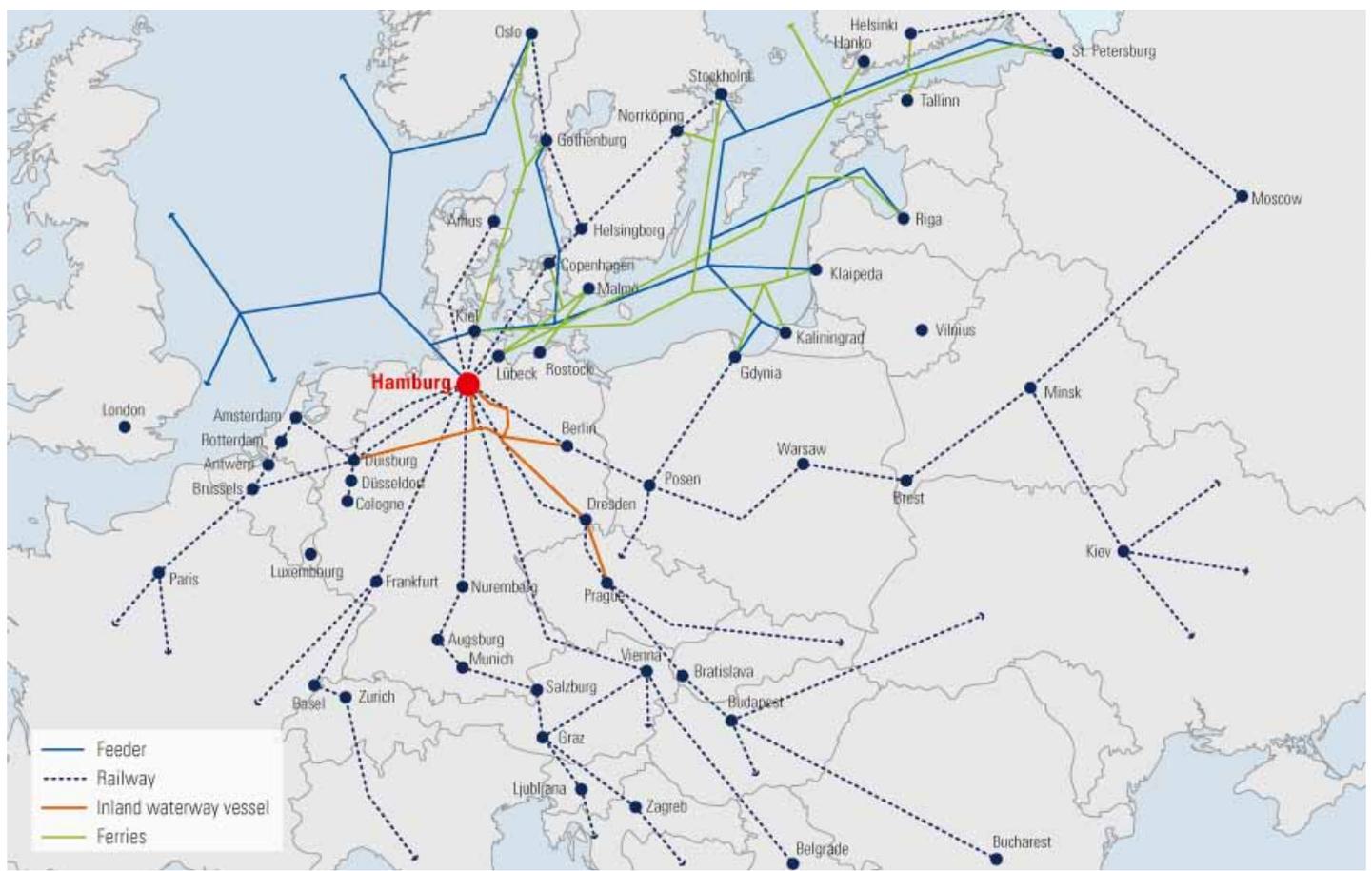
Source: HPA

THE PORT OF HAMBURG: A HUB WITH EXCELLENT CONNECTIONS

The Port of Hamburg is a central cargo delivery and distribution site or, in other words, a hub. As such the port, like a magnet, attracts ever more cargo volumes, which in turn leads to positive economies of scale and more efficient logistics services. This, combined with the port's efficient connections to international trade routes, particularly benefits the German export-oriented industry.

The favourable geographic location of the Port of Hamburg 130km inland from the open sea substantially reduces the need for expensive and less environmentally friendly road travel. Moreover, the Port of Hamburg offers the most frequent feeder services to the Baltic Sea area, whereby Hamburg as the most eastern port of the North Range benefits from its proximity to the Kiel Canal and the Baltic Sea economic area. The planned expansion of the canal to accommodate larger ship sizes will further increase the cost-effectiveness on this route. From the ecological point of view, waterway transports are generally a lot more favourable than road transports. The deployment of new large vessels further decreases energy consumption as well as pollutant and CO₂ emissions per cargo unit moved.

Figure 7: Hinterland connections of the Port of Hamburg



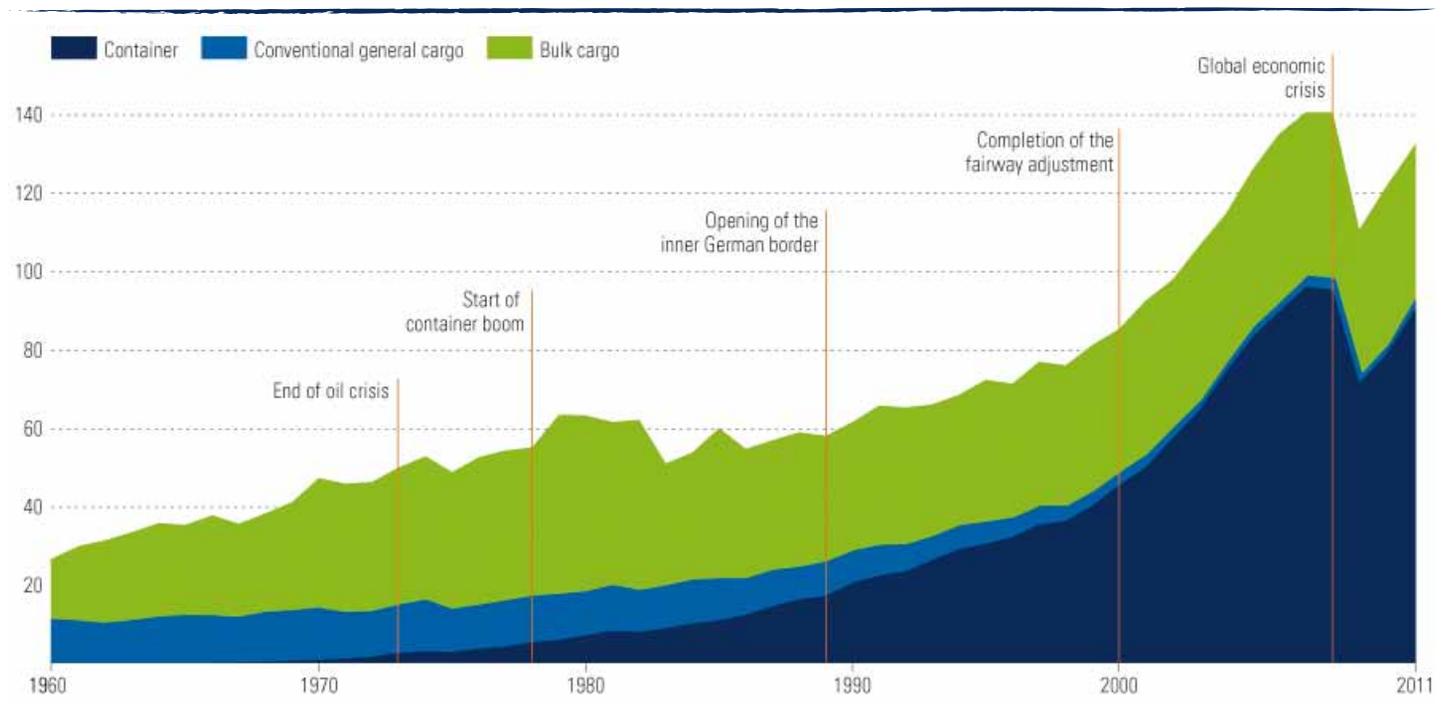
Source: Hafen Hamburg Marketing

■ CARGO HANDLING DEVELOPMENT AND MARKET POSITION

As a universal port the Port of Hamburg handles all cargo categories from containers, dry and liquid bulk to general cargo. At a share of 70% general cargo and container handling represent the key segments. Apart from its geographic location, the main criteria for the Port of Hamburg's success are reliable connections to dynamically growing economic regions, a wide range of logistics services and large regional cargo volumes (locally generated cargo volumes), the latter being the result of the concentration of consumption, production and distribution activities in the metropolitan region. At the same time the importance of competitive criteria such as efficiency, reliability, cost level, safety and security, IT integration and environmental standards is rising. The catchment areas of the major competing North Range ports of Rotterdam, Antwerp, Le Havre, Zeebrugge, Bremische Häfen and Hamburg overlap and market shares may change at any time. Continuous efforts must therefore be made to maintain and improve the competitiveness of the Port of Hamburg.

Targeted expansion projects in Hamburg realised prior to the crisis paved the way for strong growth, in particular in container handling. Following the approval of the River Elbe channel deepening, Hamburg was able to continually gain market share within the North Range from 1999 to 2006, not least due to the additional capacities available at Container Terminal Altenwerder from 2002. New record highs were achieved in 2005 and 2007 when annual volumes increased by 1 million TEU over the respective previous years.

Figure 8: Development of total cargo handling in the Port of Hamburg in million tonnes



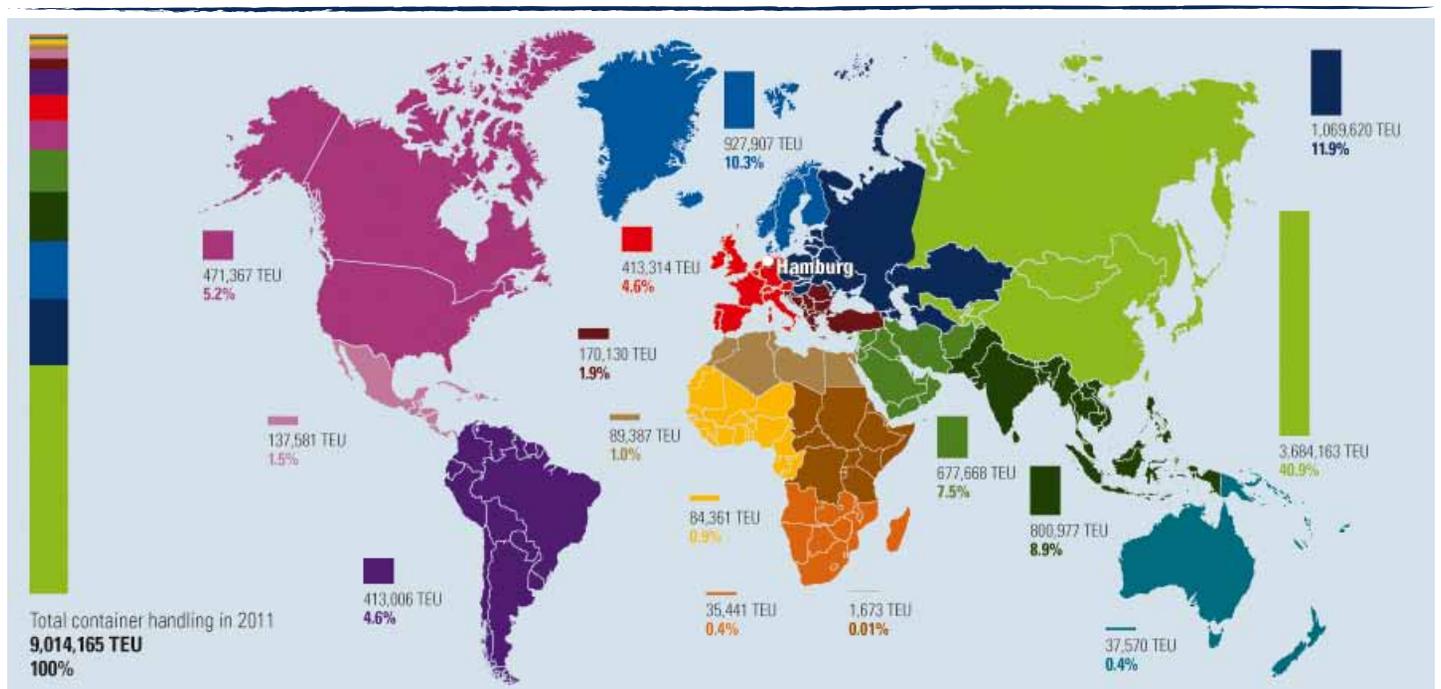
Source: HPA

STANDARD CONTAINER HANDLING DEVELOPMENT

Handling volumes in the North Range container ports have shown an upward trend since 2010; combined the ports handled a total of around 37.3m TEU in 2010 and 40m TEU in 2011 – the same level achieved in the record year of 2008. Before that, container throughput grew by 11 % annually, whereby the share of the German North Sea ports in North Range handling volumes rose substantially. This was primarily due to the positive development of Asia's economies and growth in the Baltic Sea states. The attractive geographic location, the special dynamics of the destination and source markets and expansion measures catering to requirements caused above-average growth in Hamburg. In 2008 a total of almost 10m TEU was moved through the port. However, due to the global financial crisis and the associated economic downturn Hamburg saw cargo volumes plummeting by 28%. A distorted market and cost situation as well as the fact that transshipment traffic shifted to other North Range ports contributed to that. In part, the North Range ports were, and still are, bypassed completely as ships called and call directly at Baltic Sea ports. The share of dedicated terminals in Hamburg is low compared to competing ports, which also contributed to the drop in volumes. A major competitive strength of Hamburg's handling companies,

leadership in quality, was obviously of no relevance to shipping companies who, due to the crisis, were rather cost-conscious, at least temporarily. Compared to transshipment traffic, sea-land transports have proved to be relatively stable.

Figure 9: The Port of Hamburg's trade areas: container handling 2011 by trade area in %



The Most Important Container Trade Areas

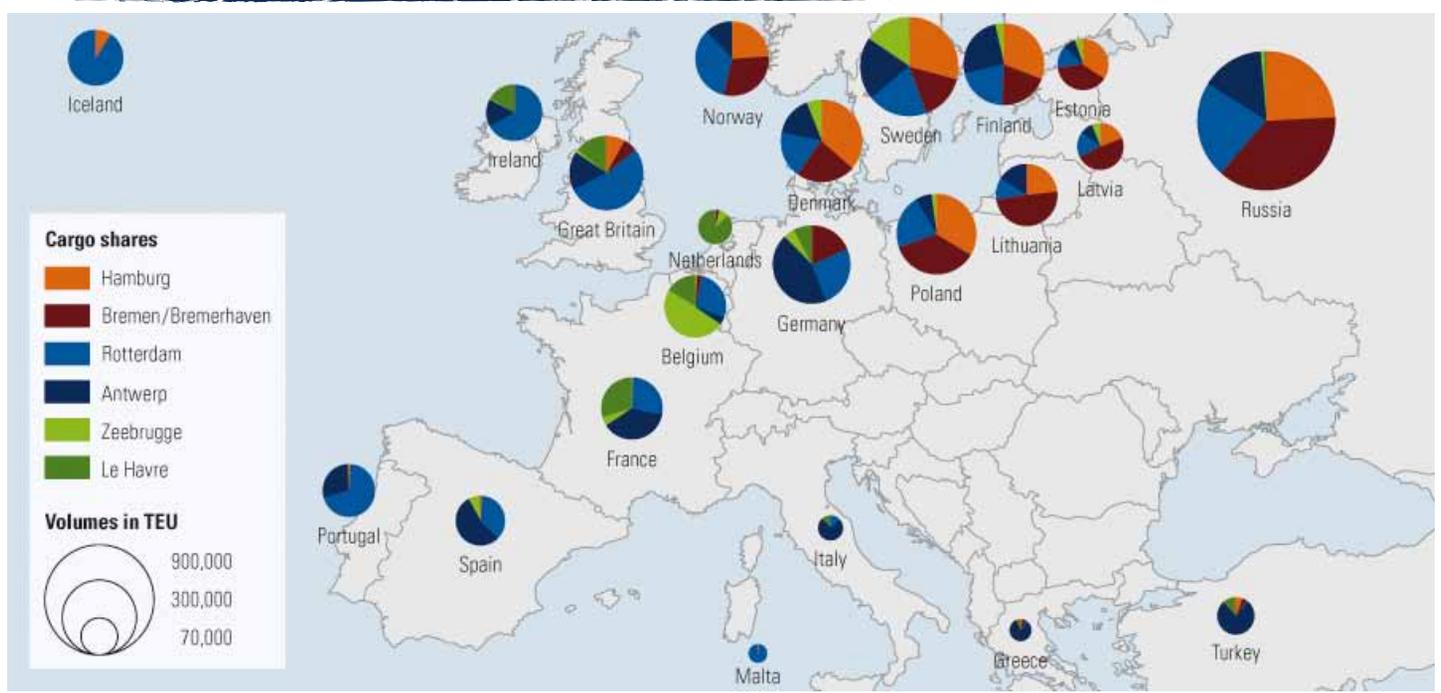
The Northeast and Southeast Asia region still is Hamburg's most important overseas container trade area, representing over half of the total cargo volumes handled. Among the North Range Hamburg has a market share of about one third. 28 of 40 container liner services running between northern Europe and East Asia in the summer of 2011 called at Hamburg. All major container shipping companies and alliances rely at least on one service calling at the Port of Hamburg.

Short-sea shipping and feeder services to and from northern, central and eastern Europe and Hamburg moved 1.6m TEU in 2010 and about 2.4m TEU in 2011. This corresponds to a North Range market share of about 30%. The strong demand for Asian consumer goods in eastern Europe in particular has contributed to the positive development. Already at the beginning of the 1990s this demand led to a rapid increase in transshipment traffic. After the crisis-induced drop, this trade segment has picked up significantly and the Port of Hamburg was able to gain back its market share. The two trade areas, Asia and northern/eastern Europe, make up about 75% of Hamburg's container handling.

In 2010 a total of 24m TEU travelled between the North Range ports and their European hinterland, of which 9m TEU were moved in Germany, the largest sub-market. The federal states of North Rhine-Westphalia, Bavaria and Hamburg each recorded more than 1m TEU.

The Port of Hamburg moved more than 5m TEU in hinterland traffic in 2010. Apart from particularly high market shares in Denmark and Schleswig-Holstein, Hamburg achieved a market share of over 50% throughout in the eastern federal states, Berlin and the rest of central and eastern Europe. Of the total of 4m TEU transported between the Port of Hamburg and the inner-German hinterland, roughly 700,000 TEU were bound for or came from Bavaria, about 500,000 TEU went to or came from North Rhine-Westphalia despite good connections to the western ports of the North Range, and approximately 400,000 TEU each were moved to and from Lower Saxony and Baden-Württemberg. Around one fifth of the hinterland cargo moved through Hamburg stays in the area of the metropolitan region of Hamburg as locally bound cargo.

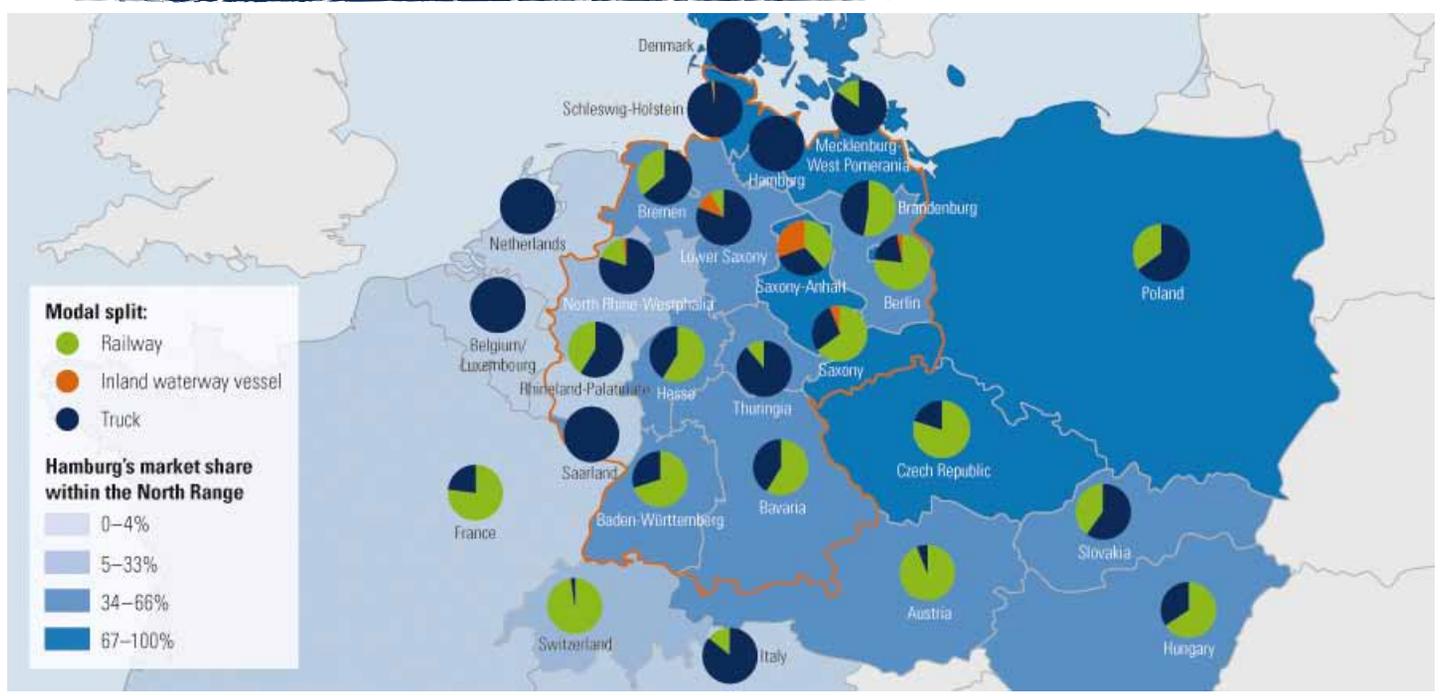
Figure 10: Country-specific transshipment volumes and share of the Hamburg – Le Havre range in 2010



Modal Split: Distribution of Container Traffic

The share of transports by inland waterway vessels as a part of the Port of Hamburg’s container hinterland traffic is still rather low; the River Elbe, the Elbe Lateral Canal and the Mittelland Canal are the most important waterways. The most significant mode of transport in the metropolitan region and the surrounding countries is the road. Cargo destined for regions that are relatively far away from the Port of Hamburg’s direct train connections and especially urgent freight are transported by road over longer distances too. The share of Poland-bound truck transports is also quite high, but 90% of transports to Austria and Switzerland take place by rail. Overall, the Port of Hamburg with a railway share in hinterland traffic of almost 40% is structurally clearly distinct from the other North Range ports.

Figure 11: Market share of the Port of Hamburg and modal split by hinterland region in 2010



Source: ISL (2011)

DEVELOPMENT IN CONVENTIONAL GENERAL CARGO HANDLING

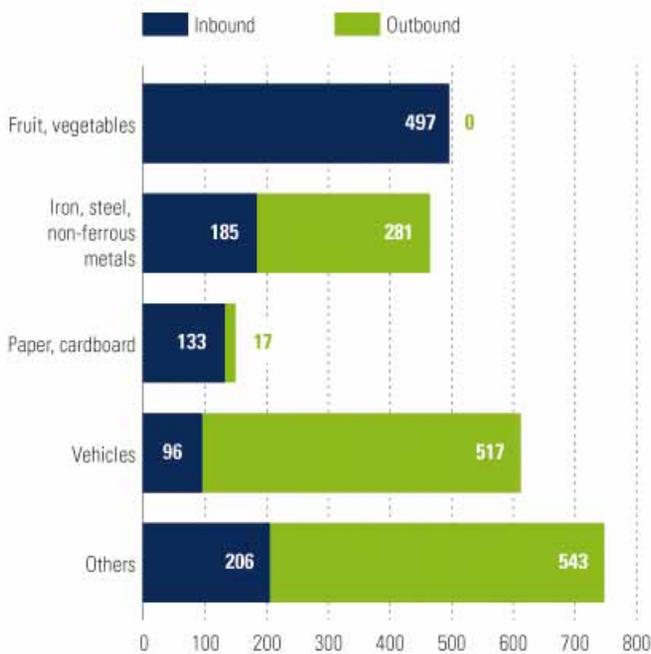
Between 2004 and 2008 conventional general cargo volumes handled in the 14 major ports of the North Range rose from 64m to 70m tonnes. In 2009, as a result of the crisis, cargo throughput dropped to 54m tonnes, however in 2010 it climbed to 62m tonnes again. In Hamburg this cargo segment, consisting mainly of iron/steel, fruit and vehicles, recorded 2.5m tonnes in 2011, which is equivalent to 2% of the total cargo volumes handled.

Over the period 2006 to 2008 the five largest North Range ports handled a record of 20m tonnes of iron and steel annually, with Hamburg handling a share of 0.5m tonnes, roughly two thirds of which was outbound traffic. This level could more or less be maintained until 2011. Conventional fruit volumes handled in the North Range ports from 2004 to 2008 ranged from 3.0m to 3.5m tonnes; in 2010 this figure stood at 2.8m tonnes. With a share of about 20% – equivalent to roughly 0.6m tonnes – Hamburg managed to retain its second place in the market and even expand it in 2011. As to east-bound traffic, e.g. to Poland, Hamburg holds a dominant position as on-transport takes place almost exclusively by truck.

Vehicle handling developed a lot more dynamically in the past than the aforementioned cargo segments. Compared to the other North Range ports this segment proved to be stable in Hamburg even during the crisis and in 2010 reached levels similar to those in 2008. Hamburg has thus climbed to fifth rank within the North Range. This trend continued in 2011.

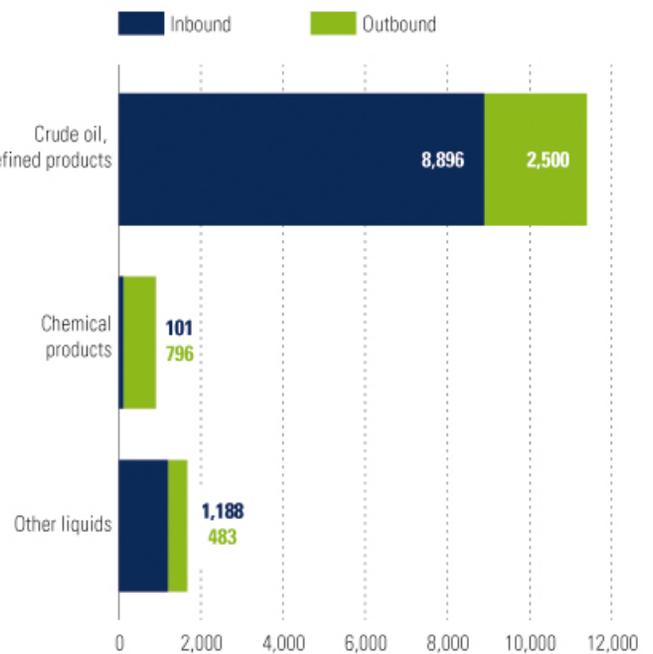
Conventional general cargo also comprises large workpieces and industrial plants, commonly called project cargo. Growing at an average rate of 11% from 2004 to 2008, this market represented the most dynamically growing sub-segment by far in conventional general cargo handling. Despite a slowdown in 2008, the Port of Hamburg already achieved a new record high of 330,000 tonnes in this sub-market in 2010.

Figure 12: Conventional general cargo handling in the Port of Hamburg in 2011 in 1,000 tonnes



Source: HPA

Figure 13: Liquid bulk handling in the Port of Hamburg in 2011 in 1,000 tonnes



Source: HPA

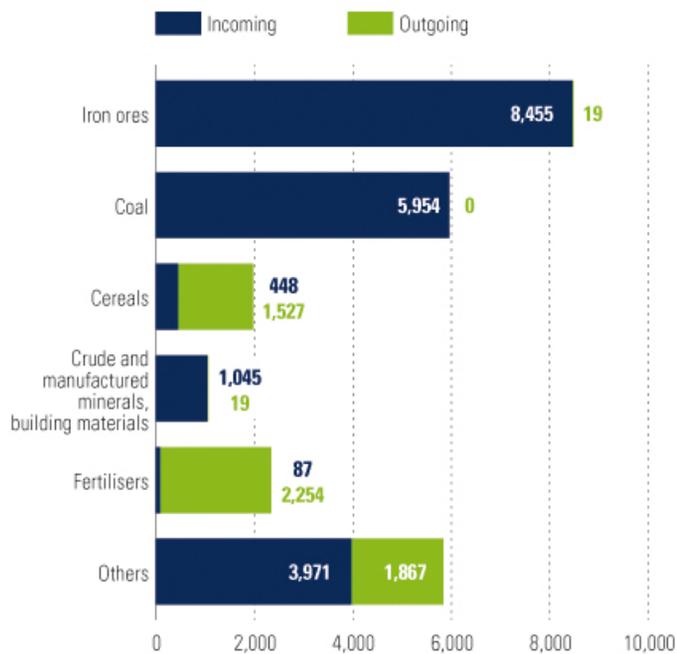
DEVELOPMENT IN BULK CARGO HANDLING

Rapidly rising handling volumes of refined products in particular had a positive effect on liquid bulk volumes handled in the North Range. In Hamburg, too, crude oil and refined products dominate maritime imports of liquid bulk which amount to around 10m tonnes. Approximately two thirds is destined for refineries or industrial plants in Hamburg. Stored or processed products are mostly transported to local consumers by truck. Roughly 4m tonnes of liquid bulk, most of which are refined products, leave the Port of Hamburg by vessel. 40% of the refined products are produced by local refineries and handled directly. The rest is primarily delivered by rail.

Dry bulk volumes handled in the North Range also rose. This was due to an increase in coal imports. A plunge in iron ore volumes reflected the decline of industrial production in Europe in 2009. However in 2010 iron ore volumes went up again to 9.3m tonnes.

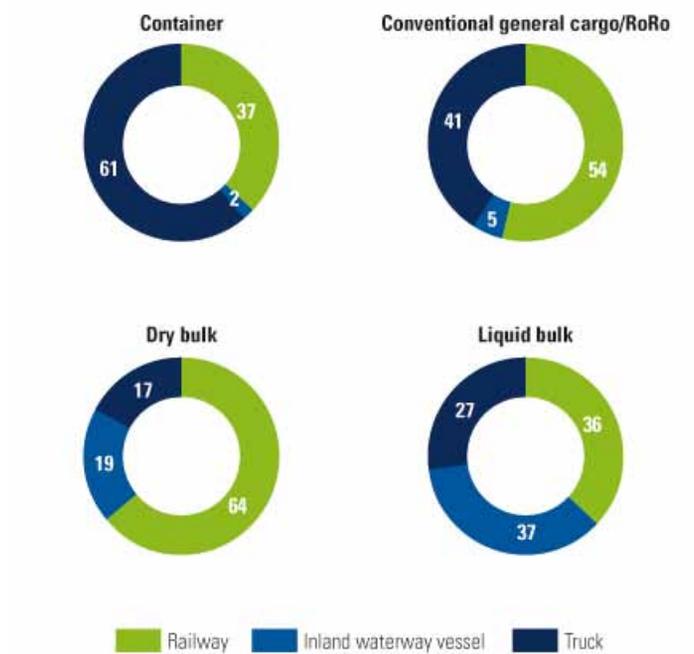
Currently, about 20m tonnes of dry bulk cargo reach Hamburg by sea. Iron ores, coal, cereals, feedstuff and oil seeds count among the most important cargo groups. Most of the iron ore is delivered to steel mills in Lower Saxony and Brandenburg by rail. Roughly 50% of the annual average of around 5m tonnes of coal is transported off by inland waterway vessel and 50% by railway – mostly bound for power plants in Lower Saxony. Oil seeds, which are directly processed in Hamburg, make up the largest proportion of cereal, feedstuff and oil seed imports. Of the roughly 5.7m tonnes of dry bulk cargo leaving Hamburg cereals, feedstuff and oil seeds make up the largest proportion. Fertilisers alone have a share of around 40%. With the exception of fertilisers most dry bulk cargo to be exported by sea reaches the Port of Hamburg by inland waterway vessel and truck. Products of this cargo group reaching the port by rail usually come from the federal states south of the Port of Hamburg and the Czech Republic.

Figure 14: Dry bulk handling in the Port of Hamburg in 2011 in 1,000 tonnes



Source: HPA

Figure 15: Modal split of the Port of Hamburg's hinterland traffic in 2010 in %



Source: ISL (2011)

The Port of Hamburg's overall performance is convincing: the development of handling volumes, its market position in the North Range, its diverse market relations and its reliable handling services in all major cargo groups are proof of that. The financial and economic crises of the past years have not negatively affected these strengths. The high proportion of container handling certainly poses temporary risks. However in the long run, opportunities outweigh them by far. To ensure a successful future, it is imperative that the required channel depths, sufficient terminal capacities and efficient hinterland connections are guaranteed.

transports of the Port of Hamburg would hardly be affected. Overall, any additional volumes the southern ports might gain will be relatively low.

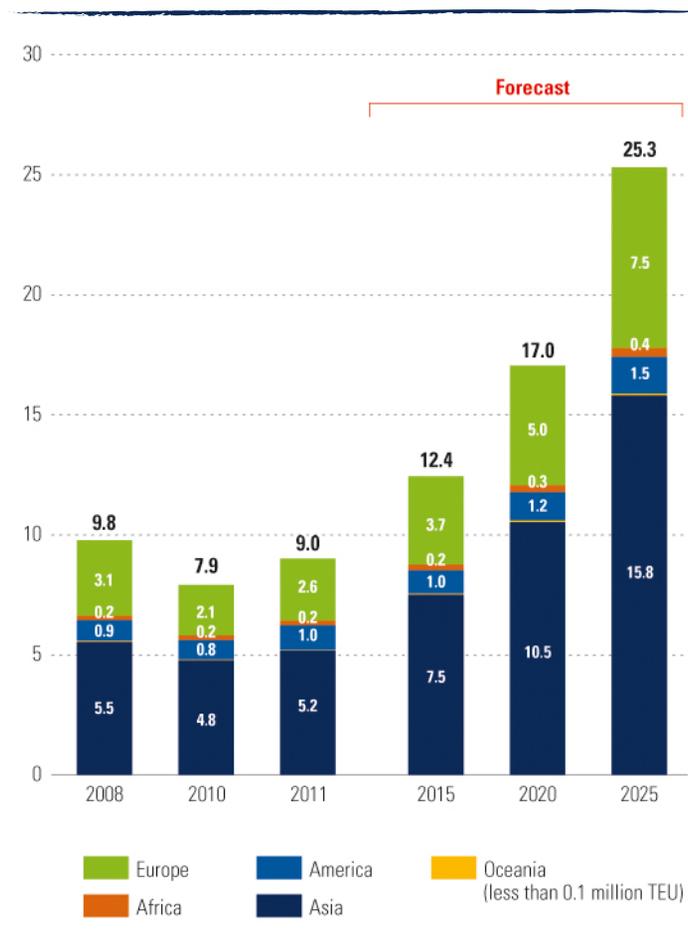
With regard to Baltic Sea-bound traffic it may be said that the number of direct calls replacing feeder services, which rose due to the crisis, has not had any significant market effect. In the medium term the potential for direct calls may level out at about 600,000 TEU, which roughly equals one direct service per each large shipping company and/or shipping line alliance. The most likely forecast scenario seems to be a moderately optimistic development of handling volumes. This assumption is based on the combination of an optimistic economic scenario with a basic competition scenario that incorporates all the factors mentioned above. For Hamburg this translates into excellent development perspectives, namely a projected container handling potential of 25.3m TEU in 2025 (12.4m TEU

in 2015, 17.0m TEU in 2020). Based on the above scenario the Senate of Hamburg and HPA will plan infrastructure investments and determine the required handling capacities.

The current economic development in the Port of Hamburg has so far supported the forecast mentioned above: After touching bottom at the end of 2009, figures in 2010 and 2011 clearly pointed upward again. This applies in particular to container handling – in the Port of Hamburg and the entire North Range – the development of which clearly is in line with the optimistic economic scenario.

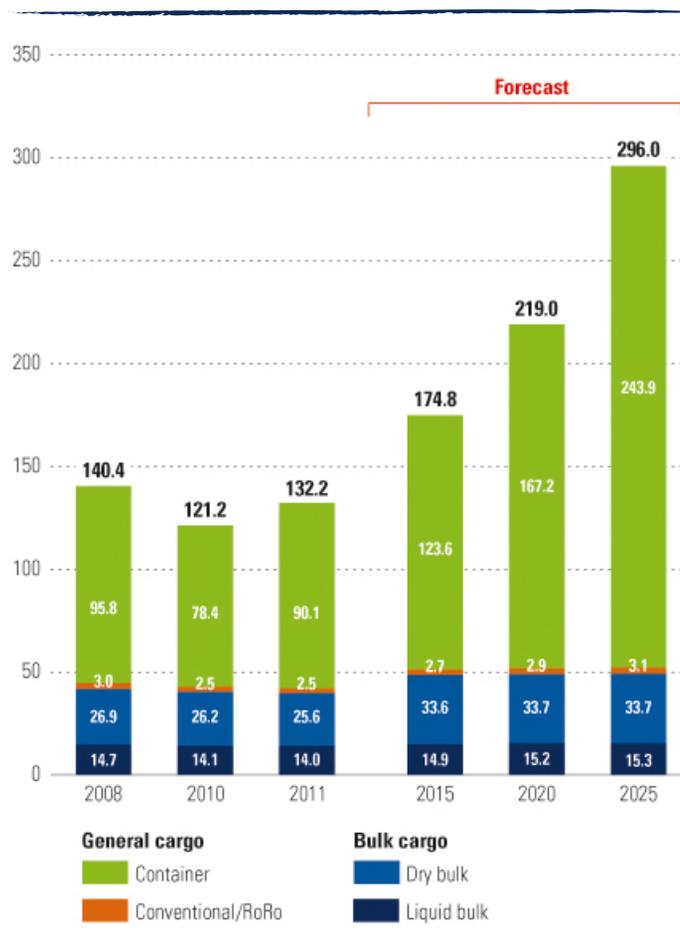
The regional differences in production costs, which vary considerably worldwide, will continue to exist over the medium to long term and it is not likely that a world economy based on the division of labour will be replaced or the trend to globalisation will stop. Global growth is fuelled in particular by emerging Asian economic powerhouses such as China and India, but

Figure 16: Container handling in the Port of Hamburg by shipping area in million TEU: actual values and forecast



Source: ISL/IHS Global Insight (2010), HPA

Figure 17: Total cargo handling in the Port of Hamburg over the years to 2025 in million tonnes: actual values and forecast



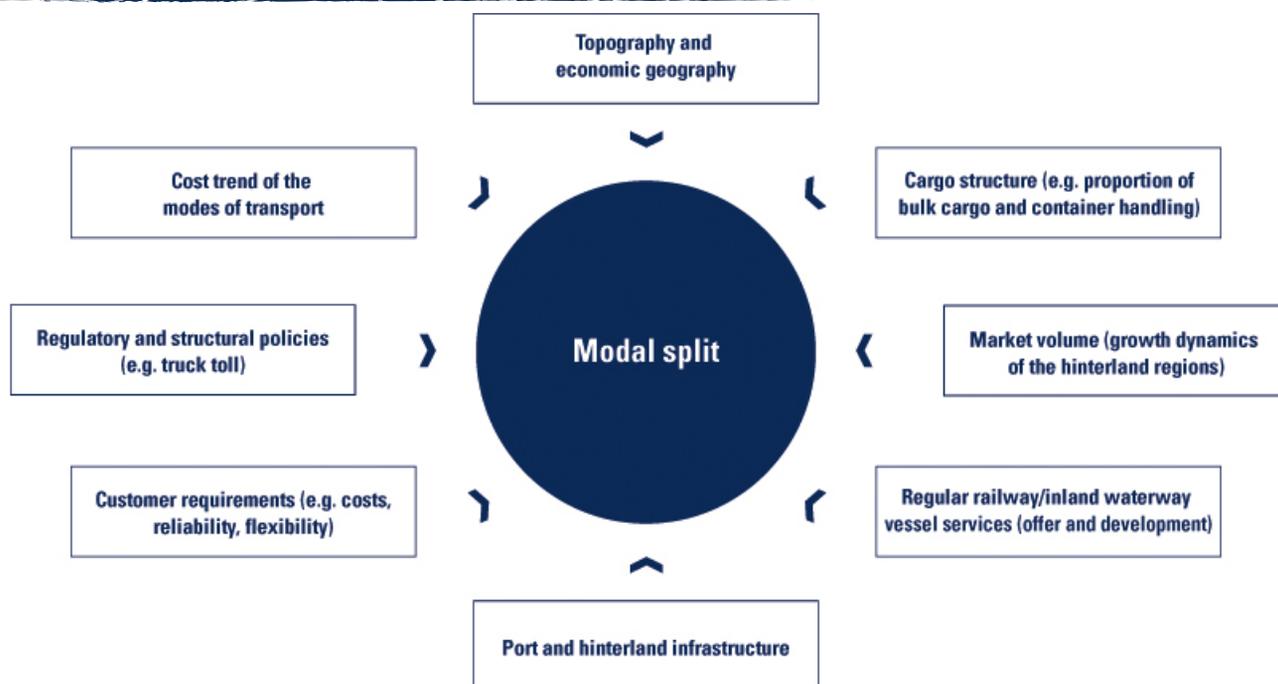
Source: ISL/IHS Global Insight (2010), HPA

- Container Terminal Altenwerder 4m TEU
- Container Terminal Burchardkai 6m TEU
- Container Terminal Hamburg (Waltershof) 6m TEU
- Container Terminal Tollerort 4m TEU

The optimisation and expansion projects initiated will enable the Port of Hamburg to adequately cater to future demand. According to the Association of Hamburg Port Operators the existing capacities and capacity expansions will be sufficient to cope with predicted container volumes between now and 2025. Additional berths for large ships can be built in the Steinwerder area. Further capacities will be available in the port expansion area in the long term.

The development planning of the Senate of Hamburg not only depends on the forecasted handling volumes and expansion plans of single handling terminals, but also takes into account the long-term trends of the resulting overall performance of the port as outlined in the various operational concepts as well as the global and regional economic development relevant to the port. Planning is thus based on regularly updated forecasts and integrates strategic and competitive aspects.

Figure 18: Factors that influence the modal split of a port



HINTERLAND RELATIONS: TRAFFIC VOLUMES AND DISTRIBUTION

Politics and parties of the port industry involved in the port dialogue 2011 agree that one of the main challenges to be coped with over the period to 2025 is how port-internal traffic and hinterland transports should be dealt with in the future.

The present forecast of handling potential points to hinterland freight volumes of around 194m tonnes and 14m TEU respectively for 2025. This calls for the development of concepts outlining the economically and ecologically most favourable division of freight across the various transport modes (modal split). Among the modes of transport available – railway, inland waterway vessel and truck – the first two not only offer economic advantages over the truck, but also hold the largest capacity reserves and are more beneficial to the environment and climate.

The modal split in a port is mainly determined by its economic and geographic location. Ports with a high proportion of locally generated cargo naturally have a higher share of truck traffic as in short-distance traffic the truck still beats all other modes of transport. In ports such as Amsterdam, Rotterdam and

Antwerp, which are all close to the River Rhine, the modal split share of the important inland waterway vessel is 50%.

The type of cargo also has a considerable impact on the modal split: for logistical reasons containers are frequently moved by truck. Bulk cargo, on the other hand, is ideal for transports by rail or inland waterway vessel, which are both cost-effective carriers concentrated on a limited number of relations. The dynamic development in east European regions, which are already primarily served by rail, may have a positive effect on the railway share of Hamburg’s hinterland traffic. In container traffic, too, more transports will probably shift from road to rail because, in view of the expected increase in volumes, it will be worthwhile for many regions to establish regular rail services as an economic alternative to today’s road traffic.

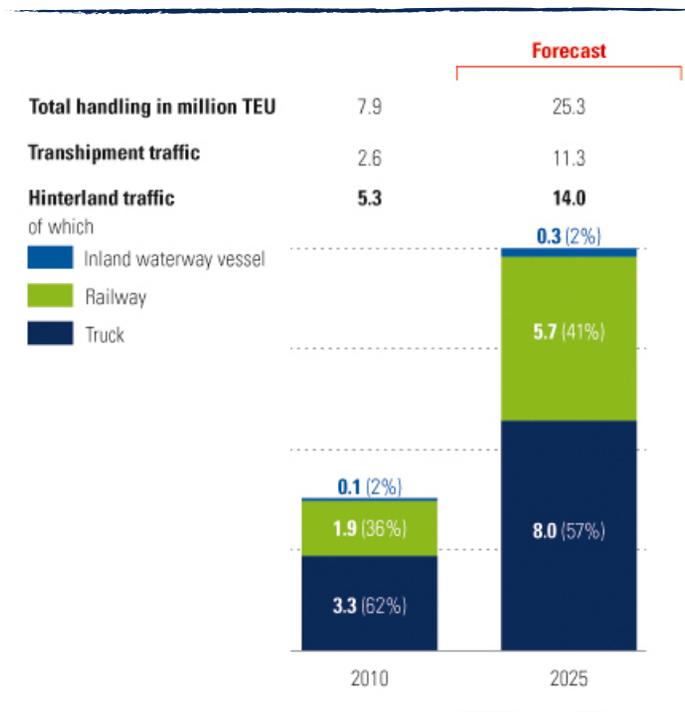
Which mode of transport customers ultimately choose will primarily depend on costs. Energy costs play a major role in pricing: if, for instance, oil prices continue to rise above average, this will decrease the competitiveness of truck and inland waterway vessel.

External circumstances are causing a shift from road to rail. First estimations predict that in the modal split of Hamburg’s hinterland transports roughly 5% of container traffic will have shifted from truck to rail by 2025. This is equivalent to a rise in railway share from 36% to then 41%. The Senate of Hamburg strives to further increase the share of containers transported by rail provided the necessary regional and cross-regional railway network measures and projects will be realised. Considering these factors, the proportion of inland waterway vessel transports may be assumed to remain more or less unchanged. The Senate of Hamburg, through advancing measures, strives to increase the share of inland waterway vessels beyond that.

The Hamburg Port Authority is pushing the implementation of projects to upgrade the transport infrastructure so as to enable the port to cope with volumes on hinterland transport routes predicted to rise significantly in future. In order to utilise the strengths of each mode of transport and to fully benefit from intermodal advantages, the hinterland-related transport infrastructure projects mentioned in the Ahrensburger Liste, a summary of priority transport projects for the north of Germany, must be implemented in a timely manner.

In view of the objectively necessary restrictions existing in the greater area of Hamburg with regard to new transport routes, the efficiency of existing ones must be increased. This primarily comprises the establishment of traffic control entities, increasing the stabilisation and distribution of traffic over 24 hours on 7 days a week as well as the seamless connection of port roads and cross-regional networks. In addition,

Figure 19: Modal split in container traffic in 2010 and estimated volumes for 2025 in million TEU



Source: ISL/IHS Global Insight (2010), HPA

Figure 20: Overview of the major transport infrastructure projects for the Port of Hamburg

Most of the measures form part of the Ahrensburger Liste

Waterway

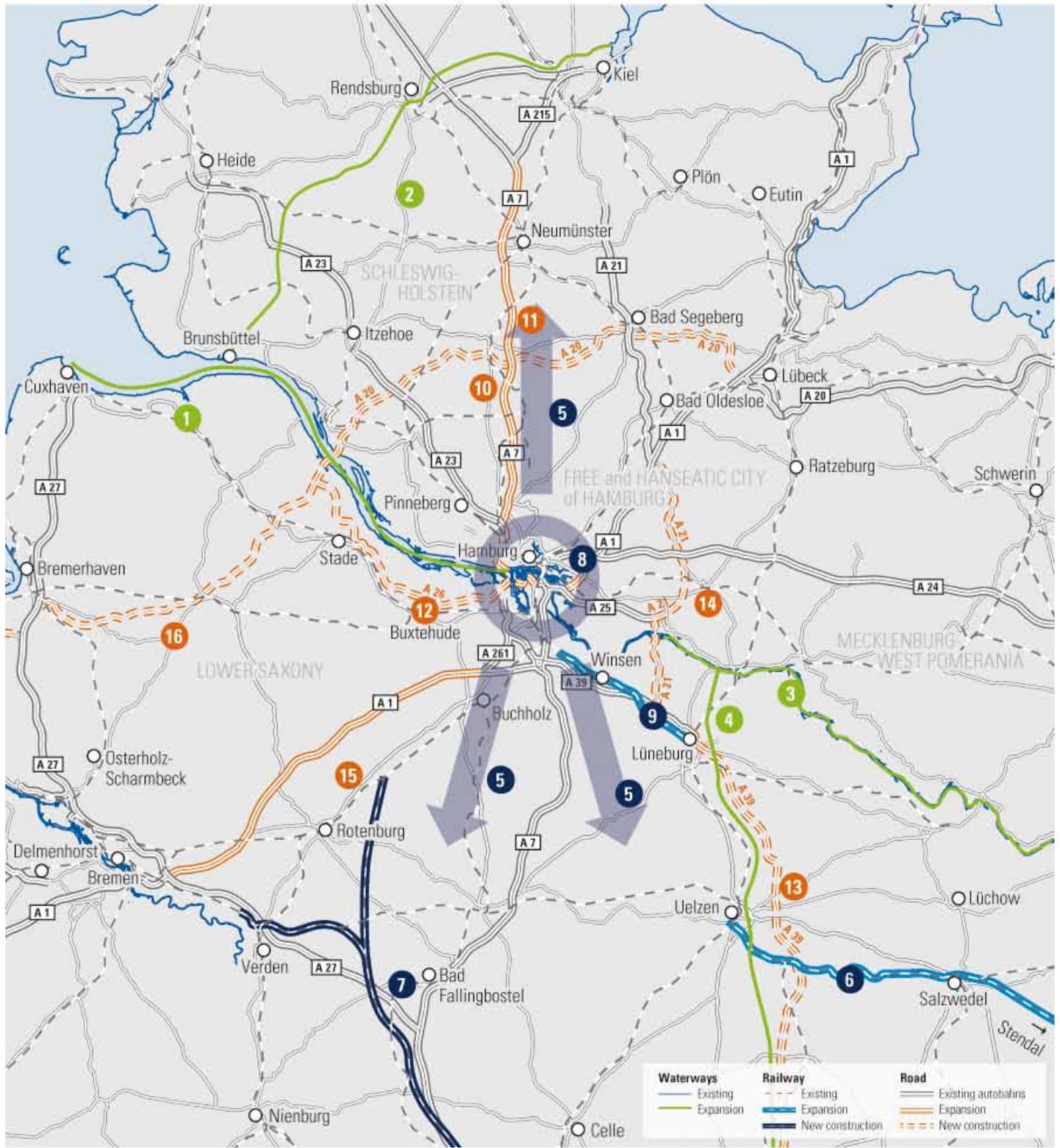
- 1 Fairway adjustment of the Lower Elbe (Untereibe) and Outer Elbe (Außenelbe)
- 2 Maintenance and expansion of the Kiel Canal (channel deepening, modernisation of locks and other measures, a. o.)
- 3 Maintenance measures in the Mid Elbe (Mittelbe) and Upper Elbe (Oberelbe) (navigation channel depth of at least 1.60 metres on 345 days/year)
- 4 Upgrading of the Elbe Lateral Canal (modernisation of the Schamebeck boat lift and new construction of the Lüneburg lock)

Railway

- 5 Connection of the port's hinterland traffic flows when updating and adjusting the trans-European transport (TEN-T) network
- 6 Expansion to two tracks of the Uelzen-Stendal axis to upgrade the South Germany/Southeast Europe corridor
- 7 New construction/extension of the Hamburg/Bremen-Hanover axis (Y-line) for passenger and freight traffic
- 8 Measures to ease the strain on Hamburg as a railway hub
- 9 Expansion to three tracks of the Maschen-Stelle-Lüneburg axis

Road

- 10 Further extension of the A 20 (autobahn) from Lübeck to Stade
- 11 Expansion of the A 7 to six and eight lanes respectively from Bordesholmer Dreieck to the Hamburg state boundary
- 12 New construction of the A 26 from Stade to the A 7 connection as well as extension to the A 1
- 13 New construction of the A 39, Lüneburg-Wolfsburg
- 14 Further extension of the A 21 from the Hamburg bypass to the A 39
- 15 Expansion of the A 1 to six lanes from Buchholz to Bremen
- 16 New construction of the A 22 from Stade to Bremerhaven



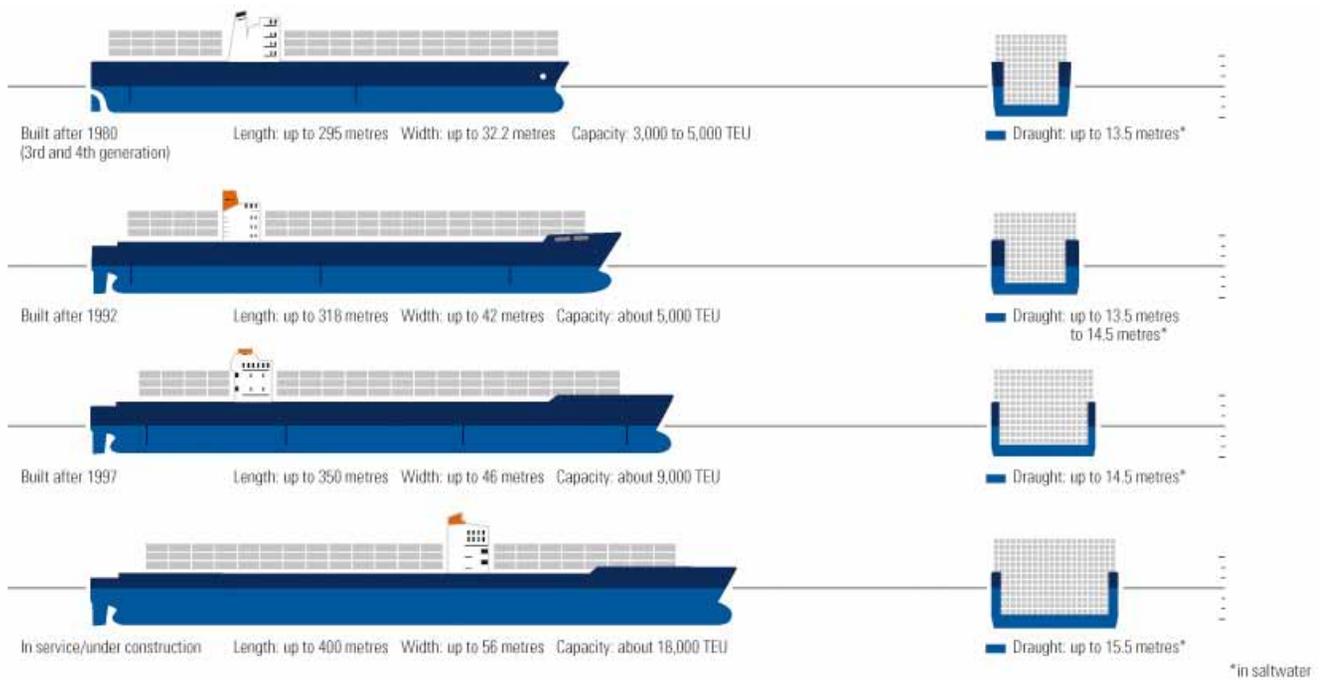
Source: HPA

capacity adjustments with regard to hinterland routes that fall in the area of responsibility of the federal government appear indispensable. In the medium term, the proportion of truck traffic could be decreased substantially in favour of the railway by integrating the port railway more closely in handling facilities, in particular by offering tri-modal transport combinations.

SHIPPING INDUSTRY: MEDIUM-TERM OUTLINE CONDITIONS

Hamburg’s port policy not only addresses quantitative development, but also integrates qualitative dimensions in its planning. The forecast of potential is supported by a number of market studies and market assessments, which may have a direct impact on day-to-day operations in the Port of Hamburg that goes beyond capacity issues.

Figure 21: Growth in dimensions of container vessels



Source: Fairway adjustment project office

Ship Size Development

The development of ship sizes plays an all-important role. For many years now, market conditions have been determined by growing ship dimensions. This applies to all sub-segments of the world's shipping fleet and in particular to container shipping; it applies as much to mega-carriers as to feeders. The new generation of container ships of the largest dimensions are primarily in service between Europe and the Far East which are of great importance to Hamburg. More and more, the ship size determines which North Range ports are called. Due to its proximity to the markets in northern and eastern Europe, its high volumes of local cargo and its role as a hub with high cargo volumes Hamburg is a preferred destination. To maintain its competitive edge in the long run, Hamburg must be able to handle large, cost-efficient deep-sea ships. In view of the rapid development of ship dimensions expected in the coming years, these calling conditions will become a crucial competitive characteristic within the North Range. The impending River Elbe fairway adjustment is an important prerequisite for the Port of Hamburg to increase its market share in the large-size segments, or prevent the loss of it, and thus maintain its position as a shipping hub for traffic from and to Asia.

Ecological Aspects in Maritime Traffic

In addition to the development of ship sizes, ecological aspects are gaining ever more importance in maritime traffic. The use of clean technologies will enhance the ecological quality and improve the carbon footprint of ships. Major approaches currently being pursued are the reduction of contaminants and greenhouse gases in fossil fuel burning and the use of alternative, less harmful fuels such as LNG (liquefied natural gas). Via the International Maritime Organization (IMO) initiatives have been launched to further restrict the use of heavy fuels in ship engines. Due to the establishment of nitrogen oxide and sulphur oxide emission control areas and EU regulations applicable to vessel berths, the use of heavy fuel oil in the relevant ports has been substantially restricted. In the coming years, stricter regulations will increase the requirements imposed on shipping companies and ports. Ports are trying out new energy supply systems to enable ships to switch off polluting ship aggregates during loading / unloading and berthing times. In the medium and long term, standards will be developed to assess the ecological quality of transports by ship, handling activities and landside on-transport, and the market will consider it a matter of course that such standards are in place and regularly updated. Slower vehicle speeds introduced during the latest global economic crisis to better utilise capacities clearly benefit the environment.

Trends in the Shipping Company Market

Ship owners increasingly invest in their own terminals or acquire interests in terminals to secure handling capacities (dedicated terminals), and a transport and logistics site is well advised to co-operate with them. This was particularly evident during the latest economic crisis when shipping companies channelled their cargo to dedicated terminals to achieve optimum utilisation.

Today the 10 largest container shipping companies control more than 58% of the total seaborne cargo volumes – in 2001 this figure stood at 35%. This rapid development clearly shows that there is a trend towards consolidation and re-organisation in the added-value chain of the shipping and logistics sector. This is enhanced by a trend in the freight forwarding sector that allows companies which, on the basis of purchased transport services, arrange the shipment of goods for third parties to acquire an ever larger share in global seaborne freight and position themselves along the entire added-value chain. The trend to outsource logistics services remains unchanged, and global players will continually expand their market share in this field, too. More than ever, the leading ports are facing market-defining customers who have a decisive influence on goods flows, which is why their site strategies and technological decisions – e.g. IT use and IT integration – should be analysed in detail to commit them to the site.

A number of the trends described above significantly influence the market structure and market position of single ports. At the same time, however, the classical criteria for choosing a port remain highly important. These are, e.g., port fees and charges which mainly consist of terminal handling fees as well as pilotage charges and port dues, etc. The attractiveness of hinterland connections and their cost structure also play a vital role based on which it is possible to determine a preferred catchment area of a port.

■ GLOBAL DEVELOPMENT TENDENCIES

To analyse the long-term market opportunities of the Port of Hamburg over the years to 2025 and beyond, it is imperative to integrate the available knowledge about economic, social and cultural change processes of a very broad scope (mega-trends).

Relocation of Production Sites and Goods Flows

Due to above-average growth of individual, high-volume markets such as China, India and eastern Europe, new production centres will form both based on local demand and in relation to costs of labour, raw materials and transport with the respective consequences for global goods flows and their composition. A re-industrialisation of eastern Europe, for example, may open new opportunities for its gateway, Hamburg.

Higher Consumer Goods Demand with Changed Key Focus Areas

The future will likely see a change in key demand areas due to the economic and demographic development of regions such as China, Russia, India and Brazil (BRIC states), where demand for consumer goods of all categories will rise. This will result in new goods flows in the transport and logistics sector, which in turn will offer new opportunities for the Port of Hamburg. In how far these new opportunities can be realised depends on how well the port's east European hinterland can raise its profile and strengthen its position as an exporter of high-quality consumer goods and how well hinterland transports into this region can be improved.

New Requirements as to Investments in Infrastructure Expansion Projects

New production and consumption centres as well as larger overall production, trade and transport volumes will require considerable investment in all areas of infrastructure in regions all over the world. Increasingly, new funding models involving private partners will be leaned on to provide infrastructure facilities in accordance with demand. In route-bound transports and ports such models are already in place and thus change the regulatory framework of competition in the port industry. The Port of Hamburg, too, will deal with changed funding structures when developing its infrastructure.

Stronger Focus on Environmental Protection and Energy Efficiency

Activities to protect the climate and environment are on the rise all over the globe and many countries are introducing regulatory mechanisms. The importance of sustainability strategies for companies and economies is growing. The trend towards eco-friendly maritime transports described above is part of a global innovation, followed up by mega-trends that not only lead to the ecological improvement of existing systems, but create completely new markets and sectors. If the Port of Hamburg can shape its profile accordingly, it will be able to establish new loading categories, attract new cargo handling and production companies and gain new customers for its services.

IT Systems that Lead to Increased Efficiency and Growth

The importance of IT systems will continue to grow in all sectors, contribute to the further development and improvement of processes and systems and enable the establishment of new business fields. Shipping and maritime trade in particular have large catching-up potential compared to the rest of the transport and logistics sector, offering opportunities to increase the efficiency as well as to establish new business models.

Changes in Transport Chains due to Safety and Security Requirements

Throughout the transport and logistics industry requirements as to the safe transport of high-quality or dangerous goods and the need for counter-terrorism measures are growing. This will have an impact on cost structures, however it will also offer the transport and logistics industry as well as ports the opportunity to reposition themselves and sharpen their competitive edge.

Hamburg will continue to meet the challenges posed by global trends and implement the required port infrastructure measures, among others. The port industry and port management expect all handling segments to grow in accordance with the forecast for the period to 2025 outlined in this Port Development Plan.

Sharpening the Profile of the Port

■ FOCUS ON GROWING MARKETS AND REGIONS

According to long-term global forecasts permanent growth in China, India, Brazil, Russia and eastern Europe will be much stronger than in the developed economies of Western Europe. The resulting trans-continental goods flows will have an impact on the business of the Port of Hamburg. In a market position built up over the years, Hamburg's focus must lie on securing and expanding trade with Asia and eastern Europe and developing new growth markets.

HAMBURG'S POSITION IN INTERCONTINENTAL TRADE

For Hamburg to retain its position in the North Range as an important handling hub for goods from Asia, the port should strive to strike a balance between outbound and inbound maritime traffic flows. To achieve this, Hamburg needs to put a stronger focus on combining European goods flows bound for Asia.

Hamburg will become more attractive for shipping lines and freight forwarders when, apart from shipping goods from Asia to Europe, they can also return with full container boxes. Besides the traditionally strong machinery and vehicle export trade, the Hamburg Port Authority, within the scope of the global trends analysis, identified containerised exports of cereals as well as recyclables and raw materials (e.g. recycling material, cellulose) to be suitable for transports from Europe to Asia. These cargo categories already play an important role and show strong growth.

The Free and Hanseatic City of Hamburg will offer shipping companies and their big customers – Asian industrial producers with a focus on European markets – even more attractive site conditions to encourage them to establish their European headquarters in Hamburg, which is why getting shipping companies with a high share of cargo business in growth markets to commit to Hamburg is desirable.

Hamburg is the “Most Western Baltic Seaport”

The importance of the Port of Hamburg in the international exchange of goods is predominantly based on its hub function for goods from and to the Baltic Sea area. To secure this position, the River Elbe fairway adjustment as well as the expansion and maintenance of the Kiel Canal are pivotal infrastructural prerequisites. The latest generation of container ships must be able to call the Port of Hamburg at economically favourable conditions to allow Hamburg to retain its hub function for the Baltic Sea area.

The Port of Hamburg is the North Sea port that is closest to the Baltic Sea. The option to combine large seaborne cargo

volumes bound for the Baltic Sea area offers cost advantages that enhance the competitive edge of Hamburg with regard to deliveries to other hinterland areas.

In some cases Baltic Sea ports make an attempt to handle direct calls from Asia and establish transshipment structures from Gdansk and Gothenburg. It is currently difficult to assess if these traffics will be profitable in the long run or if this is an effort to win cargo for otherwise underused types of ships. This development is carefully monitored. In this context, it is particularly obvious just how important the demand-oriented expansion of the maritime traffic infrastructure is (fairway adjustment, Kiel Canal) to secure the Port of Hamburg's position.

Mediterranean Seaports as New Competitors

Due to its excellent rail connections, the hinterland of the Port of Hamburg in the south not only extends to Austria, but all the way to the states in south-eastern Europe. Ports on the Adriatic Sea and Ligurian Sea are trying to gain market share over the large seaports on the North Sea by investing in their hinterland transport infrastructure.

The total volume the southern ports may gain in markets other than their current markets is considered relatively small even if they realise the capacity expansions as planned.

The seven ports in the north of Europe currently handle four times as many containers as eleven significant ports on Europe's southern coast. The large handling volumes implicate highly efficient distribution structures. This is due to a favourable combination of several economic and geographic factors.

- First, 70% of Europe's cargo handling and cargo volumes are concentrated in the northern half of Europe.
- Next, Europe's topography strengthens the position of the northern ports. The Alps present a natural border so that the catchment area of the North Range ports extends to the regions of Switzerland and Austria to the north of the Alps.
- Handling volumes and the topography contributed to the development of high-capacity, cost-effective intermodal corridors that are well connected to the North Range ports.

In order to reinforce and expand the Port of Hamburg's function as a gateway to eastern and south-eastern Europe and in view of the growth rates in the Mediterranean Sea ports, it is of particular importance that the federal government and DB Netzwerk AG, a subsidiary of the German national railway, expand the railway network.

In this context, the SECA (Sulphur Emission Control Area) regulation is distorting competition. The regulation requires the use of low-sulphur ship fuels only for the North Sea and Baltic Sea; it does not apply to the Mediterranean Sea or the Spanish and French Atlantic coast. There, and in other European waters, fuels with a higher percentage of sulphur content may be used. This may weaken short-sea traffics, which is not desirable, because not only feeder services may be shifted to land modes of transport, but it may also lead to container hinterland traffic shifting from the more environmentally friendly North Sea ports to Mediterranean Sea ports with high emission levels such as Trieste, Koper and Rijeka.

Besides principal environment-relevant improvements, it is in the interest of Hamburg and the other North Range ports that the SECA regulation applies throughout the European Union and that competition between the ports is not distorted because different environmental standards apply in the territorial waters of the European member states. This position is actively voiced on various committees. In a joint initiative presented to the upper house of the German parliament [Bundesrat] the federal coastal states of Lower Saxony, Schleswig-Holstein and Hamburg therefore asked the federal government to advocate the implementation of uniform limit values for sulphur in ship fuels that apply in all territorial waters of the EU.

The harmonisation of European guidelines with IMO regulations on sulphur content of ship fuels as advocated by the European Commission is supported by the ports of Hamburg, Antwerp and Rotterdam as is the proposal to extend the scope of application of the SECA regulation to the 12-mile zone along the coasts of the European Union. If the European Parliament and European Council agree, the regulation will create fairer competitive conditions.

Trans-European Networks

The aim of the trans-European transport network (TEN-T) is to expand the transport infrastructure and the connections within the European Union to support internal market needs to guarantee smooth passenger and freight flows and promote growth, jobs and competitiveness. Though existing cross-border infrastructure is taken account of, links between these core corridors are to be established within the framework of the network policy. The ports function as important logistic nodes with trimodal connection to the distribution routes into the hinterland. It is of decisive importance that the Port of Hamburg is well integrated in these networks and these networks are further developed.

Funding provided by the European Union must be allocated fairly and it must not interfere with competition between European port sites as otherwise, there is a risk that the Mediterranean Sea ports will use EU funds to expand which will distort competition. Furthermore, the implementation of transport management systems that optimise infrastructure utilisation and, as a result of increased efficiency, lower CO₂ emissions should be rewarded.

The Port of Hamburg as a transport hub for seaport-hinterland transports is a part of the core network. The most recent proposals of the European Commission contain rail, road and waterway relations (seaside access: River Elbe, Kiel Canal, Mid Elbe and Upper Elbe [Mittel- und Oberelbe], Elbe-Lübeck Canal, Elbe Lateral Canal) that are of significance to the Port of Hamburg and its hinterland traffic.

North and South America

Apart from Europe and Asia, trade with North and South America is of special importance to the Port of Hamburg. Whereas the port's share of trade with South America is traditionally high and the growth of the emerging economies there has had a positive effect on Hamburg's handling volumes, the proportion of shipping from and to North America should be much higher given the importance of the US American and Canadian economies. Targeted marketing is to help utilise this handling potential better.

Cruise Shipping

Over the past couple of years the Port of Hamburg has become an attractive cruise ship destination. This is due to the many touristic attractions the city has to offer, the unique inner-city location of the port and excellent waterside and landside infrastructure for cruise ships. Compared to other competitors in the cruise ship segment, Hamburg also offers excellent air connections and attracts international cruise ship passengers who start or end their journey in Hamburg. Cruise shipping not only benefits the tourism industry but retail trade, too. Large-scale events, such as the Cruise Days or ship christenings, underpin the positive development in this segment. Cruise ship calls rose from 104 in 2010 to 118 in 2011. This development underlines the need for additional cruise ship facilities, which the city has responded to. Hamburg currently disposes of two cruise ship terminals in Altona and HafenCity. The terminal in Altona was inaugurated in 2011 and proves that the City of Hamburg is able to respond to the needs of the cruise ship sector at short notice. Based on the development so far, the sector is likely to grow further. In 2012, 164 calls and over 400,000 passengers are expected to visit. Over the years to 2015 passenger numbers are predicted to grow in the double-digit range, and further berth capacities may have to be provided in line with urban planning regarding River Elbe embankment structures. If the prediction proves correct, the Senate of Hamburg will contemplate the construction of a third terminal in a timely manner, including the possible investment of shipping companies.

Project Cargo

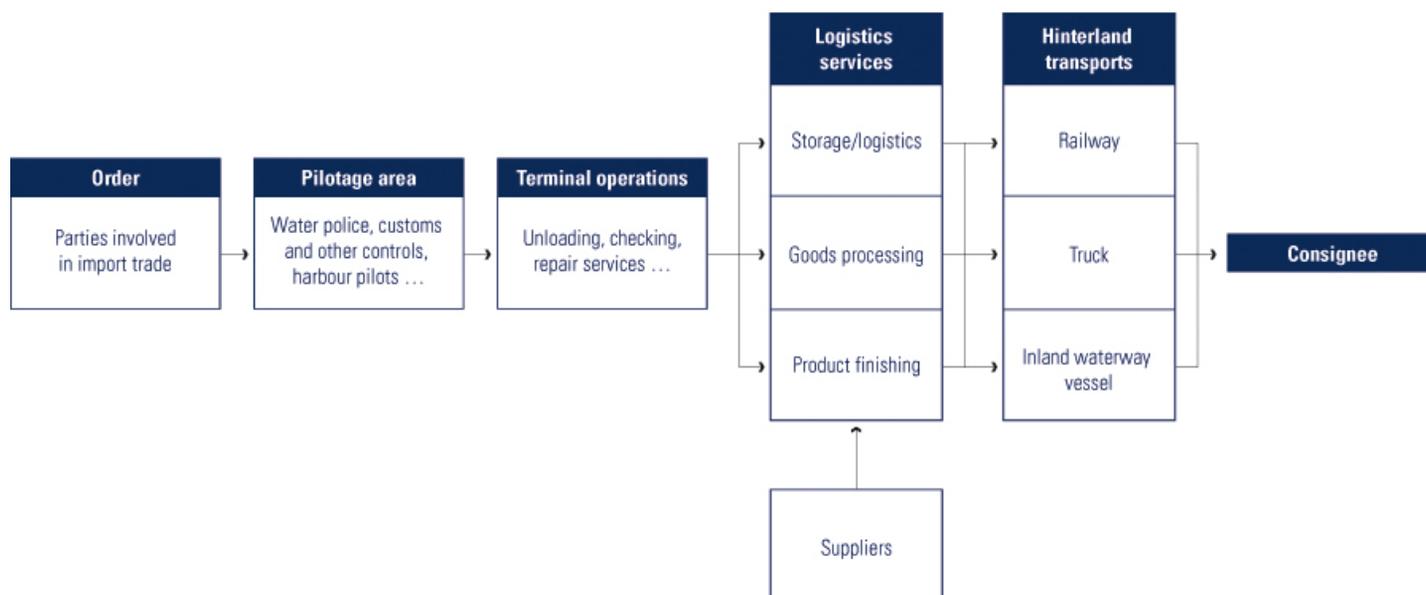
Machines and plant components, whose dimensions and weight are such that it is impossible to transport them by road or rail, are called project cargo. Project cargo has always been an important business segment for the Port of Hamburg. Due to the complexity of the individual consignments, project cargo is a highly labour-intensive, high added-value business. Very often, final processing steps are performed shortly before the products are actually loaded. The wind power industry with its onshore and offshore wind farms in particular may offer additional potential. Worldwide demand for wind turbines will likely require port services on a permanent basis, which at the moment are mainly provided by ports other than Hamburg. Even though other ports along the North Sea coast dispose of spatial site advantages to function as base ports when offshore wind farms are established, there is potential for Hamburg as a wind energy industry stronghold both with regard to shipping and assembling large components for wind turbines. The Port of Hamburg houses several terminals specialised in this type of project cargo. The market is being carefully analysed if additional specialised handling facilities are economically sensible and to what extent associated industrial activities such as research, development and production can be located in Hamburg. This requires the short-term improvement of approval procedures for heavy-goods and special transports. Overall, the project cargo segment – in particular in combination with industrial settlements – is projected to grow significantly over the coming years.

These special efficiencies, achieved when several providers form an alliance, have so far played a subordinate role in the communication of logistics companies. The Hamburg Port Authority, in conjunction with Hafen Hamburg Marketing, will establish a web-based communication interface that will match logistics services offered with the services required. This kind of virtual freight services centre will facilitate customer-oriented marketing of logistics services without competing with the services offered by private companies.

Integration of Major Players in the Transport Chain

Analogous to many other sectors, the logistics sector too is experiencing ongoing consolidation among companies that started as small businesses providing transport and freight forwarding services only, but over time have become big-sized logistics providers who increasingly shape and control the logistics chain and additionally offer the value-added services mentioned above. Freight forwarders in particular have turned into customers that exercise great influence over cargo flows and the integration of additional, commercial functions. Like shipping companies they now control cargo movements and their decisions may have a strong impact on the success of the port. In future sustainable strategic location concepts will increasingly be developed together with shipping, cargo handling and logistics companies.

Figure 23: Value adding-relevant activities on the example of a services chain for goods imported via the Port of Hamburg



Shipyards

The shipbuilding industry in the Port of Hamburg has a long tradition and with its shipyards and suppliers still occupies a key position in Hamburg's maritime economy even after many crises and adjustment processes. In view of the fact that around 12,000 sea-going vessels call the Port of Hamburg annually, Hamburg has to provide ship repair facilities.

Long years of experience, technical know-how and state-of-the-art manufacturing techniques are the prerequisites to stay internationally competitive. Container ships, yachts and special ships are in part built and overhauled in Hamburg's shipyards. For instance, in 2011 the shipyards received orders for 28 ships valued at three billion euros. They also reconstruct and overhaul ships. More than ten Hamburg-based shipyards, offering about 2,000 highly qualified jobs, build new ships and repair harbour crafts and inland waterway vessels all the way to large sea-going ships. They complete the range of services the Port of Hamburg as a significant final port is expected to offer, in particular repair and maintenance facilities for ship owners, and are thus able to help minimise downtimes of, for instance, cruise ships. New market segments such as the building of special ships, e.g. installation ships and platforms for the offshore wind power industry, offer potential for the sector.

Market Research and Branch Screening

The Senate of Hamburg wants to expand the industrial potential in the port. The Hamburg Port Authority therefore has been conducting targeted market consultations and branch screenings to attract suitable seaport-related sectors and companies to the site in line with the overall interests of the city. Priority target sectors are determined from the intersection of high import/export dependency. Other criteria are the future viability of the sector as well as their high functionality for Hamburg and the synergy effect with regard to businesses already operating in the port. Existing goods flows are analysed and specific value chain levels of potential target industries are looked at in detail. A recently performed analysis determined the following potential future markets or sub-functions thereof: the production of large lightweight construction elements made of innovative materials, the production of hydrogen-based fuels, methanol or methane as well as the production of deep-sea and ground cables.

Furthermore, the assembly of mining, construction and building material machines produced by foreign manufacturers or the system assembly and final assembly of locomotives and railcars may be of interest to the site. Such products have ever larger dimensions that make it very difficult to transport them by road and the respective sectors increasingly need to be close to the quay edge. However such businesses usually do not generate sufficient production volumes to guarantee that quay capacities are satisfactorily utilised at all times. On the request of the Senate of Hamburg, HPA is working on location strategies that enable production plants to jointly use quay facilities and thus make optimum use of handling capacities. Suitable sites in the area of the port are Mittlerer Freihafen and Überseezentrum.

Other fields, such as the use of eco-friendly fuels (e.g. gas power for feeder vessels) or electric drives may offer potential for the location of industry. HPA is active in these fields and will support possible prototypical applications and locations as required.

Ensuring the Quality of the Port by Providing Optimum Infrastructure Facilities

Port dialogue | results

Most of the parties involved in the port dialogue considered the following important:

Expansion of hinterland connections, e.g. by:

- Strengthening inland waterway connections (Lower Elbe/Upper Elbe waterways as a whole system)
- Expanding the Hamburg-relevant railway lines (e.g. Y-line)
- Upgrading autobahns (A 26 , A 20, A 39)
- Offering new funding systems for hinterland infrastructure facilities

Improving transport flows

- Improved use of existing time windows – 24/7 in the hinterland too
- Railway: improved use of signalling technology; longer trains
- Inland waterway vessel: more coordinated planning, general professionalisation
- Road: establishing pre-gates; longer trucks; increased use of hard shoulders

Aims

- Upgrading of hinterland connections to accommodate growing handling volumes
- Sustainable development of the modal split
- Optimisation of existing systems to achieve fast improvements

Apart from sufficient and efficient handling capacities, which Hamburg will continue to offer, the quality of the transport systems equipped to accommodate goods flows in the port and in the port's hinterland will be a key competitive factor of the port. Though Hamburg has good tri-modal connections, temporary bottlenecks exist. It is therefore imperative to continually modernise all transport systems in the area of the port and the hinterland to fully utilise the growth and added-value potential to improve or at least retain Hamburg's competitive position over competing ports. In order to be able to cope with transport flows in a sustainable way, Hamburg will continue to promote environmentally friendly modes of transport such as railway and inland waterway vessels.

In its port planning to 2025 Hamburg focuses on eliminating the risk of bottlenecks by optimising transport flows, e.g., with intelligent transport information systems to improve the utilisation of existing routes. Nevertheless is the extension of important connections urgently required. Most of the expansion projects are the responsibility of the federal government or form part of European network planning. The Senate of Hamburg, the northern federal states and the port industry will proactively promote the issue to demonstrate just how urgent the measures are both for Hamburg as a port site and the metropolitan region as well as the entire Federal Republic of Germany.

Optimisation of Transport Connections and Seaside Accessibility

Priority development projects in the field of waterways are the fairway adjustment of the Lower Elbe and Outer Elbe channels and the expansion of the Kiel Canal for feeder services. To increase the share of inland waterway vessels in the modal split, the inland waterway network in the hinterland has to be upgraded.

The Hamburg Port Authority is preparing road, rail and waterway master plans which will outline both constructional measures and intelligent transport management systems.

Apart from improving the accessibility by sea, sufficient capacities and good landside connections to the hinterland are major challenges to tackle to ensure the long-term competitiveness of the port. The key projects are:

- Extending links to the main routes towards Berlin and Hanover to improve access to central and eastern Europe. It must be ensured that south-bound/incoming rail traffic will be improved within the scope of the adjustment and upgrading of the trans-European networks (TEN-T).
- Relieving congestion in the Elbtunnel and on Köhlbrandbrücke by building the new A 26 autobahn which connects the A 7 to the A 1.
- Expanding and extending the trunk road network.

Modern Data and Application Management

IT-supported information hubs that provide information on what goods are transported where to and where from form the basis of intelligent resources planning and improved control of intermodal transports. The ongoing optimisation of the IT infrastructure is one way to give Hamburg headway in the quality competition of seaports. To improve and accelerate the process of data integration, cross-functional platform solutions using modern and homogenous IT infrastructure facilities are needed. The planning regarding future-oriented IT architecture is supported by an IT development management strategy that integrates business processes. In addition, Hamburg's solutions are constantly compared to the world's best existing systems and reviewed accordingly.

Innovative Transport Systems

Growth in the Port of Hamburg is putting an ever greater strain on the transport infrastructure. To prevent future overburdening, infrastructure facilities need to be adjusted in line with growth forecasts whilst at the same time high quality standards are observed. The Senate of Hamburg not only pursues specific expansion projects, but optimisation across transport modes and transport systems. In this context, new transport systems will be examined for feasibility or if they will be of advantage to the densest areas of the port and the city. The study commissioned by the Hamburg Port Authority – Innovative and Alternative Transport Systems – analysed how useful the systems would be with regard to container transfer movements (terminal-terminal and terminal-depot/yard) and to connect nearby hinterland container terminals. From more than 50 technological approaches, ranging from mere ideas all the way to the finished product, 20 systems were chosen and, within the scope of a benefit analysis, examined in more detail for their suitability. These systems are divided into conventional systems, such as railway and truck, terminal technology – for instance AGV, driverless trucks and suspension systems –, dual systems with two possible route types and driverless railway systems, including magnetic levitation vehicles. According to first estimates the most suitable solutions for applications in the port would be magnetic levitation vehicle systems, driverless railway systems, bi-modal systems or driverless trucks. Almost all new transport systems require their own transport infrastructure. In this context, an underground container transport system will have to be examined for technical feasibility and economic viability. In the further fine-tuning process the intention is to continue the planning involving both the developers and the port industry in a synchronised and application-orientated way.

■ WATER INFRASTRUCTURE

The most frequently used route to approach the Port of Hamburg by sea is the 130km-long passage from the North Sea on the River Elbe. Other relevant waterways are the Kiel Canal for feeder transports, the Mid Elbe/Upper Elbe and the Elbe Lateral Canal that link the port to the European inland waterway network.

The River Elbe is one of the most significant and most frequented waterways in Europe. It is the basis of the economic success of the Port of Hamburg. The Hamburg Port Authority and the Federal Waterways and Shipping Administration [Wasser- und Schifffahrtsverwaltung des Bundes] respectively reliably and sustainably ensure safe waterside access to the Port of Hamburg in the section of the river they manage. The habitat and economic area of the Lower Elbe must be used to the best interest of its users and residents and at the same time its environmental needs must be respected and protected. This is the prerequisite when it comes to developing infrastructure measures in and along the waterway, appropriate and responsible sediment management and sustainable development of the tidal Elbe.

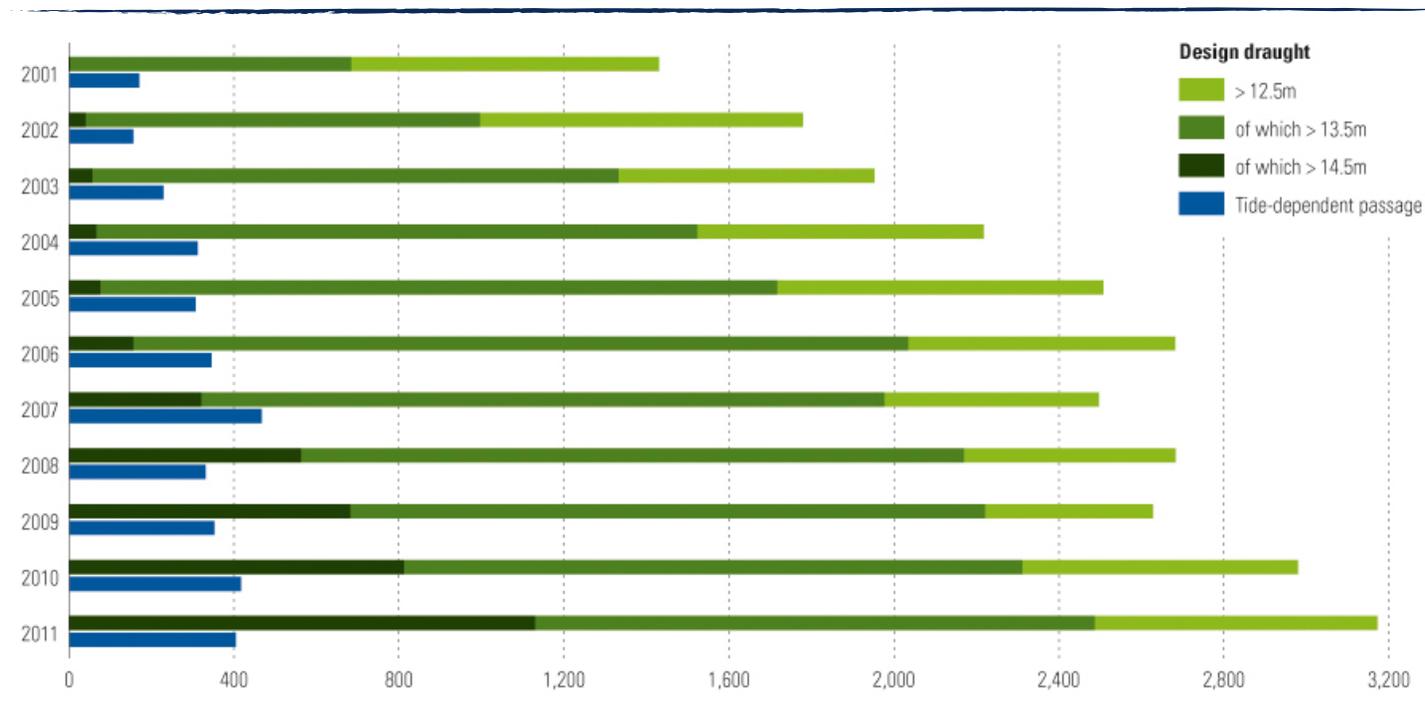
SEASIDE ACCESS

Fairway adjustment of the Lower Elbe and Outer Elbe River Channels

Deepening the channel by one metre for both tidal and non-tidal passages will bring effective short-term economic benefits and also enhance the attractiveness of Hamburg as a port site. Therefore, the Senate of Hamburg has applied for approval to adjust the navigation channel from Hamburg to the Outer Elbe with the Federal Ministry of Transport, Building & Urban Development [Bundesministerium für Verkehr, Bau & Stadtentwicklung] early on.

The economic crisis has further accelerated the worldwide trend to deploy large ships for cost advantages. This applies in particular to East Asia traffic which in Hamburg makes up about half of the total number of containers handled. The large container ships deployed on these routes usually have draughts that considerably exceed the maximum draughts permissible on the Lower Elbe and Outer Elbe. Ships of this size already handle the most containers by far. Currently, ship owners cannot use them to their full capacity because existing channel depths are not sufficient to accommodate a fully loaded ship. This situation is only tolerated by transport businesses

Figure 26: Large container ships in the Port of Hamburg: movements of ships with a design draught of > 12.50 metres (in saltwater)



Source: HPA

because they are confident that the adjustment announced by the Senate of Hamburg will be followed through.

The intended channel deepening will allow ships to carry approximately 1,000 TEU in addition and enable the port to receive vessels with a draught of up to 13.50 metres (in salt-water) at all tides, which will benefit the “pack donkeys” of global maritime traffic in various ways. Arrival, handling, land-side inbound and outbound delivery times will remain constant throughout the year, allowing all partners to rely on fixed, identically scheduled timetables. Conversely, unplanned deviations from schedules do not lead to unpredictable waiting times. Ship operators will thus be free to decide how much cargo they load, they will not depend on water levels and can do away with troublesome empty-container logistics. Ships with a draught of up to 14.50 metres will be able to navigate the Lower Elbe and Outer Elbe at high tide within a substantially wider time window.

Apart from having deeper draughts, modern large container ships are also broader. Some of them have a beam of more than 50 metres. The river section from Glückstadt to the Port of Hamburg today only accommodates ships up to a maximum width of 45m, which is why in addition to the deepening of this sub-section a differentiated widening of the river

channel is planned so that in future even the largest container ships can pass each other.

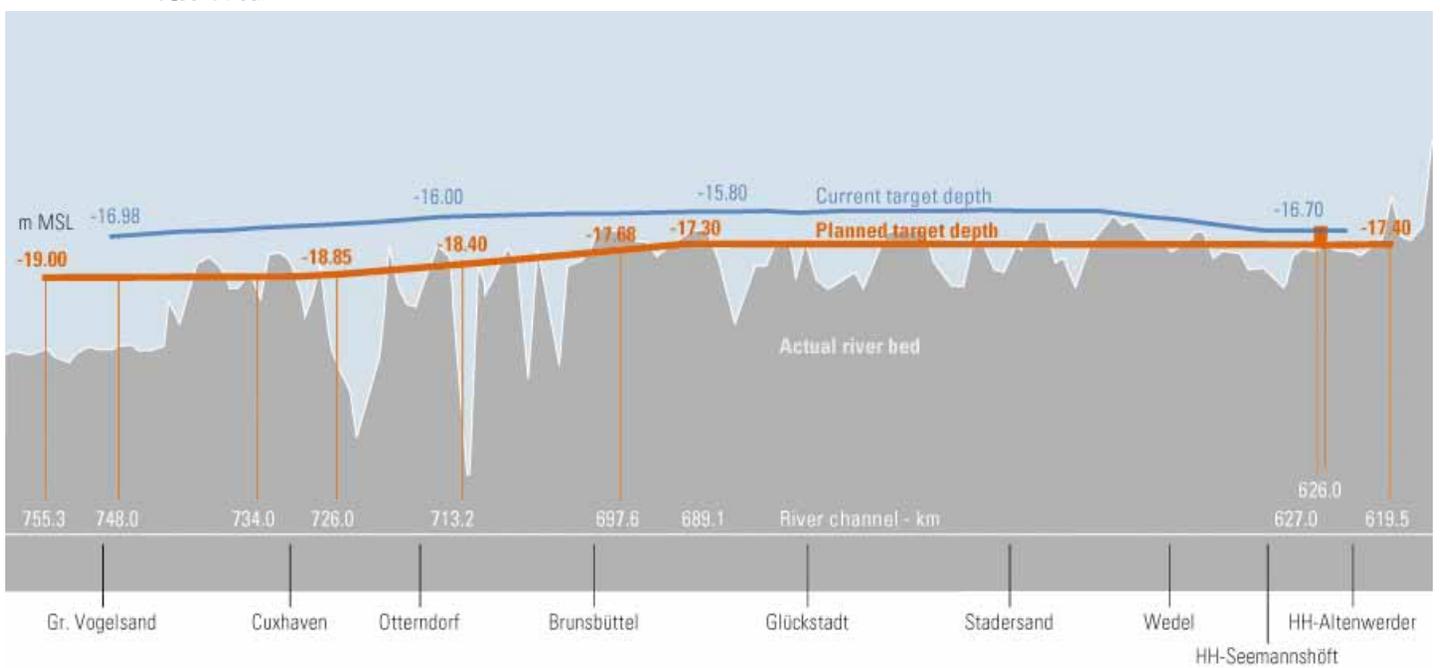
In close coordination with the Federal Waterways and Shipping Administration the project has been finalised in April 2012 for submission to obtain official planning approval. Despite the expected legal dispute, the project is planned to be realised as soon as possible. The actual expansion work will take about 21 months. After 6 months, the first depth improvements will have been achieved.

The development after the deepening in 1999 has clearly shown that the new depths will indeed be utilised within a very short time.

Expansion of the Kiel Canal

Feeder services play a significant role in the portfolio of the Port of Hamburg. With more than 150 weekly departures Hamburg offers the highest number of feeder services in northern Europe. Baltic Sea traffic makes up around 30% of Hamburg’s container handling. Transshipment volumes will continue to grow in line with container handling volumes and support the hub function of the site. The excellent connections to the Baltic Sea ports are a unique selling proposition of Hamburg.

Figure 27: Adjustment of the Lower Elbe and Outer Elbe river channels: cross section of the planned deepening



Source: Fairway adjustment project office

To secure the future viability of the Kiel Canal, it must be maintained and expanded further. This includes the complete overhaul of the two large locks in Brunsbüttel, which started operations in 1914, the adjustment of the eastern route between Königsförde and Kiel-Holtenau, the deepening of the entire canal by 1 metre from the current 11 metres to 12 metres, the restoration of the Kiel-Holtenau locks, the new construction of the bridge, Levensauer Hochbrücke, within the scope of the adjustment measures regarding the eastern route and the new construction of a large railway point in the area of Oldenbüttel.

To avoid disruptions the large locks in Brunsbüttel must be permanently available during the urgently required complete overhaul of individual chambers. The decision to provide funding to construct a 5th lock chamber to offer a short-term overhaul alternative hence is welcome. After that, medium and long-term measures to increase the capacities of the Kiel Canal are required for which the federal budget needs to provide funds over the next years. If the canal is not expanded, there is a risk that cargo bound for the Baltic Sea area will shift from Hamburg.

CONNECTION TO THE INLAND WATERWAY NETWORK

The Mid Elbe and the Elbe Lateral Canal connect the Port of Hamburg to the German inland waterway network. The inland waterways, for instance, connect the industrially highly developed regions of Hanover/Braunschweig/Salzgitter/Wolfsburg, the ports in the River Elbe basin and the ports in Germany's largest industrial area, the Ruhrgebiet.

Principally, Hamburg offers excellent economic and ecological alternatives to freight transports on land.

In 2011 the Port of Hamburg recorded handling volumes of about 10m tonnes, making it Germany's third-busiest inland port, preceded only by Duisburg with about 52m tonnes and Cologne with approximately 11m tonnes.

Compared to other types of cargo, inland waterway vessels have a substantial share of 25% in bulk cargo hinterland traffic. In container trade a total of 2% is currently transported by inland waterway vessels. As container transports by inland waterway vessel have been rising continuously, volumes can be expected to grow in this segment as well as in the segments of project cargo and heavy-duty goods. This is confirmed by a cargo potential analysis that due to organic growth predicts 182,500 TEU for 2015 and 270,000 TEU for 2020, thus underpinning earlier studies. Irrespective of the above, the Senate of Hamburg strives to achieve an inland waterway vessel share of at least 5% in the modal split. In order to realise inland waterway potentials, a marketing campaign to promote inland waterway vessels needs to be launched

that emphasises the ecological potential and helps to acquire potential large-volume shippers and new providers of inland waterway transport services. In addition, infrastructure maintenance measures need to be carried out.

Currently, around 90% of all inland waterway vessel transports from and to Hamburg travels the Elbe Lateral Canal and about 10% travels the River Elbe. Cross-border transports by inland waterway vessel currently play only a subordinate role; 95% of transports is inner-German. If the navigability of the Mid Elbe and Upper Elbe is ensured, cross-border transports towards the Czech Republic are likely to increase.

The implementation of hub concepts in the hinterland may also help to increase the share of inland waterway vessels in container hinterland transports. As larger volumes can be combined, costs will be lowered and the transport quality will improve. In view of the available transport capacities in

Figure 28: Inland waterways and inland ports in the immediate catchment area of Hamburg



Source: HPA

The capacity of the Francop disposal site will shortly be exhausted. The remaining storage capacities of the disposal site in Feldhofe, however, won't be sufficient to accommodate the volumes to be stored on land annually. HPA, on the request of the Senate of Hamburg, therefore plans to install a new dredged material disposal site near the dewatering fields in Moorburg-Mitte, located to the east of the A 7.

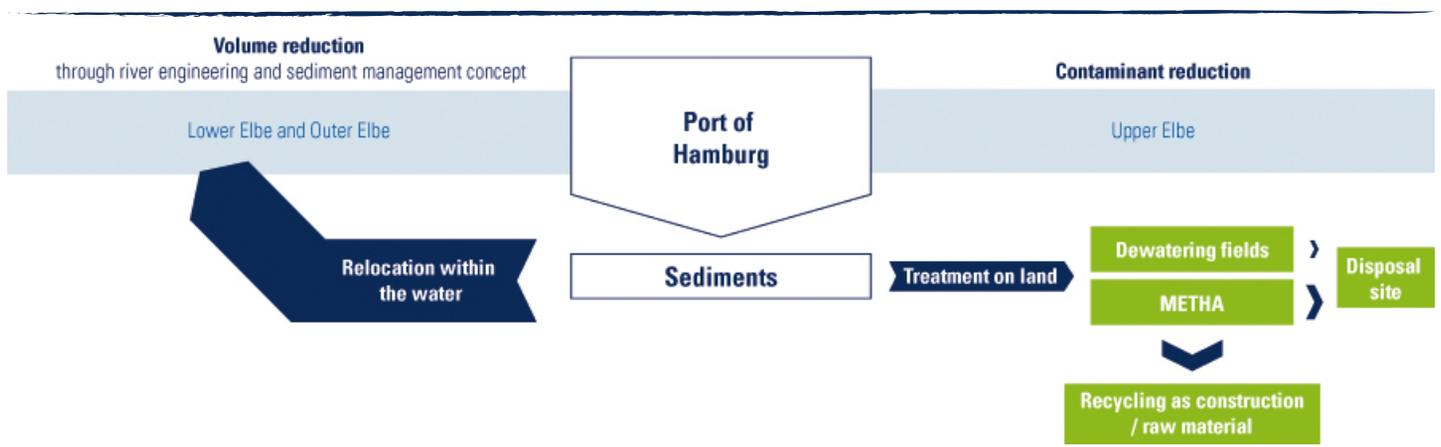
Another declared aim is to recycle the dewatered dredged material in a targeted way to save disposal site capacities. A promising alternative, already practised in other federal states, is to recycle dredged material and use it in dyke building instead of clay. In conjunction with the State Ministry of Urban Development and Environment [Behörde für Stadtentwicklung und Umwelt] and the Hamburg State Agency for Roads, Bridges and Waters [Landesbetrieb Straßen, Brücken und Gewässer] HPA is clarifying in how far it is possible to replace clay, a natural resource, with dredged material treated in METHA. Basic examinations are currently being carried out together with the Hamburg University of Technology [Technische Universität Hamburg-Harburg] to clarify the technical constraints. A pilot study has been running since 2004 to analyse if METHA material meets the ecological and technical requirements of dyke sealing.

The contamination of the Elbe sediments originates from the entire catchment area all the way to the Czech Republic. Though it has significantly improved over the past 20 years, it is still not satisfactory.

The federal states along the River Elbe have acknowledged the improvement of the quality of Elbe sediments to be a joint task, also with regard to other uses and environmental aims, and incorporated it in the river basin management plan in accordance with the Water Framework Directive of the European Parliament. Flussgebietsgemeinschaft Elbe (FGG Elbe), a river basin commission, and the International Commission to protect the River Elbe (IKSE) [Internationale Kommission zum Schutz der Elbe] have set up work groups that will work out restoration plans. The Senate of the Free and Hanseatic City of Hamburg, represented by the Hamburg Port Authority and the State Ministry of Urban Development and Environment, also provides funds to support these efforts through the project called ELSA (Elbe sediment pollutant remediation). This way measures will be implemented in a timely manner and help to further improve the quality of sediments. The concrete aim of the ELSA project is to kick-start measures that help to improve contamination levels in the River Elbe, in particular in Elbe sediments, engage experts to monitor the measures and provide financial support if required. In the medium and long term, the quality of suspended sediment is to be improved to an extent that enables the relocation of fresh suspended sediments within the river.

The Tidal Elbe River Engineering and Sediment Management Concept will be adjusted and updated in conjunction with the neighbouring federal states and thus ensure that measures to maintain the water depths will be taken as required. In order to secure the future of the port, Hamburg needs the support of the neighbouring federal states and the federal government.

Figure 30: Sediment management practised in the Port of Hamburg



NAUTICAL ASPECTS AND MEASURES IN THE PORT OF HAMBURG'S WATERWAY SYSTEM

The Port of Hamburg disposes of a complex waterway system where many events occur that influence each other. The Senate of Hamburg expects a significant increase in ship movements in the entire waterway system of the port over the years to 2025. Higher utilisation of berths and turning areas will have an impact on traffic flows, e.g. waiting times may be longer. The aim is to minimise disruptions through optimised traffic planning by untangling complex transport processes in terms of space and time. Simultaneously, traffic safety systems must be upgraded. A simulation model allows the Hamburg Port Authority to recreate and analyse future ship movements and their impacts.

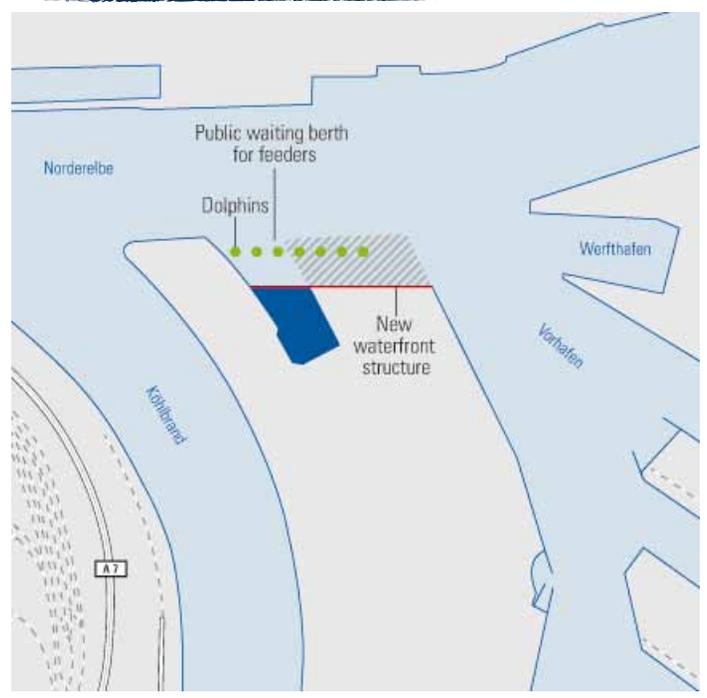
Apart from the modernisation of the Vessel Traffic Service Centre [Nautische Zentrale], which started in 2012, the development of the IT platform called PRISE (Port River Information System Elbe), which is especially geared towards Hamburg's requirements, is of significance. Jointly developed by all users, it serves to optimise allocation and planning processes. Information about arrivals, clearance and departures of ships is merged and made available to quay operators, pilots, tugboat operators, boatmen, shipping agents and HPA in real time. Pilot operations of PRISE started in 2012.

Figure 31: Parties involved in PRISE (Port River Information System Elbe)



Source: HPA

Figure 32: Widening of the outer harbour entrance



Source: HPA

Approach Routes and Turning Circles

To ensure that future ship generations can be processed efficiently, the nautical approach and departure conditions are being continuously improved, thus relieving the strain on networks caused by the manoeuvres of large ships and reducing emissions from ships.

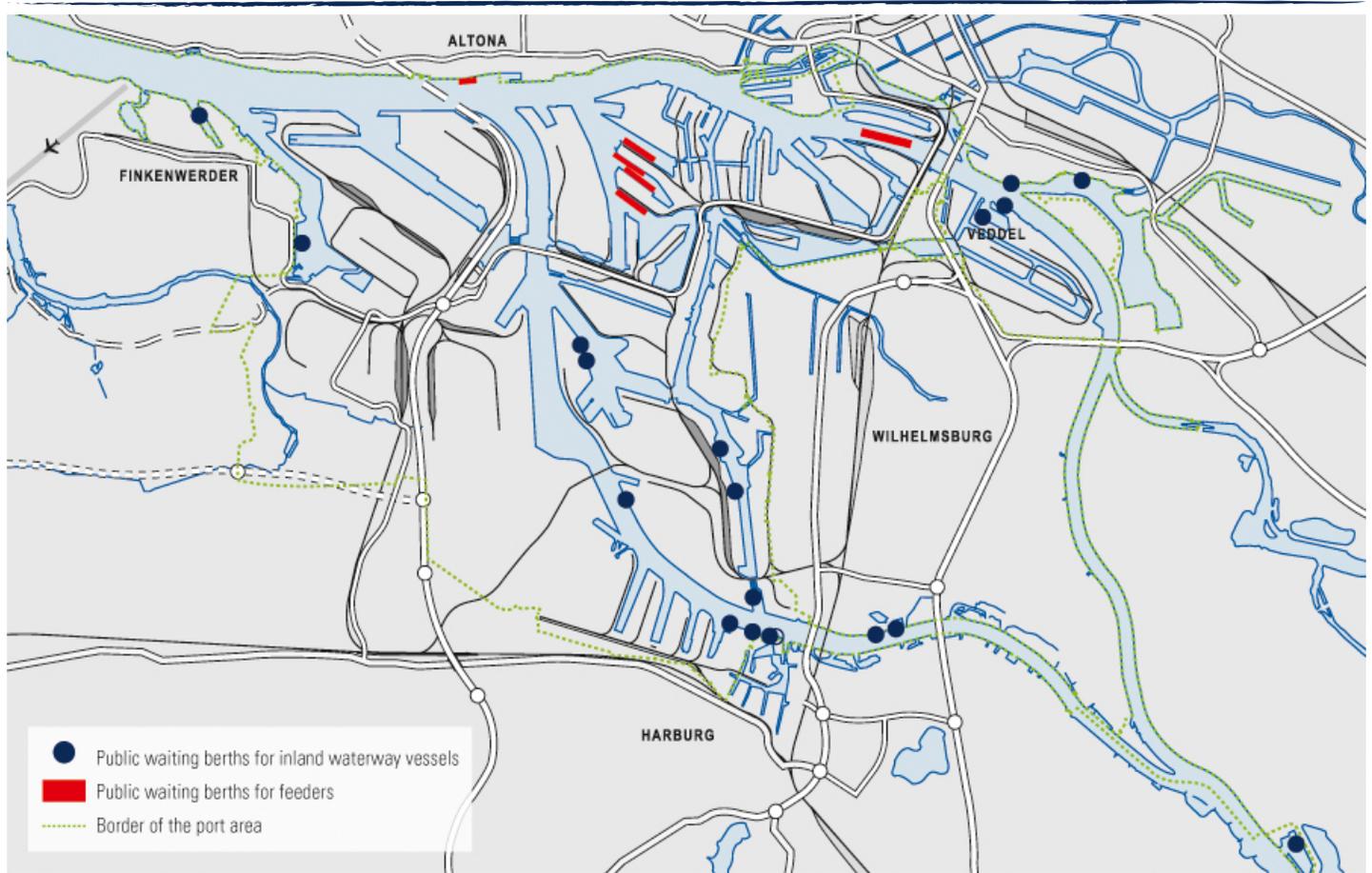
The special hydraulic situation in the Northern Elbe [Norderelbe]/outer harbour access area restricts the passage of ships with a length of more than 250 metres. Comprehensive simulations by HPA revealed that widening the access area would substantially improve approach and calling conditions for these ships. The implementation of this measure by mid 2016 will adjust the nautical conditions to those in the western port area, which is also important for the development of the area of Mittlerer Freihafen.

Widening the turning circle to a diameter of 600 metres in the Waltersshof/Parkhafen area will considerably improve the nautical situation and ensure efficient handling of ships in this area of the port, too.

Waiting Berths and Berths

The planned capacity expansion of handling facilities will further increase the demand for berths where large ships and feeders can wait for their turn and/or will be given a slot in the outgoing traffic movement schedule. Due to the planned restructuring in Mittlerer Freihafen, berths need to be relocated to other port areas and the already existing waiting berths in the Northern Elbe in the area of Überseezentrum must be retained permanently. In its update of the Hafen-City Master Plan the Senate of Hamburg provided for the existing port planning regulation on Kleiner Grasbrook/Steinwerder to remain unchanged. Regarding the development of

Figure 33: Public waiting berths for feeders and inland waterway vessels



Y-Line

The Federal Transport Infrastructure Plan [Bundesverkehrswegeplan] 2003 contains the planned Y-line. The plan provides for passenger traffic to be shifted to the new Y-line, thus freeing significant capacities for south-bound freight on the remaining lines. This is of high relevance for port hinterland transports, benefitting not only Hamburg but Bremerhaven and Wilhelms-haven, too. However, rail traffic requirements and circumstances regarding this project have radically changed. Whilst long-distance passenger traffic remained unchanged, short-distance passenger traffic in the metropolitan region in particular and freight traffic have increased substantially. It would therefore make sense to plan for the Y-line to not only cater to high-speed passenger traffic, as previously planned, but carry freight as well. Current planning therefore envisages a bypass from Hanover via Lehrte for freight traffic. The project has been given priority status in the Federal Transport Infrastructure Plan; no potential completion date is known yet. The Senate of Hamburg will continue to espouse the swift realisation of the Y-line to ensure that the reliable and eco-friendly railway continues to move freight to and from the port.

Furthermore, with regard to Hamburg as a railway hub, the BMVBS study recommends to expand the approach to the Y-line to four tracks on the Bremen line between Buchholz and Lauenbrück and to design the slip-in sidings in Buchholz for freight trains coming from Maschen as well as the slip-out sidings in Lauenbrück as flying junctions. However it is already evident that the realisation periods envisaged for the Y-line cannot keep up with the predicted increase in freight traffic, in particular hinterland traffic of the North German seaports. In the medium term, intelligent transitional solutions are called for which make sense within the scope of a future North German network conception, including the Y-line, and for which sufficient funding must be secured. Apart from the expansion to three tracks of the Maschen–Stelle–Lüneburg axis, which is planned to be completed in 2015, the efficient connection in Uelzen combined with the expansion to two tracks of the Uelzen–Stendal axis is a priority project as it will connect the Port of Hamburg to the Stendal–Magdeburg–Halle–Leipzig–Hof–Regensburg–Munich and/or Passau axis. This will ease the burden on the north-south Hanover–Würzburg–Nuremberg axis.

DB Corridor East

The highly frequented approach and exit routes of the Port of Hamburg to the south continue to lead via the overburdened railway node in Harburg, which is used by long-distance and regional passenger trains as well as freight trains, and via the Harburg–Lüneburg line. That is why the Senate of Hamburg strives to ensure that the efficient connection of the port railway network to the network of Deutsche Bahn [German federal railway] is maintained by providing an additional port approach and exit route towards the north-east. The north-east axis of Hafen West–Neue Kattwykbrücke–Wilhelmsburg, continued in the DB network towards Büchen–Berlin/Stendal–South Germany–south-eastern Europe and towards Scandinavia, redundantly connects the port to national relief lines towards its main markets as well as to the European TEN-T corridors.

The new double-track axis will enable bulk cargo and container trains coming in particular from the western port area to bypass the Harburg node and Harburg's city centre and ease the burden on the tracks there. To realise this option, the double-track line in the network of Deutsche Bahn must continue in the Nordkurve section at Kornweide and a flying junction must be built in Wilhelmsburg that allows freight trains on the Hafen West–Büchen axis to cross underneath the main north-south line from Hamburg main railway station to Harburg.

Fehmarnbelt Fixed Link

The new north-east axis also serves to accommodate the potential the new Fehmarnbelt tunnel will offer the port and the Hamburg metropolitan region from 2020. With the fixed crossing of the Fehmarnbelt Scandinavia will be closer to European centres. The Øresund region, Copenhagen, Hamburg, including the port, and Schleswig-Holstein in particular will benefit economically from this transport project. Passenger and freight traffic between the Hamburg area and Scandinavia will increase. To relieve the strain on the Hamburg–Lübeck railway line, the federal government together with the federal states involved plan to establish a commuter train service (S-Bahn) between Hamburg and Bad Oldesloe. Another option would be to bypass the Hamburg greater area from Lübeck by building a new link near Bad Kleinen via Schwerin to the south. However such an option should not come at the expense of priority projects with a high cost-benefit ratio recommended in the BMVBS study, e.g. projects to increase capacities in Hamburg as a railway hub.

Apart from the cross-regional requirements mentioned above, projects to straighten out and expand the railway node in Hamburg must be advanced. A large part of the freight trains coming from the port will continue to pass through Harburg even

after future relief lines towards the south have been installed. At the Harburg railway yard the lines branch out to the western and eastern port area and/or merge towards Maschen, Hanover and Bremen. Studies by the BMVBS und DB Netzwerk AG have proposed solutions of how train movements can be straightened out within a dense and highly utilised track network. Feasibility planning is currently being fine-tuned.

OHE Line

In addition, to relieve the strain on other lines, it would be possible to use existing secondary single-track lines of DB Netzwerk AG and Osthannoversche Eisenbahnen AG (OHE) in the Lüneburg Heath area to carry slower freight trains after they have been upgraded accordingly.

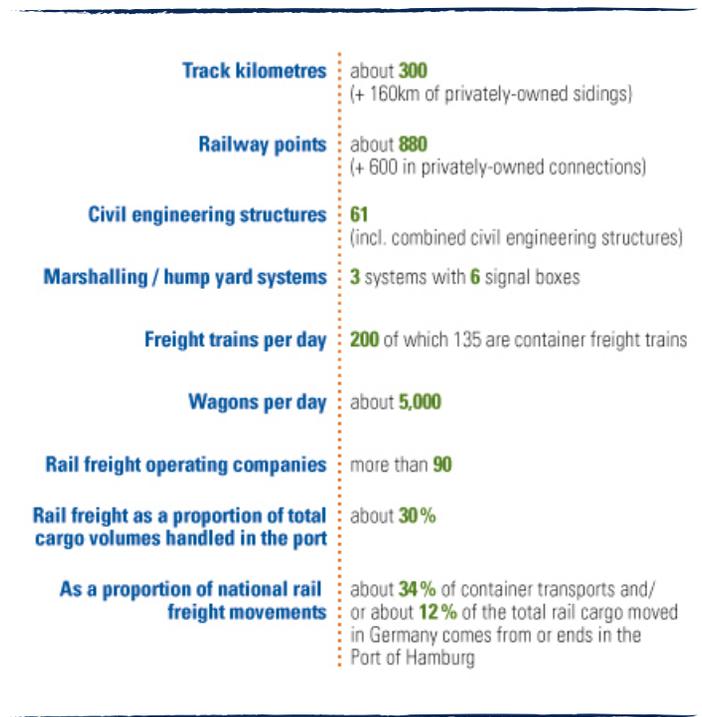
In conclusion it may be said that, based on today’s situation, the railway network expansion measures and new construction projects described above must be anchored in the new Federal Transport Infrastructure Plan 2015. Together with the associated measures planned by the Free and Hanseatic City of Hamburg they will ensure that the railway can cope with the predicted freight volumes and the ensuing number of freight trains provided the measures are realised in a timely manner.

PORT RAILWAY DEVELOPMENT PLANNING

The Hamburg Port Railway as a service provider in accordance with railway legislation guarantees the currently more than 90 rail freight operators fair access to its railway track infrastructure. The network of the port railway links the sidings of the port’s cargo handling companies to the main railway line network. The new competitive terms caused rail freight volumes to soar. The port benefits from this positive development and has become Europe’s largest railway port. This position needs to be expanded.

When it comes to future railway infrastructure development in the port and hinterland as well as railway process optimisation, it is imperative that all relevant parties (the Senate of Hamburg and HPA, DB Netzwerk AG, the port and transport industry) co-operate and jointly develop effective and efficient solutions. In this respect, the Port Railway Master Plan can be cited as a good example. Following consultation with all parties concerned, the Master Plan will take account of and incorporate the new developments in the port and transport industry in 2012 and thus ensure a modern and efficient railway system for the Port of Hamburg.

Figure 34: Port railway key performance indicators



Source: HPA

Strategic Network Planning

In view of the considerable growth rates expected in railway traffic over the coming years, the port railway network must be equipped to meet demand. The forecast of handling potential and a modal split-assessment show that in container traffic the number of trains will double and cargo volumes will triple in the medium term. Even if the current 30%-share of the railway in total cargo volumes does not rise, the average number of freight trains per day will increase from 200 today to 400 in 2020. Further growth is expected after 2020.

Against this background both the infrastructure facilities and operations of the port railway need to be optimised. This comprises in particular the expansion of existing railway yards and the construction of new track facilities in the area of the port, the upgrading of track and signalling technology as well as further operational improvements. The planning will dovetail the results of the Port Railway Master Plan, the results of the

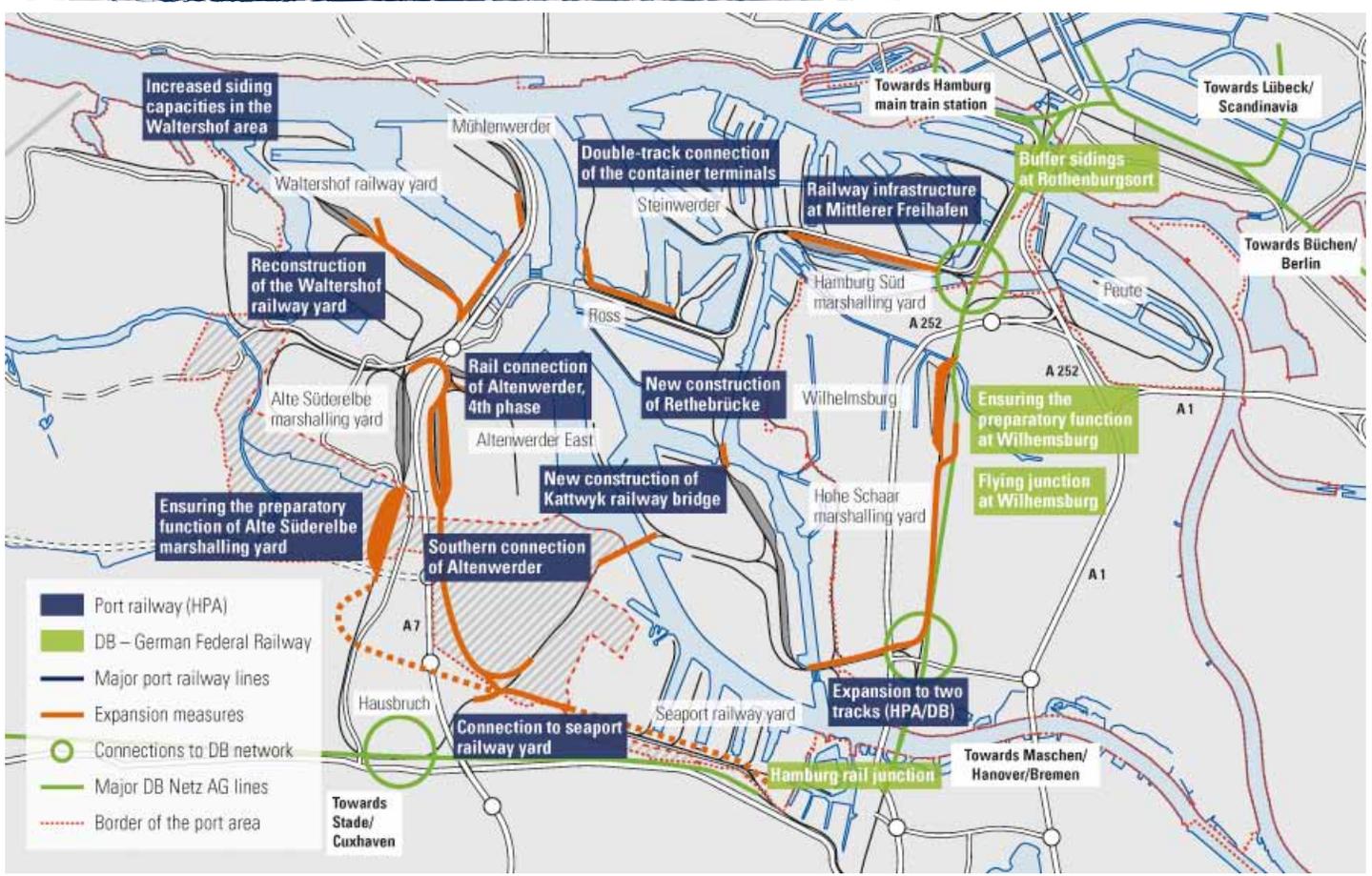
analysis of Hamburg as a railway node (BMVBS) and the analysis of Hamburg as a railway network node (BSU).

Network Compaction

As a key element of network compaction, the port railway is expanding the railway facilities in the approach and access areas to the western container terminals in line with the increase in container traffic. In Waltersshof and Altenwerder additional waiting and buffer functions as well as double-track links to every major handling terminal are being planned or implemented.

The efficiency of the railway connections between the western and eastern port area as well as to the network of Deutsche Bahn will be further improved. HPA is building two new bridges: Rethebrücke with a separate railway bridge to be opened to traffic in 2013 and double-track Kattwykbrücke, specifically built for the railway. The official planning approval process has been initiated; the first trains are expected to cross the bridge in 2017.

Figure 35: Railway track network of the port railway and planned measures



Source: HPA

The aim is to offer incentives for terminal-only trains as well to reduce shunting movements on the port railway track network. This instrument is also used to better utilise train capacities. A positive trend is already evident. The average number of TEU per container train, for instance, rose from 50 TEU in 2005 to 60–70 TEU. The future target is 90 TEU per train.

■ ROAD DEVELOPMENT PLANNING

In view of the projected increase of handling volumes in the Port of Hamburg, it is obvious that the port needs a functional and adequate road network to be able to cope with freight traffic. It is neither possible nor sensible to shift all freight from road to other modes of transport. In short-distance traffic in particular the logistics advantages of road travel are indisputable.

The rise in handling volumes will cause overall road traffic volumes to increase even if the modal split-share changes. In these circumstances it must be ensured that there are no major traffic disruptions on the port's roads and outside of the port area. In addition, optimum network redundancy will be necessary to be able to offer alternative routes at all times as the situation may require.

Port-related road traffic planning – this Port Development Plan provides for a time horizon to 2025 – must address the requirements mentioned above. The necessary road infrastructure must be maintained and expanded or newly built as required, and functional and efficient traffic management must be in place to optimally control traffic flows. At the same time, the developments in areas close to the port – be it residential dwellings such as in HafenCity or the development of new commercially used zones – must be monitored and incorporated in the planning to exclude and/or minimise possible conflicts of use.

As to port-related traffic, special attention must be paid to the link between the A 7 and A 255/A 1 autobahns. Within the area of the port the autobahns are currently linked via the main port route, Köhlbrandbrücke–Roßdamm–Veddeler Damm. Nevertheless, in the opinion of the Port of Hamburg, the port industry and urban developers the new construction of the A 26 in this area as a southern route is of pivotal importance as it would interlink the A 1 (Lübeck–Bremen) and A 7 (Flensburg–Hanover), resulting in a long-distance through-road connection – Stade–Hamburg–Lübeck – via the A 26 and A 1. The route has been selected within the scope of a holistic study on the development of an efficient and spatially adequate road network. The A 26 is to carry cross-regional long-distance traffic,

ensure the short connection of the port to the trans-European network and above all improve the connection of the handling facilities predominantly located in the western and northern areas of the Port of Hamburg. Its realisation would provide the port road network with another efficient west-east connection with high concentration effects and traffic flow effectiveness. The Senate of Hamburg will therefore advise the federal government to give priority to the new construction of the section of the A 26 between the A 7 and the A 1 – currently only listed under less urgent requirement with planning right accorded to the competent road management authority – when the new Federal Transport Infrastructure Plan is prepared.

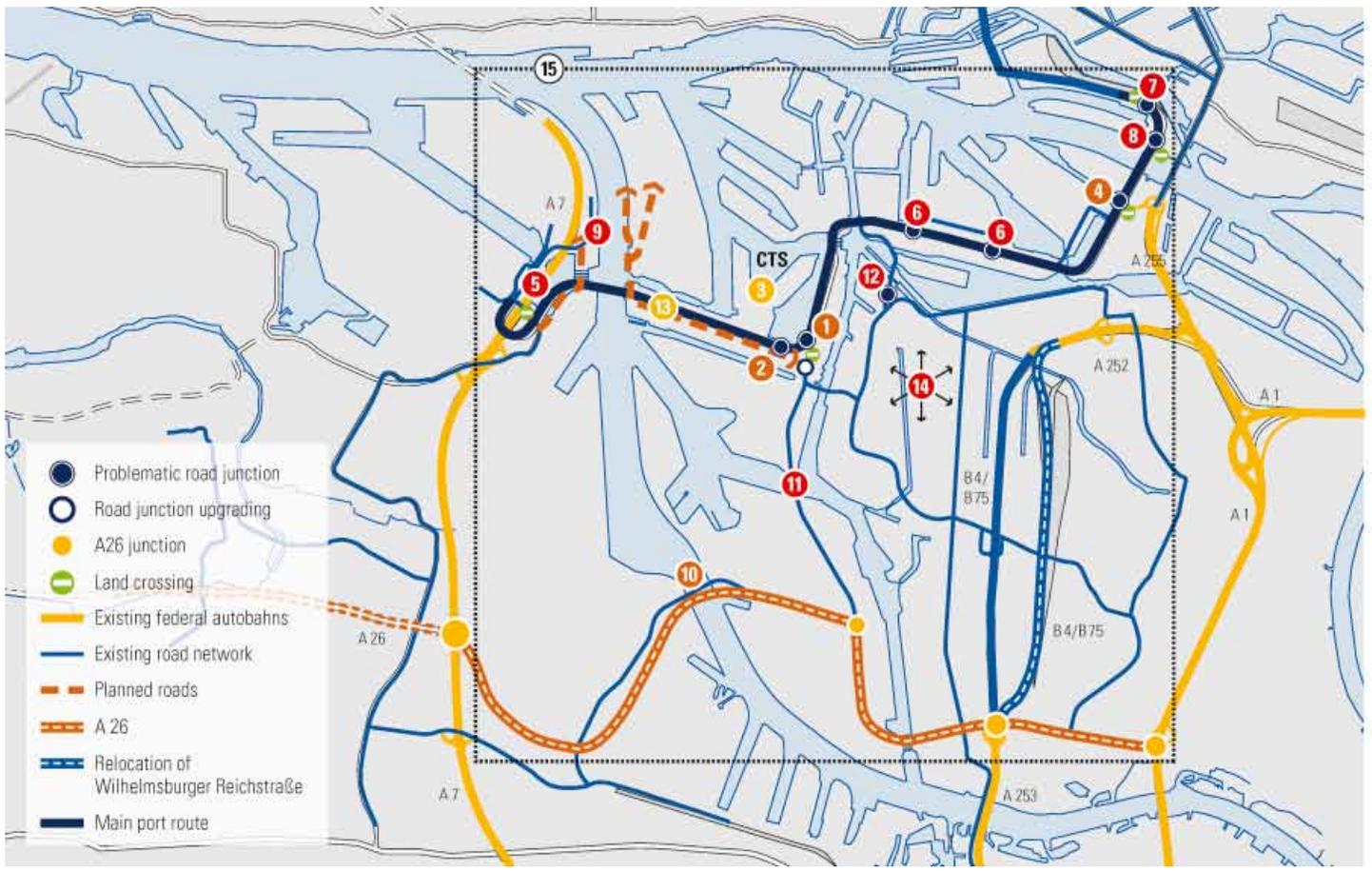
HINTERLAND MEASURES

The coming decades will see the launch of an array of significant and demanding trunk road construction and expansion projects (federal autobahns and national roads) with wide-ranging positive impacts on traffic quality, the environment and urban development both in the area of the Free and Hanseatic City of Hamburg and in the neighbouring federal states. On the one hand, they will take account of the current traffic volumes as well as the projected increases in general traffic volumes. On the other hand, they will also adequately cater to the infrastructure requirements of the Port of Hamburg, which have substantially increased and are still rising in particular due to the development of container traffic, and meet the need for additional port hinterland connections.

This includes the measures listed in the Federal Transport Infrastructure Plan (BVWP) 2003:

- 6-/8-lane expansion of the A 7 from Bordesholmer Dreieck in Schleswig-Holstein to the new autobahn junction Süderelbe (connection of the new A 26). This approximately 80km-long autobahn extension, which is important for Hamburg, will gradually be implemented and is expected to be completed by 2020.
 - New construction of the A 26 from the Lower Saxony border to the A 7 connection; expected completion in 2018.
- The timely realisation of the projects mentioned above and further additions to the North German trunk road network (A 20, A 21, A 39) will ensure that the projected rise in road cargo volumes can be handled adequately. Together with the North German coastal states their timely and sufficient funding is firmly requested from the federal government as the competent authority.

Figure 36: Port Road Management helps to control road traffic flows in the Port of Hamburg



Source: HPA

In this context, the federal government is requested to pursue an infrastructure policy across transport modes. The dialogues with the port industry revealed that shorter and simpler approval procedures would be appreciated.

FUTURE-ORIENTED STRATEGY: THE HPA ROAD TRAFFIC MASTER PLAN

The Port of Hamburg Road Traffic Master Plan is a more detailed concept that supplements the Port Development Plan. It analyses port road traffic, its infrastructural prerequisites, and medium and long-term solution approaches. The master plan takes account of the city's overall interests and is an important component of the transport concept for the entire city. It is based on the expected handling scenario, the development of land transports as well as possible shifts in the modal split based on which the expected traffic volumes

are determined. Besides the increase in traffic volumes, changes in traffic flows caused by planned restructuring and the location of new industry in the area of the port as well as changes in urban design in the area surrounding the port and changes in traffic structures must be considered. The overall picture forms the basis to determine possible improvement measures.

The Senate of Hamburg will ask HPA to advance traffic optimisation through transport management measures and, on the other hand, adjust to the restructuring and implement construction projects to increase capacities. Planning is outlined in detail in the Port of Hamburg Road Traffic Master Plan. The subsequent chapter provides a summary of the strategic approaches and planned measures.

EXPANSION AND RESTRUCTURING

Apart from optimised traffic management, additions to the existing road infrastructure are important and indispensable prerequisites to ensure smooth traffic flows.

One important urban development measure is the construction of the A 26 between the A 7 and the A 1 in the south of the port already described above. The chosen route in the south meets the project targets: it will close a gap in the cross-regional trunk road network (Stade–Hamburg–Lübeck), bundle west-east-bound traffic and port ring road traffic, improve the accessibility of the Port of Hamburg, reduce noise and pollutant emissions and separate urban residential areas.

In February 2011 the BMVBS determined the course of the route. At the moment, the remaining draft and approval plans commissioned by Hamburg are being advanced by DEGES (Deutsche Einheit Fernstraßenplanungs- und -bau GmbH) and matched to fit the extensive HPA planning in the Southern Elbe [Süderelbe] area.

Measures

Restructuring of the Neuhof junction system

- 1 Restructuring of the Roßdamm/Neuhöfer Damm junction
- 2 Easing the burden on Breslauer Straße/Köhlbrandbrücke junction
- 3 Connecting Central Terminal Steinwerder to the main port route

Restructuring works in the Tunnelstraße area

- 4 Improving the connection of the HH-Veddel federal road (A 255) after closing the Tunnelstraße land crossing

Operational measures in connection with the abolition of the free port zone

- 5 Closure of the Waltershof land crossing
- 6 Traffic control at Windhukkai
- 7 Closure of the Versmannstraße land crossing
- 8 Closure of the Zweibrückenstraße land crossing

Additional construction measures

- 9 Connecting Container Terminal Burchardkai via Rugenberger Schleuse
- 10 New construction of Kattwykbrücke railway bridge
- 11 New construction of Rethelbrücke as a replacement bridge

Köhlbrandbrücke

- 12 Improving the development of the Reiherstieg area
- 13 Replacement by new construction

Heavy-duty traffic control in Wilhelmsburg

- 14 Coordination of the concept (with BSU and citizens) Installation of signboards + public relations work
- 15 Port traffic management

● Short-term implementation ● Medium-term implementation ● Long-term implementation

In the medium and long term, additional measures will need to be carried out in the port's existing road network, which are listed in the Road Traffic Master Plan as follows:

- Restructuring work in relation to the abolition of the free port zone (Windhukkai, Versmannstraße, Zweibrückenstraße) will commence in 2013.
- The eastern connection of the main port route to the higher-order road network in the Veddel area will be upgraded by restructuring the Tunnelstraße area. To re-organise the local use and traffic structure, consultation processes with the parties concerned take place regularly.
- A second access route will connect Container Terminal Burchardkai via Rugenberger Schleuse at the end of 2014.
- The new Rethebrücke, a bascule bridge, is planned to be completed in 2014.
- A more efficient northern road to the Altenwerder area is planned for 2015. Planning regarding a southern approach road will be taken up again.
- Road traffic on Kattwykbrücke will flow more smoothly when the newly constructed railway bridge is opened to rail traffic in 2017.

As to the port's road bridges both maintenance works and the new construction of replacement buildings will be required. Köhlbrandbrücke is, of course, more than a landmark that is visible from far away and will remain an important and indispensable element of the port's road network. Nevertheless, in view of the structural state of Köhlbrandbrücke, a replacement construction is being contemplated that will also take account of the development of ships' heights, among others. A feasibility study to determine the course of the route and connection points of a new Köhlbrandbrücke is already available to secure the required land in the long term. The preferred option includes a location of the new bridge further north to the existing Köhlbrandbrücke and two junction-free connection points in the west and east, resulting in a traffic light-free main port route between Finkenwerder Ring and Argentinienknoten.

According to present knowledge today's bridge can be operated cost-effectively for some 20 years provided maintenance measures are carried out on an ongoing basis. Due to long planning lead times, however, planning and funding of the new replacement structure should start soon.

Apart from the main port route and Köhlbrandbrücke mentioned above, within the area of the port the route leading across Kattwykbrücke is significant because traffic flows are controlled and network redundancy is ensured. The new construction of a railway bridge, which according to current planning is expected to start operations in 2017, will further enhance the route's road and railway efficiency.

Apart from the bridges mentioned above, the remaining 56 fixed road bridges in the area of the port must be maintained at regular intervals. Here, too, the next years will see the implementation of new projects – in particular in view of higher traffic loads due to the rise in large and heavy-goods traffic.

The following replacement/construction works will commence in the next years:

- First bridge in Peute from 2013
- Bridges in Waltershof from 2014
- Veddel canal bridges from 2014
- Finkenwerder bridge from 2015
- Free port Elbe bridge, start of planning in 2015

TRAFFIC MANAGEMENT MEASURES

Apart from the necessary expansion projects, measures to increase capacities of existing infrastructure to optimise traffic flows and efficiently use the road network in the port are required. Among them are, for example, telematic control approaches that will prevent traffic congestion and reduce fuel consumption and air pollution.

HPA created the basis for the Port Road Management in 2009 when it defined a strategic road network. It represents the highest level in the port road hierarchy and simultaneously contains the main alternative route options within the scope of traffic management.

In 2011 the Senate of Hamburg and HPA started operations of the system called DIVA (dynamic traffic volume information system) in the Port of Hamburg within the scope of the first implementation phase of the Port Road Management strategy, funded out of the federal economic stimulus package. In the event of incidents on the port road network, variable message boards inform drivers about the current traffic situation in the port. The port incident management system not only reports sudden, accident-related disruptions, but it also displays foreseeable disruptions caused by, e.g. construction sites and bridge closures. In future this information as well as

other services, such as routing and parking space information, is planned to be sent to mobile devices.

To be able to control traffic as required, extensive traffic data must be captured safely and reliably. Throughout the port over 300 measuring stations have been installed that record traffic volumes. The measuring stations scan routes and junctions and supply information on traffic in the strategic network and on autobahn approach roads. HPA uses a combination of different collection techniques that supplement each other. Besides commonly used inductive traffic loops new technologies, such as Bluetooth or video technology, are deployed.

The traffic data collected are transmitted to the HPA Port Road Management Centre (PRMC). The PRMC staff analyse traffic processes, monitor the variable message boards and coordinate traffic light systems in close co-operation with the traffic control centre of the police. Planning aims at integrating the HPA's incident management with ring road traffic control in Hamburg and concentrating all overarching traffic control functions as well as information on critical traffic situations in the port that is relevant for the rest of the city area at the Traffic Control Centre. Incidents that largely concern the port only, such as disruptions at terminals or logistics companies as well as disruptions at bridges or the future management of parking

Figure 37: Road network in the Port of Hamburg and planned measures



Source: HPA

Figure 38: Strategic road network



Photo: HPA

■ NEW IT SYSTEMS TO OPTIMISE TRAFFIC AND LOGISTICS FLOWS

The rising dynamics of international markets and sharper competition have an impact on the development of the global transport chain which the Port of Hamburg is a part of. One current trend is the rise of transport-accompanying information services which Hamburg's strategy geared towards 2025 takes account of. What is of special importance here is to integrate goods and transport information as well as other services to enable smooth traffic and goods flows all the way to overarching traffic control. This requires a constant flow of information as well as a high degree of co-operation and trust among the parties involved.

HAMBURG PORT SERVICE AND COMMUNICATION PLATFORM

The Port of Hamburg is already well prepared and offers all companies and government agencies involved in export, import and transit processes the opportunity, via various systems, to handle transport processes fast and supported by electronic equipment. This includes in particular the existing systems provided by DAKOSY – EMP (Export Message Platform) and IMP (Import Message Platform). EMP supports export transport processes by transmitting all documents required in internationally standardised message formats. IMP simplifies import communication processes and takes account of sector-specific requirements of the port industry and government agencies, whilst simultaneously optimising the overall process from the time a ship approaches the Port of Hamburg all the way to the delivery of the goods to the customer in the hinterland.

HPA and the parties operating in the Port of Hamburg are jointly developing various services, including a communication platform that provides links to important systems such as, for example, National Single Windows, Port Community Systems, etc. Within the scope of the EU e-Maritime initiative HPA actively co-operates with business partners and state agencies. e-Maritime aims to simplify maritime administrative processes for parties to the transport chain through electronic data submission, whereby the preferred solution for all Member States is to use Single Windows for ship registration formalities in compliance with Directive 2010/65/EC. The operative implementation in the Member States is to be completed by June 2015. This is a first step towards the realisation of the e-Maritime vision. 2010 saw the foundation of the European Port Community System Association (EPCSA) by port information system service providers. It aims at promoting the EU-wide implementation of e-Logistics and e-Maritime. HPA is a

member of the executive committee of this association and actively involved in shaping the implementation.

PORT TRAFFIC CENTRE

As a long-term aim, the Senate of Hamburg envisages the introduction of an overarching traffic control centre (Port Traffic Centre) that collects traffic information about the individual transport modes and enables the joint control of all types of traffic. Besides an integrated cargo information platform, the scenario would be based on an IT-supported overarching traffic management system. HPA will realise this innovative traffic control vision by continuously and gradually integrating the individual modes of transport. With the introduction of the Port Road Management the first steps have been taken.

Relieving traffic congestion in the port can be achieved through the co-operation with sites in the hinterland, e.g. by storing back-up containers outside of the port area, combining cargo volumes to improve the utilisation rates of transport routes (e.g. shuttle transports), making use of local distribution and cargo collection options and perhaps even by integrating value-added services. Furthermore, there is potential to increase capacities at container terminals and improve inbound and outbound cargo unit services in the port provided, efficient transport connections and high data quality are available and the various IT systems involved are integrated. When planning hubs of this kind, the overall traffic situation must be looked at. Ideally such hubs are run by terminals and operators, whereas the task of HPA would be to initiate, moderate and mediate.

In order to implement projects of this kind and transmit data fast and securely as well as provide them as required to the target groups, a modern, homogenous and intelligent IT-infrastructure must be in place. Here, effective IT management and future-oriented IT architecture are necessary which HPA provides with its IT development management. A first step was the introduction of a port-wide standardised data network in 2010 via which various systems can be interconnected in the future. Further projects are being developed on this basis.

Maritime Organization (IMO) published the International Ship and Port Facility Security Code (ISPS Code) and defined an internationally binding set of measures to enhance the security of ships and port facilities, thus creating the term Safe Port. To define this quality and competitive factor in more detail, the parties involved in the process, HPA and the sovereign parties in charge will continue to assess processes and structures within the port and monitor safety-related technological trends such as, e.g. container scanning and screening, which is required for shipments to the USA, under the aspect of competitiveness and work out a safety concept together with the relevant parties in the port. If the Mega-ports Initiative of the USA to determine radioactivity in containers is pursued further, Hamburg would appreciate if the federal government and hence customs administration actively supported it.

SMART PORT 2025

The demand for more diverse and intelligent communication options in the port is skyrocketing and information technology continues to advance ever faster. Communication technologies already have a huge influence on processes both in cities and ports. Below is a vision of how IT support in the port could look like in 2025.

information such as, e.g. camera images, to the control station for the staff to have a clearer picture of actual happenings. For such a vision to 2025 to come true, infrastructure facilities must be equipped with intelligent units that are integrated in the IT architecture, and the control station architecture must be upgraded.

Networking

Improved foreseeability, flexibility and cooperation within the processes will have become important social and economic criteria in 2025. The productivity in the port can only be increased if these requirements are met. A target-oriented knowledge management within an information portal will help employees to quickly find the information and contact partner they are looking for. The data can also be provided on mobile devices via intelligent filters and context-based knowledge sources. Social network functions offer portbased parties access to the thought patterns of their partners and customers.

The project business will also have a new face in 2025. Project management will exclusively happen via platforms that offer different views of the projects on different layers both in planning and realisation.

Business internal network integration of employees will be possible via social networks. Here, project managers can, e.g., discuss their projects; questions can be asked and will be answered. The information portal will retain the knowledge for all employees and future generations.

To realise this aim, infrastructure and processes must be newly defined with a focus on creativity and problem-solving, which

in turn calls for the development of knowledge management architecture.

This vision allocates IT support a key function. The economic power of the Port of Hamburg will strongly depend on how secure its IT architecture is. This is why HPA will use the same advanced technologies as companies – autonomous sense and respond functions, analytical methods, visualisation and computer-supported modelling – to protect its IT architecture against unauthorised access by third parties. IT security systems in the port will thus become more intelligent too.

The introduction of an HPA-wide mobile device infrastructure is a step towards this vision. The IT development plan outlines these ideas as future perspectives.

■ LAND STRATEGY

Port dialogue | results

Most of the parties involved in the port dialogue considered the following important:

- Shifting functions in the port based on strategic criteria
- Site co-operation within the metropolitan region
- Maintaining the extent of port sites; surrendering of land only if compensated
- Optimising quay edge management (e.g. through multi-purpose terminals)
- Establishing added value as a further factor in land allocation
- Expanding empty container sites (in the port and outside of it)

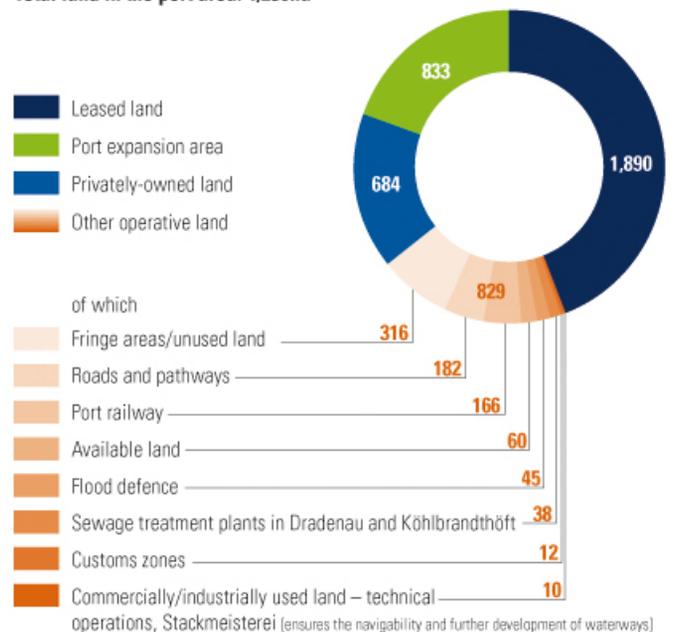
Aims

- Efficient handling of land as a valuable resource
- Increasing value creation on port land
- Balancing the interests of the port and the city in a coordinated way

Due to its close vicinity to sales markets, producers and suppliers as well as its large labour market the Port of Hamburg offers highly attractive site conditions which, however, must be underpinned by efficient infrastructure, such as transport connections, energy supply and communication networks. Intelligent land management in a densely populated environment therefore is crucial, the more so as land expansion and available port land are limited. When it comes to the public task of port development and the associated necessary provision of usable land for port purposes, public ownership of port plots of land is of special importance. The ownership of land is the all-important control element of the Senate of Hamburg when it comes to strengthening the economic competitiveness of the port, including job creation, using the public infrastructure for port purposes as effectively as possible and securing optimum cargo volumes for structural/political reasons. Moreover, strategic planning to 2025 is facing the challenge of accommodating soaring container volumes within the boundaries of the dedicated port land and the port expansion area. Current land use must therefore be optimised, compacted and intensified, in particular with regard to underused infrastructures such as, e.g., quay facilities.

Figure 39: Land use in the Port of Hamburg

Total land in the port area: 4,236ha



Source: HPA

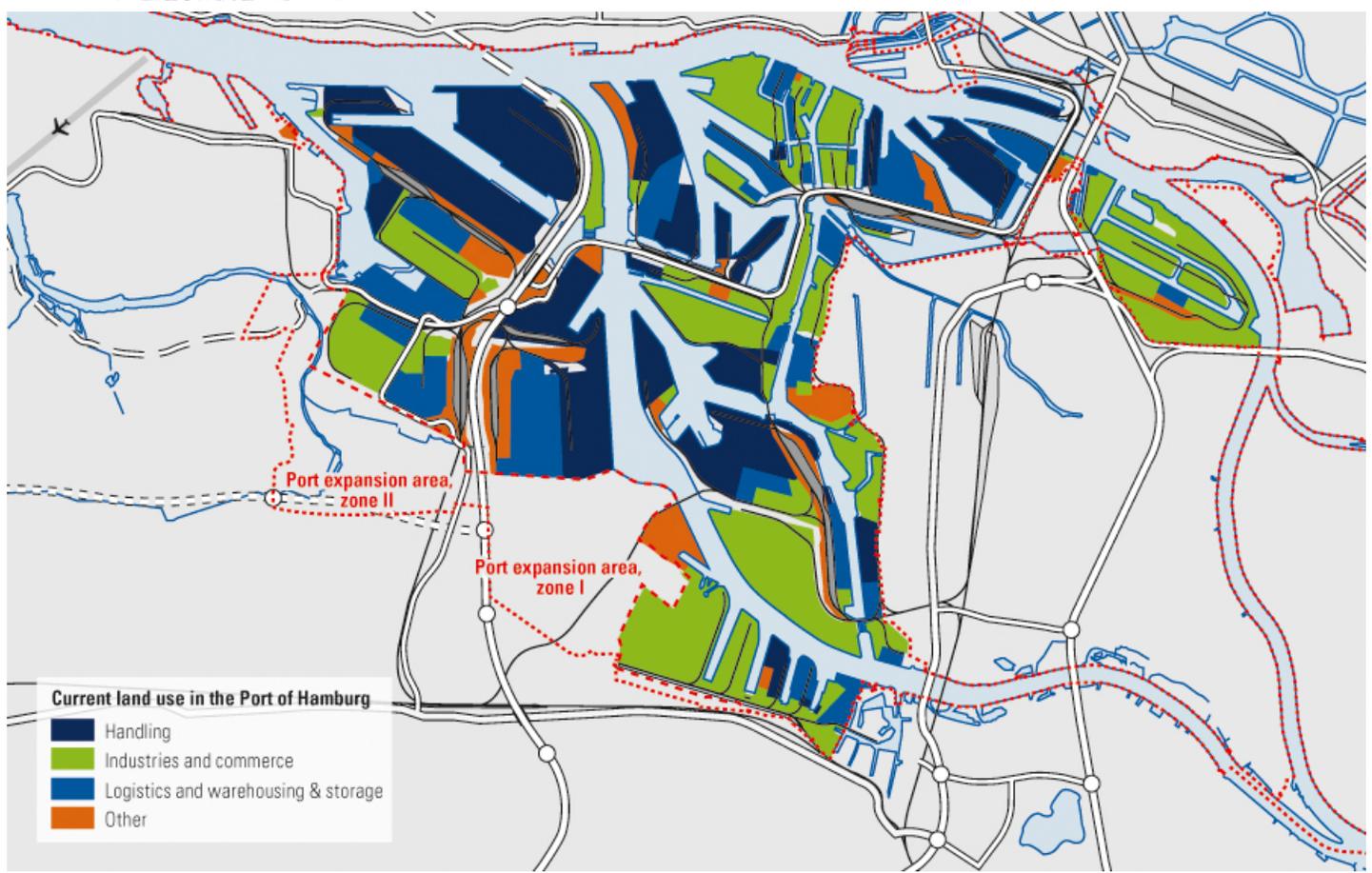
The total land available for land management covers 42.5 square kilometres, of which 6.84 square kilometres is private land owned by about 50 parties. Though the privately owned land is subject to the provisions of the Port Development Act, strategic land planning is restricted insofar as access to this land is limited.

The demand for land is diverse. The handling/logistics/industry sector requires large cohesive sites. The rising demand for large sites that offer an attractive infrastructure-land area ratio can only partially be satisfied through large-scale, time-consuming and costly restructuring or by expanding into the port expansion area. On the other hand, there is a consistent demand for land suitable for small and medium-sized companies that can usually be met within the scope of the fluctuation in the port. To be able to remain competitive, intelligent land management must skillfully balance the diverse needs. Port development therefore treats land as a valuable resource,

whereby it bases on economic criteria and uses operative options such as efficiency increase, port restructuring, use of the port expansion area and appropriate allocation criteria.

Port land strategy takes account of both port industry interests and urban development objectives. Decisions on the location of industry in the port consider the location policy applicable to the remaining city area. Possible synergy effects and target conflicts must be identified and used or resolved for the benefit of the entire city. The topic will be treated in the "Industry Master Plan" which the Senate of Hamburg, the Hamburg Chamber of Commerce [Hamburger Handelskammer] and the Industry Association of Hamburg [Industrieverband Hamburg] will jointly prepare.

Figure 40: Spatial distribution of land use



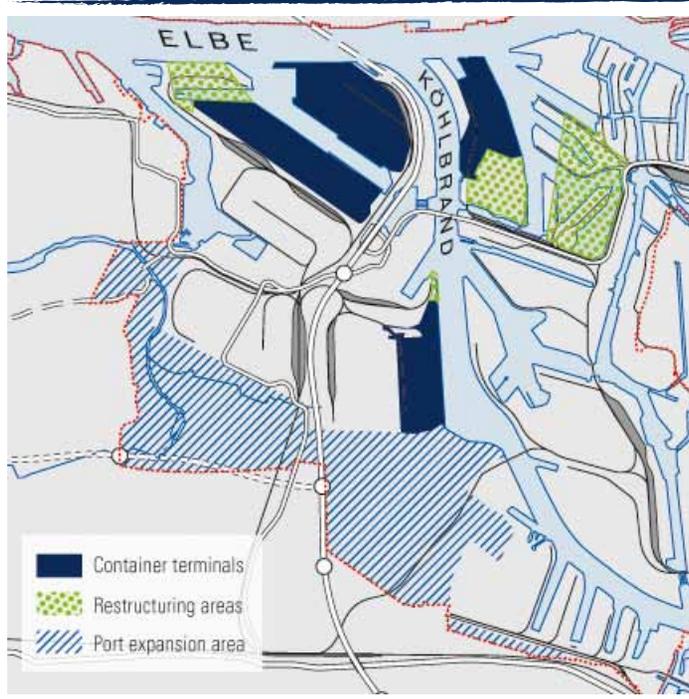
Source: HPA

INCREASING THE EFFICIENCY OF LAND

The type and efficiency of land use in the port is mostly determined by the spatial location of the individual sites. The intention therefore is to concentrate certain uses in suitable areas to create favourable operating conditions and achieve synergies and high utilisation of the infrastructure provided. Care is taken that land is optimally divided and appropriately sized to increase the attractiveness of a site. Another key focus must be to increase the intensity of land use, e.g. by introducing new, highly efficient handling and storage technologies at existing terminals or by building upward, e.g. multi-storey logistics and container storage slots. Sites used by low added-value businesses will be restructured accordingly.

HPA will continue to use lease options, e.g. by entering into new agreements or extending existing ones. In the medium and long term, rising rents will encourage tenants to use sites more efficiently. New industries may also contribute to efficient land and infrastructure use by installing joint quay facilities for businesses that require efficient handling and quayside infrastructure, e.g. to ship conventional general cargo or special bulk cargo, however which they only use at certain times due to their business model. For them it would make sense to use technical structures jointly with other businesses. If land becomes available in future, this approach will be discussed with interested land users.

Figure 41: Container terminals and restructuring areas



Source: HPA

Empty Container Logistics

The Port of Hamburg as an interface between overseas, hinterland and Baltic Sea traffic is not only located at the centre of a diverse range of goods flows, but it also is an important hub for shipping companies to efficiently handle containers. Apart from the container terminals, which many shipping companies also use as a place to handle, collect and distribute empty containers, various empty container depots are located throughout the Port of Hamburg. They offer a diverse range of transport, handling, storage and treatment services which, in part, require highly complex logistics and resources management.

Hamburg is the last European port called before a large container ship sails to Asia. Ship owners will be committed to the site if they can optimally utilise capacities by loading empty containers on board. Offering efficient empty container handling services will certainly benefit Hamburg as a final port within the North Range.

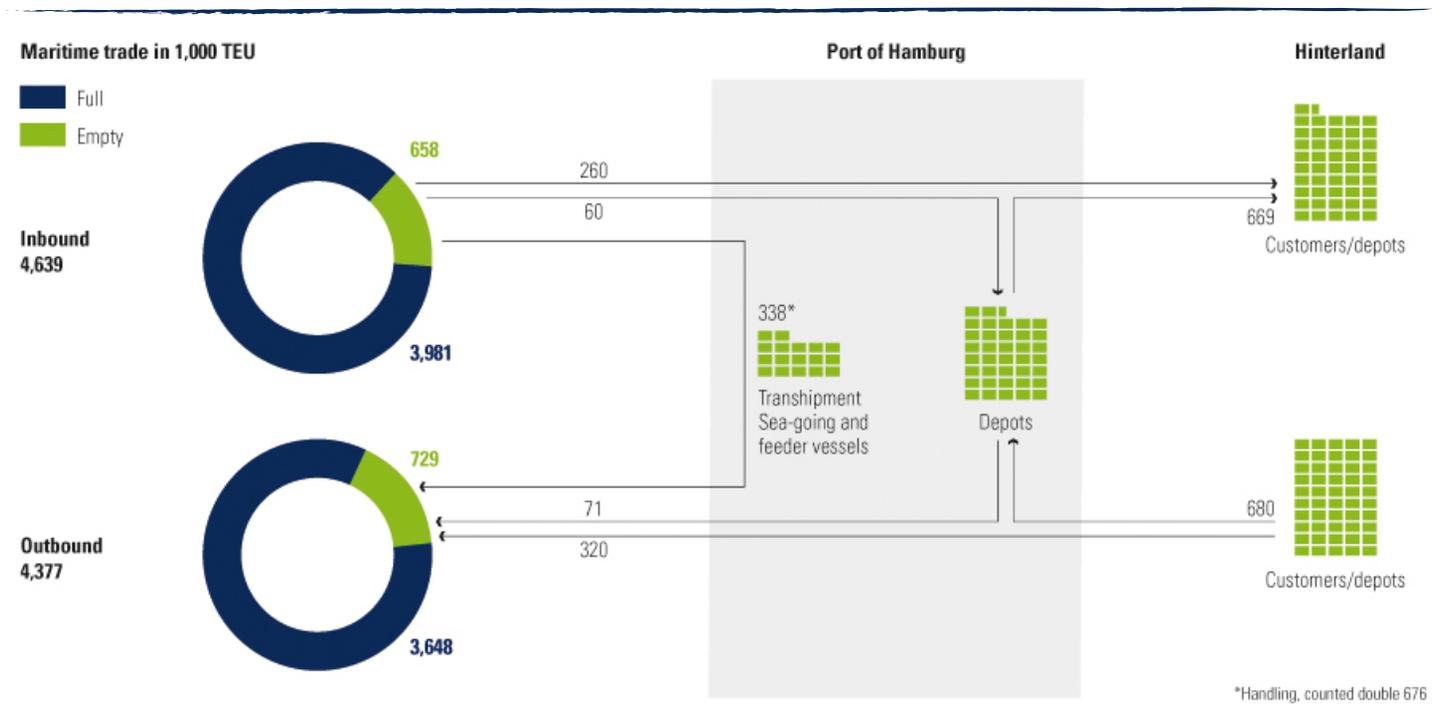
In 2011 the share of empty containers in seaborne cargo handling stood at about 15%, which is substantially below the figure achieved in 2008 (19%). Up until 2015, a slight increase to 17% is expected, in particular due to the projected rise in feeder traffic. The depots in the port also play an important role when it comes to the supply and disposal of empty containers in the

hinterland. On the one hand, many container movements take place in the short-distance range (local volume: 30%) and on the other hand, these depots are an important link in the cross-regional supply chain.

The import surplus in the metropolitan region of Hamburg with its distribution centres will continue to be higher than that of the remaining German hinterland and empty container flows will develop accordingly: the number of empty containers transported within the port via the depots and into the hinterland will rise by 1.5m TEU to roughly 3.2m TEU in 2025. The volumes moved between the hinterland and the depots alone will more than double.

If possible, the Senate of Hamburg will continue to provide land close to terminals for empty container operations, however the focus will primarily be on optimising empty container logistics. Therefore the Senate of Hamburg asked HPA to work out, together with the companies and associations involved, an overarching concept to improve empty container logistics that not only comprises the organisation of empty container logistics and storage, but also provides solutions for the smooth transport of empty containers in the port to and from external sites, e.g. by inland waterway vessel.

Figure 42: Seaborne cargo handling-related empty-container flows in TEU in 2011



Source: HPA

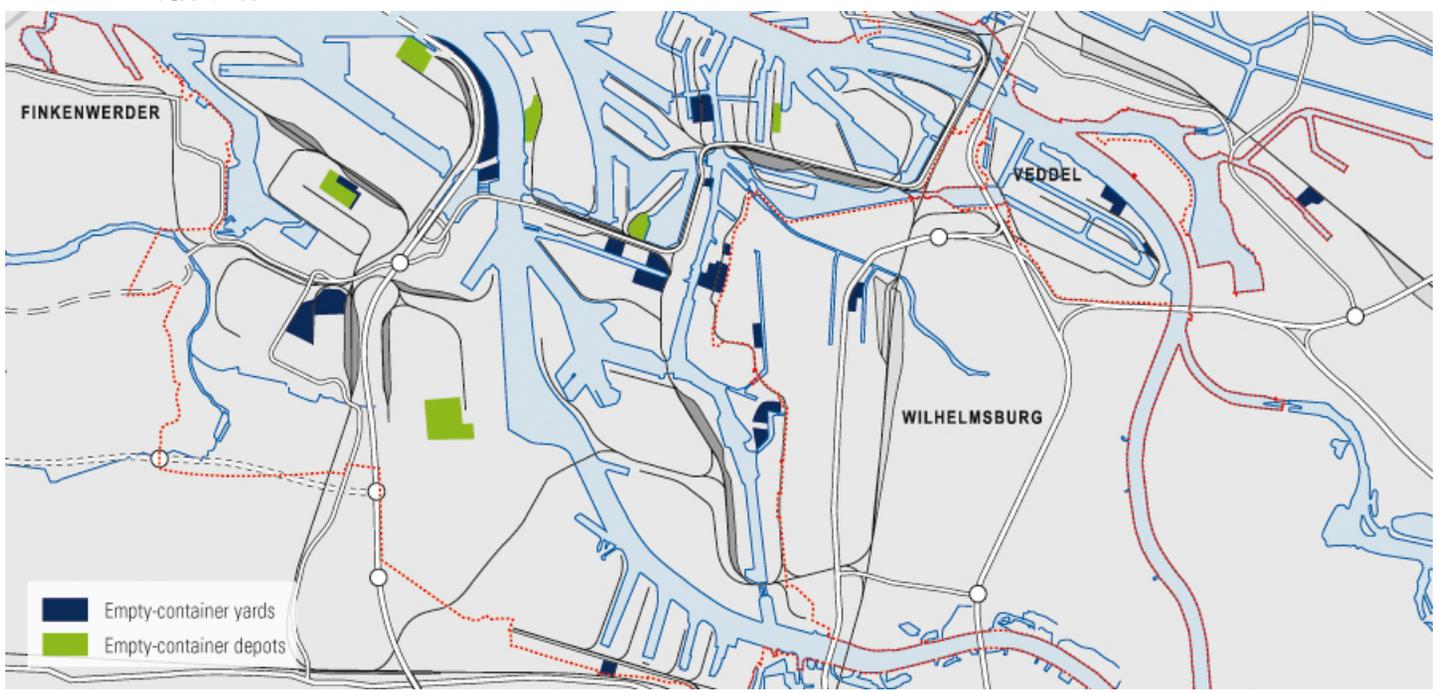
PORT EXPANSION TO THE INSIDE

The port expansion to the inside will be continued because activating land reserves through restructuring (land remediation and/or land recycling) still offers potential and is preferable to using land in the port expansion area. Examples are the two restructuring projects, the western expansion und Central Terminal Steinwerder.

However sites in the central or eastern part of the port, that are divided into especially small plots, will also be examined for their restructuring potential to be able to respond to changing requirements as needed. Existing terms of leases and the interests of existing tenants and users of water areas will be considered adequately.

In addition, the strategy of “acquiring land” will be pursued wherever possible. As such, land in the area of the Harburg seaports is mostly privately owned except for sections in the eastern periphery. Most of these large sites are occupied by the petroleum and handling industry so that when it comes to developing its leased sites and locating future-oriented industries, HPA’s options are limited and cannot even remotely be compared to the options other areas of the port offer. However as HPA is acquiring plots of land offered by private parties, thus gradually rounding off its own property portfolio, there is a chance to develop the area in the long-term.

Figure 43: Spatial distribution of empty-container yards and container depots in the Port of Hamburg



Source: HPA

PORT EXPANSION AREA

Legislation provides for the two zones of the port expansion area to be primarily used for port purposes. To guarantee the long-term competitiveness of the port, this must be adhered to. Hamburg faces stiff competition from other ports in North-Western Europe most of which – unlike Hamburg – are able to offer large sites when it comes to attracting businesses that benefit economically from being close to a waterway and look for a suitable site. The only sites available in Hamburg suitable to house modern port facilities are located in the area of the Southern Elbe [Süderelbe]. The northern banks of the River Elbe mark the state boundary and in Harburg, the Elbbrücken and the densely populated Wilhelmsburg area restrict development.

Altenwerder is a prime example of the immense economical importance of port expansion. Here, a completely new port area has been developed that now houses one of the most modern terminals worldwide. The impact it has had on the economic development of the city and the job market in the entire region is huge, and today the terminal is crucial for the Port of Hamburg to maintain its leading role in container handling.

The port expansion area in particular offers the chance to meet the demand for handling sites with berths deep enough to

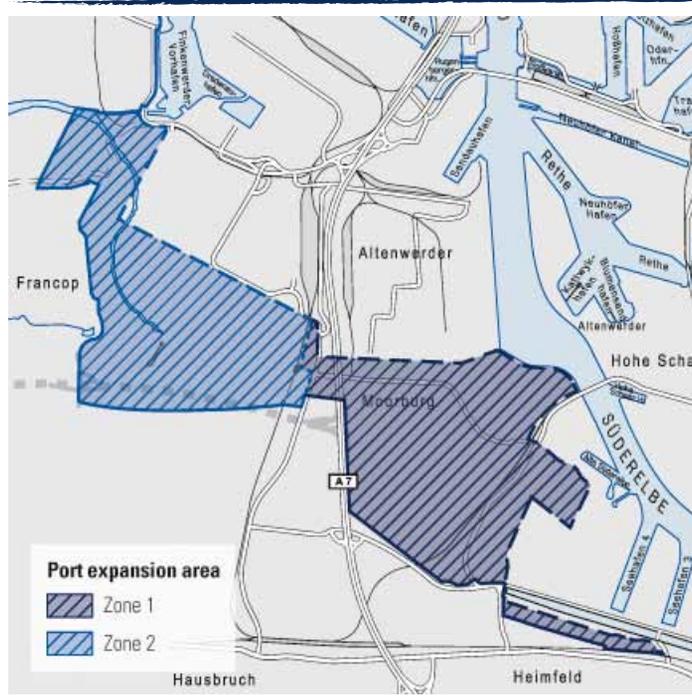
accommodate sea-going vessels and attract logistics and port industry, in particular in the area of Altenwerder West. The zone I expansion area (Moorburg) offers the last large cohesive site with excellent infrastructure connections to the navigation channel, the railway network and the autobahns and thus represents the only option to develop another section of the port. However, the port expansion area may also play an important role for the location of future-oriented industries such as, e.g. in the field of hydrogen technology, particularly in relation to the further development of the Hohe Schaar area.

In view of the projected handling volumes and the focus on added-value logistics and port industry, retaining the area as a land reserve is a unique chance and simultaneously a necessary prerequisite to ensure the long-term development capability of the Port of Hamburg. Irrespective of how the area will ultimately be used, entrepreneurial site planning will certainly consider the actual development perspectives.

Until a decision on the actual use of the port expansion area has been made, the structures and existing uses in Moorburg and Francop will be retained and protected though their development prospects are limited. Any changes required in the meantime must consider the fact that the potential of the land reserved for port purposes must not be restricted. The decision on the course of the route of the A 26 to the east of the A 7 and the HPA's disposal site planning take account of the development option this area offers with regard to access to a deep-water navigation channel. The Senate of Hamburg will nevertheless continue to espouse reasonable solutions until the land is actually used. Then, the fact that in the area of Moorburg the port expansion area overlaps with the designated Süderelbmarsch/Harburger Berge water protection area, covering about 2.2 square kilometres, must be taken account of.

However to be able to respond to global changes in shipping, transport and handling technology and goods distribution in the interest and for the benefit of the Free and Hanseatic City of Hamburg at any time and thus secure the long-term competitiveness of the port within the scope of port development, the option of expanding the port must be kept open.

Figure 44: Port expansion area



Source: HPA

NEW APPROACHES TO LAND DEVELOPMENT

In the course of the strategic further development of the Mittlerer Freihafen area the Senate of Hamburg, for the first time ever, asked for an international market consultation process to be launched. The innovative approach to directly address potential operators, investors and consultancies advertised the project to a broad circle of interested parties. The overwhelming response from over 30 national and international parties revealed the readiness of the market to take part in such planning processes. The results indicate that the process is a valuable additional tool available to land use planning because it shows the interest in and potential demand for specific components of use. It incorporates immediate and efficient feedback on long-term planning and decision processes and entails dynamic port-industry development close to the market. The Senate of Hamburg and HPA will make use of the same procedure when it comes to developing strategically relevant sites in the future.

When allocating sites, various assessment criteria apply, in particular value creation and sustainability that underpin the important macro-economic significance of the port for the city and the region. Business location criteria applied in the port are, among others, the evaluation whether the purpose of the business complements and/or enhances the range of services the Port of Hamburg intends to offer, which type of user fee income will be generated for the city, how many jobs will be provided and what kind of added value will be produced. Other aspects are the climate and environmental protection goals a business is able to pursue and in how far it supports the pairing of seaborne cargo flows.

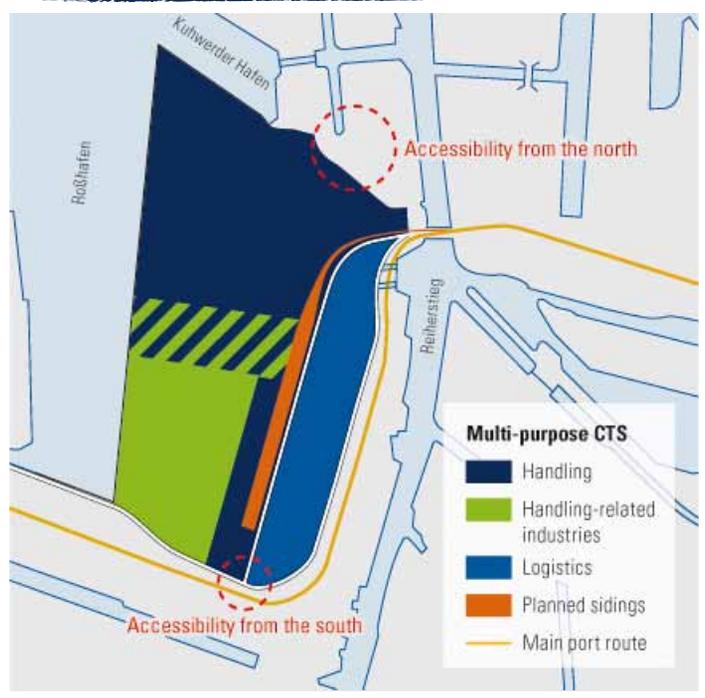
Central Terminal Steinwerder

Of outstanding importance for the Port of Hamburg is the development of new sites in the area of Mittlerer Freihafen. They offer considerable development potential as well as excellent options to gradually and significantly improve land use efficiency on existing sites and simultaneously create new sites as required.

A future Central Terminal Steinwerder at the heart of the Port of Hamburg comprises a large area within the dedicated port area that can accommodate large ships and can be divided to create new plots of land. Old quay facilities that no longer meet market requirements will be dismantled and harbour basins filled to create a new site that stretches across up to 125ha. A waterside turning area for large ships of the 18,000-TEU generation is being planned. It will be available to the entire central port area.

The dialogue that started early on within the scope of the market consultation process produced a multitude of ideas and approaches with regard to the concept of use and organisation and financing models. In addition, the market consultation process made internationally active companies aware of Hamburg as an attractive place to do business that offers many benefits and quality port services.

Figure 45: Sample layout for Central Terminal Steinwerder



Source: HPA

According to current planning the development of the area should ideally incorporate several components of use to be able to respond to market developments flexibly and quickly. Apart from handling operations (container and multi-purpose handling), the site could house production and logistics functions. This mix of uses enables optimum utilisation of synergies between handling, port-related production and logistics activities. To analyse the location potential in the field of production, a branch screening was carried out to determine port-related industries that offer long-term growth potential with the ultimate aim to commit more cargo to the Port of Hamburg and generate added value in Hamburg.

By continually adjusting and updating the planning for Central Terminal Steinwerder the Senate of Hamburg continues to pursue a sustainable port development and ensures optimised productivity and value creation in this area of the port too.

STRATEGIC DEVELOPMENT PROJECTS

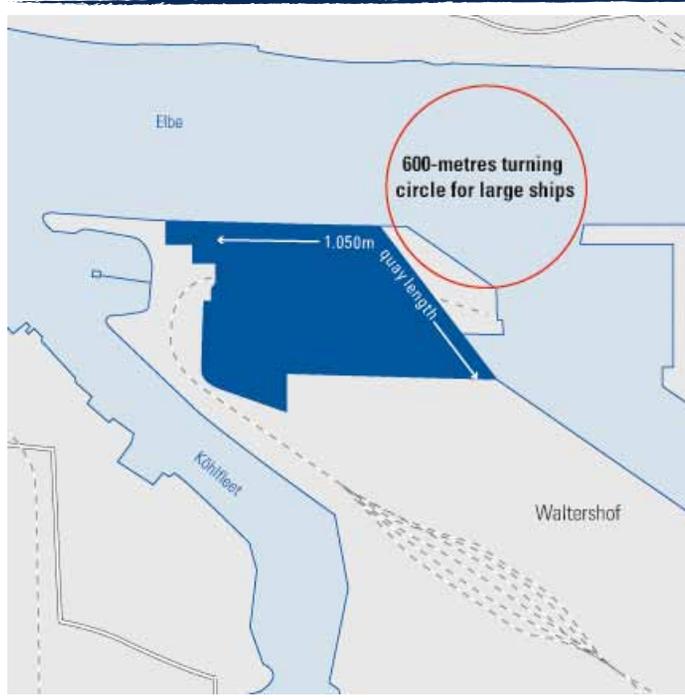
Western expansion of a container terminal in Waltersshof

The expansion at Predöhlkai is one of the key measures to expand handling capacities in the Port of Hamburg. The capacity of this terminal will increase by about 2m TEU to a total of roughly 6m TEU per year.

Within the scope of the western expansion today's petroleum harbour basin will be filled, the sites to the north of it restructured and existing contaminated sites remediated, creating approximately 40ha of new terminal area with space to accommodate two large-draught vessel berths and a feeder berth. The existing turning circle will be widened to a diameter of 600 metres to create sufficient manoeuvring space for future large container ships.

During the realisation phase as well as in the operational phase noise mitigation measures need to be implemented as the planning area is very close to residential areas. An innovative path is taken in quay wall construction where approaches are being developed to reduce noise emissions by applying alternative construction methods. According to the current planning status the first sections are expected to start operations in 2018.

Figure 46: Western expansion and turning circle in Waltersshof



Source: HPA

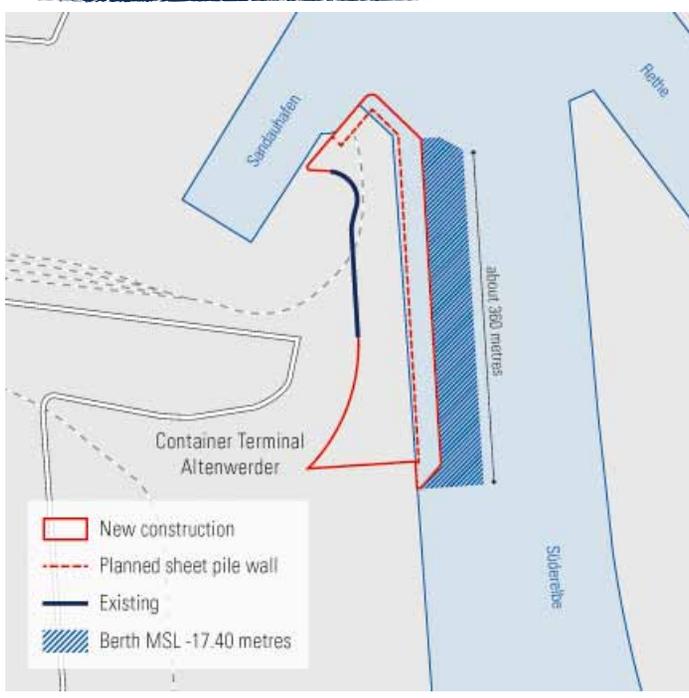
Northern Expansion of Container Terminal Altenwerder

More container handling capacities will become available within the scope of the northern expansion of Container Terminal Altenwerder. Here, an additional berth of about 360 metres in length and an approximately 3.7ha-large terminal area are being developed. The new berth will be able to accommodate large ships as well as feeders. This measure helps to optimise container ship processing at the existing berths.

Expansion of Container Terminal Tollerort

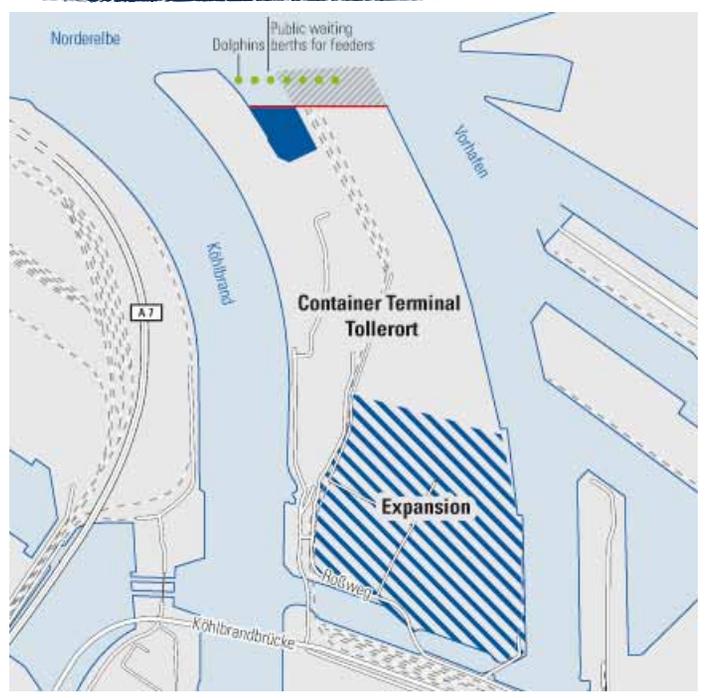
Container Terminal Tollerort has expansion potential of up to 2m TEU per year if two additional berths for large ships are built in the south. The required sites are already leased out to the terminal operator. The Senate of Hamburg would support the respective restructuring measures if it is ensured that container handling capacities are expanded as required. Currently the outer harbour entrance is being adjusted to improve the nautical conditions for container ships at Container Terminal Tollerort.

Figure 47: Northern expansion, Container Terminal Altenwerder



Source: HPA

Figure 48: Possible expansion to the south of Container Terminal Tollerort



Source: HPA

Steinwerder Hafen

To improve operational processes at a conventional cargo handling terminal in Steinwerder Hafen and to expand handling activities, the southern part of the Steinwerder harbour basin is being filled to create a 4ha-large area. The Port of Hamburg is hence meeting the demands of the dynamically developing conventional general cargo handling sector by providing an additional handling site for this cargo segment.

The handling and intermediate transport of especially heavy project cargo requires special equipment such as, e.g. floating crane capacities.

Altenwerder West

Port dialogue | results

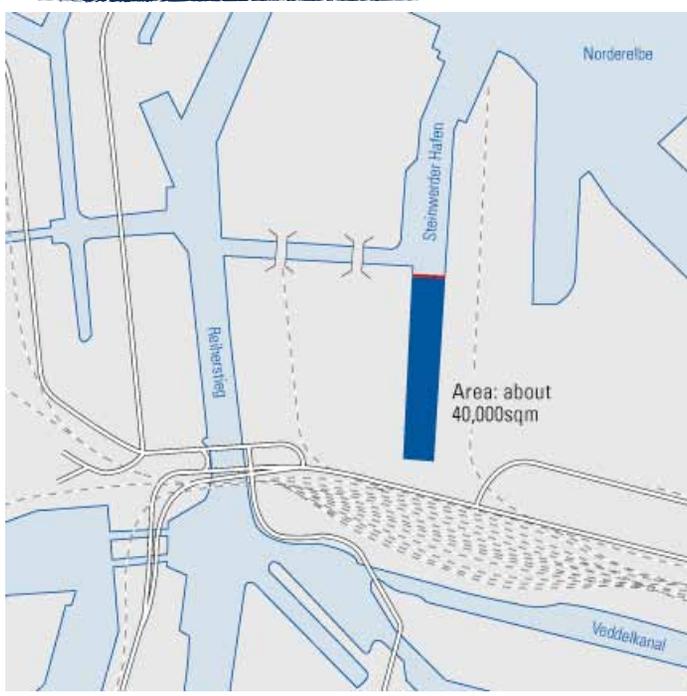
Most of the parties involved in the port dialogue considered the following important **for the Altenwerder West area**:

- Attracting industries or logistics companies with a relation to already existing adjacent businesses
- Relocating businesses not dependent on water within the port

Aims

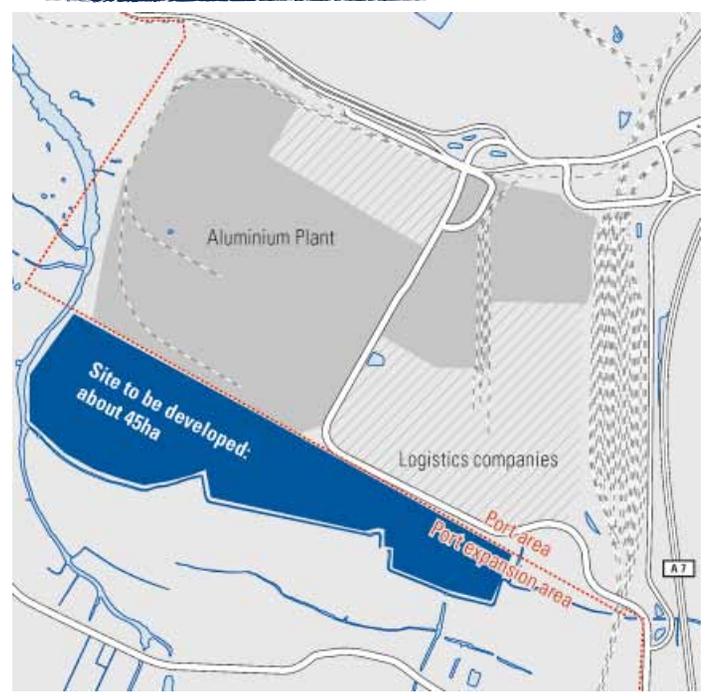
- Creating synergies with neighbouring businesses
- Freeing the quayside for handling-related businesses

Figure 49: Expansion of the Steinwerder Hafen site



Source: HPA

Figure 50: Overview map of the actual situation in Altenwerder West



Source: HPA

The ongoing strong demand for port-related commercial and logistics sites requires the short-term development of sites that are as close to existing logistics facilities and container terminals as possible. For this purpose a highly suitable, around 45ha-large site is available in the port expansion area directly south of the aluminium plant and the logistics companies in Altenwerder West, from where development of the site would be easily possible. Therefore the Senate of Hamburg will issue a port planning regulation to transfer these sites from the port expansion area to the dedicated port area. The planning prerequisites to develop and prepare these sites will be created when it has been established that the economy and job market will significantly benefit from it.

Peute

Port dialogue | results

Most of the parties involved in the port dialogue considered the following uses important **for the Peute area** in the medium and long term:

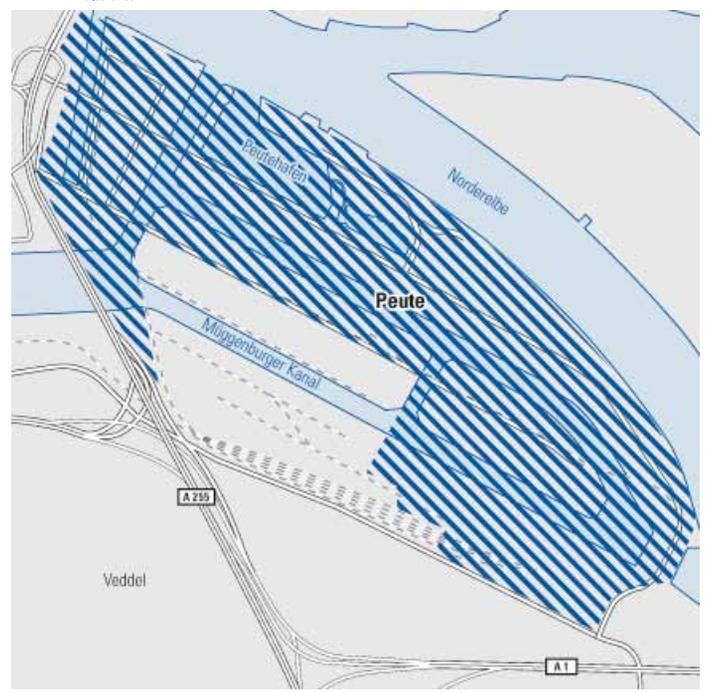
- Recycling and disposal as well as chemical industry
- Logistics close to the city with added-value character (e.g. production component)
- Increased vertical land use

Aims

- Efficient use as an industrial site (24-hour use, businesses approved in accordance with German immission legislation)
- Increasing land efficiency

The Peute area is characterised by small plots. To create sites suitable to house industrial and logistics businesses, HPA will review the planning for the coming years and realign the boundaries of sites taking into account the requirements of existing users.

Figure 51: Overview map of the actual situation at the Peute site

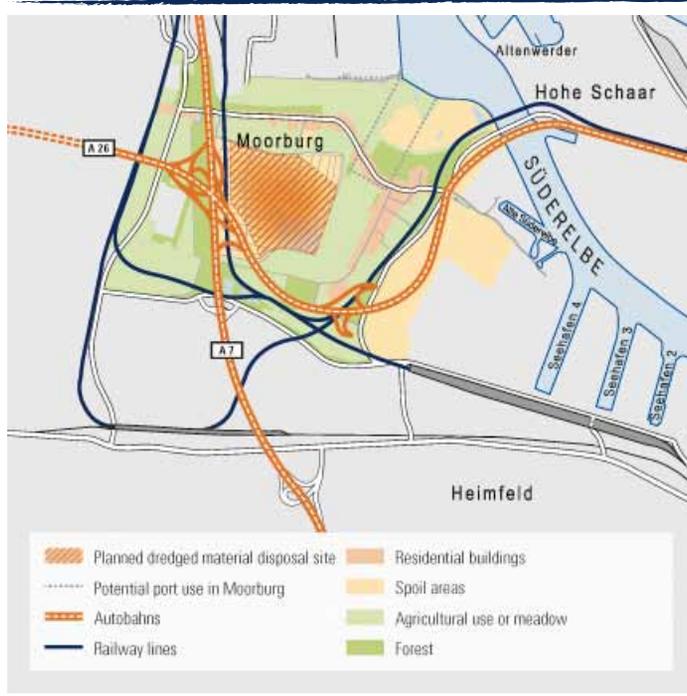


Source: HPA

Disposal Site Planning in the Port Expansion Area in Moorburg

The Senate of Hamburg has to provide disposal capacities on land for the contaminated portion of the dredged material incurred from regularly required maintenance dredging in the Port of Hamburg. The capacity of the disposal site in Francop will be exhausted soon. Therefore, the Senate of Hamburg plans to establish a new dredged material disposal site in the port expansion area on the dewatering field site in Moorburg-Mitte, located to the east of the A 7. The exact location within the planning area and the dimensions of the disposal site, which still have to be specified, the course of the A 26 and the option to generate further terminal capacities with deep-water berths in a harbour basin offering the respective terminal depths, will be taken account of. This ensures that all other future options of use regarding the port expansion area are retained.

Figure 52: Planned dredged material disposal site near Moorburg



Source: HPA

Überseezentrum

Port dialogue | results

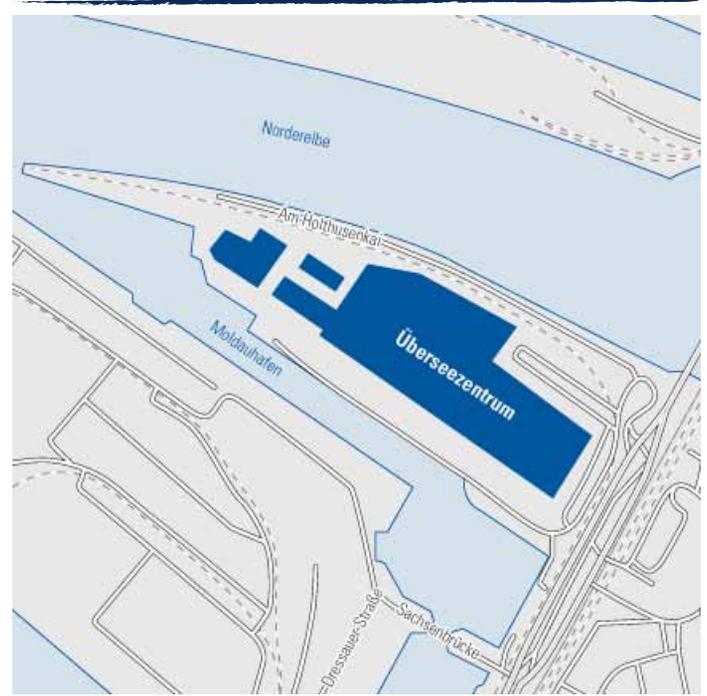
Most of the parties involved in the port dialogue considered the following uses important **for the Überseezentrum area**:

- Peri-urban use in the north (proximity to the city is required) such as cruise ship terminal, event and congress hall, offices
- Industrial use in the south such as research and development, wind power test site, heavy-duty/logistics businesses, special uses (e.g. Olympia)

Aims

- Buffer function between HafenCity and port area
- Efficient land use for port purposes
- City-friendly use with low emissions

Figure 53: Overview map of the actual situation at the Überseezentrum area



Source: HPA

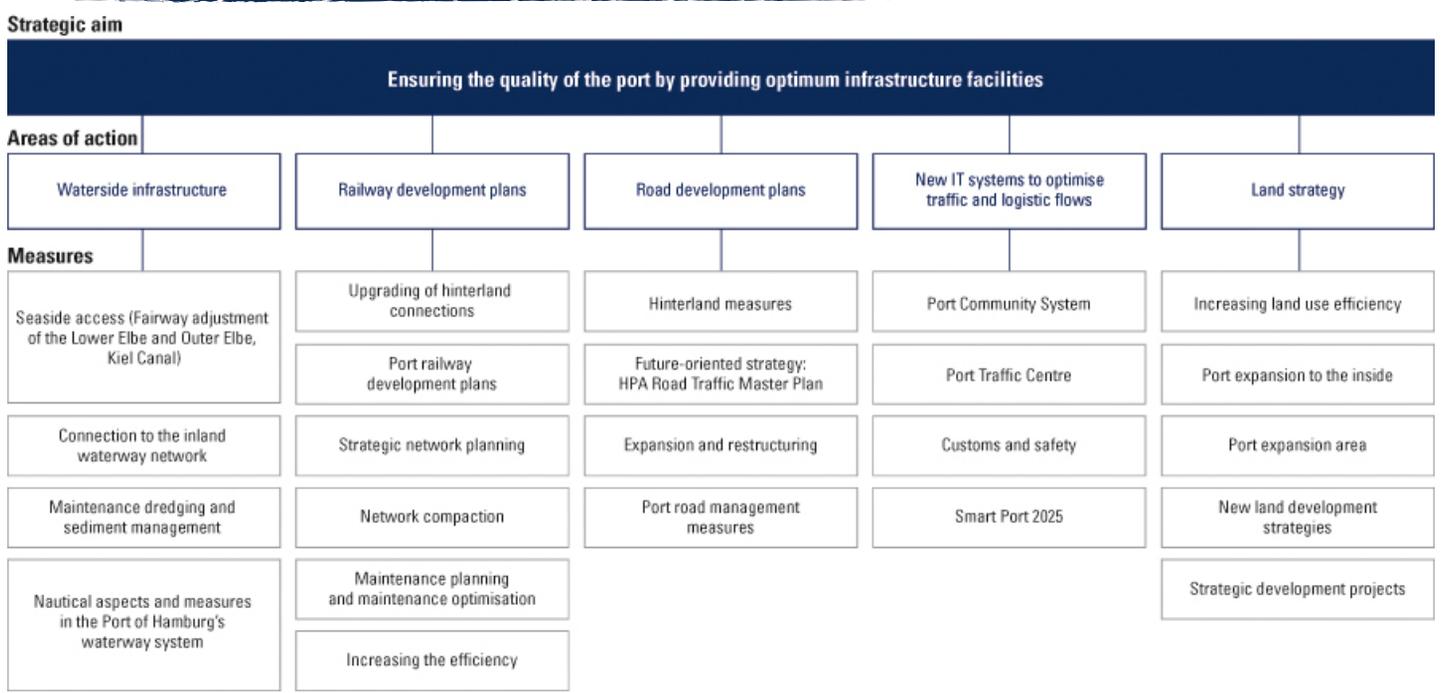
The area of today's Überseezentrum offers port-related use potential and should therefore remain available to port use. The Senate of Hamburg asked for a concept of use to be developed for this area that, within the scope of the Port Development Act, will make effective use of the location and potential of this area in line with the development of the south-eastern HafenCity and the residential quarters planned there. The State Ministry of Urban Development and Environment will be involved. The planning will, of course, take account of the current tenancies at Überseezentrum.

To the north of the River Elbe, the strip of land running in parallel to the river banks will be developed architecturally and house port-related uses that match the architectural overall picture. New uses must fit the port's emissions and immisions standards applicable there because, in view of the confined space, they need to co-exist peacefully with future-oriented port-related uses located in the area bordering to the south, in particular O'swaldkai.

The area along the river banks is primarily reserved for port-oriented commercial and office use. This area may house, e.g. port-related job training and further education institutions, offices of port companies as well as rooms and space for exhibitions, trade fairs or events or even an additional berth for cruise ships. The water's edge will be accessible to the public on foot. An attractively designed footpath network along the river banks with greenery and shrubs could lead to a viewpoint in Veddelhöft and promote the leisure attractiveness of the port. Sections of the unoccupied storage and handling area in front of Höftspitze primarily reserved for port uses could be made available to the cruise ship terminal as a parking space for coaches and passenger cars.

The waiting berths for sea-going vessels in the Northern Elbe will remain.

Figure 54: Strategic aim 'port quality': areas of action and measures



Source: HPA

The concept for the southern part of the area focuses on low-emission handling-oriented businesses dealing with large components and high-value industry that closely co-operates with science and research institutions and develops, e.g., testing facilities in the fields of energy technology, plant construction and mechanical engineering. The target group are businesses that complement and enhance the modern and structurally attractive new quarter of the Port of Hamburg. Closely associated office functions will not be set up in the halls, but in drawn-out main or intermediate buildings. The tri-modal accessibility of the area aims at serving heavy-duty vessels, among others. Moldauhafen could be a good place to build a suitable berth whereby the technical, planning and nautical conditions must be taken into account. In addition, it would be possible to process inland waterway supply vessels, e.g. to transport project cargo, and barges to handle port-internal heavy-goods transfer movements that cannot be effected by rail or truck. Already existing river bank stretches could also be used for that purpose.

Shaping the Port Metropolis with Sustainability in Mind

The political objective of the Senate of Hamburg is to shape the Port of Hamburg with the economy, ecology and society in mind. HPA will in future contribute to this objective by issuing its own sustainability report.

■ CO-OPERATION FOR THE SUCCESS OF THE PORT

Hamburg and the other seaports in Germany and Europe play a central economic role both at the national and European level. The aim of national and European economic, transport and environmental policies should therefore be to strengthen the ports as growth and job engines, thereby taking into account overarching European and national sustainability objectives and requirements.

NATIONAL AND EUROPEAN PORT POLICIES

The Senate of Hamburg strives to improve the competitive conditions for Germany's ports and thus strengthen and further expand their market position in international competition.

On the agenda are topics such as hinterland connections, environmental and climate protection in ports, funding of port infrastructure and port marketing both within the scope of the various port co-operations on federal state level and discussions with the federal government. In this context, HPA co-operates closely with other port authorities.

The National Port Concept, which was approved by the federal cabinet in June 2009, contains a strategic framework to improve the international competitiveness of seaports and inland ports. The Senate of Hamburg has welcomed the objectives outlined in the National Port Concept and will be actively involved in its implementation. The measures described in the National Port Concept concern seaport hinterland connections, port infrastructure and seaside access, education and jobs, environmental and climate protection, safety and security of the supply chain as well as uniform competitive conditions. The implementation of the National Port Concept started in 2010 under the aegis of the Federal Ministry of Transport, Building and Urban Development. The Free and Hanseatic City of Hamburg, in conjunction with the other federal coastal states, actively participates in its implementation. It is represented in the steering committee and advisory board of the work group, which is also called National Port Concept. In order to implement the National Port Concept, the coastal states have highlighted to the federal government that the following priority measures are required:

- Extending seaside access routes
- Allocating priority to the expansion of hinterland connections
- Improving the port infrastructure, modernising and expanding suprastructures
- Supporting co-operations between port sites and businesses

The Senate of Hamburg welcomes that the European Commission recognises the special importance of seaports for the entire European economy. This is also evident in the role seaports are allocated in the trans-European network planning. Measures of the European Commission that promote the development and growth opportunities of Europe's ports without distorting competition appear to make sense in principle.

The European Commission presented the cornerstones of its port policy in its communication dated 10 October 2007. In Hamburg's opinion, the sub-legal approaches contained therein are still adequate. There is no need for binding European legislation that sets forth port-specific regulations.

Overregulation that counteracts the aim of strengthening Europe's ports, i.e. the introduction of European regulations that aim at establishing new authorities and/or approval procedures that do not appear to have any significant positive effect at a Community and national level or generate additional value for Europe, must be avoided. The additional administrative burden plus the already manifold regulations that apply in the transport and port industry will cause higher costs, lead to inefficiency and weaken the competitiveness of ports and businesses and thus all functioning logistics chains.

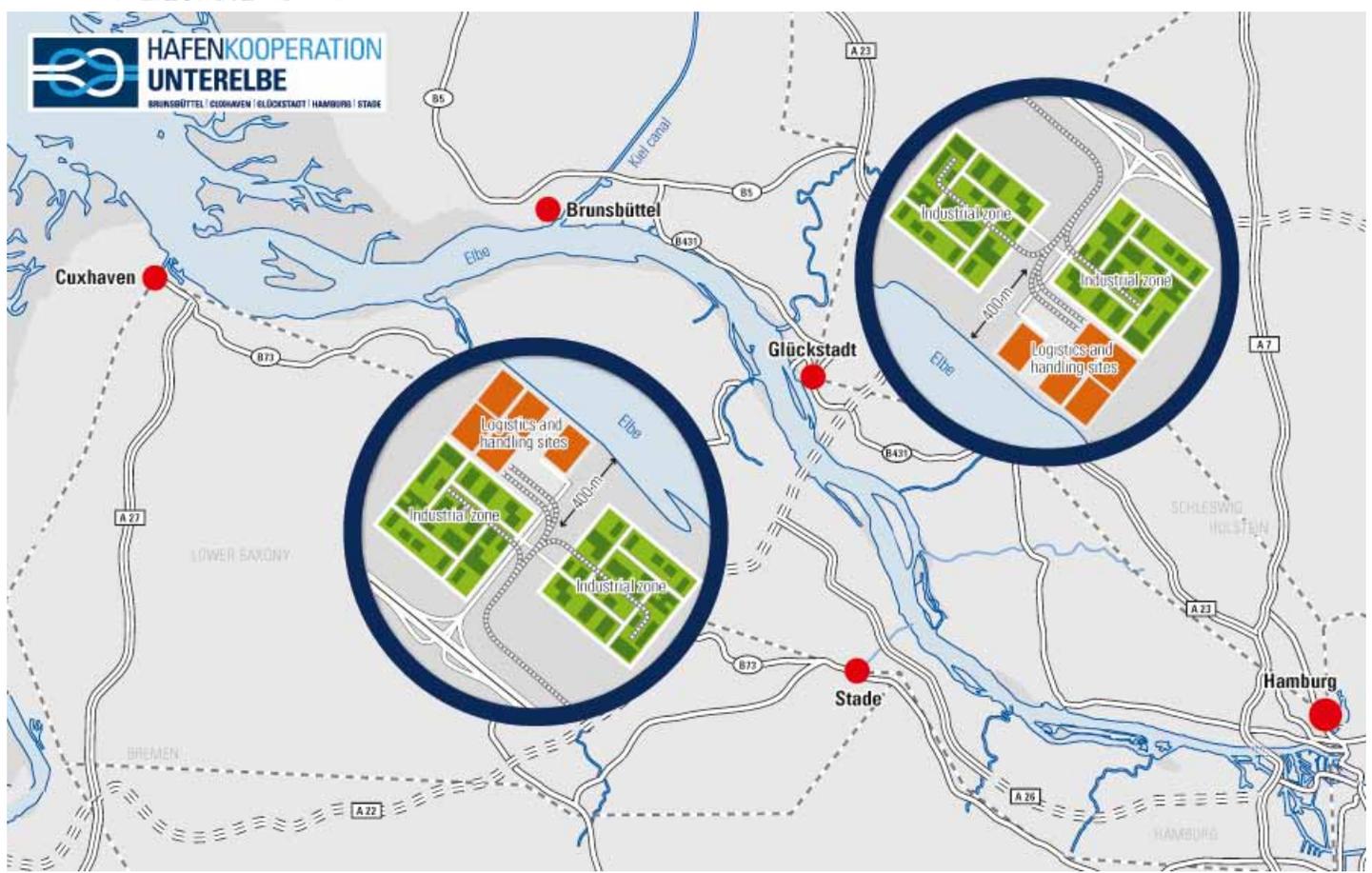
The entrepreneurial willingness to invest must not be impeded or jeopardised by unfounded regulations, but must be reinforced instead. The Senate of Hamburg believes that regulations that enhance international market concentration and thus may have a negative impact on the diverse business landscape and social balance are inappropriate. The business landscape that has marked Europe's ports for a very long time now has proven and should be retained.

The Senate of Hamburg will constructively accompany the preparation of a strategic concept for a European transport policy to 2020 by the European Commission. Hamburg is carefully monitoring all port-political activities of the European Commission, in particular port-related measures as announced by the representatives of the Commission. Together with Germany's coastal states, the federal government, the port industry and the other European seaports Hamburg strives to effectively represent the joint interests and issues at the European level as well as to represent the interests of the Port of Hamburg with EU institutions, the European Sea Ports Organisation (ESPO) and international institutions, such as the International Association of Ports and Harbors (IAPH) and the International Maritime Organization (IMO).

This co-operation is to help keep businesses in the Lower Elbe region and secure the potential of maritime trade growth for the region. It is an instrument to support the competitiveness with regard to other port regions such as Rotterdam and Antwerp. The ports along the Lower Elbe are not only attractive for logistics companies, but for the processing industry, too. Stade and Brunsbüttel, for example, still have land available to locate chemical or raw materials industry, which the port area of Hamburg does not offer. Cuxhaven and Brunsbüttel would make excellent base ports for the establishment of offshore wind farms in the North Sea. HPA will not cater to this segment. The concentration of location offers in one land portfolio widens the acquisition opportunities of all parties involved. Due to the scarcity of port land, it may be of key interest for Hamburg to have attractive options for businesses based in the Port of Hamburg available in the surrounding regions. In many port-specific technical and operative fields (quay wall

construction, organisation of technical operations, dredged material management, nature conservation regulations, etc.) the co-operation of ports may lead to improved task management, synergies and cost reductions. And not least, it will be easier for the Lower Elbe ports to advocate the need for the expansion of hinterland transport routes and seaside access with the federal government if they all act in concert. The Senate of Hamburg will actively implement the port co-operations as agreed and verify other options of closer networking and co-operation among the Lower Elbe ports. The level of awareness and acceptance of the Co-operation of Lower Elbe Ports is raised through targeted marketing activities geared towards the port industry and communal decision makers.

Figure 55: Co-operation of Lower Elbe Ports [Hafenkooperation Unterelbe]



Source: Figure similar to the one of the chambers of commerce of Hamburg, Schleswig-Holstein and Stade for the Elbe-Weser region: "Industrial zones in the age of globalisation. The future happens on the coast." 2009

With the implementation of the respective measures it will be possible to develop the dynamic tidal Elbe (the Elbe estuary) with its many shapes and facets in such a way that it is possible to improve both its various economic options of use and its ecological functions.

The long term guiding principle is to achieve an economically and ecologically balanced state: the tidal Elbe as an economic area and sustainably maintained waterway which, at the same time, is a unique cultural and natural space. This perspective is also suitable to counteract the stronger tidal and sediment dynamics expected in line with climate change.

These cornerstones of a sustainable development of the tidal Elbe already form the basis for various Elbe estuary projects. For instance, underwater deposits in the mouth of the River Elbe are an integral part of the current fairway adjustment project to mitigate the tidal energy entering the Elbe estuary. In front of Wedel, a pilot sediment trap has been installed that catches sediments transported upstream before they reach the port.

Within the port the available options are not as straightforward because port restructuring measures, which are necessary within the scope of the port expansion to the inside, frequently involve the filling-up of water areas, in other words tidal volume decreases. Restructuring in the port may result in the non-compensated loss of water areas which has an impact on the tidal range, flow conditions and aquatic habitats. This is to be dealt with adequately within the scope of existing legislation and the political decision status.

It is possible to generate new tidal volume in the port, too, by deepening silted-up port areas, reconnecting former tidal zones and creating new shallow water zones influenced by the tide.

Within the scope of a pilot project to redesign the foreshore area at Spadenlander Busch/Kreetsand an approximately 30ha-large natural shallow water area will be created. Due to its valuable nature conservation functions, this new shallow water area has become a part of Auenlandschaft Norderelbe, a nature conservation area. Here, tidal dynamics can be observed from up close and the complex tidal Elbe concept, designed for the long term, can be explained and demonstrated to the interested public.

The authorities in charge along the River Elbe waterway, WSV and HPA, continue their efforts to fine-tune and further develop the strategy for the sustainable development of the tidal Elbe together with all residents and users of the river system. Increasing knowledge about system interactions and the dynamic processes in the tidal Elbe in connection with new methods and models makes it possible to better remodel the past and future hydro- and morphodynamic developments in

the tidal Elbe, thus allowing a more accurate and effective planning of infrastructural river engineering measures and analysis of their impacts. Finally, the many aspects of the concept on the sustainable development of the tidal Elbe were also taken account of in water conservation when the River Elbe Management Plan and the Integrated Elbe Estuary Management Plan (IBP, Natura 2000) were drafted. These plans were prepared together with water and nature conservation authorities as well as Elbe residents within the scope of a broad participation process. The IBP will be the guideline for governmental actions and support HPA in planning and implementing important infrastructure measures. The over 200 measures proposed in the IBP also contain the approaches mentioned in the tidal Elbe concept as well as the river engineering and sediment management concept. This proves that there is significant potential for synergies with regard to the objectives of business and water and nature conservation. The IBP also is a suitable framework when it comes to funding, e.g. mandatory compensation for interventions, or how funds from Elbe Habitat Foundation [Stiftung Lebensraum Elbe] should be used. At the same time, it also helps to secure the long-term accessibility of the Port of Hamburg. The foundation was established by law in 2010 upon the initiative of the Senate of Hamburg. Its purpose is to contribute to improving the ecological situation of the tidal Elbe by initiating and financing appropriate measures. The River Elbe habitat also benefits from the growth of the port because a proportion of the annually collected port dues and compensation paid for water areas filled up in the port are used to fund specific projects. Overall, the sustainable development of the tidal Elbe is a task and challenge that goes beyond the boundaries of Hamburg and thus requires both the joint effort of many parties and public acceptance. This can only be achieved by involving the various stakeholders on the tidal Elbe.

INNOVATIVE SUSTAINABILITY CONCEPTS

Environmentally friendly Energy Supply in the Port

In road transport HPA is pushing electrification in the port, thus pursuing further the commitment of the City of Hamburg in the field of electro-mobility. The aim is to implement electro-mobility in commercial traffic. The deployment of electric and hybrid vehicles used for inner-city deliveries is one focus area; another is the use of electrically powered vehicles to transfer containers within the area of the port.

Furthermore, the port will do its part to achieve the aim of the Senate of Hamburg to generate more than 100MW from wind power facilities installed in the area of the state of Hamburg. Based on existing mapping of suitable wind power sites, HPA will actively verify concrete sites for wind power facilities together with businesses of the port industry located on these sites and suitable partners from the energy sector as well as the cluster of renewable energies. Project preparation, application, construction and operation of the wind power facilities will be the responsibility of the businesses of the port industry and their partners from the energy sector; in specific cases HPA will be in charge. HPA will verify the sites so as to obtain approval for specific facilities in the port as soon as possible

to implement concrete wind power projects in a timely manner and get an overall picture of when the port will be able to make what kind of contribution to achieve the aims of the Senate of Hamburg to expand wind power supply. The port can thus become a kind of a “flagship store” for wind energy businesses in Hamburg. Furthermore, initial ideas on how to make use of renewable energies and efficiency technologies in the port have been developed. Energy producers and consumers benefit from the close proximity when it comes to using photovoltaics, geothermal energy and industrial waste heat other than wind power.

Figure 56: Carbon footprint of the transport chain

Overseas transport

Example: Hong Kong–Hamburg



CO₂ per route*

Plane: [Bar chart showing 270,450kg]

based on 4,800 nautical miles: 270,450kg

Container ship: [Bar chart showing 20,796kg]

based on 9,950 nautical miles: 20,796kg

* Emission per 20-foot container (19t) on the total route

Hinterland traffic

Example: Hamburg–Prague (about 600 truck km)



CO₂ per route*

Inland waterway vessel combination** [Bar chart showing 690kg]

690kg

Railway combination** [Bar chart showing 862kg]

862kg

Truck only [Bar chart showing 1,610kg]

1,610kg

** Transport by inland waterway vessel/railway to the nearest port/railway yard; from there by truck

Green Transport Chain

Due to its geographic location deep in the inland the Port of Hamburg already offers conditions that encourage the use of environmentally friendly sea-going vessels. This is reinforced by its proximity to the Kiel Canal and the feeder services available to and from the Baltic region.

Port-related businesses and logistics companies are putting ever more emphasis on an eco-friendly transport chain that takes account of the energy efficiency of various transport modes as well as the respective transport routes. This is also one of the key issues Logistik-Initiative Hamburg – a cluster initiative – is working on together with the work group named ‘Sustainability’ that was established within this network and which HPA is also active in. Furthermore, HPA will check in more detail initial options of use of innovative transport systems identified by a market study as attractive and discuss sensible application options with the port industry.

An eco-friendly transport chain is characterised by the fact that it is possible to combine different modes of transport. Hamburg provides and is expanding the necessary waterside and landside infrastructure to continue to offer this service.

Incentive Systems

To promote the use of low-emissions technologies on sea-going vessels HPA, on the request of the Senate of Hamburg, is active in a work group of the World Port Climate Initiative (WPCI) together with other ports. The group has developed an index – the Environmental Ship Index (ESI) – that measures the environmental friendliness of sea-going vessels. On the basis of this index, a specific incentive system has been developed according to which ships with particularly low emission rates are granted discounts on port dues. These discounts, rated in accordance with their respective score on the environmental index, encourage shipping companies and ship owners to deploy ‘green’ ships. Getting more ports and international providers to join in the scheme will promote the recognition and application of the index and increase the number of users. More international environmental co-operations, comparable to the participation in the WPCI, will be established and extended in the coming years.

ENVIRONMENTAL AND CLIMATE PROTECTION, NATURE CONSERVATION

Immissions Control

In spite of the fact that the deployment of modern vehicle technology has reduced specific fuel consumption – almost all handling equipment is powered diesel-electrically or electrically – inland waterway vessels are offered shore power at their berths or fuels for land transport vehicles and, above all, water crafts have become cleaner, there still is optimisation potential when it comes to clean air. The Senate of Hamburg is currently verifying shore power options and supply options for sea-going vessels and land transport vehicles powered with liquid natural gas (LNG). HPA has been asked to develop a LNG concept for the Port of Hamburg by 2015 to supply both sea-going vessels and land transport vehicles, e.g. trucks, with LNG if possible. Due to the high proportion of feeder traffic in the Port of Hamburg, the provision of LNG supply options is also seen as a competitive factor and serves to further strengthen the port strategically in this segment. On land, LNG technology is considered as an option to lower emissions from trucks passing through the Port of Hamburg and diesel-powered locomotives in the long term.

In addition, the Senate of Hamburg intends to conclude an agreement with Hamburg-based businesses to improve the air quality in Hamburg. Within the scope of this partnership for air quality and low-emissions mobility other clean-air measures are planned to be implemented in the port.

The above takes place in view of the fact that all ships travelling the North Sea and Baltic Sea will be subject to the SECA (sulphur emission control areas where strict sulphur limits in fuels apply) regulations, which will come into force on 1 January 2015. In addition, the EC Directive that obligates ships to use fuels with a maximum sulphur content of 0.1% will apply in the port.

The Senate of Hamburg strives to further reduce port-related emissions, in particular in fringe areas of the port that are in direct vicinity to emissions-sensitive urban areas. A role model is the noise mitigation concept of a container terminal operator that is being implemented in dialogue with the residents’ initiative under the moderation of HPA. The solutions worked out by this committee range from changed technical equipment and organisational measures all the way to passive mitigation measures. The noise-reducing soft touch-down procedure to put down containers is already in place. With regard to port-internal traffic (ferries, pilot boats), shore-power supplied berths, where vessels can switch off their diesel-operated on-board aggregates, are continuously being modernised and

expanded. Cruise shipping companies have already expressed their interest in using shore power for their high-consumption passenger ships. The Senate of Hamburg will pursue this issue and verify economically viable offers for the two cruise ship terminals in Altona and HafenCity by taking account of the specific characteristics of each berth. Mobile energy supply options for cruise ships will also be considered with the respective nautical circumstances in mind.

The expansion of the energy-efficient and thus environmentally friendly railway will continuously improve the environmental situation in the port. This will be enhanced by the newly introduced user charge system that rewards rail freight operators for using soot filters and noise-reduced brakes.

The parties in the port also actively implement immissions control measures in their own fields of activity. Truck fleets are gradually being modernised to comply with the EC Directives on emissions control. The HPA's floating fleet has permanently switched to sulphur-free fuels.

Like in the field of air quality, port-operating businesses are also actively reducing noise emissions. Legal regulations, such as the Kleiner Grasbrook port planning regulation, also helped to substantially reduce noise emissions. In addition, noise mitigation is taken account of when terminal areas are restructured and machines and equipment are modernised. Construction planning also favours the use of low-noise methods and equipment.

Climate Protection

The foremost aim of climate protection beyond efforts to keep the air clean is the reduction of emissions harmful to the climate, e.g. by saving energy, increasing efficiencies and using renewable energies, which HPA pursues and supports wherever possible. Many port-operating businesses have already implemented or are planning to implement energy saving programmes that benefit the environment and save costs. Moreover, many companies have voluntarily joined UmweltPartnerschaft Hamburg, an alliance between the Senate of Hamburg and Hamburg's business community with the aim to co-operate in environmental and climate protection matters, which HPA also is a member of. Some industrial businesses have voluntarily committed to reduce their CO₂-emissions within the scope of Hamburg's climate protection concept and set their own targets. Simply preparing a carbon footprint analysis or introducing an energy management system offers ideas of

Figure 57: Wind turbines in the Port of Hamburg



Photo: www.mediaserver.hamburg.de/C.Spahrbier

how to reduce emissions. This includes, for example, the refurbishment of existing buildings with the aim to save energy or the new construction of energy-efficient buildings. The deployment of modern vehicles and equipment significantly reduces fuel requirements, and the use of electrical drive technologies reduces emissions. Many innovative ideas such as using fuel cells in cargo handling equipment, recovering waste heat and installing heat pumps in the heating or ventilation systems of buildings, recovering energy in cargo handling equipment or producing renewable energies have already been implemented. The possibilities to use industrial waste heat to heat buildings by way of mobile latent heat storage units are currently being examined. Fossil fuels, currently used for heating purposes, could be almost entirely replaced by waste heat, which would enormously reduce CO₂ emissions.

The Senate of Hamburg supports the research-backed further development of environmentally relevant pilot projects and is willing to provide land for the production of renewable energies. As such, six wind turbines generating a total of 20MW are already operating in the port. More turbines to generate electricity close to consumers are in the planning. Renewable energies such as solar, wind, geothermal and biomass energy are already being produced and used throughout the port, and their share will increase over the coming years in line with rising commitment.

One component of Hamburg's air improvement programme is its Port Road Management or, more specifically, DIVA, a traffic information system that helps to control, optimise and accelerate traffic flows, which leads to higher efficiency on the road and thus reduces air pollution.

The Hamburg Climate Protection Master Plan will take account of port-specific aspects.

Compensation and Replacement

Within the scope of port development it is sometimes necessary to use land that is also of ecological value. According to nature conservation laws the loss of ecological values must be compensated. Large-scale projects in particular often entail comprehensive compensation and replacement obligations that cannot always be met in the spatial and functional context. In such cases nature conservation laws provide for compensatory payments which the competent authority will use for specific nature conservation measures to maintain the efficiency and functionality of the ecosystem.

In view of upcoming expansion projects that interfere with the ecosystem, the Hamburg Port Authority and the State Ministry of Urban Development and Environment have agreed early on to provide for compensation measures outside of the port area and purchase compensation areas. The funds required will be paid into the separate fund for nature conservation and landscape management to be used when needed. Compensation and replacement measures can thus be planned well in advance and implemented accordingly.

A part of the port dues imposed by HPA is used to fund Elbe Habitat Foundation. The foundation helps to implement projects in the River Elbe natural space irrespective of compensation and replacement measures. Among others, the foundation is financed by a proportion of the port dues raised annually.

■ PORT CITY OF HAMBURG

The Port of Hamburg is located right at the centre of the city, making the entire metropolis a port city and gateway to the world marked by a tradition and culture with a maritime flair. It offers jobs close to the city with high identification potential. Attractive residential, business and shopping quarters enjoy being close to the port, thus promoting accessibility, leisure attractiveness, understanding for and acceptance of the port. To ensure its success, it is of vital importance to promote broad acceptance of the port.

THE PORT OF HAMBURG AS A GUARANTOR OF JOB QUALITY

The Port of Hamburg is known for the outstanding quality of the work delivered by its workforce, which is predominantly due to their high level of education and performance. Whereas port-based businesses benefit from the wide catchment area of the metropolitan region, people with all kinds of qualifications – from warehouse assistants and dockworkers to port specialists and IT experts at the terminal control stations – can choose from a wide range of internationally competitive employers and a large variety of industry sectors and trades that offer numerous jobs and career opportunities.

Suitable training and further education for the entire workforce as well as effective staff recruitment provide the basis to meet the ever changing challenges of the labour market. Two important institutions in the Port of Hamburg, Gesamthafenbetriebsgesellschaft (GHB) and the Maritime Kompetenzzentrum (ma-co), cater to the port industry in this respect. In addition, businesses based in the Port of Hamburg offer comprehensive training programmes, thus boosting their competitiveness in the long term whilst simultaneously ensuring a constant supply of qualified staff. As such, Hamburg has created the new profession of port logistics specialist – an excellent example of Hamburg's efforts in staff development.

Hamburg as a centre for employment particularly benefits from the increasing diversification of the port industry and high cargo commitment in the surrounding region. When it comes to land and infrastructure development or strengthening general cargo and heavy-goods traffic, the potential impact on employment is always evaluated.

In the port the term 'quality' always includes reliability which, to a large degree, is ensured by employees. The good co-operation between the social partners contributes to that. As far as possible, the Senate of Hamburg supports the fruitful co-operation between employers and employees in a constructive way. Good co-operation entails good working results, fair working conditions and a motivating working atmosphere

which combined produce the outstanding reliability Hamburg's port industry is known for.

PLANNING INSTRUMENTS FOR FRINGE AREAS OF THE PORT

Due to unavoidable, non-port-conform changes within and outside of the port area, about 245ha of land had to be transferred from the area governed by port laws and made available for urban use.

Even if areas for port-related and logistic uses in Obergeorgswerder outside the area of the port have been provided on land previously not designated for commercial use, the Senate of Hamburg considers changes in the scope of application of the Port Development Act for urban development reasons justifiable only if this does not negatively affect the interests of the port. It would no longer be possible to compensate losses in land by applying the land management tools described above and the competitiveness of the port would be permanently weakened. Furthermore, a lasting lack of land will substantially diminish the attractiveness of the port and the entire economic area of Hamburg at the international level as well as for investors who are looking for a suitable business location.

Principally the following applies: the development of urban uses must not restrict port uses and impede port development. In the event of changes in the port environment the Senate of Hamburg will take care that sensitive uses will not be located too close to the port so that port uses or port development will not be restricted further. To identify existing and potential areas of conflict, current land uses, possible future requirements, and developments in the port and the city will be captured and compared. Based on the results the requirements of the port and the options of urban development can be determined and joint solutions can be developed.

THE PORT AS A LEISURE ATTRACTION

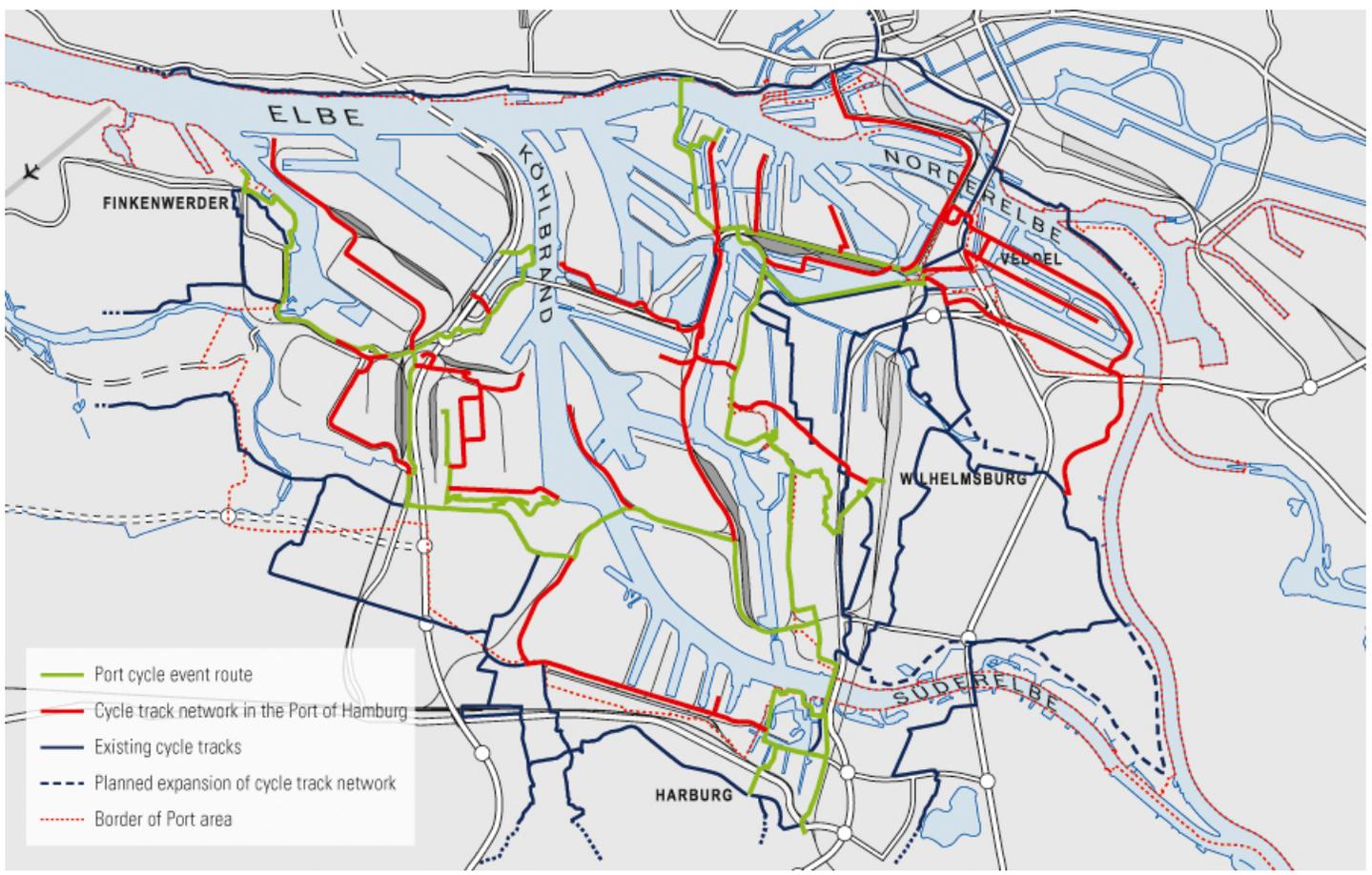
The Port of Hamburg has always been a magnet for residents and tourists alike. Tourism in particular significantly increased over the past years and contributed to the economic development of Hamburg. The Senate of Hamburg will continue to enhance the leisure attractiveness of the port and thus promote acceptance and understanding for the important role the port plays for the prosperity of the entire metropolitan region.

Already the port's manifold offers, ranging from harbour tours to container terminal visits, make it a popular leisure destination. The expansion of pathway networks and access to water areas contribute to that, whereby the regulations of the International Ship and Port Facility Security Code (ISPS) must be taken account of. The Senate of Hamburg will consult on and develop a port accessibility concept and gradually implement it, always assigning priority to the port as an industrial site and taking into account the navigational safety of ships and smooth

vehicle traffic. Attractive sights are to be identified, developed and integrated.

The Senate of Hamburg supports efforts to increase the share of bicycle traffic in Hamburg and in the port, too. As such, it is financing the Wilhelmsburg cycle track between St. Pauli Elbtunnel and Ernst-August-Schleuse. In addition, the Senate of Hamburg is preparing a Port of Hamburg Bicycle Master Plan to promote cycling. The plan envisages existing cycle tracks to be refurbished and extended at certain places so as to create an improved cycle track network that ensures that port traffic and visitor traffic will not impede each other. However if necessary, the Senate of Hamburg will make sure that port purposes have priority over those of visitors.

Figure 58: Cycle track network in the Port of Hamburg



Cruise ships that increasingly call at the Port of Hamburg are not only attractive to passengers. People from all walks of life are lured into the port when the ships make their entrance. The Senate of Hamburg, assisted by the harbour master’s office that is responsible for the navigational control of vessel traffic on the port’s waters, enables the holding of numerous events in the port. All processes are planned well in advance so that port operations are not disrupted. Among the events staged are regattas, large-scale maritime events, the Harbour’s Birthday and the Cruise Days or christenings of big passenger ships. In this context, the Senate of Hamburg will be investing considerable funds in the refurbishment of one of Hamburg’s landmarks, the St. Pauli Elbtunnel, over the period to 2013. The tunnel is used by 300,000 passenger cars, 105,000 bicyclists and 800,000 pedestrians annually.

The port development of the Senate of Hamburg also takes care to preserve the cultural heritage of the port. Examples such as the preservation of the warehouse sheds 50 to 52 at Kleiner Grasbrook show how historical buildings can enrich current uses in the port and enhance its attractiveness. The port museum is housed adjacent to the historical sheds. In the midst of the prospering port, on an area covering 3,000 square metres, it brings the past back to life. Objects such as these are a part of this cultural heritage and interesting for tourists, too. From the 50s sheds, e.g., a launch boat service (Circle Line) goes to the emigrant halls on Veddel island that were formerly located in the port. Other heritage sights are the Ellernholzhöft beacon, Landungsbrücken, Grevenhofschleuse and countless bridges. In co-operation with the monument preservation office HPA will continue to take account of the port’s historical heritage in its development concepts.

Figure 59: Strategic aim ‘sustainability’: areas of action and measures



Port development is the process of combining past and current success with future success. Like its predecessors, the new Port Development Plan of the Senate of Hamburg spans a wide arc – from the significant macro-economic importance of the port and future-oriented port-strategic areas of action all the way to infrastructure measures required in the short and medium term. Its motto “Hamburg is staying on Course” promises continued orientation towards success and utmost planning quality.

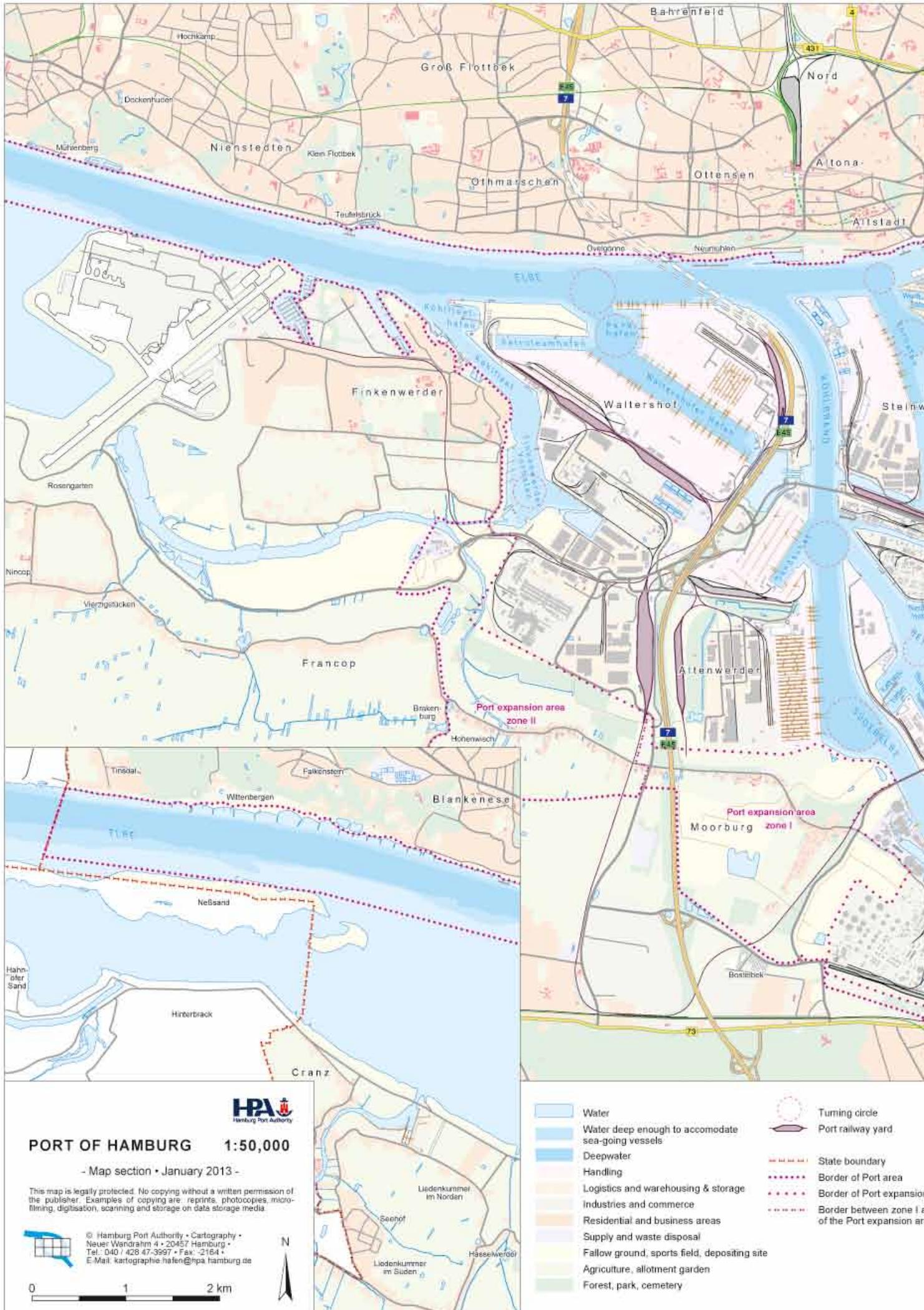
The challenges of the coming years are manifold and demanding. The success of the port is not a matter of course, but depends on all parties involved setting the right accents. For Hamburg this means focusing on growth regions, the further expansion of transport infrastructure facilities and terminal capacities as well as logistics services. It means creating more transport capacities and enabling more intelligent control of all transport modes in the port and hinterland, and – closely associated – increasing the port’s quality through sustainability, safety, security and performance. This should be complemented by the further development of the universal port in a timely manner by attracting future-oriented industries with large cargo potential and high value creation.

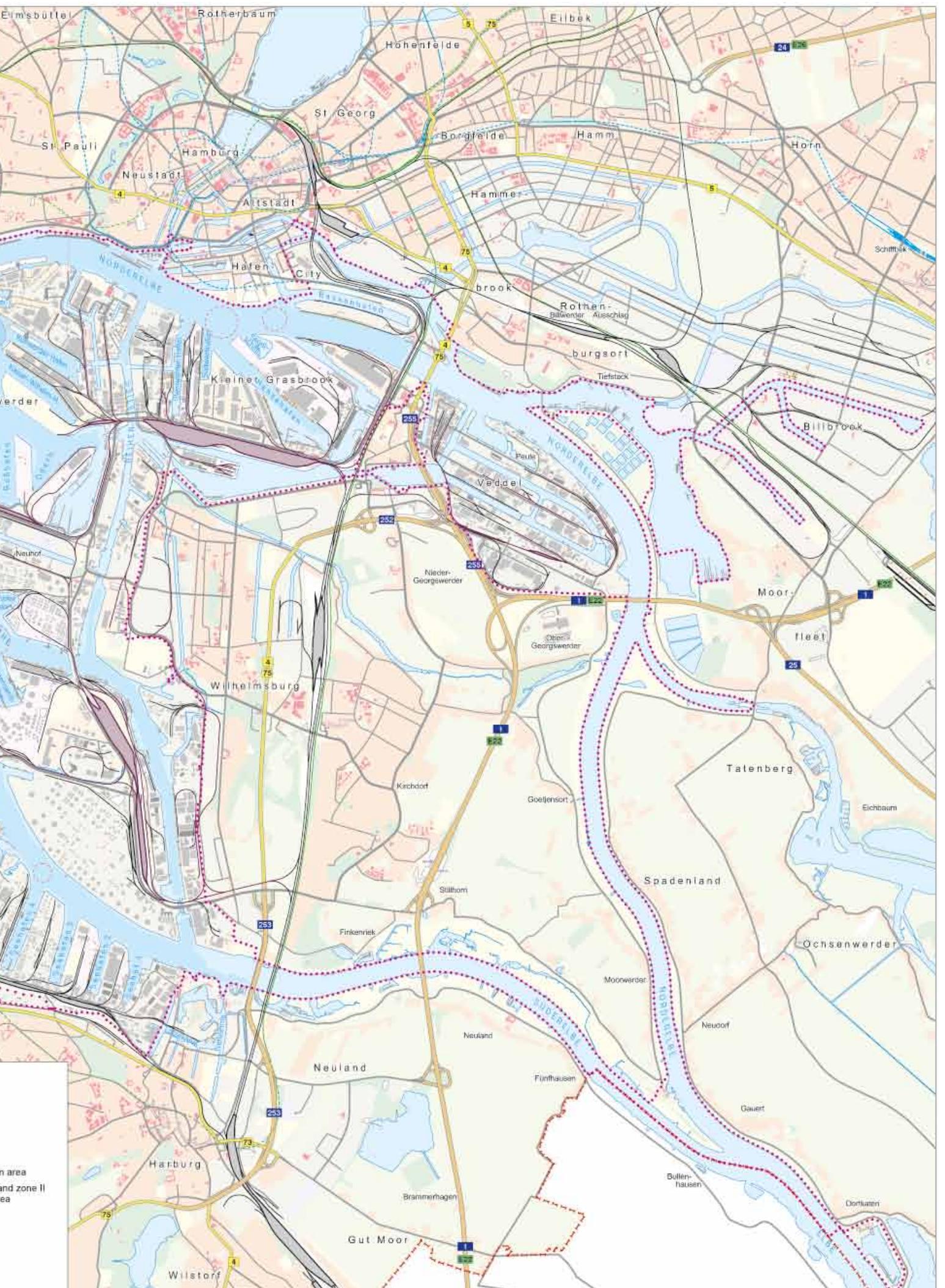
The future-oriented infrastructure projects of the Senate of Hamburg focus on land provision as required by existing and new businesses as well as on the modernisation and improvement of the different types of traffic in the port. The sustainable concepts outlined in this Port Development Plan will ensure the economic success and global economic importance of the port for the benefit of the Free and Hanseatic City of Hamburg and the entire metropolitan region over the coming decades.

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 Map of the Port of Hamburg





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