



Master Plan Port.City.Mannheim 2035+

Balance of port and urban development

Port cities often face the challenge to balance port and urban development. Port development is essential to ensure regional development. However, port sites are often located at attractive inner city locations. Hence urban developers aim at improving the value of the city as recreational area, business or housing location by redeveloping industrial sites in the ports. The emergence of urban development into the port grows usually with increasing regional wealth. However, urban development in the ports reduce the port area available for cargo handling and other port related business and thus restricts economic development in the port. Considering the expected growth in trade and transport, the reduction of port area is even more critical. Moreover, the neighbourhood of port business and urban use such as in particular housing may likely lead to conflicts. Offices and flats are impacted by emissions related to the port activities, in particular noise. These issues require a balanced development, which considers port requirements and interests of urban development.

The port of Mannheim faces the challenge to handle the expected growth of container throughput. The port is concerned that land deficit will limit port growth and will prevent employment as well as value added related to port activity. This has been the reason for the Port and City of Mannheim to jointly launch the Master Plan Port.City.Mannheim 2035+ study. The study aims at analysing the status quo situation of the port area in terms of use and potential for both port business and urban development. Land requirements related to port activities are determined based on a forecast of the port throughput until 2035. A land statement shows possible land deficits arising from the growth considering the status quo site use and site potential within the port area. The potential analysis addresses both, options for port related use and for urban development. The analysis is the base for the design of a limited number of feasible land use scenarios for the port area, which consider the requirements of both, port business and urban development. An evaluation based on relevant criteria for port and urban development will identify the best scenario.

Land use and site potential

The baseline situation of the port area is the starting point for port development. The characterization of current land use and site potential is important to analyse options for future development. This will allow to identify available land for the accommodation of growing traffic flows and related port business. Moreover, the opportunity of land use changes, both for port related use and urban development is influenced by current use and



site characteristics. The analysis should consider a sufficient large area around the port, so that all land potential for port activities and all conflicts between adjacent use can be identified and reflected in the Master Plan. Sites are classified in different categories of use, both for port related and not port related use.

Land use analysis

The outlined approach has been applied for the Master Plan Port.City.Mannheim 2035+. The Master Plan considers a large area including the port area and adjacent areas as well as land along the shores of river Rhein and Neckar. Considering the requirement to identify additional land for port development and balance port and urban interest two sections of the area have been selected for further investigation. The selection includes the port areas Rheinauhafen, Handelshafen, Industriebahnhof and Altrheinhafen and adjacent areas irrespective of the ownership. In total 1.474 ha with about 800 sites are subject of the analysis. Other areas do not provide land potential to satisfy demand due to restrictions such as the designation as flood area or environmental protection area. Moreover, there is no conflict between port and urban development identified in these areas. The analysis of site use applied in Mannheim distinguishes port related use and not port related use. As a status quo projection it considers new developments and relocations, which have been decided on. Port related site use is classified in the following categories:

- waterside container handling
- waterside dry cargo handling
- rail freight handling
- logistics
- port operation and port related services

Not port related use is classified in commercial use without port relation, non-commercial use including residential, recreational and green areas, as well as unused sites including vacancies and brownfield.

Land use Port of Mannheim

The analysis for the selected area including the port premises and selected urban area shows a high share of port related use. 524 ha of the total 1.474 ha are used port related (35%). This is regarded as high share considering the extensive green areas in the investigation area. Analysing the category of port activity a concentration of container handling in the Handelshafen is obvious. Waterside handling of dry and liquid cargo as well as logistic use without waterside handling are more equally distributed between port sections. A large share of waterside handling refers to private ports of industrial plants



located within the port area. The analysis of existing structures is important as a baseline for port development.

Site potential analysis

The site potential for port related use and urban development require both a separate analysis. The site potential for port activities is important to determine the total land potential available. Sites within the investigation area are evaluated based on a set of indicators such as location, infrastructure connections, noise limits and other restrictions, which determine the preferability of a site for port activities. A site with water access is required for operations including waterside handling. Moreover, trimodality including a good accessibility by road and rail is an important factor. In general, activities should not be restricted by noise limits or other restrictions. They may arise due to the proximity of non-port areas such as residential areas. Considering the growth of container transport and the related need for logistic settlements providing value added logistics, there is use for sites without water access. However, these sites should be located within a limited distance to the terminal to be a real option.

Additional to the potential of a site in terms of performance, the current use of a site is important to classify its potential to contribute additional land required for port related settlements. Therefore, sites with port related use are not regarded as potential. Considering the land requirements port related use should be maintained. However, it may be beneficial to use these sites for port development, e.g. to design large coherent sites for new settlements. It would require to relocate current users to other port sites. Port related settlements at vacancies and brownfields contribute to satisfy land requirements. Moreover, land potential may arise from the conversion of sites, which are not used port related. This would require relocation to sites outside of the port area.

The potential of sites located in the port area for urban development is determined by objectives of the city and related planning documents. They outline ideas and show areas respectively sites in consideration for urban use. Different measures and sites are ranked according to priorities of the city. This determines the potential of sites for urban development. The extension of urban development into the port area does usually require a conversion of land use. It would reduce land available for port related use. Apart from planning priorities the potential may be influenced by current use of affected sites and its potential for port related use. An overlay of potential sites, both for port activity and urban development, as well as sites used port related will show conflicts. These conflicts have to be considered for the planning.

Site potential Port of Mannheim



The analysis for Mannheim shows that potential sites with water access are rare. The use of the limited number among these sites without waterside handling activity would, apart from a few vacancies, require the relocation of current settlements to other locations. A larger room is available for settlements, which do not require water access. In particular green areas and brownfields, but also sites without port related use could be used for logistic activities. However, the distance to the container terminals may limit the potential for container related logistic activities.

A limited number of sites are identified as potential for urban development. Highest priority has a continuation of the development along the Verbindungskanal. Apart from two sites in the Industriehafen, sites with potential for urban development are located in the Handelshafen.

The overlay of potential sites shows conflicts in the Handelshafen port area. A number of sites with potential for urban development are either used port related or provide good conditions for the settlement of port related activities.

Forecast of port throughput and land requirement

The land requirement for port activities to accommodate cargo throughput in the longterm future is an important factor for port development. The facilitation of port throughput growth is essential to maintain and strengthen the regional economic impact of the port. The Master Plan study shows the substantial regional employment and valued added related to the port business. Insufficient land and facilities jeopardise the contribution of the port to regional wealth.

A forecast of barge and rail volumes by load category until 2035 is carried out to determine the expected throughput. The land requirements are determined considering the average space needed for the handling of one unit cargo for different load categories. It allows the comparison of land requirements with the projected land available for handling by loading category. The comparison shows land deficits by load category. These deficits should be addressed by port development scenarios.

The cargo throughput of Port of Mannheim will grow differently between load categories. This is the result of the forecast, which applies recently updated – to consider impacts of the global economic downturn 2009/2010 – projections of the Federal German Forecast for conventional cargo to extrapolate latest available figures until 2035. The container throughput projections are the result of a separate analysis considering latest global maritime container transport outlooks and developments in hinterland transport of seaports.

Conventional cargo volumes will grow moderately except for the substantial growth of coal supply for the expanded power plant. However, the power plant uses private facilities, which



are prepared for handling of the required coal volumes. The land used for handling of conventional cargo is sufficient and no additional land is required until 2035.

Container throughput will grow substantially until 2035 and lead to the requirement of additional land for container handling and related value added logistics. The global container traffic growth will lead to triplication of container throughput in Mannheim from 300.000 to 900.000 TEU in 2035. Barge container will account for the majority, so that in particular trimodal terminal capacity with water access is required. Additional to the 10 ha of trimodal container terminal area in the projected status quo, 15 ha are required to accommodate container growth. The required expansion of bimodal terminal area for rail container handling is estimated with 7 ha. Further land requirements of 32 ha in the Port of Mannheim area arise with respect to value added services for container transport such as deconsolidation and refinement of goods carried in containers.

Scenarios

The design of alternative scenarios, which illustrate the envisaged use of port sites, facilitates the decision for a preferred setting of land use in the port area. The alternative scenarios put different accents on port and urban development measures and show different options to address the objectives. The evaluation of alternative scenarios will lead to a preferred land use structure in the port area. Evaluation criteria consider both interests of port and urban development. The involvement of stakeholders from port and city further strengthens the commitment to the selected scenario. This scenario will be the core of the in-depth Master Plan elaboration.

Land requirements and site potential are main determinants for the design of the scenarios. In the Port of Mannheim the selection of sites to satisfy land requirements for container handling is the main difference between scenarios. All scenarios consider equally as far as possible the extension of existing container facilities. This limited extension is insufficient to provide the required terminal capacity, so that scenarios include the development of a new container terminal. As container handling concentrates so far in the Handelshafen, the selection of terminal location in this area would lead to synergies among container operators and strengthen the competitive position of the Port of Mannheim. The land use and site potential analysis shows two options in this port area, which are selected as alternatives for the scenarios. Either a site of up to 19 ha at the western shore of the Mühlauhafen or a site of up to 23 ha at the Neckar shore in the inner Handelshafen are designated as location of a new container terminal. Sites for container related logistic should be near to the terminal. Extent and location of land availabilities in the Handelshafen area depend on the choice of the container terminal. The scenarios consider these availabilities for development of container logistics. As potential sites in this area are insufficient to satisfy land requirements, a site of approximately 90 ha land located on the Friesenheimer Insel not far from the Handelshafen port area is considered for logistic development in all scenarios. The site is also foreseen to accommodate relocations required due to developments in the Handelshafen. Another area for relocation of port related activities is the Rheinauhafen.



Additional to the port development options, the scenarios consider alternative settings of urban development into the port area. Options differ with respect to extent and foreseen use of sites. The scenarios consider priorities of urban development and illustrate alternatives ranging from a limited extension of urban development to a substantial extension into the Handelshafen. This goes with different levels of port activity relocation and reduction of land potential for port related use. Another dimension for the differentiation of urban development is the envisaged use of sites. This is critical for planning as the implementation of offices, services and in particular housing lead to increased noise restrictions for adjacent port sites. The coexistence of port and urban activity is as far as possible taken into account by the implementation of buffer zones. These zones ensure a distance between conflicting land use and contribute to a soft transition from port to the city.

As a minimum option all scenarios foresee the implementation of offices and services at the southern Verbindungskanal and adjacent commercial use as buffer to the Handelshafen port activity. In other scenarios urban development reaches further into the Handelshafen port area, in particular in the western part of the Mühlauhafen located at the river Rhine and at the northern shore of the Verbindungskanal.

Next step: Evaluation of scenarios

The scenarios will be evaluated based on criteria reflecting port and urban interest. The objective is to identify a preferred structure of land use in the port area. This scenario will be the focus of the Master Plan Port.City.Mannheim 2035+ elaboration. The criteria include:

- Compliance with port objectives
- Compliance with city objectives
- Traffic
- Restrictions for implementation
- Flexibility of planning
- Conflicting land interests / Risk of realisation
- Investment

The selection of the preferred scenario will be based on a qualitative evaluation of the criteria. An assessment of the feasibility of the preferred scenario considering regional economic impacts and investment in monetary terms is scheduled for the Master Plan preparation.