

INTERREG IVB NWE PROJECT CODE24

Action 16: Inland ports development

Final report

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1. Project partners involved in Action 16

- Verband Region Rhein-Neckar (LP – lead partner CODE24)
- Port of Rotterdam Authority (PP2)
- ETH Zürich (PP4)
- STADT MANNHEIM² / Port of Mannheim (PP8 – Action 16 leader)
- Utrecht University (PP14)
- Port of Strasbourg (PP18)

2. Introduction and key objectives Action 16

Action 16, '*Inland ports development*', is one of the additional actions which was granted under the project extension of the INTERREG IVB NWE project CODE24. This action was the result of a call within the existing project consortium of CODE24 to have a more detailed insight into the potentials for future development of the nodes and networks between maritime and inland port systems along the corridor. In our view, the shortage of areas available for further expansion of the traditional maritime ports asks for innovative solutions in order to connect them to other water-based terminals in their catchment areas, influencing in the process also the internal spatial configuration of the nodes in the inland port system itself. This process, that is already on-going on a local initiative basis, could profit from a more coordinated strategy and a comprehensive survey of the available opportunities.

The aim of Action 16 is therefore to explore the internal and external opportunities and hindrances to inland ports development along the corridor. We are interested in which challenges can be foreseen for the future of inland ports, and how these can be met. We try to estimate what benefits in terms of a more efficient and environmentally friendly transport system could derive from the implementation of a coordinated strategy and a comprehensive survey of the available opportunities for future development of the networks between maritime and inland ports systems along the corridor. In order to explore this, we use the results from other CODE24 Actions as a starting point (e.g. the results regarding logistics clusters and spatial and infrastructural developments along the corridor from Actions in Work Package 1 and 3).

In particular, we aim to present an informed suggestion for a sustainable growth strategy for inland ports along the corridor, balancing ecological, economic and social demands of the stakeholders involved. In other words, how to promote logistics needs of companies and exploit the economic potential of the corridor without limiting the comforts of urban life in the urban regions along the corridor? Of particular interest is the future role of ports and terminals along the corridor, with a specific focus on the embeddedness of these facilities in their regional spatial and environmental contexts. This report shall highlight the importance of inland ports, not only as a player in the field of transportation, but also as a player with important local and regional responsibilities in terms of sustainability (e.g. reducing air pollution, 'green' ambitions, etc.), land development and regional economic growth.

A pilot study has been implemented dealing with the challenges inland ports are facing in their future development. This enables to conclude for development strategies respecting general and common constraints of European inland ports. The Master Plan Port of Mannheim serves as a pilot study. It should be noted that the outcomes of this action are thus largely based on the results from the exemplary case of Mannheim (Germany). The analysis of inland port development along the corridor reflects the importance of inland ports in the TEN-T network and promote ports as multi-modal logistic hubs for water navigation as a sustainable and alternative mode of transport. The outcomes are incorporated in the common strategy elaborated by the CODE24 project partnership.

3. Main activities in Action 16

One of the main activities in Action 16 is the development of the case study '*Hafen.Stadt.Mannheim 2035+*'. The study includes: '*Dealing with development constraints – mapping, evaluation, identification of scope*'. The aim of the case study was to determine, illustrate in maps, register and evaluate barriers in the spatial and operational development of inland ports, which are caused by:

- The close embedding in and interconnectedness with urban structures;
- Competing urban development and land use conflicts (e.g. housing);
- Traffic planning constraints;
- Requirements relating to environmental protection (including noise);
- Listed buildings (i.e. heritage protection);
- Technical and safety requirements or constraints.

After the identification, it should be emphasised to what extent these barriers:

- Are to be accepted in practice;
- Include scope within which proactive planning can offer suitable approaches;
- Require pro-active negotiations with stakeholders who already are in the preparation phase of development projects;
- Would be in principle acceptable, but at high costs.

The coordination with relevant regulatory authorities at the municipal, district and regional level plays a significant role in evaluating the barriers. These aspects have to be considered for the development prospects of the Master Plan.

Next to the extensive pilot action in Mannheim, some preliminary cases studies were undertaken in other countries as well. Interest focused mostly on inland ports development cases in the Netherlands (evaluation of the spatial policy of eight inland ports), Germany (exchange of experience Köln and Düsseldorf/Neuss), Switzerland (in-depth case study of Basel-Nord) and France (exchange of experience Strasbourg). The findings of these cases are collected in a case study catalogue on inland ports along the corridor (see Annex). These findings can be used to develop scenarios for the future role of inland ports.

4. Outcomes of Action 16

In recent years, inland ports have received a steadily increasing stream of attention, likely as a result of the increasing focus on multimodality and transnational corridor development. It is argued that the land-side of seaports is becoming more important as a port selection factor, as hinterlands have become more complex and overlapping. As a result, inland ports have an important role as active nodes in shaping the transportation chain within largely static corridors. Of special interest are the challenges that exist between inland ports and their urban surroundings at the local and regional levels.

Inland ports along the corridor thus are facing several challenges related to port and urban development. However, space problems or restrictions regarding time, noise or dust are the biggest problems today. Even after the economic crisis it is expected that especially container traffic along the Rhine corridor will increase significantly in the next decade. To handle the expected volumes in the ports, sufficient handling and logistic space in the ports is needed. On the other hand, cities more and more intend to restructure port areas to high quality waterside office or even apartment districts. Subsequently it is not only too little development space, but also a reduction of existing port handling space that limits the development of the port.

In the next section, the results from the Mannheim pilot study are extensively discussed to reflect the difficult trade-off between port and urban functions in inland ports development. This description of the pilot study is a reflection of the work done by the German private consultancy group 'Drees & Sommer', who cooperated with the Port of Mannheim on the Master Plan. The following thus is a reflection of the content of the outcomes as was published in one of their progress reports.

The case of Mannheim: Hafen.Stadt.Mannheim 2035+

Within the Mannheim case study, a compromise between port and city development is envisaged. In a first step a methodology for an assessment of the adequacy of space for port handling and logistics activities has been developed. On this basis an inventory of used space in the port and an evaluation of potential development space has been carried out. This section highlights the main findings of the pilot study.

Balance of port and 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 analysis Port of Mannheim

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. Port related site use is classified in waterside container and 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.

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 Port of Mannheim

The site potential 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 Industriebahnhof, 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 long-term 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.

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 Port of Mannheim

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 steps: 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 and city objectives, restrictions for implementation, flexibility of planning, conflicting land interests, risks of realisation and investments. 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. This goes beyond the scope of this final report.

5. Summary and outlook

This report has outlined the results of the work done in the INTERREG IVB NWE project CODE24 with regard to Action 16, "Inland ports development". The report has focused on inland ports development processes in Europe and has presented a detailed insight into the case study of Mannheim. The broader scientific viewpoint on inland ports development together with insights into other actions and work packages brought a wider perspective of the whole corridor and its logistic features into Action 16. The output of the case study of Mannheim can be seen as an in depth analysis of how hindrances in conflicting land use in inland ports areas can be overtaken.

At the time of writing, the scenarios as were drawn up in the Mannheim case study, are being evaluated. The design of alternative scenarios, which illustrate an anticipated use of port sites, facilitates the decision for a preferred setting of land use in the port area. The alternative scenarios stress port and urban development measures and show different aims. The evaluation of alternative scenarios will lead to a preferred land use structure in the port area. Evaluation criteria consider interests of port and urban development and can easily be transferred to other inland ports cases and land use competitions. The involvement of stakeholders from port and city further strengthens the commitment to the selected scenario.

The results of this Action might be interested for other inland ports along corridors in Europe dealing with conflicting port and urban functions. The results might also be interesting to mirror to similar developments in the case of road and/or rail terminals, in stead of inland waterways. Finally, from a governance perspective, it is interesting to pay attention to differences in legal and institutional structures between inland ports (e.g. port vs. municipal land ownership) and the implications this might have for governing inland ports.

Annex: Case study catalogue Action 16

Dutch spatial policy on inland ports: eight case studies in the Netherlands

Inland ports have been put forward as crucial linkages for efficient global freight transport and corridor development. However, the relation between port and urban development are not undisputed. In this research project, the goal is to apply the concept of port-city challenges to inland ports. The results of an institutional analysis of Dutch case study evidence show that challenges facing inland ports and cities take many forms but that all share a commonality in the trade-offs between positive and negative externalities. Different governance strategies in coping with these trade-offs are observed and it was found that a pro-active stance towards zoning contributes to efficiently accommodating mutually exclusive dimensions of inland port development.

Further reading:

- Witte, P. (2015 – forthcoming), Kiezen of delen: het belang van multi-level governance voor de ruimtelijke strategieën van Nederlandse binnenhavens. Tijdschrift Vervoerswetenschap
- Witte, P., Wiegmans, B., Oort, F. van & T. Spit (2014), Governing inland ports: A multi-dimensional approach to addressing inland port-city challenges in European transport corridors. Journal of Transport Geography 36, pp. 42-52
- Witte, P. (2014), The Corridor Chronicles: Integrated perspectives on European corridor development. Delft: Eburon Academic Publishers

Challenges for Swiss inland ports: in-depth examination of Basel-Nord

The growth ambitions of the Port of Rotterdam pose many challenges for inland ports along the Rotterdam-Genoa (Rhine-Alpine) corridor. As a response, many inland ports are preparing tri-modal expansion projects. By doing so, inland ports are becoming important players, for expanding inland ports might trigger regional-economic growth. These expansions, however, might also impact on urban life in cities adjacent to the inland ports. On the other hand, inland ports development offers new opportunities to urban development as well. This case study reports on the findings of an in-depth case study in Basel-Nord (Port of Kleinhüningen), in which the relation between port and urban development is at the centre of attention as well.

Further reading:

- Braun, C. (2014), Zwischen logistischen Anforderungen und potenzieller Stadtentwicklung im Hafen Basel Nord. Exposé MAS-Programm in Raumplanung 2013-2015, ETH Zürich

Exchange of experiences: an international comparison of five case studies

A workshop was organised involving representatives from five cities and ports in Germany, France and Switzerland to discuss and to exchange experiences regarding existing conflicts, possible solutions and their implementation as well as possible difficulties because of different development interests of port and city. The transnational exchange of experience with the Ports of Basel, Strasburg, Mannheim and Düsseldorf/Neuss together with the cities of Mannheim, Basel and Neuss added further information of possible solutions for development which could be implemented into the case study.

Further reading:

- Rausch, M. (2015 – forthcoming), Inland ports and urban development. In: Drewello, H. & B. Scholl (eds.), Integrated Spatial and Transport Infrastructure Development. The Case of the European North-South Corridor Rotterdam-Genoa. Springer Contributions to Economics (in press)