KILBRIDE | GROUP

Institute for Sustainability

LO·PINOD
LOGISTICS OPTIMISATION FOR PORTS

Port Development Strategy

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The Interreg IVB North Sea Region Programme
Investing in the future by working together for a sustainable and competitive region

European Regional Development Fund
Investing in your future

www.lopinod.eu

Contents

This strategy has been funded by the North Sea Region programme, part of the EU Inter-regional (INTERREG) initiative, LO-PINOD aims to challenge existing thinking on freight distribution and offer more sustainable alternatives. For more information visit www.lopinod.eu

1.0 Executive summary

1.1 Small and medium sized ports in the North Sea Region face different challenges to larger ports, whilst competing with larger well-funded infrastructure and port groups.

1.2 This report highlights some of the key issues faced by these small to medium sized regional ports in developing the economic hinterland to the port area, concentrating on intermodal transport infrastructure to unlock development potential. The report is a key output of the LO-PINOD project under work package 3.2.

1.3 Drawing on the transnational experiences of these ports, a port development strategy has been highlighted by the LO-PINOD partners to help future port projects in this sector and the following recommendations are made by the partners.

1.4 The aim is for these recommendations to be taken up by future port projects, EU legislators and representative bodies and regional and national planning bodies, in order to provide the support necessary for regional ports as they develop their economic hinterlands.

1.5 **Planning** support from local, national and EU bodies is essential to deliver any infrastructure project. Approvals for port area developments could be simplified allowing ports to deliver development if the project is in line with medium term planning policy documents. Multiple layers of approval could thereby be removed for rail, road and water infrastructure.

1.6 **Design** processes for new infrastructure at ports need to take account of the flow of goods within port areas, minimising potential areas of conflict. Clearly established design processes can reduce the conflicts of moving different types of products around ports across a variety of infrastructure.

1.7 **Electrification** of rail infrastructure can significantly reduce rail haulage costs but needs to be designed carefully within port areas.

1.8 **Funding** can be secured through the private sector and other sources but in all cases smaller and medium sized ports need to be able to prove security of the customer contracts for the movement of goods. Larger ports can secure funding without full traffic commitments based on the general throughput of the port, but smaller and medium sized are not able to do so, creating a significant constraint.

1.9 **Flexibility:** Small and medium sized ports are more flexible than some of their rivals and can take advantage quickly of changes in the market.

1.10 **EU programmes** can provide essential support for small and medium sized ports in order to fund areas of activities and foster closer co-operation between ports.

2.0 LO-PINOD project

2.1 LO-PINOD (Logistics Optimisation for Ports Intermodality: Network, Opportunities, Development) aims to challenge existing thinking on freight distribution and offer more sustainable and efficient alternatives. By improving short-sea routes, local ports and their inland connections, LO-PINOD activity is designed to encourage more freight to be distributed by sea. This can help reduce over-reliance on road transport, lessen the environmental impact of supply chains and deliver social and economic benefits to communities and businesses across the North Sea region.

2.2 Globalisation and an increasing demand for goods and commodities have led to a growing requirement for freight transport in Europe. Freight movement by road is causing congestion on the main transport routes and around the larger hub ports, increasing the need to review how freight can be moved more efficiently and sustainably.

2.3 LO-PINOD partners will focus on improving accessibility to more isolated regions, lessening the environmental impact of freight transport and spreading growth and opportunity outside of the major port hub areas of the North Sea Region. Diversifying into new business areas will ensure local ports remain competitive and relevant. Exploring new opportunities and investing in upgrading port infrastructure is crucial to help increase maritime and logistics activities.

2.4 As part of the LO-PINOD project, with a focus on increased accessibility of ports, Kilbride has worked with Institute for Sustainability and port partners to draw together their experience of port development and sustainable freight distribution. Through transnational meetings, workshops, collaborations and networking Kilbride have identified the key issues and challenges faced by regional ports. This Port Development Strategy proposes a roadmap for regional ports to increase their accessibility and develop multi modal connections, based on the experience and lessons learned from LO-PINOD partners.

3.0 Port Distribution Strategy Introduction

3.1 The North Sea Region economy relies on efficient and resilient market access. To support this it is crucial to develop multi-modal transport corridors and links to the maritime transport network. Regional ports are a vital component of this comprehensive transport network, supporting the role of the core TEN-T network by providing additional regional capacity that can quickly respond to business and market needs.

3.2 Regional ports from around the North Sea have been collaborating, pooling their knowledge and sharing their experiences of planning, developing and extending the multi-modal capacity and accessibility of their ports as part of the NSR Interreg IVB project LO-PINOD.

3.3 The port partners have met regularly during the course of the project (December 2010 to December 2014). There has been targeted discussion between partners as part of the agenda of meetings, technical workshop sessions and bilateral follow up and staff exchanges led by Kilbride, a UK specialist in transport infrastructure planning and development.

3.4 Kilbride and Institute for Sustainability, an independent UK charity that supports cross sector collaborations and innovation and lead partner of the LO-PINOD project, now present the transnational experiences and baseline of current status and lessons learned. These have been used to formulate the strategy and recommendations that follow as part of this Port Development Strategy.

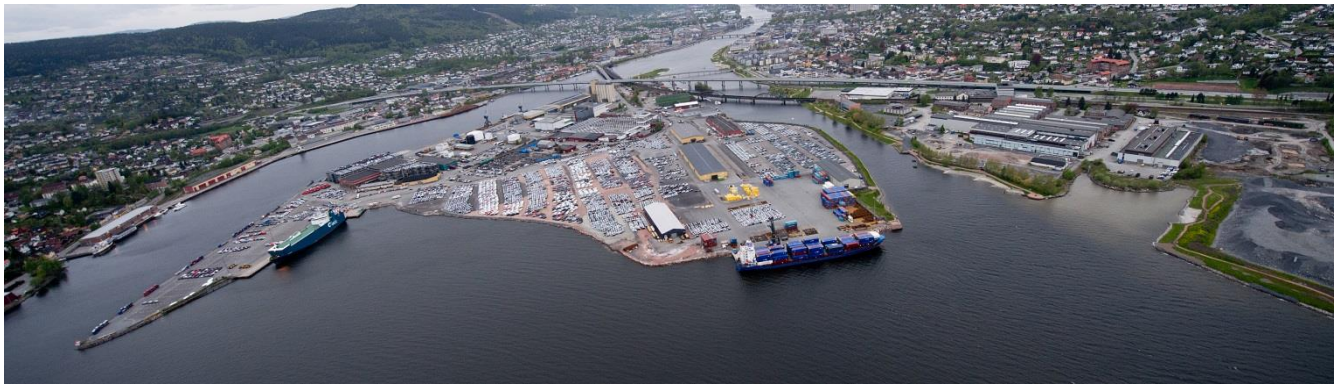
4.0 Baseline Port experiences

Port of Drammen

Introduction

4.1 The Port of Drammen sits on an island in the centre of the estuary surrounded on both banks by the town. The topography of the land on the banks of each estuary means that the port is overlooked on the south bank by a significant residential area (Figure 1).

Figure 1 *The Port of Drammen*



4.2 The rail and road infrastructure accessing the Port of Drammen is constrained by these physical characteristics in that road and rail access has to be via the existing large scale bridge accesses, which has limited capacity.

Challenge

4.3 The port has been looking at how the rail and quayside infrastructure could be expanded to meet the demands of future port activities within these constraints and those of the port itself.

4.4 Any expansion of the port activities would require land reclamation from the fjord access to the sea.

4.5 For these reasons the Port of Drammen started a design process to identify the best options for expansion.

4.6 Master planning advisers were engaged to look at the individual traffic types in the port and the best way to expand each activity. The port concentrates mainly on the transportation of cars, containers, large scale agricultural equipment and bulk product with each having its own loading and unloading requirements within the port area.

4.7 Zones were identified for the handling, storage and reception of each product type over the quay and then rail and road infrastructure was overlaid on top.

4.8 Although each product handling area could be kept separate it was clear that the rail and road access would prove more challenging as access routes cut through other handling areas and caused potential operational conflicts.

4.9 The port had to also bear in mind the proximity of the town's residential area and the impact the expansion of the port activities could have on that area. The planning design process has involved

the proposal to develop a large timber log fencing barrier along the southern port boundary to the town with acting as an acoustic and visual shield from the port.

Design

4.10 The Port of Drammen engaged with the national Norwegian rail provider, Jernbaneveket, to design the rail infrastructure improvements and to discuss financing of these improvements. This process has resulted in completion of a feasibility study, reviewed and validated by LO-PINOD project partners to identify improvements and draw out principles that could be applied to other projects.

4.11 Part of the project involves relocating the rail freight terminals from the centre of Drammen into the port areas in order to free up development land in Drammen and to simplify the shunting process within the town's rail infrastructure. At present the rail freight trains are shunted into the port area in sections taking up valuable slots on the rail network, which are in demand from passenger trains.

4.12 As a result of the port design process Figure 2 sets out the master plan:-

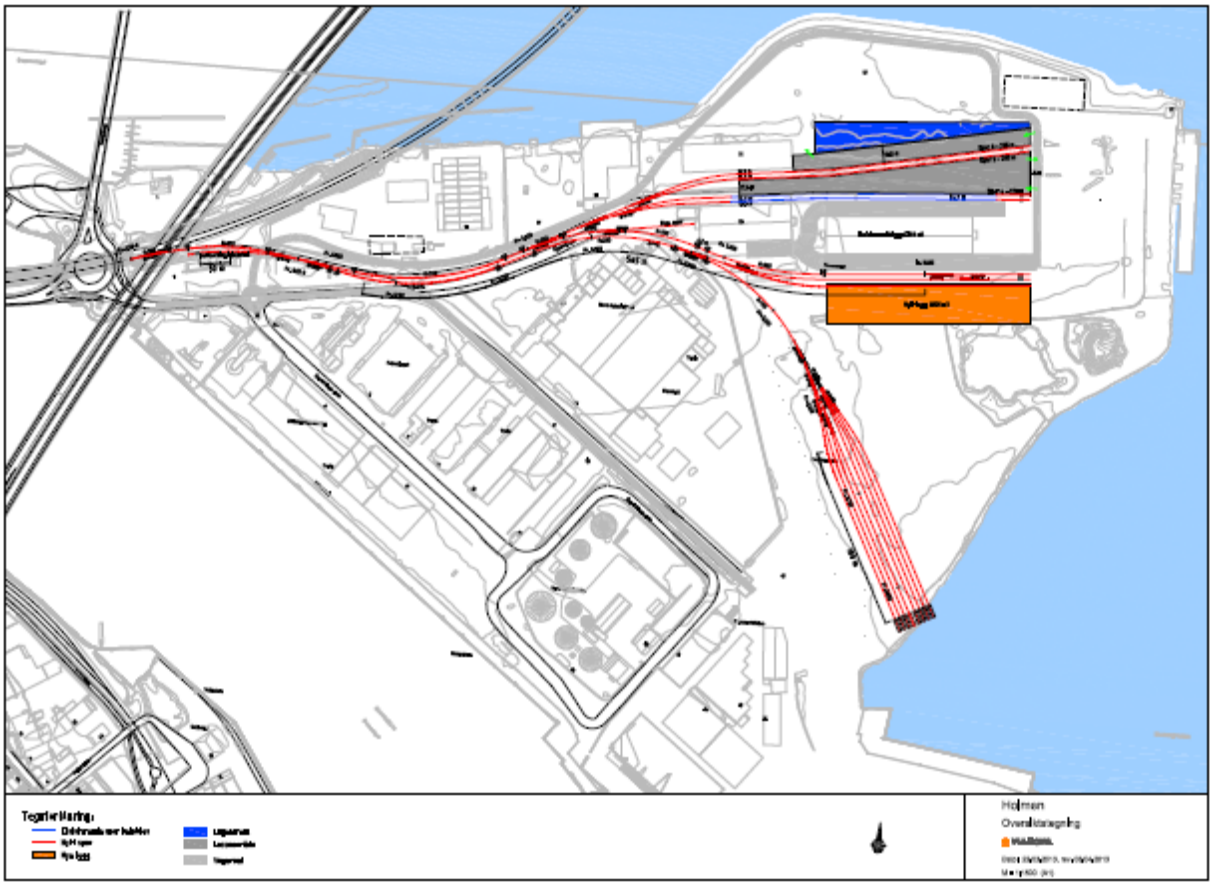


Figure 2 *Port of Drammen draft master plan*

Lessons learned

4.13 In the master plan (Figure 2) it can be clearly seen that the car rail operations located in the southern part of the port (red) have been separated out from the container operations to the northern part (Blue and orange).

4.14 This separates out the handling processes avoiding conflicts between cars moving from the quay to the rail and the car storage areas and the reach stacker movements with containers in the container handling terminal as it moves between the quayside and the container storage area.

4.15 In between these two rail terminals sits the bulk goods terminal with access to the warehousing for break bulk handling operations within the customs zone.

4.16 The handling of larger agricultural equipment can be carried out still on the quay side next to the car storage facility.

4.17 A review of the car storage facilities in other EU ports was provided by Kilbride using the port of Southampton as the example, where significant car export operations take place using rail and sea infrastructure.

4.18 Funding for the rail infrastructure was discussed with Jernbaneveket and proposals put forward to their board to fund the infrastructure in return for a levy on each train passing through the port. This example has been used by Kilbride in its discussions with potential funders as well. The rail industry in Norway will achieve significant operational savings from the freeing up of additional passenger train paths, helping their overall funding proposal.

Port of Esbjerg

Introduction

4.19 Located on the west coast of Denmark facing the UK, Norway, the Faroe Islands, Iceland and Greenland as well as the Western part of continental Europe, the Port of Esbjerg (Figure 3) is the international port of Western Denmark. Due to the port's efficient hinterland connections, Sweden and the Baltic countries are also within easy reach. Over the years, the Port of Esbjerg has demonstrated firm determination to further develop the port's infrastructure and its capability of attracting new liner services. All in all, this makes the Port of Esbjerg a dynamic hub for cargo flows between the Nordic countries, the Baltic area and Europe.

4.20 In addition, the Port of Esbjerg serves the oil and gas industry as well as the ever-growing offshore wind farm industry in the North Sea. Since the start of the Danish offshore activities in the North Sea, the Port of Esbjerg has established a unique position as one of the world's leading ports for the provision of offshore services and support. Currently, 80 per cent of the Danish offshore industry is based in Esbjerg.

4.21 In Norway, Sweden and Finland rail transport has experienced a revival. This may be due to the electrification of the railway system many years ago. This has caused easier and cheaper access to equipment. In addition, the long distances and the large volumes have been important factors.

Challenge

4.22 With more than 100,000 units per year, Port of Esbjerg is the largest handler of ro/ro units in Denmark, however, the port does not have a suitable rail connection.

4.23 Most of these units are destined to locations outside the region of Esbjerg. A substantial part is going to Zealand, thereby travelling a long distance by road and crossing the Great Belt Bridge. Both the distance and the costs connected with this crossing make it reasonable to make a switch towards a rail-based solution.

Figure 3 *Port of Esbjerg*

4.24 The interested parties estimate the demand to be between 10,000 and 20,000 units (primarily semi-trailers) per year. The largest part (estimated 90-100%) is goods to the metropolitan area of Copenhagen via the terminal in Høje Taastrup.

4.25 A rail system handling 10,000 to 15,000 units (trailers and containers) serviced by one or more traction companies therefore should be an essential part of the port's planning.

Design

4.26 The work in LO-PINOD has focussed on the potential for developing a rail-connected terminal in the port area close to the port's new facilities. Terminal design takes into account the opportunities which the electrification of the main railway to Esbjerg (planned for 2015) will entail as well as a master plan for the enhanced port (Figure 4).

4.27 The first stage of the terminal will be connected to the existing rail systems in the western part of the port with a crossing at Taurusvej. The first stage must also be designed so that, without major conversion, it is possible to construct a second phase of the terminal with train service from the east via a new and electrified freight track.

4.28 The infrastructure linking the port to the main line was less than perfect, imposing a change of traction from an electrical main line locomotive to a diesel shunting locomotive. Even though this imposes some restrictions on the flexibility of the service, a new setup in the intermodal terminal will surely help solve these problems. One possible traction company has indicated that they will stick to the use of diesel locomotives all along, thereby eliminating the necessity to change traction.

4.29 In 2012 Banedanmark investigated various solutions for a new track for freight trains to the Port of Esbjerg. The investigation is described in "Programfaserapport – Nyt godsspor til Esbjerg Havn" prepared by Niras. On 21st March 2013 the Danish Parliament decided to renew the existing track from Esbjerg Station to the Port of Esbjerg and to establish a new intermodal terminal with two new tracks for freight trains with a length of 450 m.

4.30 Phase 1 is the phase which is decided by the Danish Parliament. The rail line will be electrified to Esbjerg Station and from there on it will be necessary to use a diesel shunting locomotive to and from the new intermodal terminal in the port between Esbjerg Station and Taurusvej.

4.31 Phase 2 is in principle the same solution as phase 1, but with the capacity extended for the loading area with two new tracks east of Taurusvej. 2, show the new loading area with a length of 750 m.

Lessons learned

4.32 The experiences have highlighted the following:-

- Potential difficulties were experienced in getting access to data from freight transport companies, to assessing rail freight quantum, due to the level of competition between the companies.
- Access to equipment, e.g. pocket wagons to semi-trailers, is an issue causing challenges for rail transportation.
- A further challenge is shortage of elevation trailers and to some extent the lack of electrification of the Danish railway system.
- An electrified main track to Esbjerg would facilitate further traffic in a combination of sea and rail transport via Esbjerg.
- Generally, closer co-operation between the port, rail companies and freight providers is needed, including solutions for attracting new customers. It is of the utmost importance that the transport buyers are aware of the rail solutions matching or almost matching of the level of service provided by a lorry.
- The quality must include cost, frequency, flexibility and security of supply, the latter in the shape of a number of transport suppliers delivering homogeneous services.

Recommendations

4.33 The studies and exchange of experiences have led to the following conclusions on how best to develop the multimodal transport access to the port.

4.34 The rail line will still be electrified to Esbjerg Station and from there on it will be necessary to use a diesel shunting locomotive to and from the two intermodal terminals in the port initially. The crossing of Taurusvej is in phase 2 a level crossing.

4.35 Phase 2a is an extension of phase 2 foresees the establishing of a new electrified rail line for freight trains from Tjæreborg to the eastern part of the port. Then the electrified locomotive can drive to

the new receiving yard east of the terminal established in phase 2. It will then only be necessary to use a diesel shunting locomotive to and from the receiving yard to the loading zone.

4.36 The loading area in phase 2 and 2a is the same. It is only the train access which has been changed. The access by lorry to the loading area is both in phase 2 and 2a to take place from Taurusvej.

4.37 In phase 2a there will be no need for the rail connection from Esbjerg Port to Esbjerg Station, and the stretch can in principle be shut down or be maintained as an alternative route. Below is a plan showing the proposed final development of the port area including the new intermodal rail terminal.

4.38 The proposed layout separates the rail terminal area from the quayside activities thereby keeping control of the internal traffic movements and avoiding operational conflicts through the use of the internal road structure. Commercial and employment practices do vary between Member States but in some instances the use of the port's stevedoring companies for rail operations may result in more cost effective and efficient operations.

Figure 4 *Layout of proposed Port of Esbjerg rail and port infrastructure.*

Ridham Docks

Introduction

4.39 Ridham Docks is located in Kent, Southeast England and sits next to the site of a former paper plant which has been demolished and is now being redeveloped. The dock's activities are concentrated on a small scale short sea shipping operation and a number of aggregate, minerals, construction and energy based activities. The former paper plant has been partly redeveloped to provide a development platform for new logistics warehousing. The first user of part of this area is Morrisons retail logistics division, which has built a 1m square foot (approx. 89,000 square meters) regional distribution centre. The port hinterland has the following tenants who are potential rail customers:

- Knauf plasterboard manufacturer
- Morrisons RDC
- DS Smith/St Regis waste paper recycling
- Various logistics operations
- Tarmac Aggregates
- Brett Aggregates
- Morgan Sindall Construction
- EMR recycling
- SITA recycling

Challenge

4.40 The tenants of Ridham Docks, the port hinterland and the product coming over the quay side, are all traditional potential rail users and represent a significant target market for new rail operations. In order to open any rail terminal in the Sittingbourne/Ridham Docks area it will be necessary to reinstate the joint access line that runs from the mainline rail connection to the dock area(Figure 5).

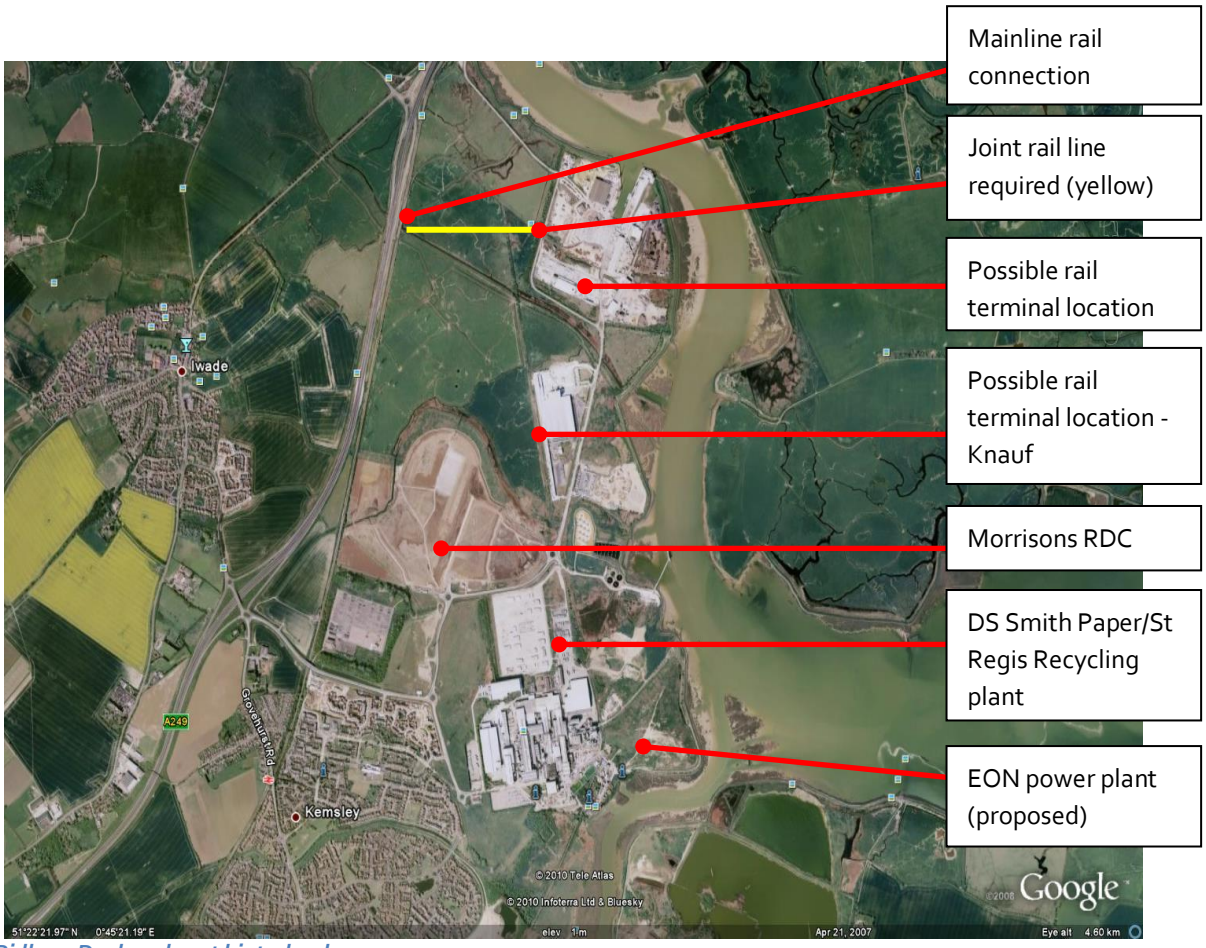


Figure 5 *Ridham Dock and port hinterland area*

Design

4.41 Kilbride has been developing rail designs for the common infrastructure and individual terminals and has been helping various commercial interests to secure the necessary rail traffic to make the reinstatement of the rail a viable financial proposition.

4.42 The key events in this process have been:

- Kilbride secured an exclusivity agreement with Morrisons to then deliver the rail freight terminal to serve its Sittingbourne Regional Distribution Centre. (Development project).
- Kilbride secured the support in principle of a private sector investor to fund the development of a rail terminal at Sittingbourne.
- Kilbride secured the support in principle of Network Rail, to fund the common infrastructure costs to reinstate the access rail line for all potential users.
- Kilbride assisted EON/Wheelabrator in securing planning permission for the development of a new rail terminal inside Ridham Docks.

- Kilbride reviewed and designed a scheme to provide a rail terminal in Ridham Docks on the land controlled by Brett Aggregates.

- Kilbride negotiated the terms for the purchase of the necessary common rail infrastructure land.

- The necessary ecological studies and approvals were carried out and applied for from the statutory UK authorities, as the projects lies within a SSSI bird sanctuary.

4.43 Kilbride have developed commercial negotiations with the following tenants to seek to secure the necessary rail traffic to make the investment viable:

- Knauf
- Brett Aggregate
- Ridham Sea Terminals
- Morrisons

4.44 At the time of writing this report the commercial commitment to the rail traffic was not yet secured..

4.45 There are three potential locations for the rail terminal:

- To the rear of Knauf
- Alongside sections A1, C A2 on the enclosed RPS plan (Ridham Coldharbour Rail Figure 2).
- Within Ridham Docks

Recommendations

4.46 Kilbride's preference is to locate the rail terminal to the rear of Knauf unless commercial agreements can be put in place to locate within Ridham docks and therefore share facilities. Until a solution in Ridham becomes available the Knauf location will need to be pursued.

4.47 Kilbride will continue to seek to facilitate the development/refurbishment of the common rail infrastructure (marked in yellow).

Lessons learned

4.48 It has been noticeable that in common with a number of other LO-PINOD partners the following points have been noted:-

- Private sector funders will only support the funding of new rail infrastructure if there are sufficient commercial agreements in place to guarantee a defined return. No speculative funding is available.

- The national rail infrastructure company, Network Rail, is best placed to take a longer term view of the potential of the rail market at Sittingbourne and yet still requires some degree of certainty over traffic commitments.

- The number of commercial interests at Ridham/Sittingbourne make any agreement on the best way to implement rail improvements very difficult.

- Planning processes for the rail terminal have been assisted by recent UK planning policy changes, but have not removed the need to comply with significant ecological considerations around the port area and third party approvals.

- The number of organisations from whom permissions are needed is numerous, which delays delivery and increases risk.

- Limited availability of land within the port area due to quayside and tenant activities has caused significant constraints on options available to the delivery of a new rail terminal.

- Operational conflicts within the port area make the design of the rail terminal difficult and commercial rights of each individual tenant have brought additional complications.

Port of Oostende

Introduction

4.49 In the LO-PINOD application the Port of Oostende was listed as a potential material investment. The proposal was for an additional rail terminal access to be developed targeted at a specific new rail requirement moving goods to Italy.

Design

4.50 The design of a new rail access to the port was carried out with the help of the national Belgian railway company and a final specification agreed, which would enhance the rail capacity of the Port of Oostende (Figure 6, Figure 7).

4.51 The delivery phase of the material investment however, saw protracted delays by the rail company and resulted in the supply of the wrong rail lines for the terminal. Despite considerable efforts by the Port of Oostende the Belgian Rail Company could not source the correct rail lines and so the project had to be put on hold.

Lessons learned

4.52 The experience of Oostende has highlighted some of the difficulties in dealing with national rail companies and has resulted in the material investment being scaled back to preparatory works only, as part of the LO-PINOD Refresh application.

4.53 There have been a number of important lessons learned from this process, which other partners of the LO-PINOD project have noted in their dealings with rail companies and the delivery of projects, in particular:-

- The ability of the rail company management to control the delivery of the end project has not been optimal.

- The approval process for completion of designs and for making decisions within the rail companies has been difficult to follow and the communication with their client has not been of the expected standard.

- The ability of the port to order and deliver its own rail infrastructure through private sector organisations has not been possible due to the control of the Belgian rail company over assets it will use at a later date. In the shipping sector independent organisations are able to approve ship designs, port infrastructure and handling equipment for a variety of international bodies within reasonable timescales, improving the competiveness of the industry. In the rail sector the Belgian Railway exerts so much control over the approval of new infrastructure that it is not possible to choose a private sector delivery route for new rail terminals or connections. An independent certification method for rail works should be possible.

- The port found they were in the end competing with many Belgian rail schemes for the funding, rather than just looking at the case for the Port of Oostende. Support for funding would be a helpful tool in the delivery of new rail infrastructure.

- The Port of Oostende found that it had to seek approval from the following bodies for the same piece of infrastructure, which proved an obstacle to delivery: City of Oostende, the town planning department, Belgian Railways, the inland waterway body. The construction of a new bridge required approvals from all these organisations delaying the project by approximately 2-3 years and placing it outside the delivery time of the LO-PINOD project.

- The difficulties experienced may have been those seen by other organisations in the delivery of the last mile infrastructure on logistics projects.

4.54 The case for the expansion of the rail infrastructure at the Port of Oostende probably still exists as the interest in new traffic is still clear, but a more effective delivery mechanism is required for this investment to be taken forward.

4.55 It is possible for a port to deliver its own rail infrastructure through private sector organisations, but it is a project that can take a very long time.

4.56 The rail project that had been presented within the framework of Lopinod, is situated in the outer port, connecting the existing rail infrastructure with the REBO terminal at the Zeewezendok. The building of the rail-bridge over the canal was a second railproject of the port of Oostende, situated within the inner port of the port of Oostende. It has not been part of the proposed investment of the port of Oostende within Lopinod, but the way this project has been finalized, shows the complexity of the management to bring these kind of projects to an operational status.

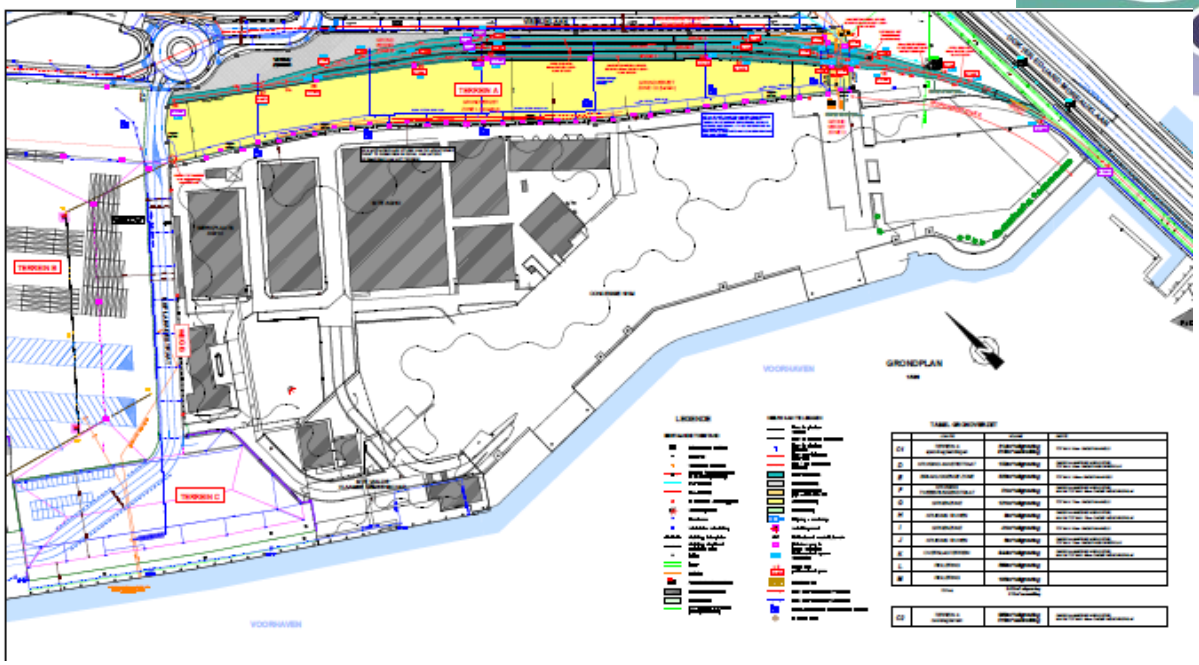


Figure 6 Port of Ostend – Western section

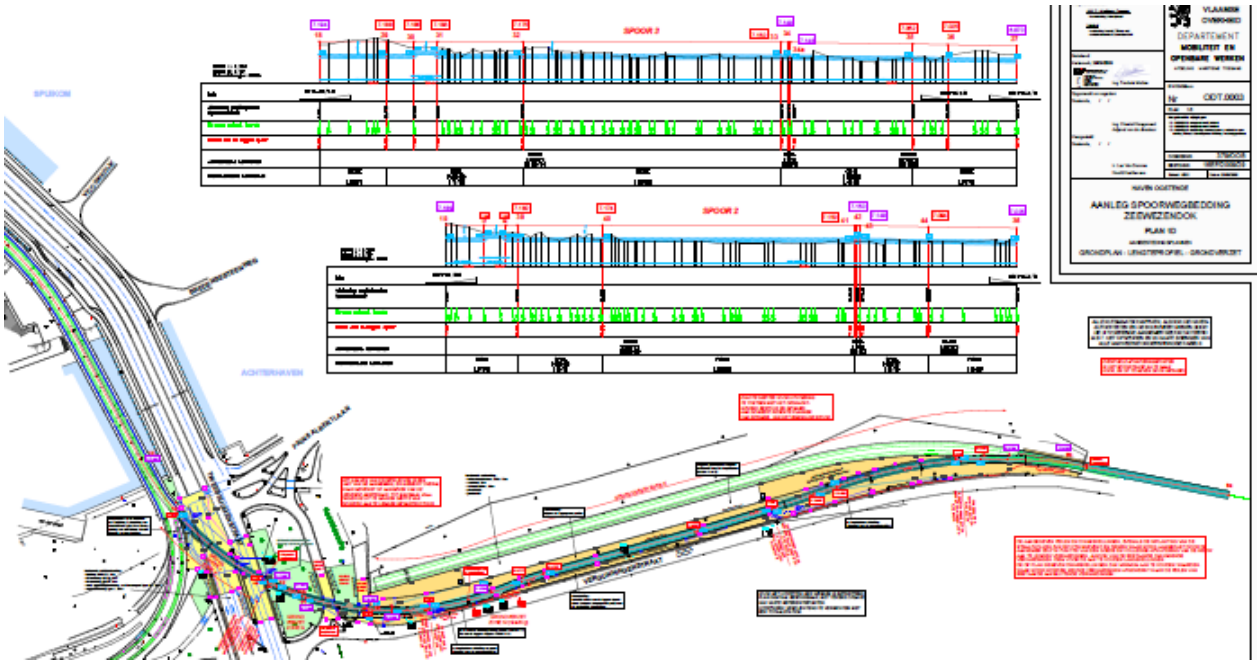


Figure 7 Port of Ostend – eastern section

Port of Sheerness

4.57 Peel Ports have commissioned a rail feasibility study as part of the masterplanning process for the Port of Sheerness, Kent, UK. This will look at the potential for a new enhanced rail terminal at the port, following the withdrawal of the wind turbine project at Sheerness.

Port of Meppel

Introduction

4.58 The Port of Meppel and District of Drenthe carried out a study into the development of a Low Carbon Harbour Plan for the Port of Meppel. A copy of the report is attached to the final report.

Challenge

4.59 The report highlights the key areas that ports can address in order to reduce its carbon footprint, which can be used by other ports in addressing this topic.

Lessons learned

4.60 The report highlights how the following areas can be approached by planning and port authorities:-

a. Use of the Trias Energetica for energy efficient design and sustainable 3Ps People Planet Profit principles.

b. Solar, Wind, Heat pump, energy management systems, use of hydrogen and other green fuel sources, tidal and wave energy, smart cell, waste water systems were all analysed and recommendations for small port areas highlighted.

c. Awareness of the low carbon issues needed to be highlighted amongst users and tenants of the port, with incentives out in place to adopt new approaches either through the benefits of being lead actors or through financial incentives.

d. A workshop of LO-PINOD partners was held to draw out the experiences of each partner in addressing the low carbon agenda at small and medium sized ports in the North Sea Region, which were used in informing the content of the final report.

e. Policy changes of the port and the district of Drenthe have helped to address the low carbon agenda for the port and were set out in their Low Carbon Harbour plan, together with future action points.

f. The strategic location of the Port of Meppel within the Zwolle-Kampen-Meppel area was set out in the Port Vision Zwolle-Kampen-Meppel report.

g. Use of rainwater systems to recycle this valuable commodity were set out, encouraging greater long term planning from the outset.

2.5

h. The importance of transport around the port area was highlighted including container movements to the road network from the port and employee transportation options.

Harlingen

Introduction

4.61 Harlingen Seaports have excellent rail connections into their port area. They have not needed to develop or improve these, however they have been focused on developing customer base for this and using their connections to attract trans-shippers to the ports.

Challenge

4.62 A large supplier was looking for a new port to direct shipping to and Harlingen developed a business case demonstrating their favourable location due to their rail connections into the port enabling rail and sea shipping route rather than road and shipping. In fact, it was a combination of sea shipping, rail and trucking. The trucking part was a choice of several options. Micro trucking from the Harlingen Railway station to the port (< 1 km) or trucking from the production facility to Harlingen Seaport (25 km) or the competitor option, trucking to port of Leeuwarden (innerport), which was < 4 km.

4.63 Despite the strongly attractive business case put forward for Harlingen by the distribution company the shipping company ultimately chose the neighbouring port of Leeuwarden as their base for operations. Despite cheaper conditions, the supplier company thought the closest port would favour them the most sustainable conditions and they supported the investment in the environmental savings and brought that forward as the reason to choose Leeuwarden over Harlingen.

4.64 What we also know is that political influence was used by the municipality of Leeuwarden (capital city in the region) and likely political motivation on the regional level to favour the innerport of Leeuwarden and find in this case the swift opportunity to upgrade the port of Leeuwarden.

Lessons learned

4.65 Even with a strong business case (financially) to promote sustainable multi-modal transport connections the port was ultimately unable to secure the customer and exert influence over business decisions.

4.66 Is there a case for political influence to encourage sustainable decision making by business? Political influence is and will be used to balance favourable or even unfavourable business cases. Even a favourable business case financially or environmentally will not be straightforward final in making a decision for optimal multi modal transport.

5.0 Transnational experiences

5.1 The LO-PINOD project has provided a neutral platform for dialogue between port partners. This has given the partners with an invaluable ability to seek the experiences of similar small to medium sized ports, organisations and businesses across the North Sea Region. This would not have been possible outside of the transnational partnership, as ports of similar size in one EU state would be unlikely to share commercially sensitive information with national or international competitors.

5.2 The transnational collaborations, within the neutral platform of partnership has been valuable in order to develop this port development strategy.

5.3 It has been possible to compare the roles of national rail operators, planning authorities and port organisations as well as best practice design principles for port developments and funding options.

5.4 The contribution from port partners will unlock investment into port capacity and connectivity in excess of €15m.

5.5 During the project Kilbride will complete at Material Investment in Ridham.

5.6 The validation of the Port Development Strategy, by the LO-PINOD partners will enable other small or medium sized ports in the North Sea Region and beyond learn from experiences

5.7 The Port Development strategy will enable other small and medium sized ports to learn from the experience of LO-PINOD partners. The validation by port partners makes this strategy relevant to the sector and will be tested by planning authorities to assess its value.

6.0 Conclusion and recommendations

The Port Development strategy aims to be a road map for developing ports to successfully integrate multi-modal transport connections. As such the recommendations are broken down into planning, design, funding and procurement, and policy considerations.

Planning context

6.1 The experience of the partners in LO-PINOD in relation to the planning policy area has been that although some ports in the North Sea Region have the support of the local authorities, there is still a multi layered approval process necessary for any new developments even if these are in line with the regional or town's planning policy.

6.2 Some consideration could be given to simplifying the approvals needed from rail, water and planning processes into a more streamlined process with a presumption in favour of development provided projects meet the policy objectives of the planning authorities.

6.3 An example of an improvement in planning policy support for intermodal terminals has been the UK SRFI planning policy guidance and National Policy statement.

6.4 The Port of Meppel and the district of Drenthe have demonstrated how the close co-operation of a port and a planning authority can help to develop policy programmes that benefit the economic and environmental development of a port.

6.5 Existing underused rail lines into port hinterlands should be protected to ensure that they can be made better use of in the future. Preserving existing infrastructure, even if currently underused, is easier and cheaper to upgrade than to completely reinstate in the future.

Design

Interface between rail, port and road infrastructure

6.6 The design and development of new port infrastructure is a complicated process involving not only the obvious associated complexities of individual infrastructure facilities, but complicated by the need to manage the flow of traffic and movement of goods to ensure an efficient port operation.

6.7 It is essential to avoid operational conflicts between flows of traffic over the quayside to road, rail and handling areas as well as the handling equipment use for each type of traffic flow.

6.8 It is necessary to have clearly defined and separated areas of activity and types of infrastructure so that road access is not compromised by for example rail movements to the quayside or the need for handling areas.

6.9 Health and safety is an essential part of the design process for new port infrastructure so that appropriate handling equipment is chosen to minimise the risk of accidents and maximise the efficiency of the port operations.

6.10 Figure 8 layouts below show how operational conflicts can occur if infrastructure is not carefully designed, but in practice the number of movements and different types of products and handling equipment make this design requirement very difficult to achieve (Figure 9).

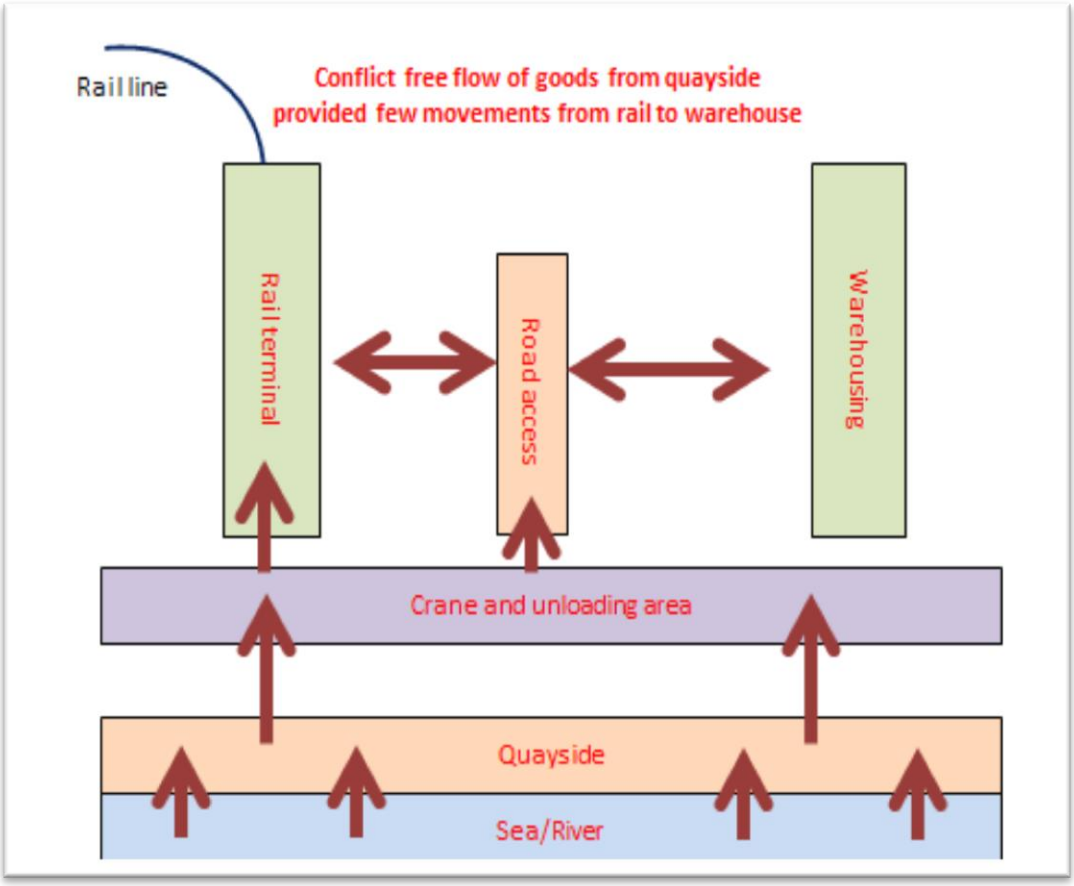


Figure 8 Conflict free port design

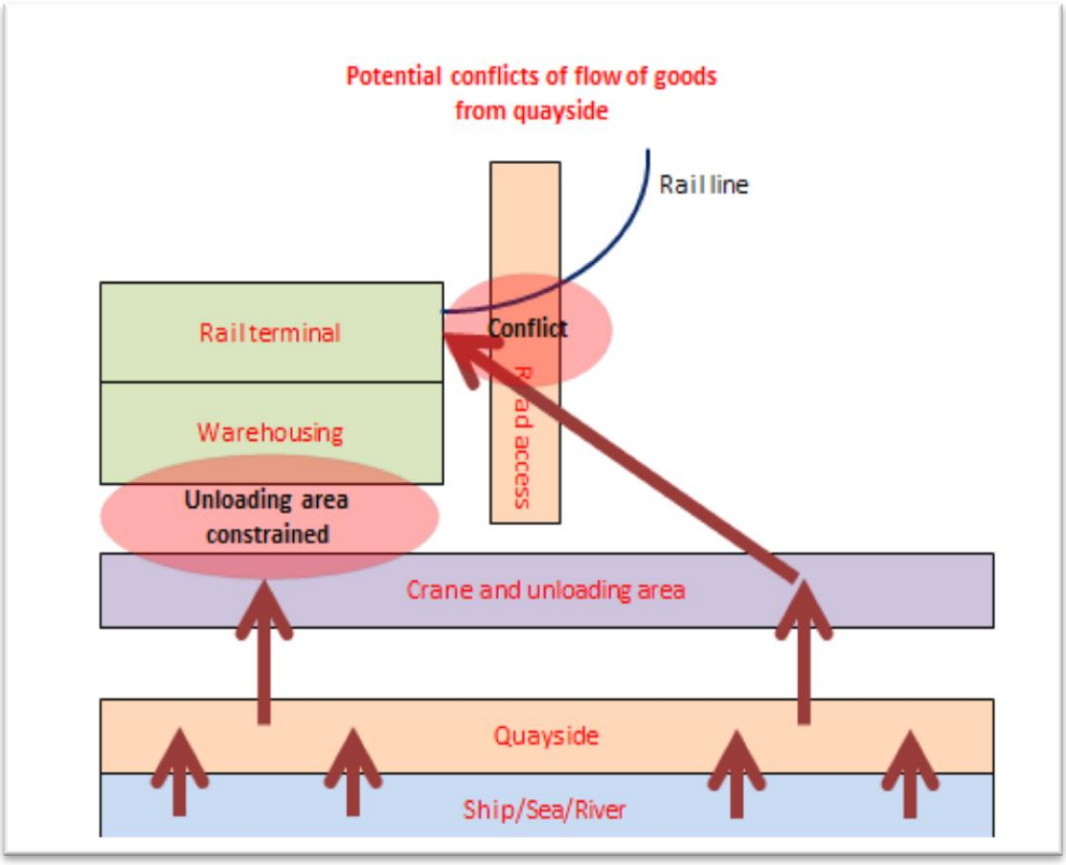


Figure 9 Port design identifying conflict areas

6.11 Port design processes need to identify all potential traffic flows associated and the handling and storage requirements of each flow, prior to designing the layout and detail of intermodal facilities in the port hinterland.

6.12 Below is an example of the practical results of the master planning design process at the Port of Drammen (Figure 10), showing where the points of conflict occurred in the early schemes, which were subsequently removed.

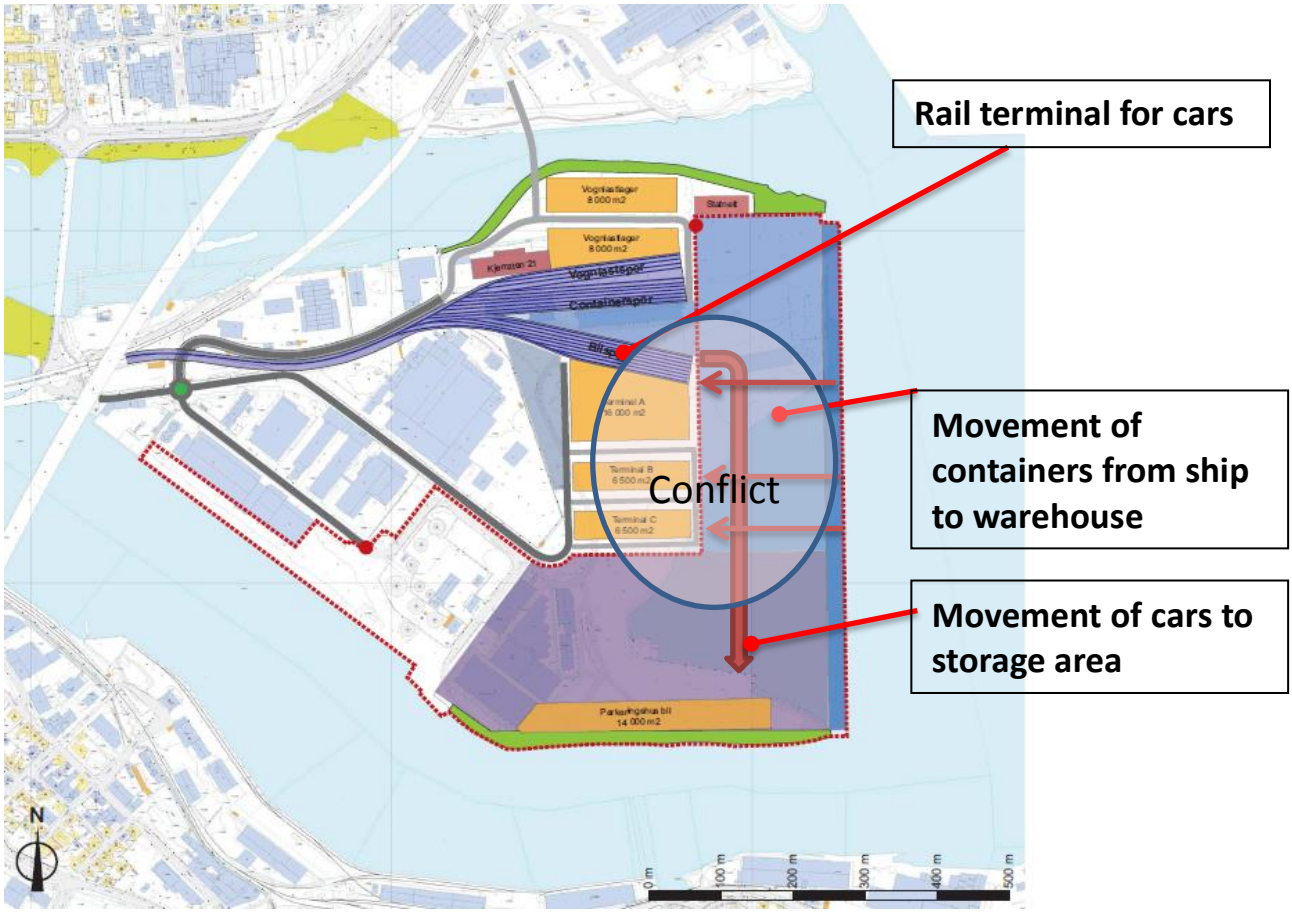


Figure 10 *Port of Drammen draft master plan*

Electrification

6.13 The widening use of electrified rail infrastructure for freight operations can have a positive impact on the cost of rail freight. In developing the wider electrified network and terminals it is important for national rail infrastructure owners to recognise that clear long term policy statements are needed to ensure sufficient notice is given to ports planning new terminals so that the appropriate choice of lifting equipment and layouts can accommodate electrified overheads lines.

6.14 The operation of rail infrastructure inside ports is also often complicated by the need to use diesel locomotive shunters particularly in areas where reach stackers and overhead gantries and cranes operate. Minimising the use of diesel shunters has the benefit of reducing the additional handling

charges and reduces the operational constraints and storage areas needed for the additional locomotives.

6.15 As a principle the use of the mainline locomotive to place rail wagons in the unloading sidings is the preferred option.

Risk profile for smaller regional ports

- Smaller and medium sized ports need the security of clear traffic commitments from end customers in order to be able to finance new investments. This needs to cover both the level of annual tonnages and the period of the commitment if private sector funding is to be secured.

Funding and procurement

Investment resources

6.16 The nature of the infrastructure is inevitably large in scale, be it new quay side areas, intermodal rail terminals or new rail connections. Smaller and medium sized ports do not have the financial resources of the larger port groupings and therefore find the scale of infrastructure investments difficult to fund even if the financial business case is a convincing one. EU programme support for SME port investment would be welcome assistance for this key industry sector.

6.17 The level of expertise required by the smaller and medium sized ports in order to deliver complex infrastructure projects is often very high, with expertise required in rail, sea, construction engineering, planning and finance. This type of expertise and human resource may not always be readily available in every area as the main business of the ports will usually be concentrated on shipping and handling requirements of customers.

Funding

6.18 The sources of funding available to smaller and medium sized ports in the North Sea Region are surprisingly few, with local authority and shareholder sources being the most common.

6.19 The changes in the debt market across the EU area over the last 5 years have also presented challenges for these types of organisations. Some private sector funders have been identified within LO-PINOD, where certainty over revenue streams is assured. This funding is expensive for SMEs.

Policy considerations

Relationship with other EU programmes

6.20 Smaller and medium sized ports require assistance in delivering quality large scale infrastructure projects and so help from EU programmes is essential. There are a number of EU programmes that have contributed to the development of the recommendations and results of the LO-PINOD project and that can help with the further development of small and medium sized North Sea ports.

6.21 The LO-PINOD project has been able to learn much from the Dryport project, WP 6, which is helping to transfer up to 30,000 containers from road to rail and has developed a low carbon harbour calculator. The lessons learned in persuading new customers onto rail at the ports is useful

background for the LO-PINOD partners in their aim of developing the port hinterland areas through new intermodal facilities.

6.22 The showcasing of port services through VOKA Chamber of commerce West Flanders has been a good example of best practice for LO-PINOD as well as the benefits of networking by medium sized ports in developing these services.

6.23 The lessons learned from the Swedish Dryport study into the environmental benefits achieved by the development of a new freight combi terminal were also noted.

6.24 In taking projects forward in the future LO-PINOD partners will continue the engagement established with the TEN T programme, as well as the opportunities being made available by the follow on programme to Marco Polo.

6.25 The LO-PINOD partners will set up a formal dialogue with the TEN T programme to ensure that small and medium sized port projects in the North Sea Region will be taken note of and recognised in future TEN T projects.

6.26 Links to other ERDF programmes are an essential tool for small and medium sized ports in the North Sea Region, as a vital potential source of funding for new investments.

6.27 A clear recommendation is for closer collaboration of medium and smaller ports to build commercial contacts and networks and to provide a voice within the EU on funding mechanisms and the promotion of investment for individual ports.

7.0 LO-PINOD partners' statement on key issues

7.1 **Planning** support from local, national and EU bodies is essential to deliver any infrastructure project. Approvals for port area developments could be simplified allowing ports to deliver development if the project is in line with medium term planning policy documents. Multiple layers of approval could thereby be removed for rail, road and water infrastructure.

7.2 **Design** processes for new infrastructure at ports need to take account of the flow of goods within port areas, minimising potential areas of conflict. Clearly established design processes can reduce the conflicts of moving different types of products around ports across a variety of infrastructure.

7.3 **Electrification** of rail infrastructure can significantly reduce rail haulage costs but needs to be designed carefully within port areas.

7.4 **Funding** can be secured through the private sector and other sources but in all cases smaller and medium sized ports need to be able to prove security of the customer contracts for the movement of goods. Larger ports can secure funding without full traffic commitments based on the general throughput of the port, but smaller and medium sized are not able to do so, creating a significant constraint.

7.5 **Flexibility:** Small and medium sized ports are more flexible than some of their rivals and can take advantage quickly of changes in the market.

7.6 **EU programmes** can provide essential support for small and medium sized ports in order to fund areas of activities and foster closer co-operation between ports.

8.0 Appendices

Port Development Strategy Method

8.1 The partners have met regularly at Partners meetings to discuss work packages 3.1 and 3.2.

8.2 In addition to this exchange meetings took place between Kilbride and the Port of Drammen in January/February 2013 during which port partners compared design principles and made recommendation for the partner to consider. Many of these recommendations were adopted by the partners involved.

8.3 Feasibility reports were exchanged between the following projects:

- Port of Drammen
- Port of Esbjerg
- Port of Oostende
- Ridham Docks
- Port of Sheerness
- Port of Meppel

8.4 Conference calls were also held with the following partners to further discuss the transnational experiences and questionnaire replies:

- Port of Oostende
- Port of Drammen
- Port of Sheerness
- Port of Esbjerg
- Port of Meppel

8.5 From these replies the joint strategy has evolved drawing on the experiences of each partner's projects and leading to the recommendations at the end of this report and approved by the partners at the partners meeting in the Port of Bodo in June 2014.

Partners' Questionnaire

Questionnaire

Have you looked at the development of port hinterland for rail purposes either inside or outside the LO-PINOD project? If yes, please provide a short summary below (Max 100 words). If no, please provide a short summary describing why not.

Have you had to deal with planning law in implementing a rail project for the port hinterland, whether local, regional, national or European laws or if not why? Please provide a short summary (Max 100m words).

Have you carried out any feasibility studies into port hinterland rail developments? Can you provide a copy of any report or summary with plans?

Have you needed to deal with your national rail company in order to carry out the project and if so please provide a short summary of the experience (Max 100 words).

Have you received City/regional/national public sector support for the development of the rail infrastructure, either in terms of financial support or planning support? Please provide a short summary (Max 100 words).

Design plans

Port of Oostende

Ostend Rail plan

Port of Drammen

PORT PLAN - DRAFT 1 OVERALL PLAN - LEG 0
PORT PLAN - DRAFT 1 OVERALL PLAN - LEG 1
PORT PLAN - DRAFT 1 OVERALL PLAN - LEG 2
PORT PLAN - DRAFT 1 OVERALL PLAN - LEG 3
PORT PLAN - DRAFT 1 OVERALL PLAN - LEG 4

Port of Esbjerg

Phase 2 overview plan
Phase 2A overview plan
Esbjerg rail plan
Esbjerg rail freight plan

Port of Ridham

Ridham rail terminal options
Ridham rail extension plan
Ridahm dock terminal plan

Rail Feasibility Studies

Port of Drammen

Port of Esbjerg

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