PILOT ACTION FINAL REPORT – PP 04 - ROSTOCK PORT

DELIVERABLE D.T2.2.4

Version 1

03 2022

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1. Ex-ante situation

The Port of Rostock is - measured in net tons handled - the biggest German Baltic Sea port. Additionally, it is one of the most important hubs for intermodal transport as it connects high-frequent ferry lines between Scandinavia and the European continent. Even if there is a huge share of road transport to and from the ferries, the number of trains carrying semi-trailer and swap bodies is growing. Presently, approximately 40 trains leave the intermodal terminal in the port of Rostock a week. The most important connects Rostock with Verona in Italy (approx. 2 departures a day) and shall be further improved from an IT-based point of views within the COMODALCE project.

With its perfect location directly at the Baltic Sea with no natural obstacles to pass to the open sea, it is perfectly suitable for all ferry- and ro/ro-traffic. The hinterland connection with access to the motorways A19 (north-south traffic in direction of Berlin) and A20 (east-west traffic in direction of Hamburg), it can serve all regions across Europe on transport axes with nearly no congestions. There is access to the national rail network and the railway lines have been modernized recently and allow high-speed transportation and heavy axle load.

As other ports as well, the handling of intermodal units is executed predominantly manually. That means checking of incoming and outgoing trains is done with terminal staff and documentation of several aspects to be checked is done on paper. This time-consuming manual process hinder the fast and efficient handling of trains given the fact, that increased transport volumes needs sufficient terminal capacities. The first step to improve this, is already done in cooperation between the terminal operator and port operator, both have commonly developed a comprehensive port management system called SKSS. Based on expectations and requirements from the industry, it needs to be extended with additional functionalities to speed up handling processes and to reduce the time of a unit in the terminal resp. the port. A joint approach with stakeholders to reach this overall aim is in place and should be realized within COMODALCE.

Based on a SWOT analysis within COMODALCE project the following table summarizes aspects describing the ex-ante situation.

SWOT analysis of the system of freight

Strengths	Weaknesses
1. M-V holds a long coastal area with several sea ports (gateways to the Baltic Sea) 2. Rostock Port is one of the most competitive German Baltic Sea Port 3. Established links (A19, A20, A14 [M-V to BR], A24, E55, E251), fast connection to Scandinavia and Adria 4. Frequent trading 5. Intermodal Hubs	1. Some hinterland infrastructure issues (conditions of established infrastructure) 2. Tight approach fairways (e. g. Wismar) 3. Fairway depth 4. Last mile connections
Threats	**Opportunities**
1. Sediment displacement 2. Enlarging container terminals/feeder in BSR 3. Intensification of direct Baltic Sea approaches by large container ship 4. Technical issues (Cyber security with ongoing digital practise) 5. Less throughputs caused by disease outbreaks or government interventions (currently: Corona virus)	1. Higher throughputs with enhanced hinterland infrastructure 2. Connecting existing infrastructure 3. Extension/intensification of current trade routes 4. OEM corridor 5. Access to European funds for the strengthening of port and inland port infrastructure 6. Increase in handling efficiency

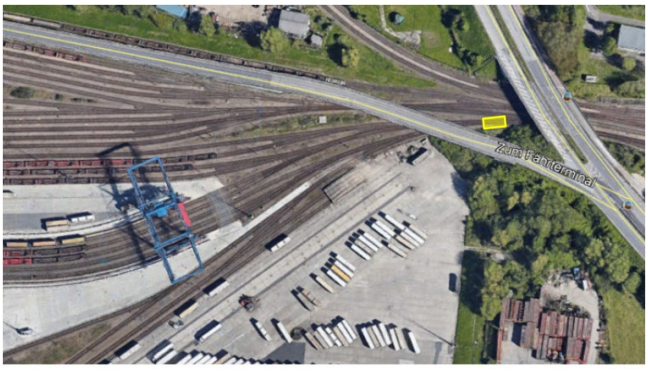
Two central needs were derived together with the involved partners and stakeholders:

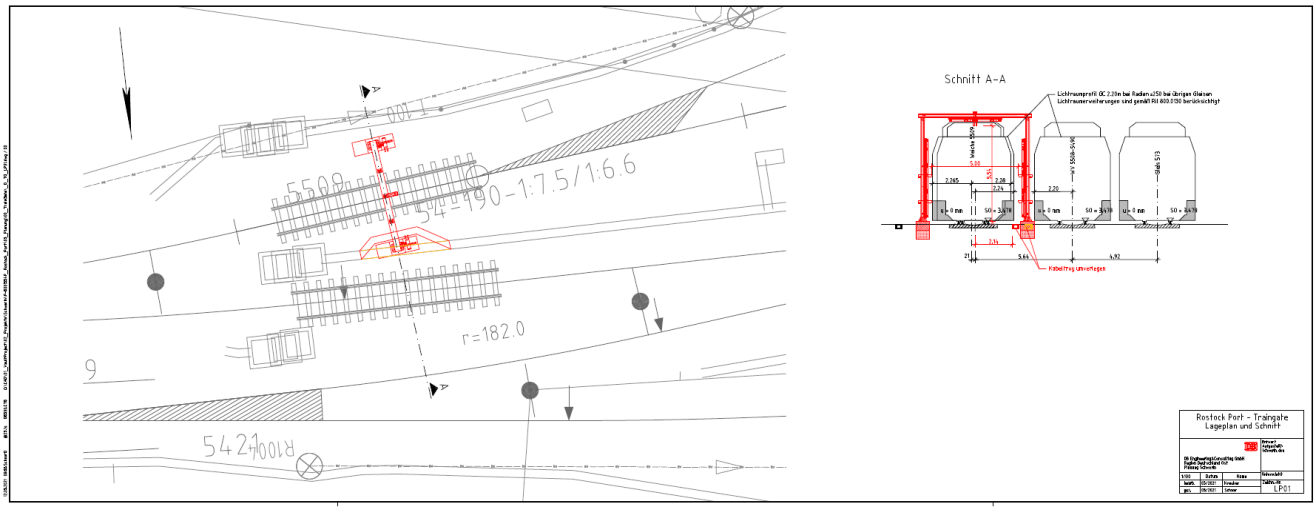
Short title of need	Description, justification	Identified by (organisation)
Rail based scanning facility	Infrastructure to monitor intermodal trains entering the port terminal	Port operator / Rail transport company / Terminal operator
Data exchange about intermodal units	Exchange of transport related, unit specific data, with regard to its current location, condition and more	Forwarding and logistics company / Port handling companies / Terminal operating company

Thus, the Port of Rostock wanted to invest into a rail-based scanning facility at the entrance point of the port's intermodal terminal. All trains (carrying semi-trailer and other unaccompanied units) entering the terminal from the near-by marshalling yard should be scanned and pictures taken by the cameras mounted on the frame. It would be the precondition for intended data transfers/exchanges later on.

2. Pilot action description

The project followed its initial development path. Regularly meetings with the stakeholders involved in Rostock took place. In close cooperation with the terminal operating company, a location for the scanning facility was decided.





The planning for the actual installation was in good progress. A detailed list of components for the scanning facility was developed and sent around to potential suppliers. First indicative offers were analysed and the formal procurement process was under preparation.

A preliminary acceptance of this decision was provided by the national rail network operator DB Netz, who has to give the final approval for that according to the applicable national law.

Contrary to previous agreements in the project meetings the location who jointly discussed and examined as feasible was not accepted by DB Netz. *The location was not suitable due to requirements coming from electrification clearance gauge as well as radius specifications in curved rail beds. Furthermore, the rail gate as such did not get in general technical approval from DB Netz and it reqired an additional planning procedure to fix this. Additional costs in a low to middle six-digit amount to change the track layout and cable canals as well as drainage loops would have been required.*

DB NETZE

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30.03.2021

Gleisgeometrische Bewertung nach Ril 883 Gleis- und Bauvermessung

Strecke:	6443 km:
Bahnhof:	Bf Rostock Seehafen
Maßnahme:	Rostock Port - Traingate Location
Planungsphase:	Vorplanung
Auftraggeber:	I.NI-O-M-S
Projektleiter:	Herr Kruse
Vorgelegte Unterlagen:	ROP rail Portal proposition, Stand: 01/2021
Ersteller:	Rostock Trimodal GmbH
Geprüfte Unterlagen:	Lageplan und Schnitt, Stand: 03/2021

Hinweise:
Die Konstruktionsunterkante (Scananlage) schränkt den freizuhaltenden Mindestlichtraum für Oberleitungen (Mindesthöhe 5,65 m) unzulässig ein.
Durch die Lage des Traingates im Bereich der Weiche 5509 (eine Weiche der Form 54-190-1:75/1:6,6) reduziert sich der Abstand zwischen dem erweitertem Lichtraumprofil des Zweiggleises der Weiche bis zum südlichen Pfeiler der Anlage auf 2,5 cm. Vom Stammgleis der Weiche bis zum nördlichen Pfeiler reduziert sich der Abstand auf 26 cm. Die Reduzierungen resultieren aus der Lage des Zweiggleises und der Erweiterung des Lichtraumprofils in Folge der Unterschreitung des dem Lichtraumprofil zu Grunde liegenden Radius r = 250 m (s. Ril 800.0130A01, Abschnitt 1(1)(6)(9) und (10).
Der lichte Abstand zwischen dem nördlichen Pfeiler der Anlage und dem Verbindungsgleis W5508 - W5490 ist gesondert nachzuweisen.
In Folge der Wahl des Standortes ist der Sicherheitsraum zwischen dem Stammgleis der Weiche 5509 und der Weichenverbindung W5508 - W5490 eingeschränkt. Durch organisatorische Maßnahmen (vgl. auch DGUV Voschrift 72 §5(3)) ist die Gefährdung von Personen auszuschließen.

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Prüfingenieur für Gleisgeometrie

As the result this new situation Rostock Port carried out a final pre-investment study to find a solution which is in the end even formally acceptable for DB Netz. Therefore ROSTOCK PORT launched a tender for a planning/pre-investment study to identify a final location and the design for the rail gate. The service description consisted of the following three parts:

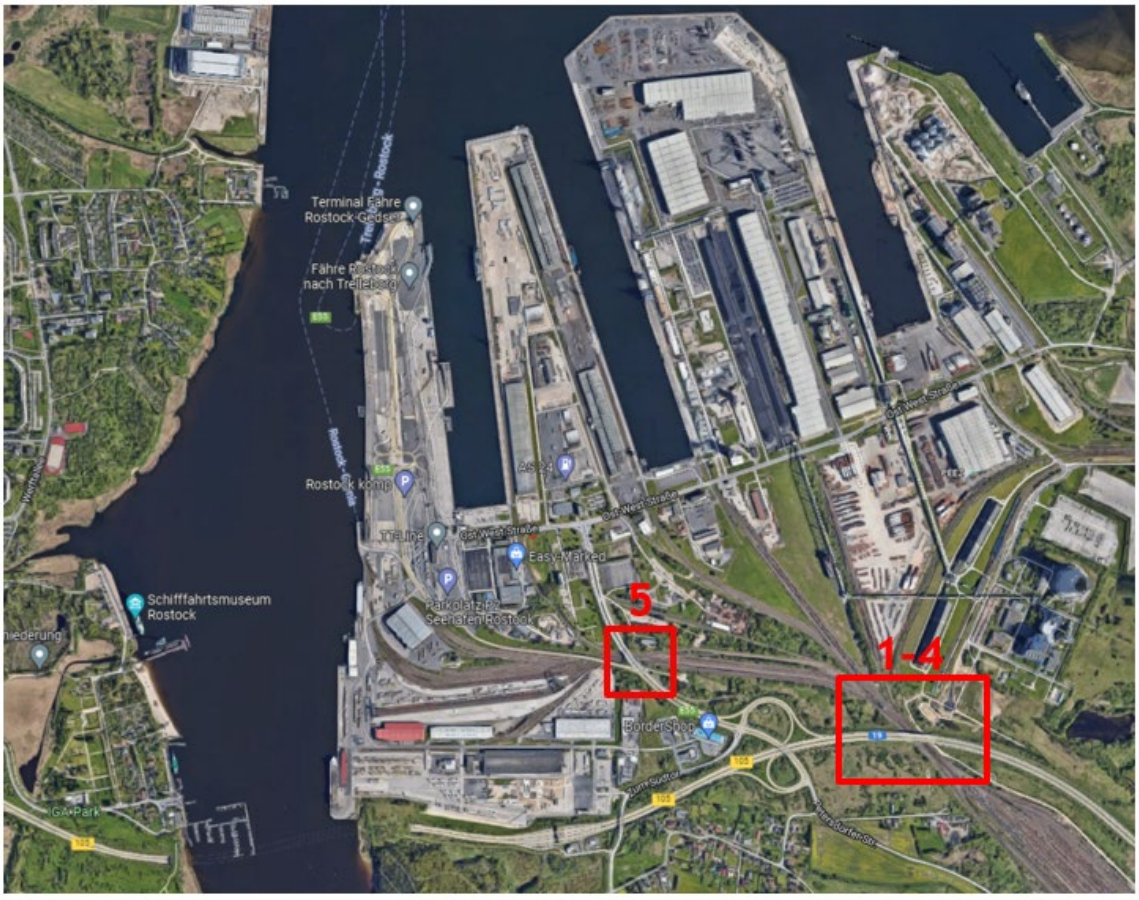
> *Step 1: basic elaboration of a suitable location (analysis of up to 3 possible locations) which are in line with DB Netz internal requirements*
>
> *Step 2: detailed analysis of technical requirements which needs to be considered during the installation and operation of the rail gate as preparatory step for the next detailed planning phases*
>
> *Step 3: detailed planning procedure aiming at the approval by DB Netz to erect a rail gate at the defined and agreed location*

Rostock Port assigned the rail planning company DB Engineering & Consulting (DB EC) with the study.

Based on the following operational premises

- *train service ends and begins in the drive-in/out group,*
- *the traction change takes place in the drive-in group (electric locomotive / shunting locomotive or shunting locomotive / electric locomotive),*
- *between the drive-in/out group and the intermodal tracks, the train movements take place exclusively as a shunting run, without using the route track,*

DB EC identified five variants of potential locations for the scanning gate in the rail marshalling yard near the intermodal terminal.



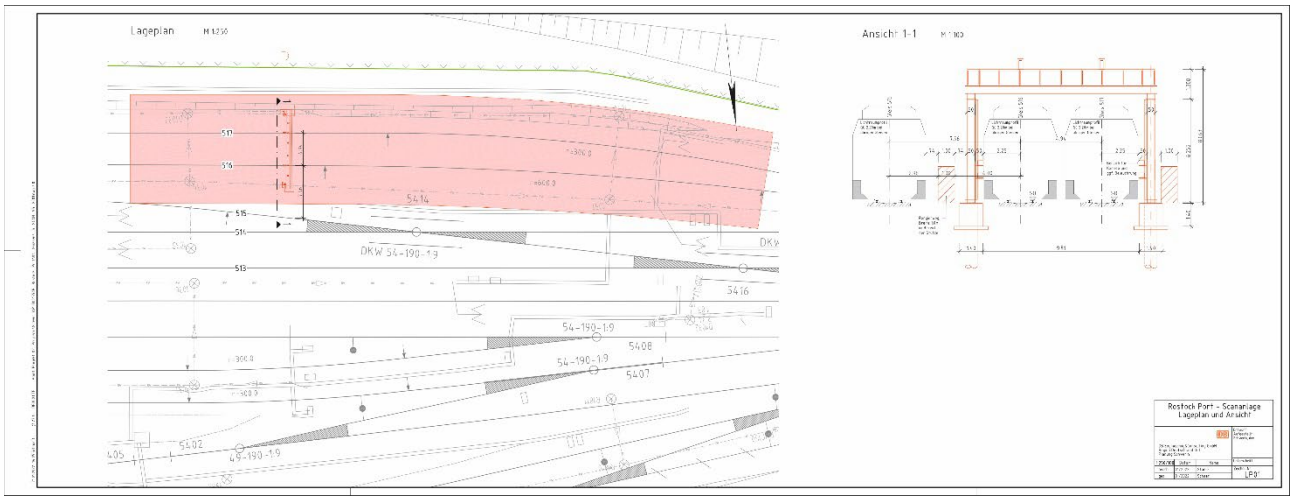
The evaluation/assessment of the five variants led to following conclusions:

Variant 1	*Variant 2*	*Variant 3 and 4*	*Variant 5*
- *technically feasible* - *not usable in practice, since track 609 can only be used as an access from the DB Cargo maintenance*	- *technically feasible* - *not usable in practice, since track 608 is the main track and can be used for shunting trips*	- *technically feasible* - *if cameras have to be arranged vertically on the supports of the portal, the control profile is restricted, so the location cannot be used* - *operationally, variants 3 and 4 have significant advantages, as all journeys in the 500 sidings including tracks 601 and 602 can be recorded*	- *technically feasible* - *all journeys in the direction of RTM are recorded, provided that it is specified that access to the intermodal tracks is exclusively via tracks 516 and 517*

Only Variant 5 was recommended with the following accompanying conditions:

- *The required standard light spaces can be implemented by a camera arrangement that must be adhered to the vertical supports of the portal.*
- *All services in and out of the intermodal system can be recorded, provided that the necessary shunting services are only made using tracks 516/517. This can be regulated operationally.*
- *Accessibility for maintenance, repair and fault work must be contractually agreed with DB Netz AG.*
- *Regulated building products should be used for such superstructures of the railway system. So-called signal bridges are a regulated construction product in the area of DB Netz AG.*

The figure shows the Design-Layout of the Scanning gate in Variant 5.



3. Conclusions

Unfortunately, the originally planned pilot action for Rostock Port in form of the installation of a scanning gate for trains could not be implemented in COMODALCE project duration. After extensive internal and external discussions, the previously fixed location did not get approval by the rail network operator (DB Netz) which is a precondition for the investment.

Alternatively, an engineering office was contracted to analyse all relevant regulations and requirements needed for the installation and to define a suitable location for the scanning facility/rail gate.

The output of the pre-investment study which recommends a new location (Variant 5) and delivers the design plans and first cost estimations for the train scanning facility is very valuable for the Port of Rostock. Next steps for the construction of the train scanning gate can build-up directly on these results.

Due to the fact that only one potential location in the rail marshalling yard could be identified for the implementation of a scanning gate for trains at the port area, Rostock Port is currently still discussing alternative technical solutions for train scanning. Beside the construction of a physical gate at the port area two other options are under consideration:

- *A gate solution outside of the port area which would be constructed and operated by the net operator DB-Netz. In this case Rostock Port would have the possibility to buy corresponding data of trains/train units and would have to create an interface between DB-Netz IT-system and the port's own IT-system. This technique is already introduced at eight locations in Germany by DB-Netz.*
- *A pioneer project of a Spanish Start-Up offering a scanning solution with several cameras on different positions at the combined transport terminal. Experiences with it have already been made in other branches. It would have to be adopted to the port sector, especially to a combined transport terminal.*

Taking the decision for one of the three sketched alternatives of train scanning solutions and its implementation at Rostock Port will be an important step towards realization of port's vision.

After the installation of the scanning gate it will be possible to check the plaques on the individual units on the train, which makes it possible to identify every single unit and to cross-check the data retrieved with booking lists and other status information already available in the port respectively terminal management system. Using cameras mounted on the scan portal, pictures can be taken from the moving train to demonstrate the condition of the unit and to ensure that everything is fine and the unit arrived at the terminal in the same condition as it left the start terminal of the train.

All data will be transferred into the existing port and terminal management system and compared to booking lists. Based on that data, port internal transport orders between the intermodal terminal and a ferry respectively ro/ro-ship are generated and submitted to a handling company. The same process is organized the other way around. While passing the scanning facility and by using tracking and tracing technologies, a status update for stakeholders like transport operators, agents and of course the owner of the unit is generated and sent automatically.