EEIG "North Sea – Baltic Rail Freight Corridor" EZIG, 74 Targowa St., 03-734 Warsaw, Poland,
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Annex 1 to the Tender Rules

TERMS OF REFERENCE
STUDY ON CAPACITY IMPROVEMENT
OF THE EEIG "NORTH SEA - BALTIC RAIL FREIGHT CORRIDOR" EZIG

1. BACKGROUND AND AIM OF THE STUDY

1.1. Background

The creation of Rail Freight Corridor North Sea – Baltic (hereafter – the corridor) aims at improving and unifying the conditions for international rail freight transport along the corridor. As one of the main improvements mentioned by the customers is unification of infrastructure parameters along the corridor, especially the maximum permitted length of the train. In order to improve the conditions for international rail freight transport along the corridor, the Management Board of the Corridor has decided to carry out a study on capacity improvement which should identify measures necessary to be implemented to increase the quality of corridor products and enhance its capacity.

This study will be a logical continuation and follow-up of the conclusions of the "Study on the Corridor's infrastructure characteristics", conducted and finalized by the Working Group Infrastructure in 2014. Results of the infrastructure study will be a starting point for the capacity improvement study.
Rail Freight Corridor North Sea – Baltic has declared in the CEF Action "Establishment of Rail Freight Corridor „North Sea – Baltic" and its further development aiming at improving conditions for international rail freight transport", action number 2014-EU-TM-0217-S among other activities "Performing a study on capacity improvement".

Excerpt of the Grant Agreement:
Activity 4: Performing a study on capacity improvement

The study on capacity improvement will focus on the length of the trains and possibly other parameters such as maximum speed, axle load, loading gauge, profile, gradient etc., with the following expected results:

- *identifying main infrastructure obstacles to allow long trains,*
- *identifying measures to remove these infrastructure obstacles, to allow a smooth and undisturbed run of long trains,*
- *assessment of the effectiveness of such a solution,*
- *identification of infrastructure investments needed.*

Allowing running long trains (740 m total length) along the corridor will improve the competitiveness of Railway Undertakings by reducing costs and by improving business efficiency.

The parameters analysed in this study will be train length, profile (loading gauge), train weight (axle/meter load/full train) and train speed, as these are important parameter for the business efficiency of RUs.

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1.2. Aim of the study

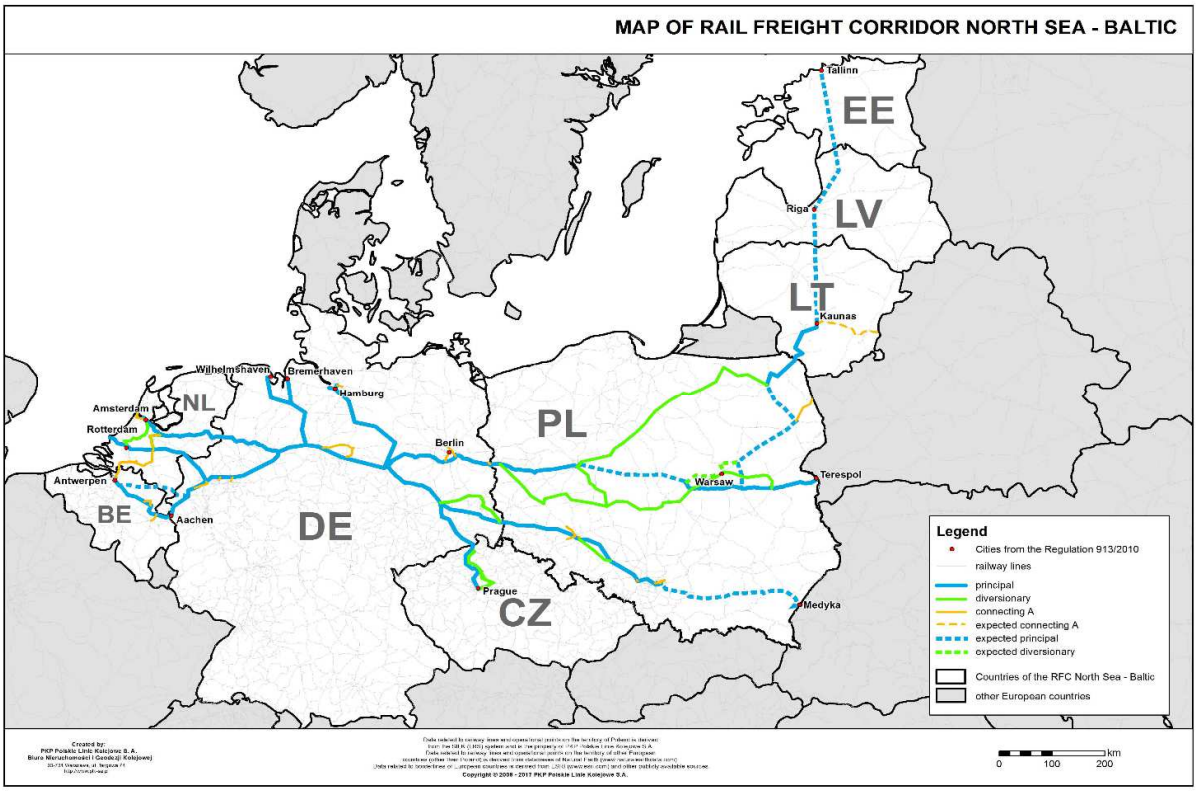
The aim of the study is to analyse the most important parameters that have the highest impact on the capacity, i.e. train length, profile (loading gauge), train weight (axle/meter load/full train) and train speed. The study should result in proposing most pragmatic and efficient measures (both infrastructural and operational), the implementation of which may lead to improved capacity on the entire corridor. The results of the study will be an answer to the frequent customer requests about enhancing capacity on the corridor.

2. SCOPE, TIMEFRAME AND APPROACH OF THE STUDY

2.1. Geographical outline of the analysis

Corridor lines: Rail Freight Corridor North Sea – Baltic route including principal, diversionary, connecting A and expected lines as indicated in the map below and the Annex 1 List of lines to be analysed. Exact corridor routing will be shared with the Contractor at the beginning of the study during the Kick-off meeting.

Analysis of expected lines in Latvia and Estonia depends upon Latvia and Estonia Infrastructure managers' (IM) decision whether or not to provide necessary data and participate in the study. Therefore analysis of these lines will be proceeded as a repetition of similar services after choosing the Contractor for the study for first six countries and will rely on the repetition of the survey data only for Corridor extension.



Corridor handover stations and terminals as listed in the Rail Freight Corridor North Sea – Baltic Corridor Information Document Book 3 for TT 2018/2019.

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2.2. Period under Consideration

2017 – 2030

2.3. Approach and data basis

Approach:

Holistic consideration of logistical chain. Analysis will cover corridor lines and handover stations as described in point 2.1. For information purpose only and limited to data provided by terminal operators, the information of main analysed parameters in terminals will be shown.

The starting position of the WPL and WPP should be the analysis of the current infrastructure parameters in order to identify bottlenecks. In the second and third stages should be proposed operational and infrastructure measures, including a cost estimation, to remove the remaining bottlenecks on the corridor ensuring the required capacity is in the place. Required capacity means that there are sufficient good quality train paths available to satisfy both the quality (parameters) expectations and the demand of the customers. In the final stage the evaluation of the demand for enhanced infrastructure parameters and comparison, whether the demand can be met with the existing or expected capacity, should be made.

Data basis:

Data that will be provided to Contractor (free of charge):

- basic infrastructure parameters;
- corridor investment plan;
- result of the operational studies;
- relevant national studies;
- border agreements;
- national investment plans;
- estimated cost of relevant currently foreseen measures (included in current national investment plans and other, if available);
- Legal obstructions for running longer/heavier/wider trains.

Data on track length in the terminals (provided voluntarily by terminal operators);

2.4. Tasks of the Contractor

Consolidate and analyze infrastructure data provided by IMs and terminals and to present the results and identify the bottlenecks which are probably not solved by the investment plan, preparation of presentations of Work Packages and results specified in chapter of ToR 3 and 4, preparation of the documents specified in chapter of ToR 2.5, continuous communication and regular meetings with WG Infrastructure, carrying out of the Study following these specifications.

Data concerning market demand and infrastructure information for terminals must be collected by the Contractor.

All costs to carry out the study (except for providing infrastructure parameter information mentioned in point 2.3) including Contractor travel costs are borne by the Contractor.

2.5. Milestones

The Contractor carries out the Study achieving all the milestones mentioned below. During the process WG Infrastructure and Infrastructure managers (e.g. Traffic management experts) provide support on IM specific matters.

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The Contractor starts the work after signing the contract and finishes with the delivery and approval) of the final report by the Management Board/General Assembly of the EEIG North Sea – Baltic Rail Freight Corridor EZIG.

- Kick-off meeting of WG Infrastructure and Contractor within 1 moth from the date contract signing;
- First draft of concept, prepared and delivered by the Contractor within 3 months from the date of contract signing, should define the methodology of the study, sources of information, the detailed work plan and deadlines;
- Intermediate report, delivered by the Contractor not later than 9 months from the date of contract signing, should provide not less than completed working package WPL (1-3), WPIP and WPP (1-3) results of analysis.
- Final report has to be delivered by the Contractor within 15 months of the signing the contract in the offices of the Contracting party.
- Final report has to be approved by the Contracting party within 3 months from the report delivery.

Regular meetings with WG Infrastructure defined in the work plan shall be held in order to validate the work packages and ensure best progress/quality. The rooms for the regular meetings will be provided by one of the IMs (free of charge).

Means of verification of achieved milestones – Minutes of the meetings provided by the Contractor and delivered documents.
The Contractor has to advise the Contracting party about conflicting or insufficient information, requirement of risks, which he identifies while preparing his offer or carrying out the study.

2.6. Scope of delivery and presentation of results

- The central contact person for the study is the leader of the Working Group Infrastructure of RFC North-Sea – Baltic;
- For specific tasks central contact person for each country is named;
- Scope of delivery: deliver reports electronically via e-mail as a word document to the central contact person of the Contracting party of the study (EEIG); 7 hard copies of final report;
- The final report has to contain an executive summary. The charts presented in the presentations have to be made available to the Contracting party;
- Language: English;
- Number of live presentations: 3 (Concept report, Intermediate report and Final report);
- Final presentation has to be delivered within 13 months in order to enable making corrections and including modifications to final report;
- Location for presentations: in central Europe (in one of the countries of the corridor).

3. WORK PACKAGES

3.1. WP Length (WPL)

WPL 1 Analysis of the current maximum train length on corridor lines

- Assessment of the current train length restrictions and analysis of (technical) rationale
- Definition of the main parameters related to running of 740 m trains
- Analysis of the reasons preventing railway undertakings from running longer trains

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- Track length in the corridor terminals (upon availability of data)
- Track length of the handover stations
- Border agreements
- Continuous train paths across borders
- Legal obstructions for running longer trains
- Original timetable and deviations (routing/rerouting)

WPL 2 Measures necessary to satisfy demand for 740 m trains

Operation

- Actual and future operating program (diurnal variation lines)
- Determination of current train lengths on the corridor in line sections.
- Systemic reflection of train lengths (effects analysis about limiting factors)
- Identify the maximum load of a motor vehicle on the corridor incl. operational or technical solution possibilities for higher maximum loads (in terms of calculation of maximum load)
- Analysis of timetables (all traffic);
- Sustainable modelling of timetabling scenarios on the basis of estimated demand for longer trains and estimated number of other trains till 2025/2030
- Analysis of necessity of sidings for additional 740 m trains along the corridor
- Description of restrictions (e.g. no stop of freight trains possible at special points)
- General and local options for handling longer trains by operational measures (if possible to avoid expensive upgrading of the infrastructure)
- Measures in disrupted situations

Infrastructure

- Inventory of the current infrastructure (maximum train length):
  - list and sketch of corridor lines
  - classification of line sections
  - equipment of the lines that influence the above-mentioned parameter (e.g. catenary, train control systems, braking distance, train radio system, hot axle boxes and level crossings, electricity substations etc.)
  - situation and effective length of sidings
- Investigation of national specialities of the infrastructure according to prolongation of train length, e.g.:
  - Hot axle boxes (e.g. examination of the stopping distance)
  - Level crossings (e.g. examination of problems because of rearward switching on)
  - distance for the stretching of freight trains
  - specific authorisation problems
- Definition of yards, stations and sidings, tunnels, etc. to be modified for longer trains (necessity and possibility)
- Proposal of necessary construction/operational measures

WPL 3 Analysis of estimated cost of proposed measures

- The cost estimation for infrastructure modification should be reliable enough to decide whether it is reasonable to take these modifications
- Estimation of costs to implement operational measures
- Evaluation of alternatives if the infrastructure modification is costly for a selected location
- Results of the cost estimation

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WPL 4 Analysis of demand for 740 m trains

- Calculation of the future (2025/2030) demand for 740 m long trains
- Analysis of the future (2025/2030) demand for other trains on corridor sections

3.2. WP Profile (WPP)

WPP 1 Analysis of the current situation concerning profile

- Analysis of ECCO report UIC (no European law) where RUs proposal for a standard is stated
- Analysis of the current possible profile on sections of the corridor with identification of bottlenecks
- Analysis of what type of trains e.g. semi-trailer (piggyback), container, combined trains, need the P/C 400/70
- Analysis of the reasons preventing trains with this profile run on the corridor lines

WPP 2 Measures necessary to satisfy demand for P/C 400/70 profile trains

Operation

- Actual and future operating program (diurnal variation lines)
- Determination of current train profile on the corridor in line sections.
- Systemic reflection of train profile (effects analysis about limiting factors)
- Identify the maximum load of a motor vehicle on the corridor incl. operational or technical solution possibilities for higher maximum loads (in terms of calculation of maximum load)
- Analysis of timetables (all traffic);
- Description of restrictions (e.g. no stop of freight trains possible at special points)
- Measures in disrupted situations

Infrastructure

- Inventory of the current infrastructure (profile):
  - list and sketch of corridor lines
  - classification of line sections
  - equipment of the lines that influence the above-mentioned parameters (e.g. catenary, train control systems, braking distance, train radio system, hot axle boxes and level crossings, electricity substations etc.)
- Investigation of national specialities of the infrastructure according to profile in case profile is smaller than P/C 400/70, e.g.:
  - Tunnels
  - Platform height
- Definition of yards, stations and sidings, tunnels, etc. to be modified for larger profile trains (necessity and possibility)
- Proposal of necessary infrastructure/operational measures

WPP 3 Analysis of estimated cost of proposed measures

- The cost estimation for infrastructure modification should be reliable enough to decide whether it is reasonable to take these modifications.
- Estimation of costs to implement operational measures
- Evaluation of alternatives if the infrastructure modification is costly for a selected location

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- Results of the cost estimation

WPP 4 Analysis of demand for profile P/C 400/70 trains

- Calculation of the future (2025/2030) demand for large profile **(P/C 400/70)** trains
- Analysis of the future (2025/2030) demand for other trains on corridor sections

3.3. WP Weight (WPW)

Analysis of the current situation concerning train weight and axle/meter load

- Definition of reference locomotive
- Analysis of the currently allowed weight (axle load and meter load) (showing least allowed weight) of a train on sections of the corridor with identification of bottlenecks
- Analysis of limitation of train weight caused by restrictions of use of articulated locomotive and/or more than one locomotive.
- Analysis of the reasons preventing heavier than allowed weight trains run on the corridor lines
- Proposal of possible measures to increase allowed train weight and axle/meter load and operational train weight and axle/meter load towards projected parameters

3.4. WP Speed (WPS)

Analysis of the difference among projected, allowed and operational speed on corridor lines and proposal of measures for improvement

- Analysis of the projected maximum speed on corridor lines
- Analysis of the currently allowed maximum speed on corridor lines
- Analysis of the used maximum speed in current timetables on corridor lines
- Analysis of the infrastructural/operational reasons preventing trains running on currently allowed and projected maximum speed
- Proposal of possible measures to increase allowed speed and operational speed towards projected speed

3.5. WP Investment Projects (WPIP)

Analysis of investment projects planned on the corridor

- Analysis of infrastructure/operational bottlenecks solved by already decided (step 1) or planned (step 2) projects of the corridor Investment Plan until 2030.

4. RESULTS

Final report must cover all work packages and recommendations for next steps regarding timetabling, operations and infrastructure development with conclusions.

The Contractor is asked to provide commercial offer for all work packages according to the Tender Rules Annex 2A – Material and Financial Schedule.

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WORK PACKAGES:

WP Length including:
WPL 1 - Analysis of the current maximum train length on corridor lines;
WPL 2 - Measures necessary to satisfy demand for 740 m trains;
WPL 3 - Analysis of estimated cost of proposed measures;
WPL 4 - Analysis of demand for 740 m trains.

WP Profile including:
WPP 1 Analysis of the current situation concerning profile;
WPP 2 Measures necessary to satisfy demand for P/C 400/70 profile trains;
WPP 3 Analysis of estimated cost of proposed measures;
WPP 4 Analysis of demand for profile P/C 400/70 trains.

WP Weight - Analysis of the current situation concerning train weight and axle/meter load;

WP Speed - Analysis of the difference among projected, allowed and operational speed on corridor lines and proposal of measures for improvement;

WP Investment Projects - Analysis of investment projects planned on the corridor.
Analysis of expected lines in Latvia and Estonia depends upon Latvia and Estonia Infrastructure managers' (IM) decision whether or not to provide necessary data and participate in the study. Therefore analysis of these lines will be proceeded as a repetition of similar services after choosing the Contractor for the study for first six countries and will rely on the repetition of the survey data only for Corridor extensions.

Annexes:

Annex 1 – List of lines to be analysed