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Inland Transport Committee

Working Party on Intermodal Transport and Logistics

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Item 6 (a) of the provisional agenda
Emerging issues in freight transport and logistics:
Issues, trends and performance in the industry

Geospatial transport statistics: Potential for modal shift from road to rail

Note by the secretariat

I. Introduction

1.   At the previous session in 2021, the secretariat of the Working Party on Transport Statistics (WP.6) presented to the Working Party on Intermodal Transport and Logistics (WP.24) its work on geospatial analysis. This work involves using the traffic census outputs on the E-Road and E-Rail networks (defined in the relevant Economic Commission for Europe infrastructure agreements) as well as Eurostat origin-destination data to map rail, inland water and road transport volumes (tonnes and tonne-km loaded and unloaded) by NUTS 2[1] region. These additional data sources complement existing work on the E-Road and E-Rail traffic censuses, both as providing an alternative data source when census results for a country are not available, and for comparing different modes against each other.

2.   WP.24 expressed its interest in using geospatial analysis to explore options for assessing intermodal transport chains to identify transport links on which more intermodal transport could take place.

3.   This document presents an example of a possible analysis of intermodal transport chain.

II. Analysis of intermodal transport chain

4.   The starting question for intermodal transport chain analysis is as follows: which are the road transit routes from which freight traffic could be most conveniently shifted to rail so that a reasonable number of freight trains could be operated in both directions, maximising the environmental, economic and social benefits of a more sustainable transport mode.

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[1] Nomenclature of territorial units for statistics maintained by Eurostat. Level two refers to "basic regions for the application of regional diagnoses." https://ec.europa.eu/eurostat/web/nuts/background.

5.   The focus is given to international transit routes, as in this way the data is generalized and cannot be assigned to specific entities from data on loading/unloading points which would threaten statistical confidentiality.

6.   For this example, data from the Polish 2015 road and rail censuses are used, filtered to the main Lithuania to Germany corridors to show road freight traffic that may transit from Lithuania to Germany. Further, the data on loaded/unloaded freight by mode of transport between a pair of countries is used from Eurostat (Lithuania-Germany).

7.   The analysis is based on tonnes loaded in Lithuania and unloaded in Germany and vice-versa. This analysis would be easier if the number of journeys could be used, however, this data is not available for country pairs.

8.   For this analysis the following assumptions are made:

- we apply 33 per cent load capacity of a TEU, i.e. each TEU would carry a load of 7 tonnes;

- one TEU is equal to one truck;

- one container train carries 60 TEU.

9.   The above assumptions will certainly not be applicable in all situations and for all corridors, given differing goods and economic structures of different regions. However, the above figures may be useful for highlighting the order of magnitude of any potential modal shift.

10.   Using the 2021 data, there were 734 thousand tonnes loaded in Lithuania to Germany and 929 thousand tonnes from Germany to Lithuania and transported by road, respectively. With the assumptions made above, this would mean almost 290 trucks from Lithuania to Germany a day and 360 trucks in the opposite direction. (In reality there is a good chance that the number of trucks per day in each direction matches for logistical reasons, with a number of empty journeys). With one train, as assumed for this analysis, carrying 60 TEU, up to 4 trains could be reasonably operated a day in each direction to carry the freight in transit between Trakiszki and Kunowice, or between transhipment stations in Šeštokai and Rzepin or Frankfurt Oder. 2021 Eurostat data show that 12 thousand tonnes were loaded in Lithuania and sent to Germany by rail, while 11 thousand tonnes went the other way. These small volumes have actually increased significantly over the last five years; in 2015, 4 thousand tonnes and 1 thousand tonnes made the journey from Lithuania and Germany, respectively. Indeed, the 2015 E-Rail census shows only 10 freight trains made the journey from Suwalki in Poland to the Trakiszki at the Polish-Lithuanian border.

11.   The Figure 1 below shows the volumes of traffic in Poland based on the 2015 E-Road census. This route would be the principal beneficiary of any increased freight, in that the existing route would experience reductions in freight traffic and corresponding benefits in road safety, air pollution, travel times, noise etc.

Figure 1
2015 E-Road Census, road transit corridors for Germany-Lithuania freight carriage
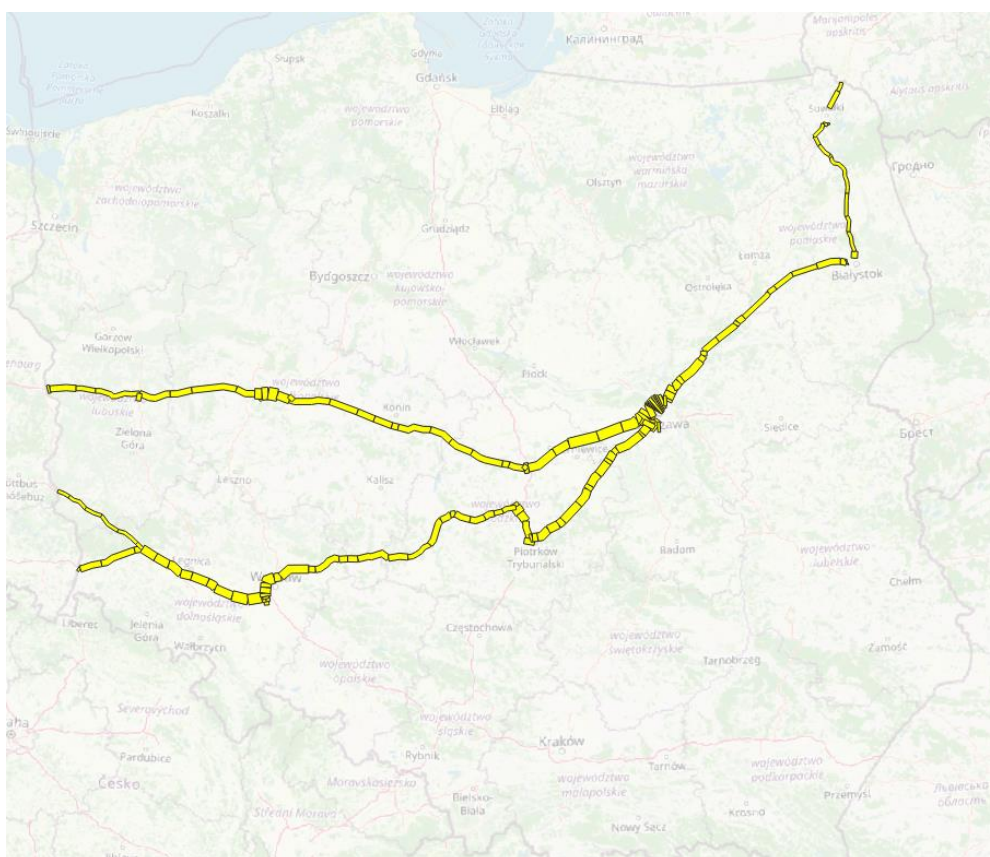
Source: ECE

12.   Figure 2 below shows E-Rail data from 2015, with only the route that any increased Lithuania-Germany traffic may run on shown. This route is based upon the North Sea-Baltic TEN-T corridor proposal. (For both Figures 1 and 2, corresponding maps showing the potential increase/decrease in freight traffic will be made available in time for the WP.24 session).

Figure 2
2015 E-Rail data, rail transit corridor for Germany-Lithuania freight carriage
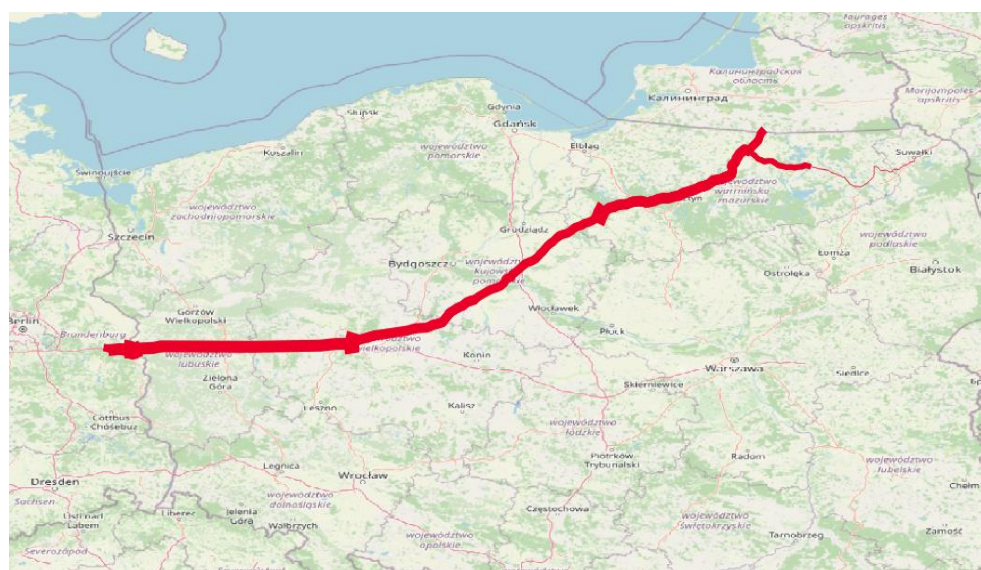
Source: ECE

13.   WP.24 is invited to discuss the example for geospatial analysis for intermodal transport chains. WP.24 may also wish to consider initiating a data collection for geospatial analysis on transit routes with potential for shift from road to rail. In particular, non-Eurostat countries providing census-like traffic data or rail and road origin-destination tonnage figures would significantly expand the potential for exploring modal shifting opportunities throughout the ECE region. This would have the added benefit of exploring transport volumes and modal shifting opportunities on Euro-Asian routes. Further, collecting information on numbers of journeys (in addition to tonnes and tonne-km) between international partners would also be useful for this type of analysis.

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