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**Economic Commission for Europe****Inland Transport Committee****Working Party on Rail Transport****Group of Experts on International Railway Passenger Hubs****First session**

Geneva, 7–9 July 2021

Item 3 of the provisional agenda

**Background to the Group****Background data on international rail connections****Note by the secretariat****I. Introduction**

1. As background information for the work of the Group and ensuring that the deliberations are evidence-based, the secretariat is presenting one of many analyses of international rail data, made available on the European Data Journalism Network (EDJnet) site. The visualisations and article are based on data collected by the authors Gianluca De Feo and Lorenzo Ferrari for the OBC Transeuropa think-tank. Visualisations and some text quoted from the original article<sup>1</sup> are reproduced here based on the creative commons license.<sup>2</sup> The authors based most of their analysis on data collected from national rail companies, which they made available alongside the article.<sup>3</sup>

**II. International passenger rail movements**

2. Figure I shows a subset of European cities based on their number of international rail connections, the size of which is based on the average length between them and their connecting cities. The cities were chosen as the city in each country with the most international connections (and so most, but not all, are capital cities). The figure shows that Vienna is the European city with most connections to other international cities (23). In addition, cities with a few less connections but with larger average distances than Vienna include Warsaw, Vilnius and Paris. Cities with just one international connection include Dublin, Helsinki, Tallinn and Thessaloniki. And the only European capitals without any direct international passenger connections are Athens, Lisbon, Madrid, Sarajevo and Tirana.

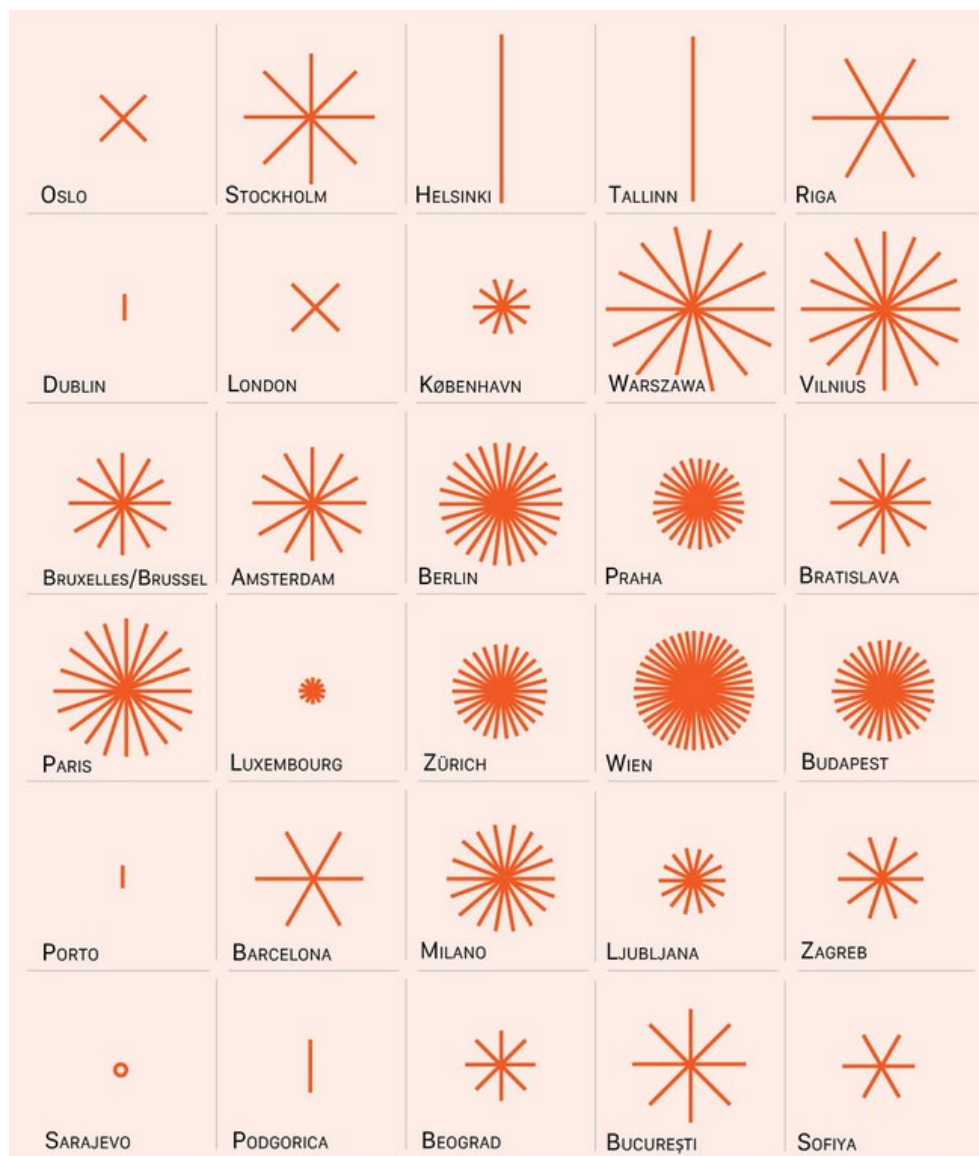
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<sup>1</sup> [www.europeandatajournalism.eu/eng/News/Data-news/More-and-more-trains-crossing-European-borders](http://www.europeandatajournalism.eu/eng/News/Data-news/More-and-more-trains-crossing-European-borders).

<sup>2</sup> <https://creativecommons.org/licenses/by/4.0/>.

<sup>3</sup> <https://docs.google.com/spreadsheets/d/12deGLMuX3u-mUaHGILt0-TXIGZnQ-NILCt6NRA4s0pU/edit#gid=588529542>.

Figure I  
**Number and length of direct rail links between major European and foreign cities**



Source: Gianluca de Feo and Lorenzo Ferrari|EDJNet.<sup>4</sup> Does not cover all UNECE countries.

3. Figure II shows country borders according to how many international passenger rail connections cross them. This is an interesting way to present how open or closed each country border is in terms of passenger rail, with the border thickness based on the number of rail passenger connections per 100 km of border.

<sup>4</sup> [www.europeandatajournalism.eu/eng/News/Data-news/More-and-more-trains-crossing-European-borders](http://www.europeandatajournalism.eu/eng/News/Data-news/More-and-more-trains-crossing-European-borders).

Figure II  
Intensity of rail connections across different borders in Europe

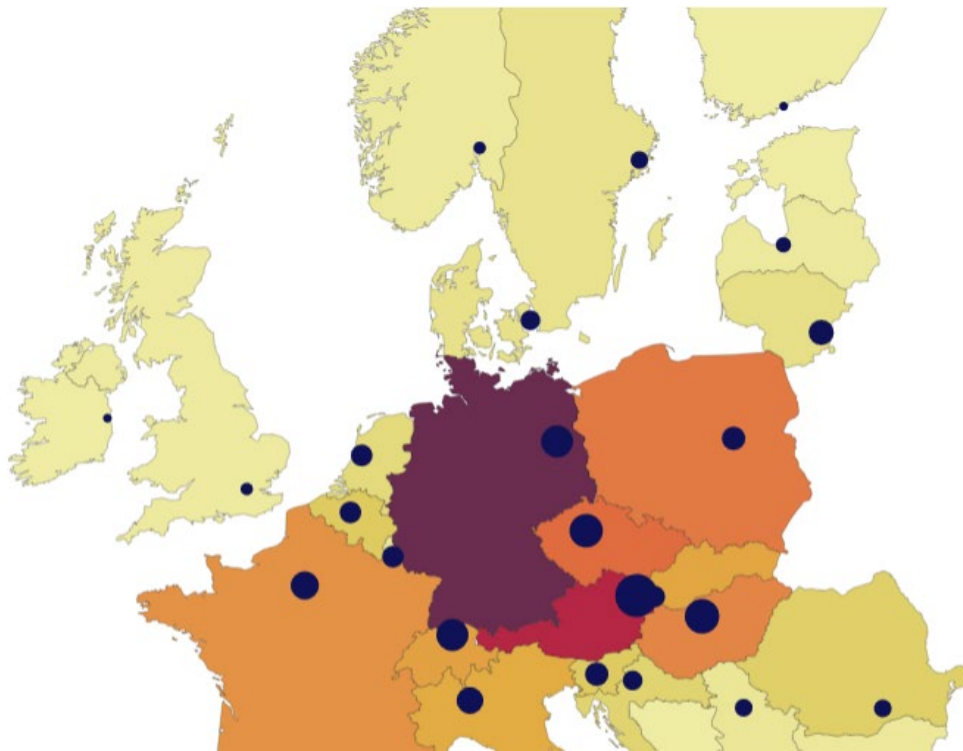


Source: Gianluca de Feo and Lorenzo Ferrari|EDJNet.

4. Figure III shows data on a country basis as well, with countries coloured according to the total number of international connections that they have. While a useful overall indicator of rail connections, this approach does naturally favour countries with lots of different borders, and Germany with nine border leads with this metric. Figure IV therefore weights the rail connections per 100 km of border, with this method Denmark comes out on top.

Figure III  
Number of cross-border rail connections per country and city with most connections

Cities: 10 ● ● 20 Countries: 1  101

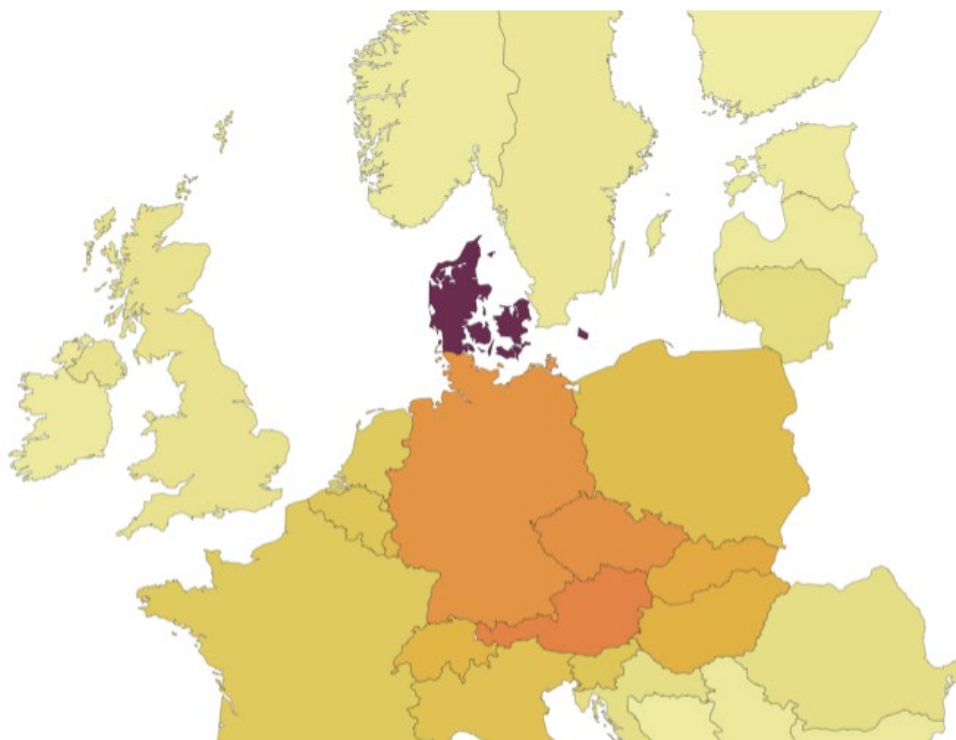


Source: Gianluca de Feo and Lorenzo Ferrari|EDJNet.<sup>5</sup>

<sup>5</sup> [www.europeandatajournalism.eu/eng/News/Data-news/Four-ways-of-looking-at-European-cross-border-rail-links](http://www.europeandatajournalism.eu/eng/News/Data-news/Four-ways-of-looking-at-European-cross-border-rail-links).

Figure IV  
Number of cross-border rail connections per 100 km of border

1  17

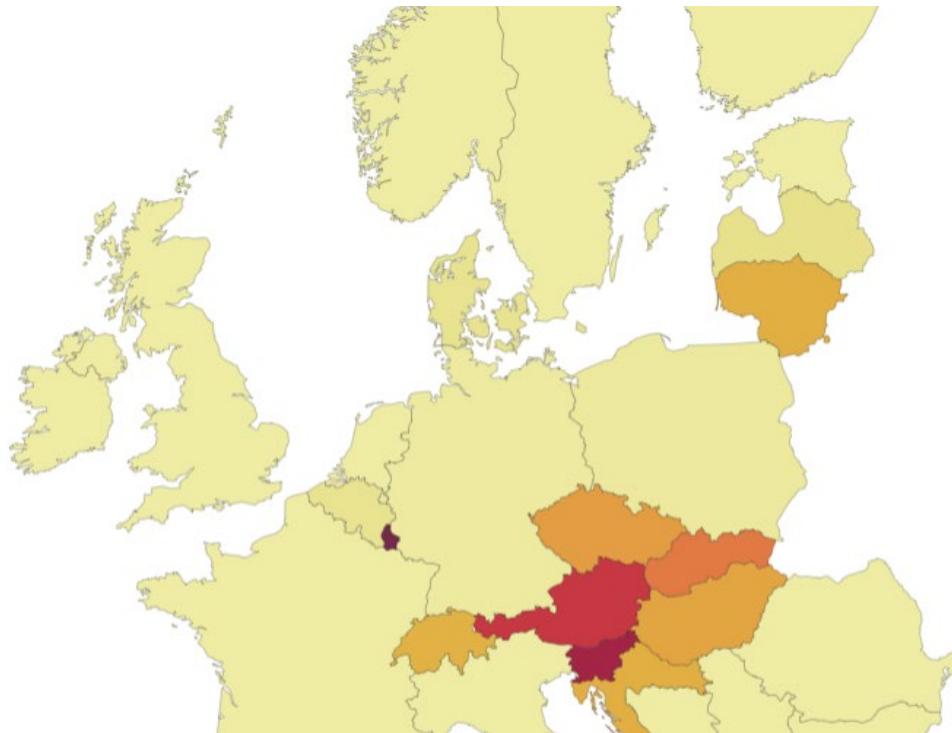


*Source:* Gianluca de Feo and Lorenzo Ferrari|EDJNet.

5. Figure V uses a different denominator, that of population, which means that Luxembourg and Slovenia have the highest number of international rail links per million inhabitants.

Figure V  
Number of cross-border rail connections per million people

0  12



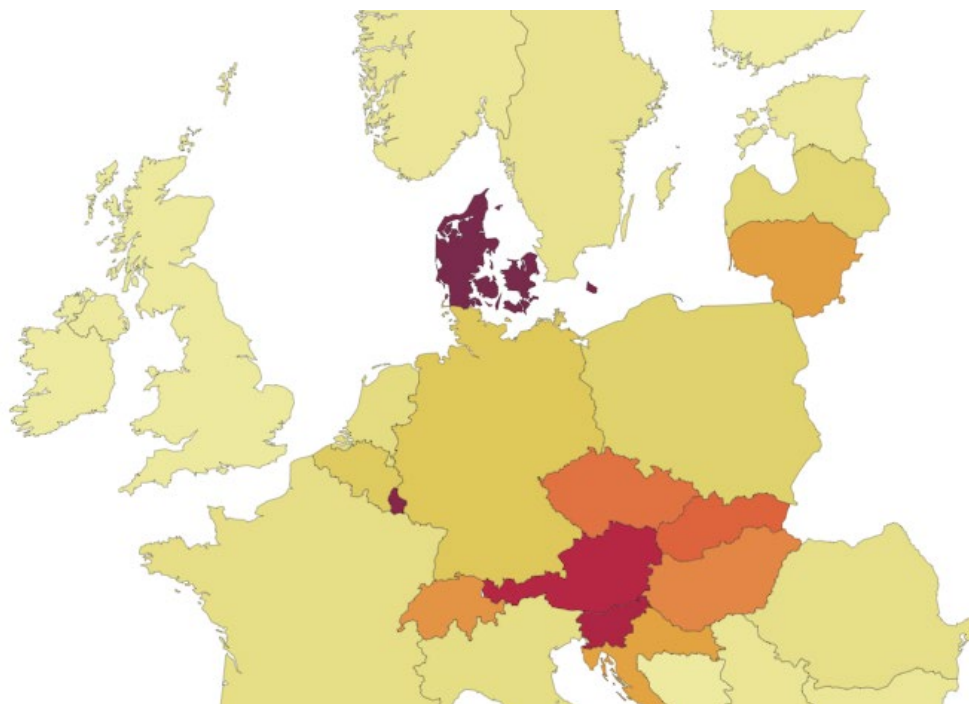
Source: Gianluca de Feo and Lorenzo Ferrari|EDJNet.

6. Finally, the authors of the article tried to combine these different parameters into an index, “rescaling the number of connections per 100 km of each country’s borders by assigning value 100 to the maximum; then adding the result to the value obtained through the same rescaling procedure applied to the number of connections per million inhabitants. This index thus accounts for both the number of connections per 100 km and per million inhabitants. The results demonstrate once again that central European countries (Austria, Slovakia and Slovenia in particular) are extremely well connected with foreign countries. The more peripheral countries remain at the bottom of the list, even though in some cases the length of their borders and/or the number of inhabitants are far from negligible.”<sup>6</sup>

<sup>6</sup> [www.europeandatajournalism.eu/eng/News/Data-news/Four-ways-of-looking-at-European-cross-border-rail-links](http://www.europeandatajournalism.eu/eng/News/Data-news/Four-ways-of-looking-at-European-cross-border-rail-links).

Figure VI  
**Cross-border rail connectivity**  
0 = minimum connectivity, 200 = maximum connectivity

0  120



*Source:* Gianluca de Feo and Lorenzo Ferrari|EDJNet.

### III. Conclusions

7. Many connections already exist between a subset of European countries. It is important that work is done to enhance the effectiveness of these international hubs to ensure that connections increase and passenger numbers rise.