The future of cross-border rail

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As the European Union wants to reduce carbon emissions in transport, shifting transport from trucks and planes to trains plays a crucial role in the strategy. But because rules and technical standards are different across the EU, country borders still constitute a burden for many railway operations.
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Railways systems in Europe vary significantly across the EU, adding to the challenge of transporting goods across the single market. Historically, train systems developed nationally, but harmonising them is crucial to shift more transport to rail, the head of the EU Railway Agency told EURACTIV.

Josef Doppelbauer is the executive director of the European Union Agency for Railways (ERA), the body in charge of reducing technical barriers between national railway systems across Europe.

You said that trains are the greenest way of transportation. Could you elaborate on why that is?

It’s simply by counting the emissions that you have per transport unit. By passenger kilometre or per tonne-kilometre, rail is at least five times better than road and even better than aviation.

But there are other aspects. You are less intrusive because you need much less space for a railway line than for a motorway. If you want to have a motorway with the same capacity as a railway line, you need a very, very big strip of land, and you have noise and pollution associated with it.

So undoubtedly, rail is the most sustainable mode of transport because most of the rail is already electrified. Eighty per cent of the rail transport in Europe is already running on electrical energy.

But when trucks, for instance, also electrify, will that change the calculation?

It will change the calculation in terms of the emissions, but it will not change the calculation in terms of the energy because per tonne that is transported, a truck needs 10 times more. The energy needs to come from somewhere.

We don’t have enough electricity to convert all the current combustion engines into electrical engines. At least 25% more electrical energy will be needed. And we don’t have any idea...
where this electrical energy should come from.

Your agency recently published a report on cross-border railways. We have 30 years of the European single market, so a lot of goods moving across borders. Why is it that the regulation is still so fragmented for the railway system?

That is exactly the problem. We have a lot of cross-border transport because we have a single market, but unfortunately, the market share of rail for cross-border freight transport is only half of the market share of freight rail globally. So this is where the huge potential is. And if we don't solve the cross-border issue, this has a negative impact on the rest as well.

The problem is that railway systems were historically built as national systems, and they are still managed from the capitals. And from a Paris perspective, they don't even know where “Aulnoye-Aymeries” [a recently closed cross-border railway connection between Belgium and France] is. For them, this is not relevant, and the political lobby behind those regions is not strong enough.

The report talks about “technical specificities for interoperability” (TSIs) so there seem to be at least some European standards. For someone who is new to this topic, could you explain what this is?

Historically, there have been national standards for railways. Take the track gauge. It has been a long process to harmonise the standard gauge.

It started in England in the 19th century, and then it took almost 50 years in England to harmonise. Now national rules have been developed. So a French system of railway rules, a Belgium, Dutch, and a German one.

But when you want to run services across borders, you need a common standard. This is where the technical specification for interoperability comes into place.

These were started originally for high-speed trains. Then in 2014, it was extended to the entire railway system, and now we are cleaning up the national rules so that in the end we have just a set of European rules which have the status of regulation, meaning they are directly applicable in each member state.

But if I understand you correctly, you want a revision of those. So they don't cover everything?

Currently, there are still many open points in those TSIs. If there is an open point, the member state has the right to make a national rule. And then we have special cases.

Even in the TSIs, for instance, it is mentioned that in Germany you can have a platform height of 96 centimetres. So we want both to close the open points and to reduce the number of special cases. But we also need to grow with the technologies. Digital aspects need to be covered in the TSIs as well.

One of the examples the report looks at is the Brenner connection between Austria and Italy. There are several factors that contribute to time loss, one of which is 20 minutes lost due to “braking rules and documents”. Could you explain what is happening there?

When you start the locomotive, you need to enter the parameters for the brake. The point is that the rules for brake parameters are different in Germany and Austria and Italy.

So, when you come to the border, you have to stop. You have to enter new parameters, you have to check that these are working. By that, you have the time loss. You never do this with your car. When you drive with your car across the border, you don't change the setup of your car.

Then there are 30 minutes for additional “technical checks”. Do you want to reduce that to zero?

Yes, because it should be sufficient to make sure that the train is working properly on departure. A train normally doesn't change when it runs for 50 kilometres, and you have to recheck it again, and then after 50 kilometres, again.

So currently, most trains from Germany to Italy are checked twice at two different borders?

Correct.

The report focuses a lot on time losses at the border, but it also says that railway systems are often used for less time-critical goods. So what role does time play compared to other factors that contribute to the decision on the mode of transport?

I believe there are three aspects. Time is money because if you take six hours more, you need to pay your drivers, your personnel more.

But another critical issue is unpredictability, because one day it takes four hours, and the other day it takes eight hours. So on average, it takes six, but you don't know when your train arrives and in some industries, you need just-in-time planning.

So, even though you have goods that are not time critical, if your arrival time is not predictable, then this is problematic. So it’s time, costs, and the unreliability.
While shifting from road to rail is crucial for reaching the EU’s climate objectives in transport, borders between member states are a burden for many train operators, particularly freight transport, a report by the EU Agency for Railways warns.

With lower carbon emissions and less energy demand per kilometre than other forms of transport, such as trucks, trains are the “most sustainable mode of transport”, according to a report by the European Union Agency for Railways (ERA) that was presented in Brussels on Monday (12 December).

However, while trucks and planes can easily cross borders within the EU’s single market, trains often face technical barriers, forcing them to stop at the border and adjust to different rules or infrastructure requirements.

At some borders, this can result in a time loss of up to nine hours, the report states, creating an obstacle for the shift to transporting freight by trains instead of trucks and planes.

The EU’s target for 2030 is to have 30% of all freight transported by train, but so far, there has not been any progress on this, says Josef Doppelbauer, the ERA’s executive director.

“The actual modal share [share of transport via train as part of overall freight transport] remains stable at around or below 18%,” he said. “And if we look carefully, we can even see that in the last
couple of years, the modal share went down”.

“So this should show you the urgency of the action. The longer we wait with actions to increase the modal share, the more difficult it gets,” he added.

**Borders are still a barrier for trains**

The ERA stresses the importance of removing technical barriers at border crossings to improve the attractiveness of trains compared to other transport modes.

Looking at four case studies, two of which focus on freight transport, they calculated how much time is lost at the border due to technical checks.

At the border between Austria and Italy, for instance, at the famous Brenner Pass near Innsbruck, 50 minutes are lost due to required technical checks and manually adapting brakes to slightly different rules in Italy and Austria, respectively.

At the border between Romania and Bulgaria, the report says that between six and nine hours could be saved by reducing technical checks at the border, which are needed due to national legislation and fixing other technical issues.

“The objective is, of course, to reduce this time lost to zero,” Doppelbauer said, to reach a “seamless drive-through”.

Instead of requiring technical checks at the border, brakes could, for instance, be checked before the train’s departure and after arriving at the final destination.

For the European Commission, harmonising train rules within the EU is not only about saving time at border crossings but also making it easier to start new railway services.

“Technical barriers matter,” said Keir Fitch, who heads the unit for rail safety and interoperability at the European Commission, speaking at the same panel as Doppelbauer.

Differences in technical specificities between member states often means that to start operating on a specific route, new trains have to be ordered, which are specifically modified for the countries they pass through.

This “also means that setting up any new service is a much greater risk,” Fitch explained.

“And that fundamentally is what we are trying to address by all this rather technical sounding of ‘getting rid of national rules’. It’s about making sure you can use your railway equipment flexibly and cheaply across Europe,” he added.

**Commission, blogger clash over passenger transport**

Borders are not only an issue for freight transport. Passenger trains also face challenges when crossing borders, says Jon Worth, a blogger who travelled every EU border with a railway connection during the summer of 2022.

In Worth’s view, this is not only a question of infrastructure.

“I hear from railway lobbyists all the time: ‘we need more investment in infrastructure’,” he said. “In some parts of Europe, we do.”

“But there are other parts of Europe where we have infrastructure […] which is impeccable but is actually chronically underused,” he added, referring to regional cross-border trains operating only one or two times per day without offering any flexibility to travel at a different time when plans change.

In instances like this, he would also like to see the Commission step in and organise negotiations between neighbouring regions across countries, Worth said.

But Fitch warns that this would overburden the EU executive.

“The Commission has about 30 people working on railway policy. So we cannot go solve every problem around Europe. We have to put in place the basic policy and then push the member states to deliver on their commitments on climate,” he said.

For Worth, this is not a satisfactory response.

“[EU transport Commissioner Adina] Vălean and the Commission think it’s too small, too detailed neatly on the ground to want to get the hang of it and deal with it. And so, ultimately, no one deals with it,” he said.

But “that type of problem is replicated all over Europe,” Worth stressed, referring to a recently closed regional train connection between Belgium and France and other regional connections between Latvia and Lithuania and Poland and Slovakia.

“One of the things I would like the European Union to do would be to make an annual index of cross-border rail,” Worth said. This should rate every border across the EU on whether railway services have improved, worsened or remained the same, he explained.

“Only when we know that, we can start to put some of those difficulties right,” he said.
ERA proposes solutions and emphasises the need for further reduction of the national rules, and further adaptation of the Technical Specifications for Interoperability (TSIs) to facilitate harmonisation across EuropERA – European Union Agency for Railways.

With less GHG emission, energy consumption, and external costs as compared to road, rail is set to play a crucial role in reaching the EU’s climate objectives. However, the market share of European rail traffic has increased very little over the last decade. The relative share of people and goods transported by railways, as compared with other modes of transport, has stagnated at around 8% for passengers, and around 16% for freight. International rail traffic is significant only for freight services (accounting for slightly more than 50% of total rail freight traffic) and appears to account for quite a small proportion only of passenger services (around 6%). These figures have been largely stable since 2006, suggesting that the EU is far from achieving its ambitions in this area.

The EU’s target for 2030 is to have 30% of all freight transported by train, but so far, there has not been any progress on this; in the last couple of years, the modal share went even down. This clearly indicates the need for urgent...
action; the longer we wait, the more difficult will be to reach the desired modal share in time.

Immediate action is therefore needed to remove barriers to cross-border rail transport – both for passenger and freight – in order to finally see the rail modal share growth. As a European authority, ERA will make its contribution by further reducing national rules, improving European Technical Specifications for Interoperability (TSIs), supporting regulation to improve cross-border coordination (TEN-T revision), and strictly applying EU regulation as a system authority for vehicle authorization, safety certification, and ERTMS trackside approval. However, this alone will not cut the cake. A multifaceted, EU-level approach would be needed to facilitate targeted investments with a focus on missing links at border crossings across Europe.

The Cross-Border Rail Transport Potential Report by the European Union Agency for Railways (ERA) indicates that, although the interoperability of the EU railway system is improving, technical and operational barriers at cross-borders still hamper the seamlessness of international rail connections and the modal shift to rail. The report assesses how the further removal of technical and operational barriers at European cross-border sections would contribute to the attractiveness and competitiveness of rail transport, showing a substantial potential for time savings.

The study is a factual analysis of four cross-border sections, two for passengers and two for freight rail:

- Rail passenger connection Vienna (Austria) – Győr (Hungary)
- Rail passenger connection Berlin (Germany) and Kostrzyn (Poland)
- Freight rail cross-border section Brennero (Italy) – Staatsgrenze nächst Steinach in Tirol (Austria)
- Freight rail cross-border section Giurgiu Nord (Romania) – Ruse Razpredel (Bulgaria).

The analyses present an in-depth view of the literature and collected data. The cases on cross-border passenger transport build primarily on qualitative inputs, including observations on international high-speed rail connections. The two case studies focusing on freight provide a quantitative evaluation of the impacts of technical and operational barriers on travel time, which in turn adversely affect rail volumes and modal split. Several technical and operational barriers to interoperability hampering international rail freight traffic are considered, such as for example:

- The use of braking sheets with different layouts and contents, or the setting of different requirements for braking performance (notably the braking percentages) and braking calculations (with RUs required to switch braking regimes at border crossings even if the train composition does not change).
- Member States’ national rules require (technical and mandatory) checks to be performed at border stations, at regular distances, and/or at time intervals.
- National requirements concerning the train composition might lead to unnecessary shunting at border stations, like the requirement that the last wagon of a train is equipped with a handbrake.

The report also specifies some study limitations which should be taken into account to handle and interpret with care the results presented, such as the focus only on the removal of technical and operational barriers without considering the possible spill-over effects emerging from more measures adopted simultaneously or a rough estimation of the potential growth in demand based only on time elasticities which are not fully exhaustive. Follow-up studies/analyses would be highly beneficial for fine-tuning the findings and/or for focusing more deeply on specific aspects.

Based on the findings of the study, ERA proposes solutions and emphasises the need for further reduction of the national rules, and further adaptation of the Technical Specifications for Interoperability (TSIs) to facilitate harmonisation across Europe. ERA considers that TSIs can further contribute to lowering some barriers by closing open points and by reducing, where appropriate, specific cases. Doing so would improve the prospects of rail transport in general and international rail transport in particular. In many cases, these improvements can be achieved in the short to medium term over the next years, with comparatively little financial investment.