Long-distance cross-border passenger rail services

Executive Summary

Study Contract

MOVE/2020/OP/0013

Written by Steer and KCW
October - 2021

EUROPEAN COMMISSION

Directorate-General for Mobility and Transport
Directorate C - Land
Unit C3 – Single European Rail Area

Contact: Maurizio Castelletti (Head of Unit), Nino Zambara (Policy Officer)

E-mail: *maurizio.castelletti@ec.europa.eu*
nino.zambara@ec.europa.eu

European Commission
B-1049 Brussels

EUROPEAN COMMISSION

Long-distance cross-border passenger rail services

Executive Summary

Study Contract

MOVE/2020/OP/0013

Directorate-General for Mobility and Transport
Study contract

Europe Direct is a service to help you find answers to your questions about the European Union.

Freephone number (*)**:**

00 800 6 7 8 9 10 11

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Luxembourg: Publications Office of the European Union, 2021

ISBN: 978-92-76-46045-9
doi: 10.2832/567817

EXECUTIVE SUMMARY

Overview

The European Green Deal includes a commitment for Europe to be the first climate-neutral continent by 2050. In December 2020, the Commission published its Sustainable and Smart Mobility Strategy, which identified a need for decisive action to shift more activity towards more sustainable transport modes, notably increasing the number of passengers travelling by rail. The European Parliament has asked the Commission to assess how cross-border night train services can be promoted.

The Commission has therefore commissioned this study to provide further insights into long-distance cross-border rail services, obstacles to the establishment, operation and greater use of rail services, and potential actions to remove these obstacles.

Long-distance cross-border rail since 2001

The total number of long-distance cross-border rail services in the study area, the EU, Norway, Switzerland and the United Kingdom, appears to have changed little since 2001, with around 4,500 train pairs per week, but within this total there have been two major changes:

- There was a pronounced shift from night trains (down 65%) to high-speed trains (up 95%), which may have made some journeys too brief by day for a dedicated night train to remain viable.
- The number of routes served has declined, with a focus on more frequent services on core routes, which have less splitting and joining of trains to serve two or more destinations.

Cross-border travel within the study area by public transport immediately before the COVID-19 pandemic was mainly by air, with rail and coach only carrying around 10% of public transport passengers each. Only 6-7% of total passenger journeys and passenger-kilometres involve crossing one or more borders. Only a proportion of these cross-border rail passenger journeys are on long-distance services, and only a small proportion of those on long-distance cross-border services are on night trains.

The data available suggests that the rate of growth of long-distance cross-border passenger numbers may be slowing, from around 2.1% per annum from 2005 to 2010 to a forecast 1.6% per annum for the period 2020 to 2030.

Since 2001, railway undertakings have adopted several new commercial models. Many of them face competitive pressures to reduce costs, and some have adopted elements of the approaches used by low-cost airlines. However, there appears to be only limited scope to introduce low-cost rail services, particularly given the importance of en-route infrastructure charges in the costs of rail operations, especially on high-speed lines.

Long-distance cross-border rail market potential

The study has been carried out during the COVID-19 pandemic, which has affected both services and demand since early 2020, and may result in lasting changes in demand, particularly for cross-border business travel. Nonetheless, during 2021:

- National railways, competent transport authorities and commercial operators have put forward proposals for new commercial and PSO cross-border night

trains on several routes, although not all of the routes announced during 2021 have yet begun operations.
- Member States have put forward proposals for new cross-border day trains including, in May 2021, a "TEE 2.0" network of long-distance cross-border services and coordination of Europe's rail services as a "Europatakt" regular interval timetable.

Where possible, these emerging proposals have been taken into account in this study.

Meanwhile, passenger attitudes to rail and to other modes continue to evolve, and some governments have introduced initiatives to ban or restrict short domestic flights.

For **long-distance cross-border night trains**, little information is available on existing passenger numbers, revenue or profitability, but good information exists on cross-border air connections on which rail could, in principle, successfully compete. We found 8 existing proposals for new night train services, all of which parallel dense air flows. We identified a further 16-17 potential origin-destination pairs where there might be sufficient demand to support a night train, and assumed that they could be combined into a fictive network of 11 routes. These 11 additional routes could require 170-250 couchette and sleeping cars and cost €90-135 million per annum to operate, but we estimate that they might attract a further 2-5 million passengers per year to rail. If operated daily, they would restore one-fifth of the volume of night trains lost since 2001.

We are aware that more potential routes for night trains may emerge if demand grows, for example due to changing passenger attitudes. However, the introduction of a larger number of new night train services might prove to be difficult without either additional capacity, or reallocation of existing capacity, in many city centre stations, as discussed below. In this situation, the obstacle of **commercial, economic, social and environmental viability** may be superseded by an obstacle of **infrastructure capacity and capacity allocation.**

For **long-distance cross-border day trains**, it is more difficult to estimate what additional services might be viable, partly because of the lack of passenger data, and partly because proposals for new services have emerged and been withdrawn as the study has progressed. We estimated that 27 new long-distance cross-border train pairs might attract an additional 1 million cross-border passengers. Depending on whether these were additional to existing services, rather than existing services joined together to create cross-border routes, they could require up to 400-500 vehicles, mainly in 7-10 car high-speed train sets, and cost up to €0.5 billion per annum to operate.

The **financial viability** of these services will vary. Over any distance, sleeping accommodation on night trains appears to cost more to provide than seats on aircraft, coaches and other trains. Over short distances, seats in conventional-speed trains operating by day or night can cost less to provide than some air services. There is insufficient data on passenger demand to estimate which new services could generate sufficient net passenger revenue to cover their costs and which would require PSO support.

Higher prices for carbon-based fuels, or higher taxes on them at the global, European or national level, would negatively impact the costs of other modes. Conversely, rail can be subsidised in recognition of its potential environmental benefits relative to other modes, considering its high level of electrification. We note that changes to taxation or subsidy of different fuels and different transport modes are being considered as policy measures at the European level and in many states.

Obstacles to long-distance cross-border rail

While there is uncertainty in the scope for, and cost and viability of, long-distance cross-border rail services, there was broad consensus among the stakeholders we contacted on the range of obstacles to their expansion.

Infrastructure charges vary widely, and in many cases are much higher than "the cost that is directly incurred as a result of operating the train service". The legislative framework only permits charging more than this cost where it does not "exclude the use of infrastructure by market segments which can pay" it. However, many stakeholders said that services which could be operated commercially are excluded by charges which are more than they can pay. At present, infrastructure managers are permitted to set higher charges for cross-border services than for domestic services. High charges act as a barrier to entry and can leave expensive infrastructure capacity unused. Lower infrastructure charges would not necessarily result in lower fares, but could attract new entrants and price competition, at least where regulatory bodies did not decide that they would compromise the economic equilibrium of one or more PSO services.

Infrastructure capacity depends on the configuration of the network, the speed and stopping pattern of each rail service, whether they need to operate at regular intervals, how they are timetabled around each other, and whether there is a need to provide connections between them. Changes planned by 2030 may increase rail connections, speeds or capacity, but this does not mean that suitable capacity will be available for any particular proposed long-distance cross-border service. Constraints at many city centre stations may limit the scope to operate additional long-distance cross-border trains, and particularly night trains which typically arrive in the morning commuter peak. In addition, night trains, or individual stops on night train routes, may also cease to be viable where new links and high-speed lines offer such short journey times by day that there is too little remaining demand for travel overnight. In some cases, infrastructure capacity may be available at one to two years' notice, but in others, capacity enhancements may take a decade or more. Where capacity is constrained, domestic PSO services are often prioritised ahead of long-distance cross-border services.

Rolling stock will also be needed to operate additional cross-border services, and lack of suitable rolling stock is an obstacle to introducing them. For night trains, around 1,500 couchette and sleeping cars exist, but second hand stock may be in poor condition or otherwise unattractive to passengers, and few new vehicles have recently been ordered. It can be difficult to raise finance to buy more new rolling stock to provide services in a new market. In contrast, airlines and coach operators can use leased aircraft or coaches to test new routes for short periods and, if these are not successful, return them or try elsewhere.

Ticketing systems are necessary for passengers to research travel, to buy tickets and to make reservations, and to provide evidence to railway undertakings that passengers are entitled to travel on their services. Railway undertakings and ticket vendors cannot always sell end-to-end long-distance cross-border journeys to passengers, or enable them to book successive railway services operated by one or several railway undertakings. In some cases, a passenger can buy a single ticket valid on any combination of trains, by any mix of railway undertakings, between any two stations. In other cases, booking successive railway services operated by railway undertakings in the same group requires two transactions. This is partly a reflection of the tension between integration and competition. Ticket vendors can often sell two or more fares as a single transaction, but only railway undertakings and competent transport authorities can create fares for connecting services, where there is sufficient market demand to do so, and where permitted by competition authorities.

In principle, a long-distance cross-border journey on the services of two or more operators can be offered for a market-priced end-to-end fare which is less than the sum of their separate fares. In practice, the end-to-end fare is sometimes more than the cheapest combination of separate fares. In addition, most long-distance cross-border markets may be too small for it to be worth one or more operators setting and sharing a special end-to-end fare.

Passenger rights in relation to successive railway services operated by one or more railway undertakings are technically complex. The new rail passenger rights Regulation (EU) 2021/782 creates requirements to offer through-tickets, and rights for passengers who hold them, but some stakeholders have noted that through-tickets can be more expensive than a combination of tickets offered at special fares, making them less attractive to passengers.

In 2018, less than 80% of EU27 long-distance and high-speed passenger services were operated and arrived less than five minutes late. Passengers making journeys requiring changes of train are often concerned at what will happen if, for whatever reason, they fail to make the connection onto one or more of the trains on which they intended, or are booked, to travel. Railway systems often do not allow railway undertakings to identify passengers holding tickets for connecting journeys, or to hold connections for passengers whose train is delayed. Delaying departures can disrupt services, and result in missed or broken connections for other passengers.

It is legally and technically complex to link separate tickets including season tickets, smartcards, Pay As You Go (PAYG) and other new technologies into a single contract, and then to assign liability for missed connections. Even if one party were made liable, many trains and stations have no passenger-facing staff, and many passengers must use their own initiative to deal with a missed connection.

Passengers may base their expectations on their perception of air travel, but all airports have passenger-facing staff who can provide assistance, all airlines have the name of every passenger and know whether they and their baggage are on board but not all airlines offer connections as a single transaction, ticket, contract and fare.

There has been extensive investment in railway infrastructure and rolling stock to reduce journey times, but the benefits may be lost for connecting passengers who, for whatever reason, fail to complete a connection and reach their destination later than expected and, in some cases, after additional expense and inconvenience. Railway undertakings cannot realistically operate a service in which no trains ever arrive late. However, the stress and risk of changing trains could be reduced by giving passengers clearer information on minimum connecting times within and between stations, and wider provision for passengers to specify longer connecting times.

Unless the punctuality and reliability of rail services reaches much higher levels, the most effective way to improve passengers' experience of, and confidence in, connections may be clearer information on minimum connecting times within and between stations, and wider functionality in journey planners and ticketing and reservation systems for passengers to specify longer connecting times.

PSOs for cross-border services which are not or could not be delivered commercially could in principle specify the entire service on a consistent basis, with railway undertakings receiving support for a PSO package service, with cross-subsidy between profitable and unprofitable seasons, days, times of day and station calls, but there are significant barriers to doing so. Many existing PSOs have been awarded directly, but from December 2023 they will have to be tendered competitively by competent authorities. Many competent authorities are constrained by the powers granted to them in national, regional and local legislation, and are often subject to democratic control of where and how they spend their resources. Competent authorities wishing to specify a PSO for a cross-border service may need to deal with

local consultation and administrative processes operating in different timescales, in different locations, in two or more languages. Competent authorities may not provide PSO support on sections of route served by commercial services, or near or across borders. Some competent authorities favour gross cost contracts and others favour net cost contracts, in some cases explicitly combining loss-making services with profitable ones which cross-subsidise them. This creates a need for agreed processes to allocate costs and revenues to particular services, competent authorities or railway undertakings.

Technical, operational and safety obstacles to cross-border operations remain. Differences in electrification systems can be dealt with by multi-system locomotives and trains, but there is a limit to the number of different systems that can be accommodated within a locomotive or fixed-formation train set. Differences in track and structure gauge can be managed with stock with gauge-changing equipment and smaller dimensions, and standard gauge high-speed lines are extending into Spain, with the Iberian gauge, and the Baltic states, with the Russian gauge. Many other technical differences are being addressed through Technical Specifications for Interoperability (TSIs), but in some cases existing assets, systems and procedures can only be made compliant when they become due for renewal. However, the European Train Control System (ETCS), intended to be a single common system, in the short term can act as an additional system which is required for only a short part of a journey. A trend to fixed-formation trains, with a wide variety of incompatible coupling and other systems, and different technical requirements on each network, can make it increasingly difficult for a single train to be split into portions to different destinations.

European railway policy has emphasised a level playing field for access and charges based on costs directly incurred, but in practice permits prioritisation and different infrastructure charges for different market segments, even if they impose the same costs. Increasing congestion undermines the vision of new entrants requesting capacity and starting services in the timetable 12-18 months later. The timetable operated at points where the network is congested or constrained is often planned many years in advance, particularly where investment to address congestion has been justified by a commitment to specific PSO services. Many networks, including the largest, in Germany, are moving to regular interval, clockface or "Takt" timetables, in which a future timetable is designed by consensus and then the infrastructure and trains needed to operate it are built. The "Takt" approach of centralised long-term planning can, depending on the levels of capacity utilisation which are planned, make it difficult to make major changes or to accommodate new entry at short notice.

Potential measures to remove obstacles

The table below lists current practice or potential measures to address these obstacles.

Obstacle	Practice or potential measure	
Infrastructure charges	Ensure that infrastructure charges are set at the cost directly incurred	IC1
	Fix charges for a relevant period, with increases phased	IC2
	Compensate railway undertakings which cannot operate services due to works or closures	IC3
	Analyse the ability of cross-border services to bear mark-ups taking into consideration their competition with other modes of transport as well as their competition with domestic services	IC4
	Wider reform of infrastructure charging with the objective of meeting economy-wide climate neutrality	IC5
Capacity and capacity allocation	Where necessary, plan infrastructure to deliver regular interval (clockface or Takt) timetables	CA1
	Ensure further implementation of the European Train Control System (ETCS)	CA2
	Explicitly permit capacity allocation to be based on social or environmental value	CA3
	Offer more framework agreements for long-distance cross-border services	CA4
	Complete and refine the international Timetabling Process (TTR)	CA5
	Develop hubs for long-distance cross-border trains	CA6
	Wider reform of the allocation of railway infrastructure capacity with the objective of meeting climate neutrality	CA7
Rolling stock	Require that unused stock be offered for auction	RS1
	Public sector guarantees to limit risks to leasing companies	RS2
	Ensure non-discrimination in rolling stock leasing prices	RS3
	Consider wider EU and/or EIB co-financing of cross-border rolling stock	RS4
Ticketing and rights for connecting	Encourage access to sell railway undertakings' tickets on fair, reasonable and non-discriminatory (FRAND) principles, including through Open Sales and Distribution Model (OSDM)	TP1

Obstacle	Practice or potential measure	
passengers	Define and publish minimum connecting times within and between stations	TP2
	Offer passengers the option to request longer connecting times	TP3
	Use, refine or extend the Agreement on Journey Continuation (AJC) to ensure that industry assists and re-routes passengers as much as possible	TP4
	Record and publish delays and their attribution to causes and parties	TP5
	Revise Regulation (EU) 2021/782 on rail passenger rights to ensure journey connection, easy booking and lower prices and promotions resulting therefrom	TP6
	Reform the regulatory framework for passenger rights for all modes	TP7
Creating cross-border PSOs	Use PSOs for long-distance cross-border services to improve financeability	PS1
	Ensure that long-distance cross-border PSO services are specified in full	PS2
	Provide start-up funding support for new long-distance cross-border services	PS3
Data collection, reporting and monitoring	Extend reporting requirements, for example to RMMS	DA1
	Create an open industry database of ticket sales	DA2
Other proposals	Wider reform of transport taxation, such as through the Delivering the European Green Deal package, with the objective of meeting climate neutrality	OP1

Source: Steer. For further details see Chapter **Error! Reference source not found.**.

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: https://europa.eu/european-union/contact_en

On the phone or by email

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

– by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),

– at the following standard number: +32 22999696, or

– by email via: https://europa.eu/european-union/contact_en

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: https://europa.eu/european-union/index_en

EU publications

You can download or order free and priced EU publications from: https://publications.europa.eu/en/publications. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see https://europa.eu/european-union/contact_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1952 in all the official language versions, go to EUR-Lex at: http://eur-lex.europa.eu

Open data from the EU

The EU Open Data Portal (http://data.europa.eu/euodp/en) provides access to datasets from the EU. Data can be downloaded and reused for free, for both commercial and non-commercial purposes.

MI-07-21-133-EN-N

ISBN : 978-92-76-46045-9

doi: 10.2832/567817