

FUTURE RAIL Missing Links

How to restore Europe's missing border links

SIMON MAARFIELD MSC

Transport Planning & Policy,
KCW GmbH, Berlin

Ever fewer direct connections, rapidly disappearing night trains and routes that have lost all their passenger services. No trains between the capital cities of neighbouring Baltic countries, poor connections on the French-Spanish frontier and long detours to cross the Slovak border by rail, to name but a few issues. Yes, the picture with regard to cross-border passenger train services in Europe really does look bleak.

This negative outlook has sparked several initiatives to raise awareness of the situation and to seek improvements, not least the 'Missing Links' campaign in 2015 promoted by the Greens/European Free Alliance group in the European Parliament. This was spearheaded by the former Chairman of the Transport & Tourism Committee, Michael Cramer MEP.

The campaign, largely directed at the European Commission, examined 98 dismantled or otherwise closed regional cross-border routes, singling out 15 as potential candidates for reactivation. The campaigners believed these would represent both much better value for money and offer greater potential for social cohesion than TEN-T level mega-projects. These routes were subsequently reviewed in *State of Play of Cross-Border Railway Sections in Europe*, a report published by the Directorate-General for Mobility & Transport in 2016.

Until recently, however, there had been no comprehensive assessment of



Photo: Simon Maarfield

A study for the European Commission finds that reinstating international services across borders may not be as difficult or as expensive as previously thought.

A cross-border service to Wien and Payerbach-Reichenau calls at Břeclav in the Czech Republic. As well as regional operations, the station is also served by long-distance EuroCity, Railjet, RegioJet and night trains.

Fig 1. The study divided Europe's 365 rail border crossings into operational and non-operational. Only 156 carried regular passenger services in the 2017 timetable.

the status of all current and former rail border crossings within the EU and EFTA. With pressure on the European Commission growing, in spring 2017 the Directorate-General for Regional & Urban Policy commissioned a study from KCW and its project partners: *Comprehensive Analysis of the Existing Cross-Border Rail Transport Connections and Missing Links on the Internal EU Borders*. The rest of this article discusses work carried out as part of the study, highlights its findings and analyses its recommendations for action.

Scope of work

The study covered the 26 EU member states with rail networks plus Liechtenstein, Norway and Switzerland. It was carried out between summer 2017

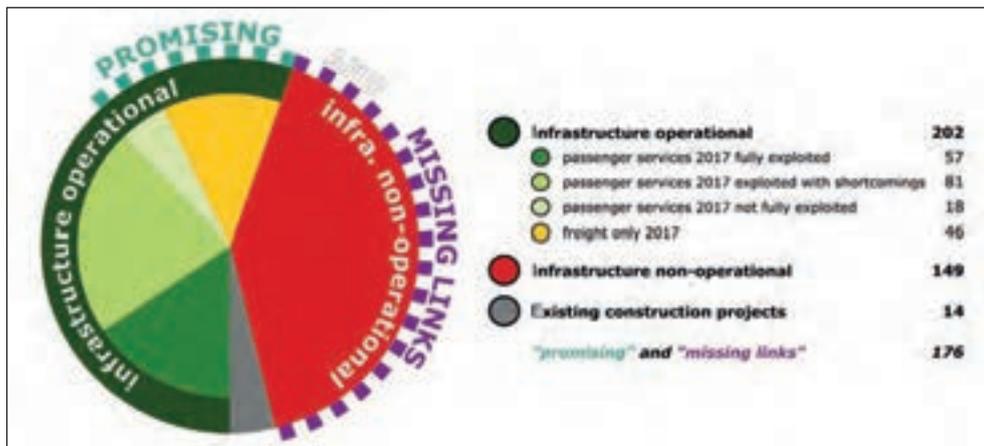
and spring 2018 and has since been published by the EU Commission.¹ It is divided into three parts:

- the preparation of an inventory of all existing and former cross-border railway lines between the EU and EFTA member states, including their classification as *Missing Links* (railway border crossings where the infrastructure is no longer operational) or *Promising Links* (inadequately served infrastructure);
- analysis of possible new services on *Missing Links* and *Promising Links* in relation to potential demand, economic feasibility and political interest, leading to a shortlist of the *Potentially Most Beneficial Projects* for further detailed examination;
- the formulation of broader policy recommendations.

Cross-border lines classified

The first part of the study documented a total of 365 railway border crossings which, based on the 2017 passenger timetable and local sources with regard to freight traffic, were classified as shown in Fig 1. The crossings and their broad classifications are shown on the map in Fig 2.

In 2017 there were 156 border crossings with regular passenger services, representing 43% of the total or 77% of operational lines. However, when the quality of passenger services relative to the importance of the route was examined, only 57 routes were deemed to



have an adequate level of service, classified as *Fully Exploited*.

A further 81 routes were classified as *Exploited with Shortcomings*, meaning that either speed or service frequency were inadequate. Another 18 routes were designated *Not Fully Exploited*, indicating that both speed and frequency were of such a low standard that services were unattractive and potential demand was unlikely to be satisfied. Freight-only and *Not Fully Exploited* border crossings were then classified as *Promising Links* for further analysis.

These figures led to the first major finding of the study, namely that missing infrastructure is not the only reason for a lack of passenger services. Almost a quarter of the operational lines are freight-only, while about one-third have extremely poor or no regular passenger services.

Adding in those lines classified as exploited with shortcomings, 72% of the operational routes could be described as having an inadequate level of service. This may well be an underestimate, as the study did not differentiate between cross-border routes served by through trains and those with trains that start or end at a border station. Forcing cross-border passengers to change trains reduces the attractiveness of rail

substantially, a situation that has been exacerbated by the substitution of long-distance international services by regional trains that end at the border. Examples include the border between Austria and the Czech Republic at České Velenice, Lichkov on the Czech-Polish border and Forst on the border between Germany and Poland.

All this suggests that significant improvements to cross-border connectivity by rail may well be possible without major infrastructure investment. Taking one example, only two of nine operational routes between Hungary and Slovakia carried passenger services in 2017, despite historic close ties between the countries and the significant Hungarian-speaking population in southern Slovakia.

A total of 176 *Missing Links* and *Promising Links* were identified for subsequent analysis in the second step of the study. The inventory also shows that 143 of these do not lie on the TEN-T Network, to which the EU's rail funding has so far been almost entirely focused.

Fact sheets, including maps and information on the history, ownership, operational status, technical data and bodies responsible for procuring passenger services, were produced for all border crossings other than those classified as redundant.²

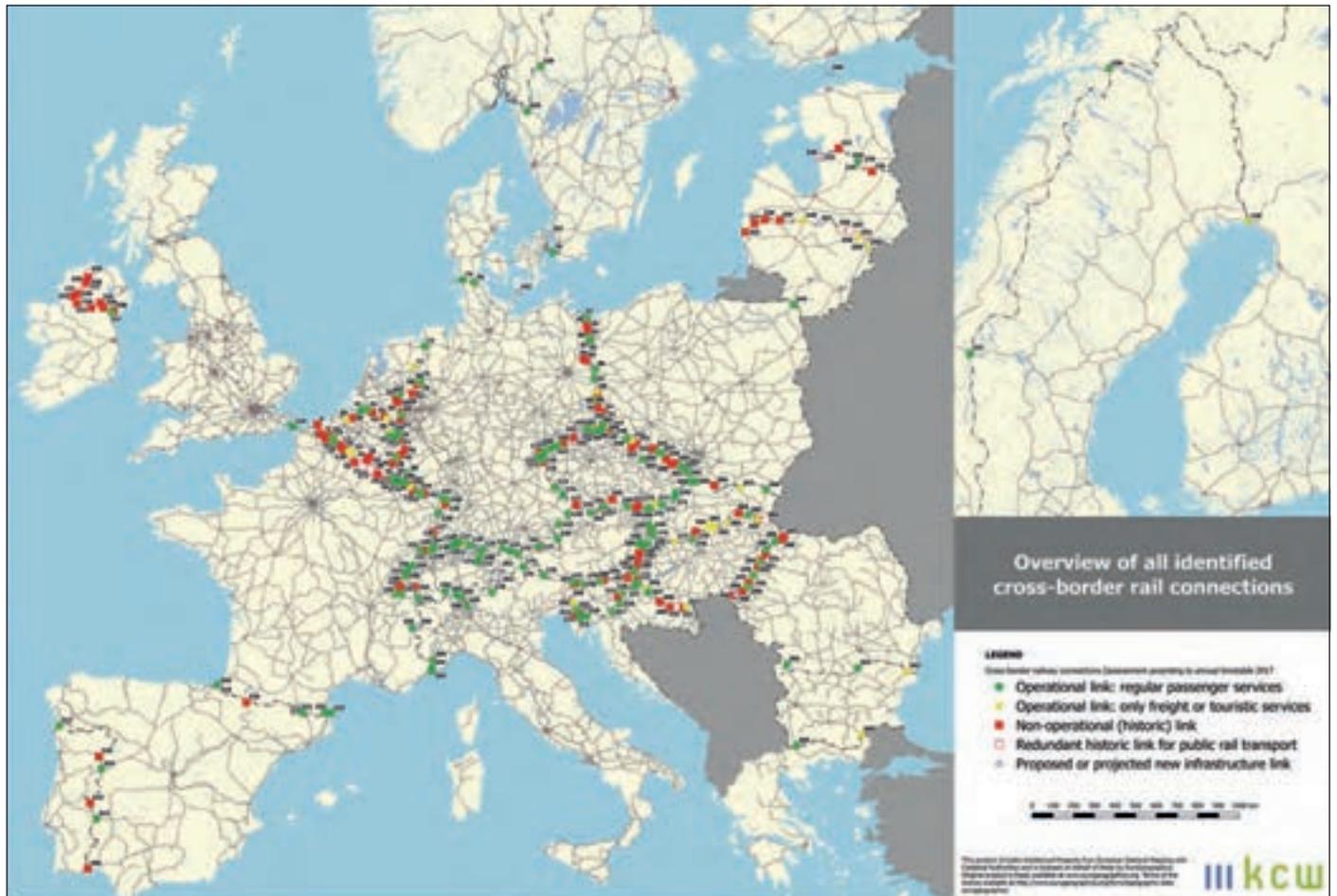
Possible new services

In the second part of the study, the classic four-step demand forecasting model was used to construct a pan-European origin-destination matrix of potential rail demand. This was then assigned to each border crossing with passenger services on a 'theoretically fastest route' basis. *Missing Links* and freight-only lines were then individually 'opened' within the model to estimate potential demand. These estimates were then compared with regionally differentiated threshold levels of minimum demand to warrant reactivation or improvement. If a route met or exceeded the threshold, it was shortlisted for further analysis.

The 38 routes in the initial shortlist were then assessed as follows:

- an outline passenger service concept was developed on the basis of estimated demand potential and typical regional service standards, exploiting synergies with existing services and rolling stock utilisation wherever possible;
- infrastructure requirements to enable operation of the proposed service were examined and costed by KCW's project partner Royal HaskoningDHV;
- annual operating costs and farebox revenues were estimated, excluding

Fig 2. This map shows the location of Europe's rail border crossings and their classification according to the study.



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ALPINE INITIATIVE

MI.CO.TRA points the way

Following the withdrawal of all daytime passenger trains between Villach in Austria and Udine in Italy in December 2009, the Italian autonomous region of Friuli-Venezia Giulia launched the MI.CO.TRA project in 2012 with the aim of re-establishing passenger services. MI.CO.TRA stands for *Miglioramento dei COLlegamenti TRAnsfroNtaliери*, meaning improvement in cross-border links.

The chosen funding vehicle was Interreg A, a European Regional Development Fund programme that supports co-operation between neighbouring regions separated by national borders. A partnership was established with the Austrian *Land* of Kärnten, Austrian national operator ÖBB, which provided the rolling stock, and Friuli-Venezia Giulia's in-house operator FUC, which supplied the multi-system locomotives required. Two daily return trips serving most intermediate stations were introduced in June 2012. EU funds directly covered about half the operating costs in the first year, providing the vital boost needed to get the service off the ground.

The service quickly proved to be successful, and the two regions were more than happy to continue supporting it after the EU co-funding ceased in June 2013. Demand has boomed to the extent that an additional coach and up to two vehicles for ski equipment or cycles are needed in the peak seasons.

MI.CO.TRA is now widely regarded as an essential service both to support tourism and to

facilitate day-to-day cross-border travel in the region. More recently, services have been extended at weekends to and from the regional capital Trieste. Co-funding through the Interreg A project CONNECT2CE covers a substantial part of the operating costs of the extension for a period of one year. Again, it is hoped that services will thrive and that the difference between costs and fares revenue can be bridged once the EU funding ceases.

Domestic passengers in Italy also benefit from the extension, with MI.CO.TRA trains providing services on the Udine – Cervignano line that was previously closed on Saturday afternoons and Sundays. In addition, further travel opportunities were provided in summer 2018 by extending domestic S-Bahn services in Kärnten to and from Tarvisio-Boscoverde, with good onward connections.

Buoyed by the success of MI.CO.TRA, Friuli-Venezia Giulia has embarked on a similar venture to restore cross-border passenger services between Italy and Slovenia. Since September 2018 the Interreg A project CROSSMOBY has been co-funding two daily return trips between Trieste and Ljubljana for a period of one year, using ETR563 EMUs owned by Friuli-Venezia Giulia and equipped for use in Slovenia. ■

The author would like to thank [Massimiliano Angelotti](#) of the Autonomous Region of Friuli-Venezia Giulia for providing some of this information.

rolling stock procurement, leasing and depreciation; in the short-term almost all lines could be served by legacy rolling stock held by incumbent railway undertakings.

Even though rolling stock costs were excluded, the analysis revealed that most of the cross-border routes examined were unlikely to be self-sufficient and would therefore need an ongoing operating subsidy. This finding is consistent with the statistic provided by the Independent Regulators' Group – Rail that 83% of passenger train-km in Europe fall under Public Service Obligations, which for the most part means they are publicly funded and that minimum service standards are specified by public bodies.

In addition, most cross-border routes are characterised not only by lower demand than comparable domestic routes but also higher costs owing to the need for specially equipped rolling stock to cope with different power supply and signalling systems.

In other words, for most border crossings there is unlikely to be a queue of open access operators eager to run trains if only the infrastructure were reinstated or enhanced. Public authorities and in particular their cross-border co-operation therefore play a decisive role in the operation of cross-border passenger trains, especially on regional routes away from the TEN-T Comprehensive Network and the main centres of population.

Local involvement

Until this point the study had taken a top-down approach, but the project team wanted to enlist the help of national and regional public authorities to identify the *Potentially Most Beneficial Projects*. For this reason the preliminary findings were shared with the bodies responsible for the procurement of rail services in all the relevant countries.

This generated a range of responses, leading not only to the exclusion of shortlisted routes where a double negative opinion was expressed, but also to the inclusion of lines where the competent authority on at least one side of the border supported reactivation or improvement. This feedback proved to be an essential addition to the quantitative modelling work undertaken in the study.

By combining these two approaches the study designated a total of 48 cross-border railway connections as *Potentially Most Beneficial Projects* (Fig 3)³. These fall into three categories:

- 24 *Promising Links*; these have operational infrastructure and 16 are on the TEN-T Network;
- 21 *Missing Links*, of which five are on the TEN-T Network;



Photo: Carlo Stoppar

In June 2018 the successful MI.CO.TRA service was extended to and from Trieste at weekends. A train is seen here crossing the viaduct in Barcola shortly after leaving Trieste.

- three proposed new links, of which one is on the TEN-T Network.

This contact with competent authorities also led to useful exchanges that helped shape the policy recommendations and highlight best practice (p32).

Based on both the modelling work and the consultation, expanded fact sheets were produced for each border section.⁴ These detail the current situation and list targeted recommendations for each *Missing Link* and *Promising Link*. They also contain simple cost-utility analyses for all routes with high demand potential that were not subject to unanimous negative opinion during the consultation.

Recommendations

The study offers many detailed conclusions and recommendations. The most important are summarised here.

Gaps in the passenger train network are often not the result of missing or unserviceable infrastructure. A key message is that missing infrastructure — the focus of so much attention — is not necessarily the greatest problem and indeed accounts for only half of the *Potentially Most Beneficial Projects* in the study, while only 28% of all operational border crossings have passenger services of sufficient quality to come close to meeting potential demand. This suggests that much better use could be made of the existing network. The study recommends that 'quick wins' should be realised wherever possible, for example by co-ordinating timetables, offering through ticketing and extending domestic services by short distances over border crossings.

Most Missing Links and Promising Links are not on the TEN-T Networks. Cross-border lines that are not designated as part of the TEN-T Networks do not qualify for funding from the Connecting Europe Facility. On several cross-border routes the passenger service is inadequate because the authorities have been unable to agree on improvements to the infrastructure.

Of the 21 *Potentially Most Beneficial Projects* located on the TEN-T Core or Comprehensive Networks, only five are *Missing Links* and thus potentially highly suitable for infrastructure funding from the CEF. The eligibility of the other 16 routes would need to be examined in more detail to determine if infrastructure measures such as infill electrification would be needed to permit or simplify operation of attractive passenger services and the expected types and volume of freight trains.

The study recommends that funding for cross-border infrastructure projects should also be available for lines that are not part of the TEN-T Core and



Fig 3. The study identified 48 *Potentially Most Beneficial Projects*, of which 22 are located on the TEN-T Networks.

Comprehensive Networks, that synergies with measures primarily intended to boost freight traffic should be exploited, and that consideration should be given to the creation of a dedicated EU Co-ordinator for cross-border projects outside the TEN-T Networks. The co-ordinator's primary role should be to assist regional authorities to develop their plans, address conflicts and apply for funding.

Most cross-border passenger train services are in receipt of revenue support. Public authorities play a crucial role in the operation of cross-border passenger trains. The report suggests that better use could be made of opportunities provided by existing Interreg A programmes, which can play an important co-ordination role and help solve cross-border mobility challenges. Interreg A funding should be more widely available to help authorities financially support services during the start-up phase.

The location of electrification and safety system changeover points influences the feasibility of cross-border rail. The study recommends that the power supply and train control systems of country A should continue to the first major station of neighbouring country B, so facilitating operation of A's single-system rolling stock to the

first transport hub in B. EU co-financing rules should stipulate the application of this principle, while legislation should hinder its violation.

Locomotive-hauled trains have been widely replaced by multiple-units. This has increased the cost of interoperability as interoperable trainsets cost more than non-interoperable trainsets.

Newly-acquired rolling stock equipped to operate across borders has enabled new services in recent years. The study notes that EU co-funding for interoperable rolling stock would help revive cross-border services and recommends that acquisition of single-system vehicles should no longer be supported in border regions where multi-system stock would be required for regional cross-border operations.

In some cases cross-border services pay higher track access charges than domestic services, for example in Italy and Spain. National regulators and/or the EU should intervene to ensure that national legislation does not discriminate against cross-border traffic. ■

References

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