

Opportunities for reinforcing cross-border railway connections: The case of the Liège (Belgium) – Maastricht (the Netherlands) connection

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Opportunities for reinforcing cross-border railway connections: The case of the Liège (Belgium) – Maastricht (the Netherlands) connection

Efficient mobility is an essential driving force for the development of cross-border (CB) regions. The different settings and visions of neighbouring CB entities may lead to unsatisfactory transport connections across the border. This case study of a CB connection focuses on this issue and highlights, by means of a comparative analysis, how the differences in six perspectives (the economic context; urban and regional planning in Belgium and the Netherlands; the structure of the rail network; barriers in the exploitation of the railway; the current travel demand by rail; and the governance, public planning and policy context) lead to an unsatisfactory rail connection between Liège (Belgium) and Maastricht (the Netherlands). Based on the results of the analysis, we suggest reinforcing cross-mobility connections through several tools such as *(i)* the development of a common governance, by including economic and social stakeholders; *(ii)* the development of joint technical projects in relation to the infrastructure, communication systems and the rolling stock; and *(iii)* the strengthening of flows between the two sides of the border, especially the home-work flows.

Keywords: cross-border mobility, cross-border cooperation, cross-border transport, border regions, rail transport, barrier effect

1. Introduction

Passenger mobility is an essential component of the economic and social development of regions. This observation is particularly true for cross-border (CB) regions, which may be broadly defined as areas comprising adjacent territories belonging to different nation states (Lunquist & Tripl, 2009). Even if the presence of a border can result in positive

effects for the CB regions (Andresen, 2010), it can also lead to several obstacles (see Bechtold, Caesar, Christmann, Evrard, Hamez, Heinen, Marsal, Pallagst, Reichert-Schick, Teller, forthcoming). Two adjacent territories belonging to different countries can have different visions in terms of social, economic, environmental, cultural and legal development (Medeiros, 2018; Caesar, 2018). By looking at the train connection between the city of Liège in Belgium (BE) and the city of Maastricht in the Netherlands (NL), this paper aims to show how these sometimes contradictory developments and visions may lead to inefficient transport services on the two sides of the border.

CB mobility is the result of the willingness of people to access nearby neighboring countries. The reasons for crossing borders are numerous: education, work purposes, shopping activities, or for visiting family or friends (Sener, Lorenzini & Aldrete, 2015; EC, 2016). However, a recent (2015–2016) online public consultation by DG REGIO (EC) on border obstacles revealed that several hurdles to crossing the border persist (EC, 2016). In order of relevance, the major obstacles raised were as follows: legal and administrative barriers, language barriers and difficult physical access (including transport) (EC, 2016).

CB regions may be located further away from their respective central public authority, and they can therefore suffer from lower efficiency of social and economic connections due to the distance from the central political authority and due to the so-called ‘barrier effect’ (Lösch, 1940/1954; Nijkamp & Batten, 1990; Nijkamp, Rietveld & Salomon, 1990; Medeiros, 2011) or ‘border effect’ (Gil-Pareja, Llorca-Vivero & Martínez-Serrano, 2006; Guo, 2017). The barrier or border effect is defined as the impact of national borders on trade flows (Melitz, 2003; Gil-Pareja, Llorca-Vivero & Martínez-Serrano, 2006; Capello, Cargliu & Fratesi, 2018). Medeiros (2018) highlights the need to view CB transport as an opportunity in the goal of achieving CB integration and of

reducing this barrier effect. However, regarding CB transport, several concerns such as the lack or poor quality of integrated public transport systems at the border, the CB infrastructure, high pricing and low frequencies were raised by the EU citizens in the aforementioned survey by DG REGIO (EC, 2016).

Furthermore, from an operational point of view, CB transport has to cope with the following difficulties:

- (1) Flow data quality: lack of available passenger data, increase in privacy protection (EC, 2018), difficulties in accessing flow data due to rail liberalization in Europe (European Union, 2018), differing methodologies for data acquisition, CB flows not always being considered, and available CB transport data often being a proxy or aggregated (e.g. at the year level between two countries).
- (2) Interoperability problems: interoperability is defined as ‘the ability of two, or more, transport systems to operate effectively and efficiently together’ (Mulley & Nelson, 1999, p. 93). Travelling through different countries implies potentially different transport technologies. These operational barriers may concern languages, system barriers regarding travel information gauges, rail infrastructure (heights and widths of tunnels), electrification and signalling systems, train lengths, rolling stock, driving (left or right) directions and driver’s licence characteristics.
- (3) Various stakeholders and systems: the role played by national factors (e.g. socioeconomic conditions or physical geography), various legal frameworks and stakeholders, different policy priorities and governance settings (e.g. the integration of railways into communication systems and their role in local, regional, national and transnational development) (COMPASS, 2002; MOT, 2006; Bruinsma, Pels, Priemus, Rietveld & Van Wee, 2008; Roth & Dinhobl,

2008; Martí-Henneberg, 2013; Castanho, Vulevic, Cabezas Fernández, Fernández-Pozo, Naranjo Gómez, Loures, 2017).

Our analysis focuses on the train connection between Liège and Maastricht, two cities that are separated by only 30 kilometres. Both cities are peripheral in terms of their respective national scales, but they are also two pillars of a potential cross-border polycentric metropolitan region (CBMR) located in the Euregio Meuse-Rhine (EMR). Major obstacles however persist. The aim of this paper is to determine how different settings and visions may lead to an unsatisfactory rail connection in this context. Six different perspectives are discussed: the economic context; urban and regional planning in BE and NL; the structure of the rail network; barriers to the exploitation of the railway; the current travel demand by rail; and the governance, public planning and policy context. To inform this discussion, a mixed methods approach using quantitative and qualitative data was applied. A review of the scientific literature, secondary data, policy documents, spatial planning documents and media articles has been conducted.

The analysis of a CB case implies some methodological issues concerning data acquisition, the definition of the study area and different cultures, as well as individual and public choices (de Ruffray, Hamez, Meddahi, Moron & Smits, 2008). Regarding flow data, the Dutch rail operator NS, for instance, has agreed to publish its data; however, these data sometimes exclude passengers using another rail operator in the Dutch stations. For SNCB, the Belgian national rail operator, no data have been provided since 2015.

The study area concerns the Liège-Maastricht railway line and refers to different scales: the local scale refers to the neighbourhood of this line; the national scale refers to the location core and periphery and to the governance system of railway transport; the Euregional scale refers to the CB context between cooperation and competition between cities and regions; and the European scale refers to the building of a CBMR, in particular

highlighted by the development of the Trans-European Transport Network (TEN-T). The EMR is particularly concerned with the high-speed line linking Brussels, Paris and London to Germany (Ruhr Valley, Cologne and Frankfurt).

Finally, cultural differences or different public or individual choices affect our analysis as well. For instance, modal choice is historically different between the Belgian and the Dutch sides of the border: if cycling is an attractive transport mode in NL, it is not in the Belgian Walloon side of the border, especially in the Liège region (Rietveld & Daniel, 2004; Vandenbulcke, Thomas, de Geus, Degraeuwe, Torfs, Meeusen, Int Panis, 2009). These facts impact the potential attractiveness of railway stations in a suburban context where bicycles, buses and trains can be in competition.

The paper is structured as follows. The case study area as well as the state of the art of cross-border cooperation (CBC) in the EMR will be presented in the following section. The paper then provides a comparative analysis of the differences in the six aforementioned perspectives, showing how these lead to an unsatisfactory rail connection between Liège and Maastricht. In section four, solutions for overcoming these differences are discussed, with the objective of improving the rail connection between the two cities. Finally, the main conclusions are drawn, and the research perspectives are specified.

2. The case-study area and Cross-border Cooperation (CBC) in the Euregio

Meuse-Rhine (EMR)

As discussed previously, Liège and Maastricht share the same spatial features regarding their locations: they are peripheral in terms of their respective national scales, but they are central in the CBMR at the heart of the EMR. The EMR covers an area of 11,000 km² and is populated by approximately four million people (see Figure 1). There are three official languages in the EMR: Dutch in the NL and Flanders, the northern part of Belgium; French in Liège, Wallonia, the southern part of Belgium; and German in

Germany (DE) and in *Ostbelgien*, the eastern part of Belgium. The diversity of languages, cultures and landscapes is promoted as an asset by the authorities in the region. The EMR region has tried to develop a CBMR, aggregating its main cities around a central rural area which is called Three Countries Park and includes the most important cities of eastern Belgium (i.e. Liège and Hasselt), southeast Netherlands (i.e. Maastricht and Heerlen) and western Germany (i.e. Aachen). At a larger scale, this area is located between four main European areas: (i) the central Belgian metropolitan area, including Brussels (Van Meeteren, Boussauw, Derudder & Witlox, 2016), (ii) the Randstad Holland (Van Oort, Burger & Raspe, 2010), (iii) the Metropolitan Area of Rhine-Ruhr and (iv) the Greater Region around Luxembourg (Sohn, Reitel & Walther, 2009).

[Figure 1 near here]

Cities and regions that are partners of the EMR share common features and issues: a location that is remote from the national economic centers and capitals, deindustrialization and a lack of headquarters and advanced services, one of the driving forces of metropolitan dynamics (Lambrechts, Kloosterman, Werff, Van der Röling & Kapoen, 2006; Aujean, Castiau, Roelandts & Vandermotten, 2007). These metropolitan dynamics have the ability to generate CB flows. Until now, functional integration has remained weak in respect of the economic and commuting issues in comparison with other European CBMRs (ESPON, 2010), but are stronger with regard to leisure and education, and especially housing (Strüver, 2005; Van Houtum & Gielis, 2006).

A cooperation entity between the partner-regions of the EMR region was founded in 1976, making it one of the oldest Euroregions (Kepka & Murphy, 2002). In 1991, the trilingual (German, Dutch and French) EMR CBC was turned into a *Stichting* and thus

achieved judicial status in terms of Dutch rights (for a detailed description and analysis of the history of this collaboration, see Kramsch & Dimitrovova, 2008; Malherbe, 2015).

In terms of CBC, the *Stichting* EMR exists as a side structure to the Interreg EMR, which is primordial in terms of the financing of CBC. With the EMR 2020 strategy, the regional authorities have set up a long-term vision to tackle CB issues. Furthermore, partners from the Province of Limburg (NL), the Province of Limburg (BE), the Province of Liège (BE), the German-speaking community of Belgium (BE) and the region of Aachen (DE) plan to set up a thematic pilot European Grouping for Territorial Cooperation (EGTC) for the four key topics of the existing Euregio: (i) language education, (ii) transport and mobility, (iii) environment, and (iv) CB health services. In 2001, the five major cities of the EMR (Maastricht, Aachen, Heerlen, Hasselt and Liège) created a city network called MAHHL. As the cities do not form an urban continuity, the main objective of this network is to improve the links between these cities through the improvement of road and rail connections.

Knippenberg (2004) elaborates on the politico-territorial history of the CB area and questions 'the image of a region that has 'always' been a unity' (p. 610) that has been promoted by the regional authorities. He concludes that social, juridical, economic and cultural barriers persist, although national borders such as physical barriers have been removed (see also Christians, 1991; Valkering, Beumer, de Kraker & Ruelle, 2013; Malherbe, 2015; for a previous analysis of the similar official rhetoric of Euroregions, see also Kepka & Murphy, 2002). In regard to spatial planning and infrastructure, the work of De Vries (cited by Knippenberg, 2004) presents a striking example of the simultaneous planning of and investment in the Maastricht-Aachen airport (NL) and the Bierset airport in Liège (BE), two airports that are less than 40 kilometres apart, illustrating the persistent importance of national borders in the decision-making process.

Malherbe (2015) analysed the European Spatial Development Perspective (ESDP) from 1999 (EC, 1999) and the *Schéma de Développement de l'Espace Régional* (SDER) that was published in the same year (Gouvernement wallon, 1999). He shows that both documents highlight the importance of the CB leverage and polycentrism for the development of European territories and, more particularly, for the reconversion of Wallonia (Malherbe 2015, p. 5). This observation is especially true for Liège, a city that is still suffering from the decline of heavy industry (Nauwelaers, Maguire & Ajmone Marsan, 2013; Malherbe, 2015; Baldin, 2016). Malherbe, however, makes the point that Liège continues to fall behind on CB developments. He considers the often-made assumption that this loss is explained by the language differences to be reductionist, and instead highlights the importance of overcoming the endogenous capacities of the territory, as well as the capacity to go beyond the physical and/or symbolic borders. Knippenberg (2004) also refers to the strong institutionalization in the bordering regions as a main reason for the remaining separation. Furthermore, Hassink, Dankbaar & Corvers (1995) and Kramsch & Dimitrovova (2008) refer to an uneasy mixture of cooperation and competition in this region.

3. Comparative analysis

In this section, we present the joint and different visions between these two CB regions regarding the economic context, urban and regional planning in BE and NL, the structure of the rail network, barriers to the exploitation of the railway, the current demand for travel by rail, and the governance, public planning and policy context.

3.1. Economic context

The economic analysis is based on a postulate: the CB transport demand partly depends on the CB economic dynamics. Table 1 provides some economic data concerning

the three most important NUTS 3 (Nomenclature of Territorial Units for Statistics of the third level) regions, including Liège (*arrondissement de Liège*), Maastricht (*Zuid-Limburg*), but also Aachen (*Regio Aachen*), the third most important EMR city.

[Table 1 near here]

Table 1 exposes the unbalanced economic development between the Liège region on the one hand and Maastricht and Aachen on the other. Liège is the main city from a demographic viewpoint, and was the main economic centre for several centuries before declining for several decades, like some other European old industrial regions. If Liège is having difficulty with its economic recovery plan, Maastricht and Aachen have developed a (partially common) strategy to integrate European and global urban networks and to collect associated spillovers (Malherbe, 2015).

Some common CB economic specializations have been identified between the Province of Liège and the Dutch Province of Limburg, the NUTS2 regions associated with Liège and Maastricht, according to the European Cluster Observatory data: biopharmaceuticals, environmental industries and logistics for the emerging industries, construction, education and knowledge creation, insurance, performing arts and upstream chemical products for the 'classical' sectors. Universities have also developed a local network, called the Top-Technology Region – Eindhoven, Leuven, Aachen triangle, joining all the universities of the EMR, the Katholieke Universiteit Leuven and the Technische Universiteit Eindhoven to reinforce exchange across the EMR borders (Nauwelaers, Maguire & Ajmone Marsan, 2013). Retail is probably the most integrated economic sector, with significant CB flows. The border effect is weak: 88% of respondents go shopping beyond their national borders, especially for tourist motivations, according to a survey (BRO, 2009).

Despite a lack of previously revealed CB mobility data, the functional integration between Liège and Maastricht is demonstrated by Belgian public data: fewer than 1% of trips (less than 10,400 for a weekday) with the Liège urban region as point of departure or destination and the Maastricht region (Pluris, 2018). In comparison, trips to the rest of Wallonia are approximately three times more important than to the rest of the EMR for an equivalent demographic weight. A total of 20,000 cars cross the border on the Liège-Maastricht highway every day, comprising a substantial part of the European transit traffic (2018), and 2,500 passengers cross the border on the Liège-Maastricht railway (2012) (Arcadis, 2013; Pluris, 2018). Concerning the CB commuting flows, these flows are predominantly oriented from the Province of Liège, with an attractive housing market for Dutch citizens, to the Dutch Province of Limburg (Stevens, 2007). Figure 2 shows these commuting statistics and illustrates the weak potential of the railway Liège-Visé-Maastricht for these trips, seen as a consequence of the dispersal of residential locations across the Liège countryside.

[Figure 2 near here]

3.2 Urban and regional planning in Belgium and the Netherlands

If the Netherlands is recognized for its planning, which supports urban compactness, Belgian planning tends to use the US model, with a large urban sprawl, despite similarities in relation to the urban framework and the socioeconomic system (De Vries, 2015; although De Vries focuses on the Flemish part of BE, his findings are relevant for the Walloon part as well). This dissimilarity can be explained by some historical factors.

Firstly, the historical foreign domination in BE has created greater disruption in relation to governmental interventions than that in NL, with its age-old autonomy and its

public management of polders. That is why an individual approach is more developed in BE.

Secondly, the urbanization processes were also very divergent. In BE, the urbanization process was intense in the late nineteenth century during the phase of industrialization. This urbanization was guided by a pro-rural public choice to limit the socialist influence in the urban neighbourhoods: a dense transportation network, including the railway network, was built, and the rural exodus was avoided thanks to the promotion of rural housing and the attractive costs for home-work trips (De Vries, 2015). By contrast, urbanization in NL intensified after the Second World War, at a time when urban planning was more developed. The country was largely destroyed during the war, and there was demographic pressure requiring public intervention to coordinate urbanization.

Thirdly, the construction industry is structured around large-scale operators in NL and is able to intervene in urban areas, while home ownership and privately commissioned homes are most common in BE, reinforcing the sprawl (Halleux, 2009). Finally, transportation was largely supported by the Belgian authorities, first with the railway network (until approximately 1950) and afterwards with cars and roads, featuring large incentives in comparison to other European countries (Halleux, Brück & Mairy, 2002).

3.3 Structure of the rail network

Regarding the railway network, two stations on the High-Speed Train (HST) network are located in the EMR: Liège-Guillemins and Aachen-Hauptbahnhof. Liège-Guillemins, the main station of Liège, is the nearest station from Maastricht (32 minutes to Liège-

Guillemins and 85 minutes to Aachen-Hauptbahnhof by train¹). If Liège is the centre of a local ‘railway hub’ with seven local lines, the frequencies on these lines are lower in comparison with other major Belgian cities (maximum 2 trains per direction per hour at peak hours for the most frequented lines). An urban service around Liège is in the pipeline, similar to the German model. Maastricht-Centraal, the main station of Maastricht, is the terminus of two Dutch lines: the first is local, connected to the Heerlen urban region; the second is connected to the rest of NL (to the Randstad Holland).

The third line joining Liège-Guillemins and Maastricht-Centraal is the one examined in this paper. An overview of the line is provided in Figure 1. It is approximately 30 kilometres long, 18 kilometres in BE and 12 kilometres in NL, with 6 kilometres as the average distance between stations. The reference speed is approximately 120 km/h, with a speed reduction to 90 km/h over several kilometres due to the winding route of the track (TRITEL, 2011), which is due to the enclosed valley location, and the railway is located between the Meuse river and a highway. Six stations punctuate the journey between the two major stations: three on the Dutch side (Maastricht-Centraal, Maastricht-Randwijck and Eijsden) and three on the Belgian side of the border (Visé, Bressoux and Liège-Guillemins). The Belgian and Dutch stations on the line have the same urban features on either side of the border: two central stations in large cities with an InterCity (IC) connection (Liège-Guillemins and Maastricht-Centraal), two suburban stations (Maastricht-Randwick and Bressoux) and two stations in small towns (Eijsden and Visé).

1 Data from Google Maps provided by the different operators for a typical weekday during peak hours (provided in June 2018).

3.4 Barriers to the exploitation of the railway

The exploitation of a CB railway leads to some specific issues, often resulting in additional costs of exploitation (see section one). These costs have to be considered to ensure the profitability of the railway exploitation. Specific barriers regarding this particular line have been identified by the engineering consultancy Arcadis in a report for the Dutch authorities of the Province of Limburg (Nollen, de la Haye & Roos, 2013).

Firstly, there are multiple railway borders: if the signal border is located at the same place as the national border, the voltage border is located between Eijsden and Maastricht-Randwick. Serving the Dutch station of Eijsden from Maastricht-Centraal requires a dual-current train. Eijsden station (NL) is therefore considered a Belgian station. With regard to the security system, the border is located at the same place, with two different safety systems between BE and NL. The standardization costs at the national border should be approximately 8.5 million € according to Arcadis (2013).

Secondly, the train facilities for crossing the border cause additional costs; trains have to be able to support several voltages, safety and communication systems. The gauges between Belgian and Dutch railways are identical, which reduces the additional costs. It is not possible to provide the amount of these additional costs because it also depends on the other kinds of equipment (Wi-Fi, train layout, etc.) and on the rail scheme: the mechanical needs are different for urban and IC connections.

Thirdly, the bi- or trilingualism of the train drivers and staff is an issue in the EMR. This issue can become an additional cost in some regions or local labour markets where trilingualism is less established.

3.5 Current demand for travel by rail

Liège and Maastricht can be reached by four means of transport: bicycle, bus, car and train. In terms of the time factor, the car remains the fastest means of transport between

the two cities (25 minutes) in comparison with the train (33 minutes) and the bus (59 minutes). The current service comprises one omnibus train per direction per hour between Hasselt, Liège and Maastricht, with several peak-time trains between the Belgian border (Visé), Liège and Brussels. The average speed on the Liège-Maastricht railway is approximately 56 km/h for an interstation distance of 6 kilometres, which is characteristic of an urban service (Pluris, 2018).

The service quality is also an essential factor in CB connections, covering common ticketing, travel information and the quality of service. Between 2005 and 2012, the number of CB journeys has tripled with the implementation of an IC train between Maastricht-Centraal and Brussels via Liège and all the four intermediate stations of the line. However, this IC relationship was abolished in 2013 due to the negative impact on punctuality on the Dutch schedules, and has been replaced by the local train, mentioned above. The interurban flows are largely oriented to Brussels rather than between Liège and Maastricht itself.

The interurban flows are completed by the local demand for each urban region. The current train supply is weak for urban service: fewer than two trains per direction per hour during off-peak times (Pluris, 2018). This partially explains why Eijsden station is the least frequented station in NL (see table 2)². On the Belgian side, the local demand is concentrated in Visé, with workers and students who commute to Brussels and to Liège.

[Table 2 near here]

2 Data provided by NS, the Dutch national railway company, and accessed at: <https://www.treinreiziger.nl/aantal-en-uitstappers-per-station-2013-2016/> (accessed June 28, 2018).

The main difference between the two sides of the border is the situation of the suburban station: Bressoux in BE and Maastricht-Randwijck in NL. Firstly, the modal choice is large, due to the proximity of the station to the city centre (see Figure 1), with bus, bicycle, walking, car and train competing. Then, the attractiveness of suburban station also depends on the urban functions established: some faculties of Maastricht University, including the University hospital, and the exhibition centre, are located near the Maastricht-Randwijck station. By contrast, no trip factor and some brownfield sites are located around Bressoux station. The rail scheme quality to Brussels is the main driver for the use of the station, which has seen passenger flows evolve in recent years.

To sum up, travel on the Liège-Maastricht line is currently structured around the IC demand from Maastricht to major cities such as Brussels, Cologne or Liège, the HST hubs, and the relatively weak local demand for urban service around the two urban regions with a persistent border effect.

3.6 Governance, public planning and policy context

Some background information on policy and urban planning documents as well as major events is required in order to deepen the analysis and to provide some information on future planning targets. Three main strategic documents organize the planning in the Liège region: a Walloon strategy, a strategy for the Province of Liège (the latter are called Provincial Territorial Development Plans or *Schéma Provincial de Développement Territorial* SPDT in French), and finally a local strategy for the Liège urban area corresponding to the NUTS 3 region, which includes Liège. Looking at Liège's stakeholder positioning vis-à-vis Maastricht, the *Schéma de Développement de l'Arrondissement de Liège* (SDALg) suggests that Maastricht is perceived as the main competition with regard to (shopping) tourism. The analysis of the position of Liège within this CB area undertaken by Malherbe (2015) is consolidated by several statements

concerning the position of the city in the SDALg. However, in the SPDT and the *Plan Provincial de Mobilité* (Provincial Mobility Plan), the future visions developed by the ASBL Liège Europe Métropole, a supra-municipal non-profit association, another narrative is promoted, namely that of an integrated CB region with good (rail) connections to Maastricht (see Figure 3).

In the year 2009, the 437 million € station Liège-Guillemins was finally inaugurated. It was described as the most modern and spectacular station in Europe. On his website, Didier Reynders, Minister of Finance at the time, had published a short note on the controversy of the name given: ‘Not without procrastination. Officials have long hesitated between Liège-Charlemagne, Liège-Euregio, and even Liège-Limburg.’ (Reynders, 2009; own translation). The discussions that occurred at the time clearly showed divergent positions between, on one hand, a kind of linguistic and symbolic de-bordering implicit in a preference for the name Liège-Limburg – the provinces of Limburg exist in BE and NL respectively – and, on the other hand, a preference for the status quo, thus Liège-Guillemins. These discussions regarding the name highlighted the importance of the historical borders of the territory, territorial identities and language (see Schreurs, 2007; La Dernière Heure, 2007). The monumental building that was supposed to act as a driver for the reconversion of this city quarter was designed by Santiago Calatrava, a well-known proponent of contemporary architecture. However, a vast amount of newspaper articles and web commentaries documents the conflicts of interest that occurred in the city during the planning and implementation of the project. Nevertheless, the fact that HSTs were able to pass through Liège from that moment on was and still is considered an opportunity for the development of the city.

[Figure 3 near here]

Looking at the main planning document in Maastricht, we cannot speak of a re-bordering process. However, this does not mean that the city of Liège is necessarily included in these outward-looking visions. In the *Provinciaal Omgevingsplan Limburg* (POL 2014, translation: Provincial Environment Plan for Limburg), for instance, Liège finds itself in a marginal position, whereas the importance of connections between South Limburg and Aachen, described as a city that ‘already has a robust and steadily growing knowledge economy’ (POL 2014, p. 26), is highlighted several times. Interestingly, the Euregional conurbation of Liège-Eupen-Aachen-Parkstad-Sittard-Genk-Hasselt-Maastricht in South Limburg as an element of the CB Tri-Country Park is also brought to the centre of attention (POL, 2014).

At the Euregional scale, some measures such as a CB ticket have already been put in place. The following quote illustrates the self-promotion of the *Stichting EMR* as a mediator that wants to encourage the improvement of CB connections: ‘In 2020, the Euregio Meuse-Rhine wants to be actively involved in encouraging cross-border mobility and developing the physical infrastructure for this in the Euregio.’ (EMR2020 Steering Committee, 2013, p. 12)

Some targets that are highlighted in the vision for EMR2020 concern an improvement in the internal and external accessibility of the EMR. The external accessibility of the EMR mostly builds on the high-speed axis Paris/London/Amsterdam – Brussels – Liège – Aachen – Cologne (TEN-T Priority Axis No. 2 PBKAL). Improving the internal connection of the two high-speed stations in the EMR (Liège and Aachen) is considered an important step. Furthermore, the services between the major cities in the EMR (Hasselt, Liège, Maastricht, Heerlen, Roermond and Aachen) should be expanded and need better coordination (EMR2020 Steering Committee, 2013, p. 36).

EurekaRail, a grouping of several Dutch Limburger stakeholders, is focusing on three CB routes: *(i)* Maastricht – Liège – Leuven – Brussels, *(ii)* Weert – Hamont – Antwerp, and *(iii)* Roosendaal – Antwerp (EurekaRail, 2018a). The implementation of the ‘Drielandentrein’ (Three-Country train) was considered a key response for improving the CB rail connection. This IC between Liège, Maastricht, Heerlen and Aachen was supposed to take 60 minutes for the 79 kilometres between Liège and Aachen via Maastricht, and to run twice an hour. The main intention for this train was to facilitate access to the high-speed connections for the inhabitants of the Euregio (see Figure 3). However, this train will not be implemented for the time being, as the Arriva train is not yet allowed on the German track and it ‘is not welcome in Belgium’ (OV magazine, December 04, 2018; own translation). These points add to the rather critical review on governance and CBC in the EMR raised in section two.

4. Divergences and outlook for convergence

The six analysed perspectives reflect three main frames that relate to *(i)* the public choice and governance in relation to transport and planning, *(ii)* the state of the infrastructure, and *(iii)* the motivation to use this public transport. This section discusses the divergences previously highlighted, and provides some suggestions that could lead to a more satisfying railway connection between Liège and Maastricht.

4.1 Public choice and governance in relation to transport and planning

As Knippenberg (2004) put it, ‘the image of a region that has ‘always’ been a unity’ (p. 608) has to be confronted. Whereas the stakeholders in Liège envision international connections on the one hand and better accessibility of the suburban stations on the other, Maastricht mostly focuses on national and international connections. The analysis of the main spatial planning and governance documents clearly shows that the two cities are not

only distinct in terms of recent economic developments, but also frame 'the other' differently. Limburg (NL) and thus also Maastricht instead look to the city of Aachen with regard to CB economic development, by focusing on R&D (POL, 2014). Liège seems to be perceived mostly as a hub with regard to international rail transport. The focus is thus on the Liège-Guillemins station and not truly on the city as such.

Furthermore, divergent development strategies, which are of course linked to historic developments such as urban sprawl, can persist and cannot easily be merged. In terms of rail, the agendas of the two city regions seem to stand in opposition to each other. With the plans to set up the Drielandentrein, the Dutch actors have adopted a proactive attitude. However, recently, this plan was stopped at the borders.

Another goal is to reintroduce an IC train between Maastricht and Brussels. The frequency of these Dutch trains on the Liège-Maastricht railway line would be four trains per hour per direction (two between the major cities of EMR, one direct to Brussels, and the current Hasselt, Liège and Maastricht connection by the Belgian rail transport operator) instead of one per hour per direction. This strategy raises some issues: *(i)* the question of profitability in a CB region with weak functional integration across the border, and *(ii)* the idea that the desire of Liège stakeholders to open new urban stations could be restrained by the Dutch desire to connect Maastricht to the major cities as quickly as possible (see Figure 3). These issues illustrate the deadlock between two different strategies on the two sides of the border. The profitability also depends on an equilibrium in passenger flows.

The integrated governance of CB regions has been highlighted as success factors for improving the policy capacity of these regions (Klatt & Herrmann, 2011; EC, 2016; Harguindéguy & Sánchez Sánchez, 2017; Mendoza & Dupeyron, 2017). The creation of an official juridical status for the EMR was a step in the right direction. The current

consultations about the improvement of the train connections between NL and BE can be considered an additional step in the right direction. More collaboration is nevertheless needed to develop a strategic vision of this CB area. In addition to the public authorities, this collaboration should also imply the presence of social and economic stakeholders, to provide a long-term common vision (the importance of coalition-forming to achieve the goal of sustainable mobility is for instance documented by Banister, 2008). Domestic local and regional discordances and the persistence of borders at the ‘psycho-social’ scale (Gerber, 2012) must be overcome in order to proceed in terms of this process.

One example of a collaborative establishment of a rail line could be the establishment of a ‘*contrat d’axe*’ (Mauliat & Krauss, 2014), or axis agreement, a bottom-up tool developed in France during the last decade. It comprises an agreement joining all the stakeholders in planning and transport to improve the quality of public transport, and especially along a regional railway. The market liberalization and the competitive situation between the different operators might however hinder the CBC.

4.2 State of infrastructure

Some of the interoperability problems relating to safety and communication in Europe have already been included in the ‘Technical Specifications for Interoperability’ (European Railway Agency, 2011) and have been addressed by the replacement of the national systems by a unique and coherent European Rail Traffic Management System (ERTMS) with its harmonized safety (European Train Control System – ETCS) and communication (Global System for Mobile communications – Railways – GSM-R) components. In addition to infrastructure improvement, it is also necessary to adapt the rolling stock. The upcoming Drielandentrein, which was supposed to have already begun running (EurekaRail, 2018a), was part of the plans to improve interoperability issues.

The three languages that are spoken in this region are an additional constraint. For the Liège-Maastricht connection, information for travellers should be given at least in French and Dutch. The level of pricing, ticketing and information to passengers has already been addressed in European-financed projects such as the Interreg V-A project EMR Connect (EMR Connect, 2018).

Even if some practical issues have already been implemented in the EMR to reduce the technical problems between BE and NL, some initiatives are still needed to enhance the rail connection between Liège and Maastricht. These initiatives may take the form of private-public partnerships, the reorganization of local economic markets (e.g. in the application of concessions), pure technical innovation or an improvement in the quality of the services.

4.3 Motivations to use public transport and to cross the border

The main issue is to rebalance the economic relations between the Liège and Maastricht regions. This issue simultaneously concerns industrial development, advanced services, retail, research and development, as well as the attractiveness of the universities. If Liège and Maastricht are in similarly peripheral positions in terms of their respective national scales, Maastricht is more internationalized than Liège.

The urban sprawl of housing and economic activities in BE reinforces the lack of attractiveness of Belgian stations and cities (e.g. in terms of retail and tourism). For instance, the main campus of the University of Liège is located in the southern suburbs of Liège, 8 kilometres from the nearest station (Liège-Guillemins), while the main campus of Maastricht University is located next to Maastricht-Randwijck. Regional development and urban planning in BE have introduced the issue of the urban attractiveness of the city of Liège, but the past and current planning culture promotes urban sprawl despite the recent political desire (Gouvernement wallon, 1999) at every

scale (local, sub-regional and Walloon). This phenomenon may be related to the local political fragmentation and the lack of coordination of urban planning and transport at the urban regional scale.

CB economic opportunities should be promoted to stimulate the relationship between the two sides of the border. This approach could be an opportunity to break down walls between Liège and its CB regions, because the size of the Liège urban area and its economic basin (approximately 1 million inhabitants) and its international integration are not sufficient to insert the city into international networks. Insertion into international networks would require an improvement in the involvement of Liège stakeholders, as mentioned by Nauwelaers, Maguire & Ajmone Marsan (2013), including the University of Liège, perhaps outside of CB innovation dynamics, corresponding to the Top Technology Region/Eindhoven-Leuven-Aachen Triangle (TTR-ELAt). Another concern is in the constitution of a common framework to extend economic relations and to create room for innovation spaces (Lundquist & Tripl, 2009). This framework corresponds to an implementation of institutional and cognitive proximities between the Euregio stakeholders: an improvement in the circulation of information or economic opportunities and a common structure for funding.

5. Conclusions

Accessibility of CB cities through efficient transportation modes is a critical factor for ensuring good development of CB regions. However, various visions and perspectives may be confronted with difficulties because of the border. Through a comparative analysis of the case study of the railway CB connection, this paper highlights how the differences of settings and visions from six perspectives (the economic context; urban and regional planning in BE and NL; the structure of the rail network; barriers in the exploitation of the railway; the current travel demand by rail; and the governance, public

planning and policy context) lead to an unsatisfactory rail connection between Liège and Maastricht. Major issues that are encountered relate to different settings and visions in terms of the following:

- infrastructure of the rail network,
- interoperability problems related to different voltages and languages,
- different situations/locations of urban and transport networks,
- unequal economic development on the two sides of the border,
- unequal use of the railway and different local strategies in the future, and
- consequences of different planning cultures.

These issues can, however, be approached in the future through different tools such as *(i)* the development of joint technical projects related to the infrastructure, communication systems and rolling stock; *(ii)* the development of a common governance, not only at the institutional level but also including economic and social stakeholders; and *(iii)* the reinforcement of flows between the two sides of the border, especially the home-work flows. Even if physical borders have been abolished between BE and NL, there is still some work to do to overcome social, cultural, economic and governance borders. The recent failure of the Drielandentrein, which is now a ‘train that runs through one country’ (De Limburger, December 03, 2018, own translation), is, however, further proof of persisting governance issues at the domestic and the CB levels explaining the lack of efficiency in terms of CB transport.

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[beyond-ism/proceedings/baldin - ecological-approach-in-regenerative-design.pdf](https://www.slu.se/globalassets/ew/org/centrb/fuse/conf-beyond-ism/proceedings/baldin_-_ecological-approach-in-regenerative-design.pdf)

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Table 1: Reference data concerning the three main regions (NUTS3) mentioned in the article (Sources: Eurostat, IWEPS & CBS).

	Arrondissement de Liège (BE)	Zuid-Limburg (NL)	Regio Aachen (DE)
Population (2017)	625,131	600,037	552,472
Surface area (km²)	797 km ²	660 km ²	707 km ²
Employment rate (2016 in %)	54.0	60.9	65.2
GDP (2015, in billions €)	18,476	20,831	19,483
GDP per inhabitant at national scale (national mean = 100)	78.7	85.9	91.3
GDP per inhabitant at European scale (mean UE 28 = 100 (EU28))	98.3	118.5	116.2

Table 2: Number of passengers in every station of the Liège-Maastricht railway line in 2015, the current supply and the recent evolution following the last data available at the same date (Sources: SNCB and NS with different methodologies).

Station	Passengers (2015)	Recent evolution	Classical train supply (for a weekday)
Liège-Guillemins HST hub (B)	17,124	Increasing	20 trains per hour for national and local service and 20 HST per weekday, 1 per hour per direction to Hasselt and Maastricht.
Bressoux (B)	175	Variable	1 train per hour per direction and 2 trains per direction per day to Brussels.
Visé (B)	683	Increasing	1 train per hour per direction and 2 trains per day to Brussels (terminus).
National border between BE and NL			
Eijsden (NL)	81	Decreasing	1 train per hour per direction.
Technical border between the Belgian and the Dutch railway network: signal systems, power supply systems...			

Maastricht-Randwijck (NL)	1,776	Decreasing	8 trains per hour, 1 to Visé-Liège, 7 to Maastricht and the other cities of Limburg (Heerlen and Roermond).
Maastricht-Centraal (NL)	15,633	Decreasing	15 trains per hour for national and local service, 7 to Maastricht-Randwijck, among which 1 continues to BE.

Figure 1: Location of the Liège-Maastricht railway line and its six stations in the Euregio Meuse-Rhine and in the HST network (Author: Wilmotte; Sources: European Environment Agency, 2014; OpenStreetMap data, 2018).

Figure 2: Location of commuters living in the Province of Liège (residential location) and working in the Dutch Province of Limburg (workplace location) (Author: Sandu; Sources: ETIL, 2014; Imergis Kaarten).

Figure 3: Schematic map of the two strategies (Author: Wilmotte; Sources: EurekaRail, 2018a; Liège Europe Métropole, 2018).