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The slow and difficult implementation of high speed rail interoperability in Europe: the case of the Atlantic Corridor

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Abstract

The European Union (EU) has started to create a railway transport network with all the national networks of its member states, in order to join all them and even its differences and building some corridors as priority work. This article presents the current situation of the Atlantic Corridor and the difficulties in integrating the importance of rail interoperability in its development. First, our methodology is presented (section 2). Then, it attempts to define the corridor object and the way in which European governance has set up the TEN-T (section 3) by presenting the concept of interoperability as European standardisation (section 4). It analyses the current problem of implementing all the necessary steps to homogenise the various national networks in order to reach a true European Corridor (section 5). To put all these concepts into perspective, we focus on one of the nine corridors proposed in the TEN-T: the Atlantic Corridor (section 6). Through its history and development, we present the current status, the difficulties and barriers to its effective implementation and the solutions envisaged to enable the construction of the true continental network (section 7).

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1. Introduction

Since the 90s, the European Commission tried to improve the interconnection among State Members and the interoperability of national transport networks through a Trans-European Transport Network (TEN-T). However, only since 2013 the focus shifted from the articulation of existing national networks to the structuring of nine major European transport corridors, including the Atlantic Corridor. The latter, whose use is uncertain (freight, passengers or mixed traffic), is still not completed as a transport infrastructure. It aims to link both Spanish and Portuguese ports to Port of Le Havre (northern France) and to the Rhine axis, at Strasbourg and Mannheim (Germany). This corridor has many interests, such as the most important: improving rail freight and passenger transport in Western Europe. Nevertheless, the development of the Atlantic Corridor is hampered by major political, technical and operational difficulties,

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challenging the emergence of unified strategies around this object and hindering the strengths of rail freight in both the European Atlantic Arc and Eastern Europe.

With this in mind, our aim is to show how interoperability is a central element in the European transport system. It shows how the TEN-T network attempts to unite and stitch together the European area. The second part seeks to show that rail interoperability and standardisation is an important element in connecting the European states. This work on the reshaping of European transport policy will also provide useful insights into the problems of uniformity in the rail network, while focusing on three cross-border projects: the GPSO HSL, the Basque Y HSL, and the Lisbon-Madrid HSL. In what way is European construction through the TEN-T struggling to take shape because of the many problems of interoperability?

2. Materials and methods

This research is the fruit of a joint reflection on the European rail network and the difficulties involved in building it. This work relies heavily on qualitative methods. In fact, we have combined both grey literature, such as official reports on transport from different administrative levels (such as the European Commission, strategic and action plans for transport planning, etc.) and the infrastructure managers concerned, to understand the political will of Europe and the countries concerned with regard to the TEN-T. A large number of interviews (around thirty) for all the actors politics and techniques were also carried out for this article, enabling us to identify the real ambitions of governments and local players in creating a united area through interconnected transport projects. Internet sources, like websites, blogs and social networks, were explored too.

3. TEN-T: the ambition of a unified European network

3.1. *The emergence of a common transport policy (1950 – 1991)?*

The Treaty of Rome in 1957 established transport policy as an instrument of European integration [Szimba et al. \(2004\)](#). However, faced with the reluctance of member states of the European Economic Community (EEC: Belgium, France, Germany, Italy, Luxembourg and the Netherlands) and the difficulty of harmonising the common transport policy, the latter remained at the project stage, as attested to by the Spaak Report of 1956. In the 60s, the EEC agreed on an action programme for the implementation of a common policy (1962) and on customs unification (1968). The report of the Organisation for Economic Co-operation and Development (OECD) and the European Conference of Ministers of Transport (ECMT), published in 1977, proposed that the European area was structured by axes called “corridors”. Two types of transport axes are mentioned. The first consists of international corridors that should connect the main European cities. The second, called “national corridors”, should connect two cities in the same country. Ten years later, in 1986-1987, the Single European Act came into force, laying the foundations for transport policy on the trans-European network. Thanks to the common market, renamed as the “single market”, this offers the possibility of free movement of goods, people, capital and services in Europe¹. This freedom of movement gives the European Commission the opportunity to gain influence in the field of transport. On the one hand, by responding to the European Court’s criticism that the Member States have not developed the common policy provided for in the Lisbon Treaty (2007). On the other hand, by developing a Keynesian investment programme focused on transport infrastructure of common interest and the creation of a European high-speed train network [Aparicio \(2017\)](#).

3.2. *The creation of the trans-European transport networks (1992 - 2002)*

In the 90s, a compromise of priority projects between each EU Member State took place. It was in 1992, through the Maastricht Treaty, that the development of trans-European networks in the transport infrastructure sectors (TEN-T) emerged. This action aims to promote “the interconnection and interoperability of national networks as well as

¹ However, it was not until 1993 that the borders between the countries of the European Union disappeared with the implementation of the Maastricht Treaty agreements.

access to these networks”². The first ten TEN-T corridors were defined in March 1994. These corridors, commonly known as the “Crete corridors” (or “Helsinki corridors”), are located in Central and Eastern Europe (in other words, to improve the link between Eastern Europe with the rest of the Union). The aim of these corridors is to develop the economically weakest regions. In June 1994, another priority list of 11 so-called “high priority” transport projects was created, this time for Western Europe.

In December 1994 in Essen (Germany), three additional transport projects were agreed, increasing the list from 11 to 14 trans-European transport network infrastructure projects [Sichelschmidt \(1999\)](#). The first general principles for the financing of TEN-T projects and thus imply a major role for the ERDF, the Cohesion Fund, and European investment loans. The Treaty of Amsterdam, signed on the 2nd October 1997, also marked a turning point in European transport policy. Indeed, as a result of this treaty and the enlargement of Europe, all transport projects must be integrated into the objectives of sustainable development.

In order to comply with the objectives of rebalancing the European territory, to respond effectively to the increase in goods and passenger flows³, but also to the geopolitical and administrative context (requests for gradual accession of many countries to the European Union), technical (a large number of priority projects delayed), and financial (the launch of work proved more complex and costly), the guidelines defining the TEN-T policy were therefore profoundly revised in the 2000s.

3.3. *The TEN-T revisions, a better articulation of national networks (2003 – 2022)*

The reflections of the European Commission during 2002 - 2003, chaired by Karel Van Miert (former vice-president of the European Commission), resulted in a new TEN-T map with a list of 30 priority projects to be launched before 2010 and completed before 2020. Several objectives of this revision can be mentioned as being able to respond efficiently to the increasing flows but also to integrate the new EU countries into Western Europe. In 2004, the total investment cost for the completion of these projects was estimated at between 220 and 250 billion euros. Between 2005 and 2006, the European Commission created two elements for a better coordination of the TEN-T. The first was the appointment of the first six “European coordinators”. The second element, which was set up in October 2006, was the implementation of a Trans-European Networks of Transport Executive Agency, to manage transport projects in the best possible technical and financial way.

Since 2009, in order to ensure that TEN-T projects fit in with strategic transport plans at both European and national level (in each Member State), the European Commission has been carrying out an in-depth reform of the TEN-T guidelines, as shown by the Green Paper, the third White Paper (2011) and, above all, the new TEN-T regulation in 2013, which stresses the need to build a system based on the interconnection and interoperability of nine intermodal corridors, and then 10, including the Atlantic corridor. Only major infrastructures are retained which are articulated around corridors previously defined as projects which are themselves divided into two networks [Beyer \(2014, 2015, 2020\)](#). A core network is expected to be completed by 2030 and a second network, called the comprehensive network, to be connecting all EU regions by 2050. The Atlantic Corridor crosses four countries: Germany, France, Spain and Portugal. It represents more than 7,800 km of main rail network, and more than 4,400 km of road sections. The origin of the name of the corridors in 2013 comes from the European Commission’s desire to use maritime markers and not numerical elements to avoid a hierarchy between them [Libourel \(2015\)](#).

4. Interoperability: standardisation for national networks in Europe

The need for an interoperable European network led to the promotion of the gradual establishment of a railway system of the same standards by the European Union, which was initiated several decades ago. In fact, although the subject of a “common transport policy” (Title IV) was envisaged as early as the Treaty of Rome (1957), it was not until the advent of the single market in 1992 with the Maastricht Treaty that the subject of single continental transport was seriously addressed. The standard has always existed for road, inland waterway and air transport. However, this

² Treaty of Maastricht. 1992. “Treaty on European Union”. https://www.cvce.eu/content/publication/2002/4/9/2c2f2b85-14bb-4488-9ded-13f3cd04de05/publishable_en.pdf

³ Information taken from the second White Paper of 2001, entitled “European Transport Policy for 2010: Time to Decide”.

was not the case for rail transport. Despite its more than 175 years of existence, the mode that is now considered to be the most future-oriented and environmentally friendly, has not made any progress in developing an international network; thus, although some countries have made agreements to connect their national networks, there is an almost systematic change of locomotive at each border.

In the context, of this analysis of the Atlantic corridor, unlike most continental TEN-T corridors, this one does not even have a single track gauge, which complicates the continuity of the corridor at the border. Indeed, this is one more barrier, but we can list many others: signalling systems, power supply voltage, availability of capacity (of train paths or in stations), knowledge of the language of the country crossed or even the respect and compatibility of the timetables proposed for the manager, and without taking into account discrimination or other bad practices in order to avoid competition.

4.1. Historical standardisation

During the early days of the railways, standardisation was not a problem for the railways; they all had one concession (or even several for one route) and were free to develop their operating system as they saw fit to achieve a mature and powerful system. Indeed, competition with other means of transport was not an option; the time required for road transport was not comparable. Although Stephenson decided in 1830 on a gauge of 1,435 millimetres for the railway between Liverpool and Manchester, there was no technical reason behind this proposal. Indeed, it was only the gauge chosen for the design of his first mining locomotive.

Other companies in need of locomotives asked him to supply them with this material, as he had a monopoly on selling it, and it was he who effectively standardised the gauge. Another English engineer, Isambard Kingdom Brunel, advocated a wider gauge, 2,140 mm, which offered the possibility of higher speeds, allowed the use of larger wheels and facilitated their maintenance. The so-called “gauge war” ended in 1846. For the first time in the history of the railway, a decision was taken to achieve the desired network effect. A governmental commission in the United Kingdom prohibited the construction of lines with a different gauge in Great Britain. The 1,435 mm gauge was adopted, but unification was far from complete because other aspects such as gauge were not touched. As the UK was almost a monopoly supplier of railway equipment, the commercial battle had been won and the European gauge in general respected that of the British locomotives [Lamming \(2003\)](#).

Focusing on our corridor, Spain was the first to make a decision. In 1844, seeing the importance of creating a consistent network for the country, a report nicknamed “Subercase” (after its authors), advised keeping a wider gauge (1,672 mm) to ensure the power of locomotives with large boilers to overcome the orography of the Iberian Peninsula. Portugal had started negotiations with France to establish a European network and have a way to connect Lisbon with the rest of Europe. In this respect, in 1851 the Portuguese government asked Spain for its forecasts regarding the gauge and dates for the establishment of the line between Badajoz and the French border.

In 1852, French diplomats stressed to the Spanish government the importance of a standard gauge in European countries in order to conduct international business. Starting from the same idea as the engineer Brunel, the answer was clear, there was no intention to change the Spanish gauge because it was not intended to make the convoys cross the border but to tranship the goods. The basic idea was the same: no company will be able to put its vehicles on a network that is not its own. The answer to the French was clear. Compared to the traffic on the domestic network, the traffic with France would be much smaller, so it was useless to affect the performance of the entire national network on the pretext of establishing more fluidity with Europe⁴. Thus, in Spain, the 1855 railway law fixed the gauge at 1,672 mm. In Portugal, it was the Spanish investor (the same one who ran one of the great Spanish companies, the Marquis of Salamanca) who set the gauge at 1,665 mm, an almost identical measure⁵. Of course, this difference does not prevent an interconnection between the two Iberian countries [Moreno Fernández \(2018\)](#).

⁴ A report by the Ministry of Equipment in 1854 referred to the 1,300 km of track that would have had to be rebuilt and pointed out that: “compared with our domestic traffic, the traffic with France will always be reduced, and it will be difficult if not impossible for people or goods to circulate on our territory - for example, to pass as far as Madrid in the same carriages as those occupied on French territory; all of which are good and weighty reasons for not being in favour of identical track gauges in France and Spain”, according to [Moreno Fernández \(2018\)](#).

⁵ The calculation was not done by measuring with the international system, but in Portuguese feet different from Spanish feet, which explains this small variation.

4.2. Major international agreements

After this haphazard start, a conference was held in Berne in 1882 to start looking for standards. The start of the European express trains with the *Compagnie Internationale des Wagons-Lit* (CIWL) as their most important driving force and the intensification of the exchange of goods between states had highlighted the problems of isolated national systems. The result of this first meeting was the creation of the *Convention internationale concernant le transport des marchandises par chemins de fer* (CIM) in 1890, the *Convention internationale concernant le transport des voyageurs et des bagages par chemins de fer* (CIV) in 1923 and other international bodies, including the International Union of Railways (UIC) in 1922. It was the latter that was to have great strength and to show that the most powerful players were the railways. Despite these advances, when electrification arrived, each country took different decisions, and as a result created another difficulty for international traffic. Indeed, because of the lack of continuity, as the cars or wagons were pulled by the company to which the network belonged, nobody gave importance to this new barrier. Taking advantage of the reconstruction of countries in the 50s, Louis Armand, president of the SNCF and the UIC, launched his project for a European company, the *Société Internationale des Chemins de Fer Européens*, in the following terms: “The leaders of the railways were faced with a choice, just like politicians: either we join or we integrate”⁶. This idea gave rise to the Trans-Europe-Express (TEE) network and the UIC standard wagons (EUROP) and coaches RIBEILL (2003).

To return to the Atlantic Corridor, the agreement⁷ in 1863 between the *Compagnie du Midi* (France) and the *Compañía de los caminos de hierro del Norte de España* (Spain) resulted in the construction of an international link with each type of gauge; each station had a platform adapted to receive the train of the company of the country opposite. In addition, it can be seen from this agreement that the foreign policy of the countries was one of the most important points in this affair: the trains only stayed in the foreign station to pick up or set down passengers. In the case of our corridor, two cross-border services can be mentioned, such as the Sud-Express which was born in 1887 and the Lusitania Express in 1943. The former is a connection of the Iberian Peninsula with Europe, linking Paris, Madrid, Lisbon and Porto, while the latter connects Lisbon with Madrid. As far as the Sud-Express is concerned, it only reached Hendaye (France) and soon the carriages started to change bogies by lifting 3 carriages at a time without getting passengers off LAMMING et al. (2005). This changed with the arrival of the Talgo equipment and the automatic gauge change with an installation in the back station of Irún (Spain). This facility will be used as a justification by the Spanish government for not needing to change gauge on its network.

4.3. Standardisation of the European Union railways

In 1988, the European Economic Community started to take the standardisation of the European transport and energy markets seriously. In this context of insufficient standardisation, the companies continued to work together and included the European Commission and CEN and CENELEC as European standardisation bodies in their thinking. Indeed, the start of liberalisation was seen as an opportunity for the monopoly companies. A first directive⁸ was published in 1991 which laid down some technical principles for European railways but directed its most far-reaching changes to social and economic issues. The consequences for the companies were serious: they lost some of their power. The Commission began to gain power and in 1996 it published another directive⁹ for the standardisation of the network that was being built, that of high-speed rail MOURAREAU (2003). Thus, “Technical Specifications for

⁶ L. Armand, 1974, *Message pour ma patrie professionnelle*, Les amis de Louis Armand, p. 85.

⁷ Agreement on the operation of the connection line from Irún to Hendaye and the traffic service relations between the two companies signed in Paris the 4th December 1863 available in the open archive of the Basque Railway Museum: <https://museoa.euskotren.eus/sites/museo/files/2021-05/5.pdf>

⁸ Council Directive 91/440/EEC of 29 July 1991 on the development of the Community's railways. URL: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31991L0440#>

⁹ Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system. URL: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:31996L0048>

Interoperability” (TSIs) documents were published from 1999 onwards, and they have been refined through successive revisions to arrive at the current version. TSIs have several areas of application¹⁰. Firstly, to areas of a structural nature:

- Infrastructures;
- Energy;
- Control and command and signalling;
- Rolling stock.

In a second stage, to areas of a functional nature:

- Maintenance;
- Environment;
- Operation;
- Users.

In the French scenario, after the construction of the new high-speed line Paris-Lyon, the Atlantic link became important to equip a second line from Paris; fully opened in 1990; it has two branches to Tours and Le Mans [Leboeuf \(2013\)](#). In the Spanish case, another important event took place: during the renovation of the Madrid-Seville line, it was converted into a high-speed line with the standard rail gauge and the European gauge. This was the start of the rail gauge conversion throughout Spain. This conversion, which is not yet complete, reached the border on the Mediterranean side (via Barcelona and Perthus) in 2013 [Macias i Arau \(2011\)](#) and in a few years on the Atlantic side as explained below (see 6). Indeed, in need of modernising its railway infrastructure, Spain asked for help from the European Union, which set as a condition the assurance of interoperability with other European countries by using the standard gauge, the ERTMS signalling system, the gauge and in general all the TSIs necessary to continue the march towards uniform railways at the European level. The Talgo rail gauge change system in Irún and Portbou (Spain), which was used to justify the non-necessity of the change at national level, is now being used to compensate for the new borders produced by the partial change. In 2019 there were 34,312 crossings of these “internal borders”, an average of 94 per day. Meanwhile in Portugal, the infrastructure manager (IP) already integrated the road and rail network, which has probably made road transport more important, although in recent years this has been reversed, but Portugal does not intend to start a gauge change of its rail network as Spain does. Nevertheless, a different gauge change system specific to freight (OGI system) is being installed in Irún station to handle international traffic.

The Sud-Express link, renamed Elipsos, was abandoned in 2013 when the Barcelona-Paris TGV service (and from Madrid with a connection) was introduced. The Atlantic coast crossing is only possible by day with a change at Hendaye station. The night rail service has been modified by lengthening its route and then abandoning it in 2017 when the High-speed line *Sud Europe Atlantique* (SEA, between Bordeaux and Tours) enters into service. Between Hendaye and Lisbon, there have been service degradations for an abrupt end in 2020 due to the health situation, thus depriving Lisbon of any international rail link, the only European capital in this case. In addition, local international services have been proposed as on the axis between Porto and Vigo from private initiatives and under the conditions of the freely organised market (possible since 2010 in international connections). It ended in failure due to lack of commercial interest. Other projects are underway, such as that of the Nouvelle Aquitaine - Euskadi - Navarra Euroregion (a project called Transfermuga), which is attempting to set up a rapid transit system between the cities of San Sebastián and Bayonne as an international public service obligation (PSO). It seems to be unsuccessful in Spain as the state and the region are fighting over their competence. Even if some arrangements are made to ensure exchanges (transport card valid on both sides of the border), the project seems to be stopped at the moment.

¹⁰ Detailed information is available on the European Railways Agency website: https://www.era.europa.eu/domains/technical-specifications-interoperability_en

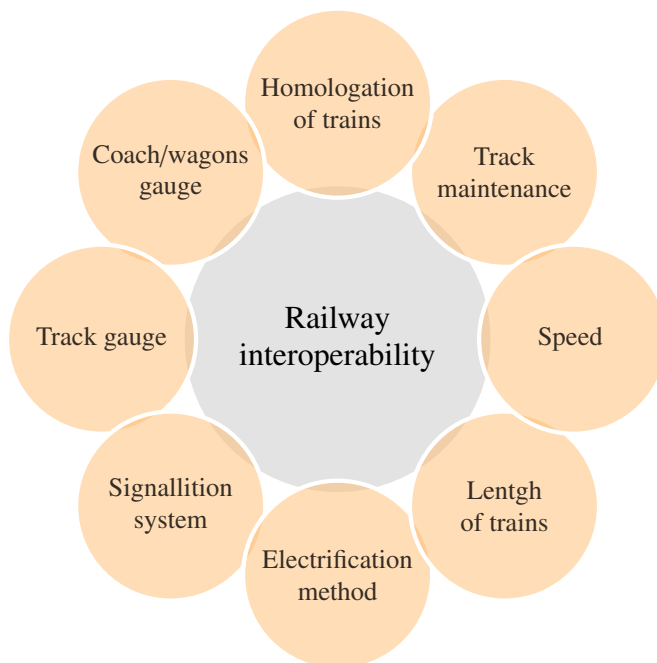


Fig. 1. The main standardisation challenges for rail interoperability .

5. Multimodal corridors face problems of uniformity of the rail network

5.1. The technical challenges...

The creation of a corridor network therefore requires “the development and implementation of thousands of projects aimed at removing bottlenecks, establishing missing links and improving interoperability between the different modes of transport and between regional and national transport infrastructures”¹¹. The aim is therefore to create an interconnected network, thus moving from connections to interoperability Margail (1996). Beyond this European will, it must be noted that in cross-border areas the movement of trains from one border to another seems difficult for many reasons. They may be directly linked to the status of the infrastructure (degraded, winding, single track, etc.), and to the difference in gauge between the networks of various neighbouring countries. For instance, the Iberian Peninsula has Iberian track (1,668 mm), while France has a standard gauge (1,435 mm). Other standardisation issues are related to gauge, such as problems of approval of rolling stock, couplings, braking systems, and power supply systems Lamming (2003). Some are also related to trains and coaches¹², such as gauge.

In addition to this, there are problems of load, length and speed of trains, which seem to be important limitations for freight transport between France and the Iberian Peninsula for example. One of the major problems in Europe is the different signalling between countries Wurmser (2003). In addition to the difficult traffic rules, drivers also need to be bilingual and have a good knowledge of these standards. Nevertheless, solutions exist to respond effectively to these many challenges, such as the European Rail Traffic Management System (ERTMS), which is a European initiative that aims to harmonise rail signalling in Europe. However, the equipment of this system is still very heterogeneous in Europe and very expensive.

¹¹ European Parliament. 2022. Trans-European Networks - Guidelines. <https://www.europarl.europa.eu/factsheets/en/sheet/135/trans-european-networks-orientations>

¹² The use of the term couch refers to a towed vehicle specially designed for passenger transport. The term wagon refers to a vehicle specialised in the transport of freight.

5.2. ... intertwined with different political and economic wills

In addition to technical barriers, both political and economic factors are disrupting the unification of the European rail network too. Even if the TEN-T seems to play a role as a coordination platform, behind it lies national planning specific to each country. First of all, the constant change of government leads to not one, but several transport strategies, which often result in rail projects being delayed for years or even cancelled. Furthermore, if we take the case of the Atlantic Corridor, we notice that the priorities in the realisation of the French and Spanish network seem to reinforce the economic weight of their capital (Paris and Madrid) through the development of a high-speed train network in a hub and spoke pattern. The Franco-Spanish cross-border link thus seems to be secondary, as in the case of the French “Grand Projet Sud-Ouest” (GPSO) project, which is intended to link Bordeaux to Toulouse and Bordeaux to Dax (see 6.1), or the “Basque Y”, even though the latter is under construction, unlike the former (see 6.2). The same observation can be made in Portugal (see 6.3). On the other hand, the economic and financial crises also marked a turning point in the countries’ railway policies. Governments are thus scaling back their priority projects. This choice is not without consequences, since it varies the time horizons of the projects and the emergence of a social divide (between protagonists and protesters), thus jeopardising the political compromises on either side of the border, but also coordination and the issues of interoperability and intermodality at different levels (European, national, regional and local).

6. Case study: In the face of political, social, economic and ecological conflicts, the implementation of rail interoperability remains slow

6.1. The GPSO project: a French HSL without political commitment?

From the 2000s onwards, in the context of major European infrastructure projects, the European Union was planning major projects such as the GPSO in order to ensure the coherence, interoperability and connection of the transport networks of the member states. This project, which originally combined two separate high-speed rail projects (Bordeaux-Toulouse and Bordeaux-Spain), is now merging them into one (see figure 2). This project has multiple obvious issues on several scales. Firstly, on a European scale, it will improve the western interconnection of the French rail networks by providing high-speed services to the South-West and also to Spain. Then, on a national scale, it will link Paris to Bordeaux in 2:04 hours instead of 3:15 hours, thanks in particular to the HSL *Sud Europe Atlantique* (SEA). Finally, on a regional and local scale, it offers the possibility of freeing up traffic slots on the current saturated line for regional TER trains, freight trains and combined transport Wolff (2015).

However, in 2003, due to the overabundance of HSL projects and their estimated costs, the State decided to abandon its commitment and to limit itself to the Bordeaux-Toulouse section. The realisation of the section beyond Bordeaux is mainly linked to the participation of several territorial actors, and in particular the regions, in the project of the first high-speed line called HSL SEA from Tours to Bordeaux, built and operated as a public-private partnership Fouquieray and Manceau-Antoniuzzi (2017). This section, which entered into service in July 2017, was built thanks to funding from the European Union, the State, LISEA (the concessionary company for the line for a period of 50 years from 2011 to 2061), SNCF Réseau, as well as numerous local authorities, all of which conditioned their support for the continuation of the line further south, and thus for the completion of the GPSO project Zembri-Mary (2018).

From the beginning of the 2010s, the timetable for this link varied due to an ambiguous political will. In fact, France is witnessing a questioning of the profitability of rail lines on the one hand, linked to the indebtedness of the SNCF, which can no longer finance all rail projects, and on the other hand to the emergence of environmentalist and NIMBY struggles Wolff (2015). Initially planned for 2010 (according to the European Parliament and Council decision of 1994), the entry into service of the high-speed line between Bordeaux and Toulouse, currently planned for 2032, could be postponed to 2034 COI (2022). Moreover, the cost of the operation amounts to 10.3 billion euros for this line and 3.7 billion euros for Bordeaux-Dax, especially since the European Union announced in June 2022 that it would not finance the HSL links between Bordeaux, Toulouse and Dax. This HSL project is therefore at the centre of a process of territorialisation at all levels (national, regional and local) and a project of crystallisation between a multitude of actors with diverse expectations. On a national scale, the French desire for more intensive and efficient rail infrastructure is combined with a strong demand from the French regions (*Nouvelle Aquitaine* and *Occitanie*). In the eyes of regional

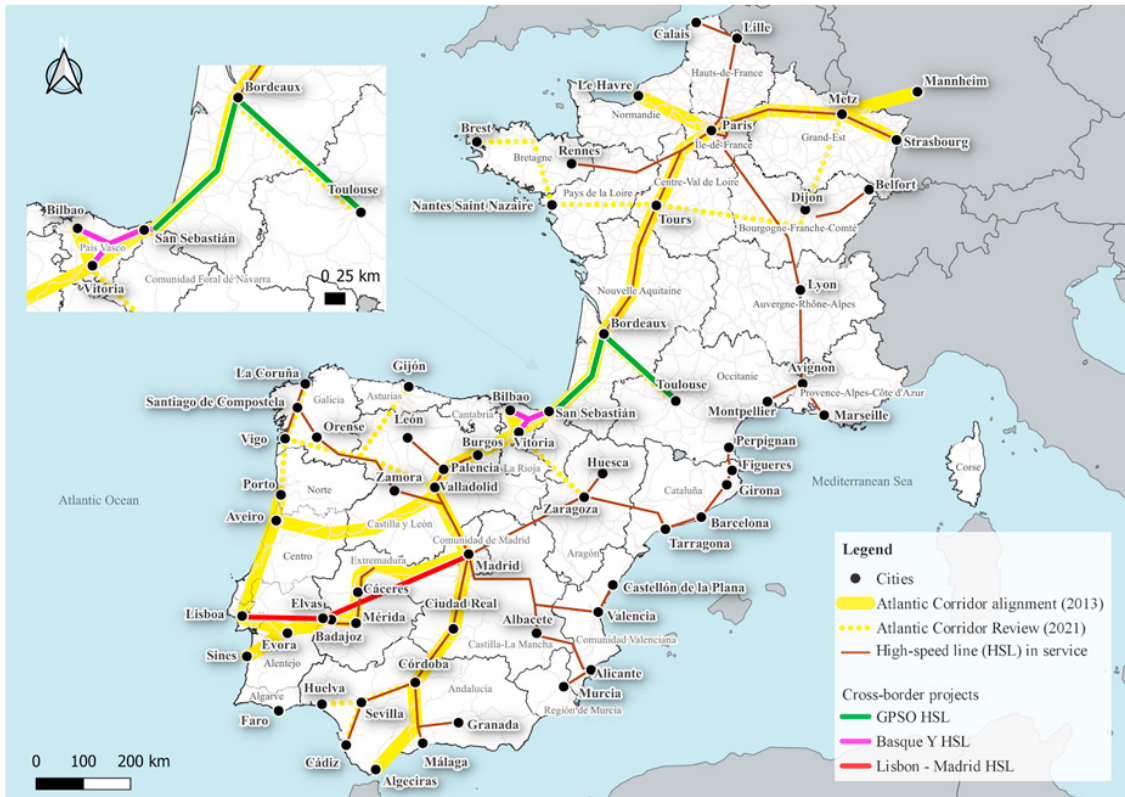


Fig. 2. A representation of the Atlantic Corridor focusing in the projects of our case of study [European Union \(2013\)](#); [European Parliament \(2022\)](#).

and local players, high-speed rail thus represents a bouquet of economic and development opportunities. Nevertheless, there is strong environmental and social opposition to this project. The European and national desire for the GPSO is thus part of deep-seated technical and political struggles, limiting and delaying interoperability between France and even Europe with the Iberian Peninsula.

6.2. The Spanish Basque Y project, facing unprecedented political, technical and financial challenges?

In Spain, another rail project commonly referred to as the “Basque Y” is intended to provide interoperability with France. This project is a railway line about 175 kilometres long forming a “Y” that aims to link three Spanish cities Bilbao, San Sebastián and Vitoria. It is intended to provide a continuous link between Madrid-Valladolid-Victoria-Irún and France. This project has always been conceived as a tool for the internal structuring of the Basque Country region, as was the case in the 1980s with the motorway projects in this area. This project has many similarities with the GPSO. Firstly, since 1994 it has also been part of priority project number 3 “High-speed rail axis in south-west Europe”, and then in 2013 it became part of the central network of the Atlantic corridor. On a regional scale, the latter dates back to 1986, but it was not until 1993 that the Spanish government’s objective of linking Madrid to Paris via Pamplona and the Basque Y was achieved. Secondly, it plans to reduce the journey time between Bilbao and Madrid (in 2 hours 40 minutes), Bilbao to Bordeaux (1 hour 55 minutes once the Basque Y and the GPSO are fully operational) and Bilbao to Paris in 4 hours. Thirdly, it is part of a process of strong mobilisation “characterised by competition between the Basque and Spanish administrations, recurrent confrontation between the regional administration and social movements leading to violent radicalisation dynamics, and a first experience of cross-border cooperation” [Audikana \(2015\)](#).



Fig. 3. Building status of Y Basque HRL at the end of 2022.

Furthermore, on 12 December 2002, the Basque government launched a call for tenders to the drafting of projects for six sections of the Basque Y. The project had two specifications (Basque and Spanish governments). The construction of the Basque Y only started in 2006 and should be finished in 2027, i.e. 5 to 7 years earlier than the GPSO which has not yet started. According to this representation (see figure 3), we can see that the construction of the entire network is practically complete. However, it is important to specify that the connectivity of the new high-speed line from Vitoria to Burgos, Bilbao to Santander and San Sebastián to the French border is still in the planning stage. Without the completion of the high-speed line, interoperability is therefore impossible. Aware of this lack, in May 2021 the Spanish government authorised the tender for the work between Astigarraga and Irún, thus ensuring the link with the French border via the Madrid - Hendaye line¹³.

This prompts us to claim that national governments (Spanish and French) seem to have a key role in infrastructure projects. As mentioned earlier, different governments dictate transport priorities, but these often vary according to the mandate, resulting in the postponement of the decision to start construction work. This was particularly the case in the 1990s, when the Spanish Ministry of Transport favoured other projects such as the Madrid-Barcelona-Figueras line, which opened in 2013¹⁴, and the Madrid-Valladolid line (in operation since 2007)¹⁵. The design of the project is nevertheless unique, as its financial cost is estimated at 4,860 million euros, or about 27 million euros per kilometre in 2017¹⁶. In addition, half of the route of this high-speed line (60%) will run through a tunnel due to the topography of the Basque Country. For all these reasons, not to mention the potential technical challenges to be met, the gen-

¹³ Ministerio de Transportes, Movilidad y Agenda urbana. 2021. “El Gobierno autoriza la licitación de las obras de implantación del ancho estándar entre Astigarraga e Irún por un valor estimado superior a 59 millones de euros”. <https://www.mitma.gob.es/el-ministerio/sala-de-prensa/noticias/mar-18052021-1352>

¹⁴ The Madrid-Barcelona-Figueras high-speed line is made up of three sections: Madrid-Lérida, opened in 2003; Lérida and Barcelona, opened in 2008; and Barcelona and Figueras, opened in 2013.

¹⁵ The French government also favours the commissioning of other LGVs such as the LGV Méditerranée (from Lyon to Marseille) in 2001 or the LGV Est européenne from Paris to Baudrecourt (2007) and to Strasbourg (2016).

¹⁶ European Investment Bank. 2017. “AVE Y VASCA EXTENSION”. <https://www.eib.org/fr/projects/all/20170041>

eralisation of interoperable equipment seems slow Troin (2008) and far from being achieved on the French-Spanish border.

Anyway an attention point should be highlighted at this point. As explained, from 2013 all the necessary infrastructure for a border crossing was prepared at Mediterranean side. Today only 4 trains of passengers each day, also some fret. There is not a real service prepared for the near border villages, only a long distance one (where take a ticket to cross the border is not an option for everyone); today there is not an PSO in this part and the infrastructure is absolutely sub-utilised. This problem has several reasons: the French side is not absolutely interoperable, the politics at one side another of the border doesn't want to propose an PSO service, there is not a real incentive to doing this for operators. Maybe it will be easier at Atlantic corridor because the euroregion wants it but also because Renfe has announced a service between San Sebastián and Bayonne from the moment that first effects of Y Basque will be visible (late 2024).

6.3. Is the interoperability of the Lisbon-Madrid high-speed line primarily a political issue?

In the 90s, one of the objectives was to link the major European cities, and in particular the capitals, by 2010 with high-speed lines such as those between Lisbon and Madrid. However, thirty years later, no high-speed project between Spain and Portugal has yet been completed. To understand this delay, we need to look at the different Portuguese and Spanish national transport policies in the 90s. At that time, the Portuguese government seemed to be planning a project that focused on the Atlantic coastline, linking Lisbon with Porto and Lisbon with Madrid via two high-speed lines. On the Spanish side, as we mentioned earlier, the Spanish government wanted to build a rail network from Madrid that followed a star-shaped organisation. Following this desire, a European Economic Interest Grouping called *Alta Velocidad(e) España Portugal* (GEIE-AVEP) was created in the 2000s. The Portuguese government is conducting a number of studies launched by *Rede ferroviaria de Alta Velocidade* (RAVE) to develop, coordinate the studies, financing and operation of a new high-speed rail network.

The primary objective is to reduce travel times between Lisbon, Porto and Madrid, and thus promote the interoperability of the Iberian Peninsula and Europe. However, due to the debt crisis in the Eurozone in 2010, the Portuguese government completely abandoned in 2012 - 2013 the realisation of the Lisbon-Madrid HSL, even though it had been identified as a major interest since 2003. Since 2014, the Portuguese government has chosen to modernise and renovate only existing railway lines through modernisation plans (*Ferrovias 2020*, PNI2030, National Railway Plan) and to build certain sections with a European vocation, such as Evora-Caia, thanks to the European funds allocated for the creation of the Atlantic Corridor. It can be seen that in the 2013 TEN-T, the Evora - Mérida project is included in the core network of the Atlantic Corridor and is to be prioritised over the Lisbon - Madrid HSL. In Portugal, this cross-border line is considered to be “the biggest new railway project of the last 100 years”¹⁷ according to the Portuguese Prime Minister, Antonio Costa. The line alone is estimated to cost 456 million euros¹⁸ and has been under construction since 2017, with the majority of the work apparently for freight transport¹⁹. In addition, there are technical challenges of interoperability (electrification of the tracks in progress, etc.). Even though Portugal and Spain have been meeting every year since 1983 at Iberian summits to promote cooperation between the two countries in order to develop common policies, it is clear that the Spanish and Portuguese national wills seem to be much stronger than those of Europe.

7. Conclusion

In conclusion, the historical interest in a European corridor connecting France and the Iberian Peninsula was not shared by all the stakeholders in the territory. This lack of commitment to a common transport policy is still visi-

¹⁷ Portuguese Republic. 2018. “The biggest new railway line work of the last 100 years”. <https://www.portugal.gov.pt/pt/gc21/comunicacao/noticia?i=a-maior-obra-de-linha-ferroviaria-nova-dos-ultimos-100-anos>

¹⁸ Infraestruturas de Portugal. 2016. “Railway 2020 infrastructure investment plan”. <https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=%3D%3DBAAAAB%2BLCAAAAAAABAAzNjI2BgCLvY6vBAAAAA%3D%3D>

¹⁹ The objectives are to cope with the increase in maritime traffic in the port of Sines (the number of containers in the port of Sines has risen from 40 containers in 2003 to 1.7 million containers in 2018) while at the same time freeing up capacity on existing rail lines such as Abrantes - Elvas.

ble today through existing technical barriers. However, it seems that a mutual attachment was found in the 90s with the creation of a trans-European transport network (1994) and the first railway interoperability directive (1996). On the other hand, it can be observed at different levels that there is still a strong technical discontinuity at the borders (Basque Y high-speed line, GPSO high-speed line, Lisbon-Madrid high-speed line, Transferruga, etc.) but also political discontinuity (delayed or even abandoned projects). The latter despite the initiatives underway as illustrated by the appointment of a Spanish coordinator in January 2023 for the development of the Atlantic corridor (this appointment is reminiscent of what was achieved in 2018 in the Mediterranean corridor in Spain). To overcome the lack of interoperability between the Iberian Peninsula and France, a few solutions can be proposed:

- In order to overcome the gauge difference, the use of Talgo trains to cross borders can be systematically intended for passenger traffic. Indeed, this very light rolling stock has the particularity of changing from one gauge to another without stopping the train. In addition, Irún station is currently building a rail gauge changing device (OGI system) which will allow the circulation of freight trains in the corridor. On the other hand, all these solutions seem to be temporary (a few decades at most) and cannot be thought of as long-term solutions.
- In order to overcome the border effect, the importance of local cross-border transport must be a priority and thought out in conjunction with the expectations and habits of the population. The establishment of international PSOs must be considered and not questioned by the political competences of each region, as shown by the Transferruga project.

Railway interoperability is therefore an essential element to allow the creation of a single European network without hindering trains on different railway networks. Here, European corridors such as the Atlantic corridor could be a good tool for the installation of ITS because of the increase in flows (passenger and freight) and competition from other modes (air, road) but also to stimulate the economy of the countries.

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