EUROPE ON RAIL

Reviving French–Spanish passenger rail lines

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Eco-union & RAC-France

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EUROPE ON RAIL

Europe on Rail is a European initiative led by civil society organisations to reduce carbon emissions derived from international mobility. Through research work and by bringing together actors of the railway sector, the aim is to foster ambitious policies for a train revival in Europe.

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eco-union is a non-profit organisation based in Barcelona that aims to promote the climate transition towards sustainability in Europe and the Mediterranean region. We work with governments, companies and international institutions to develop and implement policies that accelerate the energy transition, sustainable mobility, and green and blue economy, among other sustainable development issues.

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The RAC France coalition brings together 36 national and local associations for the fight against climate change and a fair, integrated and ecological transition. They act at every relevant level, from international to local.

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1. Introduction and context

This report aims to compile and assess the state of the **French-Spanish passenger trains**, with a particular focus on medium and **long-distance – night and day – cross-border connections.** This first section introduces the modal share of passenger rail transportation and the challenges the sector is facing in terms of cross-border mobility.

1.1. Transport, rail and climate mitigation

The transport sector is responsible for **27% of total greenhouse gas emissions** in Europe[1]. The European Climate Pact states that to achieve climate neutrality by 2050, emissions from transport must be **reduced by 90%.** It is therefore essential to decarbonize European citizens' mobility. The **European Commission** strategy to achieve this systemic change - the Sustainable and Smart Mobility Transport Strategy - has three pillars:

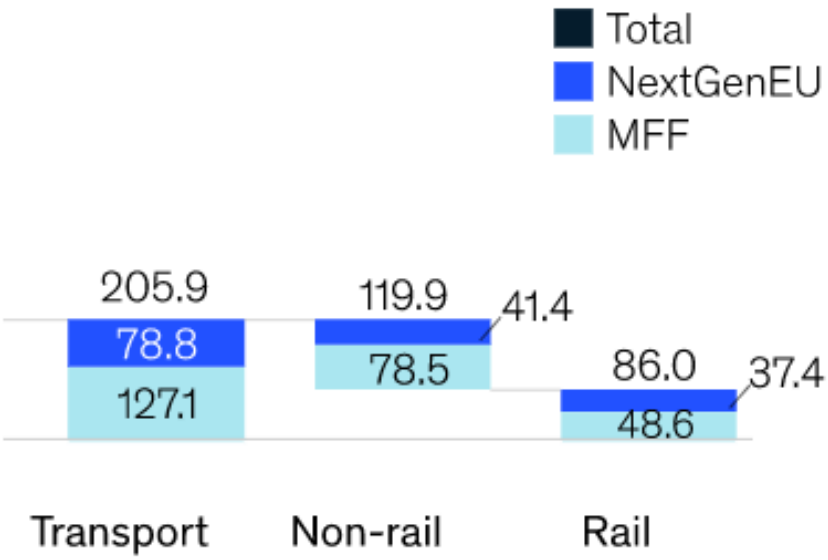
- Make all transport modes more **sustainable**, by increasing the share of zero-emission cars, vessels and aircrafts (which are thought to be market ready by 2035) in transport.
- Promote the availability of sustainable **alternatives** in a multimodal transport system,

[1] Greenhouse gas emissions from transport in Europe - EEA

- Put in place the right **incentives** to drive the transition, by applying 'polluter-pays' and 'user-pays' principles in all transport modes, through carbon pricing and infrastructure charging mechanisms.

Today, **aviation and road** are the most **carbon-intensive modes of transport.** Despite their well-known harmful impact on the environment, both sectors still benefit from large **investment plans.** Following the pandemic, European funds were put in place to help member states with recovery and implementing the European Green Deal. It is estimated that €86 billion of this funding could be used for rail projects over 6 years, but it is estimated that non-rail transport could receive much more, up to €119,9 billion, or 58% of what is being allocated to transport.[2]

Figure 1. Funding breakdown of Multiannual Financial Framework and NextGen EU 2021-2027



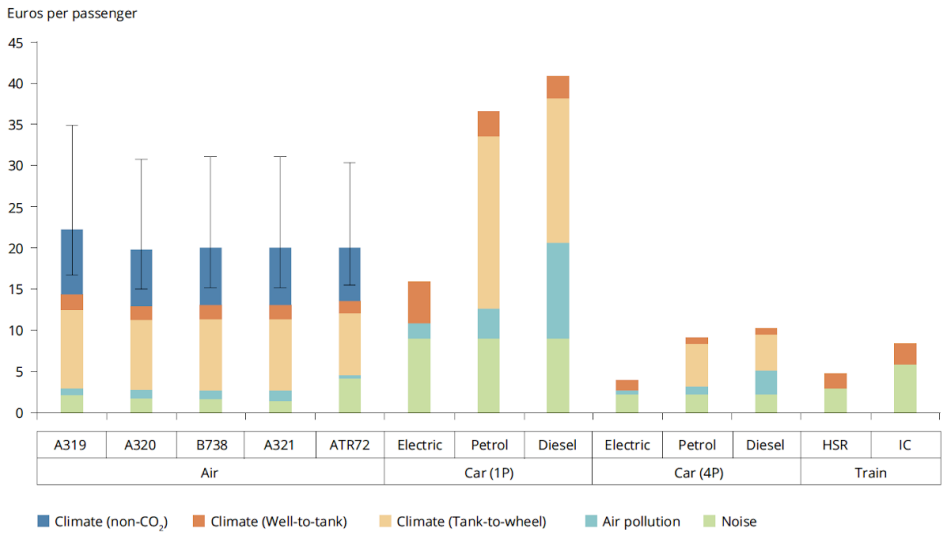
Source: McKinsey

Rail is a low-emissions mode of transport, especially when compared with road and air transport modes. When looking at the environmental costs, **air travel and cars with a low occupancy rate are the most costly for the environment** (See Figure 4). Only electric cars carrying four people have a smaller impact than rail. When taking into account only the climate cost (including non-CO2 emissions from air travel), we see that rail has a small cost, even

[2] Safe, smart and green: Boosting European passenger rail's modal share - McKinsey

estimating low occupancy rates for high-speed rail (66%), and intercity trains (36%). The higher the occupancy rate for trains will be, the lower the cost for the climate per passenger will be.

Figure 2. Emission costs of different transport modes (1000 km)



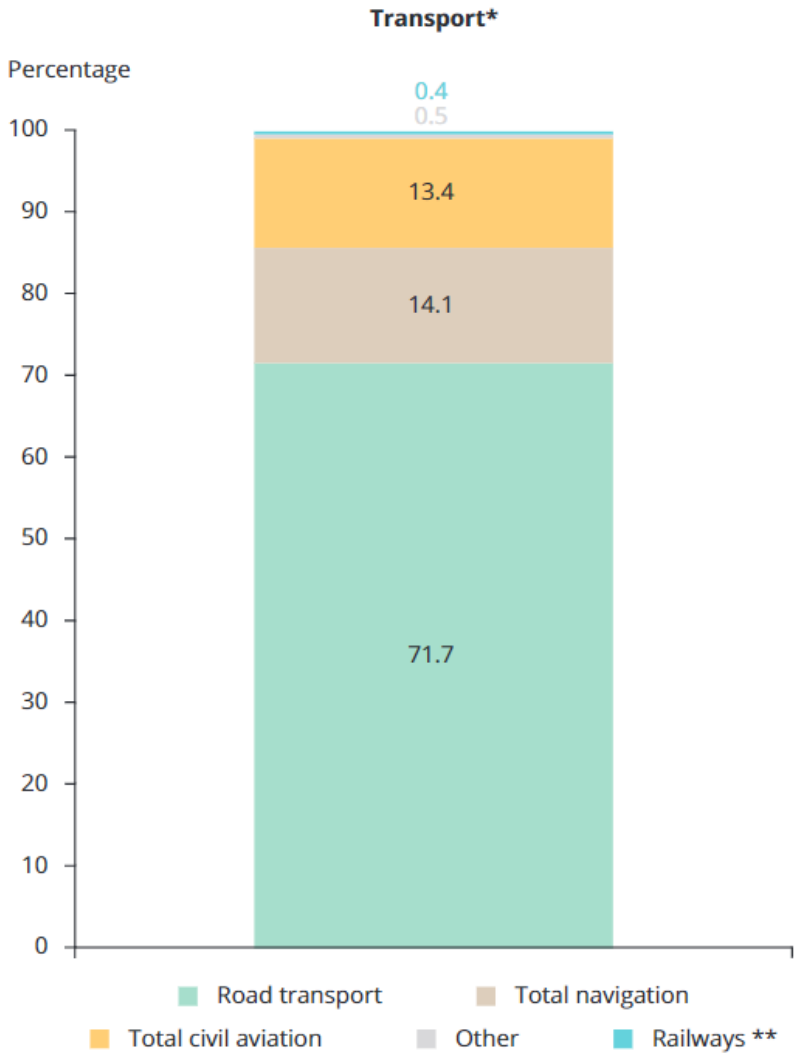
Note: The error bars reflect the uncertainty for the non-CO_2 climate costs of aviation based on Cox and Althaus (2019). Occupancy rates: aircraft 80 %; HSR 66 %; IC (intercity train) 36 %.

Source: EEA

According to the **European Environment Agency**,[3] only 0,5% of total transport emissions are associated with rail mobility, while 72% are associated with road transport, 14% with shipping and 13% with aviation (see Figure 3). However, **the modal share of rail remains stagnant** (about 8%)[4] and people are increasingly using air travel and the car rather than rail.

3 Decarbonising road transport - The role of vehicles, fuels, and transport demand - EEA
4 Modal split of passenger transport - Eurostat

Figure 3. EU transport GHG emissions by mode of transportation



Source: European Environment Agency[5]

[5] *Including international bunkers (international aviation and international maritime transport.
**Excluding indirect emissions from electricity consumption

Figure 4. Passenger transport by road/rail modes in billion passenger-kilometres and car share in the EU-27, 2000-2019

Source: EEA

Rail isn't used to its full potential, especially not as a means of cross-border travel. Indeed, increasing day and night train rail connections between France and Spain requires going over multiple hurdles. At the end of 2021, the EU published its New Action Plan for Rail, intending to boost long distance and cross-border passenger rail. Important obstacles to this development exist, and the action plan identifies several leads to address them:

Figure 5. EU action plan to promote long-distance and cross-border passenger rail

Source: Own creation based on European Commission information

1.2. Obstacles for cross-border rail mobility between France and Spain

Developing an attractive offer is one of the main challenges to promote night and day train connections between France and Spain. Indeed, despite being well equipped, some cross-border lines are not operating well such as the Toulouse-Barcelona, Marseille-Barcelona, Lyon-Barcelona or Paris-Barcelona. **Competition** with airlines slows down the renaissance of French-Spanish passenger services. Airlines can offer a wider range of prices and flight services, usually offering cheaper prices than rail. For example, the starting price for a

Paris-Barcelona by train is 39€[6], and only 15€ by plane[7]. 21 airlines offer this journey[8], while the rail line is operated only by Renfe-SNCF en Cooperación[9].

Another challenge is the coexistence of two **track gauges**[10] (1668 mm in Spain and 1435 mm in other countries). Yet, solutions exist to face this technical issue. First, some railway equipment can be interoperable, as is the case for Talgo's equipment. This Spanish-listed manufacturer of high-speed trains was using it for the Paris-Madrid night train connections, which closed in 2013.

One last challenge to overcome is the impact of mobility restrictions due to **COVID-19 pandemic.** With the closing of borders in neighbouring EU countries in March 2020, rail connections have been stopped for an indefinite period. Many services on these cross-border lines have not reopened, and others have lost money as they were hit hard by the pandemic: it indeed led to a reduction of passenger numbers by more than 50% which resulted in service levels being reduced or withdrawn.[11]

From this perspective, this report mainly focuses on the train lines related to the **Atlantic corridor** connecting **Paris/Bordeaux to Madrid** through Hendaya; and the Mediterranean corridor, connecting **Paris/Montpellier to Barcelona** through the tunnel of Perthus. What potential for these lines? *What are the main infrastructure, operational or commercial challenges and opportunities? What solutions can it bring in the short, medium and long term?*

6 Trains from Barcelona to Paris - trainline.com
7 Cheap flights from Barcelona to Paris - kayak.com
8 Idem
9 Trains from Barcelona to Paris - trainline.com
10 For more information about gauge and rolling-stocks issues, see The future of night trains in Iberia - Trains for Europe
11 SNCF to end cross-border high-speed cooperation with Renfe - International Railway Journal

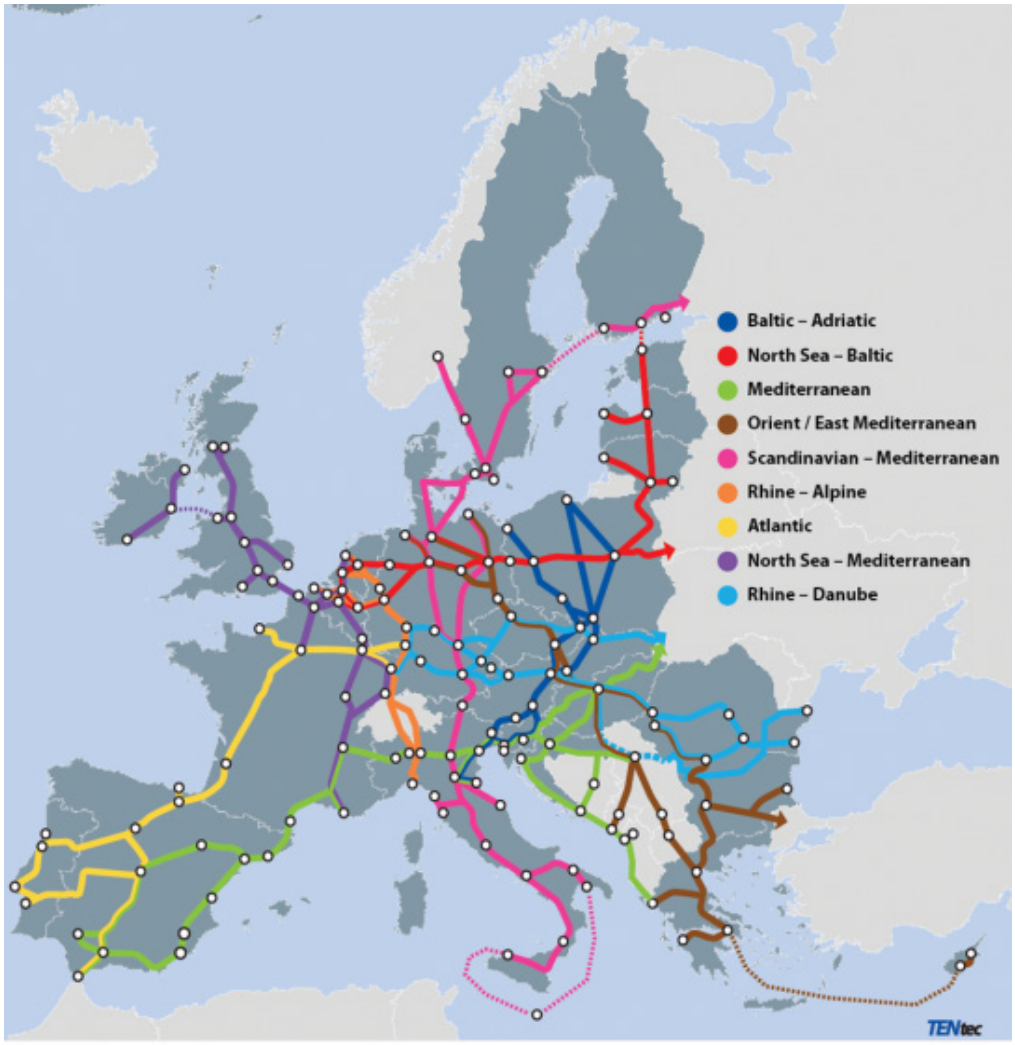
2. State of play of French and Spanish rail connections

There are two rail connections : through the Atlantic corridor or the Mediterranean corridor, part of a **Trans-European Transport Network** (TEN-T). This part sheds light on the Trans-European Transport Network (section 2.1) and its two corridors, the Atlantic (section 2.2) and the Mediterranean corridor (section 2.3).

2.1. Trans-European Transport Network (TEN-T)

The Trans-European Transport Network (TEN-T) is the **European interoperable transport network conformed by freight and passenger transport infrastructures.** The network covers road, rail and waterways as well as seaports and airports. The objective of the TEN-T is to **enhance economic relations between EU countries** by creating a coordinated space of the different member states' national roads through common regulations and technology.

Figure 6. TEN-T Core Network Corridors



Note: the nine TEN-T core network corridors are based on the CEF and TEN-T Regulations (1316/2013 & 1315/2013); they have been created as a coordination instrument to facilitate the completion of major parts of the core network of strategic importance.
Source: European Commission, Directorate-General for Mobility and Transport, TENtec Information System

Source: TEN-T Core Network Corridors (Freight and Passenger)

2.2. Atlantic corridor

The TEN-T proposes nine core networks. The **Atlantic Corridor** runs through **Spain, Portugal, France and Germany,** covering more than **6200 km.** Its infrastructures are used for **both passenger and freight transport,** and services are managed by different operators. **Passenger transport** is in the charge of several operators such as **Renfe** Viajeros (Spain) and **SNCF** Voyageurs (France). The **freight corridor** is managed by the **Atlantic Rail Freight**

Corridor (RFC Atlantic)[12]. There is no similar entity for passenger rail, which may hinder the development of cross-border services.

The **Atlantic corridor** connects **France to Spain** through the **Hendaye/Irun** border section. The rail services in this corridor are managed by two different public operators, **Renfe Viajeros** (Spain) and **SNCF Voyageurs** (France).

Figure 7. Map of the Atlantic Corridor and main cities connected

Source: Annual Report 2020 - Atlantic corridor

2.3. Mediterranean corridor

The Mediterranean corridor is another axis in the TEN-T network. It crosses **six European countries:** Spain, France, Italy, Slovenia, Croatia and Hungary. The corridor starts in the south-western Mediterranean region of Spain, follows the coastlines of Spain and France, and crosses the Alps towards the east

[12] The RFC is born out of the association between 4 different infrastructure managers: Adif (Spain), IP (Portugal), SNCF Réseau (France) and DB (Germany).

through Italy, Slovenia and Croatia before reaching Hungary. It is approximately **9,300 km** long and primarily consists of road and rail.

Figure 8. Map of the Mediterranean corridor

Source: El Corredor - El Corredor Mediterraneo

Between France and Spain, the International cross border connection is achieved through the **Le-Perthus tunnel.** Despite the very high investment of 1 100 million for the Le Perthus tunnel, this corridor is not as used as expected, particularly because of the lack of interoperability (different voltage, signalling systems, limited number of adapted locomotives) and convenient services[13]. The EU had estimated in 2018 that the line was only **used at 20% of its capacity** in terms of passengers, and 7,5% for freight[14].

Two projects are to be implemented to increase the attractiveness of the corridor. In **Spain**, the **UIC gauge** will be extended to the south, from **Tarragona to Malaga.**[15]

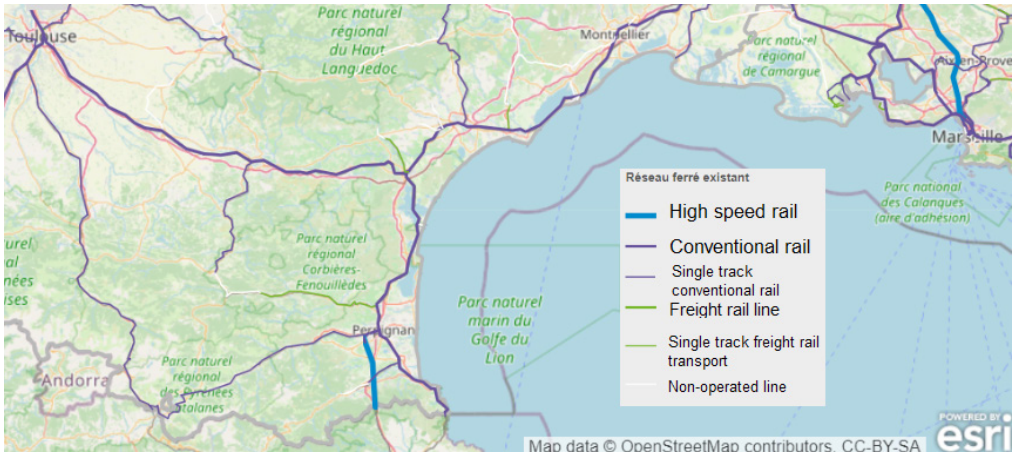
13 Key features and challenges for the Mediterranean Corridor - CETMO
14 A european high-speed rail network: Not a reality but an ineffective patchwork - European court of auditors
15 https://elcorredormediterraneo.com/estado-de-las-obras/

Figure 9. Current state of the Spanish portion of the Mediterranean rail Corridor

Source: Estado de las obras - El Corredor Mediterráneo

In **France**, the construction of the **missing high-speed link** between **Montpellier and Perpignan** is in the pipeline[16]. At the moment, the deadline for this project is set at 2030 but it has not been deemed a priority by the French government, which hinders the development of more consequent and efficient traffic on this line.

Figure 10. State of the Mediterranean Corridor on the French side in 2018



Source: Carte interactive du réseau ferré français

16 https://www.sncf-reseau.com/fr/entreprise/newsroom/cp/rapport-activite-responsable-2021

3. The Atlantic corridor

The difference between the standard **gauge network** in France and the Iberian gauges in Spain and Portugal present a challenge for railway operations across the Pyrenees. **No train services** are currently operating on the **Hendaye/Irun** border section, making French-Spanish cross-border connections difficult from a medium-long distance perspective. However, it is still possible to reach the Spanish border via the Atlantic corridor, but without direct line services. Future infrastructure and service projects are currently underway to revive French-Spanish direct lines.

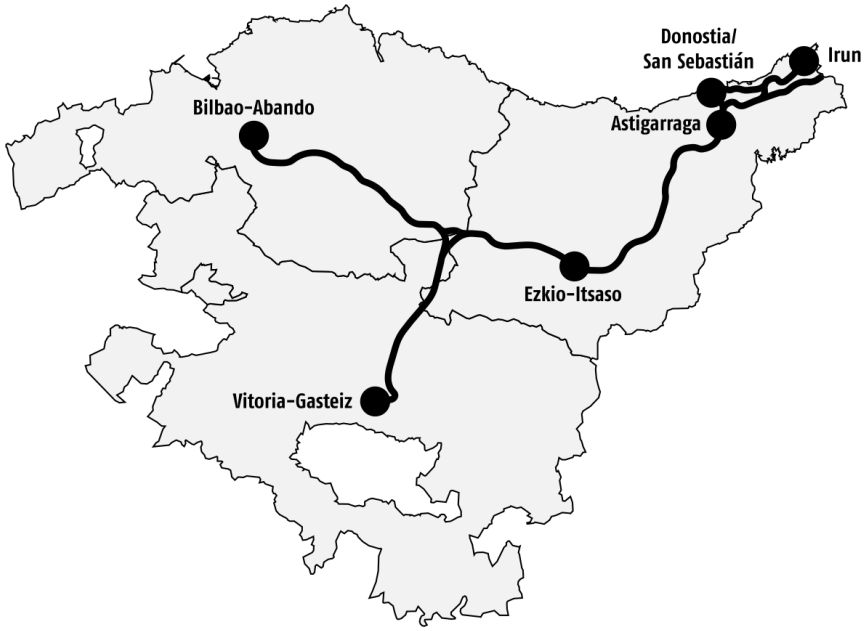
3.1. State of the infrastructure and projects on the line

The French section **Bordeaux-Hendaye** benefits from electrified UIC track 1500V CC, whereas the Spanish section **Irun-Madrid** benefits from electrified Iberian track 3 000V CC. As track gauges are different on the two sides of the connection (1668 mm large in Spain, and standard in France), only **interoperable train cars** can be used to cross the border on this line.

The **Basque Y project,** aiming for implementation at the earliest in 2027, more probably 2028, should implement the same UIC track gauge between San Sebastián and Irún, which will **facilitate cross-border connections.** Indeed, apart from building 160 km of new Y-shaped high-speed railway line between **Vitoria, Bilbao and San Sebastian,** the Basque Y project will also upgrade the section from San Sebastián to Irún to a dual-track gauge along 17 km.

Efficient connections at the border are essential, but we also need to take into account the plans for infrastructure on each side of the border. In the case of the Atlantic corridor, the line on the Spanish side is expected to be built by 2025 and will allow for a **faster connection from San Sebastián to Vittoria and Bilbao.**

Figure 11. Route of the Basque Y project



Source: Basque Y, Wikipédia

The **Basque Y project** opens the way to a **better connection between France and Spain.** However, the **Euskotren (public regional rail operator)** is the only train running the **Irun-Hendaye** segment at the moment, which makes it impossible to have direct high velocity trains crossing the border. The **SNCF** and **Euskotren** train stations in Hendaye are now connected, which facilitates the cross-border connection.[17]

The project **TRANSFERMUGA-RREKIN** led by the **Nouvelle-Aquitaine Euskadi Navarra Euroregion** aims to improve the offer of cross-border transport services. In collaboration with rail actors, they have been working on the infrastructure, as well as **services to passengers,** with an online portal helping customers to choose the best itinerary for their trip in the region. But what this reveals is that it is still very difficult to find a journey connecting the two countries that does not require several train changes.[18]

17 Inaugurado el nuevo Centro Intermodal de Hendaya
18 Proyecto Transfermuga-Rrekin

As part of the project, a **study on the possibilities for connection between Bayonne and Donostia** was conducted.[19] Long-term rail projects to connect the Basque Y to France are only in the definition phase.[20] The project to **implement standard gauge between Astigarraga and Irun,** which has been approved by ADIF and will be financed by NextGenerationEU funds, does not yet have a planned completion date.[21] For this reason, the report recommends using local trains and other means of public transportation in the meantime to facilitate the crossing of the border by other means than the individual car.

3.2. Paris-Madrid line

Train services for the **Paris-Madrid** line were operated by the night train **Elipsos 409** "Francisco de Goya", affiliated to **RENFE** and **SNCF**. It was a direct train going from Paris-Austerlitz to Madrid-Chamartin, stopping at Orléans, Blois, Poitiers, Vitoria-Gasteiz, Burgos and Valladolid. This night-train connection was abandoned in 2013. Due to economic losses, the remaining Spanish night-train lines, Madrid-Porto and Madrid-Lisbon, closed in 2021, after having been halted due to the pandemic.[22]

Despite the existing infrastructure between Paris and Madrid through Hendaye and Irun, **no international services are running** at the moment.

However, the start-up Midnight Trains is currently considering offering the Paris-Madrid connection. This company, co-founded by two French entrepreneurs, plans to offer multiple night train connections from Paris to other European cities, including Madrid. The **first connection is planned for 2024,** though details on the schedule and prices have not yet been communicated.[23]

In March 2021, the French Ministry for transports published a **call for expression of interest**[24] for launching new international night train services in open access, mentioning explicitly the Paris-Madrid line. The call for expression of

19 Oportunidades para una linea express Bayona Biarritz Donostia
20 Adif AV licita la redacción del proyecto de obras para la implantación del ancho estándar en la estación de Irún
21 Adif AV licita el proyecto de obras de implantación del ancho estándar entre Astigarra e Irun
22 Cuándo lo más ecológico es lo más difícil: seis trayectos poco razonables en tren - El País
23 Midnight Trains proposes European "hotel on rails" for 2024 - Globetrender
24 Train de nuit: le gouvernement veut ouvrir une dizaine de nouvelles lignes d'ici dix ans - Le capital

interest mentions that the French government could financially support the launch of these new international night train services, at least for the beginning.

3.3. Climate benefits of a Paris-Madrid line's relaunch

The **night train connection** between the two capitals would be particularly beneficial for the reduction of air emissions, as the following figures show:

PARIS-MADRID	Air connection	Rail connection
Distance	1075 km	1376 km[24]
Travel time	2h (this only takes into account flight time and not the anticipation time recommended by airlines operators)	10h
Number of passengers (based on 2019 data)	2 569 046[25]	385 350[26]
CO2 emissions/ passenger[27]	196 kgCO2e[28]	6,05 kgCO2e
Total yearly CO2 emissions	503 533 016 kgCO2e	2 331 368 kgCO2e
Climate mitigation potential (15% modal shift hypothesis)	**Reduction of 15% of carbon emissions** (73 197 232 kgCO2e)	

The French government made the hypothesis that **10 to 15% of air traffic could be transferred to rail** with a functioning night train line. However, the report emphasises that even a modal shift as minimal as this would require a real commercial effort to attract customers[30]. For the **rail connection** we made an hypothesis for a **15% transfer of 2019 air passengers to rail,** and found that over 300 000 passengers could potentially take the train instead of the plane if there was a competitive offer.

25 Through Hendaye
26 Air passenger transport between the main airports of Spain and their main partners airports - Eurostat (2019)
27 Estimation of a 15% modal shift from plane to train, based on 2019 numbers.
28 Estimated CO2 emissions by mode of transport for BCN-Paris, including non-CO2 emissions - ADEME
29 Including non-CO2 emissions, factor 1,8 (ADEME)
30 Etude du développement de nouvelles lignes de trains d'équilibre du territoire (TET) - Gouvernement Français

According to ADEME's emissions' estimation data for the Madrid-Paris journey, travelling by air means emitting about **32 times more** CO2 emissions than travelling by rail, accounting for non-CO2 impacts. We see that there is a **substantial potential for a modal shift from air travel to night trains,** which would greatly reduce the overall amount of CO2 emissions associated with the Madrid-Paris journey in a year. What also needs to be taken into account is that as the Paris-Madrid train would also stop in intermediate touristic cities such as Bordeaux or San Sebastien, there would be significant **additional CO2 reduction.**

4. The Mediterranean corridor

The Mediterranean corridor benefits from three international lines connecting France to Spain. However, services are currently operating on one line only, from Paris to Barcelona. The corridor between France and Spain was negatively affected by the COVID-19 pandemic as connections closed without being reopened. The line faces other challenges that may hinder its development and growth.

4.1. State of the infrastructure and projects on the line

Two rail sections are crossing the border along the Mediterranean corridor:

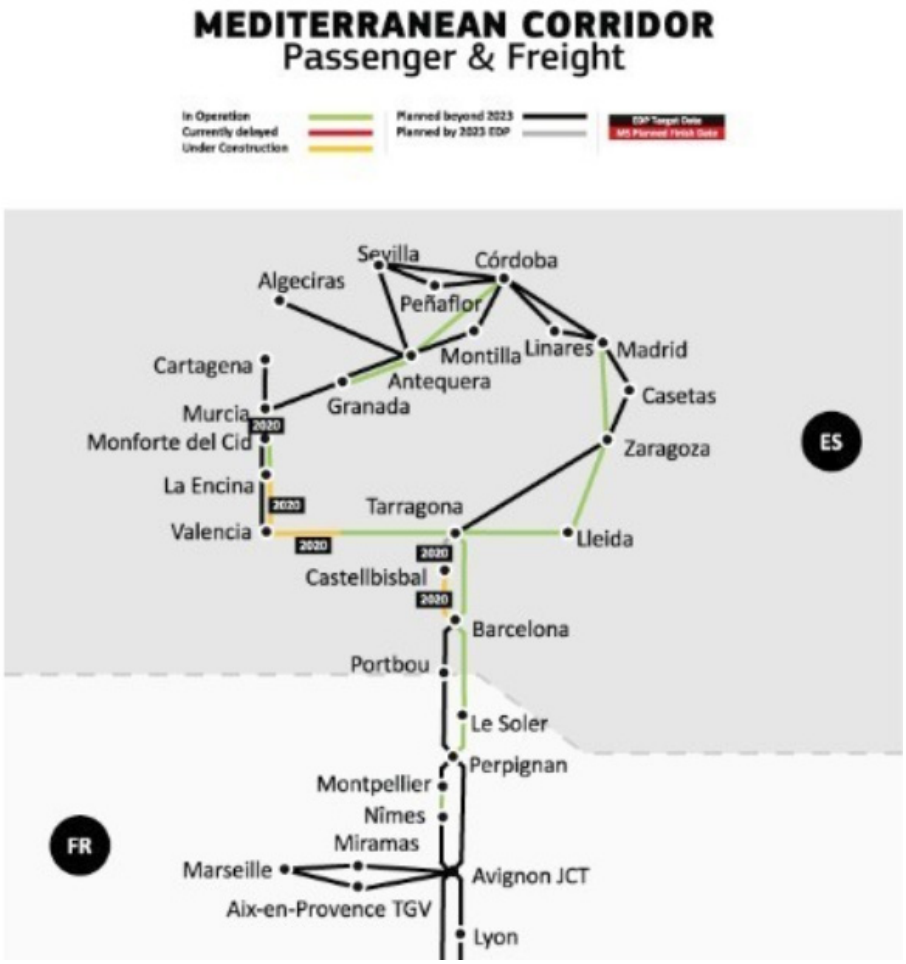
- **Regional train Puigcerdá (Spain) / Latour-de-Carol (France)**
- **Regional train Portbou (Spain) - Cerbère (France)**
- **Figueres (Spain) - Perpignan (France),** through the Perthus tunnel.

On the latter, 3 **international connections** have been or are operating:

- Paris-Lyon-Montpellier-Barcelona
- Marseille-Montpellier-Barcelona-Madrid
- Toulouse-Barcelona (abandoned in 2020 because of the COVID-19 pandemic)[31]

[31] European timetable, new services, new trains but no major changes - International Rail Journal

Figure 12. Map of the Mediterranean Corridor - Passenger & Freight



Source: The Mediterranean Corridor (europa.eu)

The **Figueres-Perpignan** line offers good connecting infrastructure between France and Spain through the **Perthus Tunnel,** which opened in 2010. 1 100 million euros were invested in this tunnel, and 9 years later, in 2019, it was still operating at only **10% of its capacity,** with 14 trains crossing the border every day. In 2016, TP Ferro, the French-Spanish concessionaire for the tunnel's works, went bankrupt, with over 500 million of debt, and the line is now managed by SNCF Réseau and ADIF.[32]

Many obstacles prevent efficient and considerable use of the line. First, it appears that the infrastructure can be **vulnerable to climate conditions.** In 2019, traffic was interrupted for close to two weeks between Montpellier, Perpignan and Spain, as a result of heavy rain on the route that damaged the tracks. Important work was needed to repair the line. There is **still no high-speed**

[32] El Pertús: Catorce trenes diarios para un túnel de 1.100 millones - El País

line between Montpellier and Perpignan, which participated in cutting completely the traffic between these two cities following this meteorological event. This is not considered a priority by the French authorities and as of now, there is no plan to establish this high-speed line before 2030, even though Spain has fulfilled its obligation to offer a high-speed line reaching Perpignan from its side of the border.[33] This means that the speed is limited to 160 km/h between Perpignan and Montpellier. In addition to this, the maximum **speed** is 200 km/h between **Barcelona and Figueras.**

Moreover, **three different voltages** are in use along the Corridor and this particularly challenges cross-border operations. Finally, a train length of 750 metres is **only allowed on the French network** and in the rest of the Corridor various train length restrictions apply, allowing a train length between 400 metres and 750 metres.

An additional issue arose as **ADIF (spanish rail network manager)** is asking conductors to **speak Spanish** to drive on the **Cerbère (France) to Portbou (Spain),** a 2 kilometres section, which resulted in some SNCF trains (night trains and intercités, and it could soon affect regional trains) stopping in Cerbère before the border[34]. Because of the track gauge on that section, it can only be used by French trains, and French drivers could not be trained in time in Spanish to avoid the line stopping in France.[35]

A project for a high speed line between **Perpignan and Montpellier** is currently being discussed. The first section (Montpellier - Béziers) is being planned for 2030, and the second one (Béziers - Perpignan) for around 2040[36]. **However, it is not necessary to wait for the development of this high speed line,** given the fact that existing speeds are still relatively high, and that travel times remain reasonable: for instance, it takes around 3h05 for a **Barcelona-Montpellier** journey, during the day.

Ultimately, the technical issues faced with the line have solutions, but there needs to be a political will to encourage the development of the use of rail. Decisions can be taken that would facilitate exchanges between the two countries.

33 Les dégâts sur l'axe SNCF Perpignan-Montpellier relancent le débat d'une ligne à grande vitesse - France Bleu
34 Guerre ferroviaire franco-espagnole: un scandale pour les passagers - Le Figaro
35 Le train de nuit Paris-Portbou ne va plus en Espagne - AFP
36 More info

4.2. Lines connecting France to Barcelona

Passenger services exist or have existed on the following 3 lines:

	Paris-Lyon/ Montpellier-Barcelona		Marseille-Barcelona-Madrid		Toulouse-Barcelona
	Paris-Barcelona	Lyon-Barcelona	Marseille-Madrid	Marseille-Barcelona	
Distance	1133 km	663 km	1161 km	520 km	425 km
Travel time	6 hours 41 minutes	5 hours	7 hours 43 minutes	4 hours 32 minutes	3 hours
Services	Renfe - SNCF en Cooperación	Renfe - SNCF en Cooperación	Renfe - SNCF en Cooperación	Renfe - SNCF en Cooperación	Renfe - SNCF en Cooperación
Starting price[36]	49€	39€	59€	49€	29€
Current situation	The line is **currently functional.** But despite the high potential of this line, **only two trains per day operate.**		The connection between Madrid and Marseille, suspended during the COVID-19 pandemic, **has been relaunched.**[37] However, it only offers one connection a day in each direction.		The line from Barcelona to Toulouse was suspended in 2020 due to the Covid pandemic, and **permanently ceased its activity in 2021.**[38]

However, on February 16 2022, the French operator SNCF announced that **cross-cooperation between SNCF and Renfe will stop by the end of December 2022** due to the lack of profitability.[40]

Night trains could play a significant role to connect Barcelona to Paris and other French cities. Recently, the French Minister for Transport announced the objective of a **new night train line** between Paris and Barcelona and Bordeaux/Metz/Geneve/Nice/Bordeaux to Barcelona by 2030.[41] A night train line between **Barcelona and Roma** could also be considered.

37 Data collected from sncf-connect.com on the 26th of july 2022 for one-way trips
38 Madrid reprendra le train à grande vitesse avec la France en avril - Le Courrier d'Espagne
39 European timetable, new services, new trains but no major changes - International Rail Journal
40 SNCF to end cross-border high-speed cooperation with Renfe - International Railway Journal
41 Night trains: the new lines to be taken in France from 2023 - The Limited Times (newsrnd.com)

In March 2021, the French ministry for transports has published a **call for expression of interest**[42] to launch **new international night train services in open-access,** mentioning explicitly several lines between France and Barcelona through the Mediterranean corridor: i) Paris-Perpignan-Cerbère-Barcelona, ii) Luxembourg-Metz- Strasbourg-Barcelona, and iii) Metz-Genève-Nice-Barcelona. The call for expression of interest mentions that the French government could financially support the launch of these new international night train services, at least for the beginning.

Moreover, the start-up Midnight Trains is currently considering offering the Paris-Barcelona connection. Commercialization is planned for 2024, and the start-up is willing to use the same infrastructure as French operator SNCF.[43]

4.3. Climate benefits of a Paris-Barcelone line's relaunch

The **night train** connection between Paris and Barcelona would be particularly beneficial for the reduction of air emissions, as the following figure shows:

PARIS-BARCELONA 15% modal shift hypothesis	Air connection	Rail connection
Distance	848 km	1090 km
Travel time	1h45 (this only takes into account flight time and not the anticipation time recommended by airlines operators)	6h40
Number of passengers (based on 2019 data)	2 705 610[43]	405 841[44]
CO2 emissions/ passenger[45]	191 kgCO2e[46]	3,77 kgCO2e
Total C02 emissions (2019)	516 771 510 kgCO2e	1 530 021 kgCO2e
Climate mitigation potential	Reduction of 15% of 2019 emissions or 75 985 610 kgCO2e	

42 Train de nuit: le gouvernement veut ouvrir une dizaine de nouvelles lignes d'ici dix ans - Le capital

43 New network of European sleeper trains planned | Rail travel | The Guardian

The French government made the hypothesis that **10 to 15% of air traffic could be transferred to rail** with a functioning **night train line.** However, the report emphasises that even a modal shift as minimal as this would require a real commercial effort to attract customers[48]. For the **rail connection** we made an hypothesis for a 15% transfer of 2019 air passengers to rail, and found that over 400 000 passengers could potentially take the train instead of the plane if there was a possibility. This hypothesis does not take into account passengers that already take, or could take the Barcelona-Paris day train. For this reason, the potential number of passengers by rail could be even higher.

Travelling by air from Paris to Barcelona means emitting about **51 times more CO2 emissions** than travelling by rail for the same journey, accounting for non-CO2 impacts. Considering both the **volume of passengers** and **higher amount of emissions per passenger** for air travel, increasing the modal share of night and day trains on the Barcelona-Paris journey would lead to a significant reduction of around 15% of overall emissions of CO2 for this route.

44 International intra-EU air passenger transport by main airports in each reporting country and EU partner country-Eurostat (2019)
45 Estimation of the market share that could be obtained by night trains on the Barcelona -Paris line -TET
46 Estimated CO2 emissions by mode of transport for BCN-Paris, including non-CO2 emissions - ADEME
47 Including non-CO2 emissions, factor 1,8 (ADEME)
48 Etude du développement de nouvelles lignes de trains d'équilibre du territoire (TET) - Gouvernement Français

6. Policy recommendations

Cross-border rail between France and Spain is majorly important as a way to connect the two countries in the most sustainable way possible. Travellers have access to some alternatives to the plane and the car, but the connections are not used to their fullest potential and the offer is not up to par. One challenge is that the EU has no mandate (nor financial resources) to implement a system for long-distance cross-border passenger rail. It can only support EU member states and other actors in the implementation of the TEN-T.

There needs to be a strong engagement in favour of rail travel and concrete actions to foster its development.

1 Improve information to travellers

passengers should be provided with details about the existing rail/public transport connections, in order to find the best journey in the easiest way possible. The TRANSFERMUGA-REKKIN platform is an interesting example that could be replicated for the Mediterranean corridor. Passengers should also be informed on the climate footprint of their journey, and shown how it compares to other modes of transportation.

2 Promote new (day and night) services

Opening lines to new operators, from the public or private sector can be a first step. Through the new action plan for rail and the associated calls for tender, the EU can also participate in the development of these services. The offer of services should be increased and improved to encourage people to choose the train.

3 Enhance governance and stakeholders engagement

Euroregions can provide expertise, capacity building and territorial involvement, and travellers associations, CSOs and tourism agencies (national, regional and local) can bring an understanding of the needs and wants of travellers. It is also important to promote cooperation between these actors, and collaboration on both sides of the border.

4 Support investment in smart and targeted rail infrastructures

An analysis of the situation is important to know where to focus investment, as it is limited. The connection between France and Spain by rail is difficult in part because of specific portions of line that we can easily identify, such as Irun-Hendaya on the Atlantic side and Portbou-Cerbère on the Mediterranean side.

5. Conclusions

The sector of transportation is responsible for an important part of CO2 emissions and therefore offers considerable potential when trying to reach the climate targets set by the EU. There is a necessity to shift from **carbon intensive** modes of transportation, like the plane or the car, to others with a lower impact, such as the train. The border between France and Spain offers an interesting opportunity to stimulate a **modal shift** from aviation to train by reviving medium/long distance cross-borders train connections between France and Spain.

Assessing the current French/Spanish connections shows us that this shift could be accelerated with the **relaunch of previously abandoned lines** that were effective and could be ready for use again both in the Mediterranean and Atlantic corridors. We have seen that in **France**, there was a political drive to revive night trains, which could benefit the cross-border connections.

On the other hand, other challenges still hinder the effective use of **medium/ long distance train** connections between the two countries. We highlighted some technical issues, such as gauge differences, but these problems have solutions (rolling stock that can adapt to different tracks, for example). A clear political will is needed to overcome the challenges faced by rail in cross-border mobility. It is important to ensure the competitiveness of the train in the face of other modes of transportation in order to make a modal shift doable, which could lead to less emissions from the transport sector.

Some of the ongoing projects, such as **Basque Y,** are addressing the technical issues regarding interoperability that have made it difficult until now to offer cross-border lines in the Atlantic corridor. However the different operators are

not exploiting to their full potential the lines connecting France and Spain. We have highlighted here what the significant benefits from a modal shift from aviation to train could be in terms of reduction of CO2, and what lines could be developed. The more emphasis is put on achieving the climate targets, the more sense it makes to really develop a cross border rail activity of quality and attractive to passengers between France and Spain.

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About EuropeOnRail

EuropeOnRail is a European initiative led by Civil Society Organizations to reduce carbon emissions from international mobility by promoting night and day passenger trains between European cities and countries.

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