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MSc TIL
Thesis Project

Institutional and technical requirements for a new operator to run a French Intercity line

The case of Nantes-Bordeaux



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Preface

This report is a MSc Thesis Transport Infrastructure and Logistics (TIL) at TU Delft, that was conducted from January 2012 to May 2013, partially at Veolia Transdev in Paris and partially in Delft.

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Summary

While the fourth railway package is under way at the European Commission in Brussels, French railways are at a crossroad. Despite being one of the first to restructure its organization and separate infrastructure management and train operations in 1997, and opening freight to competition in 2006, since then the industry can appear as though nothing had changed. There is marginal train competition introduced by the Italian railways between Paris and Milan, the new freight operators have managed to capture a quarter of traffic, but the main segment, national and local passenger trains, is still to be opened.

Resistances are multiple and varied. Some based on economic rationale – opening TGV traffic brutally would disorganize production and not benefit anyone – others lie more with French corporatism and reluctance to change. With 150,000 employees under the highly protected railway worker statute, and millions of French workers at threat of not being able to go to work when a strike occurs, it takes very strong political will to push for opening of the larger share of railway operations, however shy that opening could be. Under the government of Nicolas Sarkozy and with the strong impulsion of Nathalie Kosciusko-Morizet, minister for Ecology and Transports until May 2012, the idea was promoted to open competition progressively for national transport, beginning by one or two Intercity lines. This strong stance and the interest of third-party operators triggered the present study with a central question:

What are the requirements for a new TOC to operate a French Intercity line if it were to be tendered to competition in 2014? How would this apply to the specific case of Quimper-Nantes-Bordeaux-Toulouse?

To answer the main question, the research approach begins with a system analysis of French railways and their environment. This first section begins broadly by considering the organisation of railways throughout Europe. This continental outlook first underlines that there is no single but several approaches or models to opening passenger train operations to competition. In any case, whether the national operator is kept as a whole (in Germany or in Sweden) or cut in smaller chunks (in the United Kingdom), competition has brought in strong productivity gains and increased the quality of service to the customers. But to meet these results, prerequisites are negotiations with the actors and specifically the employees, and strong regulation to guarantee fair and efficient competition, backed by strong political will.

Then the analysis focuses then on the French organisation and on how competition could be introduced. Because of the multiplicity and complexity of the actors involved, the system is first considered in its environment, with an analysis on the political decision centres that actually fund public transports. The focus then turns on the railway industry itself, considering the current rift between the two key actors, SNCF on the one side (transport operator) and RFF on the other (network management), with the myriad of smaller actors revolving around them. SNCF has the weight of the years and a very rigid and vertical organization, making it practically an administration in itself, if not a branch of the Transport Ministry. RFF is a younger organization (born in 1997) that gained its limited powers by fighting every inch against SNCF. Originally an artificial accounting trick to get the debt of railways out of the State accounts and allow for entry in the Euro, RFF has managed to develop its credibility and have a voice that counts in the industry. The process antagonized both companies, SNCF

generally considering RFF useless if not illegitimate, and RFF feeling threatened by SNCF. The absurdity of the situation is even pushed further with RFF actually not being able to maintain the tracks itself but having to use SNCF workers for that. This results in SNCF paying tolls to RFF who then pays SNCF to fulfil railway works. It is estimated that as many as 45,000 SNCF workers are actually working directly for RFF. These imbrications and the complex relationship between SNCF and RFF accounts for very high transaction costs, deepening the debt of the industry.

Beyond the issue of how the relationship between RFF and SNCF should be improved, the question is how best to introduce competition. Competition in the market and competition for the market are introduced and discussed, the latter being preferred due to the natural monopoly quality of railways and French social preferences. Given resistance to change mentioned above, the introduction of competition is likely to be very progressive, starting probably with experimentation. And since the Intercity lines are most likely to be opened first, they are considered in depth and analyzed, and it is shown there are opportunities for development there.

All along this first chapter on system analysis, requirements are gathered. These are external requirements that have to be making the railway market interesting for a new operator to enter it. They are assembled and grouped along the lines of external political factors, stakeholders' involvement strategy and choice of the most suitable line.

To analyze a line and elaborate a service design, a methodology is developed and described, kept in general terms, and applied to the case study of Nantes-Bordeaux, firstly for Institutions analysis and then for technical analysis. These lead to criteria that will be used in for the evaluation. Because of the key role of political figures in funding and deciding over transport infrastructures and operations, the first part of the analysis focuses on a systematic analysis of local politicians and their networks of influence. Key figures are identified, that could push the project forward and perhaps even attract funding. Then the environment of the line is considered, with specific attention to the users demands, formulated in line committees and via the users' associations.

The technical analysis of the line describes the state of the infrastructure, with the challenge of a line that is only partially electrified and is aging rapidly, with speed limitations as low as 40 km/h on certain segments, the current rolling stock is introduced, that is also characterized by great age and subsequent low reliability. Then, so as to get an idea of possible demand potential and development possibilities, the competition is systematically analyzed for air, car and coaches, with all lines and routes described and analyzed, in terms of travel time and price. Nantes-Bordeaux suffers from strong car competition, with travel time by car quite similar and very little toll costs. Nantes-Toulouse faces strong direct competition from airlines, with very regular flights operated by Air France but also by Easy Jet, thus at prices often below that of the train, for a much reduced travel time. These different lines of analysis lead to criteria that will eventually be used to evaluate proposed scenarios.

Following the analysis, scenarios are drawn, on the institutional side and on the technical side. With the criteria elaborated in the analysis, these scenarios are then evaluated qualitatively and quantitatively.

For the institutions, it has thus been accepted by all actors that the dual situation between SNCF and RFF must be put to an end. Two scenarios are considered, one seeing RFF getting full infrastructure management and overseeing all employees linked to the network, while

SNCF would retain train operations only. The second scenario sees SNCF building itself in a holding overseeing both network management and train operations, copied on the German railway industry. Both scenarios are discussed and evaluated. The full separation scenario leads to more fair competition, but the holding scenario is more acceptable for the workers and for the government.

On the technical side, three service scenarios are built, according to the systematic approach elaborated. The key differentiation point is whether to consider the line as a whole and spread services over its full length (Scenarios T1 and T1bis) or to strive to provide services where they are most needed, i.e. on the central segment between Nantes and Bordeaux (Scenario T2). Both possibilities are assessed with the criteria and it appears that if focusing on the central trunk makes more sense from a user and operator point of view, allowing for more trains to service the most useful part, spreading services over the full length also secures support of many more political figures that can prove key in funding the project.

Finally an outlook into future prospects considers the influence possible improvement works would have on running time, with a likely time gain of 90 minutes on the whole, and a much better service to the customers as a consequence. To further improve service, hourly services are drawn and evaluated.

Overall, it appears that there is room for a new approach on French railways that would discard past “historical” timetables and strive to build new ones based on users’ demands rather than on politician games. This new approach, although unsatisfying for historical user groups, can unleash untapped growth potential and develop ridership on train services.

Once and if the experimentation of competition on Nantes Bordeaux is achieved and successful, the next step could be a relatively independent group of lines with a much larger volumes, typically Paris to Clermont-Ferrand. More generally, now that questions arise about the pertinence of TGV as an absolute ideal for all territories, there is room for a reflection on the key role of Intercities in France, which should not be seen anymore as a leftover between TGV and TER but as a key means of transport and growth factor, which, if it is adapted to the needs of today’s users, can definitely meet success and improve lives of passengers.

1. Introduction

The French railway market is still relatively closed to competition, when compared to some of its neighbors. France was ahead in 1997 when it took steps to separate infrastructure ownership from the historical operator¹, but it did not try to keep this leadership. To the contrary competition in freight was opened at the latest possible date (2006), as was international passenger traffic (2010). National passenger traffic is still operated under a national monopoly of SNCF², both for commuter and Intercity lines.

Allowing for competition does not mean competition is concretely present. In fact, new freight operators captured a reasonable market share of 29% as of 2011³, but passenger traffic is still nearly un-challenged. The only new operator for passengers in France is Thello, owned by Trenitalia and Veolia-Transdev, running night services between Paris and Venice.

Reasons for this reluctance for competition in railways are multiple but lay mainly with the importance of the national operator, SNCF, and the strength of its unions. Politicians from all sides are rarely willing to confront the powerful railway unions, and the option taken is often to keep things as they are. The general opinion is however evolving a lot, mainly due to the low satisfaction for the services provided by the national operator and the general cost of the current system. Recent polls⁴ showed that an ever larger share – 66% – of the population has a positive attitude to introducing of some competition on national passenger railways. Even some politicians acknowledge it could help: regional councils find it difficult to negotiate their transport contracts with SNCF and would be ready to award some fraction of the lines to new competitors. But these same regional councils are nearly all governed by the left wing socialist party, whose political agenda calls for less competition, not more. They thus find themselves in a difficult situation. The State is likely to facilitate the process by opening up some of the subsidized Intercity lines, to set an example and show through an experiment that competition can bring something to railway passenger transport.

There is thus an opportunity to look into Intercity passenger transport and determine how competition could help and what new operators could bring in terms of innovations and services.

This first chapter will elaborate on the found problem and raise the questions that will lead to research and solution finding.

First a description of the state of competition in transport in France is elaborated. From this starting point, an outlook in the forces pushing for more or less opening to competition is given and the resulting trend is analyzed, so as to elaborate on the opportunity to prepare an opening of the market.

Secondly the objective of the research is provided, divided in sub-questions and leading to the built up of the research plan.

¹ (Loi 97-135, 1997)

² (Loi 82-1153, 1982)

³ (Ministère de l'Ecologie, du Développement durable, des Transports et du Logement, 2011)

⁴ (EU DG MOVE, 2012)

1.1. Problem Statement

The state of competition is quite contrasted in French Public Transports. Air transport and international passenger transport (road and train) is run by competition in the market, urban transport is organized as competition for the market and national rail transport is basically closed to any competition. See Appendix 10 for an overview of competition in other modes. Also see section 3 for details on competition in and for the market. The key element for other modes is that urban transports are usually organized around competition for the market.

1.1.1. International passenger transport – officially open to competition

International transport is open to competition in the market, on all transport modes: air, road but also railways. However competition has yet to materialize on international routes on French railways. The only competitor, who started in December 2011, is Thello, an operator owned by Trenitalia and Veolia Transdev and running night services between Venice and Paris. On the other destinations, which can be very profitable for SNCF (Eurostar and Thalys for example), no competition has come yet.

This absence of competitors on a market that is already open can be explained by three factors: technical difficulties, capital difficulties and low incentives. Lines such as Eurostar and Thalys are beneficial mainly because of the high performance of the high speed train. To enter this market, a competitor thus needs highly technical trains, which will have to be vetted by French safety authorities. The recent example of the difficulties of the ICE 3 of Siemens shows how long the path can be. Another barrier to entry is the capital needed to start any competition. One train unit is worth about 15 to 20 million Euros. And it is not possible to start small. To exist on the market, a competitor would have to offer decent frequencies and this requires tremendous upfront starting costs. Thirdly, SNCF has had a very keen strategy of alliances with neighbouring operators, offering them shares in the capital of international services, while always retaining a majority stake. Thalys is owned by SNCF, NMBS and DB, Aléo is owned by SNCF and DB, Eurostar is owned by SNCF, NMBS and a British operator, Lyria is owned by SNCF and SBB, and Ellipsos is owned by SNCF, Renfe and SBB. Artesia was formerly owned by SNCF and Trenitalia but the second withdrew from the alliance and chose to start its own services, in a joint venture with Veolia Transdev.

1.1.2. National passenger railways – a State monopoly

Railway transport on national lines is a State monopoly awarded by law to SNCF. There are three different types of services offered:

- TGV services are non-subsidized and roughly profitable. One could discuss about subsidies, because the toll price does not cover all of the infrastructure costs, but operations are profitable at least for 70% of the lines. The 30% loss-making TGV lines are kept running as a tool for territory cohesion.
- Intercities (TET) are subsidized and organized under the authority of the State. SNCF still has monopoly on them but it could be opened up from 2014.
- Regional trains (TER) are organized by the regional authorities, which have to contract with SNCF. They could be allowed at some point to organize open bids with other competitors.

1.1.3. Forces pushing to open up competition

European standards and legislation are the main external drive towards more competition in French railways. Foreign operators are asking for an equal right to compete in France, complaining that SNCF, Veolia and RATP are winning market shares all over Europe while the domestic railway market is closed. French politicians also want a change, especially those presiding over the regional authorities, where negotiations over transport with SNCF are tough and costs are considered too high for troubles public spending times. Competition is seen as a tool to force SNCF to disclose or reduce its costs and be closer to the clients' demands. RFF, the network manager, considers competition as an excellent tool to balance its relationship with SNCF. It would give RFF credibility and a reason to exist. Other operators of course see a very large market where they can only win market shares and develop their expertise. Finally, there seems to be a strong support of the public opinion, with a majority asking for the introduction of competition in Transports, the main expectation being a decrease in fares and an improvement of punctuality. Even SNCF management sees some good in competition, insofar as it could help steer up modernization in the firm itself.

1.1.4. Forces trying to stop competition

SNCF unions claim that they see competition as a threat to their jobs, their salaries and their benefits. They fear they would have to work more, retire later and earn less. The message is carried through strongly through regular strikes, demonstrations and events organized by the unions and largely followed by workers.

Since French unions are very closely linked to the left leaning political parties, they find voices that forward their opinions in the general debate in France, and the left has openly said in the recent campaign that it would aim at putting an end to competition in freight. The public opinion is also very sensible to arguments fighting against “brutal” competition, “social dumping”, job destruction and private firms killing good services. Competition is often seen as inadequate for public services.

1.1.5. Resulting trend: an experimentation as a compromise

Thus the previous government has chosen to slowly open up competition, step by step, to experiment it and see what it could bring and improve in the industry at large, while bearing in mind that the main competitors would probably be Veolia-Transdev, more or less State-owned, followed in a later time by Arriva (Deutsche Bahn).

Since regional authorities are not willing to be the first ones to open to competition – they would be designated as liberals otherwise – the national state has decided to start by opening some of the TET (Intercity) lines, beginning from 2014. This would provide new operators with the opportunity to demonstrate their skills and abilities.

1.1.6. Problem statement

In contrast to EU regulations, the French Railway market is relatively closed to competition, especially in passenger transports and it is difficult for a new operator to enter and operate one or several lines.

1.2. Objective

The objective of this study is thus to study the intercity market in France and determine requirements for a new operator to enter the market and operate a line. As a case study and an

illustration, a specific line, Quimper-Nantes-Bordeaux-Toulouse (QNBT) will be studied in detail.

1.3. Main question

What are the requirements for a new TOC to operate a French Intercity line if it were to be tendered to competition in 2014? How would this apply to the specific case of Quimper-Nantes-Bordeaux-Toulouse?

1.4. Sub-questions

- **Present state**
 - What is the current state of the line?
 - In what environment is it set?
 - Who are the key influential stakeholders?
- **New service**
 - Would competition be beneficial and what would it bring?
 - What would make the new service satisfactory?
 - What train service should be designed?
- **Evaluation**
 - How would the design meet the requirements?
 - Which improvements or drawbacks would it have for the users?
 - What would be the prospects for development?

1.5. Research Approach

To answer the main question, and firstly the sub-questions, the research approach begins by a system analysis of French railways and their environment (chapter 2). Chapter 3 focuses on how competition could be introduced. Finally it considers the French Intercity network (chapter 4), because this is the most likely range of lines likely to be opened at first.

All along this first 2 chapters on institutional analysis, requirements are gathered. These are external requirements that have to be making the railway market interesting for a new operator. This naturally leads to chapter 5 where all requirements are assembled and grouped along the lines of external political factors, stakeholders' involvement strategy and choice of the most suitable line.

To analyze a line and elaborate a service design, a methodology is developed and described in chapter 6, and applied to the case study of Nantes-Bordeaux, firstly for Institutions analysis and then for technical analysis (chapter 7). These lead to criteria that will be used in chapter 9 for the evaluation.

Following the analysis, scenarios are drawn, on the institutional side and on the technical side (chapter 8). With the criteria elaborated in chapter 7, these scenarios are then evaluated in chapter 9. In chapter 10, an outlook into development prospects and their impact on services is introduced. Conclusions come in chapter 11.

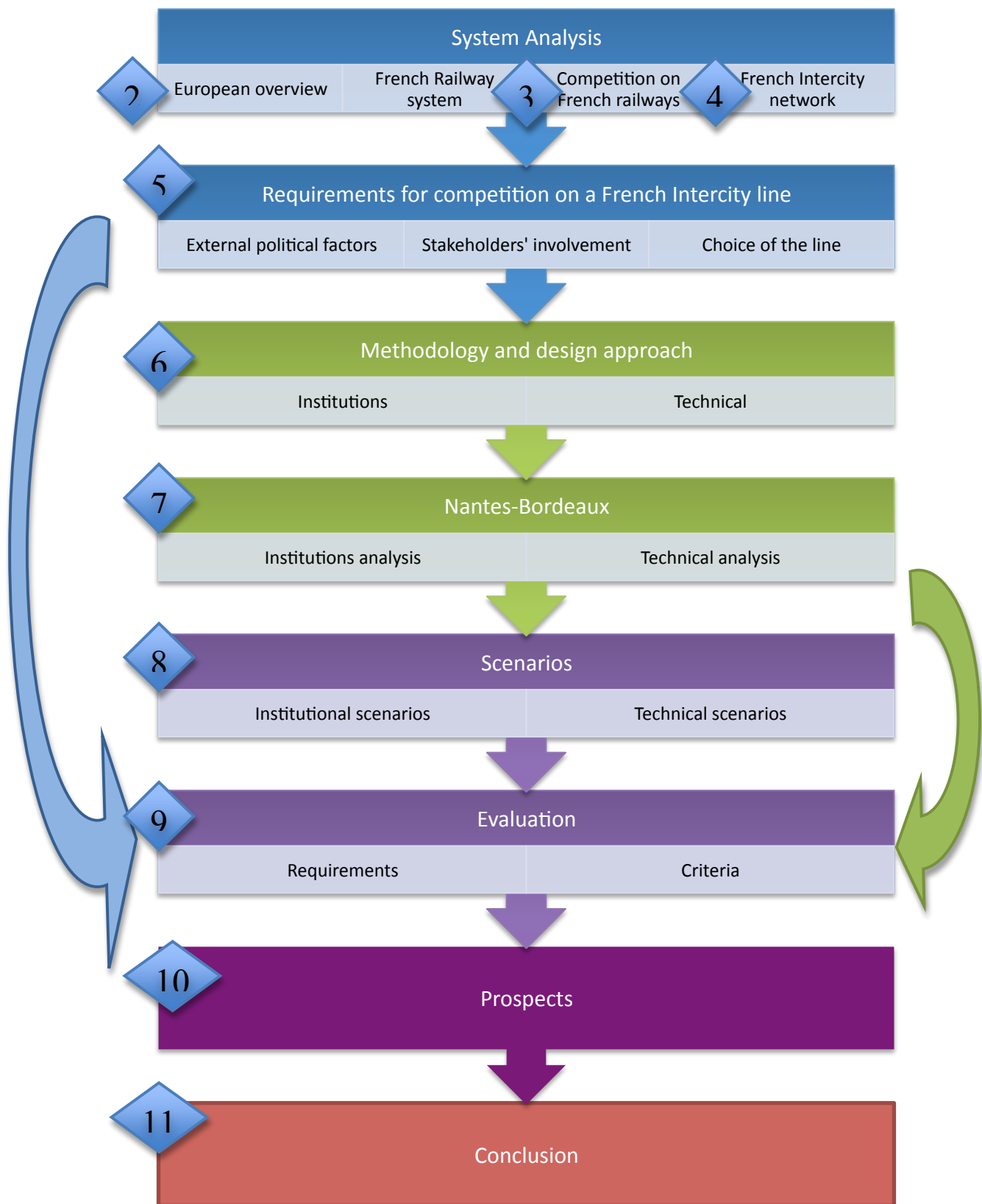


Figure 1: Research approach

2. System analysis – The French railway industry and its environment

Before the technical analysis and the design can be started, an analysis of the system's environment of the project needs to be fulfilled.

The objective of this chapter is to come with a set of requirements that will determine further research and design. To be able to embrace better how competition can be developed profitably for users and for transport authorities, the first step was to research abroad and look for ideas and conditions for sound competition. A second step will be to analyse the institution environment, from the European to the local scale, especially focusing on railway institutions naturally.

Because of the very strong influence of public decision makers on the railway industry, it is of first importance to begin by reminding the different public actors that have a say in transport in France.

In 2.2 the public actors will be analyzed and then their power over transport will be presented and analyzed. In 2.3 the organization of the railways themselves will be analyzed, starting with the stakeholders, their financial links and the issues that the current setup leads to. Then possible future organization will be discussed, as well as how the current work organization can impact reform and operations. In 2.4 the effect of regionalization of local trains is discussed, as this could be seen as a first step towards awarding local franchises to competitors and what lessons can be applied to the Intercity trains.

2.1. European overview

The study was designed to lead to findings in terms of lessons learnt and requirements to develop sound competition in railways. Three countries were thus selected, such that they would have different approach to competition, at different stages of opening, and with different railway characteristics. The United Kingdom is the country with longest experience in terms of railway competition, a very dense network and a very long history in railways. Germany also presents a major European railway system, but opened later to competition, and is just getting its first lessons from the opening of the market. Sweden presents an original model that can breed ideas.

The details of the analysis are to be found in appendix 11.

The documentation research and field trips have led to several conclusions:

— There is not one but several models possible. Like in the United Kingdom, competition can be obtained by dissolving the national operator and stimulating several companies into fighting for the market. But like in Germany or in Sweden, it is also possible to retain a strong national operator and stimulate it towards modernization via the threat of competition, or the introduction of a reasonable share of competition on railways. The Deutsche Bahn still retains most of the passenger market, but its quality has strongly improved and the costs have decreased.

_ There also comes up a need for strong regulation. In all three countries, de-regulation has led to the emergence of a strong regulating body making sure that competition is fair and (in the case of Germany and Sweden), that the main operator was not dominating the smaller actors. This regulation is something that the actors need to learn, coming from the previous state of a self-regulated national operator which acted de facto also like a Transport Ministry, such as SNCF still does in France.

Requirement 2.1.1: a strong railway regulator must be in place

_ Beyond regulation and tools to stimulate competition, de-regulation also demands a clear agenda and strong political will. Resistances are multiple and the workers of the national operator can feel threatened by the plans. A deal can be reached with them, as was done in Germany with railway employees retaining their status while the State compensates the difference.

Requirement 2.1.2: The political agenda needs to be clearly defined and backed by the government.

_ Most importantly, it is striking to realize how beneficial the effects were on all three countries. Service level has improved (United Kingdom) while ridership increased and costs for the State decreased (in all three countries). On top of that, competition in Sweden and Germany acted as a major and efficient stimulant for the national operators to improve their cost structure and services, benefitting not only passengers of the new operators but all travellers at large.

2.2. Administrative Layers in France and their impact on railways

Railways as an industry are often under close scrutiny of the State. In France, they started as concessions awarded by the State to 5 main private companies, who were grouped into SNCF in 1938⁵. Since then, SNCF is the monopolist rail operator for freight and passenger rail transport within the French borders. It thus behaved as an administration and a quasi-Transport ministry over the second half of the twentieth century, defining and applying the transport policy for the country⁶. Even if the split between RFF and SNCF (1997) and the introduction of competition in freight (2006) have induced modifications, rail transport is still very closely related to the State.

Because of this close relationship, where the State is at the same time the client, the regulator, the fund provider and the policy maker, it is very important to understand first how the French administrative structure is organized. The elements presented below will re-surface at different points in the report.

This section will first introduce the different layers and then relate them to actors in Public Transport in general and railways more specifically.

2.2.1. A complex historical background that leads to resistance to change

France has always been very proud of its know how in State administration, since Charlemagne sent his *missi dominici* around the Empire to control its good administration. Napoleon later on imposed an administrative structure based on and parallel to that of the Church, with *communes* (municipalities) next to parishes and *départements* equivalent to diocese. As an equivalent to the bishop, a *préfet* was nominated in each department. And to talk to the local priest, a municipal council elects a local mayor.

However this simple structure has become more and more complex through the years, with more layers being created and none being deleted. *Départements* were cut into *sous-préfectures* with a *sous-préfet* for each. As France got less rural and more urban, the scale of the municipality was deemed too small, and the 36,000 *communes* now have to group into larger *communautés de communes* and/or *communautés d'agglomération* to which they delegate some of their powers; finally, 22 *régions* were created on top of the 95 *départements*. Of course they have their own *Préfet de région* and (elected) *Conseil Régional*. Large cities also have *quartiers* or *arrondissements* (districts) with their own local council. And one should not forget the European Union, nowadays a key investor in infrastructure projects.

All these levels communicate more or less efficiently, have different responsibilities and powers and different resources. But since they all have a good reason to be there and are presided by influential local politicians, the debate over simplification, though often discussed, has yet to lead to actual reform.

⁵ (Ministère des Travaux publics, 1937)

⁶ (Beau, Dequay, & Fressoz, 2004)

2.2.2. A structure characterized by the multiplicity of overlapping layers and dilution of responsibility for transport

The complexity of the administrative system has a large impact on the organization of Public Transports. To sort out and clarify the structure, a table was built:

Table 1: Administrative layers in France and their impact on transport

Layer	Number	Transport role	Financial resources
EU		Infrastructure investment Regulation	Transfer from national states
<i>Etat</i>	1	National IC, TGV	General budget
<i>Région</i>	22	Regional trains (TER)	Transfer from State Tax on salaries (VT)
<i>Département</i>	95	School buses, other department buses	Transfer from State
<i>Communauté</i>		Urban transport (bus, tram, metro)	Transfer from Communes
<i>Commune</i>	36,000		Local taxes
<i>Arrondissement</i>	20 in Paris	(-)	

The large number of administrative authorities has several effects. It forms a network of Transport Authorities with more or less overlapping areas, dilutes responsibility and makes the decision processes more complex.

For example in a city such as Lyon:

- _ Urban transport is piloted by the agglomeration (buses and trams in the city centre) and tendered to Keolis
- _ On demand transport is not well developed but local municipalities can opt for specific bus services on top of the general agglomeration transport
- _ Taxis are regulated by the *Préfet*, on behalf of the State. Most taxis are independent but they must have a license to operate in the area
- _ The airport tram link is tendered by the *département* to a consortium including Veolia Transdev⁷
- _ Interurban buses and school services are overseen by the *département* and tendered to several players including Car Postal
- _ The *région* is in charge of TER local train services (to Saint Etienne, Roanne, Grenoble...) and contracted to SNCF
- _ Some interregional services are also operated as TER and contracted by the région Rhône Alpes or by neighbour regions (to Dijon for example)
- _ The central State oversees the Intercity trains (to Clermont Ferrand for example), also contracted to SNCF
- _ SNCF decides on its own for profitable TGV services (to Paris, Marseille, Nice...) These are usually direct services linking Paris to the rest of France. Some unprofitable train services

⁷ (Rhonexpress, 2010)

are also maintained as a demand from the central State to link the territories (Dijon-Marseille or Strasbourg-Lille)

_ Local government of any kind can also subsidize a TGV link via a contract for a specific service. This is the case for example for the daily TGV between Brive la Gaillarde and Lille, financed by the *régions* Limousin and Centre⁸.

Amidst all these administrative complexity, the toughest task is to coordinate the different transport networks. Given local political squabbles, it also happens that lines organized by different levels run parallel to each other. It is the case for example in Nice: the *région*, governed by left wing politicians, pays CFTA, subsidiary of Veolia Transdev, to run a train line between Nice and the Northern suburbs (Chemins de Fer de Provence). And the *département*, governed by the right wing parties, pays another subsidiary of Veolia Transdev to run buses exactly parallel to the train but at a lesser price. Both services are thus run by the same operator, with different fares and without coordination. This leads to waste of efficiency and money.

Most public figures are aware of the waste created by the system⁹, where transport networks sometimes compete against each other instead of focusing on efficiency and customers' needs. Some politicians such as Jacques Auxiette lobby for a reunion of all the transport authorities under the authority of the *région*¹⁰. Of course this is not on the agenda of Presidents of *départements* such as Dominique Bussereau or Christian Estrosi, who fervently defend their own authority.¹¹

The only *région* where transports are rationally organized under one single authority is Paris-Ile de France. The STIF (Syndicat des Transports d'Ile de France) is the single transport authority for the whole agglomeration, on all modes. This scheme is inherited from the tradition of specificity for Paris. From 1871 to 1977 there was no elected mayor for the city of Paris¹², but only a nominated *Préfet*. This was meant to contain the unruly Parisians; The general effect was that the central State actually governed the city directly, including the transports. In the end, the STIF was transferred to the *région* as late as 2005¹³, the national government keeping the upper hand on Paris transport until then.

Given the financial constraints of public budgets, including for local governments, there could be external pressure for efficiency seeking and re-organization in the near future. One of the possibilities could be that transport authorities are re-organized following a long-discussed simplification of the administrative “mille feuilles”.

For now, the impact of this administrative complexity is a large dilution of responsibility and increased difficulty in the decision process.

Requirement 2.2.1: a new rail project needs to leverage on the different decision centres and get the backing of this large variety of levels.

⁸ (Région Limousin)

⁹ (Mobilettre, 2012)

¹⁰ (Association des Régions de France, 2012)

¹¹ (Mobilettre, 2012)

¹² (Assemblée, 1871)

¹³ (Assemblée, 2000)

2.3. Organization of the railway industry in France

The organization of the industry will first start with a stakeholder analysis, followed by a financial analysis. Both lead to concluding on the key issues facing the French railways, an analysis of proposed models of competition and an analysis on how work organization and social issues can act as a brake on reform.

2.3.1. Current organization: two main actors...

The current organization of the railway industry was set in 1997 when network ownership was taken out of SNCF and given to the newly created RFF (*Réseau Ferré de France*). This was meant as the separation between network and operations. Indeed at the beginning of the 1990s, the European Union decided to split infrastructure management on the one side and transport operations on the other¹⁴. From 1995 to 1997, an accounting separation was set up within SNCF, and in a second step in 1997, the government decided to create RFF and give it full legal autonomy.

Two players emerged from this decision, SNCF and RFF:

SNCF (*Société Nationale des Chemins de Fer*) is in charge of rail transport operations on the French national network¹⁵. It has a turnover of 8 billion Euros in 2011, with a complement of 4.5 billion Euros paid for by *regions* for the TER and Transilien (regional rail transport). The group has as many as 450 subsidiaries and organizations, grouped in 5 branches or activities

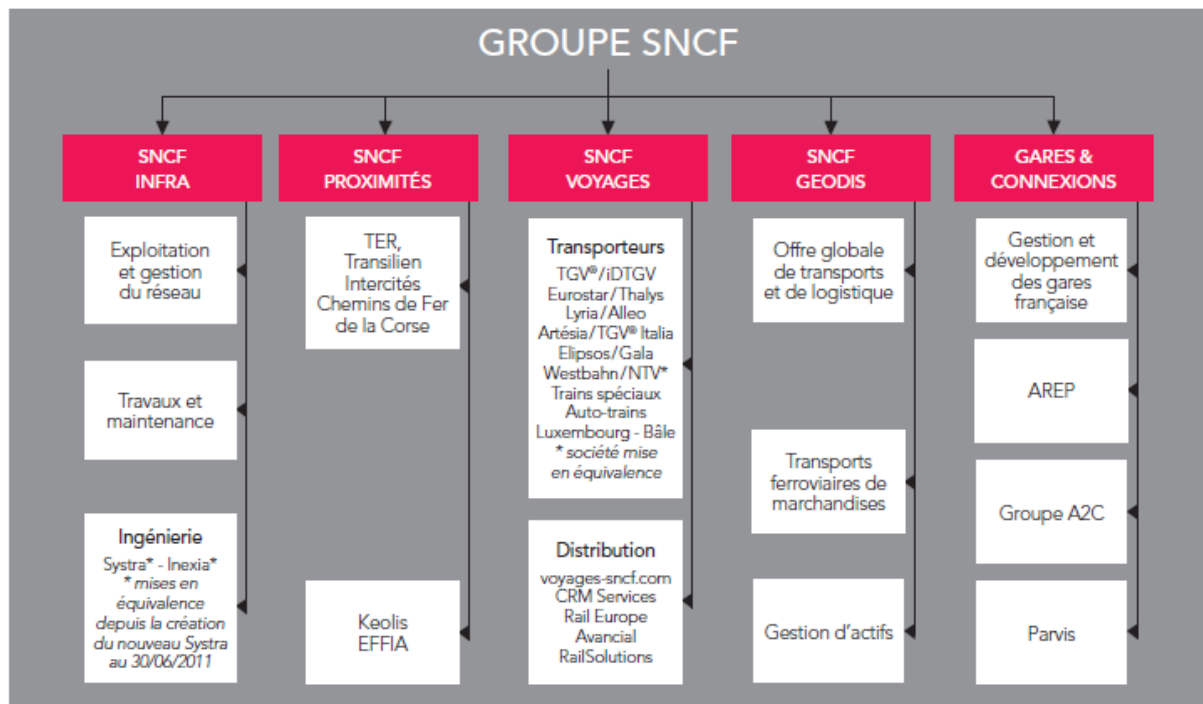


Figure 2: Structure of SNCF (Groupe SNCF, 2012)

For detailed analysis of the 5 branches, see Appendix 12.

¹⁴ (EU, 1991)

¹⁵ (Loi 82-1153, 1982)

RFF (*Réseau Ferré de France*)

This public entity owns the network, the station platforms, and a range of installations such as shunting yards, and areas along the tracks. It has several responsibilities:

- _ Infrastructure manager, in charge of network operations. This is delegated to DCF (see below).
- _ Timetable planner and train path allocation. This is also partly delegated to DCF.
- _ Network maintenance, for the existing tracks. This is outsourced to SNCF Infra.
- _ Network planning and construction of new lines. This is often contracted out to private partners.

RFF has a turnover of 4.7 billion Euros in 2010¹⁶, and spending is split in 1.4 billion Euros for the existing network and 1.4 billion Euros for network development.

The separation is still somewhat virtual: RFF owns the network but has to delegate its management and maintenance to SNCF Infra, the network management branch of SNCF. In the same way, traffic management and timetabling is done by the DCF.

DCF (*Direction des Circulations Ferroviaires*) is a specialized entity. It was created in 2010 within SNCF, at the demand of the government. It has a body of 14,000 employees among which 13,000 traffic managers, regulators and switch operators, and 500 timetable designers. DCF is autonomous within SNCF, with a director nominated directly by the government, and a separate budget, fully funded by RFF. DCF thus works for RFF, according to the objectives and principles set by RFF, but with agents who keep their SNCF status and contract. In the long run, it is likely that DCF is included fully into RFF but the transfer of the agents is an issue.¹⁷

In this scheme, SNCF is both the main client of RFF, paying for the infrastructure tolls, and its main supplier and service provider. This original design was intentional, the aim being to split SNCF so as to abide by the European law and get its debt out of the State national debt (just before the Euro was introduced), while keeping SNCF whole by making sure RFF was just an empty box, a virtual partner who would merely validate everything. To this day, RFF only has 1,200 employees, which means it has very limited control possibilities over SNCF.

The State, owner of both SNCF and RFF, is somewhere in the middle, trying to sort out the information it gets and where the money goes.

¹⁶ (RFF, 2010)

¹⁷ (RFF, 2010)

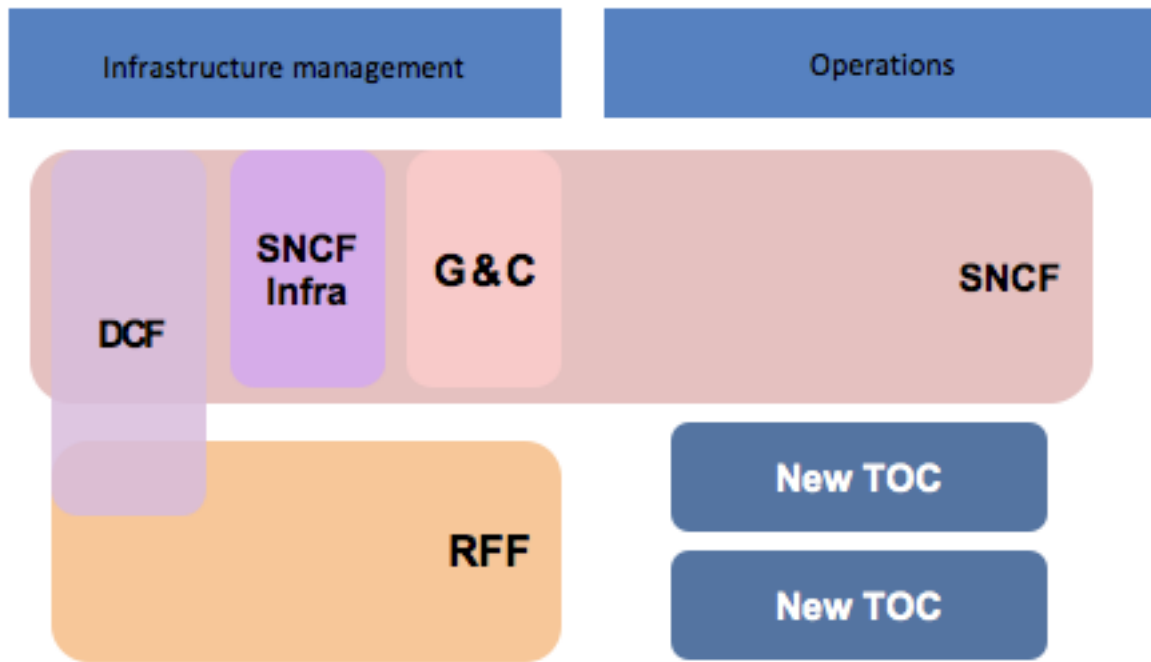


Figure 3: Current organization of railways in France

Legend:

SNCF (*Société Nationale des Chemins de Fer*), national operator

RFF (*Réseau Ferré de France*), network owner

SNCF Infra, network maintenance

DCF (*Direction des Circulations Ferroviaires*), traffic manager

G & C (*Gares et Connexions*) stations owner and manager

2.3.2. Current organization: ... a multiplicity of small players

To monitor this structure, a network of regulating bodies was set up:

- **ARAF** (*Autorité de Régulation des Activités Ferroviaires*), regulation authority for railways

ARAF is an independent public authority, created in 2009¹⁸ to “facilitate the functioning of the public service and of competitive activities in railway transport, to the benefit of the users and clients of rail transport services”. It is for example in charge of making sure the different TOC can access on a fair and unbiased basis to the railway network and associated services. The Authority is under control of French Parliament and Justice.

A governance council of the authority was set up in 2010, with seven members with different backgrounds: economists, lawyers, railway experts, businessman and politicians. Its President, Pierre Cardo, former French MP, was nominated by the French President.¹⁹

The authority was given large powers to regulate the railways:

- _ Extensive investigation powers, including controlling accounting
- _ Executive legal powers to clarify the existing law and specify its details in relation to network access, network use, access to essential services and use conditions for these services, control over the precise borders of regulated activities within the national operator,

¹⁸ (Loi 09-1503, 2009)

¹⁹ (Les Echos Conférences, 2011)

accounting rules used for these activities, and principles defining the financial relations between these activities.

_ Sanction power for found irregularities, either following a suit or on its own initiative: ARAF can fine the firms up to 5% of their turnover and restrict access to the infrastructure.

The main missions associated with these powers is to observe the conditions of access to the infrastructure and guarantee the coherence of the measures taken by the infrastructure manager and the TOCs, in terms of economics, contracts and techniques. The authority can, after having consulted appropriately, make any recommendation on the functioning of railways.

The ARAF publishes views and decisions on railways, especially on:

_ Projects of regulations affecting access to the rail network, design, realization, and use of infrastructure and facilities for railways

_ The DRR (Document de Référence du Réseau – railway code) that gathers all the rules of the network

_ Tolls paid by the operators to access the network and facilities. These tolls can only be applicable after a validation by ARAF

_ The nomination or revocation of the director of DCF (traffic management within SNCF for RFF)

The missions also include:

_ Deal with and solve disputes appearing in relation with access to the network and facilities

_ Publish opinions on the decisions of the EPSF (safety authority) that would be considered discriminatory by one of the actors.

_ Make sure that open access passenger transport services are aimed mainly at international transport, with a limited amount of national trips only.

- **EPSF** (*Etablissement Public de Sureté Ferroviaire*), safety authority

Safety was historically a responsibility assumed within SNCF. As an administration, SNCF was in charge of running the trains and of controlling itself. However, changes in the European legislation and the introduction of competitors demanded that an independent authority be created. EPSF was thus formed in 2006, with experts in charge of controlling and guaranteeing railway safety for all the actors. According to its missions, EPSF “issues authorizations, carries out audits and inspections, takes part in the work to draw up safety rules and helps to harmonize European rules.”²⁰

There are also two key associations:

- **UTP** (*Union des transports Publics*), Public Transport Union, including all PT operators and all railways operators

The association gathers 150 firms of urban public transport in France. According to different statuses, they can be linked to large groups such as Car Postal, Keolis, RATP, or Veolia Transdev, or they can be independent²¹. Since 2006, the UTP also gathers rail firms, with the entry of freight actors, followed by passenger operators. There is a specific commission for railways in the UTP. The aim is to build common positions, submitted to the council, and then forwarded to the main players and institutions: Ministries, European institutions, regulation authorities, service providers etc.

UTP has five key missions:

²⁰ (EPSF, 2011)

²¹ (Union des Transports Publics et ferroviaires, 2012)

- _ Represent its members, on the national and European levels. This consists mainly of lobbying activities with the State, the administrations and the politicians, but also other partners such as the network provider.
- _ Intensify the social dialogue between the different actors. The UTP has in the past negotiated with the unions the regulations governing work in the public transport branch, and is now very active with ongoing negotiations for rail freight employees.
- _ Underline the value of French experience in Public Transport and help its members export worldwide, via multiple communication channels such as the fair organized yearly in Paris.
- _ Analyze the transport environment and follow its evolutions through a range of indicators updated on a regular basis
- _ Stimulate thinking and debate on Public Transport, laying out the right arguments and possibilities, and feeding the debate in the media.

UTP is organized around several Commissions; Specifically, the *Commission des Affaires Ferroviaires (CAF)* is in charge of all matters relating to railways. This commission took a very active role in the national public consultation on railways in 2011, underlying the positions of the UTP members; it also keeps a constant dialogue with RFF to negotiate and improve the network access conditions and the fare structure. The two main stakes are consequently the global organization of railways in France and the negotiations on the work agreement for rail employees. The CAF is also involved in the introduction of competition for railways and its conditions.

- **AFRA** (*Association Française du Rail*), French railways association

The UTP groups all rail operators including SNCF. In this context, the new operators felt they could not truly express their positions and decided to create an association for the new actors. The AFRA is thus designed as the association that groups “all the actors considering that French railways will only be able to expand and blossom in a regulated competitive environment.”²²

In this respect, AFRA focuses on missions similar to that of the UTP but cantered on a competitive point of view:

- _ Push forward competition on French rail
- _ Organize and stimulate thinking and debate
- _ Represent and defend the new TOC in relation to the administration, the State and regulation bodies
- _ Develop communication of its members
- _ Work in a close partnership with the other associations of the branch, notably UTP

The members of AFRA in 2012 are Colas Rail (subsidiary of Colas), EuroCargoRail (subsidiary of Deutsche Bahn), Europorte (subsidiary of Eurotunnel), and T3M for the freight activities. Trenitalia, Veolia Transdev and Deutsche Bahn are represented for passenger transport, and Vossloh is a rolling stock member.

2.3.3. Financial flows between the railway stakeholders in France

This imbrication between the network owner and the rail operator has consequences on the complexity of the financial flows. As a whole, the State is subsidizing the rail system for an amount of about 10 billion Euros per year²³. The main costs requiring subsidies are network development (new high speed lines), retirement scheme of SNCF employees, and, most

²² (AFRA, 2009)

The financial structure is thus balanced, with SNCF paying RFF 3.4 billion Euros for access tolls in 2010 and RFF paying SNCF 3.2 billion Euros in maintenance works for the network.

The situation is satisfactory for no one

- RFF has no take on its finance: if it raises the tolls, then SNCF will be likely to increase the maintenance bills in retaliation. And it cannot legally ask any other competitor to do the maintenance.
- SNCF is more and more pushed towards greater transparency on its maintenance costs, the result being a cost payment, with no possibility to make profit on this very large activity.
- As SNCF knows it will be paid more or less exactly according to its costs, it has no incentive to improve productivity²⁷
- The State is heavily subsidizing the whole system
- The debt issue is not solved, with RFF carrying an ever-increasing debt and SNCF having to bear a debt once again.

2.4. The effects of regionalization of French local trains

Formerly local trains were supervised and organized by the national government. In 2002, regionalization of TER was completed. The consequences were mainly an increase in service and ridership, as well as a large cost increase.

According to French law²⁸ regions are now responsible for local trains, which are fully operated by SNCF. Regions have to set up a contract with SNCF to determine the conditions of operations and financing of local regional trains.

The process of regionalization for passenger train transport started in 1970. The first contract was signed in the East of France between SNCF and Lorraine for services between Nancy, Metz and Thionville. In 1978 the North signed the first contract including new train sets. The LOTI law²⁹ completed the process in 1982, strengthening the responsibilities of local government. Thanks to this law, several regions were able to sign a convention with SNCF from the middle of the 1980s, aiming at developing local passenger train transport. The institutional framework was completed in 1995 and 1997 with the creation of RFF³⁰. Finally the law SRU³¹ fully transferred authority to all regions (excluding Paris) from 2002.

Because data on Intercity trains is not publicly available, and SNCF has only scarcely begun to hold separate accounting for each Intercity line and for the TET in general, it is interesting to consider the evolutions and the situation of the local TER trains, that will reflect the cost structure and organization of the TET. Indeed, **although the markets are somewhat different, the interrelations between the two segments make it possible to consider their similarities and learn from TER when studying TET.**

²⁶ (Rhoné, 2012)

²⁷ (Lévêque, 2009)

²⁸ (Loi 82-1153, 1982)

²⁹ (Loi 82-1153, 1982)

³⁰ (Loi 97-135, 1997)

³¹ (Assemblée, 2000)

2.4.1. Development of regional trains in the last decade

For the last 10 years the market of **regional passenger transport has seen an important growth**. Traffic grew from 7.4 billion passenger.km in 1998 to 12.6 billion passenger.km in 2009, accounting for an average annual growth rate of 5%. This growth even accelerated over the past 5 years, with an average annual growth of 6.4% for 2004-2009.

In parallel to this increase in ridership, services have grown from 115 million train.km in 1998 to 174 million in 2009, which accounts for an average annual growth of 3.8%. This growth has slowed down over the last years, with an average annual growth of 2.2% for 2004-2009.

Thus the average occupancy rate of the local trains has risen from 63.9 passengers per train in 1998 to 72.3 passengers per train in 2009; with an accelerated growth over the last years (average annual growth of 1.1% over ten years and 4.1% over 2004-2009).³²

In terms of financing, this evolution in ridership and volume of service has been accompanied by increased public funding. The public funding of TER paid to SNCF is split over three items: operating subsidy (1.99 billion Euros in 2009), compensation for social fares (0.35 billion), and subsidy for investment in rolling stock (0.99 billion). 73% of this funding comes from the central government, through the subsidies it gives to the *regions*. The rest comes directly from the local taxes collected by the regions. The amount of public subsidy has grown very significantly over the last decade: whereas the State and the regions had a transport budget for TER of 2 billion Euros in 2002, subsidies have gone up to 3.3 billion Euros in 2009, amounting to an increase of 68%. All budgets are concerned with this increase: operating subsidies (+65%), social fares compensation (+65%) and investment subsidies (+74%).

The comparison of the evolutions in terms of service volume, ridership and funding shows that the **public funding has increased significantly over the last decade**. From 2002 to 2009, service volume has grown by 18%, traffic by 42% and funding by 68%. This is reflected in the contribution per train.km that went up from 9.6 Euros in 2002 to 13.5 Euros in 2009. Even corrected for the inflation, the growth still is from 10.4 Euros per train.km in 2002 to 13.5 Euros in 2009, or an increase of 30%.

2.4.2. Regional disparities

The situation of TER is very different from one region to the other. Production cost per train.km goes from 14.7 euro per train.km to 26.5 Euros, with an average at 19.8 Euros. Unit cost per traveller.km is even more dispersed, ranging from 21 cents to 51 cents, with an average of 26 cents. This reflects the spread in ridership per train, ranging from 29 passengers per train to 111, with an average of 76 in 2009.

Regionalization of local trains thus led in parallel to increased services (measure in train.km), increased ridership (passengers.km) and an even larger increased funding from the taxpayer to SNCF. Lines that were long deemed not profitable were re-opened or saw increased frequencies, while the balance between user contribution and taxpayer financing shifted to the detriment of the taxpayer. The fact that this very voluntarist policy was met by increased ridership underlines that **there was indeed a market to tap, to bring passengers back into trains thanks to a better service**. But the wide spread from one region to the other shows that the same policy could not be successful all across the territory. For less populated areas, it simply led to financing empty trains, with a disputable impact on pollution.

³² (Ministère de l'Ecologie, du Développement durable, des Transports et du Logement, 2011)

Transposed to the TET trains, this means that there is likely to be a large potential for growth for Intercity trains, provided financing is available to improve the services. But this potential is likely to be very variable from one line to the other, so good care needs to be taken when choosing the desired lines.

Requirement 2.4.1: Backing from the local and regional governments should be sought so that they can finance improved quality and eventually lead to higher ridership

Requirement 2.4.2: the Intercity line considered must be chosen carefully according to geographical and local opportunities.

3. Introducing competition on French railways

The experience of competition in the French freight railways is analyzed in 3.1 and an analysis on how competition could be introduced in French passenger railways is displayed in 3.2, along with an analysis of the foreseeable consequences of the proposed models.

3.1. Competition in freight transport

As in other European countries, massified freight transport by rail has played a key role in France but progressively depleted. In 1960, the market share of rail was 65% of all freight (measured in ton.km), against 35% for road. In the seventies the split was half for each mode. And in 1980 rail freight dropped to 39%, which means that over the course of twenty years, the modal split was reversed between road and rail³³.

This decline of rail freight was observed in most European countries. Rail market share in Europe decreased from 21% in 1970 to 8.4% in 1998³⁴. The European Commission thus set out to revitalize railways through a set of measures: creation of an integrated railway network, dedicated freight network, and introduction of competition. It was expected that the entry of new competitors would help take back market shares on the road, or at least stop the decline of rail.

The rail freight market was thus opened throughout the European Union. France decided to wait until the last possible minute and opened its national market only from March 2006 (the deadline was January 2007). Despite this late opening, it was not actually prepared. This produced effect opposite to expectations: instead of stimulating the market, rail freight globally shrunk from 52 billion ton.km in 2000 to 32 billion ton.km in 2010³⁵. In only five years, new operators have taken a market share of 20%, within a shrinking national market. However the markets captured were mainly conventional heavy traffic with large volumes and frequencies, with the more difficult markets (point to point, irregular...) left to the national operator.

The fact that SNCF could not redistribute the revenues of lost profitable markets to finance loss making markets incited it to cut drastically over its non-profitable activities in freight transport. Numerous terminals were closed and services discontinued. This was made parallel to the development of the economic crisis in 2008 and to a large movement of deindustrialization in France.³⁶

More importantly, the introduction of competition for freight was not prepared in terms of social stakes. There was no specific law in place to govern work of private operators employees. SNCF employees are still under the regulations of a specific body of rules dating back to 1940, while private workers were simply following general work regulation³⁷. Specific industry negotiations were led over the years to regulate work and ensure safety of

³³ (Ghigonis, 1999)

³⁴ (Commission Européenne, 2001)

³⁵ (Ministère de l'Ecologie, du Développement durable, des Transports et du Logement, 2011)

³⁶ (Geveaux & Lepaon, 2012)

³⁷ (Grignon, 2011)

operations, but the work has been halted by the recent government, on the grounds that the new agreement would still be detrimental to SNCF.

At the end of the day, because of this failure, politicians and unions are reluctant to reproduce the same mistakes on the passenger market and want to take steps to make sure competition is beneficial to the industry. It can also be argued that competition in freight was indeed beneficial to the rail freight industry insofar as it limited the fall of market share against road.³⁸

Requirement 3.1.1: Introduction of competition on passenger railways should be prepared upfront and negotiated with all actors, especially unions and workers.

3.2. Opening up French passenger rail to competition?

European countries have been implementing the introduction of competition in the railways for the last twenty years. Although the process is not yet fully completed, it should be achieved in the upcoming years through the full opening of passenger transport. A project of European legislation is to be introduced by the European Commission on this subject in the upcoming winter 2012-2013. This transformation from a model of State monopolies to open competition raises questions over the objectives and benefits of competition, from the point of view of the taxpayers and the clients.

3.2.1. Monopolies lead to suboptimal equilibria

A firm in a situation of monopoly finds itself alone on the market for producing one or several goods. This monopoly is thus supposed to capture and satisfy the entirety of demand for this good or service. The origin of a monopoly can come either from the specificities of the industry itself (natural monopoly or innovation monopoly) or stem from a political decision to protect an industry (legal monopoly). In the latter case, the persistence of the monopoly is only due to legal entry barriers for would-be competitors.

The French railway industry has a situation with two distinct types of monopolies:

On the one hand network management relates to a natural monopoly: the tremendous cost of infrastructure building and maintaining implies that the running of parallel networks is economically inefficient. Because there are increasing marginal returns in the development of infrastructure, its organization as a monopoly on a large scale is justified.

On the other hand, the production of transport services is still a monopoly guaranteed by law for most of the services. French law³⁹ states that SNCF is the only firm allowed to provide national railway passenger transport. This legal protection prevents competitors from entering the market.

Compared to a competitive industry, the monopoly industry can lead to a sub optimal economic situation, which can be difficult to regulate by the State. In the absence of strong regulation, the monopoly fixes itself the prices and production levels such that its profit is maximized. It thus produces at a higher price, leading to a lower level of demand and production. The collective surplus is then diminished and a monopoly rent is created, to the detriment of consumers. On top of that, the legal monopoly decreases the incitation for the player to innovate and reduce its costs, in the absence of competitive pressure.

³⁸ (Malecot, 2012)

³⁹ (Loi 82-1153, 1982)

The only way is then for the State to regulate the monopoly, by fixing prices and production, while giving incentives to increase productivity. But regulating often proves unsatisfactory because the public operator is not incentivized to reveal its costs truthfully. In the end, the public monopoly often faces financial difficulties, and such is the case of the French railway industry, whose cost for the State has increased constantly.

The introduction of competition in a monopolistic industry should in theory lead to an improved market, increased productivity and more transparent costs⁴⁰. The entry of one or several new competitors or at least the threat and organization to do so⁴¹ has several effects on the market. It should lead to an increase in productivity of transport operators (and cost transparency) and to a diversification and increase of supply. For the same level of transport service, the better productivity of the players should eventually decrease the need for public funding. Another choice can also be to keep the same funding level and increase supply.

3.2.2. Several advantages can be brought by competition, under conditions

Several conditions need to be met such that competition can deliver its promised benefits. Focusing the historical monopoly on the network and infrastructure activities while opening other activities to competition can bring cost transparency, increased productivity, decreased costs and margins, development of innovation and quality, and improvement of the investment policy.

These benefits are conditioned on several elements⁴²:

- _ the initial state of the market (how efficient the monopoly already is)
- _ the existence of market imperfections (entry barriers)
- _ the evolution of the historical operator
- _ possible imperfections in the regulation
- _ support of the government

3.2.3. Modalities of competition

There are two main models possible to open competition. Competition can be in the market or for the market.

Competition in the market

Competition in the market is defined by an open access to the network for any operator. The TOC are then competing directly against each other to seduce the passengers and they determine autonomously the services they run (price, schedule, frequency, rolling stock, on board facilities etc.) This freedom of organization is limited by the capacity of the infrastructure and can be regulated to guarantee safety or the global efficiency of the system (transfers for example). Such competition can be effective, with several players on the same market, or only potential, with merely the possibility for any operator to enter the market. Such an organization of competition cannot be set up for subsidized transport, but only for profitable markets.⁴³

⁴⁰ (Savary, 2011)

⁴¹ (Baumol, 1982)

⁴² (Abraham, 2011)

⁴³ (Savary, 2011)

Competition in the market has several advantages:

- _ TOC can define the service (price, schedules...) at the closest of the demand of passengers, and taking into account modal and intermodal competition.
- _ the market is free of entry and exit.
- _ competition can lead to lower prices and increased quality and frequencies to the benefit of passengers.

Drawbacks can also appear:

- _ there is a risk of unstable service, with constant modifications to adapt to demand and optimize profitability.
- _ the infrastructure tolls can limit the degree of openness of the market
- _ there is no ex ante coordination of the services of competing operators, except if the regulation imposes it
- _ railway financing is reviewed, with the share paid by passengers decreasing and compensated by taxpayers, as profitable links cannot cross subsidize loss-making services anymore.

Competition for the market

Competition in railways can also be organized for the market. Such is the case of public transport run for a transport authority. A contract can give the winning bidder the right to run a service with exclusivity on a line or region, compensated by subsidies. Bids can be based on quality, but most often are decided on the lowest bidder i.e. the bidder asking for the less subsidies gets the franchise.

This type of competition has several advantages:

- _ service is decided upon by the transport authorities and the government. They have a larger aim than basic financial profitability and social variables can be taken into account.
- _ public tendering with competition between bidders enforces cost transparency, which in turns allows for reduced subsidies
- _ contracting allows for a stable definition of the services and construction of coherent schedules, fares and distribution schemes.
- _ level of service is not dependent on the network access fare.

It also has drawbacks:

- _ supply is slower to adapt to shifts in demand
- _ incentives to innovate are smaller
- _ the level of service is dependent on public subsidy and can thus be reduced according to the state of public finances
- _ tenders that are designed too large can represent entry barriers for new alternative operators.
- _ the tendering process induces transaction costs for the government.

Because of the relatively low demand on Intercity lines (except suburban lines going to Normandie), because of the need of coordination with other services and because of the sensitivity of French actors, the **French government made the decision to begin with an experimentation with competition FOR the market.**

3.2.4. Introducing competition in French railways – The Intercity network

Given the advantages the competition in railways promises for the users as well as for the taxpayers, it could be brought forward as a strong stimulant for change and productivity gains. To make it more acceptable and thus more lasting for the unions, the employees and the public, the model found should be sound, reasonable and progressive, to be able to display its positive effects step by step.

Thus a first step could be to start with competition for the market on a small scale. One long discussed possibility would be some group of lines of local trains. These present the advantage of being independent and relatively small, thus enabling not so big actors to step in, and thus guaranteeing effective competition in the bids.

But these local lines have the disadvantage of being managed by the regional authorities, who are extremely reluctant to competition for political reasons. They could open some of the lines and are looking into the issue, but none of them wants to be the first one, as this would be too much a political risk.

It thus falls to the central State to act and experiment competition in railways. Central Government has control over two service groups: national high speed (TGV) lines and Intercity (TET) lines.

TGV lines are excluded for a first experimentation for two reasons. The first is technical and financial: TGV trains are very expensive and long to build, so it would take a very strong and powerful new actor to enter this market. Said otherwise, the entry barrier is too high for now. The second argument why TGV lines are not preferred is that given their organization and the operational profit SNCF makes out of it, opening them would destabilize the whole railway industry financing scheme.

In the end, **the most appropriate service to experiment competition are found to be Intercity lines.** They will thus be studied more in detail in the following chapter. What is yet to be determined is in what organizational environment such an experimentation could be run. The organization of the railways is thus discussed first.

3.2.5. Work organization and social issues

Social issues are key especially for SNCF unions who fear what they call social dumping from new TOC⁴⁴. They explain that lower salaries and longer working hours would not only be detrimental to the national operator but also lead to safety breach and accidents. The general idea is that the employees of the new TOC would be enslaved to their driving post day and night, and would fall asleep while in operations.

There are however two distinct social problems which makes SNCF labor costly, and competition will probably not be on the salaries. SNCF employees are costly because they are well paid but also mainly because the work organization is out of date⁴⁵.

The first point (labor cost), stems from the salaries themselves, but also mostly from a range of advantages and statutes which allow SNCF workers to work short hours, retire early and

⁴⁴ (Sud Rail - Solidaires, 2012)

⁴⁵ (Lévêque, 2009)

have generous social benefits: a job for life, retirement at 50 (soon 52) for the drivers, generous welfare system, free transport for the employees and a good part of the family etc. But the new TOC are very unlikely to compete on these grounds. It would not be wise to underpay the drivers, because they would then have an incentive to flee to SNCF, which would gladly welcome them given the training cost. Thus to the contrary of common ideas, new TOC drivers are likely to be paid at least as much and probably a bit more than SNCF drivers.

In exchange for these high salaries and benefits, the new TOC would touch upon the second competitive problem of SNCF: work organization. The most obvious point would be longer hours, but it is far from the only one. Another key aspect is polyvalence of the employees. SNCF has a very vertical organization whereas new TOC, given their size at first, will probably have workers who are trained for several jobs. As Veolia Transdev demonstrates in Carhaix, commercial employees can also manage security on their line segment. In Lyon, it is also demonstrated that employees can operate as drivers or on-board crew as long as they are trained for both.

The questions of status and work organization are very highly sensitive for the unions and the employees. If a scheme of staff transfer was introduced for competition for the market, measures would have to be taken to conjugate the rights of the workers and that of the employer⁴⁶.

Requirement 3.2.1 Negotiations on work conditions should be led prior to introduction of competition

⁴⁶ (Grignon, 2011)

4. Analysis of the French Intercity network

Since the Intercity services are most convenient and most likely to be open to competition first, probably through experimentation, the focus of this section will be to elaborate on the French Intercity market and the characteristics of the network. It will lead to requirements that will eventually lead to choose the most suitable line in Chapter 5.

4.1. The French Intercity Network – a leftover service between TGV and TER

The French Intercity network is hard to define as a whole. It is not designed as a network but more the remains of what is in-between TER and TGV. The services are thus depleting, replaced by TGV services as they open, and it is difficult to identify a strategy for them, which is highlighted and the volatility in branding.

As for the services themselves, from a more technical point of view, they are very heterogeneous (being only defined as “the rest”) and often have limited frequency and service level.

This has been reached because of a lack of policy for the service. Thus to renew the policy, key success factors for the line are identified and the most appropriate line for experimentation of competition is identified as Nantes-Bordeaux.

4.1.1. Intercity services depleted as TGV lines were built

Context has been difficult for classical intercity trains over the last twenty years in France. Competition was harsh, coming from other modes, with the development of highways, and more importantly, cheap airline links throughout the country, but also intramodal competition, with the large development of TGV. As TGV lines were built, IC lines were shut down. This strategy of SNCF pushes train users into more comfortable and more expensive high speed trains. It was illustrated in 2012 by the closing of the Paris-Belfort-Mulhouse line following the introduction of TGV Rhin-Rhône.

On the opposite end of the market, regional traffic (TER) is now operated under the authority of the 22 French regions, contracting it to SNCF, while TGV expands on profitable long distance markets. In the end, classical Intercity trains (Corails) are left to the rest of the market, competing what TGV and TER don't do. This means that on most lines, traffic has constantly decreased and losses have deepened while SNCF tried to cut on services, meeting strong local resistance.

Numerous reports and inquiries were led, since as early as 1995⁴⁷. In 2005 the idea was first raised to actually contract these lines to SNCF⁴⁸. Indeed, the idea has always been for SNCF to use its profits on other lines to finance the loss-making services. The operator was more and more reluctant to do so and there was high pressure from local politicians to contract the services so that they would not be depleted again. Only in 2010 the decision was taken to contract the Intercity services. A convention⁴⁹ was signed between SNCF and the Ministry for

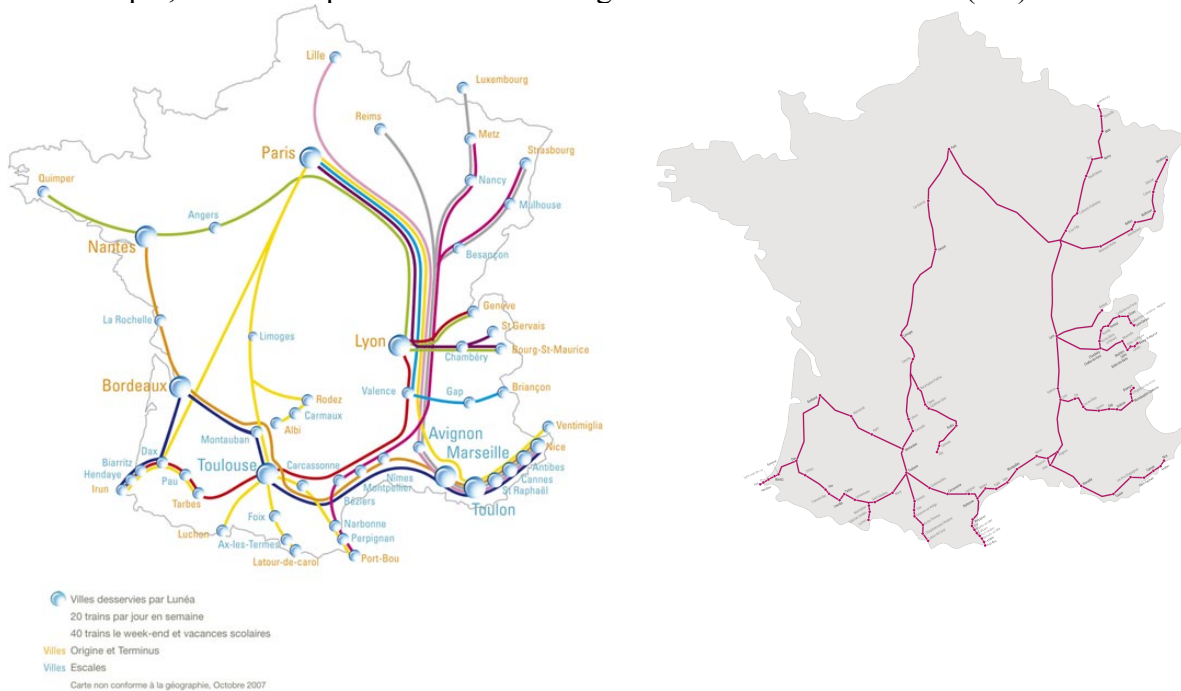
⁴⁷ (Barel, 1995)

⁴⁸ (Conseil Supérieur du Service Public Ferroviaire, 2005)

⁴⁹ (Pépy & Mariani, 2010)

Transports, covering 2011 to 2013. In the meantime, the number of services had already been cut from 25 in 2005 to 18 in 2010.

For example, the two maps below show the night train services as of 2007 (left) and 2012.



Lunéa in 2007

Intercités night services in 2012

It is striking on these two maps that within a few years services to Lille, Reims, Nantes and Quimper were simply deleted, while actual services on the rest of the network were drastically reduced. Services such as Hendaye-Genève only run once a week for example.

In particular the two night trains Quimper-Nantes-Lyon-Genève and Nantes-La Rochelle-Bordeaux-Toulouse-Marseille-Nice disappeared.

Several reasons can be found for this striking reduction in Intercity services. The most natural one is the policy of SNCF, following the development of TGV, to cut traditional services. This helps filling up higher yield High Speed Trains and increases comfort for passengers. However SNCF is easy to blame whereas another competitor may have proven more damaging: airlines. For example consider long distance East-West lines such as Lyon-Nantes or Lyon-Bordeaux, who were considered as primordial in the 1970s and until the 1980s, with their array of branches irrigating corners of the territory. Nantes-Lyon has now fully disappeared and Bordeaux-Lyon is in a very poor state (operated mainly by TER). The traffic has not disappeared however. It has simply shifted to airlines, with Air France and newer competitors such as Easy-Jet offering very competitive travel by air between distant cities. In this respect air competition can be seen as a key success factor for traffic, and will be studied closely in the next chapter.

4.1.2. Uncertain strategy reflected in tumultuous branding

The hesitations of the State and SNCF are notably reflected in the names used to designate the intercities.

Until 2003 they are simply called “Corail”, referring to the rolling stock used.



Standard Corail coach

© Michèle Daniau / AFP



Public branding

© Damien Cesselin

Today this rolling stock is assigned to intercities but also to TER services.



TER Franche-Comté

© M. Rinaldi



TER PACA

© P. L. Guillemin

From 2003 to 2010 they are referred to as “*Trains Inter Régionaux*” (TIR) or “*Lignes d’aménagement du territoire*”. The brand used remains Corail.

In 2010 the name “*Trains d’Equilibre du Territoire*” (TET) makes its first apparition, but they are still operated under several brands: TéoZ for 3 profitable services (Paris to Clermont and Toulouse, Bordeaux to Nice), Lunéa for sleeper trains and Intercités for the rest.



Brand TéoZ

© DIS



1st and 2nd class coaches TéoZ



Brand Lunéa
© Rail Europe



2nd class coach Lunéa
© freephoto.com



Intercités Normandie
© Spottrains



Detail: branding hesitations
© L'Express

Finally in 2012 a large marketing campaign groups brands all the services under the unique Intercités brand.



Advertising campaign, 2012
© SNCF

4.1.3. Highly heterogeneous services

The convention signed in 2010 between the government and SNCF details six types of TET services, but it is difficult to find common characteristics. These are simply ‘the rest’, lines that are not covered either by TER or by TGV. It makes them somehow the abandoned lines of the French network. There are 18 remaining lines split according to the following characteristics⁵⁰:

- *Grandes Lignes Radiales* (Radial Intercities) are the main long distance Intercity lines linking Paris to the distant regions. Travellers are mainly leisure and business orientated. Typically Paris-Clermont.
- *Grandes Lignes Multipolaires* (Multipolar Intercities) are transversal Intercity lines linking large poles on a long distance. That means they are the long distance lines that do not originate from Paris, typically Bordeaux-Nice or Quimper-Toulouse. Customers are mainly leisure and business.
- *Pendulaire avec cabotage* (Commuter with cabotage) are average distance commuter lines linking Paris to suburbs until 200km, mainly for daily commuters. These services are often in direct competition with identical TER services, typically to Amiens.
- *Mixte pendulaire directe et antennes* (Commuter lines and antennas) These Intercity services link Paris to further reaching suburbs (100-300km), typically Cherbourg, Orléans and Tours. Travellers are a mix of commuters and leisure/business.
- *Irrigation du territoire* (Territory irrigation) are inter-regional links (i.e. not originating from Paris) with a low traffic and very low frequency, typically Caen-Tours.
- *Rhin-Rhône* are the lines who were deemed to evolve following the introduction of TGV Rhin Rhone between Belfort and Dijon. Typically Line 5 Paris-Troyes-Vesoul-Belfort-Mulhouse has been drastically reduced.

⁵⁰ (Pépy & Mariani, 2010)

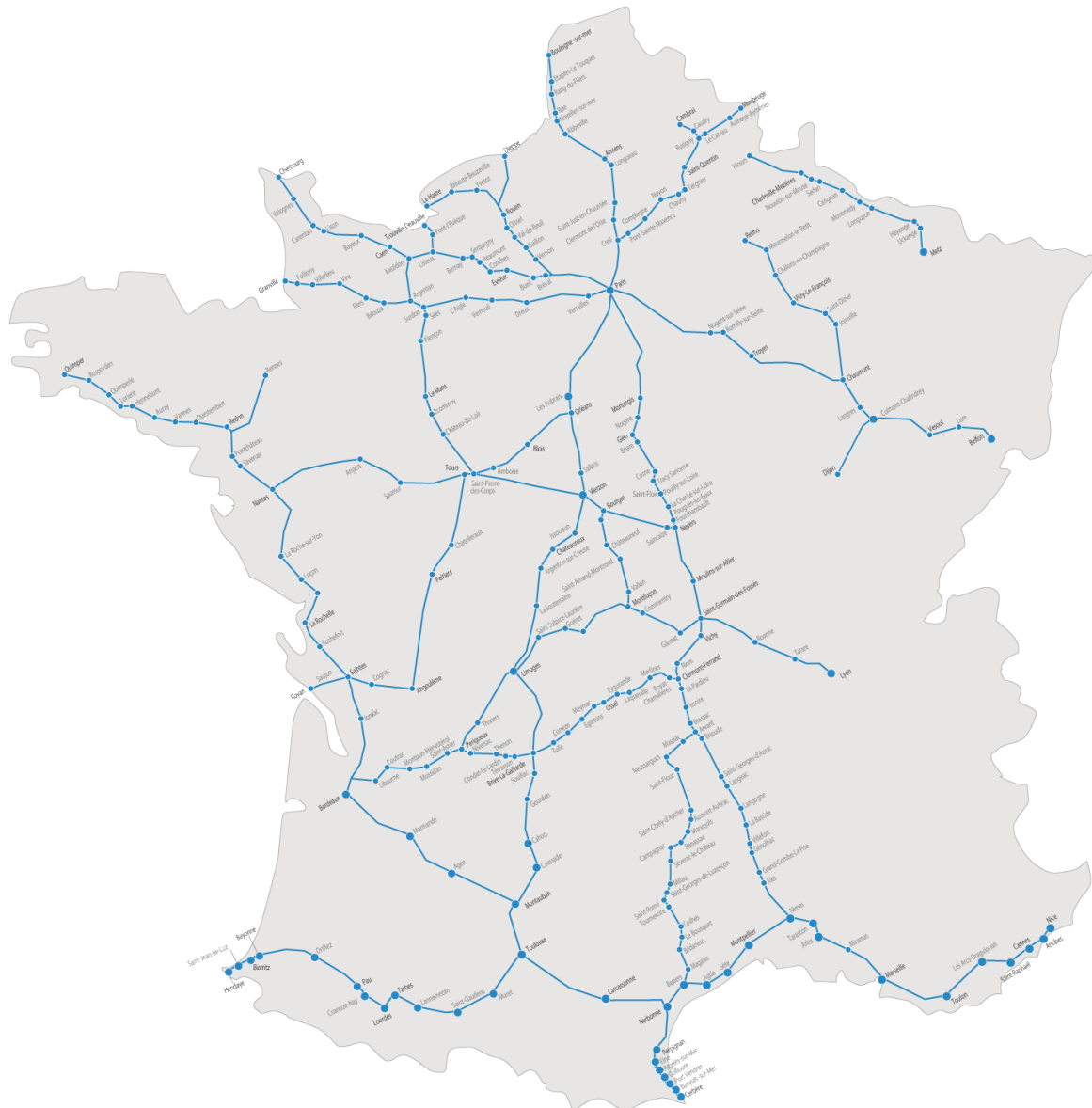


Figure 6: French Intercities (day services) – © SNCF

Thus this array of lines has no network relationship, and offer very different services to different types of customers. Lines are absent from South-East of France (except for night trains) and more organized around the cities of Tours, Nantes, Bordeaux, and Toulouse. There are 10 radial lines originating from Paris and 8 transversal lines linking the regions. The lines link 2 to 4 regions on distances going from 100km to 600km, while lines less than 300km represent more than half of services and Paris has a major share of traffic. Some lines go through highly populated areas (Bordeaux-Nice) while others cross low-density regions (Paris Granville), sometimes even on a very long distance (Paris-Troyes-Mulhouse). In the end it is not possible to refer to the French Intercités as a network per se with a global coherence and positioning.

To makes things even more complex for passengers, the services are not regular along the week, and they are most often totally different during weekends. The only common point is the fare system, based on kilometers – although former Teoz and Luneau still have compulsory booking and a limited yield system.

4.1.4. Limited service and low traffic on most Intercity lines

More than half of the lines only offer 1 return per day at most.

The busiest lines offer more than 10 returns per day, typically on Paris-Le Havre or Paris-Orléans-Tours, in which case there is a satisfactory service, identifiable by the travellers. But these lines are actually mainly commuter lines bringing workers to Paris, and heavily subsidized by the regions. For example Région Centre offers subsidies on the work monthly fare for locals working in Paris.

The less busy line, Reims-Dijon, offers one return per week, others go as high as one return per day (Quimper-Toulouse). In the latter case the Intercity service is very punctual and the service on the line is often completed by TER services, partial or complete. For example Bordeaux-Lyon is operated by TER as branches originating from Clermont.

Such low traffic often means that the lines are in direct competition against parallel TER services. They are drowned in other services and very difficult to identify for the customers. On top of that the stopping patterns are questionable. French Intercities have a tendency to stop frequently in small cities, making it hardly different from TER services. For example many trains to Normandie have a stop in Mantes La Jolie, which is clearly still the agglomeration of Paris. At the same time, trains running on a long distance, for example Paris-Vesoul, have an inadequate service level, with no on-board bar.

4.2. A lack of policy for the French Intercities

On top of the natural depletion consecutive of the new air competition mentioned in the first paragraph, SNCF pleads it had to cut services mainly for political and financial reasons. To sum it up, SNCF cannot manage to balance lines where traffic is low and running costs high.

Still according to SNCF, these lines are mostly mid-distance, linking two regions, and should thus be taken in charge under the authority of the regional governments – that is financed directly through regional subsidies instead of indirectly through TGV cross-subsidy. Indeed, under the current scheme, SNCF is paid 200 million euros per year to run the Intercity network. The money comes from the central government, but 175 million euros of it are financed via new tax on – profitable – TGV trains.

On the whole, SNCF pleads that the Intercity lines, with their accumulated deficits, present a threat for its investment capacity, to the detriment of other services. And given the relatively small amount of travellers, SNCF would prefer to simply drop it, reduce it or transfer it to the regional governments – to the exclusion of profitable lines such as the Normandie network of course.

SNCF is thus engaged in an active lobbying campaign such that the central and regional governments can take in charge the cost of the Intercity network, which it sees as a national cohesion mission relevant for government and the administration but not in terms of commercial activity. It partially won that campaign in 2010 when the convention TET was signed, but the effect was neutral on its costs since the funding is still coming from TGV cross subsidies, this time going through the filter of central government.

Other factors explain the current state of the intercity network. While the priority has been given successively to TGV and TER over the last thirty years, classical intercities have never been given attention and do not benefit from any long term vision. To illustrate this, it is striking that the reduction of traffic on intercities, besides being partly due to air and road competition, was also partly induced by SNCF itself.

The national operator indeed has a policy of giving priority to “radials” i.e. lines originating from Paris, over other inter-regional lines. This is reflected for example in the booking website voyages-sncf.com where passengers have to fight their way through to find itineraries not going through Paris. On a trip such as Lyon-Metz for example, the website only suggests trips via Paris whereas direct inter-regional trains do exist, including TGVs running on classical lines. But it is more profitable for the operator to have passengers travel on the expensive TGV network and transfer in Paris - even if the total trip time is longer.

Transferring intercity lines to regional government and TER branding has worked on some links and can be extended to other services (Caen-Tours for example). But this logic cannot work on all the lines. Even with the extension of competition, there is a remainder of core lines who are necessary because they do not have TGV alternatives. These services include the Normandie lines (except if a hypothetical LGV was opened to Rouen), services along the Southern edge of France (Bordeaux-Marseille-Nice, except if hypothetical TGV lines were built), lines to Orléans and Clermont (except if a very hypothetical line to Clermont and Lyon was built) and transversal lines such as Quimper-Toulouse via Nantes and Bordeaux. Given the faint likelihood of new TGV lines being built in the upcoming years, a specific policy needs to be built for this group of core intercities.

4.3. The French Intercity Network – Opportunities for development

Despite all its woes, the French Intercity network has some key development opportunities, provided identified success factors are met. They lead to the possible opening of a first French Intercity line to competition, Nantes-Bordeaux.

4.3.1. Identified success factors for an Intercity line

This short analysis has shown there is a demand from the users and room for an intermediate service in France between TER and TGV. Both models have their limit: TER is less relevant on long distances and very complex to organize when crossing several regions; TGV works well on direct links to Paris but is unprofitable on longer inter-regional services, which SNCF tries to cut. This leaves a room in-between for a real intercity network, serving regional agglomerations and offering the infrastructure necessary to growth.

For an intercity line to be successful, there are however a range of criteria to be met such that the line can be attractive to the customers, gaining sufficient ridership, and operationally feasible for the transport company.

- *Suitable geography as a support for demand*

Intercity lines should be designed to link cities, i.e. large metropolitan areas. This role is mainly fulfilled by TGV except on the lines mentioned in the section above. This criteria however excluded rural services crossing the desert, which are more relevant for TER or buses.

- *Limited intermodal competition*

As illustrated on the Lyon-Bordeaux line, a large demand for transport is not sufficient. Train also needs to be competitive other airlines. On lines longer than four hours where there is an intensive air traffic offered there is no point in operating a service. Except to offer transport possibilities to intermediate cities, but then TER is more relevant once again.

- *Limited modal competition*

An intercity line running parallel to a TER does not make sense because it will always be less frequent and thus less attractive to passengers, if it has similar stopping patterns. This is significant on the Nantes-Quimper line for example where only 1 Intercity per day runs in the midst of dense TER traffic. Similar conditions apply for TGV competition. When most of traffic from Paris to Mulhouse was absorbed by TGV, the line lost its interest, once again except for intermediate stations which are then more relevant for TER. An exception could be Paris-Toulouse line for example, where the travel time of TGV and Intercity is not significantly different (5:30 against 6:30) and a low cost scheme can be operated.

- *Smooth transfers with other networks*

Because of the previous criteria and since intercities need to operate as a network, including with the other two networks (TGV and TER), smooth transfers between the trains need to be guaranteed for passengers. This means cross-platform transfers, short transfer time and solutions in case of delay.

- *Adapted comfort and on-board services*

Finally, even if all the above-mentioned criteria were met, there still would be a low ridership if the service was not adapted to the current demands in terms of comfort. As has been observed abroad (see appendix) in Italy and Great Britain for example, attractive on-board services are possible and increase passengers willingness to pay, and most importantly, willingness to travel by train. The reference in this area, besides European competitors and experimentations such as Thalys, should be the standards set by the airlines.

These can be summed up in the following requirements:

Requirement 4.3.1 The Intercity lines need to link large metropolitan areas with sufficient demand.

Requirement 4.3.2 The Intercity lines need to be developed where there is limited competition from other transport modes.

Requirement 4.3.3 The Intercity lines and the TER network need to complement each other rather than be in frontal competition

Requirement 4.3.4 As a higher hierarchy transport means, Intercity must facilitate transfers to lower levels such as TER and local transports.

Requirement 4.3.5 On-board service needs to be adapted to the demands of the passengers

5. Requirements for competition on a French Intercity line

Chapters 2 and 4 led to an accumulation of requirements seen as necessary pre-requisites for a new operator to enter the French Intercity railway market. These requirements can be grouped into 3 main headers. The first describes external political factors that need to be met and can be influenced by lobbying. The second concern is stakeholders' management and involvement, and finally the third limits the possibilities for lines to be chosen. The requirements will then be used in chapter 9 to check the suitability of the scenarios.

5.1. External Political factor – lobbying strategy

This first set of requirements consists of a range of external factors, that are not on the decision level of the TOC himself. They describe policies that need to be implemented such that the market can be attractive to a new operator, and without which the opportunity are not interesting anymore.

2.1.2: The political agenda needs to be clearly defined and backed by the government.

2.1.1: a strong railway regulator must be in place

3.6.1: the future railway organization should guarantee equal access to the infrastructure and fair competition.

3.1.1: Introduction of competition on passenger railways should be prepared upfront and negotiated with all actors, especially unions and workers.

3.2.1 Negotiations on work conditions should be led prior to introduction of competition

Although external, these requirements can be influenced, notably by active lobbying with the national and local instances and with the different stakeholders such as user groups, workers, unions, political parties, and the industry at large. This is however not the focus of this report.

5.2. Stakeholders' involvement and management

The second range of requirements underline the need for close stakeholders management.

2.2.1: a new rail project needs to leverage on the different decision centres and get the backing of this large variety of levels.

2.4.1: Backing from the local and regional governments should be sought so that they can finance improved quality and eventually lead to higher ridership

The influence of local government can be key, and prominent local figures need to be identified and approached to gather support for a project.

5.3. Choice of the line

Eventually the third set of requirements is more directly in line with technical and institutional requirements presiding over the choice of a first line to be opened amongst the large number of possible services.

2.4.2: the Intercity line considered must be chosen carefully according to geographical and local opportunities.

4.3.1 The Intercity lines need to link large metropolitan areas with sufficient demand.

4.3.2 The Intercity lines need to be developed where there is limited competition from other transport modes.

4.3.3 The Intercity lines and the TER network need to complement each other rather than be in frontal competition

4.3.4 As a higher hierarchy transport means, Intercity must facilitate transfers to lower levels such as TER and local transports.

4.3.5 On-board service needs to be adapted to the demands of the passengers

5.3.1. Nantes-Bordeaux, the most likely line to be opened first

Given the success factors developed above and the current array of Intercity lines, it is possible to determine which line is most likely to be opened.

The Normandy lines are excluded because they are too large and the volume would not be suitable for an experimentation.

Paris-Picardie lines are excluded because of the strong mix with TER services that makes it very difficult to run the TET as a self-standing service. The same criteria excludes Southern lines (Nice-Marseille-Toulouse-Bordeaux).

Eastern lines are excluded because traffic and potential is very limited with the development of TGV in this area and the opening of new TGV tracks.

Night trains present a limited interest, notably due to the competition against day TGVs and airplanes. For the same reason of competition, day lines to Toulouse and the South are also not preferred.

In the end, the line that fits best the demands for an experimentation of competition is Nantes-Bordeaux. Indeed, mix with other traffics is limited, competition against other trains or planes is nearly non-existent, it has a potential for development and the volume is sufficiently large to be interesting, but not so large that it would be in itself an entry barrier.



Figure 7: Quimper-Nantes-Bordeaux-Toulouse Intercity line. In red the section partially not electrified

Nantes-Bordeaux Intercity line covers the whole western façade of France from Bretagne to the Pyrenees, crossing most of the Atlantic area. It serves four major agglomerations: Quimper, Nantes, Bordeaux and Toulouse, for a total length of 884 km.

6. Methodology for analysis of a French Intercity line and design approach

The methodology will focus on three key aspects: institutional analysis, technical analysis, and design approach.

6.1. Institutions analysis of a French Intercity line

Institutions analysis is separate in two parts. The first one focuses on the local political figures and other figures of influence. The second part focuses on environment in a broader manner, including specifically geography and analysis of the users' demands.

Analysis of key public figures

The analysis of influential public people is a first key step into apprehending a French railway line. Because networking is so key to the French mentality, identifying strong proponents and opponents to a possible project is a first elementary step. These key agents can then be used to push forward certain parts of the project and facilitate its development.

The different administrative layers of the French government are analyzed in depth, with the following key points:

- _ Composition of the local assembly, with number of seats per party and total number of seats
- _ Head of the local government
- _ Vice-President in charge of transport (when available)

When possible, a short résumé is built: date of birth, school when relevant, functions of importance, political or otherwise, and political color. This enables an identification of the networks in which each personality is involved.

Usual French codes identify the schools:

ENA: Ecole Nationale d'Administration

X: Ecole Polytechnique

ENS: Ecole Normale Supérieure

ECP: Ecole Centrale Paris

IEP: Institut d'Etudes Politiques, Sciences Po Paris

And the political parties are designed as follows:

PS: Parti Socialiste

PRG: Parti Radical de Gauche (left)

PC: Parti Communiste

MPF: Mouvement pour la France (right)

UMP: Union pour un Mouvement Populaire (centre-right)

UDF: Union des Démocrates Français (centre-right)

NC: Nouveau Centre (centre)

Modem: Mouvement Démocrate (centre)

DVD: Divers Droite (right)

EELV: Europe Ecologie Les Verts (greens, left)

The levels analyzed are:

- _ Regions
- _ Departments
- _ Large cities

Diagnosis of the territory

The second part in the analysis of the institutions is the diagnosis of the territory. This consists three sub-parts:

Firstly a qualitative diagnostic of the state of the railways in the territory is to be led, focusing on usage, age of the line, and expectations for the future.

Secondly an analysis of the Geography is led, focusing on identifying the main attraction and production points and possible geographic obstacles on the line.

Lastly and key to any project, an analysis of the demands of the users is led. This is to be based on reports and demands of users associations on the one side, and analysis of the *Comités de Ligne* on the other. These organisations are regular meetings held between SNCF, RFF and the users, to discuss the line and its evolutions and strain to match the expectations of the users to the projects of the operator.

6.2. Technical analysis of a French Intercity line

Analyzing a French Intercity line is done in 5 distinct steps: the analysis studies first the infrastructure that the line will use, then how current services are organized, and which rolling stock is used. Then an analysis of intermodal competition is done, finally leading to a conclusion on strength and weaknesses of the line.

Analysis of the infrastructure

The line is described precisely in terms of the composition of the trunk(s) and branch(es), possible stops, distances and running time, as well as the specificities for each segment in terms of demand and users.

Analysis of the services

Current services operated by the incumbent operator are analyzed in terms of frequency, times, comfort, price and travel times.

Analysis of the rolling stock

The rolling stock is presented, the main characteristics are analysed, and the age, number of vehicles and assignment of the trains are researched. If available, an indication of reliability is given.

Analysis of intermodal competition

To develop an estimation of possible demand on the line, an analysis of intermodal competition is to be led in its different components. For air transport, main airports and main lines are to be identified. Then prices and frequencies are to be researched, as well as travel times. For cars, main routes that could compete with the train line are identified, travel times are researched, as well as fuel and possible toll costs. Finally, long distance coaches are considered, where available.

Critical analysis of strength and weaknesses

The analysis of the strengths and weaknesses of the line from a technical point of view is led through a SWOT analysis, leading to a conclusion on the possible axes of development for the line.

6.3. Design approach for services on a French Intercity line

Several decision variables can be distinguished. When a value is chosen for each variable this set of values designs a scenario.

Variable 1: Including the antennas ? – scope of the line

Case 1: Take into account the whole line from end to end

Case 2: Limit to central trunk only

Case 3: Focus on the central trunk, with limited antennas or one or both sides, to be determined.

Variable 2: Through services ? – turning points

Case 1: Turning points for the trains are chosen as the main nodes

Case 2: Turning points are pushed further from the main nodes so that key nodes benefit from an increased number of through services. Turning points thus become secondary nodes at the limit of the agglomeration centered on the key nodes.

Variable 3: Hierarchy of the stop pattern

Case 1: all intercities have the same stopping patterns

Case 2: Two levels of hierarchy are defined. Thus stops are served either by all trains or only by lower intercities. This would put the total number of levels to three, accounting for TER.

There are thus theoretically 12 possible scenarios. (3x2x2) that could be built and studied. The field of study is restricted by several factors:

Firstly the variables are not fully independent. For example, through services with turning points out of the main nodes are possible only if the antennas are included in the line. Value 2.2 is incompatible with value 1.2.

Secondly Variable 3 can be used to build alternate scenarios or improve scenarios, but it does not call for the development of specific distinct scenarios. Stopping patterns are a decision that can be discussed for each scenario independently of all the other choices made.

Table 2: Table of compatibilities between Variables 1 and 2

	Main cities	Secondary nodes
Full length		
Trunk only		
Limited antennas		

Finally for variable 1, the focus on the trunk only is not acceptable for the public authorities granting the funds. The line is considered as a whole so there should be a minimum of through services.

In the end, in the remaining actually possible scenarios, only those that make sense relating to the institutions analysis and the diagnosis of the territory will be considered and studied more in-depth. **Given the incompatibilities mentioned above, scenarios kept will be Full length-Main cities and Limited antennas-Secondary nodes.** Then for each of these, consideration will be given to whether it is appropriate to have several stop patterns or only one level.

These are the principles according to which the scenarios will be built further in detail: If travel times are symmetrical along the line, timetables are also designed on a symmetrical pattern, in both directions and on both antennas; Scenarios are built with the same capital cost involved (x trains running); to allow for a comparison; Timetables are built according to an hourly pattern with gaps. For example one service every two hours, departing at fixed time.

7. Institutional and technical analysis of the Nantes-Bordeaux line

Following the methodology drafted in Chapter 6, this part develops the analysis applied on the case study of Nantes-Bordeaux, first for the institutions and secondly for the technical aspects. They lead to criteria that will be used to evaluate the scenarios in Chapter 9.

7.1. Institutional analysis of the Intercity Nantes-Bordeaux and its environment

Following the conclusion that Nantes Bordeaux is the most likely line to be opened first to competition (see above), this line will be the main focus of the next chapters.

An institutional analysis will be done first, followed by a diagnostic of the territory.

7.1.1. Institutional environment of Nantes-Bordeaux

Details in appendix 1: Institutional environment, from page 76.

Institutional framework

5 *régions* are concerned by the line: Bretagne, Pays de la Loire, Poitou-Charentes, Aquitaine and Midi-Pyrénées.

The line also crosses 9 *départements*: Finistère, Morbihan, Loire Atlantique, Vendée, Charente-Maritime, Gironde, Lot-et-Garonne, Tarn-et-Garonne, and Gironde.

Political figures

Political personalities of national importance have their base along the line: Ségolène Royal (former candidate to the Presidency) in La Rochelle, Jean-Marc Ayrault (Prime Minister) in Nantes, Jacques Auxiette (Socialist personality, head of the French *régions* association) and Alain Juppé (very long career as a Minister and Prime Minister) in Bordeaux, Philippe de Villiers (national political personality, former candidate to the Presidency) in Vendée, and Dominique Bussereau (former minister, close ally to Nicolas Sarkozy) in Charente-Maritime. Besides this large array of national personalities, there is also an array of more local political figures with a strong importance: Jean-Yves Le Drian in Bretagne (now Defense Minister), Jean-Michel Baylet in Midi-Pyrénées, Brigitte Barèges in Montauban and Philippe Cohen in Toulouse.

Political impact on the IC line QNBT:

Local politicians in the rural areas (e.g. Saintes, Jonzac) make strong statements to defend the line and especially the link to the metropolis (Nantes and Bordeaux). Three segments of the line are identified as especially sensitive: Nantes-La Rochelle, Saintes-Bordeaux and Bordeaux-Toulouse. But there seems to be no defense of the line as such, from point to point. The local administrative divisions make it hard for the politicians to deal with the line as a whole because it is so split over several authorities.

Instead, the politicians focus on more rewarding projects, seen as more profitable by the voters: tilting trains and high-speed trains. They are very deep in the debate and organization of the new high-speed lines planned in the region (Le Mans-Rennes-Bretagne, Le Mans-

Nantes, Tours-Bordeaux, Bordeaux-Toulouse, Bordeaux-Hendaye-Irun). These projects take all the energy and the media attention, leaving the traditional IC line in the shadows.

Criteria 7.1.1: The project will preferably be attractive so that it can raise the interest of local politicians.

Diagnosis of the territory

This section will focus on the diagnosis of the territory itself, consisting in an analysis of the rail infrastructure, and an analysis of the local geographical factors, finally followed by an analysis of users' demands.

Current state of the rail infrastructure

The line is old and not so well maintained, especially between La Rochelle and Bordeaux, where it is not electrified. Some bridges are desperately in need for heavy works and this drastically limits speed on certain segments, down to 40 kph. Signals are also a concern on some segments.

The segment between Nantes and La Roche-sur-Yon was electrified in 2008 to improve the link between the two cities. A complete track and ballast renewal was also done in 2011 on this section.

However, the next segment, between La Roche Sur Yon and La Rochelle, needs heavy investment, estimated by RFF at 220 million euros, to restore the line and change the bridges. Some of the works have been planned, so as to improve TER (local trains) services, but there are large financing issues.

On the other hand, the local governments managed to gather 890 million euros for a highway completion between Rochefort and Fontenay le Comte. This project will ensure a complete highway trip from Nantes to Bordeaux and is meant to alleviate traffic on the heavily congested and accident-prone national roads. It is thus a priority in financing, reflecting the current focus still being on roads rather than railways as a solution to solve congestion issues.

Geographical analysis

The line is organized around two major poles, Nantes and Bordeaux. Each metropolis has its own surrounding influence area, which produce daily migration traffic between the centers and the living areas.

Besides these two main poles, there is are a few secondary cities (La Rochelle, La Roche-sur-Yon) and some more rural stops (Saintes, Jonzac).

Users' demands analysis

Details in appendix 2 from page 93. Main users' demands are to keep the double track line between La Roche-sur-Yon and La Rochelle and change the bridge on the river Lay in the North of Luçon; they also want to replace the old rolling stock, which now consists of old carriages and as-good-as-dead diesel engines (more than 40 years of use) and increase frequencies to at least 6 return trips per day between Bordeaux and Nantes, some of which should go all the way to Quimper and Rennes on the one side, Toulouse and Hendaye on the other side, and take into account daily migrants' needs around the two metropolis. Finally they ask to coordinate the different IC and TER services

Criteria 7.1.2: The services should be more frequent between the two main agglomerations (Nantes and Bordeaux), ideally up to 6 daily returns.

Criteria 7.1.3: Services should be offered to daily migrants going in and out of the main agglomerations (Note: it can be debated that this should be the function of TER, not TET)

Criteria 7.1.4: TET services should have optimized coordination with TER and other transport modes to offer smooth connections

7.1.2. Conclusion on the institutions analysis

The European overview underlines that although there are different paths to competition for railways, all lead to a strong increase in efficiency and gains can be shared by the taxpayers and the users. It also underlined that to be achieved, this aim needs a very clear agenda and strong political support, and a strong regulation system to be implemented.

The in-depth analysis of the French railways institutions underlined how two main key actors dominate the sector, though the successful introduction of competition in freight meant that a range of regulating bodies prepared the ground for larger competitive possibilities. This analysis also underlined the key opportunities in competition, laying in the Intercity network that is set aside by the national operator, and the key threats to the opening of the industry, coming mainly from the operator itself and its employees.

Finally, the analysis of the institutions of Nantes-Bordeaux Intercity line underlined the opportunity for several actors to introduce competition on the line and how the users and some locally strong politicians could back up the project.

The next logical step is to dig into the technical analysis of the line to determine if there is also an opportunity from the technical point of view.

7.2. Technical analysis of the Nantes-Bordeaux line

Following the institutional analysis, the project will now be considered from a different point of view, and the technical aspects will be researched.

A first cornerstone of this research will be the analysis of the infrastructure, as this will be the base of both demand and supply possibilities. Secondly, an analysis of competition, modal and intermodal, will be lead, so as to build a representation of demand. Finally, on the supply side, the issue of rolling stock will be analysed and possibilities for services will be discussed.

7.2.1. Current infrastructure and service

This part is supported by Appendix 7: Presentation of the line (distance and running times) and Appendix 8: Detailed fares, from page 100.

It will focus on the description of the line and its main segments, segment by segment.

Description of the line

Three major agglomerations are served by the IC line (Nantes, Bordeaux and Toulouse), completed by Quimper to the western end. The line can thus be analyzed through the prism of its three segments, delimited by the main poles.

The table below displays fares in 1st class and 2nd class for the IC, as well as distance and travel time. The latter include a 20 minute stop in Bordeaux or Nantes for through trains, to change the engine.

Table 3: Travel time, distance, and prices in 2nd and 1st class

2 nd	1 st	Quimper		Nantes		Bordeaux		Toulouse	
Quimper				254km	2:30	627km	7:00	884km	9:50
Nantes		€34.98	€52.50			373km	4:10	629km	7:00
Bordeaux		€69.27	€103.87	€47.35	€71.05			256km	2:30
Toulouse		€89.89	€134.83	€69.44	€104.12	€35.20	€52.83		

This underlines that the line is not very relevant for the end-to-end traveller such as Quimper-Toulouse, with nearly 10 hours of train, but also not even for partial services such as Quimper-Bordeaux or Nantes-Toulouse, each amounting to 7 hours train. On such long distances, planes are much preferred by travellers and it is very difficult for trains to be competitive.

Quimper-Nantes

From **Quimper to Redon**, the line stops at the main poles of South Bretagne (Vannes, Auray, Lorient), each of which is at least as important as Quimper itself. The IC is in competition on

this segment with TER Bretagne for local services and TGV Atlantique for longer ODs. Thus the exact role of the IC is not very well defined on this segment.

From **Redon to Nantes**, the line has mainly a function of agglomeration train for Nantes, competing with TER Pays-de-la-Loire.

The line is a double track and electrified all along the way from Quimper to Nantes.

Currently, the service consists mainly of TER trains, offering transfers with the main IC segment Nantes-Bordeaux. There are also through service from Quimper all the way to Bordeaux, but these must stop for 20 minutes in Nantes to change the engine, which reflects very badly on global travel time.

Thus the line is useful to link South Bretagne to Nantes, even though the mix with TER needs to be clarified. But the lack of visibility of the different services (TGV, TER, IC) between Redon and Quimper is very detrimental to the IC. And for passengers, going from South Bretagne to the South of Nantes is a very uneasy trip, with either a terrible transfer or a very long travel time.

There are improvement work planned between Rennes and Quimper, following the building of the HSL Le Mans-Rennes. The speed could be upgraded to 200kph and travel times in South Bretagne would be reduced if rolling stock allows for such speeds. (But there is no HSL project beyond Rennes). At the same time, these improvement works could also lead to an increase in competing TGV services between Rennes and Quimper.

Related to the new HSL in the West, hourly timetables are set to be implemented in the whole area in the period 2016-2018. This could be used as a tool to clarify the roles of each type of service.

Nantes – Bordeaux

From **Nantes to La Roche-sur-Yon** the line is a double track and electrified. The traffic supported consists mainly of daily migrations, complementary to TER PDL. Demand is high and growing on this recently modernized segment.

From **La Roche-sur-Yon to Bordeaux** the double track line is **not electrified**, requiring diesel engines. Maintenance is lagging, requiring heavy improvement works, replacement of bridges, and possibly a reduction to a one track line on some segments.

Regional poles are served along the way: La Rochelle, linked to Paris and Poitiers by direct TGV services, but also Saintes, a regional hub for TER diesel traffic, and Jonzac, a rural pole with migrants working in Bordeaux.

The Intercity service is more relevant and better organized than between Quimper and Nantes, but it faces a multiplicity of local TER services, making the global service not very readable. The main issue remains however a very long travel time, of 4h10min versus 3h30min by car from Nantes to Bordeaux.

No High Speed Line project is planned on this segment to this day. Some improvement projects are mentioned, such as a full electrification, improvement or renewal of the bridges, and improvement of tracks and signals. A reflection on tilting trains needs to be led.

Bordeaux – Toulouse

A travel time of 2h30min between Bordeaux and Toulouse makes it possible to do a return trip within one day by train. This long distance traffic is completed by migrant workers between Langon and Bordeaux and between Montauban and Toulouse.

The line is fully electrified and double track; the state of the infrastructure is rather good but traffic is intense and disturbed by important maintenance works.

Services from Nantes to Bordeaux go all the way to Toulouse once a day, with a 20 minute stop in Bordeaux to change engines. The other IC services are mixed with a variety of train services: IC Bordeaux-Nice (6/day); TGV Paris Toulouse (5/day), TER Aquitaine and Midi-Pyrénées, and even one TGV IS Bordeaux-Dijon. The role of the IC is thus in need for clarification on this segment.

A HSL project between Bordeaux and Toulouse is projected for 2020-2025. Even if the outcome is still uncertain, the role of the IC will be questioned: TGV traffic from Paris will increase, also carrying passengers between Bordeaux and Toulouse; a project for ICGV (High Speed Intercity) could be implemented, on the model of Marseille-Nice; and TGV IS could serve Toulouse-Bordeaux-Nantes, provided the line were fully electrified. All these projects would question the place of the IC, its exact market and its relevance between Bordeaux and Toulouse.

Conclusion – a segmented line

The graph below introduces all current services offered by SNCF between Quimper and Bordeaux, excluding partial and local TER services, and also excluding Redon-Quimper TGVs because they are only partial services on the line.

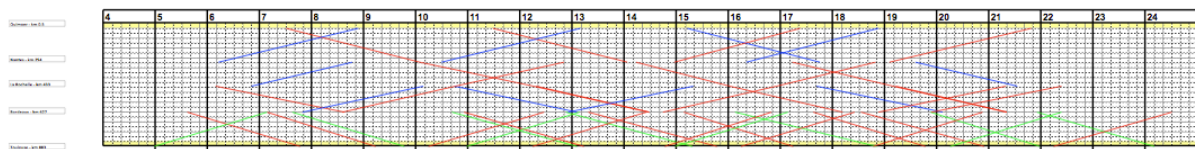


Figure 8: Graph timetable of current services between Quimper (up North) and Toulouse (down South). IC in red, TER in blue and TGV in green

All in all, there seems to be a lack of coherence for the line as a whole, running all the way from Quimper to Toulouse. Each of the three segments has its own specificities, market and challenges, and even sub-segments. Through traffic, that could justify the line, is to be found if it needs to demonstrate that satisfactory transfers cannot appropriately suit travel demands. In any case, a preliminary work with the authorities to clarify the market target of the IC and coordinate the different rail services on each of the three segments.

7.2.2. Rolling stock

Rolling stock on the TET line consists of tracted trains BB 67400 with Corail carriages for the passengers. Some of these Corail carriages have been renovated to the new Intercités or even



Teoz standards, while others are still under their initial colours. According to the listing annexed to the contract between SNCF and the State to run the TET network, locomotives date as far back as 1970, and up to 1974. This means all engines are now reaching 40 years of service, which is considered as a sound limit for such equipment. Investigations on the line showed that 12 BB67400

assigned to TET trains are based in Bordeaux, and thus affected to Nantes-Bordeaux services as well as Bordeaux-Toulouse and Bordeaux-Lyon. Traditionally, SNCF equipment is not assigned to any specific line but mixed in a larger pool.

7.2.3. Modal competition

This part will be supported by Appendix 3: Analysis of modal competition, Appendix 4: Analysis of airport services, Appendix 5: Flight schedules, and Appendix 6: Flight fares, from page 95.

Air competition

Three large international airports lie in the catchment area of the IC line: Nantes, Bordeaux and Toulouse. Additionally, La Rochelle has developed as a very important Low Cost Carrier base and destination, mainly with the British Islands and Northern Europe.

There are flight services in direct competition with the train on the segments Nantes-Bordeaux and Nantes-Toulouse. Nantes-Toulouse has quite a large offer with 4 return trips per day including one operated by a Low Cost Carrier (EasyJet), whereas the service is limited to two return flights per day between Nantes and Bordeaux, operated only by Air France and allowing a return trip in one day only from Nantes to Bordeaux.

Air fares range from 650-800 euros (return) for a short booking on Air France, going down to 280 euros for advanced booking. EasyJet offers fares up to 360 euros for short bookings and 71 euros for advanced bookings.

These services and prices illustrate there is a demand for travel point to point between the major agglomerations, with passengers ready to pay for quite a large amount as long as travel time is reasonable.

Car competition

It takes 3h30min to go from Nantes to Bordeaux, for a perceived cost of 60 euros, including 24 euros for tolls.

The road consists of a modern 4 lanes highway all along the trip, making road especially competitive for small groups and travellers looking for flexibility and comfort.

The development of car sharing in France, expected to boom amongst travellers, is also a competitive advantage to road, especially for small groups.

Long distance coaches

There is no long distance coach service for now on transversal lines. The only long distance coaches in the area run either towards Paris and the North or towards Marseille and Italy. Thus they could be competitors only on the Bordeaux-Toulouse segment.

In a context of developing competition and opening up of coach routes, there is likely to be a development of long distance coach service, on a model similar to Spain. Companies could be Speed, Eurolines, or Stage Coach for example.

7.2.4. Assumed demand and ridership

There are two approaches to assess current ridership. The first one is to look into ticketing figures and extrapolate from it, especially for monthly or yearly pass holders. The second is to conduct a battery of counting on-board trains and in stations.

Because passenger ridership data is still the full property of SNCF, and the State is still not pushing hard enough for disclosure, such figures cannot be found for any French line. It is also unfortunately forbidden to count passengers on trains or in stations, except for SNCF itself naturally.

However it is not forbidden to take the train at different times of the day and on the different segment and assess how busy they are. The trains were seen to be quite busy between Bordeaux and Nantes especially, in the morning as well as in the middle of the day. Further indications for this attractiveness was given by the analysis of competition and the fact that Air France and easyJet run regular lines there. Since the low-cost airline does not usually run unprofitable lines, it shows there is demand for such trips, which could be brought back to the train with adequate pricing and suitable services and timetables.

Since the demand analysis and prediction is not the main subject of this analysis, it will be assumed for now on that demand is sufficient and this will need to be checked by further research once the government makes the data available.

7.2.5. Conclusion and technical recommendations

The line benefits for strong local political support, with several local figures that also have broad national influence, to begin with one ex-PM, the current PM and a former runner for Presidency. This political support can rely on a strong demand for transport in a dynamic and developing area, with limited air transport possibilities between Bretagne and Atlantic. The strongest competitor to be faced is road transport, with very developed car usage and excellent infrastructure at low costs (there are no tolls in Bretagne). The development of low cost air carriers could also be a threat, especially between Nantes and Toulouse, but then on such a distance it can be questioned whether train is really relevant. To strengthen the possibilities of the line, possible development axes are introduced in the next section.

Development possibilities

A first priority should be to clarify the services and make them readable and more user-friendly, for example by implementing hourly timetables. A second development direction could be in the improvement of comfort and on-board services to match the expectations of the customers more closely. This could be completed by an attractive fare system that would give trains a better chance at competing with road, notably for small groups.

Criteria 7.2.1: Hourly timetables should be implemented so that the service is easier to understand for the users

7.3. Conclusion of the analysis – sum of the criteria

All along chapter 7, criteria were collected. They are summed up below and will be used in chapter 9 to evaluate the scenarios.

7.1.1: The project will preferably be attractive so that it can raise the interest of local politicians.

7.1.2: The services should be more frequent between the two main agglomerations (Nantes and Bordeaux), ideally up to 6 daily returns.

7.1.3: Services should be offered to daily migrants going in and out of the main agglomerations (Note: it can be debated that this should be the function of TER, not TET)

7.1.4: TET services should have optimized coordination with TER and other transport modes to offer smooth connections

7.2.1: Hourly timetables should be implemented so that the service is easier to understand for the users

8. Systematic building of institutional and technical scenarios

The objective here is to build institutional scenarios and technical scenarios according to the methodology that was elaborated in Chapter 6. Based on this method, and applied to the specific case study of Nantes Bordeaux line for the technical side, different scenarios can be elaborated and described in detail.

8.1. Institutional scenarios – introduction of competition in France

To consider possible future organizations of the French railway, key issues are discussed first, followed by a discussion on the possibilities and positions of each of the key actors, and finally an insight in key social issues and work organization in French railways.

Besides the financial issues, the system as it is raises the question of the independence of SNCF as a key actor not really willing to let new competitors in: As SNCF agents are responsible both for timetabling and traffic management, they may be suspected of favoring their employers' trains over possible new competitors. If SNCF makes money on stations and network management, it could be used to cross finance its operations and lead to biased competition. Transaction costs are very detrimental, with very difficult negotiations on every single point between RFF and SNCF. RFF wants to assert itself as a legitimate actor and on the other side SNCF is still questioning the very existence of RFF and considering itself as the only decision center for railways. Finally, as SNCF is still owner and manager of all stations, questions are raised on its capacity to allow new competitors to get in stations on a fair basis⁵¹.

Since the *Assises du Ferroviaire*, a national consultation organized by the government in the autumn 2011, the debate has been fierce over a possible new organization of the industry⁵².

Two models are suggested, by RFF and SNCF. A third one, that SNCF would even prefer but does not advocate for, is a come back to full vertical integration.

8.1.1. Scenario I1: Full separation of RFF and SNCF

RFF is willing to push the 1997 to its limits and totally integrate all infrastructure activities⁵³. That would mean SNCF Infra, DCF and G&C would be taken out of SNCF and integrated into the network manager.

⁵¹ (Gallot & Grass, 2012)

⁵² (Morali, 2011)

⁵³ (Rhoné, 2012)

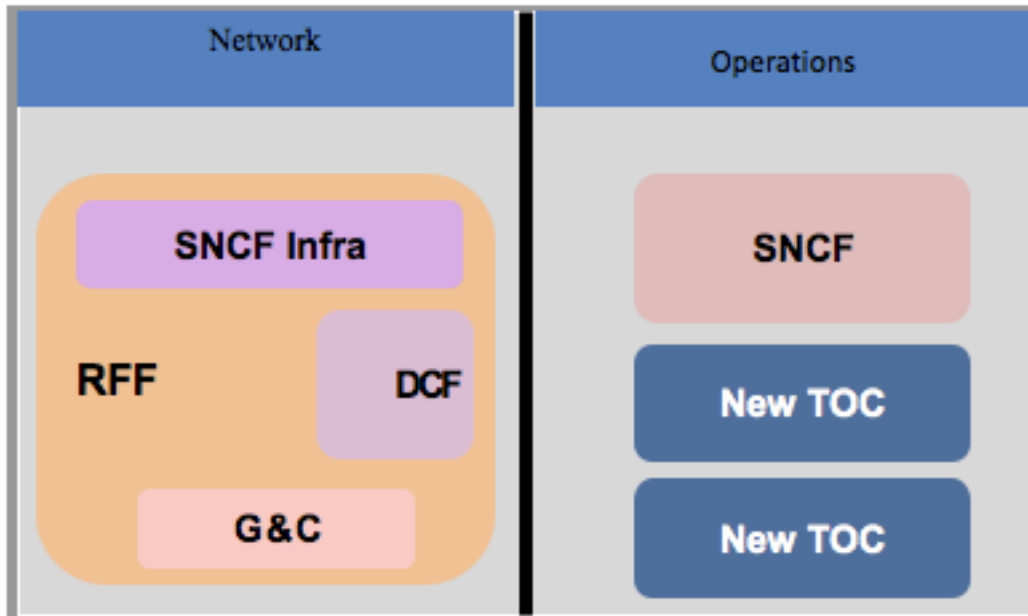


Figure 9: Ideal organization of the industry for RFF

8.1.2. Scenario I2: Holding grouping all railways activities

The solution advertised by SNCF is based on the German model: RFF would be reduced to a validating body, a filter to make demands anonymous, and SNCF would take all network activities under the umbrella of a holding⁵⁴.



Figure 10: Ideal organization for SNCF

8.1.3. Scenario I3: Full integration under SNCF umbrella

A third scenario would be to come back to the situation pre-dating 1997, with all infrastructure and operational activities centred under the roof of SNCF. This is the most extreme version but it needs to be looked into because it is a typical scenario.

⁵⁴ (Morali, 2011)

8.2. Technical scenarios – Timetables and Rosters

Following the methodology for design, where variables were defined, the detailed design will build scenarios in detail.

This will consist in two main points, the detailed timetables and the rosters for the rolling stock, based on the availability of 4 trains, so that scenarios can be compared with each other.

Given the table of compatibilities between variables exposed in 6.3, presented again below, there are three possible scenarios. However, because the institutions analysis underlined the strong influence of political stakeholders on the line and the necessity to make some effort to keep the line as a whole, the extreme possibility of running only the central trunk is excluded. There needs to be some trains running on the antennas. The two proposed scenarios will thus be “Limited antennas / turning at secondary nodes” (T1) and “Full length / turning at main cities” (T2).

Table 4: Table of compatibilities between Variables 1 and 2

	Main cities	Secondary nodes
Full length		
Trunk only		
Limited antennas		

Timetables are built according to the following travel times

Segment	Travel time
Quimper / Redon	01:45
Redon / Nantes	00:45
Nantes / La R/Yon	00:45
La R/Yon / La Rochelle	01:15
La Rochelle / Saintes	00:50
Saintes / Jonzac	00:30
Jonzac / Bordeaux	00:50
Bordeaux / Marmande	00:45
Marmande / Agen	00:30
Agen / Toulouse	01:15

Travel times between the main cities is hence as follows:

Journey	Travel time
Quimper / Nantes	2:30
Nantes / La Rochelle	2:00
Nantes / Bordeaux	4:10
La Rochelle / Bordeaux	2:10
Bordeaux / Toulouse	2:30

Stopping policy is split between IC Express, Slow and TER, according to the following table:

Segment	Stop	IC Express	IC Slow	TER
Quimper-Nantes				
	Rosporden			1
	Quimperlé			1
	Lorient	1	1	1
	Hennebont			1
	Auray	1	1	1
	Vannes	1	1	1
	Questembert			1
	Redon	1	1	1
	St-Gildas-des-Bs			1
	Pontchâteau			1
	Savenay (St Nxr)		1	1
Nantes-Bordeaux				
	La R/Yon	1	1	1
	Luçon		1	1
	Velluire		1	1
	La Rochelle	1	1	1
	Saintes	1	1	1
	Jonzac		1	1
	St-Mariens-SY			1
Bordeaux-Toulouse				
	Langon		1	1
	Marmande		1	1
	Agen	1	1	1
	Montauban		1	1

8.2.1. Scenario T1 – Through trains – Serving the metropolis

This first scenario is based on the combination of “considering main trunk and extensions to antennas” and “turning points at secondary cities”.

Demand from end to end (Quimper to Toulouse or even Quimper to Bordeaux) is relatively small. The constraint of a full length service could thus be taken out if it is proven useful. This would also allow for a more effective use of engines, since only electrical power is required between Quimper and La Roche sur Yon for example.

The objective is thus to build a service offering the possibility to go through the main agglomerations without transfer, for example from Redon to La Roche sur Yon. In this context, the commuter function of the line is fully accepted and taken as a structural element.

The service is articulated around a main central trunk between Nantes and Bordeaux, lengthened to Redon on one side and Marmande on the other, and two antennas, Quimper-Nantes lengthened to La Roche sur Yon, and Toulouse-Bordeaux lengthened to Jonzac.

Services are thus overlapping on both agglomerations, offering an increased frequency in the dense areas.

Main segment Redon-Marmande

Timetables are built according to meet objectives from the passengers’ point of view. It is necessary to allow for a return during the day, offer a departure at a reasonable hour in the morning at the main cities (around 8), and offer a return either in the afternoon or late in the evening.

Antennas Quimper-La Roche sur Yon and Toulouse-Jonzac

Here the objectives are to make the trains run as much as possible to offer as many seat kilometres as allowed by the number of trains available while offering transfers with the central segment and striving to complement the services at the agglomerations in terms of frequency.

Timetable

Combining the central trunk and the antennas, the following timetable is designed :

Table 5: Direction Quimper-Toulouse

Quimper		08:15			16:15		
Redon	07:00	10:00		13:00	18:00		19:00
Nantes	07:45	10:45		13:45	18:45		19:45
La R/Yon	08:30	11:30		14:30	19:30		20:30
La Rochelle	09:45			15:45			21:45
Saintes	10:35			16:35			22:35
Jonzac	11:05		12:05	17:05		20:05	23:05
Bordeaux	11:55		12:55	17:55		20:55	23:55
Marmande	12:40		13:40	18:40		21:40	00:40
Agen			14:10			22:10	
Toulouse			15:25			23:25	

Table 6: Direction Toulouse-Quimper

Toulouse		08:15			16:15		
Agen		09:30			17:30		
Marmande	07:00	10:00		13:00	18:00		19:00
Bordeaux	07:45	10:45		13:45	18:45		19:45
Jonzac	08:35	11:35		14:35	19:35		20:35
Saintes	09:05			15:05			21:05
La Rochelle	09:55			15:55			21:55
La R/Yon	11:10		12:10	17:10		20:10	23:10
Nantes	11:55		12:55	17:55		20:55	23:55
Redon	12:40		13:40	18:40		21:40	00:40
Quimper			15:25			23:25	

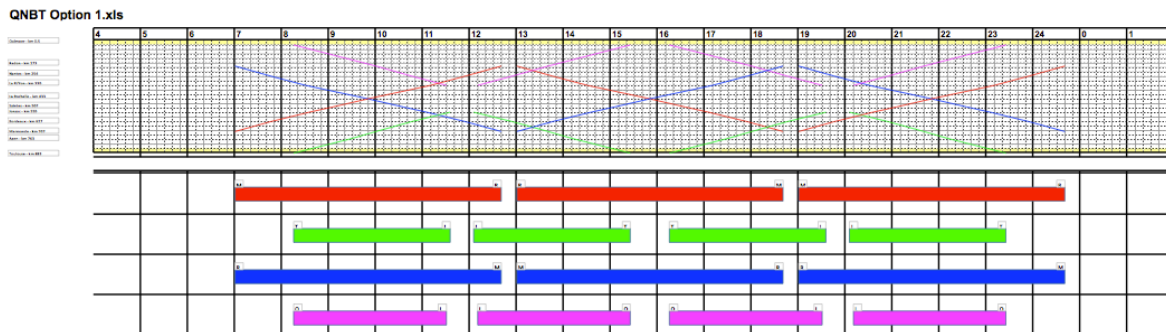


Figure 11: Graphic timetable, Scenario T1

The timetables clearly display the early morning train and the two possible returns, one in the afternoon and one in the evening, on the central trunk, while each antenna is serviced by complementary trains.

8.2.2. Scenario T1bis – Reversed through services

Scenario T1 lacks a departure in the morning during peak from the South to Nantes (first train at 10:00). Besides, two trains go through the nodes (Nantes and Bordeaux) with one hour time difference during lunch, which may seem a bit useless.

Thus the aim of this section is to design a train service such that Nantes can be reached in the morning from the South, while improving the frequency of trains along the day.

The main building principles of scenario T1 are kept, with a central segment Nantes-Bordeaux lengthened to Redon and Marmande, and two antennas, lengthened to La Roche sur Yon and Jonzac, and starting in Quimper and Toulouse.

Both service types overlap on the common segments Redon-La Roche sur Yon and Jonzac-Marmande, where commuter demand is most important.

Central segment Redon-Marmande

(same as Scenario T1) Timetables are built according to meet objectives from the passengers' point of view. It is necessary to allow for a return during the day, offer a departure at a

reasonable hour in the morning at the main cities (around 8), and offer a return either in the afternoon or late in the evening.

Antennas Quimper-La Roche sur Yon and Toulouse-Jonzac (reversed)

Here the objectives are to make the trains run as much as possible to offer as many seat kilometres as allowed by the number of trains available while offering transfers with the central segment and striving to complement the services at the agglomerations in terms of frequency.

Timetable

Combining the central trunk and the antennas, the following timetable is designed :

Table 7: Direction Quimper-Toulouse

Quimper					11:15		19:15
Redon		07:00		13:00	13:00	19:00	21:00
Nantes		07:45		13:45	13:45	19:45	21:45
La R/Yon		08:30		14:30	14:30	20:30	22:30
La Rochelle		09:45		15:45		21:45	
Saintes		10:35		16:35		22:35	
Jonzac	07:05	11:05	15:05	17:05		23:05	
Bordeaux	07:55	11:55	15:55	17:55		23:55	
Marmande	08:40	12:40	16:40	18:40		00:40	
Agen	09:10		17:10				
Toulouse	10:25		18:25				

Table 8: Direction Toulouse-Quimper

Toulouse				11:15			19:15
Agen				12:30			20:30
Marmande		07:00	13:00	13:00		19:00	21:00
Bordeaux		07:45	13:45	13:45		19:45	21:45
Jonzac		08:35	14:35	14:35		20:35	22:35
Saintes		09:05	15:05			21:05	
La Rochelle		09:55	15:55			21:55	
La R/Yon	07:10	11:10	17:10		15:10	23:10	
Nantes	07:55	11:55	17:55		15:55	23:55	
Redon	08:40	12:40	18:40		16:40	00:40	
Quimper	10:25				18:25		

QNBT Option 1bis.xls

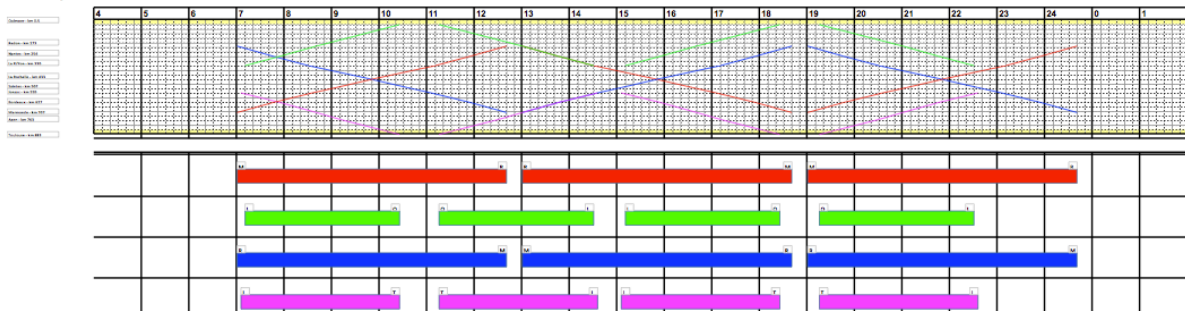


Figure 12: Graphic timetable, Scenario T1bis

Thanks to the combination of the train coming from the antenna at 11:15 with the trunk train, a smooth transfer with the afternoon trunk train can be offered while the disadvantage of having two trains following each other closely at off peak disappears. There is nearly no train from the Antennas to the cities in the morning but this can be assured by TGV and TER services.

8.2.3. Scenario T2 – Maximize central segment services

On both antennas, Quimper-Nantes and Bordeaux-Toulouse, TER services are already quite satisfactory for local journeys, and on top of that there are TGV and IC services ensuring fast journeys between big cities. It thus may seem somewhat useless to increase cost by offering services whose added-value can be questioned.

The aim of this scenario is thus to maximize the number of services on the central segment, with constant means, by decreasing services on the antennas.

The services are thus split on the three segments defined by the agglomerations: the main segment Nantes-Bordeaux and the two antennas Quimper-Nantes and Toulouse-Bordeaux

Central segment Nantes-Bordeaux

This time the timetable is built so as to strive to offer services every two hours, with a first departure very early, and last arrival relatively early (22:00 at the latest).

This segment is thus served by 5 daily returns.

Antennas Quimper-Nantes and Bordeaux-Toulouse

For the antennas, services are designed as a lengthening of the central segment, in the morning and in the evening. They are thus served by 1 daily return

Timetable

Following the reasoning exposed above, the timetables are built as below.

Table 9: Direction Quimper-Toulouse

Quimper		07:00			
Redon		08:45			
Nantes	07:30	09:30	12:30	14:30	17:30
La Roche sur Yon	08:15	10:15	13:15	15:15	18:15
La Rochelle	09:30	11:30	14:30	16:30	19:30
Saintes	10:20	12:20	15:20	17:20	20:20
Jonzac	10:50	12:50	15:50	17:50	20:50
Bordeaux	11:40	13:40	16:40	18:40	21:40
Marmande				19:25	
Agen				19:55	
Toulouse				21:10	

Table 10: Direction Toulouse-Quimper

Toulouse		07:00			
Agen		08:15			
Marmande		08:45			
Bordeaux	07:30	09:30	12:30	14:30	17:30
Jonzac	08:20	10:20	13:20	15:20	18:20
Saintes	08:50	10:50	13:50	15:50	18:50
La Rochelle	09:40	11:40	14:40	16:40	19:40
La Roche sur Yon	10:55	12:55	15:55	17:55	20:55
Nantes	11:40	13:40	16:40	18:40	21:40
Redon				19:25	
Quimper				21:10	

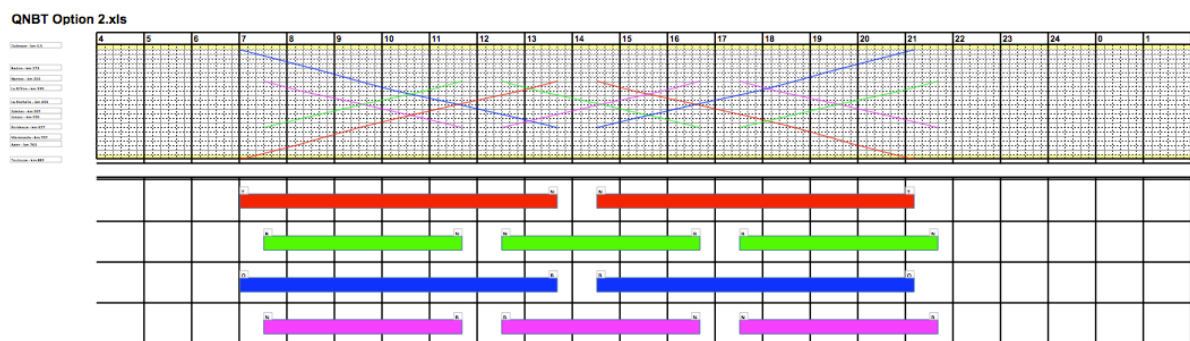


Figure 13: Graphic timetable, scenario T2

The central trunk is clearly better services, with 5 returns per day conveniently spaced, while the antennas are serviced marginally.

9. Evaluation of the scenarios

In this chapter, to evaluate the scenarios, institutional scenarios are first checked against the requirement and then technical scenarios are rated on the criteria. Prior to this systematic approach, scenarios will be discussed qualitatively.

9.1. Qualitative evaluation of the institutional scenarios

In this section, each of the three institutional scenarios is discussed at length as well as its possible impacts and acceptability from the stakeholders.

9.1.1. Scenario I1: Full separation of RFF and SNCF

The European Commission, who is pushing forward European laws towards more separation between infrastructure management and railway operations, favours such an approach. The idea is that this will facilitate entry of new operators and give less of an advantage to the main operator. It also offers a clearer structure and more transparency for the State and the transport authorities. Separate objectives can be defined for operations and network management, and performance can be clearly measured. It also means from the point of view of the State that SNCF might be less strong on the European markets, and it may underline diverging interests between the network management and train operator, with a big risk of splitting expertise.

9.1.2. Scenario I2: Holding grouping all railways activities

This solution is pushed forward on the base that it would lead to a general optimization of the system, with much lower transaction costs and a more efficient circulation of information. It is also more acceptable for SNCF workers and can help SNCF become a European leader in the railways industry. However, this scenario also has to deal with possible incompatibility with European law, possible lack of transparency eventually leading to monopoly behaviour and higher entry barriers for new operators.

9.1.3. Scenario I3: Full integration under SNCF umbrella

Such a scheme can be defended on the grounds that it allow for much better horizontal integration between the different rail actors, and tremendous costs can be saved on communication and transaction costs. For example, it is thanks to the leadership of SNCF and its stronghold of network management and train manufacturing that a project such as TGV could be researched and made successful. It is nowadays widely accepted that Alstom is an independent structure, but it was not always so and full integration does have undeniable advantages.

Of course, such a scenario would be incompatible with European law, but it would also gather very large support from the railway workers and the government.

9.2. Meeting the requirements

Following Chapter 5 page 35 there were 3 main groups of requirements, which the scenarios need to meet. They concern external institutional requirements, stakeholders' involvement and choice of the line.

9.2.1. External institutional requirements

2.1.2: The political agenda needs to be clearly defined and backed by the government.

2.1.1: a strong railway regulator must be in place

3.6.1: the future railway organization should guarantee equal access to the infrastructure and fair competition.

3.1.1: Introduction of competition on passenger railways should be prepared upfront and negotiated with all actors, especially unions and workers.

3.2.1 Negotiations on work conditions should be led prior to introduction of competition

For each of these requirements, the different institutional scenarios are assessed qualitatively, with a colour code. Green for high or good, red for low or bad, and orange for intermediate.

Table 11: External institutions requirements (white for high score, dark grey for low score)

Requirement		I1 Full separation	I2 Holding	I3 Full integration
2.1.2	Political support			
2.1.1	Strong regulation			
3.6.1	Fair competition			
3.1.1	Acceptance by workers			
3.2.1	Upfront negotiations			

The latest developments in the government's agenda indicate that the preferred solution will probably be that of a holding. But the details as to how competition fairness will be guaranteed and how regulation will be implemented are still left open.

9.2.2. Stakeholders' involvement and management

2.2.1: a new rail project needs to leverage on the different decision centres and get the backing of this large variety of levels.

2.4.1: Backing from the local and regional governments should be sought so that they can finance improved quality and eventually lead to higher ridership

These requirements are on the level of the strategy of the possible new operator. They can be used as directions to build the lobbying approach and secure the support of key actors.

9.2.3. Choice of the line

2.4.2: the Intercity line considered must be chosen carefully according to geographical and local opportunities.

4.3.1 The Intercity lines need to link large metropolitan areas with sufficient demand.

4.3.2 The Intercity lines need to be developed where there is limited competition from other transport modes.

4.3.3 The Intercity lines and the TER network need to complement each other rather than be in frontal competition

4.3.4 As a higher hierarchy transport means, Intercity must facilitate transfers to lower levels such as TER and local transports.

For each of these requirements, the different French Intercity lines are assessed qualitatively, with a colour code. Green for high or good, red for low or bad, and orange for intermediate.

Table 12: Requirements for line choice (white for high score, dark grey for low score)

Requirement		Normandie	Picardie	Est	Orléans	Clermont	Limoges-Toulouse	Nantes-Bordeaux	Marseille-Bordeaux
2.4.2	Potential demand								
4.3.1	Large cities								
4.3.2	Limited competition								
4.3.3	No mix with TER								
4.3.4	Efficient connections								

This clearly underlines and confirms that Nantes-Bordeaux is the most interesting line for a possible new operator. It has high potential demand, links large cities, while competition and mix with TER are acceptable and it offers efficient connections with the other transport networks.

9.3. Qualitative evaluation of the technical scenarios

In this part the focus is set on assessing the three scenarios on a qualitative basis, underlining their differences, their strong and weak points and the consequences they have on users and on the environment.

9.3.1. Scenario T1 – Through trains

The strongest point of this scenario is to offer possibilities of through services without transfer at the nodes. Indeed it allows for coherence to the line as a whole by arranging smooth transfers at the nodes.

The stop in Redon allows capturing the passenger flow Quimper-Rennes, from south Bretagne, that can travel the antenna on existing TER and TGV services. This means a very good service for passengers between the Atlantic and South Bretagne, provided via a limited antenna.

The antenna to Marmande is more questionable, except for the needs of the Bordeaux agglomeration. Most of the traffic between Bordeaux and Toulouse goes through Bordeaux anyway.

In the same way, antennas to Jonzac and La Roche Sur Yon are more questionable, since they do not bring a remarkable improvement to the services. However passenger interviews reveal a strong demand for travel to La Roche sur Yon and La Rochelle, illustrated by the increased frequencies of TER trains. But TGV already run on this branch and this timetable is not acceptable for commuters going to Nantes. The first train to Nantes is at 10:00 in the morning.

Thus a variation of the scenario could be to limit the antennas to Redon only, and have the other turning points set at the main nodes. It is to be noted however that local services through the cities can gather a large support from users and local politicians. One idea could be to slow down the services and increase the number of stops as they get close to the dense areas.

Turning points are shifted to secondary stations with less traffic, making the timetable less sensitive to congestion.

The frequencies and services provided for the two main agglomerations are good, but this could be seen as more relevant to the role of TER trains.

Adding the antennas lengthens the travel time, with several effects: The route is longer, so this means earlier departure in the morning and later arrival in the evening. It also means smaller turning times at the terminal stations while very long routes are more subject to incidents.

The additional stops at the large and expensive stations (Nantes and Bordeaux) increase running costs.

But such an overlapping through system is also a good compromise to avoid too long services such as Quimper-Bordeaux or Nantes-Toulouse.

9.3.2. Scenario T1bis - Reversed antennas

Services to the agglomerations (Nantes and Bordeaux) are made possible on the morning peaks: there is a train La Roche sur Yon Nantes and another one Marmande-Bordeaux.

Evening services are thus decreased from two trains (18:00 and 19:00) to only one at 19:00

Services running at the same time during the day are run as coupled trains, with two advantages: there are lower toll costs and staff costs, while on paper it is possible to run Quimper-Marmande or Toulouse-Redon, allowing for a through train.

Services on the antennas could be increased to 4 returns per day by adding two trains. However this is not proven as financially viable and it is uncertain whether the transport authorities would support this. The scenario chosen here is implicitly that of complementarity to TGV and TER rather than frontal competition against existing SNCF services.

9.3.3. Scenario T2 - Maximized central segment

The central segment Nantes-Bordeaux benefits from a satisfactory relatively dense service, coherent throughout the day.

Antennas are nearly empty, but assumed to be served efficiently by other services (TGV, TER and IC)

An alternative scenario could be to fully take out the antennas. This has not been considered here because it is out of the initial scope.

The last departure on the central segment from the large agglomerations is at 5:30pm. This may seem quite early. It could be translated one hour later without that being any problem for the train rosters, but leaving a large gap between the two services. The departure of 14:30 would then also need to be shifted one hour, to 15:30 for example.

This scenario also allows for a difference between express services, aimed at business passengers in the morning and evening, and slower services in the afternoon off-peak hours.

9.4. Rating technical scenarios on the criteria

Along chapter 7, criteria were gathered and concluded from the technical and institutional analysis. They will now be used to assess the different scenarios and compare them.

7.1.1: The project will preferably be attractive so that it can raise the interest of local politicians.

7.1.2: The services should be more frequent between the two main agglomerations (Nantes and Bordeaux), ideally up to 6 daily returns.

7.1.3: Services should be offered to daily migrants going in and out of the main agglomerations (Note: it can be debated that this should be the function of TER, not TET)

7.1.4: TET services should have optimized coordination with TER and other transport modes to offer smooth connections

7.2.1: Hourly timetables should be implemented so that the service is easier to understand for the users

Table 13: Criteria and scenarios ratings (white for high score, dark grey for low score)

Criteria		T1 Antennas	T1bis Reversed antennas	T2 Focus on trunk
7.1.1	Interest local politicians			
7.1.2	Frequency on trunk line			
7.1.3	Migrant services at peak			
7.1.4	Coordinate with TER			
7.2.1	Hourly timetable			

This table underlines the strong and weak points of each scenario. The main advantage of keeping the antennas strongly in the line is that this guarantees the involvement of more political leaders and potentially increases political support thus funding for the line. To the contrary, focusing on the trunk line (Nantes-Bordeaux) allows for a higher scores in terms of frequency and quality of the service, precisely because the services are restricted to where they are most relevant.

There is thus a trade-off to be considered between gathering as much local support as possible and striving to keep the line within relevant boundaries. This study however suggests that deciding to cut off the antennas and deliberately choose to rely on the trunk of the line more than on its outer parts makes sense and allows for a much higher service quality, which would very likely be rewarded by higher ridership.

9.5. Combining Institutional scenarios and Technical scenarios

There are two levels on which to combine the scenarios. First it must be checked if technical and institutional scenarios are compatible with each other. Secondly a table of preferences will be drawn.

9.5.1. Compatibility between technical and institutional scenarios

Technical scenarios dealt with the structure of the timetables and how they could be built or improved. On the other hand, institutions scenarios dealt with the environment on a very large level. If for the new operator the scenario of full separation is preferable, the institutional set up does not interfere with the timetables since these are on a very different level.

Table 14: Combining the scenarios (white for high score, dark grey for low score)

Scenarios		I1 Full separation	I2 Holding	I3 Full integration
T1	Through trains			
T1bis	Reversed through trains			
T2	Central trunk			

Thus the table of compatibility underlines that technical and institutional variables used to design the scenarios are independent and the combinations can be chosen freely.

9.5.2. Combining preferences for technical and institutional scenarios

From the point of view of the operator, and according to the evaluation done above, technical scenarios can be ranked $T2 > T1bis > T1$ and institutional scenarios $I1 > I2 > I3$.

Combining these two, the following table can be drawn:

Table 15: Combining the scenarios (white for high score, dark grey for low score)

Scenarios		I1 Full separation	I2 Holding	I3 Full integration
T1	Through trains			
T1bis	Reversed through trains			
T2	Central trunk			

This reflects the preference of the operator for a separated network manager and for more relevant services focused on the central trunk.

10. Prospects – an outlook in the future

Following the technical scenarios that were drafted and their evaluation, this chapter will focus on looking into possible future evolutions of the infrastructure and of the service. A first step will be to assess the impact of possible work improvements on the schedules, and a second will be to assess the impact of an investment in rolling stock so the frequency can be brought to an hourly timetable.

10.1. Track improvements leading to shortened travel time

There are several improvement projects under discussions. They were discussed at length in the technical analysis of the line; this section will focus on evaluating their impact on the running times and on the timetables.

10.1.1. A range of infrastructure projects with an impact on running times

In the technical analysis, different infrastructure projects were discussed and explained. Their impact on running times will be evaluated in detail here.

Track improvements on Redon-Nantes – 15 min gain

Currently TGV trains run from Paris to Quimper via Rennes. They get on the Nantes-Quimper line in Redon. However, the High Speed line itself is only limited to Le Mans so TGV trains run as normal trains on the rest of the line. It was decided in 2011 to lengthen this line from Le Mans to Rennes. Works are under way since 2012 and the line is due to open in 2017. To match this project and because the line will probably never go directly to Quimper, it was also decided to work on the infrastructure and improve the section Rennes-Quimper so that time gains can also be done there. The mid-term objective is to bring Quimper-Paris down to 3 hours. In the near future, before the opening of the line, several sections will be upgraded to 220km/h, reducing travel time by 5 minutes, and it is expected that other improvements can lead to a total gain of 15 minutes. To reach further speed gains, new sections will be needed, but they are still hypothetical thus excluded from the field of this study. (RFF, 2012)

Electrification of La Roche-Sur-Yon – Bordeaux – 10 min in Nantes and 10 min in Bordeaux

One of the last key Intercity lines not to be electrified together with Troyes-Mulhouse, this section is on the priority list of projects that need cabling soon. They are backed by strong demand from users and political will. This would increase reliability and punctuality, and take out the need to switch engines in Nantes and in Bordeaux, saving ten minutes at each stop.

Track improvements Nantes-Bordeaux – 30 min gain

Because track maintenance has been neglected, travel time between Nantes and Bordeaux for Intercities went up from 3h30min to 4h. Thus working on improving the tracks and making sure that speed limits were upgraded again would lead to a substantial gain of 30 min on this section.

Track improvements on Bordeaux-Toulouse – 15 min gain

Parallel to the new Bretagne-Pays de La Loire TGV line, another extension was decided in 2011 between Tours and Bordeaux, to bring down travel time to 2 hours between Paris and

Bordeaux. The full project is to also build an extension all the way to Toulouse but this project is very likely to be abandoned for financial reasons, and replaced by track improvements and upgraded segments between Bordeaux and Toulouse. Thus the Intercity could also benefit from a reduction of 15 min for the travel time on this section. (RFF, 2012)

10.1.2. Improved service

The improvements allow for a typical schedule presented in the table below, with time gains split over the stations in the different segments. Total running time is brought down from 9h10 to 8h00, still very long for a day service.

Table 16: improved typical schedule

Quimper	05:25
Redon	06:55
Nantes	07:30
La R/Yon	08:05
La Rochelle	09:10
Saintes	09:50
Jonzac	10:20
Bordeaux	11:10
Marmande	11:50
Agen	12:15
Toulouse	13:25

These new running times can be used to build a timetable, still based on 4 trains.

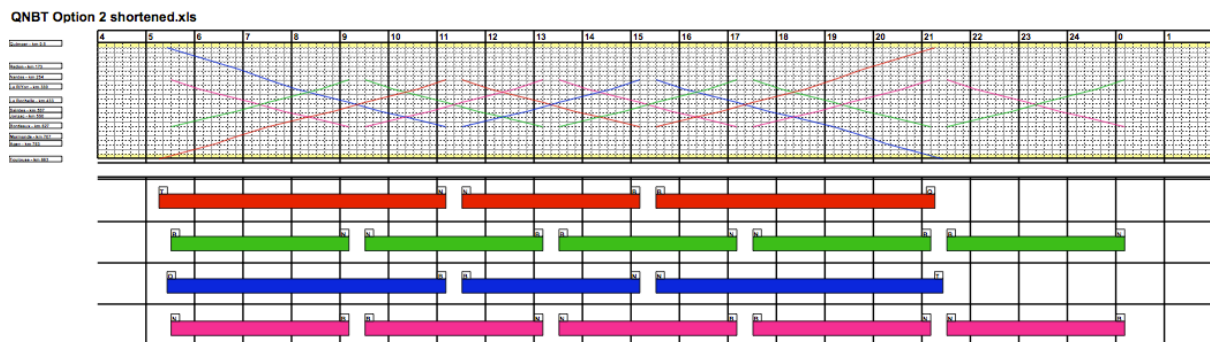


Figure 14: Timetable with improved running times

It appears clearly that the shorter travel time already allows for a much better service for the passengers, in terms of travel time of course, but also because shorter cycle times allow for higher frequencies and the timetable can be built on a two-hourly pattern, with precisely one train every two hours in each direction. The only exception is the evening gap left by the necessity to serve the antenna at least once in the day, as this was defined as an institutional requirement.

10.2. Towards an hourly service

Beyond the running times shortening, another improvement can be offered to the passengers: the line can be made much more attractive by bringing services to a full hourly timetable. This will be enabled by increasing the number of running trains to eight (instead of four):

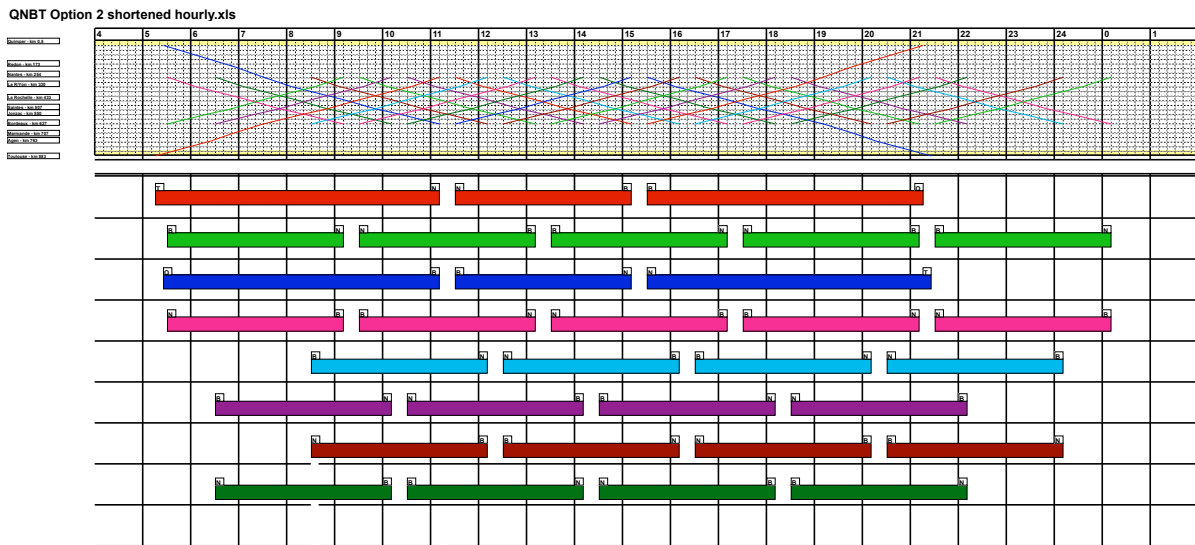


Figure 15: Improved service with 8 trains

Allowing for eight trains to run brings the service to a perfect hourly timetable in each direction, still with a gap in the evening because of the antenna.

Thus by investing in (reasonable) infrastructure work improvements, without building new lines and specifically without needing expensive high-speed lines, travel time can be brought down by 90 minutes, and by using this time reduction and investing in four additional train sets, the service can be offered on an hour basis, making the line a lot more attractive for passengers.

11. Conclusion

An in-depth analysis into the French railway institutions uncovered that although the structures are not fully ready yet, rail competition is on track. Thanks to the strong support of the European Commission and of the users, the outlook for competition in France is very positive. To get there, a certain number of obstacles will need to be overcome, namely making sure that the environment guarantees fair competition to all actors and strengthening the regulator while coming to an agreement on work conditions in the industry.

The second main finding of this study underlines that there is large untapped potential for improvement and growth on the French Intercity market. A methodology was developed and applied to Nantes-Bordeaux, but it is also meant to be applicable to other lines in possible further studies.

The study into the specific case underlined three specific French railways peculiarities: firstly, since transport authorities are so multiple and various, gathering support from local political future is a first step in any railway project in France. Secondly, once this support is gathered, innovation can be brought in by making an effort to keep past influence of the line at bay and think it anew. Indeed, the weight of successive historical corrections to the services is so heavy that they have sometimes lost their coherence if not their purpose and their customers. This new approach, although unsatisfying for historical user groups, can unleash untapped growth potential and develop ridership on train services.

Once and if the experimentation of competition on Nantes Bordeaux is achieved and successful, the next step could be a relatively independent group of lines with a much larger volumes, typically Paris to Clermont-Ferrand. Given the likely abandon of the TGV line to the centre of France, this could also be used to modernize the line and give a positive signal to its users.

The main question of the report was introduced as : “What are the requirements for a new TOC to operate a French Intercity line if it were to be tendered to competition in 2014? How would this apply to the specific case of Quimper-Nantes-Bordeaux-Toulouse?” Requirements were uncovered in details in Chapters 2, 3 and 4, and listed as follows:

External Political factors – lobbying strategy

This first set of requirements consists of a range of external factors, that are not on the decision level of the TOC himself. They describe policies that need to be implemented such that the market can be attractive to a new operator, and without which the opportunity are not interesting anymore.

2.1.2: The political agenda needs to be clearly defined and backed by the government.

2.1.1: a strong railway regulator must be in place

3.6.1: the future railway organization should guarantee equal access to the infrastructure and fair competition.

3.1.1: Introduction of competition on passenger railways should be prepared upfront and negotiated with all actors, especially unions and workers.

3.2.1 Negotiations on work conditions should be led prior to introduction of competition

Although external, these requirements can be influenced, notably by active lobbying with the national and local instances and with the different stakeholders such as user groups, workers, unions, political parties, and the industry at large. This is however not the focus of this report.

Stakeholders' involvement and management

The second range of requirements underline the need for close stakeholders management.

2.2.1: a new rail project needs to leverage on the different decision centres and get the backing of this large variety of levels.

2.4.1: Backing from the local and regional governments should be sought so that they can finance improved quality and eventually lead to higher ridership

The influence of local government can be key, and prominent local figures need to be identified and approached to gather support for a project.

Choice of the line

Eventually the third set of requirements is more directly in line with technical and institutional requirements presiding over the choice of a first line to be opened amongst the large number of possible services.

2.4.2: the Intercity line considered must be chosen carefully according to geographical and local opportunities.

4.3.1 The Intercity lines need to link large metropolitan areas with sufficient demand.

4.3.2 The Intercity lines need to be developed where there is limited competition from other transport modes.

4.3.3 The Intercity lines and the TER network need to complement each other rather than be in frontal competition

4.3.4 As a higher hierarchy transport means, Intercity must facilitate transfers to lower levels such as TER and local transports.

4.3.5 On-board service needs to be adapted to the demands of the passengers

For the case of Nantes-Bordeaux, subquestions were answered one by one:

What is the current state of the line?

The infrastructure is not very well maintained and the tracks as well as the rolling stock are aging fast.

In what environment is it set?

Competition against the line is strong, especially from cars, due to very good and cheap roads, and there is also strong competition from low cost carriers linking Nantes to Toulouse.

Who are the key influential stakeholders?

A detailed stakeholder analysis was led on the whole western façade of France, identifying key stakeholders, amongst which several former Prime Ministers and a former front runner for the Presidency.

Would competition be beneficial and what would it bring?

The different approaches to competition were discussed, and competition for the market was introduced as preferable to competition in the market for this specific case, because it allows for a more coherent organization of transports. It would stimulate the actors, and bring innovation, service improvement and efficiency gains in the industry.

What would make the new service satisfactory?

The expectations of the users were analyzed in depth and discussed. Criteria for the service were elaborated as follows:

7.1.1: The project will preferably be attractive so that it can raise the interest of local politicians.

7.1.2: The services should be more frequent between the two main agglomerations (Nantes and Bordeaux), ideally up to 6 daily returns.

7.1.3: Services should be offered to daily migrants going in and out of the main agglomerations (Note: it can be debated that this should be the function of TER, not TET)

7.1.4: TET services should have optimized coordination with TER and other transport modes to offer smooth connections

7.2.1: Hourly timetables should be implemented so that the service is easier to understand for the users

What train service should be designed?

Three design scenarios for services were elaborated following a systematic approach and based on the analysis. They either focus on the central Nantes-Bordeaux trunk line or strive to have an inclusive approach with the antennas.

How would the design meet the requirements?

It was checked that all design requirements found were met by the scenarios elaborated and that they were thus acceptable.

Which improvements or drawbacks would it have for the users?

The designed scenarios were checked and evaluated with the criteria elaborated during the analysis, so as to reveal the preferences of the users. This showed that focusing on the trunk line offered better service to the users.

Criteria		T1 Antennas	T1bis Reversed antennas	T2 Focus on trunk
7.1.2	Frequency on trunk line			
7.1.3	Migrant services at peak			
7.1.4	Coordinate with TER			
7.2.1	Hourly timetable			

Figure 16: Evaluation of the scenarios according to criteria (high score in white, lower scores are darker)

What would be the prospects for development?

Finally the impact of possible infrastructure works and track upgrades was assessed by developing new timetables and the possibility to offer an hourly timetable thanks to 8 trains being used instead of only 4 was introduced and analyzed as positive for the users.

QNBT Option 2 shortened hourly.xls

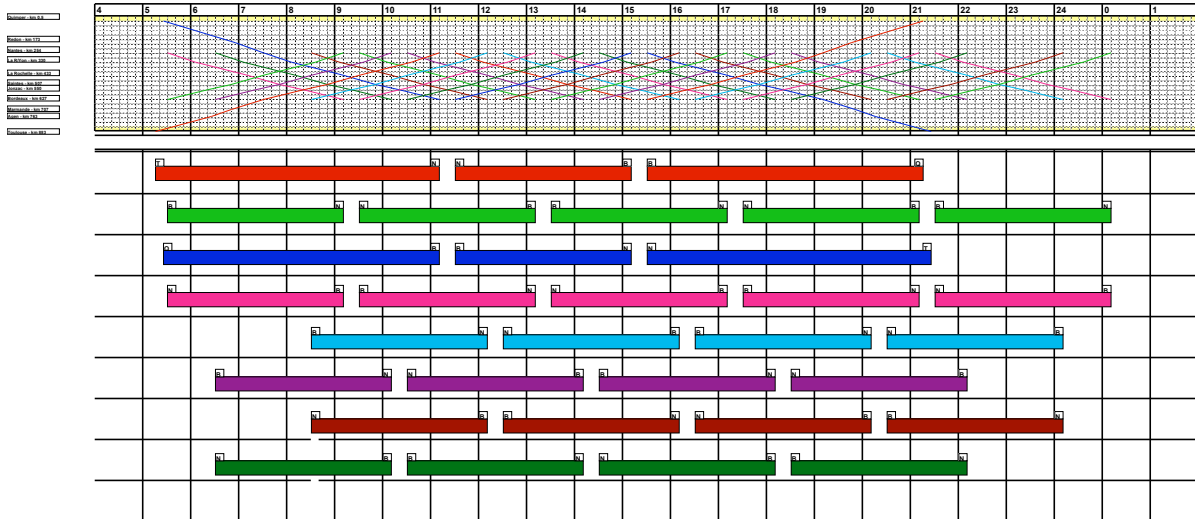


Figure 17: Improved service with 8 trains

More generally, now that questions arise about the pertinence of TGV as an absolute ideal for all territories, there is room for a reflection on the key role of Intercities in France, which should not be seen anymore as a leftover between TGV and TER but as a key means of transport and growth factor, which, if it is adapted to the needs of today's users, can definitely meet success and improve lives of passengers.

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Appendix 1 - Political Analysis

1. Methodology

The different administrative layers of the French government were analyzed in depth, with the following key points:

- _ Composition of the local assembly
- _ Head of the local government
- _ Vice-President in charge of transport

When possible, a short résumé was built: date of birth, school when relevant, functions of importance, political or otherwise, and political color. This enables an identification of the networks in which each personality is involved.

Usual French codes identify the schools:

ENA: Ecole Nationale d'Administration

X: Ecole Polytechnique

ENS: Ecole Normale Supérieure

ECP: Ecole Centrale Paris

IEP: Institut d'Etudes Politiques, Sciences Po Paris

And the political parties are designed as follows:

PS: Parti Socialiste

PRG: Parti Radical de Gauche (left)

PC: Parti Communiste

MPF: Mouvement pour la France (right)

UMP: Union pour un Mouvement Populaire (centre-right)

UDF: Union des Démocrates Français (centre-right)

NC: Nouveau Centre (centre)

Modem: Mouvement Démocrate (centre)

DVD: Divers Droite (right)

EELV: Europe Ecologie Les Verts (greens, left)

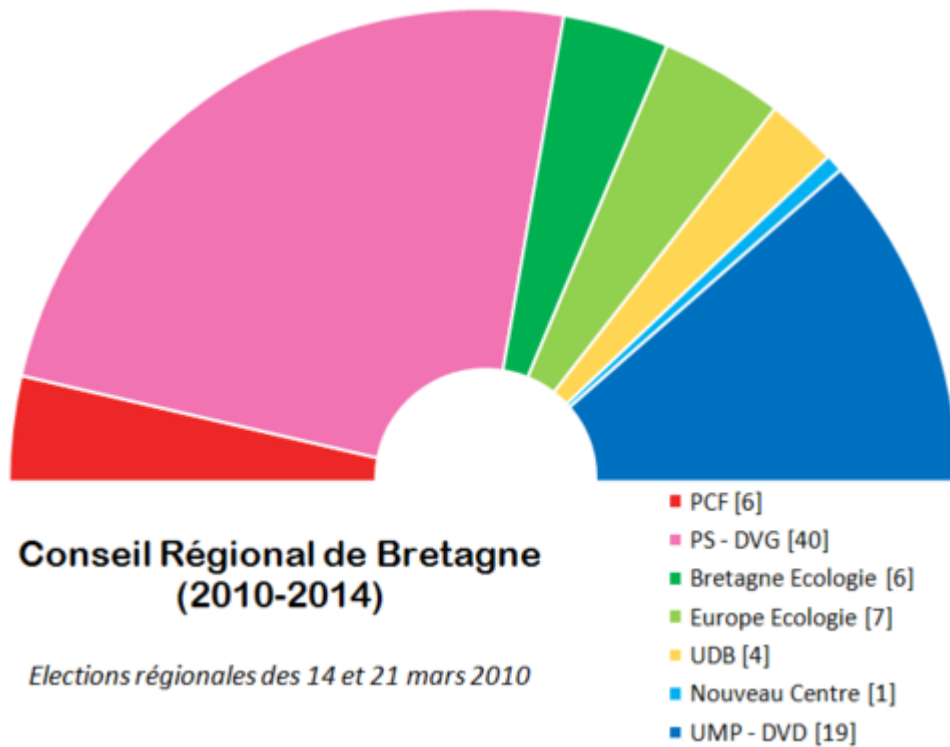
The levels analyzed are:



- _ Regions
- _ Departments
- _ Large cities

They are presented in the geographical order from Quimper to Toulouse, along the IC line.

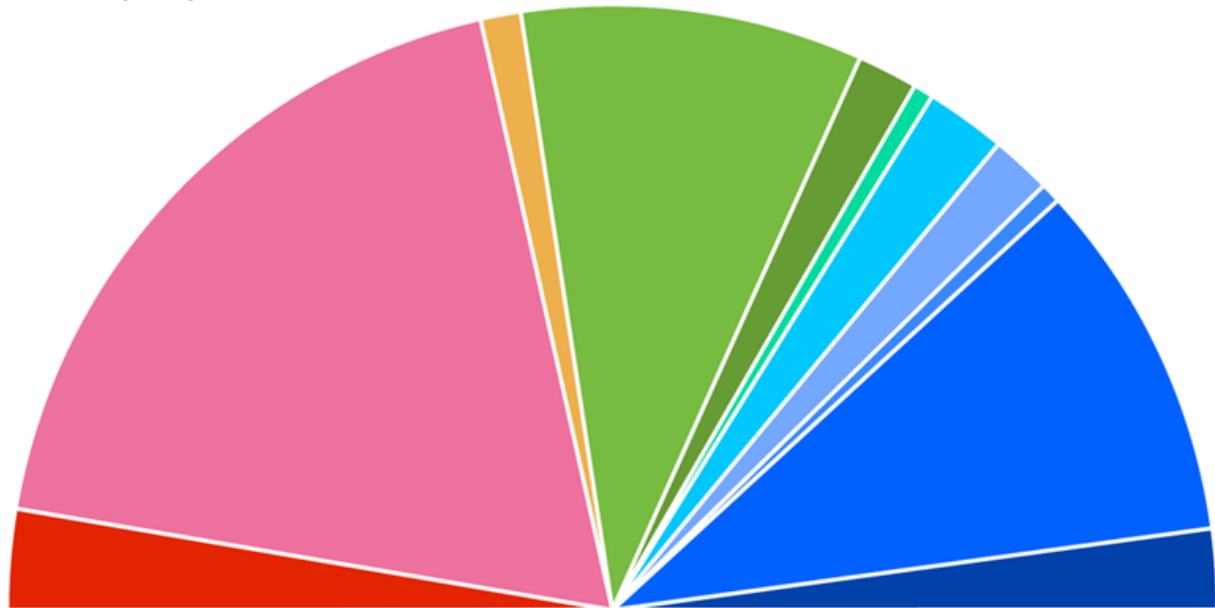
2. Régions

i) Bretagne





Président		Vice-Président	
			
Jean-Yves Le Drian PS 30/06/47 History Teacher Gouvernement Cresson (91-92)		Gérard Lahellec PC 04/04/54 Technician	

ii) Pays de la Loire



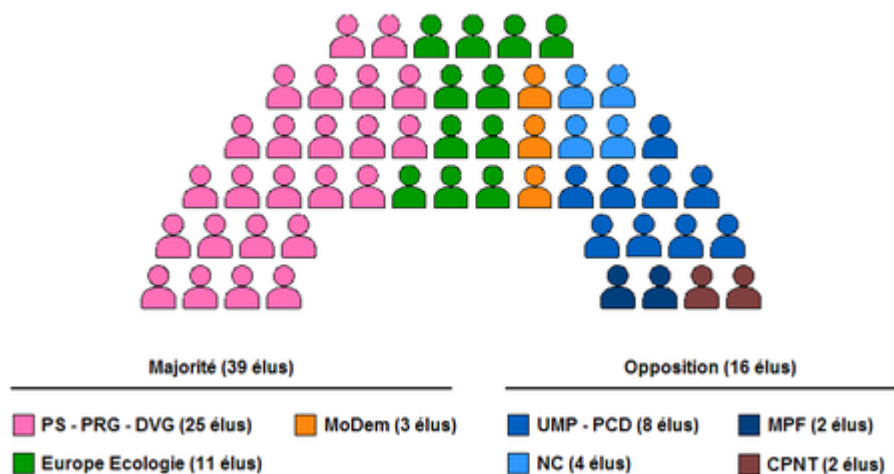
Conseil régional des Pays de la Loire (2010-2014)




<p>■ Parti Communiste [5]</p> <p>■ Parti Socialiste [35]</p> <p>■ Parti Radical de Gauche [2]</p> <p>■ Europe Écologie [17]</p> <p>■ Écologie Solidarités [3]</p> <p>■ Cap21 [1]</p>	Majorité [63]	<p>■ Alliance Centriste [4]</p> <p>■ Nouveau Centre [3]</p> <p>■ Parti Chrétien-Démocrate [1]</p> <p>■ UMP [18]</p> <p>■ Mouvement Pour la France [4]</p>
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Prés	Vice-Président
	
<p>Jacques Auxiette</p> <p>PS</p> <p>3/12/40</p> <p>Math teacher</p> <p>Président of GART (Transport authorities association)</p>	<p>Gilles Bontemps</p> <p>PC</p> <p>Docker</p> <p>Maire adjoint in Nantes' suburbs</p>

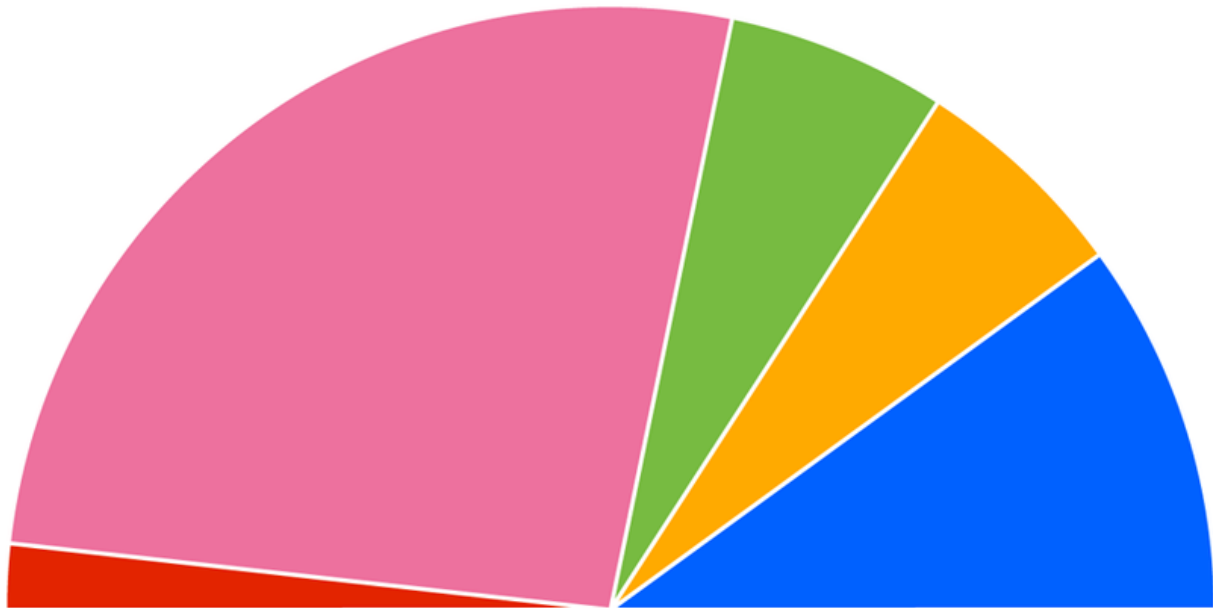
iii) Poitou-Charentes

Conseil Régional de Poitou-Charentes (2010-2014)



Pr		Prés Tran - Inf		alité	Vice		TP
	Ségolène Royal PS 22/09/53 IEP-ENA Député, Government Jospin (97), candidate for presidency in 2002		Françoise Coutant EELV Maire adjointe of Angoulême			Jacky Emon DVG	



iv) Aquitaine



■ Front de Gauche [3]
■ Parti Socialiste - PRG [45]
■ Europe Écologie [10]


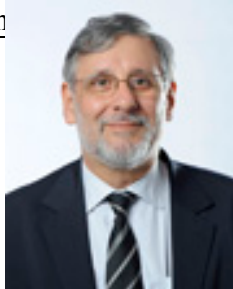
Majorité [58]

■ MoDem [10]
■ UMP Majorité présidentielle [17]

Président		Vice-Président	
			
Alain Rousset PS 16/02/51 IEP – Law Elf Député, président ARF (French Regions Association)		Bernard Uthurry PS Maire of Oloron (Pyrénées Atlantiques)	

v) Midi-Pyrénées

Membres :	91 conseillers régionaux
Groupes politiques :	<div> <div>Parti socialiste et républicain (38)</div> <div>Europe Écologie (15)</div> <div>Front de gauche : PCF-PG-GU (7)</div> <div>Radicaux de Gauche (11)</div> <div>Républicains et Territoires (9)</div> <div>Osons Midi-Pyrénées (13)</div> </div>

Présiden	Vice-Présiden
	
<p>Martin Malvy</p> <p>PS</p> <p>24/02/36</p> <p>Law, journalist</p> <p>Local career in local government, député, finance minister (92-93)</p> <p>Board ARF</p>	<p>Charles Marziani</p> <p>PC</p>

3. Départements

i) Finistère (29)

PS et DVG 40

DVD 13

Président: Pierre Maille (PS)



14/06/47

ENS Cachan – Physics teacher

Former maire of Brest

Conseiller municipal of Brest (municipal council)

ii) Morbihan (56)

UMP 24

PS 18

Président: François Goulard (UMP)



21/09/53

ECP (76) – IEP – ENA(81) – Cour des Comptes, Ingénieur DDE

Former député Démocratie Libérale

Secrétaire d'Etat Transports (04-05) and Ministre Enseignement Supérieur (05-07)

Former maire of Vannes

Villepiniste

iii) Loire Atlantique (44)

PS / DVG 36

UMP / NC 22

Président: Philippe Grosvalet (PS)



13/04/58

Former maire of Saint Nazaire

Conseiller municipal now

iv) Vendée (85)

MPF, UMP, DVD 27

PS 4

Président: Bruno Retailleau (UMP)



20/11/60

IEP

Vice-Président MPF

Sénateur of Vendée

v) Charente-Maritime (17)

UMP / Centre 27

PS / DVG 24

Président: Dominique Bussereau (UMP)



13/07/52

Son of a train worker

IEP

Worked at the Marketing Direction of SNCF (82-83)

Former Secr. d'Etat aux Transports (2002) and other government jobs till 2010

Député (Jonzac and rural areas)

vi) Gironde (33)

PS 47

PC 3

UMP Modem 13

Président: Philippe Madrelle (PS)



21/04/37

English teacher

Former député and maire of Carbon-Blanc

Former président of Aquitaine (81-85)

Sénateur

vii) Lot-et-Garonne (47)

PS PRG PC 25

UMP DVD 15

Président: Pierre Camani



19/02/52

Law, Communication and IEP

Institut Régional d'Administration in Nantes

Préfecture of 92

Directeur des Services in Marmande

Sénateur

Conseiller municipal of Puymiclan

viii) Tarn-et-Garonne (82)

PRG 15

PS 7

DVD 6

Président: Jean-Michel Baylet (PRG)



17/11/46

Journalism

Media owner (La Dépêche), following his father

Government in 84-90 (Relations ext. Coll Loc. then Tourisme)

Président national of PRG

Former candidate to the PS primary in 2012

ix) Haute Garonne (31)

PS 44

UMP DVD 5

Président: Pierre Izard (PS)



11/07/35

Pediatrician

Former maire of Villefranche-de-Lauragais

Still adjoint au maire

Vice Président of ADF

4. Large cities

i) Quimper

PS (23)

DVD (11)

Maire: Bernard Poignant (PS)



Retired History teacher

MEP 1999-2009

President of French PS in EP

ii) Lorient

Maire: Norbert Métairie (PS)



07/08/46

High school teacher

Conseiller général Morbihan

iii) Auray

PC/PS (26)

DVD (6)

Maire: Michel Le Scouarnec (PCF)



12/07/49

Retired Primary school teacher

Sénateur

iv) Vannes

UMP (33)

DVG (7)

Maire: David Robo (UMP)



10/06/70

Social worker

v) Redon

DVD(22)

Opposition (7)

Maire: Vincent Bourguet (UDF – AC - UMP)



6/07/61

PhD of Philosophy

Local political career

vi) Savenay

DVD (22)

DVG (7)

Maire: André Klein (DVD)



Former Préfet

vii) Nantes

PS 53

UMP 9

Modem 3

Maire: Jean-Marc Ayrault (PS)



25/01/50

German teacher

Député

Prime Minister (2012-)

viii) La Roche sur Yon

PS / DVG 34

UMP-NC 6

Maire: Pierre Regnault (PS)



07/02/48

Accountant

Local political career

CG Vendée

ix) La Rochelle

PS (16)

PRG (12)

PCF (8)

Verts (5)

UMP (6)

Modem (2)

Maire: Maxime Bono (PS)



01/11/47

Born in Alger

Public Law, Tax administration

Député

Interested in clean mobility

x) Saintes

PS DVG 27

UMP 6

Modem 2

Maire: Jean Rouger (PS)



10/04/40

Physician

Député (97-02)

Local political career

xi) Jonzac

Maire: Claude Belot (UMP)



11/07/36

Geography teacher

CG (Former Président 94-08)

Sénateur

xii) Bordeaux

UMP DVD 50

PS DVG 11

Maire: Alain Juppé (UMP)



15/08/45

ENS – Agreg lettres classiques – IEP - ENA – IGF

Successful national political career (Minister and Prime Minister)

xiii) Langon

Maire: Charles Vérité (PS)



Physician

xiv) Marmande

Maire: Gérard Gouzes (PS)



5/06/43

Ancien député (till 2002)

Maire since 1983

xv) Agen

Maire: Jean Dionis du Séjour (NC)



21/09/56

ECP (79), aérospatiale, Matra

Maire since 2008

Député since 2002

xvi) Montauban

Maire: Brigitte Barèges (UMP)



01/05/53

Lawyer (Private law in Toulouse)

Député since 2007

Political board of UMP

xvii) Toulouse

Maire: Pierre Cohen (PS)



20/03/1950

Informatician

Député since 1997

Priority to Public Transports (tramway, subway, BRT)

Appendix 2 - User Demands

These comments are collected from users meetings led by SNCF, RFF and the local governments.

1. Infrastructure

Users and their speakers estimate 220 million euros investment are required between La Roche-sur-Yon and La Rochelle to prevent further speed limitations and lengthening of trip time. These proposed works are assumed to be a minimum target, but they include what has already been decided and financed by the region (32 million euros) and by TER (55 million euros).

RFF, the network manager, is currently carrying out a study, financed by the government and the local governments of Aquitaine, Pays-de-la-Loire, Poitou-Charentes, Vendée, Charente-Maritime and La Rochelle.

Users insist that signals are obsolete on many segments, such as South of La Roche sur Yon.

The bridge of La Bretonniere sur Le Lay needs to be rebuilt because it is very old. RFF could finance works itself, which would mean it could be completed at best at the end of 2015. In 2011, speed was brought down to 40 kph. The local users fear that for cost reasons this bridge be rebuilt as a single track, restraining capacity drastically.

The government has played double and favoured intermodal competition by financing heavily the highway project A831 between Rochefort and Fontenay-Le-Comte. The cost of this new road is estimated at 890 million euros, of which 400 million euros is financed by national (179 million euros) and local (221 million euros) government.

From January 3rd 2011 to July 5th 2011, works to change the tracks and ballast between Nantes and La Roche-Sur-Yon were done, following the electrification of the line, achieved in 2008. Many elements of the tracks, who were reaching the end of their life cycle, were changed and renewed. This section is thus one of the most modern between Nantes and Bordeaux.

2. Train services and demand

La Rochelle users express their need for more services to the South. TET and TER services to Nantes are reinforced but the city is cut from the South and Bordeaux.

Seaports did apparently not manifest any interest in railway development for their own freight business.

RFF acknowledges having underestimated cabotage on Bordeaux-Nantes, which it then saw better while talking to the users. SNCF did not provide traffic data to RFF.

Pays-de-La-Loire local government has a target of 8 return trips per day, combining TER and TET. Local user associations fix their target at 6 returns per day. Reducing trip time to 3h30 is not achievable without very heavy works, which RFF does not see as likely. Even based on

these trip times, the study could lead to demand 2 times higher than current demand if the line were to be improved.

For this, services need to be fast (one hour at most from La Rochelle to La Roche sur Yon; less than two hours to Nantes). New stops could be implemented (Marans, Velluire, Luçon, Champ saint Père, Montaigu, Clisson). Velluire especially could be fed by a bus feeder system bringing in traffic from Fontenay le Comte and its agglomeration.

Current rolling stock is aging or out of age, limiting performance of the trains and the reliability of the timetables. This has a heavy cost in terms of travel time and delays.

3. Key priorities for passengers

Keep the double track between La Roche-sur-Yon and La Rochelle

Increase services to 6 return trips per day at least between Bordeaux and Nantes, some of which would be lengthened to Quimper, Rennes, Toulouse and Hendaye.

Reduce travel time to 3h30, against a bit more than 4 hours today.

Replace old rolling stock by more reliable and more modern trains

Rebuild very urgently the bridge of La Bretonnière sur Le Lay

Assure better complementarity and integration with inter regional services.

Appendix 3 -Modal competition

1. Airlines

Major airports in the area

3 national and international airports connected to the main European hubs

- Nantes
- Bordeaux
- Toulouse

2 main LCC airports connected in OD throughout Europe

- La Rochelle
- Limoges

A range of smaller less connected airports

- *See Appendix 4*

Regional links by air

Only two links are feasible by air directly (without going through Paris or Lyon):

- Nantes-Toulouse (60-70 min)
 - AF (3 return flights/day)
 - EZY (1 return flight/day))
- Nantes-Bordeaux (45 min)
 - AF (2 return flights/day))

Airlines timetables

Nantes-Toulouse

- Flights AF
 - Morning / Day / Afternoon
 - A return flight within the day is possible both ways
- Flights EZY
 - Afternoon / Evening
 - No possibility to fly return during the day

Bordeaux-Nantes

- AF only
 - First departure from Nantes at 11:55
 - Last departure from Boprdeaux at 14:45
 - Return flight in the day possible only from Bordeaux to Nantes

Details in Appendix 5

Airline fares

Return flights cost € 650 (N-B) – € 800 (N-T) with AF for a short booking (D+1), going down to €277-281 for an advanced booking.

EZY fares are clearly lower, D+1 booking costs €360 return and anticipated booking goes as low as €71 return

These fares are considered excluding promotional fares.

Details in Appendix 6

2. Car

Data collected from ViaMichelin in April 2012. Fuel cost was then €1.60 per liter.

Total Tolls	Total Highway	Quimper		Nantes		Bordeaux		Toulouse
Quimper				232 km		565 km		799 km
				219 km		525 km		755 km
Nantes		24 ^E 90	02:32			335 km		767 km
		0 ^E	02:09			296 km		526 km
Bordeaux		82 ^E 84	05:37	59 ^E 25	03:23			244 km
		24 ^E	04:52	24 ^E	02:34			235 km
Toulouse		124 ^E 80	07:44	101 ^E 08	05:28	43 ^E 38	02:23	
		41 ^E 50	06:52	41 ^E 50	04:35	17 ^E 50	02:03	

3. Buses

The French national bus market is still nearly closed to competition for long distance. Coach services running on international lines are allowed to carry a very limited proportion of passengers on French national routes.

Eurolines operates lines in the evening towards Paris (from Rennes, Nantes, La Rochelle, Bordeaux) and lines going East to Italy (from Bordeaux).

The coach services could radically change if the opening to competition is implemented. Eurolines as well as other players (Speed, StageCoach) have projects ready to be started but keep very secretive on the precise plan.

Appendix 4 - Secondary regional airports air services

Quimper

- AF
 - Orly
 - London City
 - Figari

Lorient

- AF
 - Orly
 - Lyon

Rennes

- Nada

La Rochelle

- AF
 - Lyon
 - Orly
- EZY
 - Bristol
 - Gatwick
- FR
 - Bruxelles
 - Cork
 - Dublin
 - East Midlands
- LCC
 - Edinburgh
 - Birmingham
 - Leeds
 - Stansted
 - Lyon
 - Manchester
 - Oslo
 - Porto
 - Southampton

Poitiers

- LCC
 - Edinburgh
 - London
 - Lyon
 - Ajaccio

Limoges

- LCC
 - Ajaccio
 - Bristol
 - Leeds
 - Liverpool
 - Stansted
 - Lyon
 - Newcastle
 - Nottingham
 - Orly
 - Southampton

Angoulême

- Nada

Périgueux

- Orly

Appendix 5 - Flight timetables Nantes-Bordeaux / Nantes-Toulouse

1. Nantes-Toulouse

Airline	Nantes - Toulouse		Toulouse - Nantes	
	Take off	Landing	Take off	Landing
AF	06:40	07:40	08:20	09:20
AF	15:40	16:40	17:15	18:15
EZY	15:45	16:55	19:45	20:55
AF	18:50	19:50	20:30	21:30

2. Nantes – Bordeaux

Airline	Bordeaux - Nantes		Nantes - Bordeaux	
	Take off	Landing	Take off	Landing
AF	06:40	07:25	11:55	12:40
AF	14:45	15:30	20:25	21:10

Appendix 6 - Airline Fares

Return flights cost € 650 (N-B) – € 800 (N-T) with AF for a short booking (D+1), going down to €277-281 for an advanced booking.

EZY fares are clearly lower, D+1 booking costs €360 return and anticipated booking goes as low as €71 return

These fares are considered excluding promotional fares.

- Published day return fares excluding promotional fares
- Source: websites of the airlines, beginning of April 2012
- All costs are included (especially fixed payment costs on EZY) but no additional luggage is included
- Access costs to the airports excluded (taxi...)

(euros)

Booking date	Nantes - Toulouse		Nantes - Bordeaux
	AF	EZY	AF
D-1	825	360	650
D-2	762	310	650
D-7	619	132	388
D-14	370	124	277
D-30	281	85	277
D-90	281	71	277

Appendix 7 - Line description and travel time

1. Description of the line

	km	interstation	Elec
Quimper	0		
Lorient	65,347	65,347	x
Auray	99,848	34,501	x
Vannes	119,039	19,191	x
Redon	173,44	54,401	x
Nantes	254,421	80,981	x
La Roche sur Yon	330,45	76,029	x
Luçon	367,93	37,48	0
La Rochelle	433,402	65,472	0
Rochefort	462,646	29,244	0
Saintes	506,541	43,895	0
Jonzac	549,922	43,381	0
Bordeaux	627,363	77,441	0
Marmande	706,178	78,815	x
Agen	762,854	56,676	x
Montauban	833,297	70,443	x
Toulouse	883,775	50,478	x

2. Travel time

Segment	Travel time
Quimper / Redon	01:45
Redon / Nantes	00:45
Nantes / La R/Yon	00:45
La R/Yon / La Rochelle	01:15
La Rochelle / Saintes	00:50
Saintes / Jonzac	00:30
Jonzac / Bordeaux	00:50
Bordeaux / Marmande	00:45
Marmande / Agen	00:30
Agen / Toulouse	01:15

3. Distances (km)

	Quimper	Lorient	Auray	Vannes	Redon	Nantes	La Roche sur Yon	Luçon	La Rochelle	Rochefort	Saintes	Jonzac	Bordeaux	Marmande	Agen	Montauban	Toulouse
Quimper	0	65	100	119	173	254	330	368	433	463	507	550	627	706	763	833	884
Lorient	65	0	35	54	108	189	265	303	368	397	441	485	562	641	698	768	818
Auray	100	35	0	19	74	155	231	268	334	363	407	450	528	606	663	733	784
Vannes	119	54	19	0	54	135	211	249	314	344	388	431	508	587	644	714	765
Redon	173	108	74	54	0	81	157	194	260	289	333	376	454	533	589	660	710
Nantes	254	189	155	135	81	0	76	114	179	208	252	296	373	452	508	579	629
La Roche sur Yon	330	265	231	211	157	76	0	37	103	132	176	219	297	376	432	503	553
Luçon	368	303	268	249	194	114	37	0	65	95	139	182	259	338	395	465	516
La Rochelle	433	368	334	314	260	179	103	65	0	29	73	117	194	273	329	400	450
Rochefort	463	397	363	344	289	208	132	95	29	0	44	87	165	244	300	371	421
Saintes	507	441	407	388	333	252	176	139	73	44	0	43	121	200	256	327	377
Jonzac	550	485	450	431	376	296	219	182	117	87	43	0	77	156	213	283	334
Bordeaux	627	562	528	508	454	373	297	259	194	165	121	77	0	79	135	206	256
Marmande	706	641	606	587	533	452	376	338	273	244	200	156	79	0	57	127	178
Agen	763	698	663	644	589	508	432	395	329	300	256	213	135	57	0	70	121
Montauban	833	768	733	714	660	579	503	465	400	371	327	283	206	127	70	0	50
Toulouse	884	818	784	765	710	629	553	516	450	421	377	334	256	178	121	50	0

Appendix 8 – SNCF Rail fares on Quimper-Nantes-Bordeaux-Toulouse

See attached Excel file

Appendix 9 – SNCF Timetable Quimper-Nantes-Bordeaux-Toulouse

See attached Excel file

Appendix 10 – Competition in other public transport in France

1. Airlines – a fully deregulated market

The air industry is mostly deregulated and open to any competition (Open skies agreements within the EU and between the EU and the US). A very tough competition between airlines is stimulated by low barriers of entry, allowing new competitors to find their marks and capture market shares. The ultimate result of this open competition policy is that Ryanair openly advertises itself as the biggest European airline (in terms of passengers transported per year). This industry is open to competition on the model of a competition in the market. Activities are not subsidized and nearly any one can open nearly any route.

2. Urban transport – competition by franchizing

Even subsidized transport such as urban and inter-urban buses is open to competition, but this time on the model of competition for the market. Most agglomeration tender their public transports to an operator, and bids are held every few years for the contenders to compete on quality and cost. Up to one year ago the largest operators were Veolia Transport (Group Veolia Environment), Keolis (Group SNCF), Transdev and RATP. In 2011, Transdev was merged with Veolia Transport, with a part being sold to RATP.

Thus the remaining operators as of 2012 are Veolia-Transdev, Keolis and RATP. The first is currently being sold by Veolia Environment and will probably become half public (50% of the shares would go to *Caisse des depots*), SNCF has a majority stake in the second and the third is fully State owned. This leads to a specific case of competition between government owned firms.

The only anomaly in urban transport is Paris, where RATP has a guaranteed monopoly for the upcoming 20 years at least.

3. Inter-urban buses – franchising with an outlook for more competition

Inter-urban buses are currently organized with competition for the market only. A small opening was made for competition in the market: operators such as Eurolines are allowed to use their international routes to transport a limited share of passengers on national trips. At some point, the market is likely to open up more deeply, with bus companies allowed to create lines and compete against each other, in the same way international transport is organized. This would result in an open competition in the market on national bus routes.

One likely limitation would however probably be implemented: at the request of SNCF and transport authorities, bus lines would not be allowed to compete directly against train services.

Appendix 11 – Analysis of competition on European railways

1. The United Kingdom – Strong competition in a market open to multiple operators

This analysis is based on a documentation search and analysis and on a field trip to the United Kingdom. The route followed was

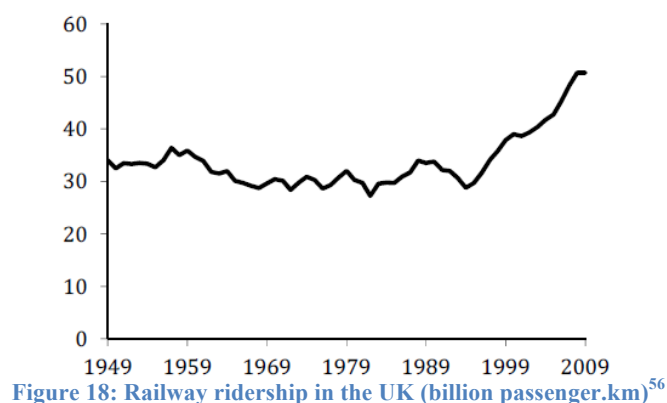
- _ London-Glasgow, IC, operated by Virgin Trains
- _ Glasgow-Edimburgh, IR, operated by ScotRail
- _ Edimburgh-York, IC, operated by East Coast Main Line
- _ York-London, IC, operated by Grand Central Railways
- _ London-Brighton, IR, operated by First Capital Connect
- _ Brighton-London, IR, operated by Southeastern
- _ London-Paris, HST, operated by Eurostar (SNCF)

This analysis will focus on the organisation of British railways in the first place, and how it evolved to house competition, and then the current state of competition in the country.

i) Organization of railways the United Kingdom

The British government decided in 1993 to overhaul the industry with the Railways Act. Passenger transport was re-organized in franchises, open to bids for public tendering. The quasi totality of rail services is currently operated under franchises (the two exceptions are London-Heathrow air link and the Eurostar). Freight transport is fully open and not subsidized.

The consequences of this overhaul were a major increase in demand, with an increase in ridership of 76% from 1996 to 2009 whereas this demand had remained nearly stable since WWII⁵⁵.



⁵⁵ (Abraham, 2011)

⁵⁶ (Office of Rail Regulation, 2010)

ii) Current state of the railway market and degree of opening to competition

Following the Railway Act, the industry is governed by five main actors:

- **Transport authorities:** the Department for Transport (DfT), a branch of Central Government, has authority over rail transport in the kingdom, with the exception of Scotland and London (TfL). It is responsible for defining the policy, funding the industry and tender the franchises⁵⁷.
- **The Office of Rail Regulation (ORR)** created in 2004⁵⁸, is in charge of regulating railways on two distinct areas: rail safety but also economic regulation, coordinated with national government.
- **Network Rail** is the public owned network manager. It gets its revenues from infrastructure tolls and direct government subsidies. It is in charge of management and maintenance of the network.
- **Transport Operating Companies (TOCs)** operate the train services across the country. They compete in bids for tenders over a bunch of lines which are then awarded for a limited period. The contracts are very precise on services, including stops, frequencies, and quality levels. Some lines are also open to competition in the market (for example London-Brighton or York-London).
- **Roscot** rent rolling stock to the TOCs

The franchise system results in a quite complex system for passengers, with twenty different operators competing on different markets.

⁵⁷ (Darling, 2004)

⁵⁸ Railway and Transport Safety act, 2004

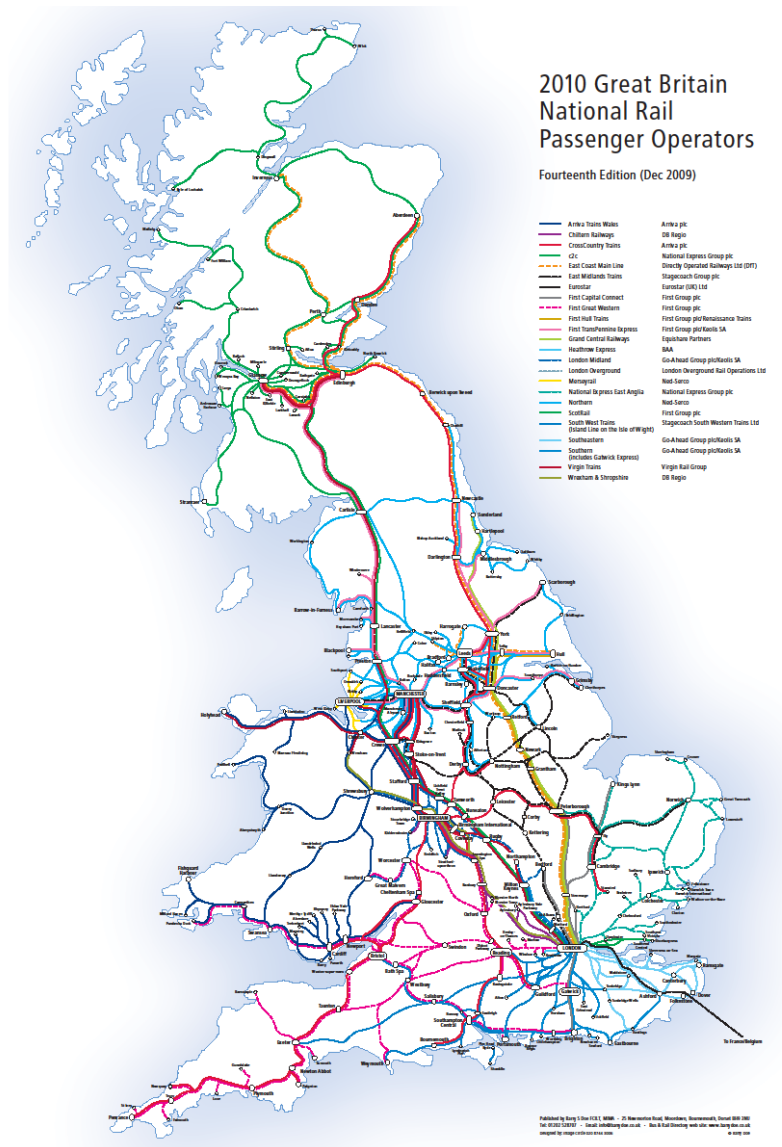


Figure 19: TOCs in the UK⁵⁹

Constraints on distribution ease the complexity somewhat, with certain tickets compatible on different companies. Distribution is thus unified to facilitate transfers. On the plus side, passengers benefit from a very diverse offer, segmented to suit the different markets, and very flexible to adapt to market trends.

iii) Conclusion

Thus the United Kingdom presents a fully open railway industry. The impact was a very significant increase in ridership, a more efficient management of the network after initial adjustments, and adaptation of supply to the demands of passengers. However the global cost of railways has not decreased, notably due to the important need for investment to renovate, following a long period of network depletion.

⁵⁹ (Doe, 2009)

2. Germany – a National Operator strengthened by competition

This analysis is based on a documentation research and on a field trip to Germany. The route followed was

- _ Arnhem-Hamburg via Duisburg, ICE, operated by DB in a partnership with NS
- _ Hamburg-Copenhagen via Fredericia, operated by DSB in a partnership with DB
- _ Malmö-Berlin, night train operated by Veolia Sweden
- _ Berlin-Leipzig, Interconnex, operated by Veolia Verkehr
- _ Leipzig-Berlin, ICE, operated by DB
- _ Berlin-Amsterdam, IC, operated by DB in a partnership with NS

This analysis will focus on the organisation of German railways in the first place, and how it evolved to house competition, and then the current state of competition in the country, regarding freight and passenger services.

i) Organization of railways in Germany

Germany has a relatively high population density, of 230 inhabitants/km², against 110 in France. Contrary to the French network, the German net is very dense and saturated, homogenous over the territory (versus centralized), organized around several nodes in the country.

Over the last twenty years, German railways have changed drastically. The European Regulation of 1991 and the first three railway packages (2001, 2004 and 2007) have induced a modification of the organization, with a progressive introduction of competition in railways. The reforms were aimed at two objectives: guarantee unhindered and fair access to the network for all operators, and set up accounting separation between network management and railway operations. It started in 1994 by a major reform that reorganized railways around three axes⁶⁰:

- _ First the national operator was reorganized. Deutsche Bundesbahn and Deutsche Reichsbahn, the two operators from Western and Eastern Germany were merged into DB AG. This new entity was given a private status with the federal government as its unique shareholder. It was further separated into four independent branches: regional passenger transport (DB Regio), long distance passenger transport (DB Fernverkehr), freight transport (Railion) and infrastructure management (DB Netz). A fifth branch was added in 1997: Stations (DB Personenbahnhöfe).

- _ Secondly a specific structure was set up to absorb the debt of the railways. A regulating body, the EBA, was given responsibility for guaranteeing fair access to the network. It was also in charge of infrastructure projects and funding. The federal government is responsible for maintenance and extension of the network; the network branch of DB is in charge of the actual works and receives subsidies and tolls for this mission. The BEV takes in charge the debt and the pension schemes.

- _ regionalization of regional passenger transport (see below)

These reforms brought the German railways from a state of heavy debt and large operational losses (combined 5 billion euros per years in 1990, and a forecast of 20 billion per year in 2000 if nothing was done) to a dynamic company with a large developments abroad (30% of

⁶⁰ (Geveau & Lepaon, 2012)

turnover) while retaining major positions nationally (80% market share for freight, 75% for regional transport and 99% for national transport)⁶¹.

ii) Current state of the railway market and degree of opening to competition

Freight – competition led Germany to become Europe leader

Following the large reform in 1993, DB thrived to reform its freight activities. It became leader in Europe in a few years. This was enabled notably because of competitive pressure to reform as the home market was open to intensive competition from local and foreign operators. In a growing market, where the volumes of DB did not decrease in general, the new operators captured 20% to 25% of market share. There are a total of 300 licensed freight operators, with 30 large ones.

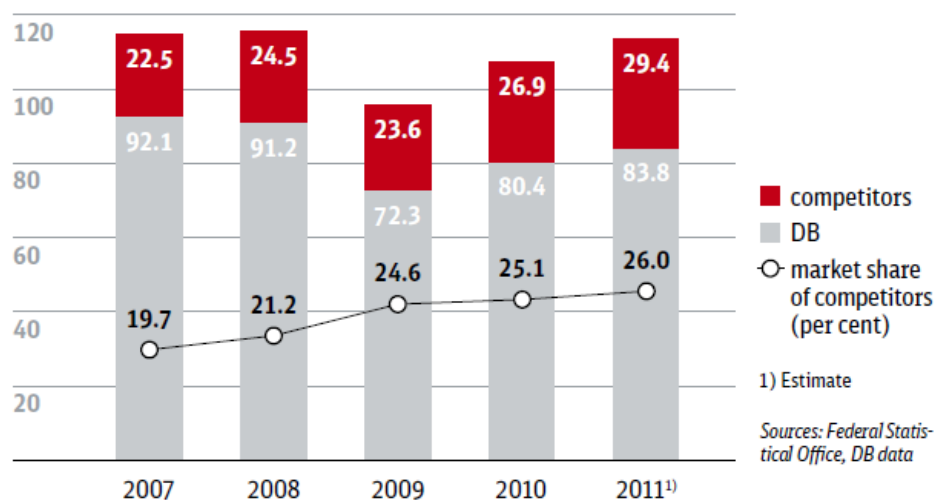


Figure 20: Market share of DB Schenker and competitors⁶² (billion ton-km)

Long distance and international passengers – marginal competition

Although in theory open to competition, international and long distance traffic is mostly operated by Deutsche Bahn. There are exceptions such as Thalys Cologne-Aachen-Brussels, in which DB holds a stake of 5% but against which it runs a competitive service with its own ICE trains. Veolia Verkehr also runs one long distance train on the Leipzig-Berlin-Rostock line (Interconnex) but this remains marginal niche markets.

DB has privileged partnerships with neighboring operators, for example on the Amsterdam-Frankfurt-Basel route with NS, or on the Paris-Frankfurt/Stuttgart routes with SNCF. The reasoning is that DB considers it can compete on an open access basis where the market is mature and large enough (Cologne-Brussels) but it needs a strong partnership with other operators where the main challenge is to compete against airlines (Paris-Munich). On the latter, the choice is to create the market and split it, the main identified competitor being airlines and not another rail operator.

⁶¹ (Gallot & Grass, 2012)

⁶² (Deutsche Bahn AG, 2012)

Regional passenger transport – Power to the Länder

Since the beginning of the 1990s, Germany has opted for regionalization of local passenger transport. Organization and supervision of regional passenger transport was voted in 1993, to be enforced in 1996. Since then, all 16 Länder have been fully in charge of regional railway transport, with a large autonomy on decisions and choices. In particular the Länder have the option to delegate their responsibility to local authorities, and to set up tendering bids for the local lines supervised by them. There are thus a total of 33 local transport authorities responsible for transport policy, choice of operators, funding and fares. Over 70 railway operators, including DB, operate local services. The federal State compensates the Länder with several billions per year (6.6 billion euros in 2007 for example).

Along with regionalization, competition was introduced in regional railways. After 16 years, almost a quarter of regional services is provided by competitors (measured in billion train.km, see Figure below).

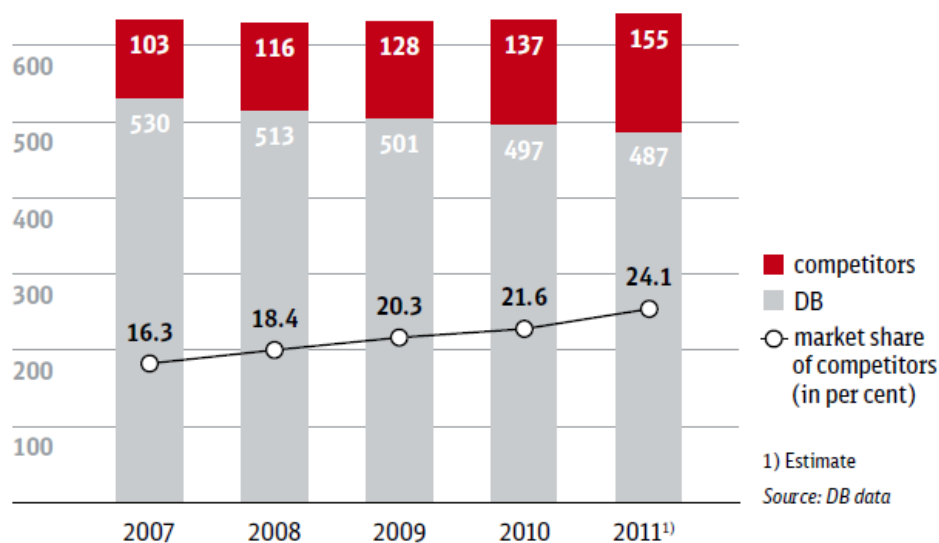


Figure 21: Competition in regional railways - billion train.km⁶³

Not all services are open to competition. Transport authorities have a choice between an open bid for tendering or a direct award to DB. In the beginning, a large share of open contracts was awarded to competition (60% of opened train.km on the period 2002-2006⁶⁴) but since then DB has regained competitiveness and is fighting back for its market.

⁶³ (Deutsche Bahn AG, 2012)

⁶⁴ (Séguret, 2007)

The degree of competition varies from one Land to the other. For example in 2004, a Land such as Bayern was still virtually closed whereas in neighboring Thüringen more than a quarter of train.km was operated by competition.

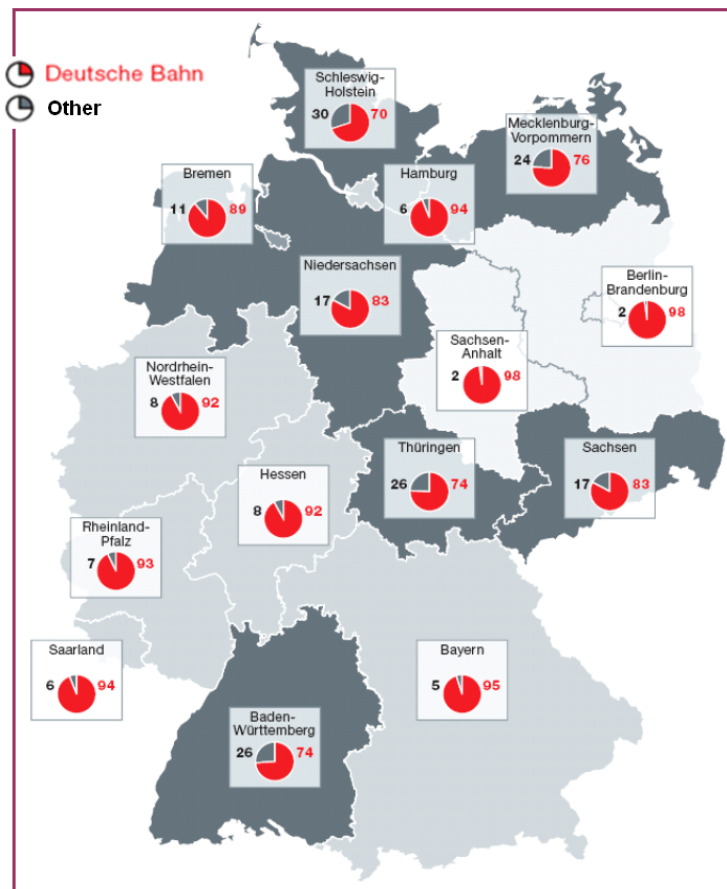


Figure 22: Degree of opening to competition in German Länder in 2004⁶⁵

The regionalization had three main effects. It drove the implementation of an hourly timetable, a massive renewal of rolling stock and the control of fares by transport authorities. In the end, train.km production increased by 28% from 1993 to 2006. All this led to an increase in ridership of 46% over the same period.

Implementation schemes varied but general patterns can be drawn:

- Bids and tenders are on the scale of a line or a small group of lines, never on the whole Land. This allows smaller competitors to bid for the market.
- Most often competition is organized for the market, but competition between operators on the same line is sometimes accepted by the transport authorities
- Risk lies mainly with the transport authorities: operators are paid a fixed amount per train.km. This means that all income risk lies with the transport authority, while the operators bear the risk of productivity.
- Control by the Transport Authorities is tight; they decide on lines, frequencies, fares, and rolling stock.
- Contracts usually last about 5 years if the PTO is buying the rolling stock, and 15 year if the operator does.
- Rolling stock is most often financed by the operator, and maintained in its own yard or outsourced.

⁶⁵ (Deutsche Bahn AG, 2004)

iii) Conclusion

German railways thus present three different markets and competitive states for the three segments (regional, long distance, and freight). Competition has been organized for the market where relevant and conditions have been set up such that new operators could profitably enter. There are however discussions now, with demands coming from new operators to keep the direct award possibility. This would be justified by the need for long term commitment in order to invest in rolling stock. But it freezes the market and closes the access, so that only current participants may take part further. This debate will be settled at the level of the European Commission for the Fourth Railway package.

Germany is thus an example of opening to competition while retaining a national operator. It proves that if well organized and under certain conditions, the scheme can benefit the travellers (with an improved level of comfort), the State (decreasing funding) and the national operator, who used the opportunity to modernize and reorganize its structures.

3. Sweden – Competition stimulating large productivity gains from the national operator

This analysis is based on documentation research and analysis and on a field trip to Sweden.

The route followed was

- _ Copenhagen-Malmö, Oresund, jointly operated by Veolia Sweden and DSB
- _ Malmö-Berlin, night train operated by Veolia Sweden

A return to Malmö-Stockholm was also planned, with one way travelling the X2000 of Swedish Railways and the return on the open access service operated by Veolia Sweden. Unfortunately it had to be cancelled for planning reasons.

This analysis will focus on the organisation of Swedish railways in the first place, and how it evolved to house competition, and then the current state of competition in the country.

iv) Organization of railways in Sweden

Sweden has a population of 9.3 million, which amounts to a density of 21 inhabitants per square km, for a rail network of 10,000 km length, mainly in the South and around Stockholm, where most of the population lives. The State owns the network, and the lines are divided in three categories: (profitable) national IC lines, open to competition since 2009, (unprofitable) long distance (mainly to the North, organized by the national government), and InterRegional (organized by local PTAs).

Introduction of competition

This state was reached by progressive opening of the market since 1980. It started in the 1980s by accounting separation between the operator (SJ) and the network. In 1988, a fully independent network owner was created, Banverket, later merged into Trafikverket. In 1992, provinces were given the possibility to contract their IR services to alternative operators, in 1996 freight was fully open, and in 2010 all national lines were fully open.

The initial aim of competition in railways was double: it was expected on the one hand to improve productivity and on the other to allow for other funding sources to take part in the industry. The productivity targets were reached, with cost cuts of 20% for the PTAs when market was open, including when SJ was awarded the tender.

v) Current state of the railway market and degree of opening to competition

The introduction of competition led to a redefinition of the roles of railway stakeholder on the government side:

- **Public Transport Authorities (PTAs)** are in charge of transport policy, including fares and services.
- **Rikstrafiken** is a national agency in charge of development of long distance train travel. It notably insures necessary coordination between the local PTAs, subsidizes long distance services where required and organized related bids.

- **Järnvägsstyrelsen**, the regulating body, is in charge of safety, and security. It was merged in 2009 into Transportstyrelsen
- **Konkurrenverket** is the competition authority, guaranteeing a fair competition and access conditions to the market.



Figure 23: Swedish Railways⁶⁶

vi) Conclusion

In 2010, the market was still mainly controlled by SJ, with 65% share in passenger transport, and three major operators, Connex, Arriva and Tagkompaniet holding a combined 30% market share. A total of 25 railway companies operate freight and passenger services across

⁶⁶ (Banverket, 2009)

the country under a range of conditions. Both freight and passenger volumes have steadily grown following the introduction of competition, with passenger ridership nearly doubling from 6 billion passenger.km in 1992 to 11 billion in 2008. Effects were also observed on fares, which decreased significantly⁶⁷.

⁶⁷ (Abraham, 2011)

Appendix 12 – The five branches of SNCF

SNCF (*Société Nationale des Chemins de Fer*) is in charge of rail transport operations on the French national network⁶⁸. It has a turnover of 8 billion Euros in 2011, with a complement of 4.5 billion Euros paid for by *regions* for the TER and Transilien (regional rail transport). The group has as many as 450 subsidiaries and organizations, grouped in 5 branches or activities

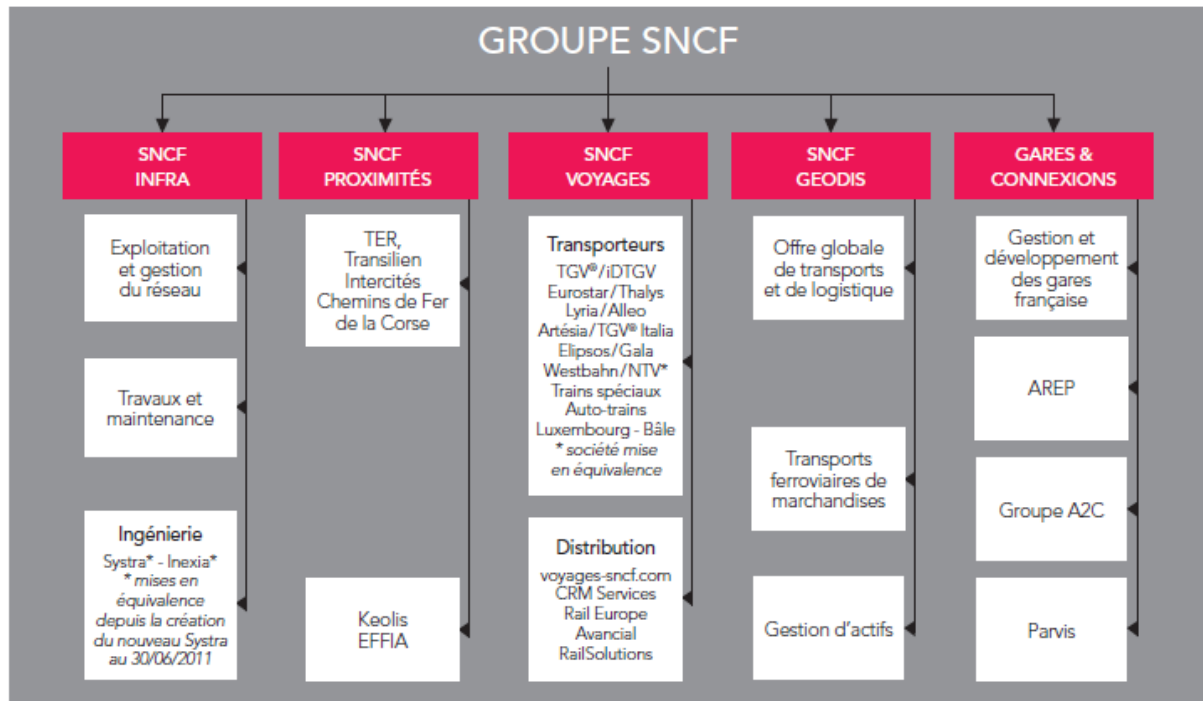


Figure 24: Structure of SNCF (Groupe SNCF, 2012)

Proximités oversees regional and local transport. It has three main components: TER (*Trains Express Régionaux*), Transilien (trains in Paris, lines C to U and parts of RER A and B) and Keolis. The two first account for the monopolistic activity in France for regional railways, while Keolis is a private law firm, partly owned by Caisse des Dépôts du Québec (30%), and plays in the competitive arena. With Arriva and Veolia Transdev, it is one of the three big players in urban and inter urban transports in the world, operating urban networks such as Lyon or Rennes in France (bus, tram and metro), or Melbourne in Australia. It is also a partner in the operations of the trains on HS1 in the South East of the United Kingdom. *Proximités* was also adjoined the TET or Intercity services (including night trains). It thus forms a branch where all activities are subsidized and contracted with a transport authority. It has a turnover on its own of 12 billion Euros and transports 10 million passengers per day.

⁶⁸ (Loi 82-1153, 1982)

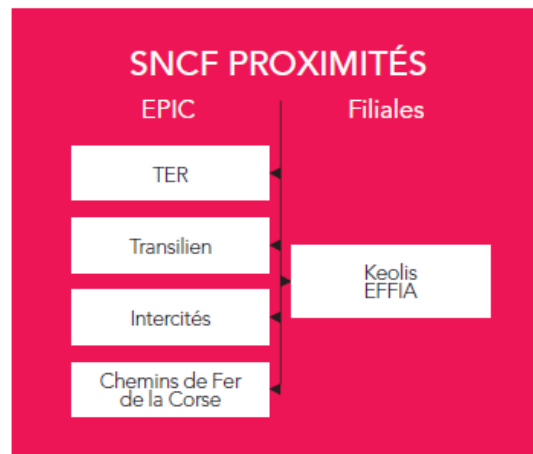


Figure 25: Structure of SNCF Proximités (Groupe SNCF, 2012)

Voyages oversees the former *grandes lignes*, consisting mainly of TGV lines. This includes TGV links in France, European links operated under TGV brand, such as Brussels-Marseille, and the range of subsidiary SNCF created along the years, mainly as partnerships with the neighbouring operators: Eurostar to London, Thalys to Brussels, Amsterdam and Cologne (with Deutsche Bahn and NMBS), Alleeo to Frankfurt and Stuttgart (with Deutsche Bahn), Lyria to Switzerland (with SBB), Ellipsos to Spain (with Renfe) and formerly Artesia with Trenitalia. Voyages also includes subsidiaries such as IDTGV (low cost TGV brand), Aspartam (ever lower cost TGV), or IDBUS (Buses running throughout Europe), but also the website voyages-sncf.com, which operates as a travel agency and sells hotel rooms, car rentals, plane tickets and full trips besides the traditional train tickets. The *Voyages* branch thus groups all the competitive services and operations of SNCF, where trains are operationally profitable – and could be one day opened to competition in the market. It has a turnover of 7.3 billion Euros and 130 million customers per year.

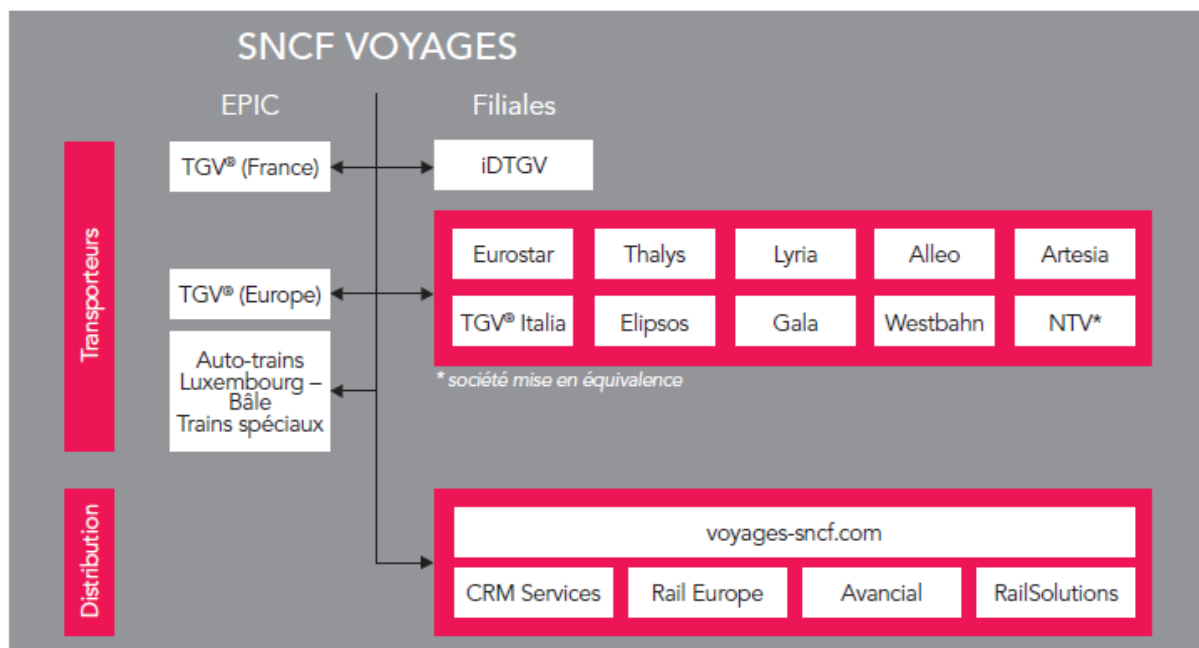


Figure 26: Structure of SNCF Voyages (Groupe SNCF, 2012)

_ ***SNCF Geodis*** is constituted of all the logistics activities of SNCF. Similar to DB Schenker (though not by size), it includes several separate entities. *Fret SNCF* is the traditional freight operator of SNCF. However, to fight the depletion of its market share and be able to compete on more equal ground, SNCF also created subsidiaries such as VFLI, a private law firm which carries freight on rail. SNCF also bought Geodis, a major player in road freight in France and Europe, and which constitutes a large share of the freight activity of SNCF. Other entities such as Sernam are also found in SNCF Geodis, which thus groups all the activities and subsidiaries related to freight transport, by rail or road. It has a turnover of 9.4 billion Euros.

_ ***Gares et Connexions***, similar to NS stations, owns and operates all stations in France. It is the most recent of all SNCF branches, and was created to guarantee the equality of treatment between the different actors once the market starts opening. One specificity is that SNCF owns the stations but not the platform and the tracks within the stations, which then belong to RFF. Within station operations, SNCF has subsidiaries dealing with parkings (Effia), shopping centres, architecture (AREP) and cleaning for example. It has a turnover of 1.2 billion Euros and 14,000 agents.

_ ***SNCF Infra*** is a very particular branch. Fully within SNCF, staffed with SNCF agents, managed by SNCF, its role is to manage and maintain the infrastructure on behalf of RFF. The two main components are infrastructure management on the one hand and track maintenance and works on the other hand. It has 52,000 employees and a turnover of 5.3 billion Euros