Greenways and véloroutes: promising tools for regional development

Investigating the Nîmes and Montpellier Bypass railway project

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ABSTRACT

In a context of increasing attention to sustainability issues, France has formulated a number of strategies to develop greener transport practices. The French National Sustainable Development Strategy is one of them and - among other topics - it encourages soft mobility and the development of active modes of transportation such as walking and cycling. In such a setting, the Nîmes and Montpellier Bypass railway project stands out thanks to one of its specificity: planning simultaneously for a high-speed line and a véloroute. A critical investigation of the véloroute’s planning process within this project provides elements that may improve usual greenways and véloroutes projects.

SAMMANFATTNING
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I will finish with loving thoughts for my family, my friends and my most beloved boyfriend. Your support despite the geographical distance between us made me so much stronger and wiser.
LIST OF ABBREVIATIONS

DSCR: Délégation à la Sécurité et à la Circulation Routières or Road Safety Commission
DUP: Déclaration d’Utilité Publique or Declaration of Public Utility
G&Vs: Greenways and véloroutes
MEDDE: Ministère de l’Écologie, du Développement Durable et de l’Énergie or Ministry for Ecology, Sustainable Development and Energy
NMB: the Nîmes and Montpellier Bypass railway project.
NSDS: the French National Sustainable Development Strategy 2010-2013
PPP: Public Private Partnership
RFF: Réseau Ferré de France or French Rail Network.
SN3V: Schéma National des Véloroutes et Voies Vertes or National Greenways Blueprint

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1. LEAD-IN

This first chapter provides the reasoning for choosing the subject of greenways and véloroutes. It states the research question, clarifies the purpose of this thesis and eventually, it offers a reading guide of the upcoming chapters.

1.1 INTRODUCTION

The significance of transport and mobility issues in the field of urban and regional planning is no longer to be proved. The interrelated flows of people and good contribute a great deal to shaping our neighborhoods, cities and regions.

There has been a huge increase in the frequency, speed and distance of human mobility since the industrial era. Indeed, technological progress has metamorphosed transport systems and has progressively eased the access to increasingly performing modes such as the car, the train, and later on the high-speed train and the plane. This ever-facilitated mobility has been encouraged for its benefits on the world’s economic and social patterns (e.g. possibility to work with people from all over the world or to travel for tourism). (Crozet, 2009) This has been true to such an extent that further and faster mobility has been considered a characterizing feature of the modern society: “in many ways the modern world is inconceivable without these new forms of long-distance transportation and travel. It is not the pedestrian flâneur who is emblematic of modernity but rather the train passenger, car driver and jet plane passenger” (Lash and Urry, 1994, p252).

In line with this context, the French transport policy was once oriented towards a greater provision of transport infrastructures. But the recent and internationally shared awareness regarding sustainability issues and the attention to long-term impacts of the human activity have questioned this “modern” mobility pattern. Indeed France, as many other countries, is now being confronted to the negative impacts of it: environmental impacts (e.g. high levels of pollution and of greenhouse gases emissions) as well as socio-economic impacts (e.g. transport network congestion, urban sprawl, unequal access to transport facilities). (L’Homel, 2012)

A shift is now occurring with a global tendency to promoting more environmental friendly and carbon-free mobility. Prioritization of collective transportation (e.g. buses, tramway, train, car-pooling), encouraging the use of renewable energy for transport (e.g. electric vehicles, buses fuelled with biogas) and promoting soft mobility and active modes (e.g. walking, cycling, skating) are the main axes developed to improve sustainable mobility.

In the field of urban and regional planning, several paradigms developed with the hope of turning the greater need for greener mobility from good will planning theories into practical and conclusive changes. One of them, most fully developed in Europe according to Robert Cervero is the model of Transit Oriented Development (TOD). Cervero defines it as a “straightforward concept: concentrate a mix of moderately dense and pedestrian friendly development around transit stations to promote transit riding, increased walk and bicycle
travel, and other alternatives to the use of private cars.” (Cervero, 2006) This concept has successful examples of implementation in various urban contexts - Brazil, Singapore, and Sweden to name a few – and even in the notorious car-dependent USA.

At a larger scale, the interplay of planning for transportation infrastructures and for economic development is also acknowledged. Peter Calthorpe posits that the regional scale is the most relevant scale to address current issues regarding transport and sustainability. He argues that “more than ever, regions define our lives. Our job opportunities, cultural interests and social networks” develop at this scale (Calthorpe, 20002). Doubting that transit alone could be sustainable, he argues that new transport planning should accommodate all modes and make the most of each.

In France a particular attention is being put on cycling both as a daily mode of transportation and as a leisure activity. Great efforts have been made to develop dedicated itineraries for soft and active mobility spreading outside urban areas called greenways and véloroutes. Although the term véloroute is typically French, the term greenways refers - both in concepts and in reality, throughout the literature – to a great diversity of man-made trails which may differ in spatial scale, purposes, landscape contexts, and planning strategies (Ahern, 2005).

Between 1998 and 2010 no less than 7 300 km of those infrastructure have been created in order to reach the total length of 10 000 km of cycling lanes. The objective of the French authorities is to reach a total length of 20 700km of these regional infrastructure by 2020. (MEDDE, 2011b) The following comparison may help grasp the significance of the French objective regarding greenways and véloroutes: in 2009, France had the most extensive network of high-speed lines in Europe with 1 884 km (the objective–length for G&Vs for 2020 is approximately ten times longer) and the second greatest European network of railway infrastructures which was 29 273 km-long (objective–length for G&Vs for 2020 amounts to around two third of this length) (RFF, 2009a).

The considerable investments in greenways and véloroutes warrant a close attention to the French mobility policies surrounding those infrastructures. What potential do they hold and what is the rationale for developing them in France? In fact this thesis work will investigate a novelty within the topic of greenways of véloroutes in France: the simultaneous planning of a véloroute and of a railway line. Indeed a high-speed line project in the South of France called The Nîmes and Montpellier Bypass includes the creation of a véloroute along with the railway line.

1.2 Problem Statement

It appears that the topic of greenways and véloroutes can be examined in the light of transport and mobility policies, of planning processes, of economic benefits and much more. The investigation of the Nîmes and Montpellier Bypass case – so far unique in France – will
here aim to get a valuable image of the conditions under which the véloroute was planned in
the NMB project and to answer the following research question:

What is the relevance of planning for a véloroute simultaneously to a regional high-
speed line?

What is the rationale for this original arrangement? Could it be traced to a specific
intention or did the NMB’s véloroute just happen to be part of this railway project? Which are
the advantages and disadvantages of the combined planning of the railway and the véloroute
compared to the traditional way of planning G&V? What lessons could be learned from the
investigation of the NMB case?

This study will thus discuss the relevance of planning for G&Vs as such by investigating the
potentials of such infrastructures for French regions. It will question the place of such a
process within the French mobility policies. And then determine the main advantages and
downsides of planning for a véloroute within the Nîmes and Montpellier Bypass project.

1.3 Purpose

The main purpose of this thesis work is to understand the relevance of planning for a
véloroute within the NMB railway project. By investigating how this planning was done, it will
be possible to assess this so far novel arrangement in relation to the potentials and limitations
of usual planning processes of greenways and véloroutes.

1.4 Reading Guide

A brief explanation of the structure of this report might be helpful for the reader to go
through this thesis work and understand the research process and the findings.

The following chapter describes the methodology that was used to carry out this master thesis.
It presents the research design that was adopted and the empirical work (introducing SETEC
INTERNATIONAL – the company responsible for conceiving of a half of the railway line and
of the NMB’s véloroute ; presenting the literature research and the qualitative research); and it
examines the reliability, validity and generalizability of the study.

Chapter 3 presents greenways and véloroutes in France, and explains how they are built. It
then discusses the potentials G&Vs for the development of French regions. Lastly it highlights
some shortcomings of the current planning practice and the current planning processes
aiming at creating G&Vs.

The next chapter introduces the contextual background of the Nîmes and Montpellier Bypass
railway project, before it analyses the relevance of including a véloroute project within it. It
discusses both the framework and the actual planning practice of the véloroute within this project.

Finally, the last chapter summarizes the reflection on which this thesis work was articulated and then provides a reflection on the work carried out for the thesis and on how the study could be enlarged.
2. METHOD

This chapter describes the research design that was adopted for this thesis work, and explains how the quantitative and qualitative data were obtained.

2.1 THE RESEARCH DESIGN

The work carried out for this thesis can be characterized as exploratory research. Indeed, the main purpose of the work is to give an image of a novel situation (planning a véloroute simultaneously to a high-speed railway project) which is thus not well understood a priori. The reasoning for this investigation followed a process of “questioning and inter-relating”. The mind map shown by the figure 1 below summarizes the main steps in this study.

![Mind-map of the research design](image)

The first step consisted in separately defining greenways and véloroutes on the one hand and on the other hand contextualizing the NMB railway project. From those two distinct subjects it was possible to derive a number of topics such as environmental sustainability, inter-modality in mobility issues, tourism and improved accessibility etc. which could tie together the two subjects. For this thesis work, the most interesting points that interrelated G&Vs and the NMB project were deemed to be:
- the question the potential of the infrastructures for regional development, and,
- the place of the creation of these infrastructures within current French transport and mobility policies.

At this stage it was possible to confirm that the research question warrants study. Finally a set of question dealing more specifically with the NMB’s véloroute were raised.

Identifying the type of research design contributes to choosing relevant methods for the empirical part of the research. In exploratory research the problem is unstructured which means that the elements coming into play are not given a priori or not completely understood. Such research design thus calls for observations, investigations and theorization; that is to say that it requires mainly qualitative methods during the empirical part of the research. (Ghauri and Grønhaug, 2010, p56).

Accordingly, the research made use of an internship within SETEC INTERNATIONAL – a French engineering company responsible for conceiving a half of the railway line and of the NMB’s véloroute - to observe and investigate the NMB project and especially the topic of planning for a greenway. This observant position was completed with literature searches the gathering of quantitative and qualitative data.

2.2 Empirical work

2.2.1 Presentation of SETEC INTERNATIONAL

SETEC INTERNATIONAL is one in about thirty other companies of the French engineering and consultancy group SETEC (from the French Société d’Études Techniques et Économiques meaning Technical and Economic Studies Company). The group was created in 1957 and is now one of the biggest engineering groups in France with more than 2 100 employees and a turnover which reached 235 million € (more than 2 billion SEK) in 2011. SETEC operates on projects all over the world thanks to the location of its companies in many cities of France and many places of the world (Europe, Africa, South America and Russia). (SETEC, 2011)

SETEC is more specifically responsible for producing the detailed preliminary design of the eastern half of the railway line. Within the group SETEC, a number of companies are involved in the project but the main actor is SETEC INTERNATIONAL.

Each company of the SETEC group specializes in specific activities and/or area of expertise. SETEC INTERNATIONAL works primarily with:

- transport economics (studies of passenger and freight transportation, studies of traffic and revenues and economic studies);
- design and construction supervision for linear infrastructures (roads and motorways, standard and high-speed railways, canal, ports and airports);
- protection of the environment (impact assessments, compensatory or protective measures, statutory procedures, and landscape architecture).

The company’s areas of expertise include the design of linear infrastructures; operations in geotechnics; earthwork and road pavements; and lastly economic audits. (SETEC, 2011)

In 2011, SETEC INTERNATIONAL had over 262 employees and a turnover of 37 million € (more than 316 million SEK). SETEC INTERNATIONAL has four offices in France and its headquarters is in Vitrolles (close to Marseille). (SETEC INTERNATIONAL, 2011) Within SETEC INTERNATIONAL five departments are involved in the NMB project:

- the department of project management and design. It supervises over and coordinates the work that is carried out by the other departments and by the other companies of the SETEC group. It also produces the geometric design of the line and works with the other companies of the SETEC group.

- the department of hydrology. It studies the natural water flows and how they have to be managed and preserved. It also works with the questions dealing with the drainage and sanitation of the platforms and decks of the roads and the railway;

- the department of acoustics. It studies the impacts in terms of noise and air pollution are and plans for the mitigation of these impacts;

- the department of geotechnics. It is responsible of the technical plans concerning earthwork, road pavement etc. and it studies potential risks linked to land (in-)stability;

- the department of environment. There inventories of local species and natural constraints are made. The department identifies, assesses and analyses environmental impacts and plans for mitigation measures. It also delivers statutory procedures;

- the department of equipment. It is responsible for the study of required safety amenities (safety barriers, guard rails, road signs etc.) as well as operating amenities (service areas; rest areas, emergency lanes, tollbooths etc.).

In every department a team of CAD technicians and technical designers assist the engineers.

2.2.2 Research activities around the véloroute

In practice, the research activities targeted both the design of the high-speed line itself and the design of the véloroute. Indeed within SETEC INTERNATIONAL both issues were treated concomitantly. The first stage of this study consisted in reading through official documents to understand how the context of the creation of the NMB’s véloroute was presented. Then, by searching for more general literature on the topic it was possible to get a bigger picture on the topic, to be able to understand the stakes with those types of infrastructures; and to reflect on the official presentation.

At the beginning of this thesis work, SETEC INTERNATIONAL had already chosen a preliminary itinerary for the véloroute. This preliminary choice was being refined as the
project went on. At this stage, a multi-criteria analysis was carried out with the aim of studying potential alternative routes. To do so, two field trips were conducted one month apart (February and March 2013) to settle down a number of technical issues and to get a clear and concrete image of the environment that the users of the véloroute would enjoy. This evaluation made use of quantitative data such as road traffic figures. Once the route was validated; the technical 3-D design of the véloroute could begin. This design had to be controlled to ensure that it would meet the required technical specifications: soft slopes, width of the lanes etc. (for more details, see section “3.1.2 Implementing greenways and véloroutes: technicalities and beneficial elements” in the next chapter).

One part of the empirical work consisted in designing a semi-structured questionnaire (see annex A – Questionnaire on greenways and véloroutes) to investigate the average knowledge about greenways and véloroutes among the people working at SETEC INTERNATIONAL (the choice of the respondent is further discussed in the next sub-section “2.3 Reliability, validity and generalizability”). A sample of 60 respondents could then be gathered and the answers contributed to discuss the hypothesis that the French users did not have a sufficient knowledge about greenways and véloroutes. The choice of a semi-structure questionnaire facilitated the exploitation and the possibility to do a statistical analysis of the data gathered. A first pilot questionnaire was sent out to four respondents in order to make sure that the questions were correctly formulated, that they were properly understood and more importantly that they did not trigger any feeling of reluctance or discomfort.

2.3 RELIABILITY, VALIDITY AND GENERALIZABILITY

The scope of this research work is limited to France which makes it not directly generalizable. However the French case can be relevant for other countries in Europe and even around the world since France is a significant cycling country in Europe. Indeed, according to the French ministry of Ecology, Sustainable Development and Energy (MEDDE, 2011a) France is the first destination for cyclists and the third country in numbers of bicycles-sales behind the Netherlands and Germany.

The use of observations contributes to gathering accurate first-hand data collected in the natural setting and thus makes this thesis work reliable. However the risk here with using such a qualitative technique is the participation of the researcher into the observed situation. For this thesis work, one of my objectives was to assess the planning process of the véloroute and yet I was working on a daily basis with an actor of the planning process I was investigating. This situation bears the risk of a biased analysis and but I believe that I managed not to get influenced by the stakeholders with whom I worked. Indeed I always tried to wonder how each and every single decision could be perceived on all sides and also I had myself no power of decision over the processes; instead I remained only an executant of others’ decisions only
and with virtually no power of decision over the processes. In this position, I could observe very thoroughly the processes and stakes interplay.

The use of a convenient sample which means the respondents available at the time being for the questionnaires needs also to be discussed here. The main advantage of it was that it guaranteed a rather high response rate. When it comes to examining the generalizability the survey, it has to be said that the sample does not represent the general French opinion. Indeed the first issue arises from the fact that the respondents are all members of the same company and might tend to have similar mindsets and behaviours. Yet, their answers provide valuable information since the topic of greenways and véloroute has by no means proved to be an element of similarity within the company. Only a few respondents actually worked on the NMB project, and when they did their work only focused on the technical design of it. Besides, there is no reason a priori to believe that they share the same interest in touristic activities or have similar leisure-oriented transportation habits. Nevertheless, one point of similarity was unavoidable: although the respondents come from different regions of France, they all live in the same department and it is reasonable to believe that their touristic opportunities may look alike; at least concerning the question of using greenways and véloroutes for touristic purposes.
3. THE POTENTIAL OF GREENWAYS AND VÉLOROUTES FOR REGIONAL DEVELOPMENT

Chapter 3 presents greenways and véloroutes in France, and explains how they are built. It then discusses the potentials G&Vs for the development of French regions. Lastly it highlights some shortcomings of the current planning practice and the current planning processes aiming at creating G&Vs.

3.1 PRESENTATION OF GREENWAYS AND VÉLOROUTES

3.1.1 Greenways and véloroutes in France

Greenways are non-urban pathways designed for the restricted use of non-motorized users: pedestrians, cyclists, skaters, horse riders and disabled people to name a few. The creation of such lanes is encouraged by the French government because greenways are considered tools that promote environmental-friendly and safe mobility both on a daily basis and for leisure activities. The definition of greenways was first added to the Traffic Laws on the 16th September 2004 by a governmental decree and as part of the policies in favor of non-polluting mobility in France. Besides, the creation of greenways in France is part of a greater elaboration of a “green” cycling network proposed by the European Greenways Association and supported by the European Commission. (DSCR, 2004)

Véloroutes are distinguished from greenways because they refer to non-urban and continuous biking routes for medium or long distance travels which do not fully meet all of the technical standards of greenways. One objective of the French authorities is that, in the long run, véloroutes will follow become greenways. Figure 2 below illustrate the difference between greenways and véloroute when it comes to their ground coating.

Figure 2 – An example of technical difference between a greenway and a véloroute: the ground coating.
G&Vs are viewed as transport infrastructures that enable *soft mobility or active mobility* which is defined as “movements in the streets or on roads that require no other energy that human effort such as walking, cycling, skating, rollers-riding…” (GART, 2008). In this thesis G&Vs may be referred to as *soft infrastructures* as a reference to the fact that they are infrastructures constructed to enable soft mobility.

Greenways and véloroutes have to be constructed in accordance with the *Schéma National des Véloroutes et Voies Vertes* (SN3V) or National Greenways Blueprint which specifies where and how they can be built. The latest one was elaborated in 2010 with an additional aim to better connecting the French greenways’ network to the European one (see figure 3 below). Deriving from the national blueprint, each region has to define a regional greenway blueprint. (MN3V, 2005)
3.1.2 Implementing greenways and véloroutes: technicalities and beneficial elements

Greenways and véloroutes should meet a number of technical criteria defined in the SN3V and illustrated by the figure 4 below. The technical specifications are set to make sure that all categories of users feel comfortable when using them – especially children, disable people and elderly people. The vicinity of the greenways, and the resting areas along them should have a specific landscape-design. Moreover, the routes should be avoiding the crossing of roads that have a great traffic level (more than 1000 vehicles a day) and whenever that is not possible an extra attention should be put in the design of the intersection to ensure the safety of the
greenways 'users. The itinerary should be indicated and equipped with specific road signs. (SN3V, 2010)

Figure 4 – Technical specifications for French greenways and véloroutes

The average cost of creating a 1 km-long greenway or véloroute as specific infrastructure is around 100 000 € (around 860 000 SEK) in France and varies depending on the ground surfacing chosen and excluding the land and right-of-way costs. When it comes to adapting existing roads to enable the existence of those itineraries, the costs are around 20 000 €/km (around 172 000 SEK). In both cases, an additional cost of around 1 200 €/km (around 10 300 SEK) for signalization purposes and so on should be added to the construction costs. Finally the maintenance costs vary between 2 500 and 4 000 €/km and year. (CyclotransEurope, 2012) The cost of right-of-ways or simply the availability of land is often an important issue when it comes to the practical creation of the feature. To overcome this issue, G&Vs follow very often old, unused or abandoned road and increasingly former railway trails which are out of service. Often, this has the double advantage of reducing the construction cost as well.

The technical choices (for instance the ground coating used, or the amount of signalization boards along the way) will have considerable implications on the accessibility of the itineraries and on their popularity.

To guarantee their profitability, the SN3V thus insists that the greenways and véloroutes should be as much as possible integrated into the local socio-economic context by serving a number of public facilities (railway stations or schools for instance) as well as touristic locations. The integration also implies a provision of service to the users of the véloroute: accommodation, information points, repairing points, resting areas etc. along the itinerary. Indeed such integration is a decisive element in producing economic benefits for the local economy (creation of jobs, promotion of local activities, local landscape and local products for instance) and makes the itinerary successful.
3.2 Greenways and véloroutes, tools to value the French regions

3.2.1 Soft infrastructures encouraging green mobility for all…

The use of greenways and véloroutes is in line with the promotion of non-polluting modes as well as with the encouragement of intermodal transportation. Indeed French public transportation means (regional buses, trains, and boat shuttles etc.) are in their majority already adapted to the transport of bicycles. Moreover, the promotion of green mobility applies to all users, and that is why efforts are made to improve the access of disabled people to all French public transportation means.

The potential of G&Vs for users to move about is not just a façade. Indeed, the average speed of a cyclist is 14 km/h (Biret et al., 2004) which means that in a 5 hours trip, you can ride 70 km which is almost 3 times the length of the NMB’s véloroute. That means that even with a slower pace, cyclist can travel fairly long distances which is valuable for the tourists. Currently the average speed in an electric-wheelchair is around 6 km/h which allows shorter trips, but a recent electric vehicle designed for disabled people allow them to reach 20 km/h (Bougeard, 2013).

Besides tourists are attracted by safe and entertaining trips as they should be along greenways thanks to their design criteria and the possibilities to travel along beautiful landscapes and to discover the local culture that they enable. Examples from research in the US proves that “many communities find that trails and greenways provide the tools to turn geographic resources into community trademarks that become focal points of civic pride” (Trails and Greenways ClearingHouse, undated).

Finally greenways and véloroutes are meeting places and they are places where socio-economic standard are very likely to fade away. Indeed the user has no entry-fee and the costs of riding along an itinerary for a touristic trip for instance are adaptable to one’s wishes. As a consequence there is no excluding factor in relation to socio-economic conditions. Accordingly greenways and véloroutes appear as places open to all users regardless of their socio-economic specificities.

3.2.2 … and which enhance the vitality and the structure of the territory

The 20 000 km-long (French network of greenways and véloroutes spread throughout the whole metropolitan territory. The national and regional routes make it possible to access a great deal of locations. The interest of such a network for tourism purposes is thus obvious: greenways and véloroutes allow all types of users from all kind of socioeconomic background to visit a great variety of locations and to inject money into their economies. Moreover an increasing number of tourists look for affordable and non-pollutant activities that can benefit the local economy: greenways and véloroutes have a real potential to attract them.
Accordingly, the very requirements for the creation of véloroutes and greenways include a particular attention to the integration of the itineraries into the local economy. Indeed, G&Vs can benefit the local economies if the users get an appropriate amount and quality of services when they use the itinerary. The users will be very likely to spend money and give a positive opinion about the itinerary. The first impact will be on the development of tourism, but with an increasing notoriety, some places might attract long-term dwellers and if people are very interested in living in some places, companies may be very likely to settle in those places. And with more companies, more economic activities are likely to develop for both tourists and dwellers. This exemplifies a possible “virtue” cycle that could stem from the development of G&Vs.

Another interesting feature of the French network of greenways and véloroutes is its European window. With already 6 out of 14 EuroVelo routes crossing France (see figure 5 below) the network becomes a tool to strengthen both physical and cultural ties on the European level. The creation of European itineraries of greenways and véloroute was at least the occasion to initiate the cooperation of the countries.

Finally, the creation of greenways and véloroutes could contribute to uniting local, regional and national authorities around a project that contributes to structuring the territory - since the planning process requires the cooperation of actors from these different levels (MN3V, 2005) including to solve possible conflicts or disagreements - and to enhancing the coherence of the territory by connecting more locations together.

Greenways and véloroutes thus appear as soft infrastructures that are well aligned with the recent French strategies to promote non-polluting transport modes, to highlight regional assets and to develop the local economy. Their creation sets a platform for organization and cooperation at very different scales: local, regional, national and even European levels.
3.3 A NEED FOR INNOVATIVE PLANNING PROCESSES

3.3.1 The multiplicity of actors in the planning process

In France, there are many strategies to set up the creation of a greenway or a véloroute which may vary depending on many elements: the local context, the future manager of the infrastructure, the entity initiating the creation, the funding process and so forth. And no

Figure 5 – The 14 EuroVelo Routes (Source: The European Cycle route network (2013))

1 - Atlantic Coast Route (North Cape-Sagres) - 8 186 km
2 - Capitals route (Galway-Moscow) - 5 500 km
3 - Pilgrims Route (Trondheim-Santiago de Compostela) - 5 122 km
4 - Central Europe Route (Roscoff-Kiev) 4 000 km
5 - Via Romea Francigena (London-Rome-Brindisi) - 3 900 km
6 - Atlantic-Black sea (Nantes-Constanta) 4 448 km
7 - Sun Route (North Cape-Malta) 7 409 km
8 - Mediterranean Route (Cádiz-Athens-Cyprus) 5 888 km
9 - Baltic-Adriatic (Gdansk-Pula) 1 930 km
10 - Baltic Sea Cycle Route (Hansa Circuit) 7 980 km
11 - East Europe Route (North Cape-Athens) 5 984 km
12 - North Sea Cycle Route 5 932 km
13 - Iron Curtain Trail (Barents Sea-Black Sea) 10 400 km
15 - Rhine Route (Andermatt-Hoek van Holland) 1 320 km
matter who undertakes the project, another lengthy list of state authorities, associations, and companies should be consulted (see Table 1 below for some examples). (MN3V, 2005) Such a loosely framed process enables flexibility in the planning process and it requires an active collaboration of all actors of the process. However it bears the risk of being difficult to keep under control until completion and to actually get things done. Indeed the multiplication of actors sometimes causes problems in the communication processes or the negotiations (e.g.: a lack of continuity due to changing responsible persons).

<table>
<thead>
<tr>
<th>Actor</th>
<th>Possible interventions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regions</td>
<td>Initiating, funding, maintaining, construction, land owner</td>
<td>There are 27 regions in France and a route might cross several regions</td>
</tr>
<tr>
<td>Departments</td>
<td>Initiating, funding, maintaining, construction, land owner</td>
<td>There are 101 departments in France and a route often crosses several departments</td>
</tr>
<tr>
<td>Municipalities and association of municipalities</td>
<td>Initiating, funding, maintaining, land owner</td>
<td>There were 36 682 municipalities in France on the 1st January 2013(INSEE, 2013), and a route crosses several ones.</td>
</tr>
<tr>
<td>Réseau Ferré de France</td>
<td>Initiating, funding, construction, land owner</td>
<td>An increasing number of old railway line are chosen as potential tails for greenways and véloroutes</td>
</tr>
<tr>
<td>Office National des forêts or National Forestry Office</td>
<td>Advisory role, land manager</td>
<td>Forest are valuable settings for greenways and véloroutes’ trails</td>
</tr>
<tr>
<td>Voies Navigables de France or French Office for Waterways</td>
<td>Advisory role, land manager</td>
<td>The banks of rivers and waterways are valuable settings for greenways and véloroutes</td>
</tr>
<tr>
<td>Directions Départementales des Territoires or Territorial Department Offices</td>
<td>Advisory role and statutory procedures</td>
<td>There is one such authority for each department</td>
</tr>
<tr>
<td>Office de tourisme or Tourist Board</td>
<td>Advisory role, promoting</td>
<td>They play an important role in publicizing itineraries</td>
</tr>
<tr>
<td>User associations</td>
<td>Initiating, promoting</td>
<td>They are countless (associations for hiking, horse-riding, cycling etc.) and very important to publicize the itineraries. For Europeans greenways, European associations should be involved</td>
</tr>
</tbody>
</table>

Table 1 – A non-exhaustive list of potential entities involved in the planning of a greenway or a véloroute project
The biggest hindrance for a smooth and efficient planning is actually the absence of a specific legal document for the planning of greenways and véloroutes. The difficulty actually lies in the integration of the mobility plan induced by the creation of a véloroute to other existing legal frameworks. Indeed, there are several planning documents – at different territorial levels – with which coherence has to be ensured when planning for greenways and véloroutes (see Table 2 below). Ensuring the coherence thus requires early involvements of most actors likely to participate in the planning process. (MEDDE, 2011b)

<table>
<thead>
<tr>
<th>Planning document</th>
<th>Territorial level</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schéma de Cohérence Territoriale (SCoT) Scheme for Territorial Coherence</td>
<td>Municipalities</td>
<td>Their main goal is to ensure the coherence between the urban development and the existing transport systems. They are important for the discussions regarding inter-modality which contribute to the success of greenways and véloroutes</td>
</tr>
<tr>
<td>Plans de Déplacement Urbain or Urban Mobility Plan</td>
<td>Cities, association of municipalities</td>
<td>Important since greenways and véloroutes might cross urban areas</td>
</tr>
<tr>
<td>Plan Local d’Urbanisme or Urban Planning Plan</td>
<td>Cities, association of municipalities</td>
<td>Important since greenways and véloroutes might cross urban areas</td>
</tr>
<tr>
<td>Projet d’Aménagement et de Développement Durable (PADD) or Project for Planning and Sustainable Development</td>
<td>Cities, departments</td>
<td>They set the objectives regarding sustainable mobility policies and sustainable planning.</td>
</tr>
<tr>
<td>Document d’Orientations Générales or General Orientations Document</td>
<td>Municipalities</td>
<td>They ensure the continuity and coherence between the PADD and the SCoT</td>
</tr>
</tbody>
</table>

Table 2 – Planning documents impacting the planning of greenways and véloroutes (own adaptation from MEDDE, 2011)

3.3.2 A need for improved publicity

Since the profitability of greenways and véloroutes lies in the money that the users inject in the local economy when travelling the itineraries, the question of the “popularity” of these soft infrastructures is of much interest. This question was examined with the use of literature searches and of a questionnaire.
The literature provides examples of very successful projects: for instance, the Saône-and-Loire (71) greenway route, a portion of the EuroVelo 6 (Atlantic-Baltic Sea) which generated approximately 121,000 € (more than 1 million SEK) per km in 2010 and allowed to cover the construction costs each year. Another example is the véloroute called Voie des vignes de Beaune à Santeney which was constructed as an adaptation of existing roads at a cost of 20,000 €/km, and yielded approximately 50,000 €/km (around 430,000 SEK) equivalent to recovering the investments costs in 5 months only. (Vélo &Territoires, 2010) Yet most of the itineraries are not comparable to these. The fact that the most successful examples are euro-véloroutes is not mere coincidence.

The results of the Saône-and-Loire greenway route were estimated thanks to an extensive attendance survey which included:
- 65 days of surveys and interview spread over 8 periods of the year and 20 locations
- 24 automatic recorders which counted 940,000 passages
- 19,700 visual observations of the users to determine their profile
- 3,174 short interviews of the users, and,
- 3,597 thorough interviews with 8,509 persons or entities (users, touristic organizations, shop or business owners etc.). (Bourgogne tourisme, 2010a)

The economic benefits were measured in terms of expenditures for trip preparation, transportation to get to the greenway, accommodation, leisure activities expenses and personal expenses on site (for food, souvenirs, transportation on site etc.).

In addition to deriving statistics on the economic benefits or on the visits, the survey enabled to get valuable knowledge about the users’ profiles, their wants, their needs, and their (dis-)satisfactions. The synthesis reveals that the reasons of the success are most probably: the quality of the landscape and places that the itinerary allows to discover, the technical characteristics of the greenway (signalization, ground coating, maintenance), the profitability of the investments initially made and the fact that a majority of users came in the region precisely because of the existence of the itinerary. The improvements that were still to be made deal with the provision of suitable services (water, sanitation, cafés or shops lacking in some zones), the continuity and the connection of the itinerary to urban areas, the integration of the itinerary into a wider touristic network, the cooperation of local and regional actors and lastly the attractiveness to foreigners but mostly to French users. (Bourgogne tourisme, 2010b)

One of the reasons that conducted to elaborating a questionnaire for this thesis work was the following hypothesis: in the France the first users seem to be foreigners while among Frenchmen the knowledge and popularity of greenways and véloroute is quite low. The questionnaire’s results back up this idea. A majority of the respondents (around 65%) who had ever heard of the notions of greenways and véloroutes did get to know them in their working context and for projects but not for leisure activities. Very few respondents (around 12%) knew or realized that they could practice cycle-tourism – which is the main use of greenways and véloroutes – everywhere (or virtually) in France. What is more a majority of the respondents believe that practicing cycle-tourism is difficult in France (60% of those who
expressed an opinion about that question). This can be related with the great number of responses mentioning safety questions and availability of dedicated itineraries, as hindrances to the practice of cycle-tourism (more than half of the answers). (Questionnaire results) Eventually this lack of knowledge can be considered as a value loss among French users which could potentially contribute more to the development of the G&Vs and in turn of the local economies of French regions.

The discussion above shows that creation of greenways and véloroute bears a number of limitations which make the investigation of atypical contexts or processes interesting to investigate in order to make the most of their potential for the French regions. The focus will thus shift to the Nîmes and Montpellier Bypass railway project and more specifically to the planning of a véloroute within this project.
4. A VELOROUTE WITHIN THE NMB RAILWAY PROJECT

Chapter 4 first introduces the contextual background of the Nîmes and Montpellier Bypass railway project and afterwards analyses the relevance of including a véloroute project within it. It discusses both the framework and the actual planning practice of the véloroute within the NMB railway project.

4.1 THE NÎMES AND MONTPELLIER BYPASS RAILWAY PROJECT

4.1.1 Replacing the project within the French transport policies

Within the framework of the French National Sustainable Development Strategy 2010-2013 (NSDS) aiming at achieving a greener and fairer economy; a strategy has been developed to achieve sustainable transport and mobility. The NSDS defines four main orientations regarding the mobility policy:

- “promote more sustainable mobility practices for people and goods by encouraging neighborhood development;
- strengthen intermodal transport and develop alternatives to road and air transport;
- improve the energy efficiency of vehicles, reduce their emissions and promote alternative energies;
- ensure access to services and mobility for all throughout the territory.” (NSDS, 2010)

To be in accordance with the NSDS, the existing transport systems should be optimized in order to reduce the need to create new infrastructures. The priority should be on improving multimodal transports by strengthening the complementarity between transports on water, on rail, on roads, in the air and cycling and walking. Moreover, soft mobility - especially cycling both on a daily basis and for tourism - and innovative transport systems should be encouraged. (Interministerial Delegate for Sustainable Development, 2010)

The Nîmes and Montpellier Bypass (NMB) project fits into this French strategy because it falls into the subjects of transportation modes combination and encouraged soft mobility. Indeed the project proves to have two notable specificities: the Nîmes and Montpellier Bypass is a hybrid high-speed line dedicated to both freight and passenger travel and its construction includes the creation of a véloroute or “green” biking route- simultaneously to the construction of the railway line. Those two aspects make the NMB project stand out from other projects of regional infrastructure in France.

4.1.2 Planning for high-speed railways in France

A high-speed railway is a major regional infrastructure and as such its creation requires a long process of investigations, debates, inquiries and studies. In France, the planning of high-speed lines usually follows four main phases:
- to start with, there is a preliminary debate during which the need for the creation of the line is examined. A brief study of expected advantages and downsides is carried out. The general requirements in order for the infrastructure to be useful and beneficial are also outlined. The possible cost of the infrastructure is estimated;

- then the pilot studies aim at narrowing down potential routes for the line and at outlining additional requirements (creation of additional stations, avoiding sensitive areas for environmental reasons etc.);

- afterwards, and during the Avant-Projet Sommaire which is the Basic preliminary Design phase, the route which minimizes environmental impacts and maximizes the fulfillment of the other requirement is chosen. The outcome of this phase is a report presenting officially the project, its needs, objectives and expected consequences;

- finally a procedure to obtain a Déclaration d’Utilité Publique (DUP) or Declaration of Public Utility starts. The goal is to obtain a formal acknowledgement of the fact that the project will have an overall public benefit. The DUP allows the contractor to requisition properties that are on the route of the infrastructure (in exchange for monetary compensations of course). This important phase is divided in two steps: the Enquête Publique or Public Inquiry and the declaration itself which is made by a state decree. The Public Inquiry is actually a consultation of local actors and neighbours of the future project, who get to express their claims and observations.

Once the project went through these phases, the actual design and afterwards the construction of the project can begin. All these steps can take a long time because the project can be paused for different reasons or because one phase might reveal hindrances or oppositions to the project.

The Nîmes and Montpellier Bypass railway project went through all the phases mentioned above between 1994 and 2005 and it has now entered the design phase.

4.1.3 The Nîmes and Montpellier Bypass, a project with public benefits

The Nîmes and Montpellier Bypass (NMB) is a new section of high-speed railway line that will join Manueld - to the East of Nîmes - and Lattes- to the West of Montpellier (see figure 6 and 7 below). Financed via a public-private partnership contract, it is designed as a hybrid line for both passenger and freight traffic and will be extending the Mediterranean high-speed line (LGV Méditerranée) which was opened in June 2001. This mixed-use line will be the first of the kind in France. Routed away from Nîmes and Montpellier’s urban areas, the new line will double up with the existing Tarascon - Sète line, where traffic has reached levels that preclude all further growth. (RFF, 2008b)
Last but not least, an approximately 24 km-long véloroute is planned along the line (see figure 7 below). This véloroute is divided in two parts (a result of the negotiations with the local authorities where a continuous itinerary could not be agreed on) and some portions of the itineraries are greenways while other parts are not strictly dedicated to non-motorized moves explaining why the whole route is called a véloroute (see figure 8 below).
Figure 7 – Main characteristics of the NMB railway project
Figure 8 – The NMB’s véloroute (The red portions correspond to greenways while the yellow and orange ones correspond to véloroutes)
On May 16th 2005, the NMB project was granted a DUP as the acknowledgment of the project’s public benefits. Indeed, in addition to extending the French network of high-speed lines, the project paves a new way for the development of the region Languedoc-Roussillon (see annex B on the French administrative divisions) where it is implemented and beyond. The project should address the needs for ensuring a greater and more fluid provision of transports for passengers and goods; it should be an alternative to constructing additional road infrastructures in order to expand the transport capacities for both passengers and freight; and as such it should foster the economic development of this booming region (which is expected to count 500 000 more inhabitants by 2020). The construction work alone, planned on four years (2013 to 2017), should generate approximately 3 500 jobs a year within the region and inject approximately 500 million € (more than 4 286 million SEK) into the regional economy in the fields of transport, logistics, tourism and leisure. (RFF, 2008b)

4.1.4 Main characteristics of the NMB project

The line will stretch over the two departments of Hérault (34) and Gard (30) (see Annex B on the French administrative divisions) and will be 80 km long: 60 km for the bypass as such plus 20 km of “connections” to the existing network. The high-speed trains will be operating at 220 km/h on commissioning – and they will have the possibility to reach 350 km/h afterwards – while the freight trains’ speeds will vary between 100 and 120 km/h. (RFF, 2009) The line will shave around 10 minutes off the travel time between Paris and Montpellier and thus make this journey possible in less than three hours. Moreover, thanks to that new infrastructure, an estimated 3 000 heavy goods vehicles a day could be removed from the roads of the region; and approximately 10 million tons of freight should be transferred from the road to the rail. (RFF, 2008b)

The timeline of the implementation of the project is as follows (see figure 9 below as well):

- technical studies, consultations and other procedures should be conducted between April 2012 and June 2013;
- preparatory works (preparation of the construction work and earthwork and geotechnical operations) should be conducted between July 2013 and November 2013;
- the end of the construction work and the commissioning are planned for 2017. (SETEC INTERNATIONAL, 2013)
4.1.5 NMB, a project based on a Public Private Partnership contract

The NMB project is implemented under a Public-Private Partnership (PPP) contract. According to the World Bank (2011), a contract falls into this category whenever “part of the services or works that fall under the responsibilities of the public sector are provided by the private sector, with clear agreement on shared objectives for delivery of public infrastructure and/or public services”.

Such a contract is a recent form of agreement for the building of railway infrastructures in France. Indeed they used to be built and paid for by Réseau Ferré de France (RFF), a public establishment which owns and manages the French national railway network. It is only in 2006 that the French law gave permission to RFF to use such kind of contracts (SETEC INTERNATIONAL, 2012).

The particularity of PPP contracts is that a private entity (a group of companies named OC’VIA in the case of NMB – see figure10 below) gets to study, design, build and maintain the infrastructure for the duration of the contract. Within the contract’s time frame, RFF pays an annual rent to OC’VIA. It is believed that the use of PPPs facilitates the development of the national railway network by relieving the public sector from financial constraints. A larger number of infrastructures can be built in a shorter amount of time. The public sector can benefit from the expertise of the private sector and focus its work on planning issues and regulations. (SETEC INTERNATIONAL, 2012)
On the 28th June 2012, a 25-years long PPP was signed between RFF and OC’VIA which covers 1.8 billion € (more than 15.4 billion SEK) out of the total 2.28 billion € (more than 19.5 billion SEK) of investments that the project requires. The total cost of the project is shared between the French local administrations (30%) and the public sector (70% - RFF, the French state and the European Union). At the end of the PPP contract, the line will be retroceded to RFF for free and in unquestionable working conditions. (OCVIA, 2012a) As shown by the figure 10 above, the SETEC group cooperates with OC’VIA to the project management of the line.
Since the attention to the NMB project stems from the planning of its 24 km of véloroute, this topic will be closely investigated in the next sections of this chapter, first from the point of view of the a new framework and afterwards from the practice point of view.

4.2 THE NMB RAILWAY PROJECT: A NEW FRAMEWORK FOR A VÉLOROUTE

4.2.1 Early envisioning of the project

The Nîmes and Montpellier Bypass railway project was granted a DUP in 2005 (for more details, see section “4.1.2 Planning for high-speed railways in France” above). The DUP procedure includes, amongst other requirements, the reserving of a 100-meters-wide strip of land for the future project (see figure 11 below). That implies that all municipalities, departments and regions have record in their planning documents that the priority uses of the NMB’s “DUP strip” for the NMB’s project. And the NMB’s DUP strip of land was requested in 2000. (SETEC INTERNATIONAL, 2012) This aspect of the framework is very beneficial for the project because from an early stage a great number of studies can be undertaken.

In March 2004, the first discussions around the creation of itineraries for pedestrians and cyclist started as part of the consultations between RFF and the municipalities and departments. This idea was afterwards circulated for public consultation. At this stage the intentions were to provide access to main attraction points of the project area, and to provide leisure trails around the urban areas. Thus the itinerary had to:

- connect to the high-school of Redessan (a municipality in the department of Gard (30))
- connect to sport facilities
- provide access to regional train stations
serve as a link between the five municipalities included in the area
provide access to natural and agricultural zones. (Insertion du Contournement de Nîmes-Montpellier, 2004)

The first mention of a véloroute came in July 2005 in the *Schéma Directeur d’Aménagement Paysager* or Landscape Blueprint. The véloroute was indeed considered a main integrating element of the NMB project. That is to say that the véloroute was meant to:

- contribute to structure and unite the municipalities which have quite heterogeneous landscape;
- add value and improve the slotting of the railway project into the landscape and the territory thanks to its own specific landscape treatment. (Schéma Directeur d’Aménagement Paysager, 2005)

The planning of the véloroute from the early definition of the NMB’s DUP strip facilitated the future inclusion of the véloroute within planning documents. This in turn set an agreed background for the future cooperation between the actors involved in the planning process (see section “3.3.1 The multiplicity of actors in the planning process”). On the other hand, it was observed that the creation of the trail remained an easy weapon to use for other negotiations regarding the railway project.

The framework of the NMB railway project presented another interest for the planning of the véloroute: the inclusion of the véloroute in the statutory procedures and preliminary studies. Indeed the future feature was taken into account in procedures such as the strategic impact assessment and the environmental impact assessment. Those studies contribute a great deal to defining the most suitable itinerary for the véloroute and the possible variations from it.

What remains unclear when examining the documents regarding the decision of constructing jointly a véloroute and a high-speed railway is what Jack Ahern calls the “compatibility the of multiple uses”. Indeed Ahern states that “greenways are viable because they provide multiple functions within a specific and often limited spatial area, and that these uses can be planned, designed and managed to exist compatibly or synergistically (Ahern, 2005). However in the NMB case, where the itinerary follows quite closely the railway line, one can wonder about the combination of a véloroute - for which users will need a variety of settings to enjoy and for which crossing many settlements or areas with interesting cultural heritage and so on – and a high-speed railway which should avoid as much as possible settlements and sensitive areas. It seem that to some extent the uses do not meet and may jeopardize the success of the trail.

**4.2.2 A contract with room for improvements**

The PPP contract signed for the NMB project reasserts the intention of creating a véloroute along with the railway line. It specifies the technical design of the feature – in accordance with the requirements set by the SN3V (see section “3.1.2 Implementing greenways and véloroutes:
technicalities and beneficial elements). It states that the partners design and build the itinerary at their own expenses and that the design should be validated by the department of Gard (30) before starting the construction works. The future infrastructure should be in proper using condition within a 1-year-long timeframe of warranty and will then be retroceded for free to the department of Gard (30) and. (Contrat de Partenariat – Contournement de Nîmes et Montpellier, 2011)

However, the contract leaves a number of important aspects unsettled. The future maintainer of the infrastructure is not specifically chosen; instead another agreement will be set on a later occasion (the contract does not specify when) in consultation with the department of Gard (30). Moreover, the contract limits to a minimum the design of the feature. Accordingly, while a number of parking and resting areas have to be included, the elements allowing their use are not due in the construction (for example the contract specifically states that the partners will not provide tables to eat and so forth) . (Contrat de Partenariat – Contournement de Nîmes et Montpellier, 2011) Of course that does not mean that such elements will not be included eventually, but it is very likely that the specific véloroute project suffers some delay before completion since the future maintainer – who will be responsible for complementing the missing elements - is still unknown.

4.3 THE NMB RAILWAY PROJECT: A NEW PRACTICE FOR A VÉLOROUTE

4.3.2 A coordinated combination of expert knowledge

In addition to the elements mentioned before, the NMB’s DUP had very practical benefits when it comes to designing a véloroute. Indeed the DUP facilitates a great deal the availability of land, since the municipalities, departments and regions already reserve the DUP strip for the project. Moreover, the DUP allows the contractor to requisition land and thus to acquire a right-of-way.

For the NMB’s véloroute another important benefit of the inclusion in the railway project was the coordination of the different competences who are involved in the practical studies. Indeed, instead of having the experts working after one another and expressing potentially diverging needs, a close combination and coordination was possible. Precisely, within SETEC INTERNATIONAL, the following departments were constantly co-working on the design of the feature: project management and design, hydrology, acoustics, environment; all with the help of CAD technicians and technical designers (see also section “2.2.1 Presentation of SETEC INTERNATIONAL”). The figure 12 clarifies the design process.
4.3.2. Shortcomings of the practice

One important aspect of the creation of the véloroute can be deemed not satisfactory: the attention to the regional integration of the project. Indeed, although it was observed that potential routes for the véloroute were studied using multi-criteria analysis, the greater focus was on safety issues and respect of the environment. Those issues are of course very important (as shown for instance by the questionnaire’s results), but the success of the creation of greenways and véloroutes relies also very much on its connection to attraction points.

The evaluation of itineraries was based on the following criteria:

- the total length of the route with the specification of the length of completely new paths and of the length of restored trails (this criteria allows a comparison of the future construction costs);

- the length of the route following roads with traffic levels superior to 1 000 vehicles a day (since they require a specific design to ensure the users safety);

- the list of roads with traffic levels superior to 1 000 vehicles crossed by the route (since they require a specific design to ensure the users safety);
- the environmental impacts of the creation of the route (e.g.: does it impact a sensitive area?);
- valorization of the local assets and leisure activities accessible with the route (this criterion allows to imagine the interests of the future users).

Those criteria were ranked equally in the analysis which lowers in the end the weight of accessibility to regional assets and leisure activities and as a consequence does not match the required balance between safety and attention to regional assets.

It turns out that the experiment of planning for a véloroute within a high-speed railway project offers beneficial aspects regarding both the framework (DUP and facilitated inclusion of the creation of the véloroute into planning documents) and the practice (coordinated combination of expert knowledge). But the experiment also warrants a number of adaptations in order to realize the potentials of greenways and véloroute for French regions.
5. FINAL CONSIDERATIONS

This last chapter summarizes the steps in the analysis on which this thesis work was articulated and then provides a reflection on the work carried out for the thesis and on how the study could be enlarged.

5.1 CONCLUSIONS

In France, the current transport and mobility policies aim at promoting more sustainable mobility patterns. Among the strategies developed with this aim, one focuses on encouraging green, soft and active modes such as walking or cycling. Currently, a great network of greenways and véloroutes - non-urban itineraries for non-motorized users – are being created all over the French territory. An original case of creating such a trail along with a railway line takes place in the south of France within the Nîmes and Montpellier Bypass project. This study investigated this novel arrangement and discussed the relevance of it.

The study shows that this novelty can be replaced within a wider scope of new strategies for transport and especially in the French National Sustainable Development Strategy 2010-2013 (NSDS). The question of creating a véloroute within the NMB project first stemmed from an intention of enabling pedestrians and cyclist to access to main attraction points and leisure trails around the urban zones of the project area. This question arose within the consultation process around the creation of the railway line in 2004. The véloroute was also thought of as a tools contributing to the landscape integration of the railway project. In other words the idea of the véloroute was an answer to the needs expressed by municipalities and was adopted by the constructor because it could be used as well as a feature of the landscape architecture of the project.

To be able to understand the ins-and-outs of the novelty of planning for a véloroute along with a railway line, this study investigated the potential benefits of greenways and véloroute and the current planning process. The investigation shows that G&Vs hold a great potential for the French regional economy. Indeed, those itineraries are transport link which spread all through the French territory and even beyond. As such they contribute to improving the connections between territories and they are accessible to all type of users regardless of their socio-economic background thanks to their technical design. Moreover, the creation of a véloroute includes its integration into the local economic fabric. All this characteristics make them full of potential for the development of local and regional economies in France. However, the study shows that there is probably a value loss among French users who have very little knowledge about those infrastructures and moreover that the current planning process warrants a more defined framework. That partly justifies the interest of this thesis for the NBM railway project.

Lastly, this thesis work focused on the NMB’s case. The investigation of this case shows beneficial aspects for the véloroute derived by the framework of railway project. For instance, the DUP strip facilitated an early inclusion of the creation of the véloroute into planning documents. When it comes to the practice, the coordinated combination of expert knowledge
was deemed very beneficial as it guaranteed a focus on issues of safety and compliance with environmental requirements. However, the terms of the PPP contract are considered not satisfactory because they leave a number of questions unsettled while those questions are important for the success of the itinerary. Eventually the fact the NMB has has multiple objectives and uses and that it can be examined at different scale will make a future assessment of it success/failure as a trail difficult but altogether very interesting to undertake.

5.2 Recommendations

It is possible to formulate a few recommendations based on this thesis work. To start with, considered the great investments made by France on greenways and véloroutes, it seems important to insist on the need for increased publicity around the potentials enabled by the construction of greenways and véloroutes. The municipalities should encourage their creation and convince their population, by reassuring them on the safety of those trails and on the convenience of their use.

Additionally, the framework and planning process of the greenways and véloroutes should be strengthened. A legally-binding document could better define the responsibilities and how they can be coordinated. Such a document could serve both public and private initiatives, and each all cases should emphasize the need to include in the construction of the features the necessary elements of resting areas, parking zones, information spot, repairing spots etc. in order to provide the best preconditions possible for the use of the itineraries and the realization of its potentials.

5.3 Enlargement

This thesis work warrants further study. Indeed the topic of greenways and véloroutes in France but also abroad abound in interesting questions.

First and stemming this thesis work, one could wonder whether the impacts of greenways and véloroutes on the local economy shouldn’t be measured comparatively to other infrastructures such as roads and railways. Indeed, although extensive surveys explains the reasons for the success of these itineraries and the improvements still to be made, no analysis around the number of users who can truly be interested in such type of mobility compared to car or train was found. Such a comparative analysis could contribute to truly measuring the unexploited potential of greenways and véloroutes.

Another question that could stem from this study is: to what extent regional development enabled by the creation of greenways and véloroutes is balanced within the region? Should it exclude remote areas by focusing on strengthening key regional spots (for the purpose of
preserving continuity and connections along the trails for instance)? What are the opportunities for remote places to become stronger thanks to greenways and véloroutes?

One could also wonder about the exportability of these infrastructures. First, having considered the European network of greenways, EuroVelo, there must be an interest for G&Vs at the European level. And beyond Europe, do G&Vs bear the same potential strengthening regional development in emerging or developing countries for example? Indeed countries like China or Burkina Faso are famous for the cultural inclination to cycling and as the same time they are touristic or would-be touristic destinations.

Finally a closer attention could be put on greenways and véloroutes as feature. In France for example, the investments in G&Vs have been accompanied by a reflection on how to recycle some pathways (for instance former railway trails or abandoned road) into G&Vs. From a perspective of sustainability how could re-cycling (just as in urban mining issues for example) the regional infrastructures contribute to recycle (encourage cycling) them? To answer that question a thorough evaluation of the impact of the technical characteristics of the trails on their popularity can be conducted.
6. REFERENCES

BOOKS


JOURNALS AND ARTICLES – INCLUDING ONLINE MATERIAL


OTHER INTERNET SOURCES


OTHER PRINTED SOURCES


PRESS RELEASE


STATUTORY REPORTS


**FIGURES**

Figure 2 - Wikimedia (2013). [Online] Available at: http://commons.wikimedia.org/wiki/File:Canal_de_la_Morge_DSC_0401.JPG [Accessed 1 September 2013]


Figure 5 - EuroVelo (2013). [Online] Available at: http://www.eurovelo.org/routes/ [Accessed 17 May 2013]


**TABLES**


ANNEX A – QUESTIONNAIRE ON GREENWAYS AND VÉLOROUTES

A semi-structured questionnaire was constructed in order to examine the « popularity » of cycle-tourism and the awareness of the existence of greenways and véloroutes among Frenchmen and Frenchwomen. For this questionnaire, a convenient sample of respondents who were employees at SETEC INTERNATIONAL was chosen. The questionnaire was in French as shown by figures A1 and A2 below.

Figure A1 – Questions 1 to 4 of the questionnaire
Question 1 asks whether the respondent has ever heard about the terms *greenways* and *véloroute*. For a positive answer, the respondent should specify in which context(s) the terms were brought to his knowledge.

Question 2 asks whether the respondent has ever done cycle-tourism in France or abroad. For a positive answer, the respondent should specify where. Here an *I don’t know* option was proposed, because some might not know whether the activity they have in mind falls in the category of cycle-tourism.

Question 3 asks whether the respondent knows where such activity could be done. Again, for a positive answer, the respondent should specify where.

Question 4 asks the respondent how much s/he (dis-)agrees with the following assertions:

- cycle-tourism is not a common activity in France
- it is difficult to practice cycle-tourism in France
- cycle-tourism is not worth practicing in France

An *I don’t know* option was proposed.

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**Figure A2 – Questions 5 to 8 of the questionnaire**

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42
Question 5 asks the respondent what in his/her opinion are the advantages of cycle-tourism.
Question 6 asks the respondent what in his/her opinion are the downsides of cycle-tourism.
Question 7 asks the respondent his/her gender and age.
Question 8 asks the respondent how often (a week/month/year) s/he bikes.

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<th>Yes</th>
<th>IDK</th>
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</thead>
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<td>School</td>
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<td>5</td>
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<td>Europe</td>
<td>Asia</td>
<td>6</td>
<td>1</td>
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<td>Does wandering around cycling/walking count as cycle-tourism?</td>
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<td>Does a 24h ride in Camargues (France) counts as Cycle-tourism?</td>
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<td>3</td>
<td>8</td>
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<td>Disagree</td>
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<td>Agree</td>
<td>Disagree</td>
<td>AbsDisagree</td>
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<td>Economic aspects</td>
<td>Comfort/Enjoyable</td>
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<td>Lack of services</td>
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<td>x/month</td>
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The answers to the questionnaire were exploited with Excel as shown by table A1 above. Each question was sub-divided depending on the types of answers corresponding to it.

**ANNEX B – THE FRENCH ADMINISTRATIVE DIVISIONS**

A short explanation of the French administrative division into regions and departments might help the uninitiated reader locate a few department and regions mentioned in this report.

France is divided into 27 regions which are regulatory authorities. The region themselves are divided into 101 departments (2 to 8 per region) which are quite often called by their number (see Table B1 below). The regions and departments are the following:

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<td>Amiens</td>
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<td>Poitiers</td>
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<td>Charente-Maritime (17)</td>
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<td>Deux-Sèvres (79)</td>
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<td>Vienne (86)</td>
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<td>Provence-Alpes-Côte d'Azur</td>
<td>Alpes-de-Haute-Provence (04)</td>
<td>Marseille</td>
<td>31 400</td>
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<td>Hautes-Alpes (05)</td>
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<td>Alpes-Maritimes (06)</td>
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<td>Bouches-du-Rhône (13)</td>
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<td>Var (83)</td>
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<td>Vaucluse (84)</td>
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<td>Ardèche (07)</td>
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<td>Loire (42)</td>
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<td>Rhône (69)</td>
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<td>Savoie (73)</td>
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<td></td>
<td>Haute-Savoie (74)</td>
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<tr>
<td>Upper Normandy</td>
<td>Eure (27)</td>
<td>Rouen</td>
<td></td>
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<td></td>
<td>Seine-Maritime (76)</td>
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</table>

**Corsica has a special status; it is a territorial collectivity (but considered a region)**

<table>
<thead>
<tr>
<th>Corsica</th>
<th>Southern-Corsica (2A)</th>
<th>Ajaccio</th>
<th>Population</th>
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<tbody>
<tr>
<td></td>
<td>Upper Corsica (2B)</td>
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<td>8 680</td>
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**Overseas regions**

<table>
<thead>
<tr>
<th>Overseas region</th>
<th>Department(s)</th>
<th>Capital</th>
<th>Population</th>
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</thead>
<tbody>
<tr>
<td>French Guiana</td>
<td>French Guiana (973)</td>
<td>Cayenne</td>
<td>86 504</td>
</tr>
<tr>
<td>Guadeloupe</td>
<td>Guadeloupe (971)</td>
<td>Basse-Terre</td>
<td>1 628</td>
</tr>
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</table>
Table B1 – The French administrative divisions (own adaptation from Wikipedia (2013))

<table>
<thead>
<tr>
<th>Department</th>
<th>Department Code</th>
<th>Region</th>
<th>City</th>
<th>Population</th>
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</thead>
<tbody>
<tr>
<td>Martinique</td>
<td>Martinique (972)</td>
<td>Fort-de-France</td>
<td>Fort-de-France</td>
<td>1 128</td>
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<tr>
<td>Mayotte</td>
<td>Mayotte (976)</td>
<td>Mamoudzou</td>
<td>Mamoudzou</td>
<td>376</td>
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<tr>
<td>Reunion</td>
<td>Reunion (974)</td>
<td>Saint-Denis</td>
<td>Saint-Denis</td>
<td>2 512</td>
</tr>
</tbody>
</table>

The map shown by figure B1 below provides an indication of the population of the French departments and regions with green indicating the most populated places and red indicating the most scarcely populated locations.

Throughout the report, the following departments have been mentioned:
- Gard (30)
- Hérault (34)
- Saône-et-Loire (71)

They are highlighted on the figure B1 below.
Figure B1 – The population of the French administrative divisions (own adaptation from Actualitix (2012)). The numbers on the map correspond to the departments as listed in the table B1 above.