Technische Universität München

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MASTER'S THESIS

COMPATIBILITY- AND APPLICABILITY STUDY OF THE SUSTAINABLE URBAN MOBILITY PLAN (SUMP) GUIDELINES FOR A PERI-URBAN REGION

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Topic: **Compatibility- and Applicability study of the Sustainable Urban Mobility Plan (SUMP) guidelines for a peri-urban region**

Sanem is the first municipality ever to do a Sustainable Urban Mobility Plan (SUMP) in the country of Luxembourg. Located in the South-West of the country, Sanem counts 16,780 inhabitants (January 2018) and has an area of 24.4 km2. Sanem consists of four urban agglomerations: Ehlerange, Sanem, Belvaux, Belval and Soleuvre. The landscape of the municipality may be described as "rurban" or "peri-urban", meaning it is an urban transition zone where urban and rural characteristics mix or even clash.

Knowing that Sanem is located near the French border and right next to the second biggest city in the country, Esch/Alzette, with whom it shares the agglomeration hub Belval with the main campus of Luxembourg's only university and the biggest concert hall "Rockhal", there are some urban factors that play an important role in the region. However, this doesn't apply for the entirety of the municipality as agglomerations like Ehlerange, Sanem and Soleuvre are mostly residential areas with a low density. With this in mind, the area of Sanem can be viewed as its own type of landscape with its own needs and conditions.

Since the landscapes of the municipality of Sanem can't be classified as "urban", this begs the question whether the guidelines for a SUMP, which are intended for urban regions, are still compatible for this hybrid landscape.

The creation of the "Masterplan Mobility", as the SUMP is chosen to be called in Sanem, is intended to cover all aspects of mobility. Apart from all the relevant modes of transport (pedestrian and bicycle traffic, local public transport, motorized private transport), it also includes and analyses other relevant aspects/applications of modern mobility planning (such as traffic

safety, barrier-free construction and planning, traffic and mobility management, e-mobility, etc.).

The administration of Sanem commissioned the planning and consulting bureau “Schroeder et Associés” to guide the planning process of the SUMP.

The aim of the "Masterplan" is to create a document that helps to explain, the previous evolution and the current situation in terms of mobility to the citizens and sets out a vision of future mobility in the community. The plan will include the more classical/traditional themes, as well as topics that will presumably become of greater importance in the future (such as car-sharing, e-mobility).

The aim is also to create a citizen and user-friendly program that is tailored to the municipality of Sanem, by carefully considering the needs and wishes of the community. The active involvement of citizens, in the form of participatory processes, plays a central role during the creation of the master plan. The public participation (information, consultation, workshops) should be included in every step of the planning process. Within the framework of workshops, the future visions of the citizens are set as the base for the planning model of the master plan. As mentioned, the master plan is structured according to the principles and guidelines of the "SUMP" Sustainable Urban Mobility Plan by the European Union.

The Master’s thesis will include an analysis of the present state of mobility in the municipality of Sanem, the development process of the SUMP, the goals set for 2030 and the general elaboration and implementation plan of the SUMP. The SUMP of Sanem functions as the foundation for a case study where it is compared to SUMPs of one or two other cities in Europe. These cities were deemed comparable to Sanem, in terms of the living standards and demographic of the population. The scientific question of the thesis will be: Are the guidelines of the sustainable urban mobility plan compatible and applicable to a peri-urban region like Sanem?

The scientific method behind the question will be a qualitative analysis in the form of a case study. In the aim of proving the compatibility, or the lack thereof, a series of interviews with various stakeholders in the municipality of Sanem will be made, along with a comparison with other cities, and their respective stakeholders.

Following this, a conclusion will be drawn based on the qualitative analysis, which provides a scientific background and scientific comprehensible results.

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The student will present intermediate results to the mentor(s) (Prof. Dr.-Ing. Rolf Moeckel and Dipl. Ing. Jean-Luc Weidert (Schroeder & Associés) in the fifth, tenth and 15th week. The student will submit one copy for each mentor plus one copy for the library of the Focus Area Mobility and Transport Systems. Furthermore, the student will provide a PDF file of the master thesis for the website of this research group. In exceptional cases (such as copyright restrictions do not allow publishing the thesis), the library copy will be stored without public access and the PDF will not be uploaded to the website.

The student must hold a 20-minute presentation with a subsequent discussion at the most two months after the submission of the thesis. The presentation will be considered in the final grade in cases where the thesis itself cannot be clearly evaluated.

Prof. Dr.-Ing. Rolf Moeckel

Liza Bertinelli

Abstract

This thesis reviews the compatibility of the concept of sustainable urban mobility plans in peri-urban regions. The continuous increase of the population living in urban areas in Europe is generating more and more traffic, causing economic, environmental and social issues.

During the course of this Master's thesis, two research questions will be treated, focusing on the topic of sustainable urban mobility plans (SUMPs) and their compatibility in peri-urban regions. This research will be a qualitative analysis in the form of a case study and an interview analysis. The focal point of this case study is the comparison of two regions in which mobility plans were/are being planned. The comparison was made between the SUMP (Sustainable Urban Mobility Plan) of the *municipality of Sanem* in Luxembourg and the PDU (Plans de Déplacements Urbains) in the region of the *Communauté de Communes du Bassin de Pompey* (CCBP) in France.

In addition to the comparison of the two case studies, a number of interviews were held. The goal in doing these interviews was to gain a better understanding of various viewpoints and opinions on the topic of urban mobility plans. In addition to the compatibility of the SUMP in peri-urban regions the PDU principle used in France was analysed on the basis of the CCBP example. The question was whether the PDU planning structure was better suited for a peri-urban region, due to it being planned in an intercommunal region and it having a legal framework in place.

The findings of this analysis were insufficient to conclude whether the concept of SUMPs is applicable in peri-urban regions, on the basis of the two chosen case studies. Luxembourg has a very particular mobility situation and can therefore not be used as a representative example for all peri-urban regions in Europe. The compatibility of the SUMP process could neither be proven nor dismissed in the scope of this thesis. The results of the interview analysis, however, showed that the intercommunal planning, as is the case with the PDUs, has its benefits in peri-urban regions, particularly when compared to the restricted planning scope of the SUMP. While a verdict on the effectiveness of sustainable urban mobility plans in peri-urban regions cannot be drawn from the conducted research, the importance of communication between the relevant parties, as well as the awareness of location-specific needs and influences are exploited in this thesis. Sustainable urban mobility plans are an important tool for European mobility planning and this principle should be further analysed and adapted to other smaller scale regions that don't necessarily qualify as urban.

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I would also like to thank my second advisor Dipl.-Ing. Jean-Luc Weidert, who despite his tight schedule always had an open door for all kind of questions.

I am indebted to Dipl.-Ing. Adrien Stolwijk who made it possible for me to write my master thesis in the engineering company “Schroeder & Associés”.

Furthermore, I would like to thank all colleagues in the engineering and planning office for the pleasant cooperation and assistance.

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Liza Bertinelli

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1 Introduction

1.1 The challenges of modern mobility planning

For modern and sustainable mobility planning an interaction between city planning, mobility planning and environmental protection is essential. As a result of population growth in recent years, the demand for mobility has grown exponentially. “In 2010, 73% of European citizens lived in urban areas. This percentage is expected to increase to over 80% by 2050. In some countries (Belgium, Denmark, Luxembourg, Malta, Sweden, The Netherlands) the urbanization rate will rise to over 90%”. (European Commission, 2017) With rising numbers of people moving into urban areas, their structure and planning becomes more and more relevant.

Air pollution and noise emissions are also the results of a fast-growing demand of transportation powered by fossil fuels. The energy use for the transport sector is higher than for any other end-use sector in urban areas. The transport sector accounts for nearly a quarter of global CO2 emissions. (World Health Organisation, 2014) But not only the rising air pollution and Greenhouse gas emissions are harming human health, but also the worldwide increase in traffic accidents is attributable to this high rise in the demand for mobility. (World Health Organization, 2018)

Traditionally, in European cities mobility mainly meant walking, cycling and public transport; Later the American trend of planning for the car swapped over to Western Europe and urban development phenomenon’s such as car-oriented transportation planning and urban sprawl became ever more common (Knoflacher, 2007).

Today, most European cities have to carry the burden of wrong transportation planning decisions of the past. The challenges they have to face are great ones: both economic development and mobility must be reconciled with improving the quality of life and protecting the environment. As the European Commission states in 2017, European cities are the engines of economic growth, resulting in 85% of Europe’s GDP being generated in Europe’s urban areas. (European Commission, 2017) This huge attractiveness of urban areas for businesses is directly related to the accessibility and the transportation ways an area has. "Transport is an essential mean for the economic competitiveness and for commercial and cultural trades. It contributes to bringing citizens closer to each other and answers to the fundamental need of mobility” (Famoso & Lanzafame, 2013).

The growth of urban mobility and the insatiable increasing of the transport demand poses however a huge challenge to these areas and the people responsible for transport planning.

The structural changes of cities in the last 30 years play an important role. Cities aren't one compact area with one centre anymore. They have become more and more a "gathering of polycentric multifunctional areas located around the former city core", a phenomenon called urban sprawl. (Famoso & Lanzafame, 2013) Urban sprawl started with the improving technology of transportation vehicles and cheap individual transport. The result of these changes has been an abnormal growth of private mobility and use of space with serious side effects in terms of congestion and air pollution. (Wulfhorst, 2003)

In the last 50 years transport has increased rapidly due to the availability and price of petrol, which is still perceived as a cheap and inexhaustible energy source (Famoso & Lanzafame, 2013). We are obliged to find an alternative to petrol and to environmental pollution, as the Brundtland Report underlines, we have to meet the needs of our present generation, without compromising the needs of future generations (Brundtland, 1987). An important concern for the future is the dependency on fossil fuels as oil supplies are becoming scarcer and scarcer which will jeopardize people's mobility if nothing changes in the future. (Brebbia, 2011)

In the most countries throughout Europe, the age group of senior citizens is the fastest growing one. It is expected that by 2050, the number of 80 year-olds will have tripled and about a quarter of the entire European population will be over 65 years old. (United Nations, 2019) This trend changes the demand for mobility noticeably and asks for an increased attention to the support and needs of an ageing population "to enable lifelong mobility as well as safe and suitable transport". (European Commission, 2017)

With regard to all this, an overall goal is to find innovative and ambitious solutions to improve mobility so that the urban regions and cities can develop into a sustainably "right" direction whilst making the transport modes as attractive and accessible as possible.

It is essential for cities to have a strategic plan for mobility to achieve better quality of life whilst building on existing planning practices. For this process to be successful there has to be a proper framework, adequate manpower in the planner department, sufficient financial resources and a well-structured participation framework. (Giduthuri, 2015)

With this in mind the guidelines for the sustainable urban mobility plan, short SUMP, were created by the European Commission.

1.2 Sustainable urban mobility planning

It's been several years that the European Commission actively encourages and tries to guide mobility planning within Europe. Over the last decade European organisations analyse the topic to identify a best practice approach on how to tackle urban mobility planning nowadays. This resulted in the publication of *guidelines for the development and implementation of sustainable urban mobility plans* (SUMP) in 2013, worked out by the European Commission in cooperation with the German consulting firm Rupprecht Consult. This document intends to guide local authorities and stakeholders towards a more sustainable development of urban areas and/or help to improve the usage of already existing transport infrastructure and services to assure them to be their most effective. (European Commission, 2017)

A SUMP is "a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation, and evaluation principles" (ELTIS, 2014).

The main objectives of a sustainable urban mobility plan are to improve the mobility in a city, in terms of accessibility, functional- and cost efficiency, quality and attractiveness of the urban area, and to reduce air- and noise pollution to a minimum whilst maintaining a high-quality and sustainable mobility. (European Platform on SUMPs, 2014)

The SUMP turns its main focus of planning also to the people, therefore the European Commission decided on the fitting slogan "Planning for People" for the SUMP. This strategy is one of the main differences to traditional transport planning, which tends to focus more on traffic infrastructure. (European Commission, 2017)

A sustainable mobility is when transport and city planning are in line with the concerns of sustainability. The three pillars of sustainability are the environmental dimension, the social dimension and the economic dimension. The main goal is to reduce the negative effects on the environment like air pollution and high land use/sealing. (Famoso & Lanzafame, 2013)

The *White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system*, states that the average mobility per person in Europe increased by 7% between 2000 and 2008 (passenger–kilometer per inhabitant). (The European Commission, 2011) This shows us that with a constantly improving technology of transport vehicles, people don't travel faster, but they travel further. The number of trips hasn't changed over the years, only the travelled distances are getting constantly higher.

Therefore, it is important to encourage users to use more sustainable transport modes and discourage the use of individual, private mobility. People who want to live and work in communities with high quality of life should be educated on sustainability with the aim to be ready to drive significantly less and rely more on alternative modes (walking, cycling and public transport) so to reduce traffic and air pollution emissions, improving physical fitness and mental health (De Castro, 2010).

With the SUMP being introduced in 2013, a good structural base has been created for sustainable urban mobility planning in Europe and has since then guided a lot of European cities towards a new, more sustainable mobility plan for their region.

Keeping in mind that, Europe isn't a homogenous area but rather shows a lot of diversity between its countries, cities, towns and suburbs. The question arises for how many of these areas the SUMP is applicable respectively compatible. Considering that there are significant differences in size, spatial distribution and interpretation of urban areas throughout Europe. Similar for the financial and economic situation in Europe, the gap between urban areas and rural areas is increasingly blurred. It is rightly to ask oneself if a one-size fits all concept like the SUMP is compatible with other areas that don't necessary classify as "urban".

This thesis will base itself on a case study of a SUMP momentarily being planned and soon implemented in the Luxembourgish municipality Sanem. Luxembourg being one of the smallest countries in the world, it is difficult to consider a region in Luxembourg as urban (see chapter 4.1 Luxembourg for further explanations on the unique situation of Luxembourg).

The first research question of this thesis is how the principle of the SUMP can be helpful to implement sustainable measures in peri-urban regions. This, in turn, leads to other questions: Are the compatibility and the success of a sustainable urban mobility plan in a peri-urban region still a given? Are there differences in the application process and how do these differences affect the final product?

The methodology of this thesis is a qualitative analysis of a case study comparison and a collection of interviews conducted with mobility planning experts (Description of the methodology in chapter 3 '*Methodology of the paper*').

2 Analysis of sustainable urban mobility plans in Europe

This second chapter gives an inside into the literature and the procedure of a sustainable urban mobility plan to get an idea what a SUMP exactly is how it works and what its main objectives are. To solidify the background of a sustainable urban mobility plan, there are two chapters defining what sustainability is in terms of mobility planning, it defines what the difference is between urban, peri-urban and rural area in Europe and gives an introduction to what mobility planning in various European countries looks like. Lastly this chapter analyses the French plan *"PDU"* and the divergence plan *"Poly-SUMP"* in depth to show all the different variations of mobility plans that exist in Europe.

2.1 Introduction and methodology of a SUMP

2.1.1 Background

The image of a perfect city should arguably be the same everywhere, with a secure, high quality and sustainable way of life for everybody. The planning process in cities and urban areas has gained importance in the last years and has become an increasingly complex task where planners and policy makers face daily, often contradictory needs of a city.

With the introduction of the Urban Mobility Package by the European Commission in 2013 and the publication of the SUMP guidelines in 2014, the Sustainable Urban Mobility Plan concept has been introduced to the European countries as "a strategic planning instrument for the local authorities". (CIVITAS, 2018)

The main goals of urban planning being the maintenance of a high quality of life and simultaneously creating an attractive environment for businesses without restricting traffic or affecting the environment too much pose a complex matter. The concept of the SUMP is used to foster the balanced development and integration of all transport modes while encouraging a shift towards more sustainable ones. With issues like public health, climate change, economic activity and quality of life; mobility influences the lives of people much more than the idea of transportation of goods and people from a point A to a point B. (European Commission, 2017)

The European Commission's opinion towards urban mobility planning has changed a lot over the last decade. "It became clear that urban transport is far too important to be left solely to local governments to manage". (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017)

While some bigger and more advanced countries already have planning tools like the SUMP, or established policy frameworks to support mobility planning, other countries are currently slowly easing towards the European planning concept. A third group of countries has yet to implement their first SUMP. As for the high diversity between the European countries there are many different levels of support coming from the national level towards the planning and implementing of a SUMP. The situation is a complex one, because within the countries there are substantial differences between regions. "Also, city characteristics, such as demographic and geographic aspects, financial capacities, expertise and political structures, are important context conditions for developing and implementing SUMPs". (CIVITAS, 2018) This may cause that only a minority of the European cities will dare to develop SUMPs or don't/can't fulfil the minimum quality standards that are needed for the successful implementation.

For the rightful implementation and planning of SUMPs there exist European programs like SUMP-UP and PROSPERITY, both CIVITAS powered programs, which guide and advise cities and countries throughout the whole process. (CIVITAS, 2018) In the following figure a map is shown with the geographic distinction between SUMP-UP and PROSTERITY countries/cities.

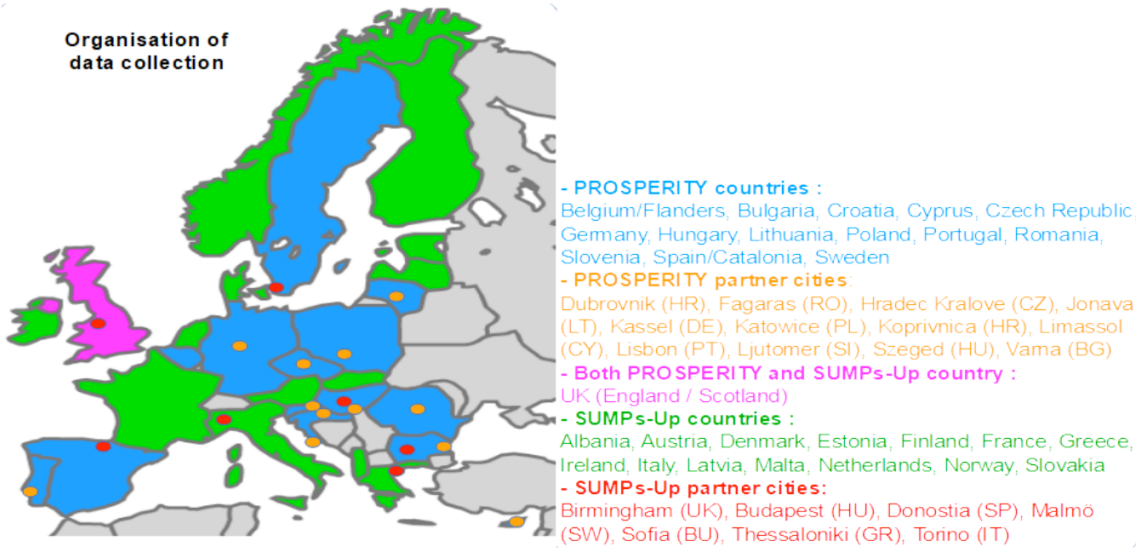


Figure 1: CIVITAS Programs Partner Distribution in Europe (CIVITAS, 2018)

2.1.2 Definition and main features of a SUMP

In 2009 the European Commission published the *"Action Plan on Urban Mobility"* which was the cornerstone of the sustainable urban mobility plan. (Commission of the European Communities , 2009) On the basis of this document the European Commission continued working on the topic, analysing case studies and improving the procedure resulting in the guidelines "Developing and Implementing a Sustainable Urban Mobility Plan" that were published in 2014. (European Platform on SUMPs, 2014)

A SUMP is "a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation, and evaluation principles" (ELTIS, 2014).

"A Sustainable Urban Mobility Plan encompasses this idea of an integrated approach; it fosters the balanced development of all relevant transport modes while encouraging a shift toward more sustainable modes" (ELTIS, 2014).

These two definitions clarify, that the purpose of a SUMP is to look at mobility and urban planning together over a longer period of time in terms of getting the most sustainable results possible for a specific area. They simultaneously are deliberately very vague to fit all possible scenarios, as regulations and framework vary greatly between the different EU member states. Therefore, it can be used in different contexts and is broadly applicable in many European countries. (ELTIS, 2012) Before the SUMP there were already similar forms of mobility planning existing in France (Plans de Déplacements Urbains, PDU) and the United Kingdom (Local Transport Plans, LTP), but there was no uniform planning structure nor guidelines that could be applied on an European scale.

The SUMP process described in the guidelines from the European Commission seeks to ensure the involvement of all the population groups, the stakeholders and the economy in a city. In their opinion, developing a SUMP shouldn't be an additional layer of city- and transport planning but rather a combination of existing plans and expanding on them. The most important planning feature of a SUMP is the involvement of the population into the planning process as for the continuous revision of the plan over the years. (European Platform on SUMPs, 2014)

The main features of a SUMP are defined according to ELTIS as such:

Main goals

The SUMPs main goal is to pledge for sustainability by trying to balance out economic development, social equity and environmental quality as much as possible. To successfully achieve the planning process of a SUMP, it has to be an integrated approach where practices and policies of land-use, transport, environment, economic development, social inclusion, health and safety on all level work hand in hand. (ELTIS, 2012) “It regards the needs of the 'functioning city' and its hinterland rather than a municipal administrative region”. (ELTIS, 2019)

The main objectives of a sustainable urban mobility plan are clearly to improve the mobility in a city, in terms of accessibility, functional- and cost efficiency, quality and attractiveness of the urban area, and to reduce air- and noise pollution to a minimum whilst maintaining a high-quality and sustainable mobility. (European Platform on SUMPs, 2014)

A long-term vision and clear implementation plan

The SUMP usually aims to implement its measures over a long period of time aligned with a vision and an overall sustainable development strategy. The defined goals can therefore often be divided into short-, mid-, or long-term objectives (ELTIS, 2012).

An assessment of current and future performance

“The Plan should build on a careful assessment of the present and future performance of the urban transport system by reviewing the current situation, establishing a baseline against which future progress can be measured, as well as defining performance objectives and related SMART targets to guide the implementation of the plan.” (ELTIS, 2019)

The balanced and integrated development of all modes

The Sustainable Urban Mobility Plan should cover all modes and forms of transport in the entire urban agglomeration, while encouraging a shift towards more sustainable modes. It would typically include the following modes:

- Walking and cycling
- Public transport (+ on demand)
- Road transport (flowing and stationary)
- Urban road safety
- Multimodality
- Urban logistics
- Mobility management
- Intelligent Transport Systems

Horizontal and vertical integration

During the SUMP process, from the development until the implementation, the SUMP constantly follows an integrated approach where all types of stakeholders are constantly involved. The cooperation, coordination and consultation take place on- and between many different levels of governments and relevant authorities. There is no specific top-down or bottom-up approach but rather a simultaneously vertical and horizontal integration of all the involved classes. (ELTIS, 2019)

Participatory approach

Transparent participatory planning is a prerequisite for citizens and stakeholders to adopt the Sustainable Urban Mobility Plan and the strategies and measures it contains. “The Local Planning Authority should involve the relevant actors - citizens, as well as representatives of civil society and economic actors” (ELTIS, 2019). It increases public acceptance and support, minimizing the risks of decision-makers and facilitating implementation. (ELTIS, 2014)

Monitoring, review, reporting

With the implementation of the SUMP, a continuous assessment and monitoring afterwards comes along with it. The progress and implementation of the measures out of the action plan should be closely monitored, which requires the plan to be transparent and the data to be accessible at any point in time. “A regular monitoring report should provide the basis for a review of implementation”. (ELTIS, 2019)

Figure 2: Key terms accounted for in the ELTISplus definition of Sustainable Urban Mobility Plans (ELTIS, 2012)

Figure 2 illustrates all the different points of focus of the SUMP and how they all revolve around the goal of improving the quality of life. This places a clear emphasis on achieving something positive for the people by means of good planning.

2.1.3 The structure of a SUMP

A SUMP consists of two elements: a process, captured in a planning cycle; and the different tools available in achieving sustainable urban mobility. This planning cycle consists of eleven main steps and 32 activities in total. This planning cycle doesn't have to be followed strictly; it should function as a guideline on how to structure the planning process for continuous improvement. Each of the steps and activities are described in detail in the guidelines *"Developing and Implementing Sustainable Urban Mobility Plans".* (ELTIS, 2014) The following Figure 3 shows a graphical overview of the planning cycle.

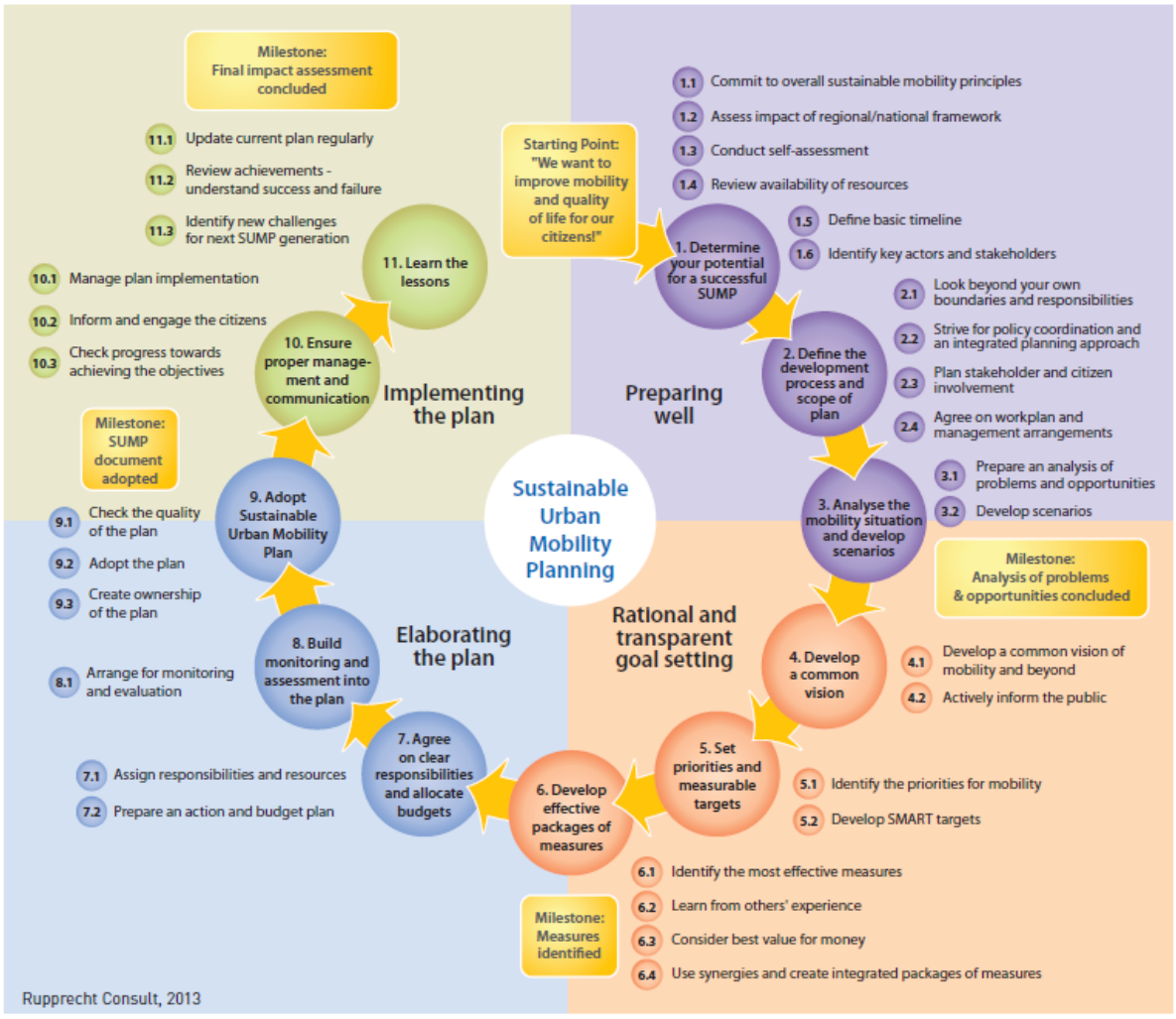


Figure 3: Planning cycle for a sustainable urban mobility plan, (ELTIS, 2014)

The first step staring the SUMP process is to prepare well and to get to know the region, the city or the municipality in which the SUMP is planned for. The analysis of the current mobility situation of the region is a very crucial step in the beginning of a SUMP as it sets the basis for the entire following planning process.

On the basis of the current mobility analysis a common vision for the future is developed and measurable goals and targets are being set on which an effective package of measures is being developed. These measures are combined and elaborated into an action plan that will be implemented throughout the whole timespan the SUMP is envisioning. Regularly the progress of implementation will be supervised and documented, until there comes a point in time to revisit the existing plan and working out an updated version of it. (ELTIS, 2014)

For this thesis, further details on the structure aren't necessary.

It is important to know that there exist different approaches regarding the guidelines and methodology of Sustainable Urban Mobility Plans throughout Europe. Not every nation follows the guidelines provided by the European Commission but some use their own national or regional methodologies that have been independently developed within the legal planning framework. There are several countries falling into this category, e.g. Belgium, where multiple regions developed their own guidelines, France, Germany, Italy, Netherlands, the United Kingdom, Sweden, etc.. Some of these countries already had mobility planning frameworks in place before the EU guidelines were published. This made it hard to assess to the SUMP, so they maintained their own way of doing it. (CIVITAS, 2018) In the chapter *2.5 Sustainable urban mobility planning in* Europe best practice examples of national methodologies are presented in depth.

2.1.4 Legal framework of the SUMP

Contradictory to some other mobility plans in other countries (e.g. PDU in France), there is no legal framework to the SUMP. The legal frameworks regarding mobility planning vary a lot inside Europe and are different for every country as they all developed various approaches to address the legislative aspects of sustainable urban mobility. (CIVITAS, 2018) It doesn't exist a unification of the legislation regarding SUMPs throughout the European Union.

Especially the best practice examples in Flanders and Brussels (Belgium), in France and in Catalonia (Spain) the legal framework is most developed. With numerous supportive policies and mandatory elements in place, these countries ensure a sustainable mobility planning concept. (CIVITAS, 2018) Apart from these countries a lot of other EU-member unions expressed a wish for a clearer and better-structured regulatory framework at the national level, not meaning that it has necessarily to be mandatory. (CIVITAS, 2018)

2.1.5 Main objectives of the SUMP

The European Commission made a list in their guiding document with the main objectives of a SUMP. These are the general goals a SUMP sets itself to achieve by improving the mobility- and spatial planning:

1. Improving quality of life:
   It shows that the improvement of the mobility- and traffic situations increase the quality of life in cities.

2. Saving costs and creating economic benefit:

   Mobility has a strong impact on a city's economic situation. A healthier environment, less congestion and better air quality can increase the attractively for businesses and investors and therefore helps the local businesses to thrive.

3. Contributing to improved health and environment:

   A more sustainable mobility planning translates to the use of less fossil fuels and the use of more active transport modes like walking and cycling, which leads to a fitter population, better air quality and less noise.

4. Making mobility seamless and improving access:

   One of the main focuses of sustainable urban mobility planning is multimodality and the creation of well-balanced door-to-door transport solutions in that context.

5. Making more effective use of limited resources:

   The SUMP focuses on balancing out the modal split of cities and to find an equilibri um of measures ensuring the most cost-effective and user-friendly solutions.

6. Winning public support:

   A participatory approach and the involvement of stakeholders ensure a higher chance of acceptance, thereby reducing the risk rejection to the implementation of ambitious policies.

7. Preparing better plans:

   The involvement of different fields of expertise ensures an all-encompassing result of measures, including all relevant transport modes whilst focusing on sustainability.

8. Fulfilling legal obligations effectively:

   With different legal requirements and frameworks in the European member states the SUMP provides an effective way to respond through one comprehensive strategy.

9. Using synergies, increasing relevance:

   The SUMP pushes inter-sectorial and interregional collaborations and considers the connections between the urban area and its surrounding context.

10. Moving towards a new mobility culture:

    Based on good practical examples, SUMPs create a new mobility culture amongst the people. Less attractive measures are easier to implement if the general public was involved in the planning process.

(European Commission, 2017)

2.1.6 Comparison of SUMPs and traditional transport plans

It is often misunderstood that a SUMP would replace existing transport plans which have been in place for several years in the different countries, instead of building on and adding to the pre-existing framework. (Rupprecht Consult, 2012)

The following Table shows a simplified version of the differences between traditional transport planning and a sustainable urban mobility plan, keeping in mind that transport planning varies a lot in Europe and can't be generalized. In chapter 2.5 "*Sustainable urban mobility planning in* Europe" further information are given.

Traditional transport planning	Sustainable urban mobility planning
Focus on traffic	Focus on people
Primary objectives: Traffic flow capacity and speed	Primary objectives: Accessibility and quality of life, as well as sustainability, economic viability, social equity, health and environmental quality
Modal-focused	Balanced development of all relevant transport modes and shift towards cleaner and more sustainable transport modes
Infrastructure focus	Integrated set of actions to achieve cost-effective solutions
Sectorial planning document	Sectorial planning document that is consistent and complementary to related policy areas (such as land use and spatial planning; social services; health; enforcement and policing; etc.)
Short- and medium-term delivery plan	Short- and medium-term delivery plan embedded in a long-term vision and strategy
Related to an administrative area	Related to a functioning area based on travel-to- work patterns
Domain of traffic engineers	Interdisciplinary planning teams
Planning by experts	Planning with the involvement of stakeholders using a transparent and participatory approach

Table 1 : Differences between traditional transport planning and SUM planning (ELTIS, 2014)

2.2 Introduction into sustainable development

Very often the aspect that differentiates conventional urban mobility planning from the SUMP concept is the sustainability factor. Sustainable development is a very broad term and can be interpreted in many different ways.

The classic definition of sustainable development comes from the former Norwegian prime minister Gro Harlem Brundtland, who said that development must “meet the needs and aspirations of the present generation without compromising the ability of future generations to meet their own needs” in order to be sustainable. (Brundtland, 1987) Nowadays, with the problems the world is regarding resource scarcity and climate change, this definition for sustainable development has quickly become a popular value and the standard for acceptable development. (Borowy, 2014)

The way in which our society works at the moment, “it is not difficult to see that current developments are unsustainable”. (Borowy, 2014) At present, “humanity uses the equivalent of 1.7 Earths to provide the resources and absorb waste”. (Global Footprint Network, 2019) This means it takes the earth over one and a half years to regenerate what is currently used in a year. This overuse is mostly caused by overfishing, overharvesting forests, and emitting more carbon dioxide and other emissions into the air than the earth’s vegetation and the oceans can sequester. (Global Footprint Network, 2019) Borowy said in 2014, that if we continue the way we are living right now and current developments stay unchanged, there will be no need to define what is unsustainable because “looking out of the window will be enough”. (Borowy, 2014) While unsustainable development is clearly recognizable, finding a clear definition for sustainable development is a little more delicate as sustainability and development, the two core elements of the definition, are generally not compatible with each other. After all, among the high amount of definitions of sustainable development that exist, they almost always include the interconnection between the environment, the economy, and society. These are generally referred to as the three pillars of sustainable development.

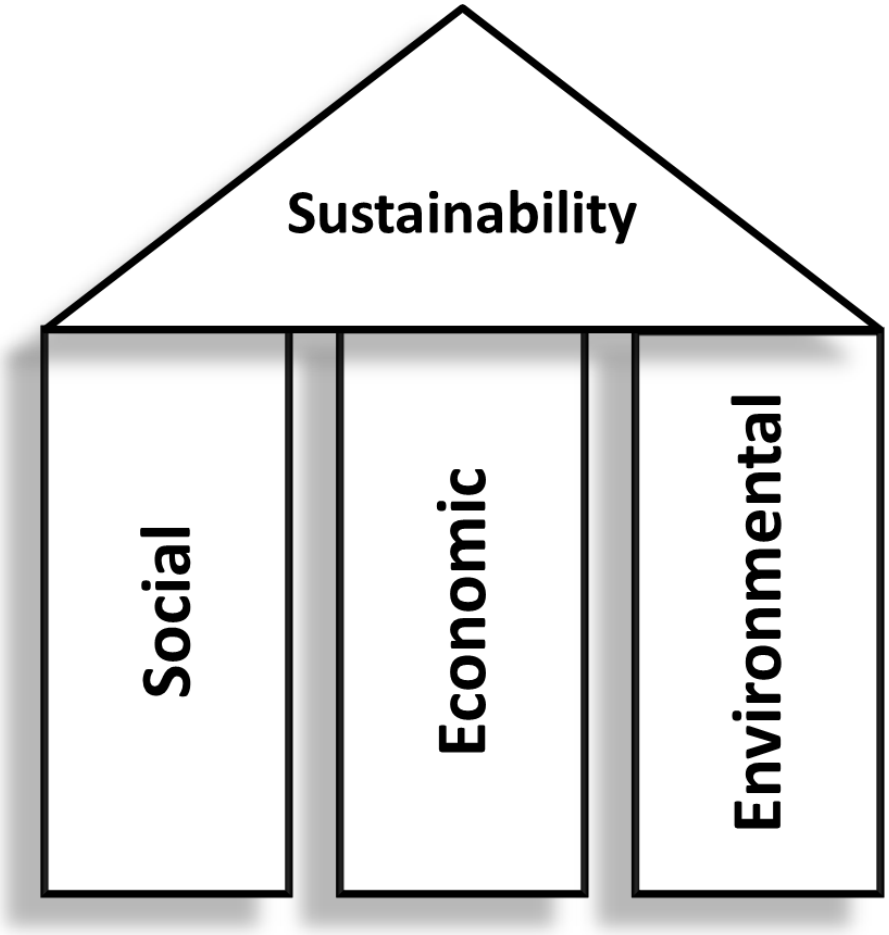


Figure 4: The three pillars model of sustainable development (Thatcher, 2015)

The social, the environmental and the economic aspects have to work in equilibrium for a process to be classified as sustainable. This also applies to mobility planning in general and particularly to the SUMP, which aims to achieve sustainability with economic viability, social equity, health and environmental quality. (ELTIS, 2014) With these goals set, the regions that want to apply a SUMP have to consider these objectives to fulfill the sustainable aspect.

2.3 Urban Europe vs. rural Europe

Speaking of urban, peri-urban and rural areas, it is important to define how these areas are classified into these categories. The Local Administrative Units (LAUs) define a functional urban area as an area “which consists of a city and its commuting zone; the latter is defined in relation to commuting patterns, on the basis of those municipalities with at least 15 % of their employed residents working in a city”, knowing that a city should have a minimum of 50.000 inhabitants with a population density of at least 1500 inhabitants/km^2. (CIVITAS, 2018)

A suburban or peri-urban region is defined as region with a minimum of 5.000 to a maximum of 40.000 inhabitants with a density of a minimum of 300 inhabitants/km^2. These areas are mostly located in a close proximity of a city. (CIVITAS, 2018)

This definition classifies both regions from the case studies, Sanem and Bassin de Pompey, as suburban areas.

"Over time, Europe has slowly transformed itself away from being a largely rural, agricultural community into a more urban, city-orientated one". According to the definition of the United Nations on what urban- and rural areas are, "more than half of the European population was living in an urban area by 1950". (European Union, 2016) By 2015, almost 75% of the European population lived in urban areas (CIVITAS, 2018). Only regions like Latin America, the Caribbean and North America had a higher share at that time. In order to illustrate the past and future situations of the population distribution between urban and rural areas, the United Nations projected the development onto 2050, as seen in the following graphs in Figure 5.

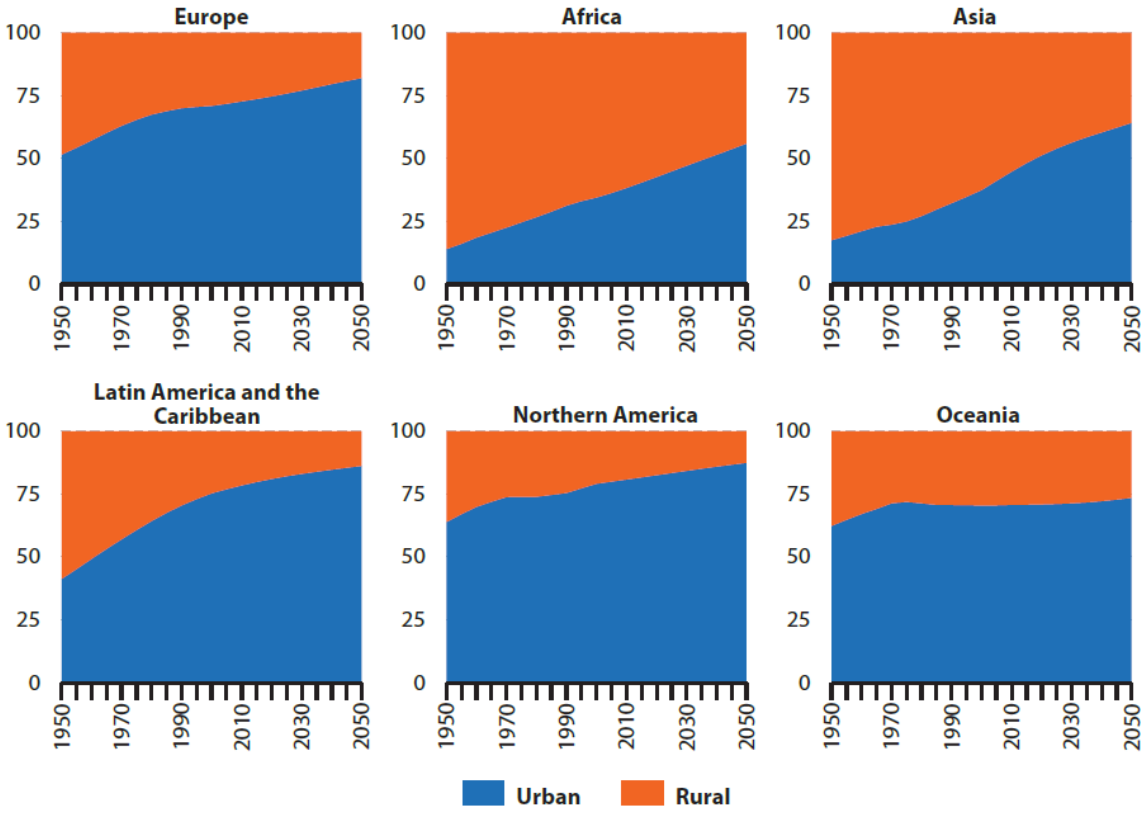


Figure 5: Share of urban and rural populations (United Nations, 2014)

After analyzing the graphs, it becomes clear that over the last decade the global level of urbanization has overtaken the number of those living in urban areas. By 2050 the share of the urban population should amount to 80% of Europe's total population. (European Union, 2016)

2.4 General SUMP progress in the EU

Based on a report from the SUMPs-UP program, “27 countries and regions out of 32 have incorporated SUMPs within their urban transport planning framework to a certain degree. 19 of them are provided with some support at the national level, including 5 (3 countries and 2 regions) forerunners who offer comprehensive legal, governance support, methodological and technical support. 5 countries have not yet integrated SUMPs at the national level.” One of the five countries that have not yet implemented a SUMP is Luxembourg.

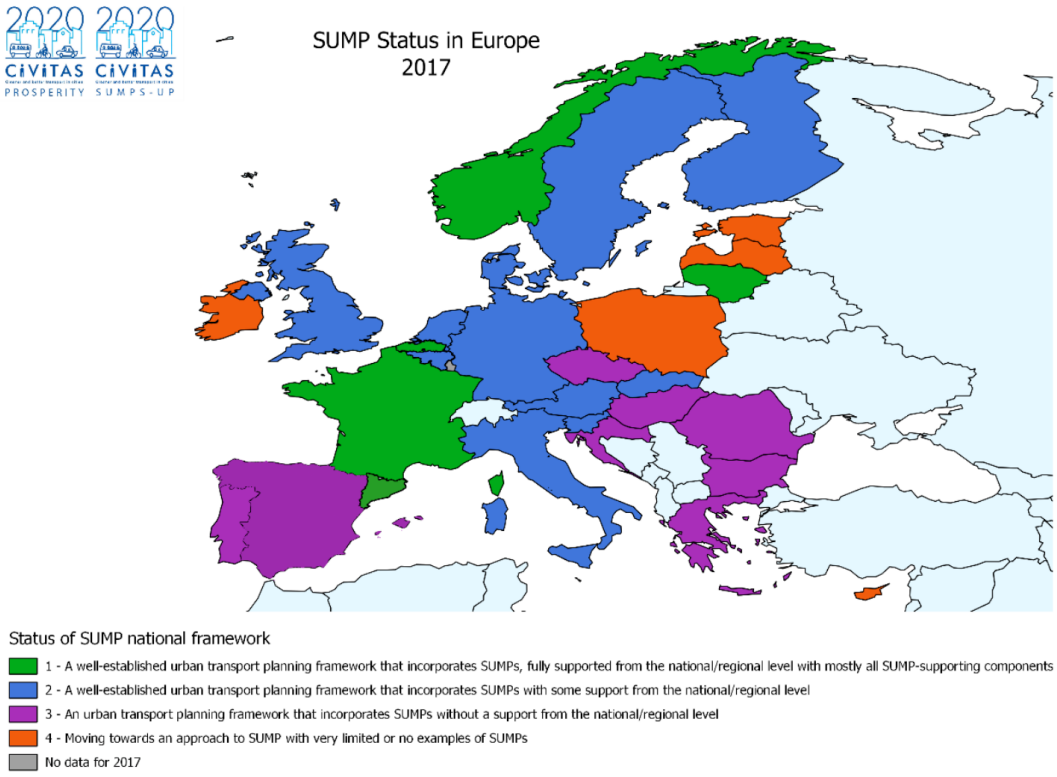


Figure 6: Mapping SUMP status in Europe (CIVITAS, 2018)

Figure 8 shows the extent to which the European countries have successfully implemented the SUMP concept, subsequently divided into five categories. The first (green) and second (blue) categories represent countries that have integrated the SUMP framework into their national urban mobility planning, with full support at a national level. These include countries such as France, Belgium (Flanders), Germany, etc. The third category (purple) has partially integrated the SUMP concept, without national-level support, including countries such as Spain, Portugal, Romania, etc. The fourth category (orange) includes countries that are moving towards the idea of SUMP in isolated regions in countries like Ireland, Poland, Estonia, and Cyprus, among others. The fifth category (grey) shows the countries that have not yet shown an interest in implementing a SUMP, or for which there was insufficient available data in 2017.

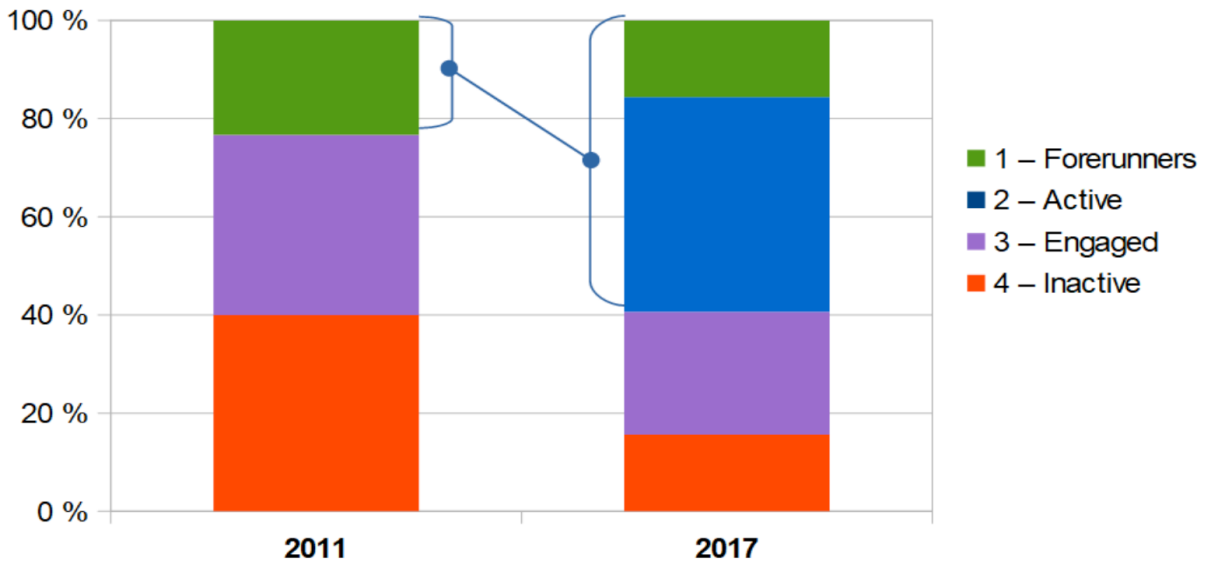


Figure 7: SUMP implementation progress status - Comparison 2011 vs 2017 (CIVITAS, 2018)

For the areas included in the case study of this thesis, it is important to note that Luxembourg is categorized in the fifth category, having not implemented any SUMP, while France is categorized as a forerunner with a well-established urban transport planning framework (PDU), fully supported at both national and regional levels.

In the following table the number of adopted SUMPs, such as the *"Verkehrsentwicklungsplan"* (VEP) in Germany, *"plan de déplacements urbains"* (PDU) in France and Local transport plan (LTP) in England, etc., have been listed to illustrate the differences in progress between the different countries. The number of cities that are currently (2017) implementing their first SUMP is listed in the second column, and in the third column the number of cities who are implementing their second or higher update of the SUMP. The leading nations/regions are France, Flanders in Belgium and Catalonia in Spain, closely followed by the UK (England). These high numbers are due to the legal obligation to implement SUMPs in these regions/countries.

	Number of adopted SUMPs	Number of 1st SUMP elaborations	SUMPs of the 2nd or higher generation
Austria	4	2	0
Belgium/Brussels Capital Region	1	0	1
Belgium/Flanders	307	1	210
Belgium/Walloon	12	1	8
Bulgaria	9	2	0
Croatia	6	1	0
Cyprus	1	3	0
Czech Republic	3	7	0
Denmark	6	5	2
Estonia	0	0	0
Finland	3	15	0
France	97	29	49
Germany	13	n.a.	n.a.
Greece	20	n.a.	0
Hungary	6	9	0
Ireland	0	8	0
Italy	16	54	0
Latvia	0	5	0
Lithuania	9	9	0
Malta	1	1	1
Netherlands	10	n.a.	n.a.
Norway	4	5	4
Poland	10	30	1
Portugal	9	10	0
Romania	65	n.a.	0
Slovakia	3	5	0
Slovenia	65	6	2
Spain/Catalonia	115	39	8
Spain (excluding Catalonia)	30	0	0
Sweden	75	100	Yes (number unknown)
UK - England	85	0	0
UK - Scotland	32	n.a.	4
Total	**1017**	**347**	**290**

Table 1: Number of cities engaged in a SUMP in 2017 (CIVITAS, 2018)

From 2013 to 2017 the number of implemented SUMP increased from 800 to 1 000. This major increase is mainly due to additional countries adopting SUMPs for instance, Romania, Slovenia and Sweden.

2.5 Sustainable urban mobility planning in Europe

The European Commission set a direction for all the countries by setting guidelines on SUMPs with the help of some programmes, such as CIVITAS and ELTIS. In the following chapter it becomes clear that there is a considerable variety of potential approaches for urban mobility planning among the 28 national governments in the European Union. Some approaches have distinct advantages over others. Therefore, the European Commission can help with their guidance document. On the other hand, it is also clear that some solutions may not be suitable in every country. Even the countries that are most advanced in urban mobility planning haven't fully committed to sustainability, providing political support or encouraging public involvement. Regardless of the different levels of advancement, political changes within a country can also lead to a shift in planning strategies over time. "You could observe a bandwidth of trends, from over-prescription, to supportive guidance to a laissez-faire approach within a certain time span" (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017).

The CIVITAS program SUMPs-UP questioned many countries throughout Europe as to what their main national challenges for urban mobility are. The top responses are illustrated in the graph below:

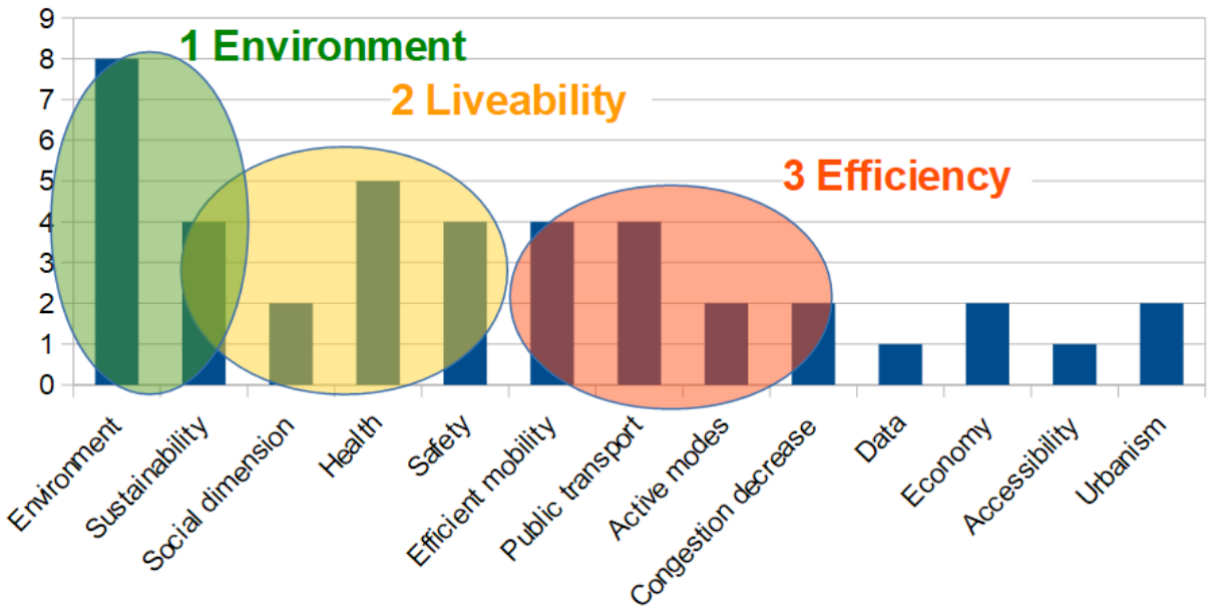


Figure 8: The major national challenges for urban mobility (CIVITAS, 2018)

The top three answers were related to the improvement of the environmental impacts stemming from mobility, the liveability and social aspects, and the efficiency of the mobility structures. Some other challenges that were mentioned less frequently, but mainly by regions in rural areas were the accessibility to cities, to build a stronger connection between land use and transport and the crucial role of transport supporting the local economy. (CIVITAS, 2018)

2.5.1 England

National Policy:

In this section the transport planning situation is reviewed in England outside of London, which has its own policy. In 1974 the first policy framework was established by the national government regarding transport planning where local authorities were required to produce "Transport Policies and Programs (TPP)" and subsequently "Local Transport Plans (LTP)". The LTP was the first transport plan with a strong emphasis on sustainability. Since 1974, three guidance documents have been published, with the third one (LTP3) being issued in 2009. This one gave the local authorities more freedom to produce genuinely 'local' transport plans that reflected local needs and aspirations than the two before (Department for Transport, 2009). In 2010 the new government decided not to require further LTPs, but there remains a statutory requirement on local authorities to update their existing LTP and keep it under review with the LTP3 as a guidance document (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017).

The responsibility for roads, traffic, parking and planning decisions, which influence transport demand lie with the cities on the local level; whereas the bus and rail services are provided by the private sector under the government's competition laws (May, Transport planning skills initiative: a plan for action, 2002).

Under the LTP system, the government specified performance indicators and targets, and monitored performance against them. In the early stages local authorities were penalized financially for not meeting their targets. These monitoring requirements have now been withdrawn. (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017)

Support for SUMPs:

In England, the Local Transport Plan provides detailed guidance to cities on the preparation of urban mobility plans, but the nature of the guidance changed over time. “The LTP1 and LTP2 guidance specified the objectives to be met in detail, and the way in which policy measures were to be justified. The LTP3 guidance gave cities much more freedom in objectives, timescales and policy measures, and provided support advice on problem identification, option generation and appraisal” (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017). This gradual change from prescription to guidance was the required change for an independent planning process.

Public participation and political support:

Throughout the LTP planning system, there has been strong support for public participation and stakeholder involvement. There are statutory requirements in the LTP3 regarding public involvement and political engagement, which emphasizes these points. (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017)

Monitoring:

The monitoring of the progress and elaboration of the measures set in the LTPs are largely left to the cities, which results in inconsistency due to the lack of resources, personnel and institutional barriers. Some measures are being supported by the government and therefore the progress is also monitored and evaluated (e.g. cycling measures), but in general transport initiatives aren’t supported (at all or very little) by the government. (May, Transport planning skills initiative: a plan for action, 2002)

2.5.2 France

National policy:

In France, urban mobility plans are called „plans de déplacements urbains” (PDU), and can be considered “almost SUMPs”, and have existed for over 30 years. They consist of planning projects spanning across several years, with the objective of defining the principle of circulation, organization of public transport, soft mobility and various other mobility topics. (Ministère de l'écologie, le développement durable et de l'énergie, 2013)

As for today 66 obligatory PDUs (>100.000 inhabitants in the region) are in place in France, and ten more are under elaboration. 33 voluntary PDUs (<100.000 inhabitants in the region) have also been implemented or are under development. Altogether around 170 urban mobility plans are either implemented or being developed in France at this moment in time. (Cerema, 2018) Since their creation, PDUs have changed a lot regarding the mobility habits and transportation issues in urban agglomeration in France, by decreasing the car use in urban centres and in counterpart increasing the use of public transport and developing of active modes. (Ministère de l'écologie, le développement durable et de l'énergie, 2013)

Since 1982 PDUs are being promoted by the French Ministry of Transport (MEDDE), which is involved in SUMPs via their local offices. In general, however, the local authorities are the ones in charge of the PDU, even though they are legally required to integrate their local mobility plan with other documents at a higher level (e.g. regional plans for inter-modality) and for specific themes (e.g. the environment). (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017)

The French association for transport and sustainable development CEREMA (Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement) helped to coordinate and to establish the guidelines for SUMPs published by the European Commission in close cooperation with other project coordinators like ICLEI and Rupprecht Consult. (CIVITAS, 2018) Therefore it isn't a coincidence that the SUMP structure and content is that similar to the one of the French PDU.

Public participation and political support:

The political involvement for PDUs is strong on all levels both national (hence all the laws) and regional. Almost all the regions with over 100,000 inhabitants have a PDU or are in the process of creating one, as it is compulsory to do so. Consequently, numerous smaller regions have voluntarily decided to develop their own PDU, or an alternative form of mobility planning. Therefore, the participation on the political side is accounted for; the process of involving the citizen has yet to be improved in the process of the PDU. The legal framework requires no public participation during the creation process of the PDU, but only a final public inquiry before the PDU is being voted for by the politicians. Some cities initiated a more participative approach on a voluntary basis to get a better interchange with the citizen throughout the planning process of the PDU. (Cerema, 2015)

Monitoring:

The progress of the PDU is regularly monitored, as is required by law. Every five years the regions/cities need to assess and, if needed, update their urban mobility plans. However, the ministry has limited capacities to control this and there are sanctions for cities that do not monitor their PDUs, in the form of fines for financing public transport infrastructure. (Certu, 2013)

2.5.3 Germany

National policy:

77% of the German population live in urban or densely populated areas (www.deutschland.de, 2019); therefore, there is a big responsibility in traffic and mobility planning. The planning process is distributed into levels between national, federal and regional authorities. The German equivalent to the SUMP, the “Verkehrsentwicklungsplan” (VEP), is mostly developed on a federal or local level by the respective counties or municipalities. (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017)

At the moment there are no guidelines that dictate how to do urban mobility planning on a federal level. There is however a national plan “the national cycling plan 2020 – joining forces to evolve cycling”, which clarifies how to plan soft mobility, particularly cycling. (FGSV, 2015)

Germany is well-known for its strong and long-lasting history in transport and mobility planning. As one of the leading nations in this topic many municipalities have a valid VEP (or similar), that get updated regularly to stay relevant. Over time these plans have changed from a more infrastructural approach to a comprehensive conceptual view on mobility planning, which corresponds with the approach of the SUMP. (UBA, 2001)

Currently, there is no legal obligation in place to do an urban mobility plan, as is the case in France. However, the obligatory municipal land use plan (Bauleitplanung), the clean air plans (Luftreinhaltepläne) and the noise reduction plans (Lärmminderungspläne) include different mobility and transport related topics that provide some answers to certain measures in this field. (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017)

In 2015, the German road and transport research association (FGSV) has published guidelines for the preparation, organization and implementation of a state-of-the-art strategic mobility planning process. (FGSV, 2015) The aim is to widen the scope of the existing planning tradition according to the SUMP guidelines. (EPOMM, 2018)

Due to the different policy levels in Germany (federal, municipal and state) the distribution of responsibilities is intricate. Some states have additional regional administrations. As the legal basis for land use planning is defined by the Federal or State Government the scope of the municipal planning authority is directly affected. Cities are responsible for the traffic on their territory except for long-distance rail and autobahns. Most public transport companies are still controlled by the city even if they are independent companies. Public transport planning is mainly done by transport associations, often divided into road and rail public transport. Parking on public grounds is solely in the hands of the cities. (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017)

Support for SUMPs:

Since there is no requirement for cities to produce an urban mobility plan, there is also no financial support from the federal or state level. Cities are only encouraged to adopt the FGSV guidelines. (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017) The only support is offered by the German Institute of Urban Affairs (Difu), which offers training and information for cities, municipalities, administrative districts, municipal associations and planning departments. Their main objective is to work in the interest of the general public, the citizen as well as the economy and the stakeholders. They provide, for example, training to cities on how to improve their cycling infrastructure (Fahrradakademie). (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017)

Public participation and political support:

There is no legal obligation for public participation in urban mobility plans in Germany, but many of the exemplary elaborations of German SUMPs include the population, either in the beginning of the planning process, or in the final phases of the SUMP (e.g. Dresden, Bremen, Leipzig).

Monitoring:

Only some of the existing or planned SUMPs intend to monitor and evaluate their progress and implementation of the measures. In Germany, however, monitoring the process is commonplace. (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017) The Federal Environmental Agency (Umweltbundesamt, UBA) gives some guidelines on how to measure progress and quality of urban mobility planning. (Umweltbundesamt, 2001)

2.5.4 Belgium

As Belgium is a state composed of several autonomous entities, regional planning isn't always easy. Planning in the field of mobility and transport is distributed between the federal state, the Flemish region, the Walloon region and the Brussels-Capital region. In the entire country the municipalities are responsible for the development of local urban mobility plans, only a few inter-municipal plans have been made to better tackle common problems. (EPOMM, 2018) From 2013 on, a mobility plan with guidelines focusing on sustainable mobility has been set in place in Flanders and all cities are obliged to implement it. The corresponding law is the "Decreet betreffende het mobiliteitsbeleid" (Decree on local mobility policy) of 2009, reviewed in 2012. (Mobiel Vlaanderen, 2018)

The Brussels-Capital region has its own plan called "IRIS". The main goals of this plan are to combat congestion and reduce motorized traffic by 2020, where each of the 19 municipalities in the region has their mobility plan that fits into the larger plan. (Mobilité Brussels, 2018)

The Walloon Region has an awareness raising program that promotes and partly finances SUMPs for many cities in the region. The cooperation between the region's mobility department (SPW Mobilité) and the cities has allowed measures to be taken that balance out economic development, environmental protection and social needs. (BEPOMM, 2018)

2.5.5 Sweden

Sustainable transport attracts a great deal of interest in Sweden, as they are a very progressive nation regarding transport planning. Since almost 85% of Sweden's population live in urban areas (data.worldbank.org, 2019), they should have strong and sustainable transport systems. Therefore, most municipalities have adopted goals and strategy plans to develop or improve more sustainable transport.

In 2004 the national transport agency developed guidelines called "TRAST", Traffic for Attractive Cities, in form of two handbooks. One aims at supporting municipalities in their work to develop the urban planning process to include transport planning, and the other includes facts and information about developing traffic strategies, plans and programs. There are already a lot of cities and municipalities that adopted a SUMP. (Durlin, 2018)

2.5.6 Italy

In Italy the majority of the municipalities are familiar with the concept of SUMP, but in Italy it is called PUM (Urban mobility Plan). The PUM can be considered similar to a SUMP as “a PUM is an integrated project on urban mobility including infrastructural measures on public and private transport... as well as on demand management by means the network of the mobility managers.” (Article 22 of the Law n. 340/2000, 2000). As is the case in Germany, PUMs are not mandatory in Italy. Instead, there are other policies in place that promote urban mobility planning like the national cycling policy, the legislation on air quality, the legislation on mobility management and many others. However, they aren’t combined in one single law or plan; each of them has useful elements to the SUMP’s implementation, but they don’t give a complete overview of the situation.

2.6 PDU (Plans de déplacement urbain)

As the chapter 2.5.2 France gave already a lot of information on the PDU (plan de déplacements urbains) the following chapter will go further in depth on that topic.

“The PDU is a comprehensive transport planning tool that determines the principles governing the organization of passenger and freight transport, traffic and parking within the scope of urban transport. The development process is led by the French urban transport authority (autorité organisatrice des transports urbains - AOTU) and involves many institutional stakeholders, both from civil society and economic ones. Its content has changed several times and its objectives have gradually turned towards the promotion of sustainable mobility in relation to urban policy” (Ministère de l'écologie, le développement durable et de l'énergie, 2013); this is the basic definition of the French PDU (French: plan de déplacements urbains). It exists since 1982 and has been created by the French domestic transport orientation law (loi d’orientation des transports intérieurs – LOTI).

The aim was to balance out the usage of the different transport modes, in response to the oil crisis and the dependency on fossil fuels of the various modes of transport. The PDU is responsible for the return of the tram in French cities like Nantes and Grenoble after their disappearance in order to “adapt cities to the car” (Certu, 2012). In 1996 the law on PDUs changed with the air quality law, which made it compulsory for areas of over 100,000 inhabitants. (Ministère de l'écologie, du développement durable et de l'énergie, 2012)

In the 80’s and 90’s the PDU as a transport planning tool for the development of public transport and active mobility (walking and cycling) has gradually developed into a more glob-

al transport plan including all modes, especially more recent issues that have received less attention in the past (e.g. environment and climate change, accessibility for people with reduced mobility, transport and urban planning, parking management and the transportation of goods). (Ministère de l'écologie, le développement durable et de l'énergie, 2013)

Since its implementation, the PDU demonstrated how effectively this plan has helped to improve and influence urban mobility. The decrease of car use and the increase of public transport and active mobility have been noticeable. This success has encouraged a lot of smaller areas to engage in voluntary implementation of an urban mobility plan. (Ministère de l'écologie, le développement durable et de l'énergie, 2013)

In France there is an entire hierarchy of planning documents set in place with legal regulations causing problems of implementation. There are a lot of stakeholders involved in the planning process and therefore impedes on the governance process between national transport authorities and the local stakeholders. (Ministère de l'écologie, le développement durable et de l'énergie, 2013) The distribution of responsibilities between the different actors is complex. The responsibility over the road-network is shared between the cities, the departments and the states, depending on the road's status. Parking is shared between the private sector (car parks) and the city administrations (public and on-street parking). Local authorities are responsible for the planning of the urban public transport, while the operation thereof is done by the private sector under a franchise. Local rail services are operated by the national operator SNCF. (Garcia, 2019) Regarding new mobility forms like car sharing and electro-mobility or active transportation like walking and cycling the cities are in charge but often with involvement from the private sector (May, Boehler-Baedeker, Delgado, Durlin, Enache, & van der Pas, 2017).

2.6.1 Legal framework of the PDU

There are four laws that structure the base document of a PDU. They define, in particular, the development phases, the objectives, the content, as well as various obligations such as consultation with partners and the population. (Certu, 2013)

The PDU is framed by the following laws:

1) The article 28 of the law “loi *d’Orientation sur les Transports Intérieurs*” (LOTI) from 1982, which states that "the PDU defines the principles of organizing the transport of people and goods, traffic and parking in the urban transport perimeter. It aims to ensure a sustainable balance between the needs for mobility and ease of access on the one hand, and the protection of the environment and health on the other. Its objective is a coordinated use of all modes of travel, including an appropriate allocation of roads, as well as the promotion of the least polluting modes and the lowest energy consumption. It specifies the measures of development and exploitation to be implemented (...)". (République Francaise, 1982)

2) The article 14 from the law “*loi sur l’Air et l’Utilisation rationnelle de l’Energie*” (LAURE) from 1996, states "... Within two years after the publication of the law on air and the rational use of energy, the implementation of a PDU is compulsory in agglomerations of more than 100,000 inhabitants (...)". (République Francaise, 1996)

3) The law “*Solidarité et Renouvellement Urbain*“ (SRU) from 2001, states the following about the function of a PDU:

   “[...] improving the safety of all journeys, in particular by defining a balanced modal share of the road network for each of the different categories of users [...]; The decrease in car traffic [...]; The development of collective transport and economical and less polluting means of transport [...]; (République Francaise, 2000) The development and operation of the main urban road network [...]; the organization of on-street parking and public parking lots [...]; Transportation and delivery of goods while rationalizing supply conditions. [...] It proposes an answer adapted to the use of the existing logistic infrastructures, [...]; Encouragement for businesses and public authorities to establish a mobility plan and to promote the transportation of their person [...]; the introduction of integrated pricing and ticketing for all trips [...]". (République Francaise, 2000)

4) The law “*La Loi pour l'égalité des droits des personnes handicapées*” from the 11th of February 2005 states:

   "All persons with disabilities have the right to the solidarity of the entire national community, which guarantees them, by virtue of this obligation, access to the fundamental rights granted to all citizens and the full exercise of their citizenship”. (République Francaise, 2005)

2.6.2 The PDU in the hierarchy of urban planning

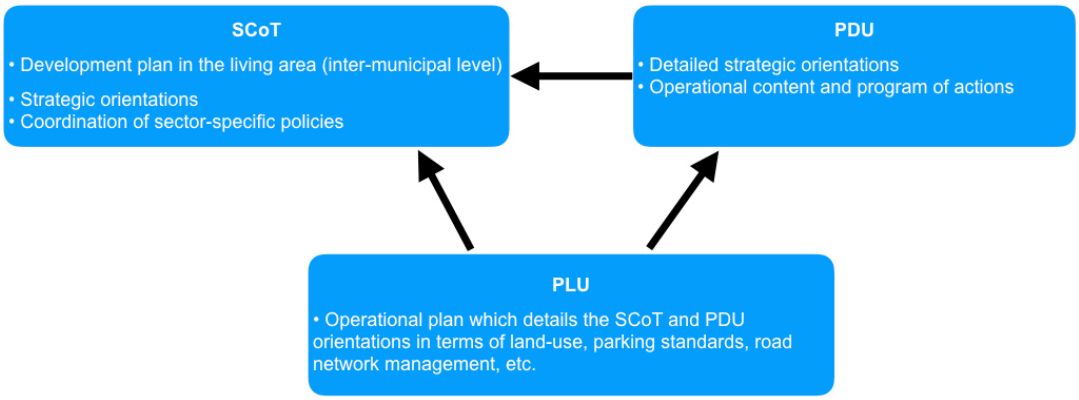


Figure 9: The hierarchy of urban planning in France (Ministère de l'écologie, du développement durable et de l'énergie, 2012)

In the grand scheme of mobility planning in France there is a main document that decides the direction, in which a region is going, namely the SCoT (French: Schéma de cohérance territorial). Overall the SCoT and the PDU express a vision of life where mobility is integrated into day-to-day life based on sustainability principles. The PLU is a small scale plan which includes concepts that are based in a local area on a smaller scale. The PLU is imbedded into the PDU and the SCoT. These three plans ensure a good spatial and mobility planning for a region, zoomed into a smaller scale but also in the grand scheme of things over the entire region. (Ministère de l'écologie, du développement durable et de l'énergie, 2012)

2.6.3 Implementation of PDUs in peri-urban regions

After a certain time of the PDU regulation being in place, it became clear that the PDU actions often face difficulties in being implemented in the peripheral areas of cities or a region. A low density is less favourable for the public transport; the areas aren't coherent as there are sectors with development gaps running through the region. This encourages the use of private cars and long-distance trips. (Ministère de l'écologie, le développement durable et de l'énergie, 2013)

The French transport planners, however, seem to have found a relevant solution for each mode to solve the problems in peri-urban regions. Sustainable mobility planning should be possible with specific measures for regions with a lower density and urban infrastructural composition. Public transport needs a network hierarchy what makes it possible to connect all the services and identifies key lines running in dedicated spaces and to which other lines they can be connected. Public transport in peri-urban spaces can also function alongside the regular way of service as an on-demand service. Inter- and multimodality with walking and

cycling is a key factor for sustainable mobility to succeed in such an area as it plays a role in expanding the public transport user base.

“Sharing” services like car sharing and carpooling are also relevant as it facilitates to reduce the number of cars on the streets. Measures like dedicated car parks and effective internet platforms for linking users to their transportation make it easier for these new modes to compete against individual motorized traffic. Finally, according to a Certu report and the experiences of French planners’, sustainable mobility in rural areas can be further aided by the development of traffic calming measures and parking management, but also by awareness rising and educational processes. (Ministère de l'écologie, le développement durable et de l'énergie, 2013)

2.6.4 Objectives of the PDU

The main objectives of the PDU are quite similar to the ones of a SUMP. The main goal is to reduce car traffic and develop public transport with the means of getting around with more environmentally-friendly mobility. It is a balancing act between all the transport modes to even out the mobility needs, the accessibility as well as the preservation of the environment and the health of everybody. Another objective of the PDU is the implementation of pricing and ticketing for mobility services; this makes the services more efficient and allows the operators to stay on top of their game financially and technologically. Similar to the public transport, parking in an agglomeration should be organized and managed.

The improvement of road safety and the accessibility for people with reduced mobility are also important points in the Plan de Déplacements Urbains. A key point in regards to the attractiveness of a public space, which is promoted by local businesses and public/local authorities, is not only conducive to improving the economy, but also to encourage people to walk or cycle small distances.

Another aspect to consider is the organization of transportation and delivery of goods within a city. These are necessary journeys completed on a weekly or even daily basis, and without proper organization, will only stifle smart mobility and the attractiveness of a city.

While the local businesses and the public authorities often improve the attractiveness of a given area, they too can be responsible for poor transport management. Daily commutes for work purposes are the prime cause of congestion today, and the commute to work should be organized, where possible, in the best possible way, indiscriminate of the profession.

In the „Code des transports“, the article L1214-2 fixes eleven goals that a PDU aims to achieve. They are:

1. A sustainable balance between mobility needs and accessibility on the one hand, and protection of the environment and health on the other hand
2. The strengthening of social and urban cohesion, including the improvement of transport accessibility for mobility impaired people
3. The improvement of safety of all trips, by facilitating the shared street space between all modes of transport and monitoring accidents involving pedestrians and cyclists
4. The decrease in car traffic
5. The development and promotion of public transport and the less polluting and energy-consuming modes, including bicycle and walking
6. The improvement of the use of the main road network, including national and regional highways, through a better allocation between the transport modes and traffic information
7. The organization of on-street parking and public car parks, by defining areas with limitations in parking time, paid parking areas, reserved parking spaces for mobility impaired people, a parking fee policy coherent with the road use policy, the creation of park-and-ride facilities, a dedicated parking policy for public transport, taxis, and freight vehicles, measures facilitating resident parking and car sharing
8. The organization of goods supply in the urban area necessary for trade and business activities, by coordinating the municipal regulations on time deliveries and goods vehicles, improving the conditions of on-street deliveries, encouraging the use of existing logistics facilities, especially those close to railways and waterways, in a multimodal perspective
9. The improvement of the transport for staff of companies and public bodies, by demanding companies to elaborate mobility plans which encourage the use of public transport and carpooling by their staff
10. The organization of an integrated fare and ticketing system for all trips, including peripheral car parking and encouraging public transport use by families and groups
11. The development and localization of charging facilities for electric and hybrid vehicles

(Code des transports, 2019)

2.7 Poly-SUMP

Alongside the SUMP guidelines and tools, there is another sustainable urban mobility plan promoted by the European Commission, called the Poly-SUMP “Polycentric Urban Mobility Plans aim to develop a sustainable urban mobility planning methodology in polycentric regions (will be described in the chapter 2.7.1 Polycentric region), areas characterised by several centres where services and goods, and therefore transport needs are scattered in different towns” (International Council for Local Environmental Initiatives, 2019).

Mobility planning in polycentric regions is often more complex, as there are normally a lot more stakeholders involved from different municipalities or even from different countries, where people’s homes and workplaces are scattered across different towns, even commuting between different cities. Similar to the French PDU, the regions doing a Poly-SUMP consist of more than one city/municipality. Also, the SUMP methodology requires a very comprehensive, intensive planning cycle that might overwhelm small cities and towns. However, small municipalities need mobility planning too. To plan a SUMP for a poly-centric region requires the coordination of policies and services of many stakeholders. (EPOMM, 2016)

Transport and urban planners, local and regional policy makers, urban and interurban public transport providers have to work together within and across administrative boundaries. Without a planning tool, the individual citizen of small-scale cities is mostly obliged to adopt a “do it yourself” solution, which often results in the increase of individual car use. As the share of people living in cities or suburban areas in Europe is constantly increasing, it will become increasingly more important for these regions to tackle mobility planning to ensure the decline of individual car use. (Adell, Ljungberg, & Trivector, 2014)

If there are several towns or cities in a region, the POLY-SUMP tool can be used to make a joint SUMP, similar to the French PDU-planning tool.

The methodology of a Poly-SUMP is to overcome these issues and build a constructive dialogue among all involved actors in order to reach a common vision of sustainable mobility, by adding the Poly-SUMP methodology that is based on the conventional Sustainable Urban Mobility Plan (SUMP) process, adding specific elements of the conventional SUMP process to widen the scope to a poly-centric region. (International Council for Local Environmental Initiatives, 2019)

The POLY-SUMP methodology was tested by an ELTIS workgroup from the 15 April 2012 until the 15 October 2014. The aim of the project was to develop a polycentric sustainable mobility planning methodology, testing concrete planning processes in six participating regions of Europe, all with characteristics of a polycentric peri-urban region. The regions are:

- Regione Marche, Italy
- Central Alentejo, Portugal
- Central Macedonia, Greece
- Parkstad Limburg, the Netherlands
- The Heart of Slovenia, Slovenia
- Rhine Alp, Austria.

They test the planning procedure towards the adoption of mobility plans in these regions and check if they can also be applied to other similar regions in Europe. (EPOMM, 2016)

The method of the Poly-SUMP turned out to be a tool that helps people to build up a mutual understanding, to agree on a common ground and to transform their capability for action quicker. (Adell, Ljungberg, & Trivector, 2014)

2.7.1 Polycentric regions

In the Poly-SUMP guidelines, a polycentric area is defined as a “network of medium-to-small cities and peri-urban villages in a relatively compact area, an area that could be travelled with a commuting time not exceeding one hour each way and not dominated by a central large metropolitan city” (Adell, Ljungberg, & Trivector, 2014).

In theory a polycentric city region consists of one larger city, with a population that doesn’t exceed 200,000 inhabitants, and a number of smaller towns, with a population of around 5,000 inhabitants. These numbers mustn’t be exactly respected, but rather function as a guidance. (Adell, Ljungberg, & Trivector, 2014).

In general, polycentric regions are more densely populated than rural regions; however the density is not high enough to escape the difficulties in achieving accessibility and competitiveness of the region in the global market. Figure 10 illustrates the definitions of the different types of regions are illustrated in. (Adell, Ljungberg, & Trivector, 2014).

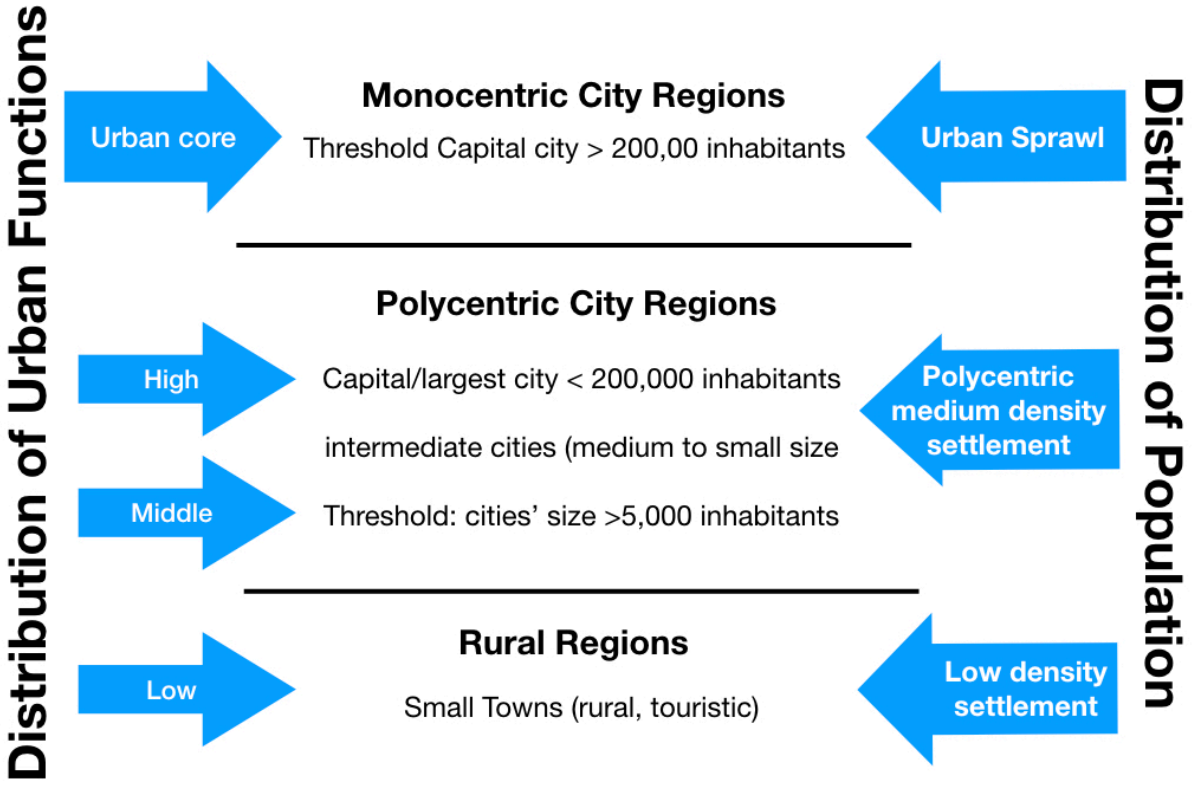


Figure 10: Polycentric vs. Monocentric and rural areas (Adell, Ljungberg, & Trivector, 2014)

2.7.2 The Poly-SUMP Methodology

The Poly-SUMP methodology is based on the conventional SUMP process with the addition of a few elements to further understand and treat the needs of a polycentric urban region and enable a more participatory process including all the stakeholders.

The conventional SUMP process consists of four stages as seen in Figure 3 whereas the Poly-SUMP methodology adds three more steps to the first three stages of the SUMP process in order to widen the scope to a polycentric region. The three elements of the Poly-SUMP consist of preparing well by understanding your region, creating common ground and vision, and using the outcomes and elaborating the plan. (Adell, Ljungberg, & Trivector, 2014)

The aim of these elements is to identify and understand the region and its special needs as they are often scattered between different administrative boundaries. Once this process is completed it gives a base on how to identify similar regions in Europe.

The goal-setting process of the SUMP can be facilitated through a workshop that includes all stakeholders. In the workshop, a common ground and vision for the future is developed, then actions and measures to realise this vision are formulated by representatives of, ideally, all

relevant mobility stakeholders. By implementing this technique, a process that can take months is reduced to three days. After the region has been analysed and the workshop has been done, it is time to elaborate a development plan of the Poly-SUMP. The gained knowledge makes it possible to create a tailored mobility plan for the region. (Adell, Ljungberg, & Trivector, 2014).

2.7.3 Benefits of the Poly-SUMP

The main benefit of the Poly-SUMP process is the capability of generating a good multi-level dialogue on mobility between all the different stakeholders in the region. This makes it possible to represent and adopt all the different perspectives, standpoints and interests during the planning and implementation process. This fosters new ways of communication and cooperation where certain benefits can be expected:

- Knowing and understanding the region offers a foundation for a collaborative planning process, as well as interregional collaboration.
- The Poly-SUMP can be used to compare regions, either focusing on particular topics or in general on the whole document.
- The results achieved in a participative process are often more comprehensive, doable and sustainable and are therefore more likely to be accepted by the population, the politicians and the stakeholders.
- The dialogue with the people increases the capacity to find solutions for complex problems, while joint forces improve the results and the learning ability of every party included.
- During workshop process people expand their opinion forming ability and learn to integrate and balance their interests. Being familiar with different arguments prevents people from adopting rigid positions.
- It is easier to implement strategies if they have been developed through a transparent dialogue, reducing the need to convince people of the adopted decisions.
- The dialogue increases people's willingness to commit to the process, "as joint responsibility creates shared success".
- The participative process helps to decrease social conflicts. Active participation in the dialogue promotes cooperation and opens up new fields of action.
- (Adell, Ljungberg, & Trivector, 2014)

2.7.4 Differences in mobility planning throughout Europe

In the last few chapters, three different mobility plans have been described. First the French PDU, one of the oldest urban mobility plans in place in Europe, with a strong legal framework and a mandatory execution for regions with more than 100.000 inhabitants. The PDU is mostly implemented in regions and not in individual cities. The SUMP on the other hand, which is inspired by and structured along the lines of the PDU, doesn't have any legal framework, nor is it mandatory for any city. And lastly, the third plan is the Poly-SUMP. This plan does not differ much from the SUMP except for one aspect, the scale of the region in which it is planned. Whereas the SUMP is usually only implemented in individual cities, the Poly-SUMP is mostly implemented in polycentric regions, which almost always include multiple cities and towns.

With these three types of urban mobility plans, the question is how planners know which type of plan is best for their region.

Regarding the case study of Sanem in Luxembourg, the second research question of this thesis is which concept of urban mobility planning is the best suited for a peri-urban region? Which of the three types of plans, PDU, SUMP or Poly-SUMP can provide the best results for a peri-urban region like Sanem?

This research question will be treated with a qualitative analysis, with the help of interviews held with mobility experts on the topic of urban mobility planning.

3 Methodology of the paper

During the course of this Master's Thesis, two research questions are envisioned to be answered regarding the topic of sustainable urban mobility plans and their compatibility in peri-urban regions, based on the example of Sanem in Luxembourg. This research will be a qualitative analysis in the form of a case study. The case study focuses on the comparison of regions in which urban mobility plans were/are being planned. The first region is Sanem, a small-scale municipality in Luxembourg which is currently working out a Sustainable Urban Mobility Plan. Sanem has peri-urban characteristics and is the basis of the comparison. The second region is the community of municipalities of Bassin de Pompey (CCBP) in France, near Nancy. This region published a PDU in 2006 and reviewed it in 2016. The two regions aren't identical but similar in terms of population density. On the basis of this comparison the first research question: whether the methodology of a sustainable urban mobility plan as proposed by the European Commission, is compatible in a peri-urban region.

In addition to the comparison of multiple case studies, a number of interviews with mobility or spatial planners, municipality representatives and stakeholders were held. The goal in doing these interviews was to gain a better understanding of the various viewpoints and opinions on the topic of urban mobility plans; mostly in France, Switzerland, Sweden and Luxembourg. The interview partners were chosen in such a way as to cover the private sector (private engineering/consulting firms), the public sector (on a municipal or ministerial level) and the political level (political representatives of Sanem). By covering all three sectors, these interviews should guarantee a complete range of different opinions and actors that are normally found in the application of urban mobility plans. The two research questions will be examined by a combination of a comparison of two case-studies and an interview analysis whilst using qualitative research paradigms. (Goertz & Mahoney, 2012)

As qualitative researches are not repeatable, measurable nor provable through statistical analysis, the researcher should remain objective despite the direct contact with the research subject during the comparison and the interviews. Nevertheless, qualitative data analysis always tends to be subjective to a certain degree; the challenge is to avoid bias in the interpretation of the data (here: the interviews and the comparison). (Prof. Rolf Moeckel, 2018)

This qualitative analysis focuses on describing sustainable urban mobility plans in an in-depth, comprehensive manner, by describing different examples of mobility planning throughout Europe, their respective evolution throughout the years, and the differences that occurred. This provides the possibility to summarize the characteristics, the similarities and the differences across various countries and regions. (Adar Ben-Eliyahu, 2014)

4 Study Area

In this section, the study areas treated in this document are being described. Firstly, there will be a brief introduction on the traffic situation of the European country Luxembourg. Following this, the municipality of Sanem, located in the south of Luxembourg, will be described. To answer the first and the second research question the municipality of Sanem and its SUMP is going to be compared to the PDU of Bassin de Pompey in the French department Meurthe-et-Moselle.

4.1 Luxembourg

The Grand-Duchy of Luxembourg is a small landlocked country in the middle of Western Europe. Luxembourg borders to Belgium in the North and the West, to Germany in the East and to France to the South. Luxembourg City, the capital of the country is, alongside Brussels (BE) and Strasbourg (FR), an official capital of the European Union and the seat of the European Court of Justice. (Kreins, 2010)

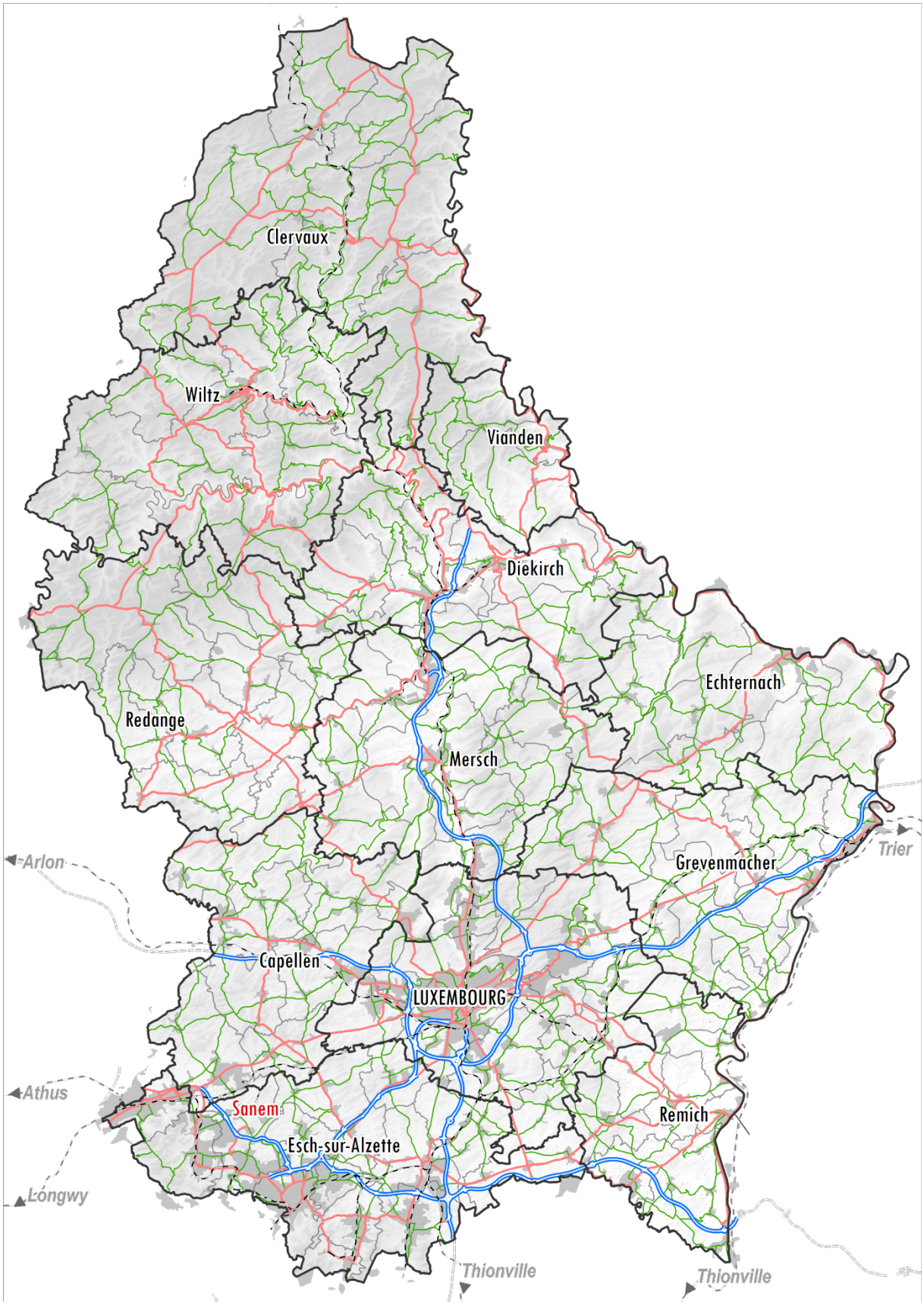


Figure 11: Basic map of Luxembourg's road network (Schroeder & Associés, 2019)

The Luxembourgish culture, the people and the spoken languages are highly intertwined with the neighbouring countries. The nation's official languages are therefore French, German and Luxembourgish, the three languages every child learns in school. (Kreins, 2010)

In January 2018, Luxembourg had a population of 602,000 inhabitants, which makes it one of the least-populous countries in Europe (STATEC, 2017), but by far the one with the highest growth rate (Central Intelligence Agency, 2017). 47% of the Luxembourgish population are foreigners (STATEC, 2018), who mostly come to Luxembourg to work. As Luxembourg is a developed country with an advanced economy, it is the country with one of the world's highest GDP per capita (trading economics, 2019).

The land use in Luxembourg is documented in four categories. 85,1% of Luxembourg's surface are woodland or agricultural surfaces, with a land sealing (buildings) rate of 9,8%, 4,5% is dedicated to transportation infrastructure and 0,6% are water surfaces. The municipality that is focused on in this paper is Sanem, located in the district of Esch/Alzette in the Southwest of Luxembourg.

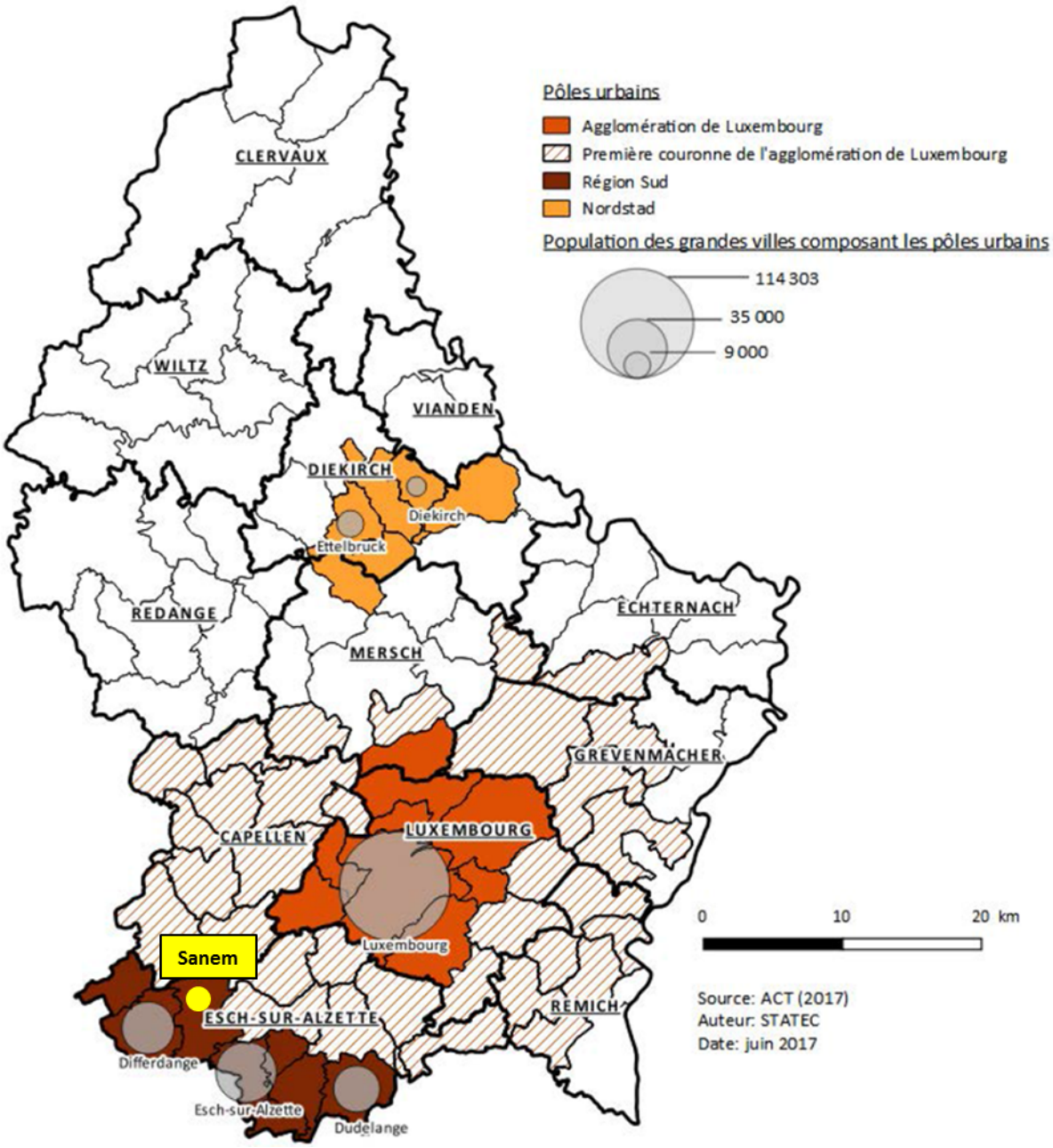


Figure 12: Luxembourg and its urban areas (MODU 2.0)

In Luxembourg and its urban areas (MODU 2.0) Figure 12 the population density is shown in the map. Luxembourg has one big attraction area being Luxembourg City. Luxembourg City is constantly growing and is the only urban development area of the country. The entire region in the south west in Luxembourg has grown also a lot in the past, to the point where it matured into a peri-urban development area. Also the north has a development area which is developing slowly from a rural area into a peri-urban agglomeration. These three areas are the most promising concerning the rise of the population density. In the following map the population distribution by the municipalities is shown.

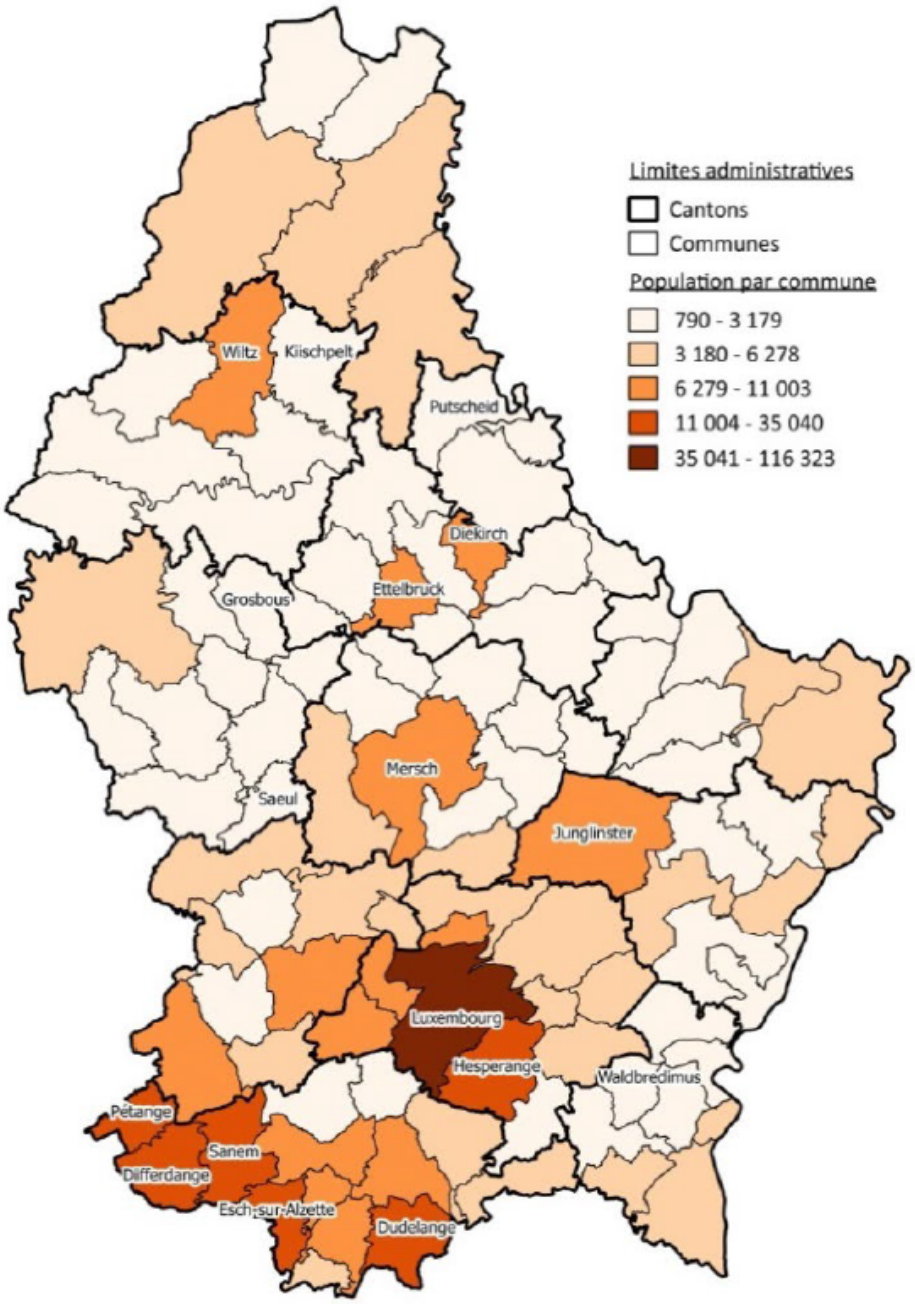


Figure 13: Population distribution (STATEC, 2019)

4.1.1 The regional traffic situation today

Luxembourg, with its geographical location and very distinct labour market, provides an interesting and unique traffic situation which makes transportation planning in the small country challenging.

4.1.2 The influence of the national labour market on transport

Looking back over the past 30 years, Luxembourg has always exceeded average European growth. Despite the global economic crisis in 2008, Luxembourg's economy was able to record growth, which among other things is attributable to the continuously growing labour market. Therefore, the population of Luxembourg is expected to grow constantly over the next few years. (STATEC, 2017)

The expected economic growth will also have an impact on the demographic and therefore also on the traffic situation in the entire country, but especially the south region where Sanem is located. (STATEC, 2017)

As the demographic and economic situation in Luxembourg is heavily dependent on migration and commuters, it is important to not only take the population of the country into account regarding transport planning, but also the high number of daily commuters from France, Belgium and Germany. The share of commuters has increased from 3% in 1961 to 42% in 2016, amounting to roughly 427,000 employees in total (ADEM, 2018). The cross-border workforce is essential for the Luxembourgish economy. The 170.000 daily commuters are mostly coming from Belgium, Germany and France. (STATEC, 2017)

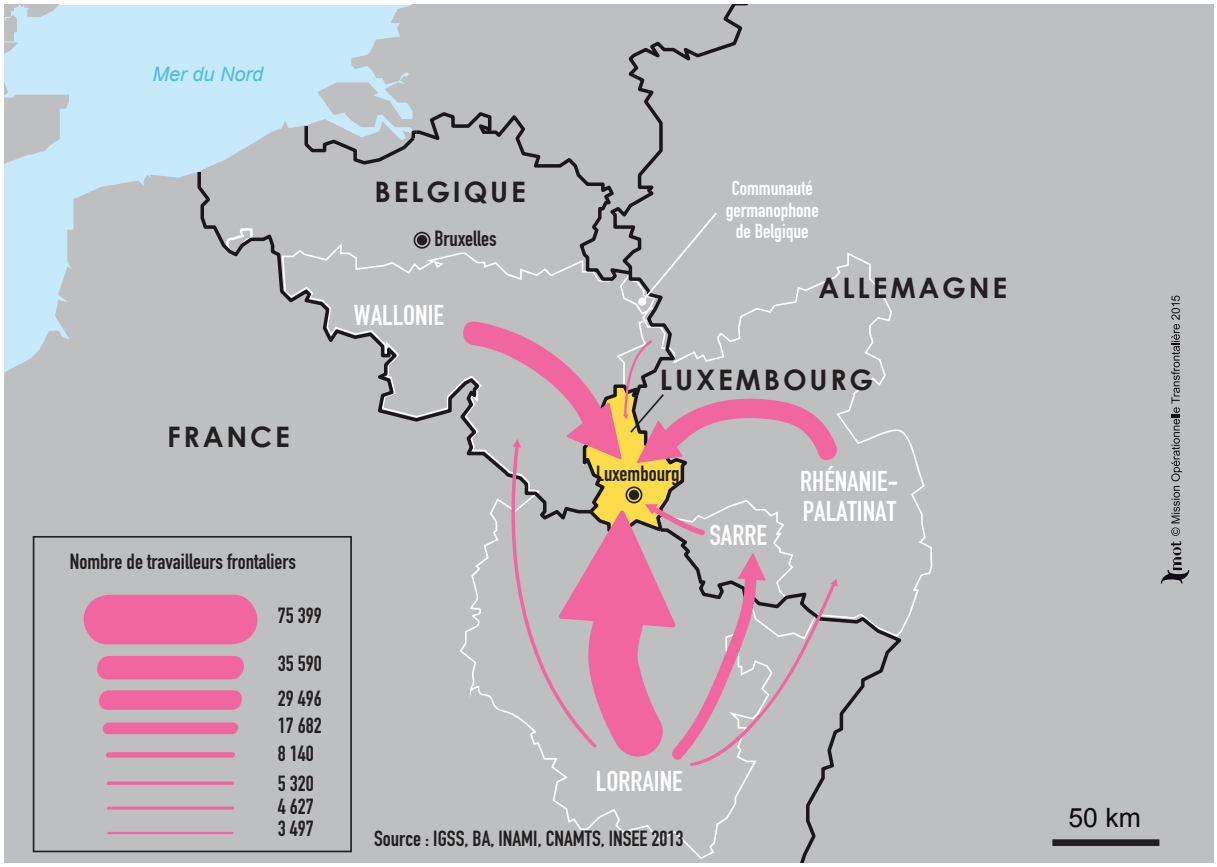


Figure 14: Cross border commuter fluxes (www.espaces-transfrontaliers.org, 2013)

The Luxembourgish institute of statistics STATEC projects that in the coming years, the share of commuters will rise to a share of 50% and then settle there (STATEC, 2017).

The long-term evolution of population growth will depend on the availability and prices of housing as well as on existing mobility and transport connections.

For the year 2030, a total population up to 790,000 is assumed. In addition, STATEC expects an annual increase of around 10,000 commuters by 2030 (STATEC, 2017), which presents an additional challenge for multi-governance and cross-border mobility planning.

As about half of these cross-border commuters come from France, they are forced to pass through the south of Luxembourg. Since the southern region of Luxembourg is also the most densely populated region, it is no surprise that there is also the largest traffic volume and consequently the biggest traffic problems.

Since the majority of the jobs are concentrated in Luxembourg City and its surrounding areas, a significant part of the traffic in the southern municipalities is through-traffic with Luxembourg City as its destination.

4.1.3 The mobility habits of Luxembourg's population today

Analyzing the national modal split of 2007 shown in Figure 15, the motorized private transport (MIV) is clearly the main transport mode in the country. The modal split represents the distribution of the use of the respective means of transport for all routes. Here, however, only the paths that were completely covered with a means of transport are considered, so that all multimodal designed routes (combination of multiple modes) are not considered here.

This is largely due to the habits of the population, but also due to the rural structure and the low density. In addition to the high proportion of MIV rides, there is still a very low occupancy rate of the vehicles: "The load of the cars, which go to the capital between 06:00 and 10:00 o'clock is 1.16 persons per car for locals and 1.22 for cross-border commuters "(MODU 2.0). This corresponds to about a two-person occupancy of every fifth car.

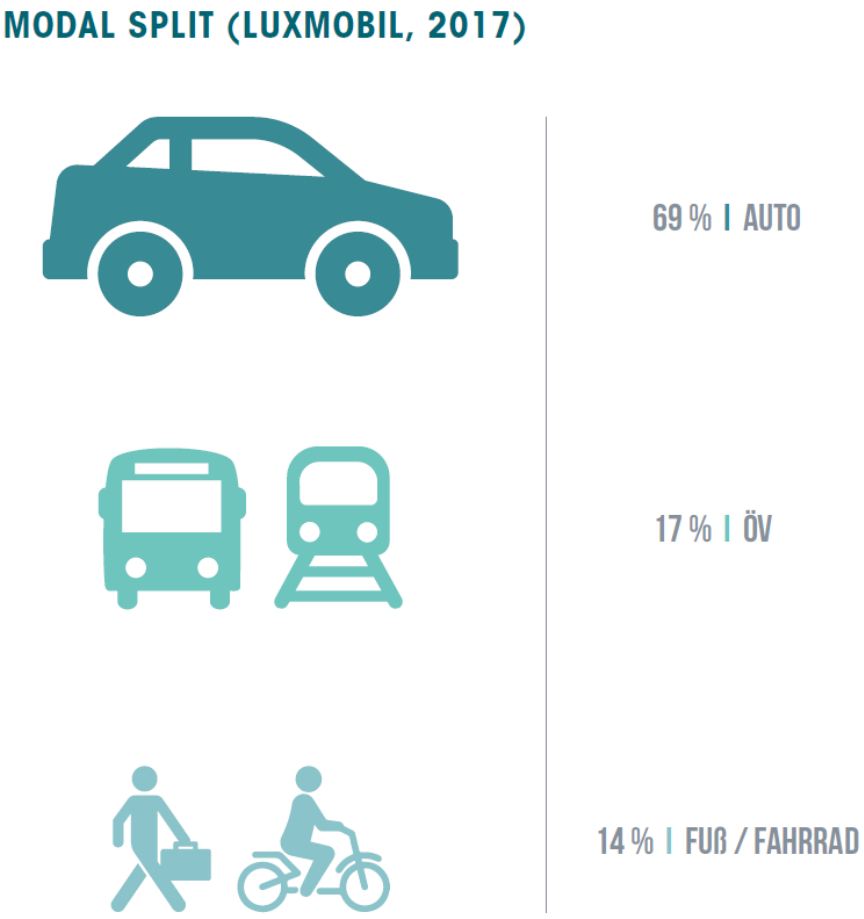


Figure 16: Modal Split of Luxembourg in 2017 (Luxmobil, 2017)

4.2 Sanem (Luxembourg)

The municipality of Sanem, with just under 16,500 inhabitants, is the sixth largest municipality in Luxembourg. In the East and the West, the municipality borders the sub-centers Esch/Alzette and Differdange, which are the second and third most populated cities in the country. To the south, the community meets the French border of the Lorraine. On one side, the municipality lies directly in the largest and most densely populated region of the Grand Duchy, the “Minett”, and on the other side, Sanem borders with France. This quickly reveals that transport plays an important role in the region. Especially the daily commuter traffic/through-traffic turns out to be one of the biggest challenges for a sustainable change.

The municipality of Sanem consists of four villages: Sanem, Soleuvre, Belvaux and Ehlerange. Additionally, a new district has developed in recent years: Belval.

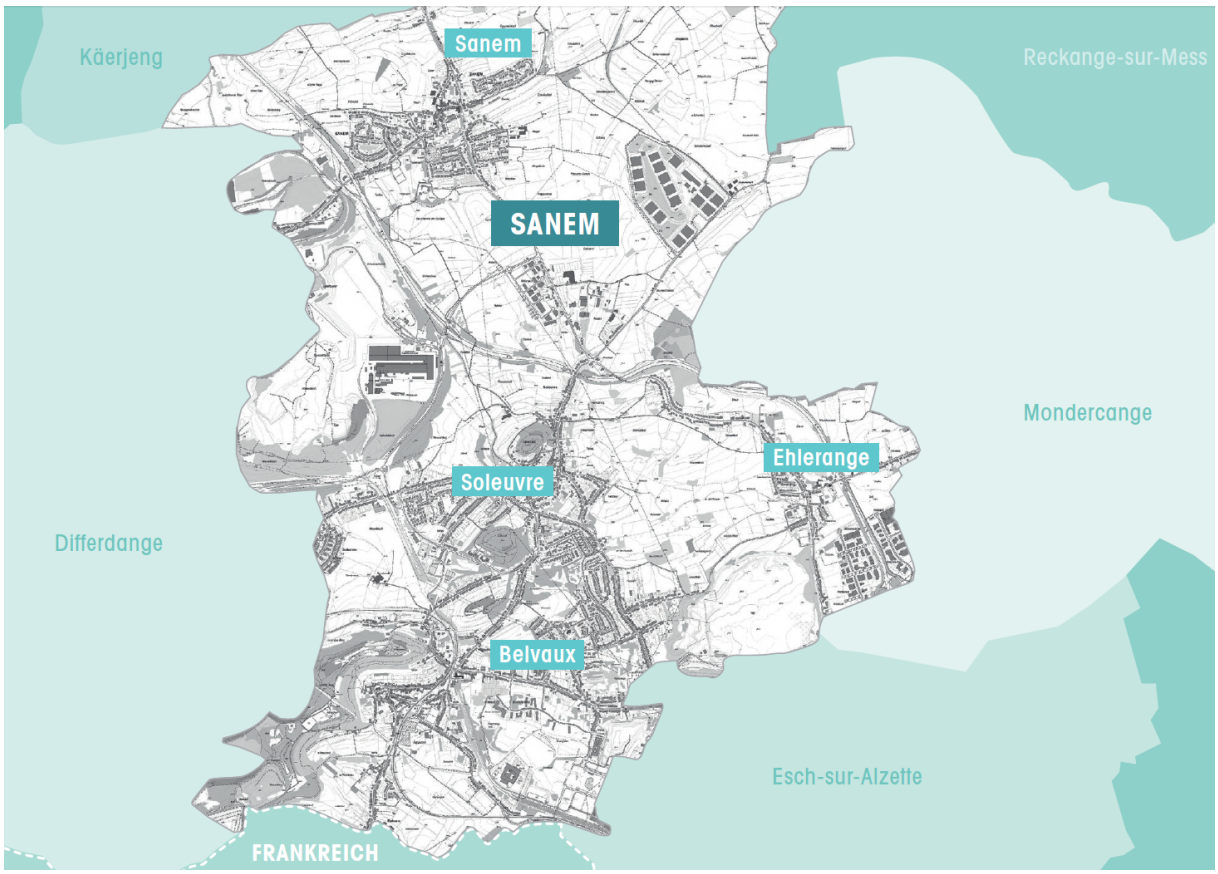


Figure 17: Map of the municipality of Sanem (Schroeder & Associés, 2019)

This innovative district has a unique position/characteristic in Luxembourg. It is an attractive interaction between housing, work, shopping, culture and education, and therefore brings a higher traffic load/volume of traffic through all modes of transport, so that there is always room for improvement and innovation to combat the congestion issues.

Looking at the structure of Belval, Belvaux and Soleuvre compared to Sanem and Ehlerange, it is noticeable that there are large gaps in the respective densities and populations, Belvaux and Soleuvre being more densely populated than Sanem and Ehlerange. This feature shows strong potential for development within the area, knowing that STATEC predicts Luxembourg's population to double until 2060 (STATEC, 2017).

Combining the development potential of these areas with the future development of the remaining areas in the Belval district, it can be predicted that the community of Sanem will not only expand its infrastructure, but also notice a prominent population growth.

The municipality of Sanem, with well over 20,000 inhabitants, will someday be a reality. This huge increase promises to be a great opportunity, especially for non-motorized traffic. This closes existing gaps in the settlement structure and thus also in the road network. The importance lies in the development of areas close to the centre, which enables the implementation of a "city of short distances".

Currently, Sanem is a polycentric region, with a mixture of peri-urban and rural properties.

"Sanem as a municipality mostly changed things regarding mobility planning and infrastructure in the past when something went wrong or wasn't working", said Fernand Heischbourg during his interview. (Heischbourg, Interview regarding SUMP, 2019) So when asked why the municipality of Sanem wants to do the first SUMP in Luxembourg he answered, that he doesn't want to continue their current planning strategy, where they run behind problems trying to fix them as soon they occur. Heischbourg says that the municipality needs a complete and coherent plan for their mobility situation, which can be applied today and also in the future. He likes the concept of a SUMP because of its structure. "In a first stage an analysis of the current situation is made, where lie the strengths and weaknesses of the region, and in a second phase objectives are being set and an action plan is drawn up". (Heischbourg, Interview regarding SUMP, 2019) This offers the responsible planners in the municipality a clear plan that can be followed up over the years and also be updated in regular intervals. "It is basically a tool to set a structure to mobility planning, with an action plan that can't be forgotten in the cupboards". (Heischbourg, Interview regarding SUMP, 2019)

The SUMP of Sanem, called "Mobility Master Plan 2030", is intended to bundle the planning and traffic concepts of the municipality of Sanem that have been carried out so far, thus continuing the systematic traffic development that has been carried out in the last decades in the municipality.

The Mobility Master Plan 2030 is a cross-traffic master plan that redefines the objectives and measures for (improved) mobility in Sanem and aligns them to future challenges. In the next few years, fundamental urban planning and socio-political tasks in the municipality of Sanem will be on the agenda.

The changing demands on the settlement structure by processes such as demography and climate protection must be considered as well as future demands on housing, the world of work and leisure activities. These socio-political and structural processes, in turn, strongly change the demands on mobility. The municipality of Sanem has made great advances in transport policy in recent years and has always tried to introduce attractive offers for all types of traffic. Being able to choose between equal and similar modes of transport not only relieves the burden on the transport sector, but also has a positive impact on the environment.

The Mobility Master Plan 2030 aims to continue this basic idea of freedom of choice for means of transport. In addition, it can be assumed that this will also change the modal split in favour of the modes of transport of the environmental network (pedestrian and bicycle traffic, public transport).

Therefore, a municipal strategic planning under this heading has the following objectives:

- Promoting a more efficient, environmentally-friendly and socially acceptable mobility of all road users and traffic-creating bodies;
- Securing and guaranteeing everyday mobility through functionally equivalent mobility services;
- Promoting responsible driving to reduce traffic accidents and pollutant emissions.

In addition to these more classic types of traffic, such as the traffic network planning for the motorised individual transport (MIV) or the traffic safety work, also more innovative aspects are included into the Masterplan, such as e-mobility, car sharing and integrated mobility management.

Urban and transport planning cannot be viewed in isolation but must be coordinated. So, the current traffic planning and programs are to be linked with the spatial planning and the national planning strategy in the municipality Sanem.

The Mobility Master Plan 2030 addresses this challenge and forms a concrete plan of action for future transport planning in the municipality of Sanem, considering all areas relevant to mobility. Through various participation processes, which were used within the framework of the master plan, a citizen- and user-oriented program was created, which can be integrated into the future planning in a sustainable way.

4.3 Bassin de Pompey

The community of municipalities du Bassin de Pompey (French: Communauté de communes du Bassin de Pompey, CCBP) is a French public institution of intercommunal cooperation (EPCI) in the department of Meurthe-et-Moselle in the “Grand Est” region. The Bassin de Pompey counts 42,000 inhabitants, an area of 156.00 km² and a density of 260 inhabitants/km². (Bassin de Pompey, 2017)

The community was founded on the 29th December, 1994 and includes 13 municipalities. The administrative centre is located in Pompey. (Ministère de l'intérieur, 2019) The Community of Communes of the Bassin de Pompey aims to bring municipalities within an area together, with the goal of developing all kinds of projects together for the entire territory. (http://www.bassinpompey.fr, 2019)

Figure 18: Territory of the Bassin de Pompey with the thirteen municipalities (http://www.bassinpompey.fr, 2019)

There are a lot of transport axes running through the territory of Bassin de Pompey, with the TGV rail network (yellow/red line), the motorway (red line), being close to the cities Metz and Nancy and having the rivers Mosel and Meurthe running through, the region has good accessibility possibilities.

Due to the geographical location, the Pompey basin is experiencing a natural phenomenon of peri-urbanization, which influences demographic dynamism and requires the territory to develop services and infrastructures on the smaller scale of around 40,000 inhabitants. (http://www.bassinpompey.fr, 2019)

On the economic front, the Pompey basin is a leading in the Lorraine valley. The economic development is due to the Eiffel Energy Park: an area of 140 hectares, with more than 120 companies located and nearly 4,000 employees working there. The two rivers and a lot of forests add to the quality of life and attract tourists. The Pompey Basin Community of Com-

munes actively participates alongside other Communities in the dynamism to constantly improve the region of the Lorraine. (http://www.bassinpompey.fr, 2019)

The privileged position of the Bassin de Pompey between Nancy and Metz, places it on a key position for the development of the territory. The community of municipalities of the Bassin de Pompey invests in sustainable and coherent development of the urban areas, mobility and environment. In this context, it participates in the development of “SCOT SUD Meurthe et Moselle”. The development of soft mobility is a major focus of the urban planners. At present, 25 km of cycle and pedestrian routes have been developed. In order to pursue a coherent development of the network, the community of municipalities worked out a master plan for the future pedestrian and cycle routes. (http://www.bassinpompey.fr, 2019)

The Community of Communes of the “*Bassin de Pompey*” (CCBP) finances organizes and manages the urban transport network "SIT" (Intercommunal Transport Service) and the public transport offer on demand (TAD) "Flexo". Currently, there are three regular bus lines and three “flexo” lines active, with nearly 200 stops to maintain. The region also co-finances and participates in the suburban public transport network of Nancy “SUB NORD” which provides the connections between the Bassin de Pompey region and the greater region of Nancy. The CCBP works in partnership with the other Transport Organizing Authorities to simplify the use of public transport by developing projects such as a multimodal information centre. It has committed itself in collaboration with Nancy to set up a new ticketing system and a mobility card.

Currently the community of municipalities is developing a masterplan for accessibility. The aim is to set up a program that makes transport infrastructures, roads and public spaces accessible for people with reduced mobility and disabilities, while respecting the national regulations (The Law on Equal Rights and Opportunities”). (http://www.bassinpompey.fr, 2019)

Eager to understand the issues and challenges of the region related to mobility topics, the responsibles of the Bassin de Pompey decided to engage in an urban mobility plan (PDU) in 2006. As the population of the region is under 100,000 inhabitants, the PDU is on a voluntary basis. The first PDU of the region was implemented over the period from 2006 to 2016 and proposed an action plan that aimed to conquer all the needs and demands of the population regarding mobility. The goal is to improve accessibility, mobility, quality and safety of travel with the preservation of the living environment. (http://www.bassinpompey.fr, 2019)

After the ten years of the PDU being in place, a synthesis on the progress and the results of the mobility plan was made, where seven objectives have been retained:

- Objective 1: Coordinate urban and mobility planning to improve the modal split.
- Objective 2: Improve and develop public transport in the region and the neighbouring territories.
- Objective 3: Promote and encourage the use of soft mobility.
- Objective 4: Stop the increase of the number of private cars.
- Objective 5: Organize and optimize parking by introducing parking management.
- Objective 6: Ensure the quality of life and reduce emissions by the transport sector to protect the environment.
- Objective 7: Give back more space to the pedestrians and cyclists and take into account the needs of people with reduced mobility.

(Communauté des Communes du Bassin de Pompey, 2006)

A more detailed look into the PDU and the synthesis document is provided in the upcoming chapter.

5 Comparing the SUMP of Sanem to the PDU of the CCBP

In this chapter the SUMP of Sanem and the PDU from the CCBP will be compared in order to examine the two research questions; the first question is whether or not the SUMP can help implement sustainable measures in a peri-urban region, and secondly, whether the compulsory application of a SUMP in a region of a predetermined size, similar to the legislative framework of a PDU, is an option that can lead to better results for Luxembourg.

5.1 Methodology of the comparison

The first research question will be treated by comparing the SUMP of Sanem to the standards and objectives of the PDU of the Communauté des Communes du Bassin de Pompey (CCBP) conducted in 2006 and revised in 2015. The revision of the first SUMP from the CCBP offers a good base to see whether the measures planned in 2006 were able to be implemented by the responsible actors and if the PDU in a smaller, peri-urban region was successful. On the basis of this outcome from the CCBP region, the comparison to the region of Sanem in Luxembourg will allow for a claim as to whether or not the SUMP in Sanem could also be a success.

To further strengthen the methodology of this qualitative analysis, eight interviews were held with mobility experts who either know the regions of the case studies, or are working in the field of SUMPs. On the basis of these interviews the second research question can be answered.

The comparison will provide not only an analysis of two regions, but also an assessment of the two documents implemented in these regions. The comparison of the PDU in the French region of the Bassin de Pompey and the Luxembourgish municipality of Sanem will be conducted step by step. First, the structure of each document will be analysed and similarities and differences will be highlighted.

Afterwards, each phase of the SUMP in Sanem will be compared to the corresponding phase in the PDU of CCBP from 2006, as well as the revised document from 2015.

5.2 Comparison of the different phases of the SUMPs

5.2.1 Structure of SUMPs

Sanem:

The SUMP of Sanem is structured in three phases. In the first phase the mobility situation of Sanem is analysed in depth. In a second phase, after the analysis has been completed, the synthesis is made wherein the overall strategy of the document is defined and where the objectives and goals of the SUMP are set. In a third phase the conception of the document, including a detailed action plan is constructed.

In the figure below, the procedure of the SUMP is shown with its three steps. The first step is based on collected data of the present mobility situation in Sanem. An important aspect of the first two steps is the participatory approach, in other words, the inclusion of the affected population. The participatory aspect of the SUMP was incorporated by means of a questionnaire given to the population in 2017 and a public workshop including the population, local politicians and planners. The second and third step are sequentially based on the previous phase and on the data gained out of the participatory approach.

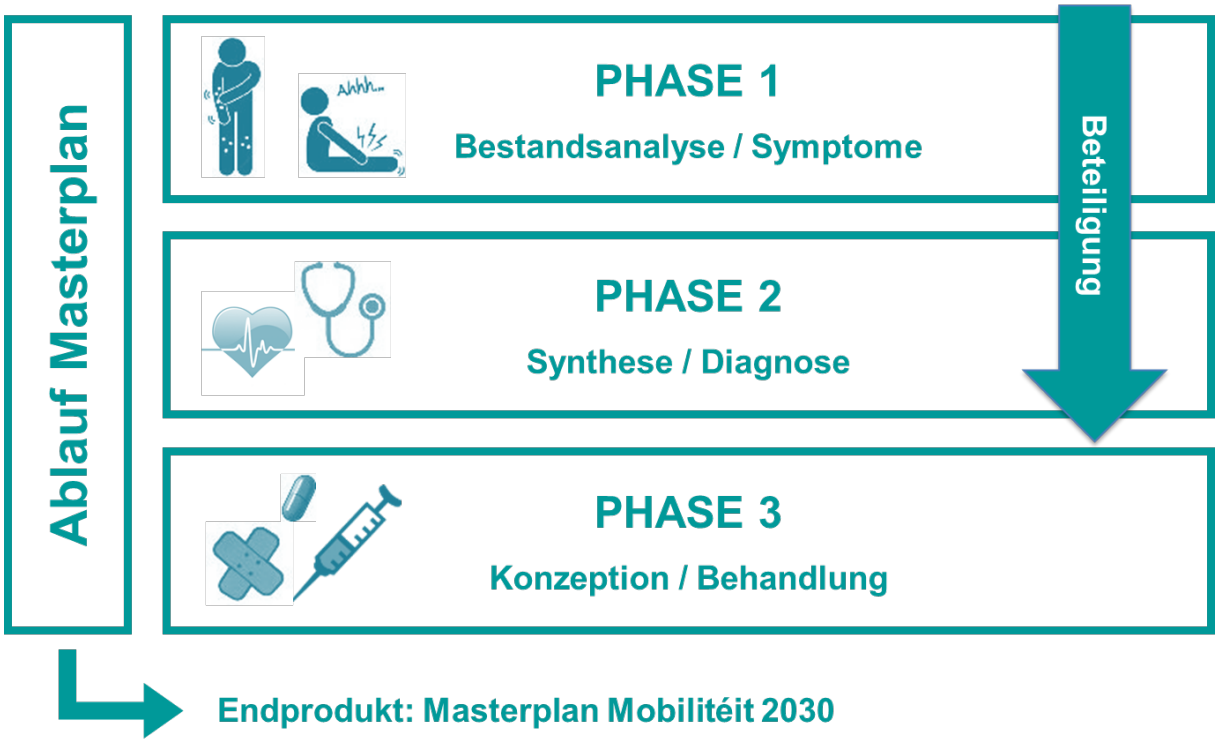


Figure 19: Structure of the SUMP in Sanem (Schroeder & Associés, 2019)

CCBP:

The French SUMP (PDU) is, contrary to the Luxembourgish one, structured in four phases. In a first phase the legislative framework and the basic methodology of a PDU are described. Additionally all the organisations and stakeholders involved in the process are listed to ensure an exemplary transparency to the document and the reasoning behind it.

The second phase of the PDU is similar to the first phase of the SUMP in Sanem, where the current situation in the region is analysed and the problems are summarized. Additionally the PDU includes a description in this phase of the overall orientation and main objectives the document wants to reach in order to clearly define the intentions behind the document. During this phase the findings of the participatory approach were included in the results in the form of a survey.

In the third phase the strategic plan for the PDU is defined, with different scenarios on how to improve the current situation and tackle the problems. In the same phase, one strategy is chosen out of all the scenarios that have been examined.

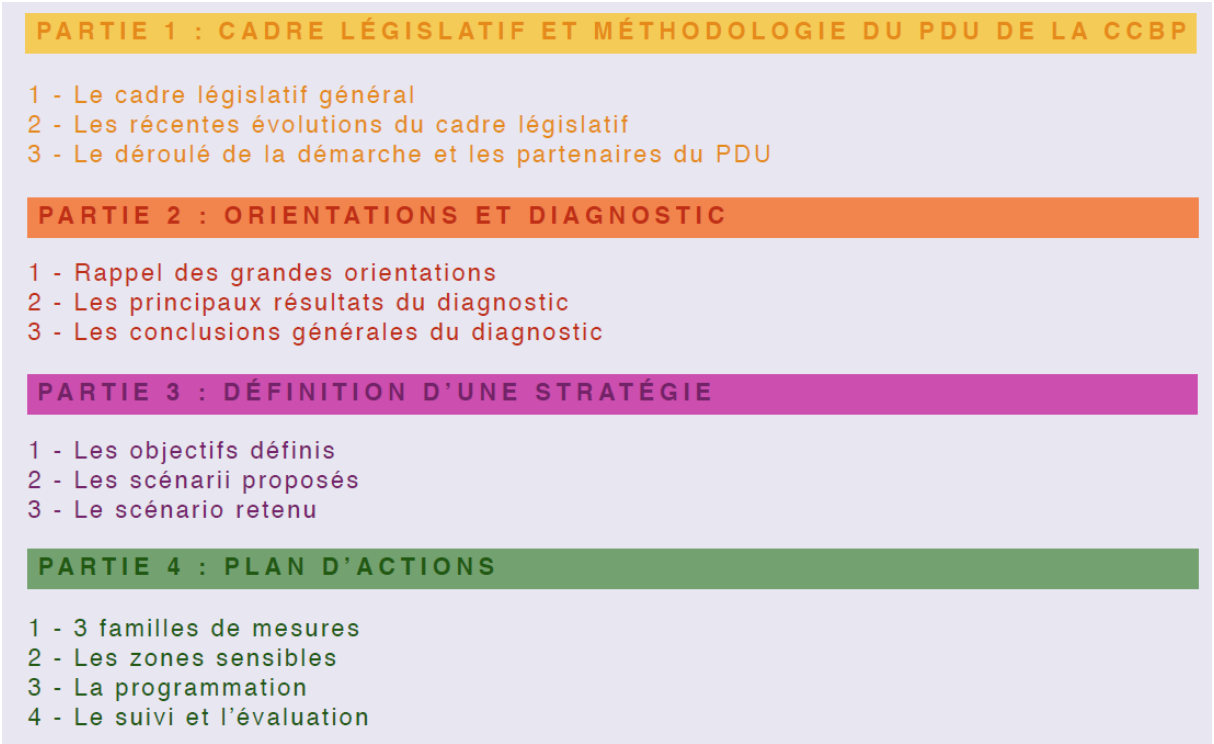


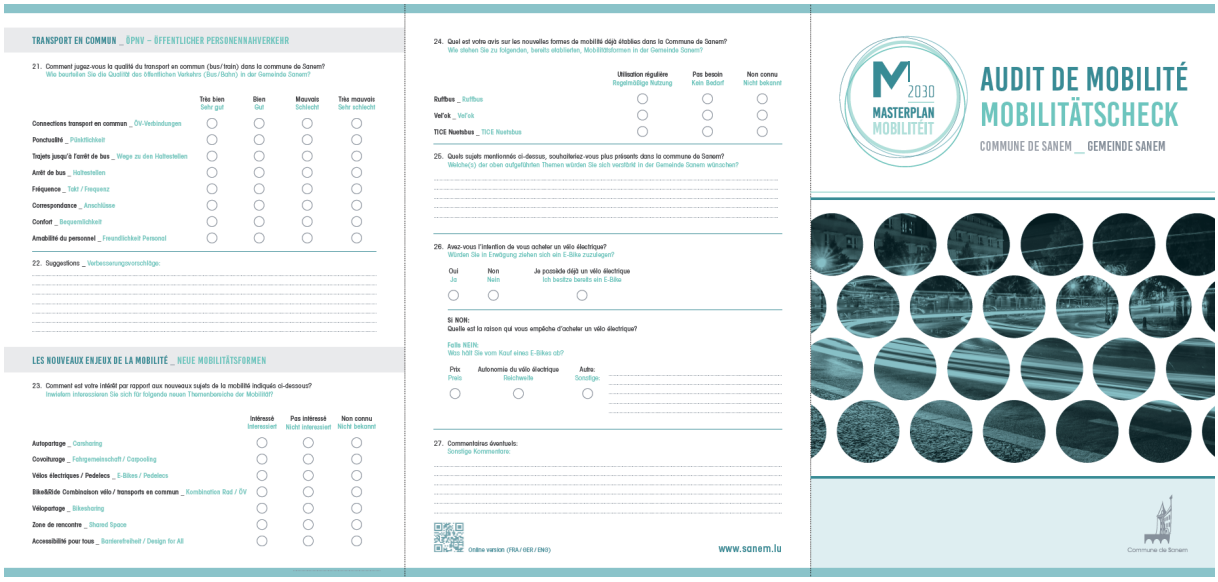
Figure 20: Structure of the PDU of CCBP (Communauté des Communes du Bassin de Pompey, 2006)

The fourth and final phase of the PDU is the action plan with the improvement measures, described in detail and with examples on where to apply them by 2016. At the end of phase four the PDU also presents the follow-up plan for the years between 2006 and 2016, and categorizes the different measures of the action plan in short-, medium- or long-term measures.

5.2.2 Participatory component of the SUMPs

Sanem:

Part of the SUMP is to include the population in an active way to contribute to the elaboration of the mobility plan. The participatory approach is/was done in two phases. In a first phase a household study was done in 2017 where the population of Sanem was sent a questionnaire. This questionnaire encompasses 27 questions about the mobility habits and the basic perception of the mobility situation within the municipality. From the 6,544 questionnaires that were sent out, about 1,000 came back, resulting in a response rate of 14%. This is a very high return rate for a household survey.



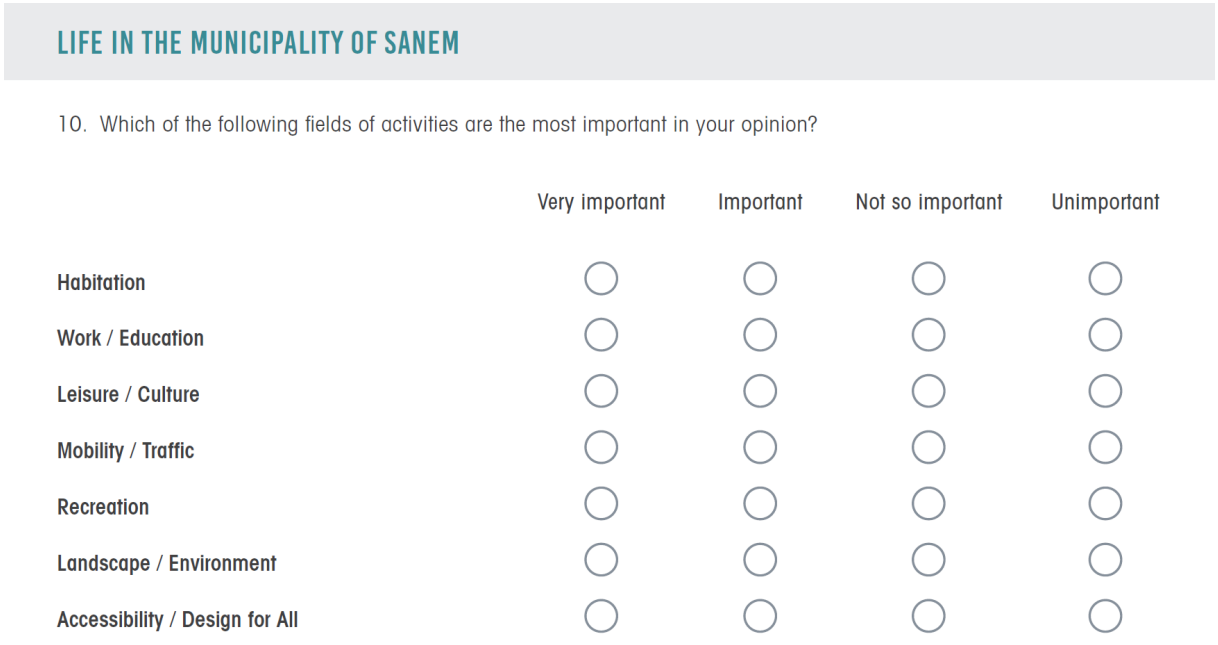


Figure 21: Example of a question from the questionnaire "Mobilitéitscheck" (Schroeder & Associés, 2017)

In a second phase, a workshop with the population and stakeholders was organized to promote a bottom-up approach. People are able to articulate their wishes and contribute to the creative process. At the end of the evaluation of the household survey a public presentation was held, where the entire population was presented the results. The same procedure will be done when the SUMP document will be published. The SUMP will be issued in two way, one complete in detail report where every last detail of the procedure is documented and one summary document where the main components and contents are listed so that the entire population gets a sense of what the SUMP is about without having to read the technical document. This process helps the document to be more transparent and to promote the mutual understanding between citizens, politics and administrations.

Figure 22: Workshop group in Sanem (Source: AC Sanem, 2nd of June 2018)

CCBP:

In the CCBP region a similar participatory approach was applied. In 2004 a household survey (enquête ménage-déplacements) was conducted. The results of this survey were never fully published to the population; they were internally treated and used for various documents. The PDU was published in a public presentation and was issued in an official document to the national instances. The main objective of this study was to obtain data related to the daily mobility of the region's inhabitants.

5.2.3 Diagnostic of the SUMPs

Sanem:

A big component of the SUMP is the diagnosis of the current situation in a region. In Sanem the diagnosis is divided into three chapters. The first chapter functions as an introduction to the region of Sanem, including the population growth, age structure, multiculturalism, composition of the households, place of employment, road safety and the cause of accidents as well as road safety in general.

The second chapter describes the current situation involving all the classical mobility measures that are in place at present. This includes all the transport modes that are represented in the region of Sanem, as well as corresponding projects and measures to promote a smooth transition of the traffic situation for everyone. This overview of all the implemented concepts portrays the actual mobility situation in Sanem. This includes for pedestrians the measures “séchere Schoulwee” (English: “safe way to school”) and a pedestrian guidance system, for the cyclists a bike sharing system (Vel’OK), the elaboration of a coherent cycling network and a bike-parking concept. For the public transport the bus transport on demand (“Ruffbus”), the public transport network and the interaction between PT-modes are being analysed. Lastly the motorized individual traffic is being examined, especially the traffic volumes, the traffic flow, as well as the noise and air pollution generated by the traffic.

In the third and last chapter of the diagnosis the modern mobility offer is analysed. This includes topics like accessibility, neighbourhood mobility, multimodality and traffic calming measures e.g. tempo 30 zones, shared spaces and residential zones, as well as alternative MIV measures like car sharing, e-mobility and carpooling.

The diagnosis of the SUMP in Sanem is structured in a way that all aspects are covered; the things that function well in Sanem as well as the problems and the issues the region must face.

At the end of the diagnosis, all the strengths and weaknesses of the mobility situation in the region of Sanem are listed:

Strengths:

- A great variety in the public transport offer in terms of modes;
- The bike-sharing service “Velo’OK”;
- The municipality has invested in and developed a great deal for a pedestrian-friendly environment in recent years;

- The progress in completing a coherent cycling network continues;
- A high coverage of traffic calming measures on the streets (tempo 30 zones);
- An active interest from/for the population regarding mobility.

Weaknesses:

- High amount of transit traffic;
- High parking demand and therefore high space consumption by the MIV;
- MIT-heavy modal split (69%);
- High rat-run traffic through residential areas;
- Cycling isn't recognized as a "real" transport mode but rather a leisure activity;
- The public transport lacks punctuality, performance and coordination;
- The information transfer and the transparency of the public transport offer are suboptimal.

CCBP:

The diagnosis of the base scenario for the PDU is structured differently. At the beginning, the four major objectives of the PDU are established:

- Ensuring and improving the accessibility;
- Optimizing and coordinating the public transport;
- Further developing and promoting the use of soft mobility modes;
- Improving the quality of life in the region for every population group.

(Communauté des Communes du Bassin de Pompey, 2006)

On the basis of these four goals the diagnosis lists all the obstacles that arise whilst trying to realize these goals. At the end of the diagnosis an inventory of all the dysfunctions of the region is drawn up:

- Issues such as large amounts of transit traffic;
- Urbanization that discourages the use of soft mobility modes;
- A constant increase in road traffic, as well as the rate of motorization per household, which also compromises road safety;
- Public transport is underused, due to the lack of performance and available information, resulting in low occupancy of vehicles;
- The development of the urban space for people with reduced mobility has been neglected for too long.

5.2.4 Synthesis of the SUMPs

Sanem:

The synthesis part of the SUMP in Sanem is very important. It defines the goals of the mobility plan and the appropriate approach in order to get the most sustainable results.

Following the diagnosis and analysis of the strengths and weaknesses of the region's mobility situation comes the synthesis in the form of eight general orientations. These orientations are established on the basis of the diagnosis and serve to structure the measures in the action plan in the coming phase into concrete directions.

The eight general orientations are:

- Reducing the share of car drivers in the modal split in favour of soft mobility.
- Improving public transport, making it more attractive and accessible to the entire population.
- Improving the information exchange and communication to promote the usage of public transport.
- Making mobility in general more environmentally-friendly.
- Improving accessibility for people with reduced mobility (PRM).
- Improving the road safety, as well as the safety feeling.
- Improving sustainability in urban and traffic development.
- Creating a new mobility culture for young and old.

These orientations are in no particular order of importance. They are worked out on the basis of the diagnosis of the current mobility situation in Sanem, the strengths and weaknesses and the results from the household survey "Mobilitéitscheck" and the participatory workshop between stakeholders and the population.

In addition to the orientations of the SUMP, the synthesis provides a vision of the population of Sanem projected into 2030. This projection shows the estimated evolution of the population as well as its age distribution. Lastly, the plan set a modal share to reach by 2030, which was inspired by the recently published national document MODU 2.0. (Ministerium für nachhaltige Entwicklung und Infrastruktur, 2018)

CCBP:

Based on the results of the diagnosis, national laws regarding urban- and mobility planning and the guidelines of the PDU approach, several objectives have been defined in order to achieve one general goal: to rebalance the modal split towards alternative modes to the car and generate more sustainable mobility.

The objectives are:

- Coordinating urban planning and mobility planning to improve traffic flow.
- Improve and develop the public transport network in and across the CCBP region.
- Promote and encourage the use of soft mobility modes.
- Reduce the usage of the private car.
- Manage and optimize the parking situation to optimize the usage of urban space to its full capacity.
- Ensure quality of life and limit impacts on the environment.
- Promote a fairer share of public space and integrate the needs of people with reduced mobility into urban planning.

These objectives are worked out on the basis of the diagnosis of the current mobility situation in CCBP and on the results of the household survey ”ménage-déplacements”. (Communauté des Communes du Bassin de Pompey, 2006)

5.2.5 Action Plan of the SUMPs

Sanem:

The action plan of the SUMP in Sanem is structured by the eight orientations defined in the synthesis. For each orientation there are numerous planned measures that include at least one chosen area of implementation, and in some cases, it is to be applied over the entire study area. The measures are then divided into short-, medium- or long term which provides a clear follow-up plan. The measures are worked out by the engineering company Schroeder & Associés in close collaboration with the city planners and the politicians in Sanem.

The measures included in the action plan vary from changing the regulations to information- and awareness-rising measures, building new transport infrastructure and entirely new mobility planning concepts. The SUMP of Sanem is a multimodal plan including all the transport modes with the goal to improve the modal split towards the goal set in the MODU 2.0

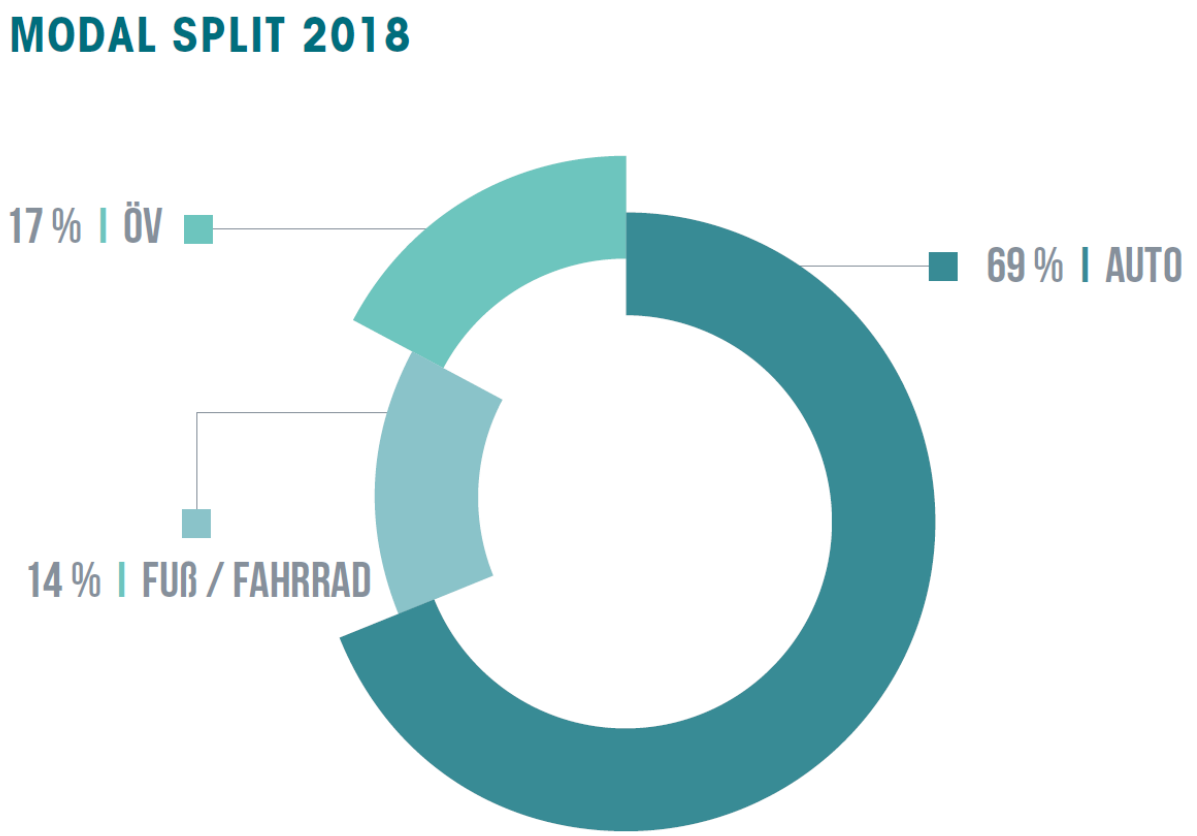


Figure 23: Modal Split of Sanem in 2018 (Schroeder & Associés, 2017)

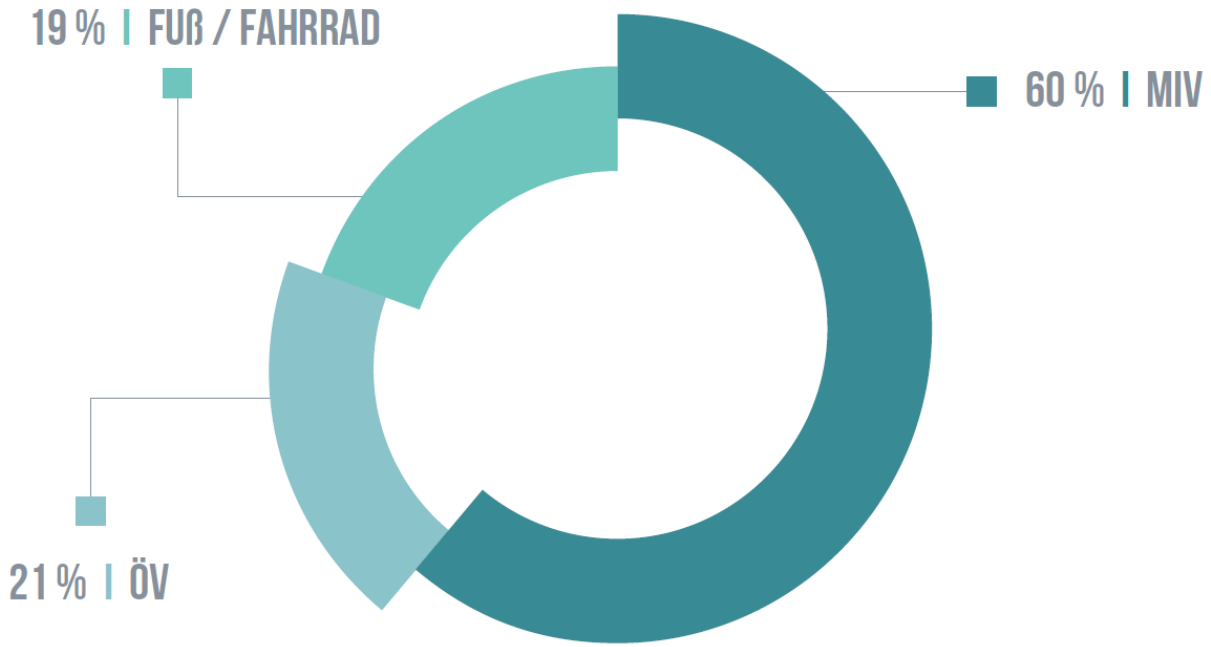


Figure 24: Projected Modal Split for 2030 inspired by the MODU 2.0 (Ministerium für nachhaltige Entwicklung und Infrastruktur, 2018)

CCBP:

As previously mentioned, the action plan of the PDU of CCBP will focus on the development of a more sustainable mobility situation, the main focus being to lower the share of car-usage in the modal split. Nevertheless, the PDU is a multimodal project. The action plan includes measures affecting all the mobility modes. Each measure taken in the action plan has impacts on various transportation modes, even if the main goal is to reduce car traffic.

The measures of the action plan that the PDU aspired to implement until 2016 are divided into three categories:

- Improving public transport
- Controlling car- and heavy duty traffic
- Promote soft mobility and improve the urban space for cyclists and pedestrians

On the basis of these categories, the measures are attributed/allocated to one of the three and directly refer to the corresponding problem areas.

In order to monitor the evolution and the effectiveness of the measures taken over the timespan of 10 years (2006-2016), a follow-up plan was set up.

The principles of this follow-up plan are:

- Record data regularly on all the transport modes.
- Analyse and synthesize the data in a uniform way so that it is comparable throughout the years.
- The progress of the measure implementation will be communicated to the population and stakeholders once a year.
- One person is designated to manage and monitor the progress of the action plan.

All these points will facilitate a smooth course of the procedure if they are respected and maintained correctly.

5.3 Observations of the comparison

The general structure of both documents is very similar with a simple concept. Both start with the diagnosis of the current mobility situation of the region, then a synthesis where a strategy is decided. Finally, the treatment/execution in form of an action plan is set in place. The differences lie in the degree of accuracy and the transparency of the process. In both documents the participatory component plays an important role for the diagnosis.

The PDU is completely transparent to the reader: the first pages encompass how the document is structured by describing the legislative framework; whereas the SUMP in Sanem is less transparent on its procedure during the elaboration of the measures. There is no legal framework in Luxembourg regarding mobility planning, as is the case in France for the PDU, they are free to decide on how to proceed with the planning process.

In terms of the participatory component the two regions have a similar approach. Both use household surveys to include the population in the planning process and gain information about their daily mobility habits. But Sanem goes further. In addition to the household survey the municipality in Sanem included a participatory workshop for the population where they could express their opinions and ideas. This workshop might not encompass the same volume of inhabitants as a survey, but it accounts for the more 'active' opinions of the locals. The workshop also allows for a more coherent exchange of ideas than a standardised questionnaire.

By comparing the diagnoses of both plans it becomes clear that the region of Sanem and of the CCBP have very similar problems, bearing in mind that the problems from the CCBP are recorded in 2004, while the problems in Sanem are current ones. Both regions show typical characteristics of peri-urban regions struggling with a large share of motorized private transport and struggle to motivate the people to switch over to public transport due to its performance issues. The public transport organization in rural to peri-urban regions is challenging because of the low density rates and long distances between points of interests. In order to provide the same attractiveness of PT that is found in urban areas, the PT network in peri-urban regions would have to be enlarged to such an extent that the frequency of the PT lines would not be financially feasible. The peri-urban areas simply lack the demand of urban areas to warrant frequency-based public transport. Therefore, multimodality plays an important role in peri-urban and rural regions to tackle the large share of motorized private transport in the modal splits.

Seeing that both the regions of Bassin de Pompey and Sanem are struggling with similar issues, despite one having 17,000 inhabitants and the other around 50,000, it shows that the mobility in a small scale city/region does not depend on the number of inhabitants, but rather on the density. CCBP has a density of 260 inhabitants/km² whereas Sanem has a density of 690 inhabitants/km², both being considered peri-urban regions within the scope of this thesis.

Both plans set themselves objectives and directions in their respective syntheses. The SUMP of Sanem doesn't specifically rank the priority of implementation to its action plan. There is a suggested hierarchy of objectives with the order in which the objectives are listed

but it isn't specifically mentioned which measures are rated higher than others. Contrary to this, the PDU of CCBP mentions a clear hierarchy to its objectives. The PDU is however, rather confusing as in every phase, new objectives are named so that so-called hierarchy in objectives, they claim to have isn't transparent. The SUMP of Sanem leaves more freedom/flexibility to the direction of the action plan. The measures are tailored to all the eight orientations and aren't weighted into any particular order. The importance of each orientation is left to personal interpretation. The SUMP in Sanem also provides a population projection for the year 2030.

The basic structure of both action plans is the same. Whereas the SUMP in Sanem categorizes the measures into the eight directions from the synthesis, the PDU in CCBP defines three groups of measures, each focusing on one specific type of mode. Both plans also divide the measures at the end of the action plan into short-, medium- and long term measures.

The differences come with the follow up plan. The SUMP in Sanem hasn't defined any specific details on how this follow up plan should be structured yet. It is however intended to talk to the responsible at the municipality in Sanem set up a structure for the follow-up actions. This can lead to irregularities in the follow-up plan up to no follow-up being done at all.

In contrary to this, the PDU of CCBP has a clear structure for its follow up plan where a procedure is set in place for the ten years of the PDU being in place.

All in all, you could say that the SUMP in Sanem and the PDU in CCBP are very similar. The regions show comparable demographic and structural features. The differences lie in the details of the plans. The PDU is a much more defined process, cause by the yearlong experience of them existing and the regulated framework from the national levelThe SUMP in Sanem leaves the planner more freedom to implement measures that are more unconventional and innovative. It also sets more defined goals, what is wanted to be achieve until 2030, whereas the PDU only suggests the direction in which they want to develop, but doesn't fixate on exact numbers (e.g. a projected modal split). All in all, the SUMP is planned in a more liberate approach which could lead to delays of implementation but this will be tried to prohibited with a clearly structured follow up plan.

5.4 Revision of the PDU (2006-2016) in 2015

The *plan de déplacements urbains* (PDU) that was established between 2004 and 2006 was analyzed and revised in the year 2015. The revision of the PDU was done in order to document the progress of the mobility situation in the region, and concluded the extent to which the action plan has been successfully implemented.

The revision includes a list of all the realized measures, the results obtained from those measures, as well as the new objectives for the following years. On the following pages the content of the PDU revision will be examined.

5.4.1 Implemented measures

The first part of the document focuses on the action plan from the “old” PDU and whether these goals of these measures were achieved.

A / The development of public transport and multi-modality	Implementation status	Time scale of implementation
A1 - Improve the speed of public transport while sharing the public space		Short term - long term
A2 - Improve the comfort of the users		Short term
A3 - Improve the information for the users		Short term
A4 - Continue the actions of the PT-associations		Short term - Long term
A5 - Optimize the service for transport on demand (ToD)		Short term
A6 - Improve the accessibility of multimodal mobility stations		Long term
A7 - Accompany the adaptation of the METROLOR at the arrival of the TGV		Short term
A8 - Start a feasibility study on the creation of an "multimodal mobility station" and the restructuration of the public transport network		Short-term - Mid term
A9 - Engage in the "Tramtrain" reflection with the CUGN and the CRL		Mid- term
B / Mastery of car travel and automobility		
B1 - Commissioning of the new Pompey bridge		Short term
B2 - Elaboration an improved accessibility for multimodal hubs		Short term
B3 - Reduce the speed of circulation		Short term
B4 -Hierarchize the road network		Mid-term - Long term
B5 -Bring urban planning documents (PLU, ZAC) into coherence		Short term - Mid term
B6 - Define a parking concept		Short term
B7 - Improve heavy duty traffic		Short term - Long term
B8 -Participate in the study of the Frouard-Liverdun and Toul-Dieulouard regions		Short term - Long term
B9 - Encourage and sensitize the elaboration of mobility plans (school and business)		Short term
C / The development of soft modes and public space sharing		
C1 - Develop a coherent cycling network		Short term - Medium term
C2 - Promote the inter-modality including the bicycle		Short term - Long term
C3 - Secure pedestrian movements		Short term - Long term
C4 - Develop bicycle parking		Short term
C5 - Accessibility of the public transport and road network		Medium term - Long term

Table 2: List of measures with information on the implementation status and the time scale of implementation

(Communauté des Communes du Bassin de Pompey, 2015)

In the table above, all the measures are depicted. If the measure is marked in green, it has been successfully implemented; if the measure is marked in orange, the measure is currently being implemented; if the measure is marked in red, it hasn't been implemented at all. Of the twenty-three measures included in the action plan of the PDU in 2006, fourteen measures have been implemented, seven are currently in progress and two haven't been realized yet.

It is remarkable that all the unrealized measures until 2015 are either short-or medium term measures. It isn't known under what criteria these measures are considered as implemented or not implemented. Therefore it is hard to know how much the situation regarding infrastructure or mobility concepts have changed.

5.4.2 Changes resulting from the PDU in 2006

The second part of the PDU revision includes the obtained results coming from the implemented measures. To get an impression of how things changed after the implementation of the measures, the representative from the Bassin de Pompey region relaunched the household survey from 2004 again in 2013.

These results were as observed:

1. The share of public transport trips increased from 7.3% in 2004 to 8.2% in 2013. This overall increase in the share of public transport represents approximately 450,000 additional trips per year for public transport modes. (ADUAN, 2013) Additionally, the frequency of people using public transport modes has also increased. A higher share of people use public transportation on a daily basis, or at least twice a week. Fewer people use it unregularly or rarely. (ADUAN, 2013)

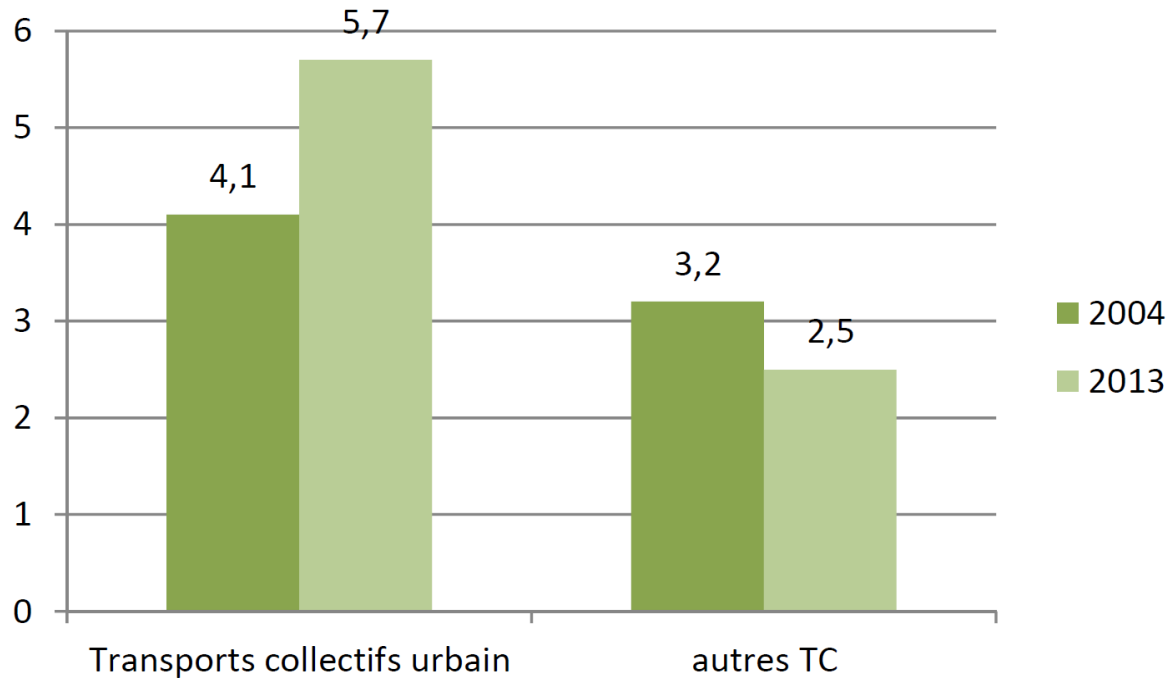


Figure 25: Share of public transport trips in the urban region (left) and in the peri-urban region (right) (ADUAN, 2013)

"Public transport has evolved into a mode of moving not only isolated population groups (students, elderly people), but also as an alternative mode to the private vehicle for many car drivers". (Communauté des Communes du Bassin de Pompey, 2015)

2. "The modal split has changed for the better towards more sustainable transportation modes" argue the CCBP planners in the revision of the PDU. (Communauté des Communes du Bassin de Pompey, 2015)

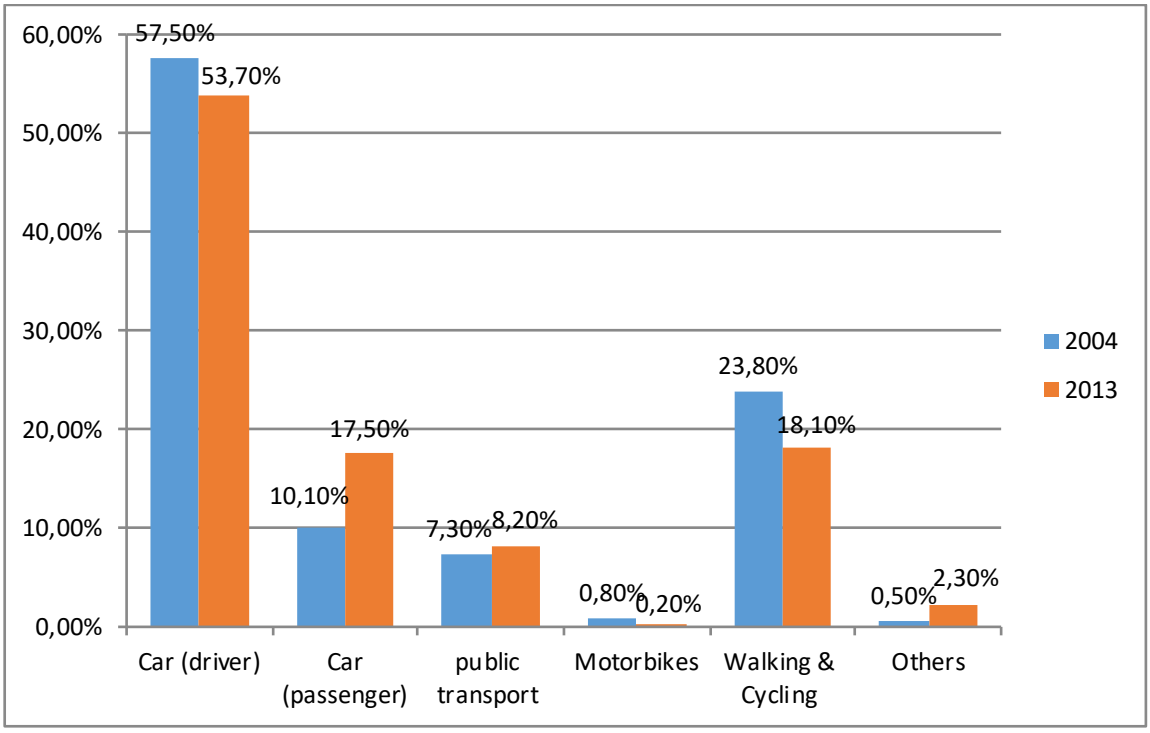


Figure 26: Comparison of Modal Splits (2004 & 2013) in the region CCBP (ADUAN, 2013)

The share of car-trips (as the driver) decreased by 3.8 percent. The share of trips by car as a passenger (e.g. carpooling) however increased by 7.4 percent, which results in the occupancy rate rising from 1.1 to 1.5 persons/car. All in all the share of car trips are rising however which is contradictory to the goals set by the PDU.

The share of soft mobility trips, like cycling or walking, has been drastically decreasing by more than five percent. This is a devastating result for a mobility plan trying to reach a more sustainable mobility a reducing the dependency on fossil fuels. (Communauté des Communes du Bassin de Pompey, 2015)

All in all the, the evolution of the modal split from 2006 to 2015 is strikingly bad. The immense decrease in soft mobility and the increase in car trips is the complete opposite results the PDU tries to reach. (ADUAN, 2013)

3. The third result established out of the revision of the PDU is the evolution of air quality in the region. Although the modal split developed towards public transport and carpooling, the share of soft mobility modes decreased. With an increasing population the amount of emissions was 2012 still too high, especially NOx and PM10-emissions.

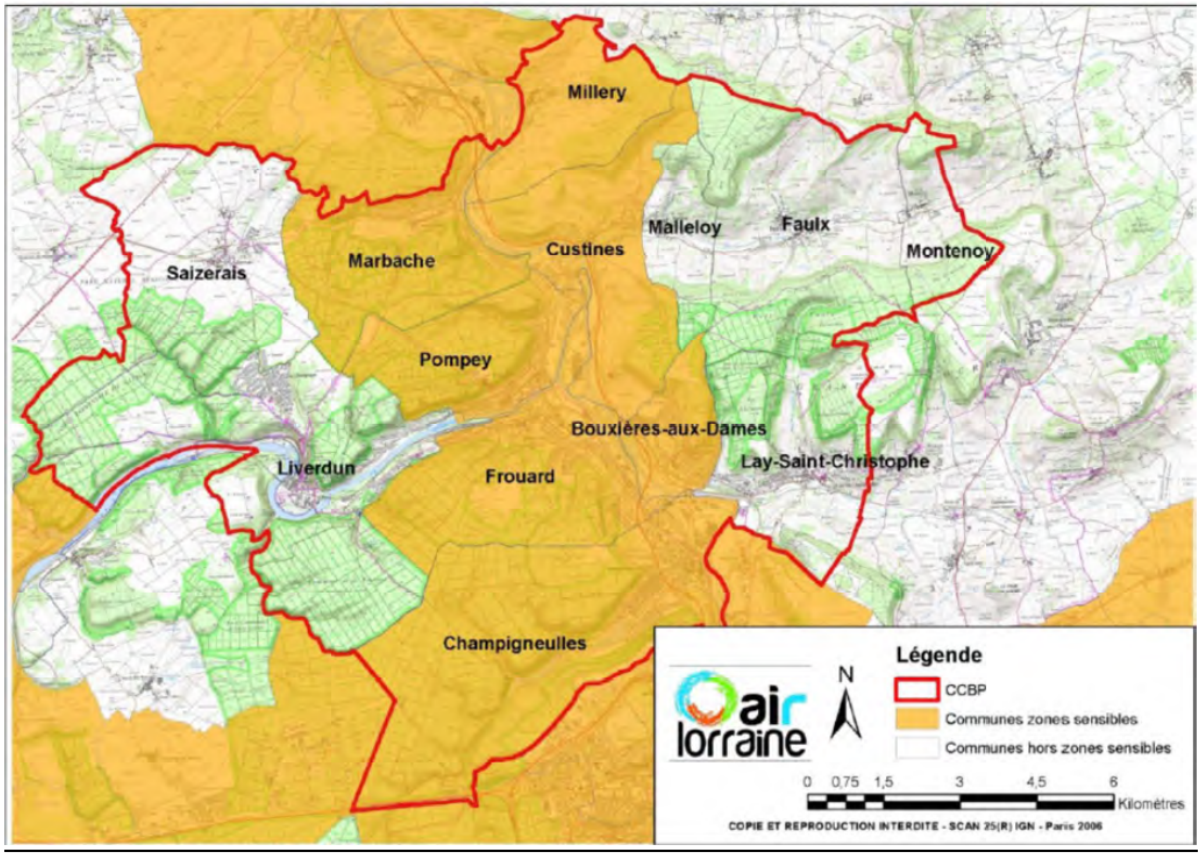


Figure 27: Regions with a high share of NOx-emissions in the CCBP area (Communauté des Communes du Bassin de Pompey, 2015)

The areas shown in yellow in the figure above are exposed to high emission rates of NOx, which can be harmful for the human health. These results go hand in hand with the evaluation of the modal split. The share of fossil fuel driven vehicles (car traffic (driver and passenger) and PT) has risen considerably, which strongly influenced the air quality, air pollution and the greenhouse gas values.

5.4.3 Update of the PDU (2006) action plan

The action plan of the 2006 PDU is updated in three steps: First, the existing measures are constantly kept up-to-date. Secondly, the missing measures will be implemented and constantly updated. Lastly, new measures will be integrated to the action plan and contribute to a constant evolution of the region's mobility situation. Just as with the PDU in 2006, the revision of the PDU in 2015 centralizes around three main objectives:

The update is done in three steps: First, the existing measures are constantly kept up-to-date. Secondly, the missing measures will be implemented and updated. Lastly, new measures will be integrated to the action plan and contribute to a constant evolution of the region mobility situation. Same as the PDU in 2006 the revision of the PDU in 2015 chooses three main objectives:

- The implementation of multimodal mobility stations (PEM: pôle d'échange multimodale), with the main goal of increasing soft mobility trips by promoting multimodality.
- Promoting the development of electro-mobility and other innovative mobility options to increase sustainability and lower the rate of emissions of the transportation sector.
- Improve the efficiency of freight transport planning and the associated logistics behind it.

These objectives are chosen based on the results the PDU 2006 has delivered. The first and second objectives are directly linked with the bad results in air quality and modal split evolution. The third objective is a new goal which wasn't included in the old PDU.

5.5 Interim conclusion(s)

During the synthesis of the PDU, the plan set itself seven general objectives to achieve by implementing various measures. In retrospect, looking at these objectives and the results from the revision of the PDU, most objectives have either not been achieved or can't conclusively be said to have been achieved due to limited data from the PDU revision.

The following conclusion to the objectives of the PDU can be taken:

- Coordinating urban planning and mobility planning to improve traffic flow.

  There was no information on the development of the traffic flow, nor was there any mention of changes or improvements regarding the urban spaces. There is no way of saying whether this objective has been achieved with the available data.

- Improve and develop the public transport network in and across/throughout the CCBP region.

  With an increase of only one percent over a ten year period, the development of the public transport is unsatisfactory. In the revision document of the PDU there are no changes in the public transport infrastructure, nor any modifications recorded in the network. As there is no information on physical changes, only the changes in the modal split can be judged. This objective has been achieved if the goal was only to increase the share of public transport trips. The increase is however disappointing considering the large timespan.

- Promote and encourage the use of soft mobility modes.

  The share of trips made by cycling or walking decreased from 23.8 percent to 18.1 percent, which is the opposite result the region tried to achieve. The reduction of 5.7 percent is a huge decrease in soft mobility trips. As the revision report states, the region suffers from a large amount of traffic-induced emissions like NOx's and CO2, which can only improve when the amount of trips with motorized transport modes sinks, in favour of non-motorized transportation. The region clearly failed to achieve this objective, and the situation has even worsened since 2004. The reason why this development took place are unknown there is no explanation described in the revision on the PDU. Possible reasons however could be a low density in the area which causes long distances between interest points and an unjust distribution of the public space between motorized and non-motorized traffic.

- Reduce the usage of the private car.

  The revision of the PDU revealed a large reduction in the usage of the private car, as the share of car trips as the driver reduced by 3.8 percent. The share of car trips made as a passenger, however, rose by 7.4 percent. So in total the share of car trips rose by 3.7 percent.

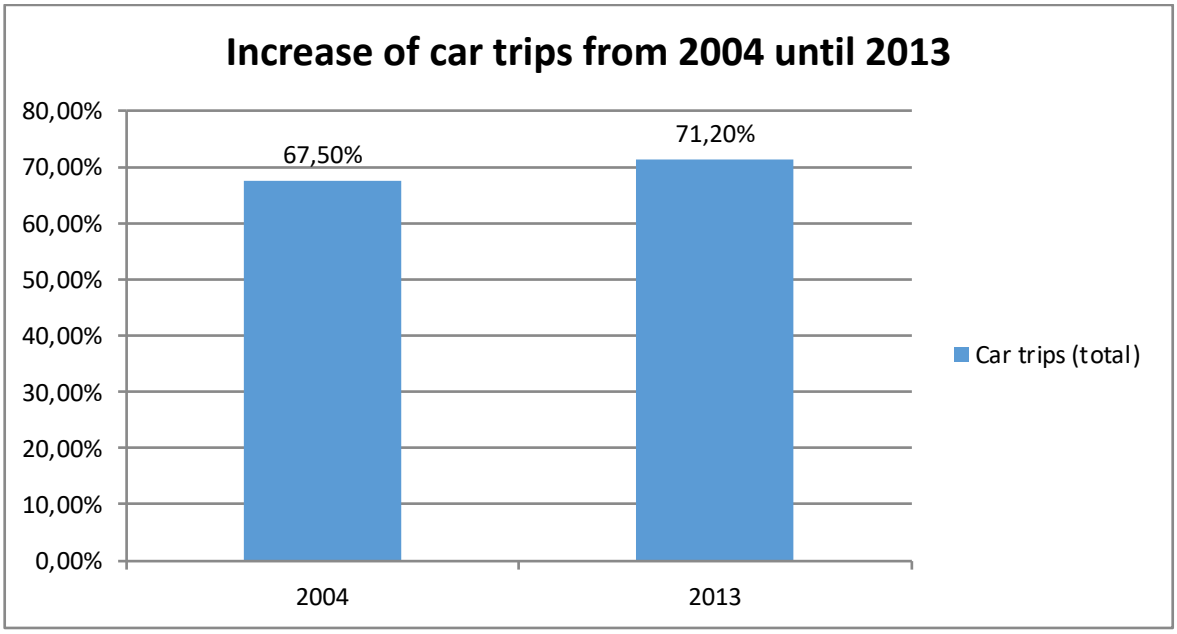


Figure 28: Increase of car trips from 2004 until 2013 (Communauté des Communes du Bassin de Pompey, 2015)

The main goal of a sustainable mobility plan should be to reduce the usage of private cars instead of shifting even more people towards the use of the car. This rise of car trips doesn't necessarily mean that there were more cars on the roads in 2013 than in 2004, because the majority of the rise is attributable to car passenger trips, but it certainly doesn't mean that the number of cars on the road sank. In combination with the bad air quality values and the rising share of car trips an increase in the number of cars can be assumed. As the population of the region didn't rise, but rather shrunk, there is no hidden increase factor to consider in the comparison of both modal splits. (INSEE, 2013) With the substantial reduction of soft mobility trips and the minor increase of public transport trips, the main mode of choice is more than ever, still the private car. Therefore this objective hasn't been achieved.

- <u>Ensure quality of life and limit impacts on the environment.</u>

The air quality in the region has worsened in the last years and regularly exceeded the threshold value of the NOx concentration throughout the entire region of the CCBP. Alongside the NOx emissions, there was also an increase in the CO2, the CO, the PM10 and the SO2 values from 2004 to 2013. These increases lead to a drop in air quality, as well as a higher impact on the environment. The quality of life, the air quality and the impact on the environment are directly correlated to one another; so it is fair to say that the quality of life can't have increased if the air quality and the impact on the environment worsened. As such, this objective hasn't been accomplished either.

- Promote a fairer share of public space and integrate the needs of people with reduced mobility into urban planning.

  Regarding the information on the creation of the public space and the adaption of the space to people with impaired mobility, there is nothing mentioned in the revision document. Therefore, it is not possible to conclude whether this objective has been completed or not.

All in all, the results presented in the revision document of the PDU from 2006 are somewhat disheartening. With the exception of a slight improvement in the modal split towards public transport and carpooling, nothing has really changed for the better. Most objectives haven't been realized even though almost all the measures in the action plan were realised. The responsible have to ask them if they took the wrong measures or if they misjudged the completion of the measures. The air quality worsens as the share of car trips rises and the number of soft mobility trips declined drastically. In summary, you could say that the PDU of the CCBP region from 2006 wasn't effective in bringing about sustainable changes, neither produced it the desired outcomes, even though nearly all the measures that the planners took were implemented, as the region claims.

During the comparison of both plans it became clear that the SUMP and the PDU are relatively similar; apart from a few details, they don't differ much from another. With the results from the PDU of 2006 leading to the conclusion that the mobility plan wasn't a success for the region of the CCBP, it gives rise to the question as to whether this will also be the case for Sanem.
The poor results of the PDU are difficult to interpret. The measures have been chosen wisely to contribute towards an improvement of the mobility situation and have also been implemented and followed up on over the years, as was envisaged with the help of the PDU.
The comparison of both SUMPs (PDU and SUMP) can't predict with any certainty or reasoning that the SUMP in Sanem will also end with negative results. It shows however that mobility planning in peri-urban regions is extremely complicated. The classic measures that cities take to implement sustainable mobility have little to no effect in low density regions. The low density of peri-urban regions entices people to dependency on the car that is hard to dissuade.
A potential explanation for the failing of the measures of the PDU is that they weren't adapted to the structural circumstances of the region and therefore failed to improve the mobility situation. This is however only an assumption because there is no provided data that could confirm this.

The prediction of the SUMP in Sanem being a success on the basis of the comparison with the PDU can't be reasonably made. However, this comparison brought some take-home messages on what the SUMP could do to prevent bad results:

- Continuously include the population into the planning process and upkeep a bottom-up approach so that people can identify themselves with the mobility plan.
- Keep an eye on the evolution on the implementation of the action and adapt it from time-to-time.
- Try to change people's mobility habits by educating them from a young age on, on what sustainable mobility is.
- Enforce the political decision over a longer period to plan mobility in advance.

6 Interviews

Over the course of this thesis, various interviews have been made with specifically chosen interview partners. This chapter first introduces all the interview partners and gives a short insight to their persona and why they have been asked to participate. The interview partners were chosen to cover the private sector, the public sector and the political level (political representatives of Sanem).

The list of questions is described in this chapter with a short background on why each question is asked and how it contributes to solving the research questions of this thesis. Lastly this chapter summarizes the findings gained from the interview data and how this contributes to scientific questions asked in this thesis. All the interviews will be attached as an audio file and/or as a summarized text file in Appendix A.

6.1 Interview questions

All the interviewees were asked similar questions. This thesis used semi-structured interviews as this enables a more consistent approach and allows the development of an interesting line of inquiry during the interviews. The questions weren't asked in a specific order, instead the interviewer adapted the questions and the order to each individual interview partner. The following list includes all the questions the interviewees were asked and why these questions were pertinent:

Tell me something about yourself, your education and working career.
This question was asked to gain insight about the interview partner, as well as their education, professional career etc.

What are the biggest, greatest challenges of today's mobility? In Europe and your region/country?
The answers to this question gave the interviewer an understanding of what topics the interviewee rates as most important and where he/she sees need and potential for improvement.

Why is it important to plan mobility in advance?
The aim of this question was to grasp how the interviewee thinks about different features of the SUMP, such as the follow-up plan or the planning of long term measures.

What is your definition of sustainability?
It is important to know how the vis-à-vis interprets sustainability, when talking about sustainable development and SUMPs.

What is your knowledge on sustainable urban mobility plans?
As the European document of the SUMP guidelines is fairly recent (2014) and the concept of the SUMP isn't known in every country, or rather known by various terms (e.g. France with the PDU); this question would clarify what the counterpart means when he/she is talking about a SUMP.

What differences do you see between the SUMP and conventional mobility plan/concept?
This question is asked to determine if there is a difference between the SUMP and conventional mobility plans in the opinion of the interview partner.

What are the different planning processes found in urban space, compared to those applicable in a rural space?
This question is asked to specify the differences the interview partners perceive when planning in an urban area versus a rural area.

What is your opinion on a small-scale municipality (Sanem) in a peri-urban area doing a SUMP?
The goal of this question is to get an impression of how reasonable the interviewees find the procedure of a SUMP in a peri-urban region like Sanem.

Do you think European countries that have been lacking in initiative regarding mobility planning (e.g. Luxembourg) need stricter regulation (like France with the PDU)?
This question serves to distinguish the advantages and disadvantages of a regulatory framework in mobility planning by mentioning the French "*plan de déplacements urbains"* (PDU).

What are the advantages and disadvantages of a participatory approach?
This question outlines the advantages and occurring issues of a participatory approach during the planning phase.

As previously mentioned, every interview partner was asked roughly the same questions. The interviews lasted for an average of 35 minutes, and were held either in person or over Skype.

6.2 Interview partners

In total, eight interviews were held regarding this Master's thesis. The following table lists all the interview partners, their occupation and the sector in which they work; listed chronologically. From the eight interview partners there is one political representative, three from the private sector and four out of the public sector.

Name:	Date:	Time:	Duration:	Type of interview:	Sector:	Occupation:
Lovisa Blomér	10.12.2018	14:00	36 minutes	Skype Call	Public sector (local)	Traffic Planner at the Municipality of Örebro,
Jeff Biever	20.12.2018	11:00	30 minutes	In Person	Private sector	Traffic Planner & Project Manager at Schroeder & Associés
Fernand Heischbourg	22.01.2019	06:30	41 minutes	In Person	Public sector (local)	Head of Department & Traffic Planner at the Municipality of Sanem,
David Tron	31.01.2019	08:00	57 minutes	In Person	Public sector (national)	Traffic Planner at the Ministry of Mobility, department of soft mobility,
Fabien Garcia	31.01.2019	15:00	35 minutes	Skype Call	Private sector	Transportation & Spatial Planner at TRANSITEC
Adrien Stolwijk	01.02.2019	11:00	34 minutes	In Person	Private sector	Partner, Head of Department & Project Manager at Schroeder & Associés
Georges Engel	08.03.2019	10:00	15 minutes	In Person	Public sector (Politician on local and national level)	Mayor of Sanem, Member of Luxembourgish Parliament
François Houot	16.03.2019	20:21	/	Written statement	Public sector (local)	Traffic Planner & Project Manager at the CCBP

Table 3: List of interview partners, ordered chronologically

6.2.1 Georges Engel

The political representative is Georges Engel, the mayor of Sanem, the municipality on which the case study and the comparison is based. He is also a member of the Luxembourgish parliament. He is therefore not only a representative of the local politics, but also one of the national level. To cover every sector, it seemed logical to include a politician on the list of interview partners, as they have a lot of power in the decision-making process regarding urban spatial- and mobility planning in Luxembourg.

Engel became a member of the city council of Sanem in 1997, until he became the mayor of Sanem in 2005 and has been repeatedly re-elected ever since. In addition to his mandate as the mayor of the southern municipality Sanem, he was elected into the national parliament of Luxembourg (French: Chambre des Députés) in 2013 where he continues to work to this day, as a member of the ruling party in Luxembourg. “Luxembourg’s situation regarding traffic and mobility is a very complex one. There is a huge number of commuters coming to Luxembourg on a daily basis to work here”. (Engel, 2019) With nearly 50% of the employees in Luxembourg being commuters that travel daily from the neighbouring countries into the small Grand-Duchy, the mobility situation is not only difficult to control on a local level but also on a national one. Cross-border mobility planning is essential for Luxembourg to succeed in lowering the share of motorized private transport in the modal split. (Engel, 2019)

6.2.2 Jeff Biever

Representing the private sector there are three interview partners that have been questioned.

The private sector does not always have the same intentions or points of view as the public sector, which can influence the objectives of a person. As such, whether or not a mobility plan for a city or municipality is warranted can be considered subjective.

Out of the interviews it turned out that the priorities of the private sector and the public sector can vary quite a bit.

The first interviewee for the private sector was Jeff Biever. A 28-year-old who studied geography/urban planning in Cologne and has been working at Schroeder & Associés for three years. With over 300 employees S&A is the biggest engineering and consulting office in Luxembourg, working for both the public and the private sector. The department “MDI” (Mobilité, Développement urbain et Infrastructures de transports) is the biggest department of the firm,

with over 60 employees who work daily on mobility plans and concepts, urban development and the construction of transport infrastructure. (Schroeder.lu, 2019)

Jeff Biever mainly works on mobility concepts and smart mobility projects for the public sector. He is one of the planners currently drawing up the sustainable urban mobility plan of Sanem, being the first one in Luxembourg.

The interview with Jeff Biever seemed logical as he is the lead planner of the SUMP in Sanem, working closely with the stakeholders of the municipality and writing the majority of the content included into the SUMP. As a geographer he has a different perspective to mobility planning than a classical engineer. “In geography the focus lies on the human in the urban space whereas the engineer looks into changing the urban space (with infrastructure) and therefore puts the human in second place.” (Biever, 2018) The right way to do it, in his opinion, is to look at how the human fits into the urban space in the best way possible. “It is important to plan new mobility concepts and infrastructure with the population in the form of a participatory approach”. (Biever, 2018)

Jeff Biever wrote his master’s thesis on the benefits of participatory approaches, and has since worked on several projects that included a participatory approach. “I think my job as a geographer is to close the gap between the engineering and planning world, trying to include the population in the constructive process as much as possible, to create something everybody profits from. Biever is convinced that the concept of the SUMP is the new tool to bring people, planners and stakeholders together to work hand-in-hand to get the best possible outcome for everybody. (Biever, 2018) Biever’s extended knowledge on participatory processes and smart and innovative mobility measures makes him a convincing interview partner. This interview was held in Luxembourgish and was translated to English by the interviewer.

6.2.3 Adrien Stolwijk

The second interviewee out of the private sector is Adrien Stolwijk. Stolwijk is an “Associés” (associate) at Schroeder & Associés, who has been working at the company for nearly 30 years in the mobility and urban development department. He studied civil engineering at RWTH in Aachen (Germany) with a specialisation in transportation systems and urban planning. He contributes a great deal of experience from his many years of working in mobility planning. “I think it is very important to find a balance in creating new transport infrastructure and mobility concepts so that you get the most sustainable result possible”. (Stolwijk, 2019)

“Momentarily, mobility planning finds itself in a kind of intermediate timespan where there are many new mobility forms popping up. It is really important to stay on track and don’t shy away from planning far ahead into the future. It’s sure that we can’t know now what mobility planning is holding or in which way it is developing itself in the future. We can’t know if we are on the right path but that should discourage us to plan ahead.” (Stolwijk, Interview on SUMPs, 2019) Stolwijk has been working closely with the municipality of Sanem for several years and knows the territory and the mobility situation in Luxembourg very well, making him an excellent candidate for an interview. This interview was held in Luxembourgish and was translated to English by the interviewer.

With Jeff Biever and many others working on the SUMP of Sanem, Schroeder & Associés have tried to find a team that is balanced in terms of experience and innovation to get the best possible result for the municipality.

6.2.4 Fabien Garcia

The third and last interview partner from the private sector is Fabien Garcia. Garcia is working for TRANSITEC. TRANSITEC is an independent engineering and consulting firm specialized in mobility issues since 1954. Their know-how is recognized in many countries of establishment (e.g. Switzerland, France, Belgium, Morocco, Portugal, South Africa). Fabien Garcia is based in the Lyon-office of TRANSITEC and works on various mobility projects throughout Europe and North Africa, but mostly in France, Switzerland and Luxembourg. Due to their involvement in a few projects in Luxembourg, TRANSITEC and Schroeder & Associés have worked in close cooperation in the past, and consult with each other every now and then on different topics regarding mobility and urban planning.

Garcia has been working at TRANSITEC for 13 years and primarily works on PLUs, PDUs and mobility plans for cities and bigger companies. “I think the problems of today’s mobility are directly related to the control (or the lack thereof) of urban development and the density.

The biggest challenge is not the mobility itself, but rather how the territory is developing over time, how people are adapting to it and how it is managed over time. There is a direct connection between occurring problems in mobility and spatial planning. These two sectors are directly intertwined and one can't change without influencing the other". (Garcia, 2019)

Garcia's ample experience and extensive knowledge on PDUs in France, and his knowledge on the mobility situation in Luxembourg make him a very interesting interview partner regarding this thesis. This interview was held in French and was translated to English by the interviewer.

6.2.5 David Tron

Transitioning from interview partners out of the private sector into the public sector, David Tron was a very interesting interviewee, as he started working in Geneva after his studies at a firm called CITEC. CITEC was founded in 1994, an engineering and consulting firm with agencies in Switzerland, Italy and France (Geneva, Jura, Neuchâtel, Vaud, Valais, Lyon, Paris, Torino). At CITEC Tron mostly worked on railway projects in the region.

After working at CITEC for eight years, Tron returned to Luxembourg in 2016 and started working for the Luxembourgish ministry of mobility and spatial development (Ministère de la Mobilité et des Travaux publics). Here, his main responsibilities lie in public transport and soft mobility projects throughout the whole country, as he is part of the direction team responsible for soft mobility planning. "More and more people in Europe are living in urban areas. Especially in Luxembourg, the population is constantly on a rise, so one of the biggest challenges in my opinion is how we use the infrastructure we have at the moment to their maximal capacity. The question isn't how many fossil fuel driven cars we can switch out to electric driven cars, because they need the same amount of space". (Tron, 2019)

Tron says that the real challenge is trying to reduce the number of cars, because the most important resource an urban area has is its space. Due to the fact that Tron worked in the private sector for multiple years and is now working for the public sector at a national ministry, makes him an interesting interview partner, contributing insights from a (whole) new perspective. This interview was held in Luxembourgish and was translated to English by the interviewer.

The other representatives of the public sector are mostly working for the municipalities that are being analysed in this paper.

6.2.6 Lovisa Blomér

The first interviewee in context of this Master's thesis was Lovisa Blomér. Blomér is a young traffic planner who studied spatial planning in Sweden, Switzerland and France. She has been working as a traffic planner for the city of Örebro for the last four and a half years. She started working for the city just after the city's SUMP was published. She didn't work directly on the planning process of the SUMP, but was active in the implementation of the SUMP's action plan. "Örebro currently has a modal split with a walking and cycling share of 50%. Four years ago, this share was still at 44%", says Blomér to indicate the positive results following their SUMP.

Örebro is a municipality and a city in the heart of Sweden, only 200 km from Stockholm and 300 km from Gothenburg. You could say that 70 percent of Sweden's population live inside a 300-kilometre radius of Örebro. With 150,000 inhabitants in the entire municipality, Örebro City is the seventh largest city in the country.

6.2.7 Céline Petit / François Houot

Céline Petit works for the *communauté des communes du Bassin de Pomey* (CCBP), the French case study region analysed in this thesis. Petit agreed on the 25th of January to do a phone interview and was sent the questions in advance, so that she could prepare her answers. After the questions were sent, the communication between Miss Petit and the interviewer stopped. She didn't respond to any emails or phone calls until the 9th of March. In her response (by mail) she asked for the questions to be sent again and a deadline for her answers. Up until the 15th March, there were no submitted answers from Petit.

On the 16th of March the interviewer managed to get in touch with another employee from the *Communauté des Communes du Bassin de Pompey* working in the mobility department, François Houot. Houot is in charge of the Mobility planning and infrastructure department in the CCBP, where he supervises and manages road and rail transport in the region. Houot got send the questions in advance and answered them in writing via e-mail.

6.2.8 Fernand Heischbourg

The third interviewee is Fernand Heischbourg, the Head of the planning department of the municipality of Sanem as well as the project manager and initiator of the SUMP in Sanem. Heischbourg started working for the municipality of Sanem immediately after he finished his apprenticeship as a technician. From there on he worked his way up, completed his engineering degree and now, after twenty-five years working for the municipality in Sanem, he is the head of the mobility planning department.

“Luxembourg is a country that relies on the car. The generations of people creating the chaos on the streets are “car-generations”, who never learned how to use public transport”, says Heischbourg, when asked what the biggest challenges of mobility planning are. (Heischbourg, 2019) In his opinion, this is due to the poor performance of the public transportation in Luxembourg. “The public transport is unreliable, always late, and trains are regularly cancelled. It is nearly impossible to rely on public transport to go to work if you don’t have flexible hours, or need to be at an appointment at a given time.” (Heischbourg, 2019) In Heischbourg’s opinion, the biggest problems alongside the low performing public transport are the high amount of transit traffic from the neighbouring countries (especially France affecting Sanem) and the mind-set of the people towards their daily mobility.

6.3 Interview analysis

The following chapter covers the analysis of the eight interviews that were held. The chapter is subdivided into sections based on the questions that were asked, while the answers of the interview partners and their respective views have been grouped together to establish a more transparent answer for the research questions at hand.

6.3.1 Basic knowledge on SUMPs

The interviews revealed that the principles of the SUMP as well as its guidelines aren’t that well known. David Tron, François Houot and Fabien Garcia said that they have very little knowledge of SUMPs, and only acquainted themselves with the process before the interview, as they were given the questions in advance. (Garcia, 2019) (Tron, 2019) “Before I saw your questions and before we were in contact, I was never really interested or exposed to SUMPs. I tried to do a little bit of research about it.” (Garcia, 2019) For him the SUMP guidelines aren’t very interesting as they have the PDU framework in France. “In the field that I work, France, Switzerland and North Africa, the SUMP hasn’t been used up until now, and as far as I’ve understood, it is “only” a guideline - an alternative working method to conventional

mobility concepts to solve mobility problems in urban areas." After some time both realized that they know the principle of the SUMP very well, they only weren't familiar with the terminology "SUMP".

For the other interview partners, they only know of the SUMP because the city/municipality/client is directly involved in implementing one. "I didn't know a lot about SUMPs before the municipality of Sanem approached us (S&A) with the idea of doing a SUMP. This being the first SUMP for Luxembourg and also the first SUMP done by Schroeder & Associés, we looked at what has been done in other cities in Germany and France, to get some inspiration. By doing that, we realized that we can't really treat Sanem like the other cities in Germany we were looking at (e.g. Hannover), because of the size, the density and the landscape of Sanem", said Biever. (Biever, 2018) The city of Örebro, for which Blomér works for, has a SUMP, but it was published before the guidelines of the European Commission were issued in 2014. "The SUMP may well be inspired by other EU guidelines as the latest guidelines weren't published yet, but I can't say for sure." (Blomér, 2018)

The only interview partner who actively read the SUMP guidelines and knew a lot about them was Heischbourg, the city planner of Sanem, who read them in preparation of the SUMP they are working on at the moment. "At the beginning I didn't realize that a SUMP was normally only applied in really big cities. After reading the planning process and the table of contents of a SUMP, I thought that there was nothing speaking against a smaller city like Sanem to also do a SUMP. I know that we can't apply the same measures in Sanem as in a big city, but I think if the SUMP is tailored to Sanem it can be a successful tool to improve the daily mobility of the inhabitants and visitors of the municipality." (Heischbourg, Interview on SUMPs, 2019)

6.3.2 Differences between SUMPs and conventional mobility plans (PDU)

In the SUMP guidelines there is a direct comparison of conventional mobility planning to the new, modern SUMP process. In

Table 1 : Differences between traditional transport planning and SUM planning , the differences defined in literature are shown. In reality, these differences aren't that black and white. Depending on what is meant by "traditional" transport planning, it doesn't differ that much from the SUMP principle. Take for example the PDU that has been in place for over 30 years in France. Garcia says that "the SUMP is in fact, basically the same thing as the PDU regarding the content, with the only difference being that the PDUs are obligatory for agglomerations

with over 100,000 inhabitants, whereas the SUMP isn't embedded into any regulatory framework. It is done on a voluntary basis." (Garcia, 2019)

"There are already some smaller agglomerations in France that have done a PDU even though they aren't obliged to, and that's really good and shows good intentions in improving the mobility situation." For Garcia the biggest difference between the SUMP and the PDU is the fact that the PDU isn't planned for one city alone, but in a coherent region. It doesn't stop at the city borders, but rather looks to encompass the entire region of a mobility network. "In France we have a huge number of small municipalities and the communal autonomy only goes as far as the communal borders. This means that they don't really have any coherence until you put them into an agglomeration." By including other cities and municipalities into the mobility plan there are a lot more stakeholders involved. This can cause some issues but in Garcia's opinion there is also a strong advantage deriving from it; "In the case where the municipality itself has no power on deciding something on their own, a higher number of stakeholders have more power of implementation. So, I think the scale on which we are planning is very important and is a key factor in the success of the mobility plan." (Garcia, 2019)

Additionally to Garcia, Tron also thinks that the SUMP principle doesn't differ that much from conventional mobility plans. "I don't see a difference; a SUMP is basically a best practice recipe on how to do a mobility plan. But this isn't something new, I already learned about that 20 years ago at university." (Tron, 2019) In his opinion the SUMP is basically the same thing as what traffic planners have already been doing for years, only with a new name and the European Commission being "involved". However, contradictory to what he just said, he mentions three things that distinguish the SUMP, which he thinks highly of: "There are a few distinctive things about the SUMP that I like. All the transport modes are included in one document, which hasn't been done often in the past. There were cycling plans, or public transport plans, but one plan including everything has rarely been done. [...] Also, in the past, the bottom up approach was something theoretical rather than realistic, whereas nowadays politicians are seeking discussion with the population more and more. […] I think the most interesting thing about the SUMP is the follow-up plan. If it is done right, it will be really interesting to see how things will evolve over the years and how the applied measures take effect."

As for Heischbourg, he appreciates the SUMP for its structured concept. “Sanem is a municipality that only changed things in the past when something went wrong or wasn’t working. So punctually there were studies being made but there wasn’t an all-inclusive plan. I prefer to work with a plan with a structured concept. It is important to look at the whole picture instead of acting punctually, without seeing the consequences of the actions one single intervention can have”. (Heischbourg, 2019)

All in all, you can say that the SUMP is a new concept with differences to conventional mobility planning, depending on how you interpret this term. SUMP-like plans, for example the PDU and the LTP, have to be excluded as they are constantly re-evaluating over time and adapt to modern concepts. The SUMP guidelines are strongly inspired by the PDU and the LTP. You could say that they are very similar with only a few differences (e.g. regulatory framework).

6.3.3 Opinions on the implementation of SUMPs in small-scale peri-urban regions

The answer to the question, whether a SUMP in a small-scale region with peri-urban characteristics would make sense, was very much divided. People either think it is a great idea and initiative for a small city or municipality to also have an envisioning mobility plan; or they’re of the opinion it is nonsense for small scale cities to do a SUMP without looking at the big picture and including the corresponding regions around it.

The people who were pro-SUMP in a peri-urban small-scale region were Lovisa Blomér, Adrien Stolwijk and Fernand Heischbourg, while Blomér is the only one who isn’t directly involved in the SUMP in Sanem.

In her opinion it is very important for every city to have its own mobility plan, no matter how small or big. “Everybody has a right to good mobility, no matter if they live in a big city or in a small rural town; therefore it is important to plan mobility ahead”. (Blomér, 2018) She didn’t say that cities have necessarily to do sustainable mobility planning on their own. “Not all the small cities have the manpower or the budget to do such a plan on their own, so it can be financially helpful if there are more actors involved. But things undoubtedly become more complicated in terms of the planning process when more cities are involved, because there are more stakeholders and more politicians involved, who have to agree on a common goal.”

Fernand Heischbourg has no doubt that a SUMP can be a success in small, peri-urban cities/municipalities, and has a very explicit view as to why it wouldn't work if more stakeholders were to be involved. "Big problems could arise with the involvement of a high number of stakeholders. That's why nobody cooperates on a regional plan. If everybody has the financial capacities to make their own plan and they don't have any obligation to work together or to make compromises - why would you?" "The advantage we have with the municipal autonomy is that you don't have to rely on anybody else other than yourself. If you need somebody from the national level to make a decision for you, you don't have to wait a long time or have to undergo complicated procedures to get in touch with somebody". (Heischbourg, 2019) In his opinion the freedom of planning the municipalities in Luxembourg shouldn't be compromised in any way. "I think it is necessary for every municipality to have a mobility plan but they have to interact and fit to each other in some way or form." [...] "When our SUMP is finished, we want to go to the ministry of mobility and the national road administration to present our action plan, and maybe we will act as a role model on how it could work in Luxembourg. Maybe there will be more small-scale municipalities interested in doing SUMPs like ours." In Heischbourg's opinion the SUMPs following the one of Sanem have to adapt to the existing SUMP, with the goal of achieving a coherent mobility plan in the region someday. This is however a very idealistic approach of thinking.

Similarly to Heischbourg, Adrien Stolwijk (S&A) also thinks that every municipality should have its own sustainable mobility plan; he, however, has another approach to argue the point. "I think it is very important for municipalities to think about their future regarding mobility. I think everybody should have the freedom to set their own goals without having to consult anybody else. Ideally, the neighbouring municipality is also doing a SUMP and finds out that their action plan and yours are very similar. It requires balancing the interests of the stakeholders, which is not easy but also not impossible, in my opinion. Whether they have the same visions or completely different visions, in both cases it is absolutely necessary to communicate. If this communication is the result of two separate SUMPs, then all the better". (Stolwijk, 2019) Stolwijk fears that if a SUMP is planned on a bigger scale it can quickly become impersonal and distance itself from ideas of the various actors. "Documents like the SUMP will show different approaches between municipalities to common problems and sets the basis on where to start for the best coherent solution in a intercommunal region." (Stolwijk, 2019)

Having covered the arguments in favour of SUMPs in small peri-urban regions, there were three interview partners who had convincing arguments against planning a SUMP in such a region. They are Fabien Garcia, a French traffic planner, David Tron, the representative for the ministry of mobility and finally Jeff Biever, a traffic planner of S&A currently working on the SUMP in Sanem. Among these three, there are two representatives of the private sector, with one directly involved in the SUMP in Sanem, and one representative of the public sector on a national level.

Jeff Biever, who knows the territory of Sanem very well, thinks that it would better to plan a SUMP on a bigger scale. It would be better to do a SUMP which includes a larger region of the south of Luxembourg, and not isolating it to a single municipality. Sanem is located close to the French border, as well as the second and third most populous cities in Luxembourg, Esch/Alzette and Differdange respectively, which undoubtedly influence one another's mobility. "You could compare it to a puzzle, if one piece is missing you can't succeed, you need to look at the whole picture to solve the traffic problems in Sanem". (Biever, 2018)

Sharing the opinions of Biever is David Tron from the national ministry of transportation (MMTP): "It is nonsense to isolate Sanem without looking at Differdange and Esch/Alzette at the same time. I would prefer to do a SUMP in the entire region of the ProSud, because it builds a coherent network and each municipality affects the other."
Tron and Biever argue that Sanem lies in the middle of a coherent region. The region they both mention, the ProSud region, is a union that includes all the municipalities in the south-west of Luxembourg.

Figure 29: Territory of the ProSud Union (www.prosud.lu, 2019)

“This region would include around 150.000 to 200.000 inhabitants, and in my eyes this would make much more sense than this small-scale plan”, argues Tron.

Additionally to the small scale, Tron also stresses that the implementation power of Sanem is limited. “The municipality of Sanem has almost no power to implement any measures regarding public transport on their own. They either need collaboration with the neighbouring municipalities, or need to consult the national level.” (Tron, 2019) Tron mentions the example of public transport planning because the public transport in Luxembourg is planned by the ministry of transportation. It is very difficult to implement changes regarding the PT-network on a local level.

David Garcia from TRANSITEC has a similar opinion as Tron and Biever. “To be honest, I don’t think that it makes much sense. I think including the southern region of Luxembourg and the border region of France would be more reasonable. Like from Pétange to Dudelange, because here you are in a coherent territory with comparable mobility situations, all lying in the surrounding area of Luxembourg City”. (Garcia, 2019) In his opinion these superordinate plans only make sense in a coherent region. “If you are going down to the level of the municipality, detailed plans like a cycling plan, a parking management plan, etc. are sensible.” (Garcia, 2019)

However, he also says that, regarding the size of a region “there is no such thing as too small or too big. I think the only thing that is important is the adaptation of the action plan to the size and the corresponding local conditions. The measures have to be adapted to the scale and density of the region in which they are planned. I think it is very important to only include measures in your mobility plan that you can actually realize”.

Three interview partners had exactly the same arguments on why planning a SUMP in the small scale of Luxembourg won’t produce the best results.

If you consider the position of the people, whilst weighing the pro and contra arguments against each other, it becomes clear that the arguments against the SUMP in Sanem marginally outweigh the arguments in favour. There is a continuous trend in the arguments of the people speaking against a small-scale SUMP. The unanimous agreement of the three interviewees that it would be better to plan on a bigger scale, like the ProSud area, adds to the power of the argument.

Among the arguments in favour of a small scale SUMP, there wasn’t such a clear defined agreement on an argument. The argument that the freedom of planning should be compromised is more a fear of something that could happen than something that will definitely happen. Additionally, the people who spoke out in favour for the SUMP in Sanem are mostly personally involved in the planning of this particular SUMP. At some extend they pursue a self-interest, at the other hand they can judge best what the municipality needs as they are the experts of the regions. Their statements can’t be considered entirely impartial.

In conclusion, the arguments against a small-scale SUMP outweigh the arguments in favour of a small-scale SUMP.

6.3.4 Differences in the planning process between urban areas and rural areas

When asked about the differences of planning in an urban area compared to planning in a rural area, all of the interview partners agreed on the fact that there are big differences between the two. Fabien Garcia, who worked for TRANSITEC in both types of regions, thinks that the biggest and most relevant difference is “the dependency on the car, which is constantly present in rural and peri-urban regions”. (Garcia, 2019) In his opinion it is possible to abstain from using the car completely in a very dense urban area. In peri-urban or rural areas however, there is still a strong reliance on the car. The classic alternatives to the motorized individual transport, like the soft modes (walking, cycling) or the public transport can’t be adapted to the entire population’s needs. (Garcia, 2019) “It is very important to manage car traffic in these areas, and to use various, new alternatives to reduce car traffic. This consists

of using the car in different ways, for example car sharing and carpooling. Speaking from experience, these measures are a helpful tool to reduce the number of cars on the streets. For me this is the main difference in the planning process between an urban and a peri-urban region." (Garcia, 2019) "The main difference is allowing an efficient implementation of public transport. Rural areas, of lower density, need to find more flexible mobility solutions that can be adapted to the needs of a peri-urban region. Characteritics of these areas are-longer distances of daily trips that hinder the use of soft mobility modes like walking and cycling" (Houot, 2019). Projecting this question onto Luxembourg, David Tron says, that "in Luxembourg there aren't many regions that you could be defined as urban. We encounter very different issues from cities like Munich, for example." (Tron, 2019) Adrien Stolwijk even states that "Luxembourg is nothing more than a big village compared to its neighbouring countries. Luxembourg City isn't a real city; in Germany it wouldn't even be determined as a city. If you put it into perspective you can't speak of urban areas in Luxembourg." (Stolwijk, 2019)

Luxembourg's mobility situation is a complex one, because of the high amount of daily cross-border commuters entering the country to work. The majority of the traffic destinations cluster in and around Luxembourg City, as Jeff Biever states: "Luxembourg City is the central magnet and the rest of the country is only the periphery or the suburbs of the city". (Biever, 2018) For Lovisa Blomér, it is very important in these cases that the city that generates the traffic in a peri-urban or rural region is included in the mobility plan. "If a smaller city makes a mobility plan, they have to take the region and the bigger city nearby into account because that is what generates the traffic."

Therefore, the measures taken in an action plan for a peri-urban region like Luxembourg/Sanem vary from those used in an urban area. As Garcia mentioned, the management of the MIV plays an important role. Stolwijk mentions that, "in Luxembourg and the surrounding borderlands, people are very dependent on the car because of the low population density. This low density limits the efficiency of public transport, and the same applies to soft mobility modes. This results in a conflict as the alternative transport modes simply can't provide the same efficiency as the car". (Stolwijk, 2019) Stolwijk agrees with Garcia on the point that the car has a lot of potential to be used as a public transportation mode in the form of car sharing and carpooling.

In conclusion, the planning in rural or peri-urban regions has limitations in terms of public transport and soft mobility modes because of the low density; therefore they can't disregard the car as an important transport mode. The key is to expand on the ways the car is used. Instead of perceiving it as a private transportation mode, it has to be used like a service (MaaS = Mobility as a Service).

6.3.5 Opinions on regulatory frameworks

The interview partners were asked if they think that mobility planning should have a legal framework in Europe. Currently, there are only few countries where urban mobility planning is obligatory, for example in France. This question was asked to find out if a legitimate framework could contribute to an improvement of urban mobility plans. "A legal framework allows for a better inclusiveness of the mobility topics and ensures coherence between the PDUs of neighboring territories. The framework is not a barrier to development" ensures François Houot, head planner of the PDU in the CCBP region. (Houot, 2019)

Most of the interview partners have a negative stance towards a legal framework added to urban mobility planning (in Luxembourg). David Tron thinks that "an obligation to do mobility plans won't lead to better results, in contrary it could lead to pro forma studies." (Tron, 2019) The main argument is that, considering the size of Luxembourg, there is no need for new laws but rather national guidelines on urban mobility planning that suggest how to proceed in the best way. Tron, Stolwijk and Garcia share the opinion that, for a country the size of Luxembourg, it is necessary to have guidelines on the national level for urban mobility planning. "These have to set a clear structure for the regional and/or communal level". (Garcia, 2019)

While everybody agreed that it wouldn't be effective to force municipalities to create a mobility plan, some think that it would be helpful for firms and bigger development plans to be required to incorporate mobility plans. Both Heischbourg and Biever think it should be mandatory for large firms and industries to create mobility plans before building their infrastructure, as the economy is one of the biggest factors contributing to road traffic in Luxembourg. (Biever, 2018)

All in all the interview partners all agreed on the fact that a legal framework doesn't contribute to the quality of mobility planning (in Luxembourg) and is therefore unnecessary.

6.4 Interim conclusion of the interview analysis

The interviews conducted for this thesis were informative and insightful. It was helpful to get to know different angles and opinions from people concerning the SUMP, especially the one in Sanem. At first glance every argument in favour or against the implementation procedure of the SUMP seemed well thought out and comprehensible in some way. However, before coming to the conclusion of the results of the interviews, there are some problems that occurred that have a crucial effect on the reasoning behind the conclusion.

6.4.1 Problems occurring during the interviews

Starting with the first interview with Lovisa Blomér, she had a hard time responding to some of the questions. She was under the impression that the interview was mainly going to be about the details on the SUMP in Örebro rather than about SUMPs in general. This could have been due to a misunderstanding between her and the interviewer. As the interview was conducted in English, some answers couldn't be given to a full extend. In retrospect, it would have been better had she been given the questions in advance so she could have prepared.

For the interview partners, Biever, Stolwijk and Heischbourg, who are directly involved in the SUMP in Sanem, pursue at some extend a self-interest and a certain degree of partiality. They worked throughout the entire SUMP, its structure and its content, so it would seem obvious that they think this is the best way to do it. Adding to their direct involvement in the case study, all three were also aware of this thesis and what is being analysed. It is possible that some of the answers they chose to give were subconsciously adapted to the scope of this thesis.

As for Garcia and Tron, who didn't know about the SUMP principle prior their respective interviews, it is hard to say if they were informed about the aspects of the SUMP concept in its entirety and this could possibly have influenced their answers concerning this topic.

The biggest problems occurred with the interview of the representative of the Bassin de Pompey region, Céline Petit. As she was the only interview partner from the French region, this interview was important to gain some more insights into their PDU. When first contacting with her, there were no communication problems. Afterward she rescheduled the interview date several times, to the point where it was impossible to get in touch with her anymore. After some time, realising that she wouldn't answer anymore, another employee from the CCBP was contacted, sent the questions and answered them via email. Due to the delay of this "interview", the answers weren't included to the fullest extent in the interview analysis.

In hindsight, there are many potential setbacks that can hinder acquiring reliable data from people when conducting interviews. The accuracy and credibility of the answers has to be analysed critically.

6.4.2 Interview results

The interviews cleared up various things that work well with the SUMP, and things that don't work as well. The first thing that was striking was the general lack of awareness from the interview partners of what the SUMP is. Even the national level wasn't fully aware of the SUMP concept. To some extent this lack of awareness could induce a lack of understanding of the concept and interest of a SUMP.

Another finding was the limited understanding of the need for cooperation and consultation between the local, the regional and the national levels during the planning process of the SUMP in Sanem. During the conversation with Stolwijk and Heischbourg, the negative aspects stood out regarding the cooperation between different levels in Luxembourg. The planners and the municipality wanted to plan within the scale of the municipality to assure that they can identify themselves with the document, without any influences from the outside. As Tron stated in his interview, he thinks it is a pity that there was no consultation of the national level (ministry of mobility) during the creation process of the SUMP.

This lack of consultation goes hand-in-hand with a lack of involvement of the national level. At the moment they only provide minimal guidance for the development of the mobility with the MODU 2.0 document. However, this plan is neither adequate nor detailed enough, when you keep in mind that it is responsible for the future mobility planning of an entire country. The interview results clearly reveal that there is no need for a legal framework for mobility planning in Luxembourg if a clear guidance is provided by the national level.

Another influence concerning the success or failure of the SUMP is the planning scale. As Sanem is planning their SUMP alone, without the neighbouring municipalities in the region, nor the help of national instances, their power of implementing the measures they've set in the SUMP is relatively restricted. The SUMP of Sanem included measures that go further than the municipal borders. However, measures including the public transport, the road hierarchy or the coherence of the cycling and road network can't be planned or changed by the municipality alone, they have to consult the regional or national level.

All in all, four issues were uncovered during the interview analysis that could compromise the success of the SUMP in a region like Sanem:

- Lack of awareness, lack of knowledge of the basic SUMP concept;
- Lack of awareness, lack of involvement of the national level;
- If the chosen planning scale is too small, no implementation/decision-making power;
- No national mobility strategy provided by the ministry in charge.

7 Conclusion

The aim of this thesis was trying to find out if the basic concept of the SUMP, as it is described in the guidelines of the European commission, can help to implement sustainable mobility measures in peri-urban regions. After defining what the SUMP concept includes, what a peri-urban region defines and what the main objectives of the SUMP are, a comparison was conducted with a French SUMP (PDU). In addition to the compatibility of the SUMP principle with a peri-urban region, a second question arises: whether or not the PDU principle is more compatible in a peri-urban region than the SUMP principle.

The PDU of the CCBP region was published in 2006 and a revision was made in 2015. This revision showed that the PDU wasn't a success. Even if the region claims to have implemented nearly all the measures from the PDU, when comparing the situations in 2006 and 2015 the statistics, the modal split and the air quality show negative results for the region. Most of the objectives the PDU strived to attain weren't reached, and in some cases the situation is even worse than before the PDU (e.g. share of soft mobility trips). The cause of the failure of the PDU is sadly not known. A lack of data and information prevents drawing a conclusion on what went wrong. The document disguised the negative results in a way that they portrayed them in a positive way and without mentioning their objectives from 2006.

Due to the fact that the PDU of CCBP and the SUMP in Sanem were structured similarly, the question arises as to whether the SUMP will also fail in attaining its goals. The composition of both case studies makes them relatively eligible for comparison, as both have a similar population density and the mobility in each region is impacted by a bigger city. Due to the insufficient data from the CCBP however, the comparison of both plans can't predict with any certainty or reasoning that the SUMP in Sanem will also end with negative results.

Due to the unclear reasons on why the PDU failed, it is hard to say whether the goals weren't met as a result of the characteristics of a peri-urban region, or if there were other causes. It is impossible to determine the compatibility and/or success of a sustainable urban mobility plan in a peri-urban region with the investigated comparison as the sole ground for argument.

In addition to the comparison of the two case studies a series of interviews were conducted. The data gained from these interviews have to be taken with a pinch of salt, because people have a tendency to be biased towards one topic. Also, the interview partners have to be chosen to represent every sector and interest group in order to cover every field of the spectrum.

As previously mentioned, the results from the four uncovered problems that hinder a positive execution of a SUMP action plan in a peri-urban region:

- Lack of awareness, lack of knowledge of the basic SUMP concept;
- Lack of awareness, lack of involvement of the national level;
- If the chosen planning scale is too small, no implementation/decision-making power;
- No national mobility strategy provided by the ministry in charge.

These issues were mainly mentioned in relation to the SUMP in Luxembourg. As the majority of the interview partners currently either live or work in Luxembourg, they would associate the entire question with Luxembourg. The four issues are also mentioned specifically for the example of the current situation in Luxembourg regarding the involvement of the national level, the lack of mobility strategy and the unfavourable chosen scale. It is hard to generalize all the peri-urban regions throughout Europe on the basis of Luxembourg and the example of Sanem, taking into account that Luxembourg has a very special mobility situation. With the high number of daily commuters coming from the neighbouring countries and the fact that Luxembourg is such a small country, the problems that occur in Sanem that were covered during the interviews don't necessarily apply to other peri-urban regions outside the small country.

As far as the implementation of SUMPs in Luxembourg goes, the interview analysis and the comparison of the SUMP in Sanem to the PDU of CCBP showed that the scale on which the SUMP is planned isn't ideal. The municipality of Sanem doesn't have enough decision power to guarantee the implementation of the action plan on their own. They aren't independent enough and have to rely on partners from the national and regional level to realize most of the measures included in the SUMP. This raises the question as to the point of an individual plan as a municipality: If the municipality has to consult an upper level either way, why can't they then be included from the beginning?

The interviews and the comparison made it clear that the best scale of planning in Luxembourg is on an intercommunal one. In the case of the south of Luxembourg this could be applied to the ProSud region. All the arguments that came up during the interviews against planning a SUMP on an intercommunal scale are inferior in comparison to the issues brought about by municipalities planning independently.

The argument of poor communication between the different levels is one that can be easily solved with effort and good will from each side. The second argument of the plan, then becoming too impersonal for the different municipalities, can be avoided if the intercommunal plan is structured in such a way that each of the individual actors has their own tailored chapter within a greater plan. In other words, a small plan would be included within a superordinate plan. This would ensure the plan's relevance to specific zones, while still retaining an overview of the progression in the region as a whole.

The concept of the Poly-SUMP could be a good alternative for the ProSud region. As a reminder, a Poly-SUMP aims to develop a sustainable urban mobility planning methodology in a polycentric region. The methodology is based on the conventional SUMP process with the addition of a few elements to further understand and treat the needs of a polycentric region and enable a more participatory process including all the stakeholders.

The PDU concept is also planned in an intercommunal region in France; it is however embedded in a strict legal framework. A similar framework isn't necessary in Luxembourg, as it is such a small country that the communication between the national level and the regional one can be done directly without an intermediate and doesn't tend to take long in comparison to other countries. With only 102 municipalities in the country, a surface of 2.589 km^2 there is no need for such instances. A legal framework only makes sense if it takes a multitude of steps for local actors to get in touch with the national level (as is the case in France).

All in all neither the first nor the second research question can be answered within the scope of this thesis. The capability of the SUMP concept to implement sustainable measures in a peri-urban region couldn't be proved nor dismissed with the comparison of the case studies or the interviews.

The second research question, whether the PDU principle, the Poly-SUMP or the basic SUMP principle is the best suited planning concept for a peri-urban region.

This question can be answered so far that the SUMP isn't ideal because of the restricted planning scale, neither is the PDU, simply because of the fact that the legal framework is unnecessary.

This thesis comes to the conclusion that there is nothing speaking against implementing a SUMP in a peri-urban region as long as the planning scale is chosen wisely, so that all the regions that have an impact on the mobility situation are taken into account and are considered in the plan. The measures of the action plan should be worked out in collaboration with all the actors that are involved in the implementation of the action plan to make sure that they

set themselves realistic goals. This suggests that the concept of the Poly-SUMP is a good alternative for peri-urban regions. The lesson learned during this thesis is that it is impossible to prove the compatibility of SUMP or any other plan for peri-urban regions on the basis of the comparison of one case study and a few interviews. SUMPs are being implemented all over of Europe and it is impossible to assume something based on the analysis of one or two particular examples. Secondly, Luxembourg has a very unique mobility situation, where it is difficult to make assumptions using the example of the Grand-Duchy as a basis for comparison to the rest of Europe.

The point to highlight at the end of this thesis is that the issue of the SUMP is a very interesting and underrated topic in mobility planning science. After all it can't be denied that every effort that is made in terms of mobility planning good. The responsible of the municipality show a lot of initiative and will to improve the mobility situation in the region. Even if the SUMP principle, in small scale peri-urban area, isn't able to fully achieve a more sustainable mobility, it is however a very important tool for the population. A document like the Masterplan Sanem is a food for thoughts for the population to rethink their daily mobility habits as they identify themselves with the document.

There is still a lot to work out and analyse, such as the research questions of this thesis which couldn't be conclusively answered yet. It is very important to continue the research in this field to constantly improve mobility planning in Europe, especially peri-urban regions.

8 List of references

Adar Ben-Eliyahu, P. (2014). *Understanding different types of research: The difference between qualitative and quantitative approaches.* Retrieved from http://chronicle.umbmentoring.org/on-methods-whats-the-difference-between-qualitative-and-quantitative-approaches/

Adell, E., Ljungberg, C., & Trivector. (2014). *The Poly-SUMP Methodology How to develop a Sustainable Urban Mobility Plan for a polycentric region.* Brussels: ICLEI Europe.

ADEM. (2018). *www.adem.public.lu*. Retrieved from www.adem.public.lu: http://adem.public.lu/de/marche-emploi-luxembourg/panorama-marche-emploi/index.html

ADUAN. (2013). *Enquête Ménages Déplacements.*

Article 22 of the Law n. 340/2000. (2000).

Bassin de Pompey. (2017). *Rapport d'activité de de développement durable.* Bassin de Pompey: ImprimerieHelio Services.

BEPOMM. (2018). *http://www.epomm.eu/*. Retrieved from http://www.epomm.eu/: http://www.epomm.eu/index.php?id=2675&country_id=11

Biever, J. (2018, Dezember 20). Interview on SUMPs. (L. Bertinelli, Interviewer, & L. Bertinelli, Translator)

Blomér, L. (2018, December 2). Interview about SUMPs. (L. Bertinelli, Interviewer)

Borowy, I. (2014). *Defining Sutainable Development for our common future.* New York: Routledge.

Brebbia, C. (2011). *The Sustainable World.* UK: Wessex: Wittpress, Institute of Technology.

Brundtland. (1987). *Our Common Future.*

Central Intelligence Agency. (2017). *The World Factbook*. Retrieved from www.cia.gov: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2002rank.html

Cerema. (2013). *Guide juridique pour l'élaboration des PDU - Papier.* France: Cerema (ex-Certu).

Cerema. (2015). *Involving citizens in the SUMP process – challenges and recent trends in French PDUs, collection local practices, mobility and transports.* Lyon : Cerema.

Cerema. (2018). *https://www.cerema.fr*. Retrieved from https://www.cerema.fr: https://www.cerema.fr/fr/centre-ressources/boutique/guide-juridique-elaboration-pdu

Certu. (2012). *Des propositions innovantes pour l'optimisation des réseaux de tramway (Innovative proposals for optimizing tram networks).* Certu.

Certu. (2013). Guide juridique pour l'élaboration des PDU. *Certu*.

CIVITAS. (2018). *Status of SUMP in European member states.* SUMPS-UP.

Code des transports. (2019). Articles L1214-1. In *Code des transports* (Vol. Chapitre IV : Les plans de déplacement urbains). https://www.legifrance.gouv.fr/.

Commission of the European Communities . (2009). *Action Plan on Urban Mobility .*

Communauté des Communes du Bassin de Pompey. (2006). *Le Projet de PDU 2006-2016.*

Communauté des Communes du Bassin de Pompey. (2015). *Bassin de Pompey : Révision du PDU.*

data.worldbank.org. (2019). *https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS*. Retrieved from https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS: https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS

De Castro, M. (2010). *Mobilità sostenibile. Approcci, metodi e strumenti di governance.* Pavia: Edizioni Altravista.

Department for Transport. (2009). *Guidance on the third round of local transport plans.* London : DfT.

Durlin, T. (2018). *SUMPS UP: Status of SUMP in European member states.* CIVITAS.

ELTIS. (2012). *THE STATE-OF-THE-ART OF SUSTAINABLE URBAN MOBILITY PLANS IN EUROPE.* Cologne: European Commission.

ELTIS. (2014). Guidelines: developing and implementing a Sustainable Urban Mobility Plan. http://www. eltis.org/sites/eltis/files/guidelines-developing-and-implementing- a-sump_final_web_jan2014b.pdf.

ELTIS. (2015). *Dutch member state profile*. Retrieved from eltis.org: http://www.eltis.org/mobility-plans/member- state/netherlands#sthash.zRMSveXj.dpuf

ELTIS. (2019). *www.eltis.org*. Retrieved from The SUMP concept.

Engel, G. (2019, 03 08). Workshop 08/03/2019. (L. Bertinelli, Interviewer)

EPOMM. (2016). *sustainable mobility in small cities and rural areas.* Endurance -European SUMP network.

EPOMM. (2018). *http://epomm.eu*. Retrieved from http://epomm.eu: http://epomm.eu/endurance/index.php?id=2809&country=de

European Commission. (2017). *Sustainable Urban Mobility: European Policy, Practice and Solutions.* Brussels: European Union.

European Platform on SUMPs. (2014). Developing and implementing a sustainable urban mobility plan. p. 7.

European Platform on SUMPs. (2014). *Guidelines on developing and implementing a sustainable urban mobility plan.* Brussels: Intelligent Energy EuropeProgramme of the European Union.

European Union. (2016). *Urban Europe: statistics on cities, towns and suburbs 2016 edition.* Luxembourg: Publications office of the European Union.

EUROSTAT. (2018). *The 2018 Ageing Report.* Brussels: European Commission.

Famoso, F., & Lanzafame, I. (2013). Urban mobility management: new challenges for a sustainable future. *Forum geografic Volume XII, Issue 2*, 164-170.

FGSV. (2015). *Working Group for Transport Planning: recommen- dations for mobility master planning.* Berlin: FGSV.

Garcia, F. (2019, 01 31). Interview on SUMPs. (L. Bertinelli, Interviewer)

Giduthuri, V. (2015). Sustainable Urban Mobility: Challenges, Initiatives and Planning. *Current Urban Studies*, 261-265.

Global Footprint Network. (2019). *https://www.footprintnetwork.org/our-work/ecological-footprint/*. Retrieved from https://www.footprintnetwork.org/our-work/ecological-footprint/: https://www.footprintnetwork.org/our-work/ecological-footprint/

Goertz, G., & Mahoney, J. (2012). *A Tale of Two Cultures Qualitative and Quantitative Research in the Social Sciences.*

Goudappel Coffeng. (2012). *SUMP:What's in it for me? .* CROW/ KPVV.

Heischbourg, F. (2019, January 22). Interview on SUMPs. (L. Bertinelli, Interviewer)

Heischbourg, F. (2019, January). Interview regarding SUMP. (L. Bertinelli, Interviewer)

Houot, F. (2019, March 17). Interview on SUMPs. (L. Bertinelli, Interviewer)

http://www.bassinpompey.fr. (2019). *http://www.bassinpompey.fr*. Retrieved from http://www.bassinpompey.fr: http://www.bassinpompey.fr/La-Communaute-de-Communes,1768,fr.html

http://www.bassinpompey.fr. (2019). *http://www.bassinpompey.fr*. Retrieved from http://www.bassinpompey.fr: http://www.bassinpompey.fr/territoire-bassin-pompey.html

INSEE. (2013). *Portrait de Territoire.* CCBP.

International Council for Local Environmental Initiatives. (2019). *www.poly-sump.eu*. Retrieved from http://www.poly-sump.eu/: http://www.poly-sump.eu/home/

Knoflacher, H. (2007). Success and failures in urban transport planning in Europe—understanding the transport system. *Sadhana*, 293–307.

Kreins, J.-M. (2010). *Histoire du Luxembourg (5 ed.).* Paris: Presses Universitaires de France.

Luxmobil. (2017). *Enquête Mobilité.*

May, A. (2002). *Transport planning skills initiative: a plan for action.* London: Transport Planning Society.

May, A., Boehler-Baedeker, S., Delgado, L., Durlin, T., Enache, M., & van der Pas, J.-W. (2017). Appropriate national policy frameworks for sustainable urban mobility plans. *Published online at SpringerLink.com*.

Ministère de l'écologie, du développement durable et de l'énergie. (2012). *PDU : the French urban mobility plan, Integrating transport policies.* Certu .

Ministère de l'écologie, le développement durable et de l'énergie. (2013). *30 years of sustainable Surban mobility plans (PDU) in France.* Certu.

Ministère de l'équipement, du Logement, des Transports et du Tourisme. (1996). *Plan de déplacements urbains Guide.* Centre d'études sur les réseaux, les transports, l'urbanisme et les constructions publiques.

Ministère de l'intérieur. (2019). *https://www.banatic.interieur.gouv.fr*. Retrieved from Base nationale sur l'intercommunalité, CC du Bassin de Pompey: https://www.banatic.interieur.gouv.fr/V5/recherche-de-groupements/fiche-raison-sociale.php?siren=245400601

Ministerie van Infrastructuur en Milieu. (2012). *Structuurvisie Infrastructuur en Ruimte Nederland concurrerend, bereikbaar, leefbaar en veilig.* Den Haag: Ministerie van V&W.

Ministerie van Verkeer en Waterstaat. (2004). *Nota Mobiliteit; naar een betrouwbare en voorspelbare bereikbaarheid.* Den Haag: Ministerie van V&W.

Ministerium für nachhaltige Entwicklung und Infrastruktur. (2018). *MODU 2.0 Strategie für eine nachhaltige Mobilität.* Luxembourg: Ministerium für nachhaltige Entwicklung und Infrastruktur.

Mobiel Vlaanderen. (2018). *https://www.mobielvlaanderen.be*. Retrieved from https://www.mobielvlaanderen.be: https://www.mobielvlaanderen.be/overheden/mobplan.php

Mobilité Brussels. (2018). *https://mobilite-mobiliteit.brussels/fr*. Retrieved from https://mobilite-mobiliteit.brussels/fr: https://mobilite-mobiliteit.brussels/fr

Prof. Rolf Moeckel. (2018). *Research Design: How to tackle a Master's Thesis.* Munich: Session 7: Qualitative Research, Evaluation Research, Unobstrusuve Research, Qualitative Data Analysis.

République Francaise. (1982, December 30). *Loi d'orientation des transports intérieurs - L O T I -*. Retrieved 03 07, 2019, from https://www.legifrance.gouv.fr/: https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000006068730

République Francaise. (1996, December 16). *Loi sur l'air et l'utilisation rationnelle de l'énergie*. Retrieved 03 07, 2019, from https://www.legifrance.gouv.fr/: https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000381337&categorieLien=id

République Francaise. (2000, December 13). *https://www.legifrance.gouv.fr/.* Retrieved 03 07, 2019, from Loi n° 2000-1208 du 13 décembre 2000 relative à la solidarité et au renouvellement urbains: https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000005630252

République Francaise. (2005, February 2005). *LOI n° 2005-102 du 11 février 2005 pour l'égalité des droits et des chances, la participation et la citoyenneté des personnes handicapées (1)*. Retrieved 03 07, 2019, from https://www.legifrance.gouv.fr/: https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000809647&categorieLien=id

Rupprecht Consult. (2012). *THE STATE-OF-THE-ART OF SUSTAINABLE URBAN MOBILITY PLANS IN EUROPE.* Cologne: European Commission.

Schroeder & Associés. (2017). *Mobilitéitscheck.*

Schroeder & Associés. (2019).

Schroeder & Associés. (2019). *Masterplang Mobilitéit 2030.*

Schroeder.lu. (2019). *https://www.schroeder.lu*. Retrieved from https://www.schroeder.lu: https://www.schroeder.lu

STATEC. (2017). *Population et emploi.* Luxembourg : STATEC.

STATEC. (2017). *Projections macroéconomiques et démographiques de tong terme: 2017-2060.* Luxembourg: STATEC.

STATEC. (2018). *Luxemburg in Zahlen 2018.* Luxembourg: STATEC.

STATEC. (2019). *Atlas Démographique du Luxembourg.*

Stolwijk, A. (2019, 02 01). Interview on SUMPs. (L. Bertinelli, Interviewer, L. Bertinelli, Editor, & L. Bertinelli, Translator)

Stolwijk, A. (2019, 02 01). Interview on SUMPs. (L. Bertinelli, Interviewer, L. Bertinelli, Editor, & L. Bertinelli, Translator)

Thatcher, A. (2015). *the three pillars of sustainable development.* University of the Witwatersrand.

The European Commission. (2011). *WHITE PAPER Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system.* Brussels.

trading economics. (2019). *tradingeconomics.com*. Retrieved from tradingeconomics.com: https://de.tradingeconomics.com/luxembourg/indicators

transitec.net. (2019). *transitec.net*. Retrieved from transitec.net: https://transitec.net/en/the-company/identity.html

Tron, D. (2019, 01 31). Interview on SUMPs. (L. Bertinelli, Interviewer)

UBA. (2001). *Act locally: the development of sustainable mobility as municipal field of action.* Berlin: UBA.

Umweltbundesamt, U. (2001). *Act locally: the development of sustainable mobility as municipal field of action.* Berlin : UBA.

United Nations. (2014). *World urbanisation prospects.* Luxembourg : Department of Economic and Social Affairs,.

United Nations. (2019). *http://www.un.org/en/sections/issues-depth/ageing/*. Retrieved from http://www.un.org/en/sections/issues-depth/ageing/: http://www.un.org/en/sections/issues-depth/ageing/

World Health Organisation. (2014). *www.who.int/*. Retrieved 03 08, 2019, from Health and sustainable development : https://www.who.int/sustainable-development/transport/health-risks/climate-impacts/en/

World Health Organization. (2018). *http://www.who.int.* Retrieved from http://www.who.int: http://www.who.int/sustainable-development/transport/health-risks/climate-impacts/en/

Wulfhorst, P. D.-I. (2003). *Interaction of landuse and transport.* München.

www.citec.ch. (2019). *https://www.citec.ch/histoire-du-groupe/*. Retrieved from https://www.citec.ch/histoire-du-groupe/: https://www.citec.ch/histoire-du-groupe/

www.deutschland.de. (2019). *https://www.deutschland.de/en/topic/life/urban-and-rural-living-facts-about-urbanisation-and-rural-exodus*. Retrieved from https://www.deutschland.de/en/topic/life/urban-and-rural-living-facts-about-urbanisation-and-rural-exodus: https://www.deutschland.de/en/topic/life/urban-and-rural-living-facts-about-urbanisation-and-rural-exodus

www.espaces-transfrontaliers.org. (2013). *http://www.espaces-transfrontaliers.org*. Retrieved from http://www.espaces-transfrontaliers.org: http://www.espaces-transfrontaliers.org/ressources/cartes/maps/show/les-flux-domicile-travail-sur-les-frontiere-du-luxembourg/

www.prosud.lu. (2019). *www.prosud.lu*. Retrieved from www.prosud.lu.

List of Abbreviations

SUMP	Sustainable Urban Mobility Plan
PDU	Plan de Déplacements Urbains
LTP	Local Transport Plan
LAU	Local Administrative Units
VEP	Verkehrsentwicklungsplan
AOTU	Autorité Organisatrice des Transports urbains
LOTI	Loi d'Orientations des Transports Urbains
SCoT	Schéma de Cohérence Territorial
PLU	Plan Local Urbain
Poly-SUMP	Sustainable Urban Mobility Plan in polycentric regions
CCBP	Communauté des Communes du Bassin de Pompey
SDG	Sustainable Development Goals
S&A	Schroeder & Associés
MMTP	Ministre de Mobilité et des Travaux Publics
PT	Public Transport
MIV	Motorisierter Individual Verkehr
MaaS	Mobility as a Service

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Appendix A: Interviews

Interview Lovisa Blomér

Introduction:

Lovisa Blomér (26) works as a traffic planner for the city of Örebro municipality, works for the municipality for four and a half years and she started working there when the sump was accepted. So she accompanied the whole process of implementing the measures in the SUMP since it came out. The sump is a short document of 8 pages, but it has a lot of subdocuments that belong to the SUMP

Main goals of the SUMP

- Modal split objective → 2020, 60% walking/cycling and PT → 2011 44% walking etc.
- Fossil free in 2020
- Reduce and improve travel time for modes like walking, cycling and PT
- Prioritize space saving transport modes
- Combined planning not only traffic planning or city planning, but co-planning

How much was your SUMP inspired by the document from the European Commission?

She doesn't have much of the history on the planning process of the sump since she only started working there when it was already finished, however she knows that there were some projects (cycling) done with structural guides.

Since their sump was introduced in 2014 it couldn't be inspired by the European guidelines because they came out in the same year.

In retrograde they inspire from the guidelines during the implementation process of the measures.

The politician decides on the municipal level, so in Örebro the sump was brought out a year late so that it wouldn't collide with elections in Sweden. So it was worked out before 2013 so before the sump guidelines were published.

However the sump may well be inspired by other EU projects even if the sump guidelines weren't published yet, but she couldn't specifically name one.

Is there a structural framework for traffic planning in Sweden?

There are building planes where a parking key is fixed. In Sweden cities aren't obligated to do a mobility plan; they do it on free terms. Nearly all the bigger cities in Sweden have a mobility plan or mobility strategy.

What is the size of Örebro, would you consider it being a big city?

The size of the city really depends on what you compare it with.

150.000 inhabitants the entire municipality and most people are living in the city centre, there is one city centre but there are some sub centres (shopping purposes) on the edge of the city. One proper city centre, with some sub centres around.. In the county Örebro is like the biggest city. It attracts people from the whole region.

Do you have already first results from your SUMP?

There has been a statistics report done and a travel survey, and concerning the modal split it changed to 50% of the trips being done by walking cycling and PT so it increased already from 44% to 50% in 4 years.

What kind of surveys do you do, how was the participatory approach structured in Örebro?

Very big dialogue with the people, they were out meeting people in the streets to talking to them, flyers were distributed to the houses of the population were they could write down their ideas and wishes.

Meeting with stakeholders where they met the population, but there was also some kind of questionnaire where people could write down their opinion on a sign.

What do you know about PDUs?

No details...

Do you think it is better for small cities to work together on a mobility plan in the region or do you think every city should be responsible for their own SUMP?

The region office was responsible for a survey; it is a way to make the smaller cities in the region to participate. Not all the small cities have to stuff or the budget to do such a plan on their own. It might be useful to work together for smaller cities.

Surely it gets more complicated when more cities are involved in a planning process because this means that there are more stakeholders, and more politicians involved, that have to agree on a common ground.

Since we have the countryside and smaller cities in the outskirts of Örebro, it is important for the politicians to include this part too. But in fact we focus on getting the people to live in the city, with reasonable distances that can be done by sustainable transport modes (not car). Because people living in the countryside a much more dependent on their car, because the public transport isn't ideal everywhere. The smaller cities that aren't in the municipality but in the region, there are a lot of people working in Örebro that buy houses there because the prices are lower and then they are forced to use the car because the PT connection aren't good, so they are also working on that currently.

You have to think about the region, if you are planning a mobility plan for a city. There is a regional travel plan that includes all the countryside but it also has to be looked at on the city level.

The regional level also has investments into the entire region, but mostly they invest into the city because the measures in the city have also advantages for the region.

The region is responsible for the public transport, but the municipality is responsible for the planning of the pt, the infrastructure of the roads and traffic lights, planning the density etc. But the region decides how the lines should go, the schedule and all that.

Do you think it makes sense to do a SUMP only for the country side near Örebro?

There are some question, in a very small scale that are important to look at for the country side, if a smaller city makes a mobility plan for themselves they have to take into account the region and the bigger city nearby because that is what generates the traffic.

Also as a big city we have to think about the municipality and the countryside around.

Can you see some strengths and flaws in the planning process of your SUMP?

It is hard to answer this question.

There are some measures that haven't been introduces yet. It would make the dialogue with the citizens easier if they were done.

When people have the opinion that it is harder to get into the city with the measures being applied, but there are some key measures missing… the commuter parking for example.

→ Signal prioritizing for buses and the bus rapid transit that are measures that still have to be decided on.

Increase in walking and cycling but the PT is still the same, there hasn't much changed. Inside the city centre measures are applied but the outskirts and people not living in the centre can't really profit from they yet because they are still fixated on the car as the PT hasn't improved yet. We do a lot of measures for cycling, bus prioritization with traffic lights has started but it doesn't show results yet. The share of PT-users is still too low.

Conclusion:

Your main challenges are investing and improving the public transport and keep on augmenting walking and cycling and reducing the individual car use. The main challenges I see for the city in the next years. We are participation in this research project, where university and companies look at fossil free transport methods, and how to increase acceptance by the population. Hard core measures and how to imply them with a higher acceptance by the people

→ How to do that, by doing dialogue with population, to ease them into the thinking of such measures to make them more acceptable. Participative approaches to heighten the ac ceptance of hard core measures. Top down vs. Bottom up approach.

Interview Jeff Biever

Introduction:

Jeff Biever is a 29-year-old Luxemburgish Geographer working for Schroeder & Associés since 2016. He studied in Trier and Cologne, Freizeit und Tourismus-geografie Bachelor and Wirtschaftgeoografie im Master) with main focus on urban planning. He wrote his master's thesis in the engineering company Schroeder & Associés, where he is currently working as a traffic planner.

Difference between a geography and engineering:

In geography the person is observed in the room, the engineer rather look at the space and how to change it and therefore put the human in second place.

The right way to do it is to look how the human can fit inside the space in the best possible way, because infrastructure only has a purpose and is useful when it is being used. It is important to plan infrastructure with human participation in the planning process with the goal in mind to build something for the people for it to work.

There are buildings, being architectural masterpieces but they miss their purpose because they weren't planed for the people.

I think it is my job as a geographer to close this gap between the engineering and planning world and the people to create something where everybody profits from.

The concept of the masterplan (SUMP) is in it structure exactly a document that will bring people and planners together, where interdisciplinary planners, stakeholders and the population work together to get the best outcome.

What are the biggest challenges of today's traffic planning?

Mobility is in a changing state at the moment, especially in Luxembourg. The younger generations have a different perception of mobility than the older ones; they aren't so fixated on the private cars.

Also the politician's mind-sets are changing into a more sustainable way of thinking about traffic and mobility and realizing that they have to live the change themselves for the people to grasp on and follow their way. The biggest challenge is in fact the transitional period that we're in at the moment, between the needed infrastructure being built like, cycling paths and tramways, but also motivating and convincing people to use them on a daily basis. It's a balancing act between investing in new infrastructure and planning with the infrastructure to move people into using the existing infrastructure on a daily basis.

On the one hand, the new concept of smart city and mobility as a service (MaaS) and the conventional modes of mobility have to be intertwined and work together that transportation becomes a service, a way of life and isn't seen as the traditional way of transporting goods or people from a to b but there is so much more that is included into the term of mobility. From information services to urbanism to social aspects to sustainability and security are all included into the services of mobility that are necessary for a successful mobility planning.

What is sustainability for you?

A term that everybody uses but nobody really knows that is means.

But, how I understand it, sustainable mobility is intelligent mobility, a simple mobility that everybody can understand and a nature friendly mobility. So in general the three bases of sustainability, being the social, the economical and the environmental aspects have to be fulfilled for mobility to be sustainable.

How much is the structure and the content of the Masterplan in Sanem inspired by the SUMP-guidelines by the European Commission?

The offer we've got from the city administration of Sanem was to do a SUMP for the municipality. It being the first SUMP for Luxemburg and also the first SUMP being done by Schroeder & Associés we took a look what has been done in other cities in Germany and France, the also looked into the guidelines and we in fact based our structure very much on these guidelines. But by doing that we saw that we can't really treat Sanem like the other cities in Germany we were looking at (Hannover etc.) because of the size, the density and the landscaping of Sanem.

The guidelines don't give specific examples at the moment for how you should plan a sump for a small scale community but I think Eltis is currently working on an update for the guidelines where this will be included.

The current guidelines are applicable on a small scale community like Sanem but they have to be altered slightly because it is very difficult to isolate Sanem and look at it by its own, the neighbouring cities and municipalities lay a big role in Sanem traffic situation of today. But not only has the region to be included but the whole country. Luxembourg being so small, everything is intertwined and affects each other.

Does a municipality the size of Sanem need its own SUMP in your opinion?

I think it is important for cities and municipalities to have a vision for its future, and for the politicians to look over the five-six years where they are in office into the future to plan consequentially towards a goal. Today there are a lot of municipalities in Luxembourg that realized that planning has to be done over a multitude of years and therefore has to be planned far in advance and therefore creating masterplans.

Sanem is now the first municipality who does such a masterplan envisioning 2030 only based on mobility planning. In my opinion it is very important to do such a document, even if it is only a small brochure or with a high expense how we are doing it in Sanem,

Sanem is one of the biggest municipalities in Luxembourg, therefore also one of the most important, housing the university of Luxembourg and many other important infrastructures, that it is a necessity in my eyes to do such a mobility plan.

However, on the other hand in a small country like Luxembourg it doesn't make much sense if every small municipality does its own masterplan. As the area where a municipality can apply their improving measures on is very limited in this case it would be more intelligent to plan in a bigger scale.

Especially in the south of Luxembourg where Sanem is located right next to the French border, the second biggest city (Esch/Alzette) and the third biggest city (Differdange) of the whole country it would be better to do a sump regarding the whole region and not only looking at one isolated municipality. You could compare it to a puzzle, if one piece is missing you can't succeed, you need to look at the whole picture to find a solution for the traffic problems in Sanem.

On the national basis there is already some sort of mobility planning being done, the MODU 2.0. it isn't really comparable to a SUMP but there some goals given on a national level where the country's government wants to be in 2025 regarding mobility.

In my opinion there will be other municipalities that will follow the lead of Sanem and also want to do a SUMP after they've seen the one of Sanem, but I think for the most municipalities in Luxembourg, except from 1-2, it would be better if they joined together in creating such a mobility plan in the region. Sure, it is a political question if this is possible because on a higher level there is no structure given.

Do you think it is important that there is a structure, a framework for mobility planning on the national level?

Yes I think that, depending on their size, some cities/municipalities should be obligated to do a mobility plan. For example car sharing or, can only be implemented if they function in the whole region, and not only in an isolated part of the country, so there is a need for the government to imply a framework for a good car sharing network. Similar with the SUMP, you need a good planning network in the whole country for that the measures can be implemented successfully. There are some planning tools that can only be successful in a top-down planning approach. I think it should be mandatory for big firm and industries to do a mobility plan before the start work or building infrastructure that is demanded by the government.

Where do you see the strengths and weaknesses of today's mobility planning in Luxembourg?

I think in the last years there have been a lot of improvement, there is a government in place at the moment that wants to plan a lot, work a lot, is modern in his thinking and has a lot of interesting ideas for example that public transport is becoming free from charge from 2020 on.

They are really trying hard to improve and invest therefore a lot into the municipalities. There however is often a lack of knowhow or a guideline on how to plan for an improved mobility, that for example building a new road, or new parking spaces won't solve the problem in the long run, but rather work in the opposite way and it will get worse.

The biggest weakness is the lack of knowledge of the planners on the regional, city level

Realistically, does the masterplan for Sanem will be a success or not?

I think it will be a plan where the politicians will guide it on, because it was created with the participation of the population, so there is some kind of pressure for the planners and the politicians to implement the measures they are setting with this document. They are taking responsibility with the publication of this document.

So, you say that the success of a masterplan is the participatory approach, that the population is involved and therefore pressure the stakeholders to implement the measures they asked for and have been promised?

Yes, exactly. The planners ask for permission in implementing measures, working and adjusting them to the needs of the population, there is pressure from both sides for these measures to be implemented. The key to success → participatory approach.

People know that there is a document coming with promises and wishes of their own and they want them to be implied.

Where you satisfied how the participatory process has proceeded in Sanem?

There was a participation of 20% which is very high. Yes I was very happy. People are very interested in mobility.

What do you think about public transport being free of charge from 2020 on?

I think it is a good idea, it is going to be a pilot project for the whole world, Luxemburg going the first country ever to offer free public transport, but also think that this won't solve the problem, of people not using pt. The problem in Luxembourg not using the public transport has nothing to do with the prizing of the tickets, but rather with the comfort, reliability and time, that apply more to the car than the pt. However, it is important for the people to see that it is important for the government to use more the PT, so far that they'll make it free because it will be a huge investment.

Where do you see Luxembourg in terms of mobility in 10 to 20 years?

It depends on the development of the country, how it will grow, if we will double in population in 10-20years if we keep on growing like that the actual road and train network will collapse. It is a very serious problem and has to be planned correctly to counter this trend.

Also to decentralize Luxembourg and Luxembourg city that there is a counter magnet like the Nordstadt and Esch/Alzette that there isn't everything in one place.

Planning urban vs rural?

The biggest problem is that the country is portrayed differently, everything is so small, and everything only works in combination with Luxembourg City. Luxembourg should be looked at like a big city with Luxembourg being the city centre and the rest of the country is the agglomeration and the suburbs of the city.

Interview Fernand Heischbourg

Can you tell me something about yourself?

Well I made the IST and became technical engineer twenty-five years ago. I immediately started working at the municipality of Sanem, in the service technique. Back then we were a smaller group than today, the mobility service as for the constructional service where one. That's why I know every service and every field of technical work that's being done in the municipality of Sanem. Today, I only work in the mobility chair of the municipality, because we are so big today, with so many people that it became necessary to divide the different fields of work. Seven years ago, I upgraded to another career path, I got the engineers degree and am currently working for ten years now as chef the project (project manager) here in Sanem. The service technique is constituted of two units, the project unit and the technical

unit. The service unit is comparable with an engineering/consulting bureau, the service maintenance are the ones who do the constructional works and maintenance.

Fernand is working now for 24 years for the municipality of Sanem.

What are the biggest challenges of today's mobility in Europe, Luxembourg etc.?

Luxembourg is a country dependent on the car; the generations of people creating the chaos on the streets are "car generations", who never learned how to use public transport. But it is also a big problem in Luxembourg that the public transport is very bad. When I'm visiting a big city like Munich for example, you could be a stranger to the city but immediately understand the public transport and find your way around. You don't need to pay attention on the schedule or when the next train is coming, you only have to look at the map to check the stops. In Luxembourg however this is very different. The public transport is unreliable, always late, trains are regularly cancelled. It is nearly impossible to rely on public transport to go to work if you don't have flexible hours or need to be at an appointment at a given time. It is also not very time effective, if you go by car you can do 2-3 meetings in a morning, if you going by public transport you are lucky to be on time to one meeting. That's the biggest problem in my opinion.

Sure, there are a lot of cars in our streets at the moment and be also have the problem with the transit traffic from the daily international commuters, who are also very car fixated. Yesterday I passed the Park & Ride parking in Belval, over 900 places (total 1600) were empty. This shows exactly how our mobility behaviors are structured, very car orientated without the aspect of multimodality. Also, car sharing and carpooling aren't so popular in Luxembourg; people aren't very open to the thought of riding along with a stranger, that doesn't fit into the population's mentality.

Children usually use the public transport often, but that normally changes at the age of 16, 17 when they start thinking about driving themselves, either on a scooter or by car (start to do their driver's license), most parents do the mistake of immediately buying another car for their child, which are now also pooled into using the car on a daily basis.

Looking specifically at Sanem, we are a "Schloofgemeng" (sleeping municipality) meaning that we have very few commercial activities in our community. We are located between two big municipalities, Esch/Alzette (second biggest city in the country) and Differdange (third biggest city in the country) that has a big impact on the traffic situation in our region. Starting with the parking management where both municipalities have very strict regulations in place and Sanem has until now no parking management. That caused that a lot of people came to

our territory to park their car for free and then continue by public transport to their work place in the neighboring municipalities. On a regional level the interest in Sanem is low compared to its neighbors, therefore the connections aren't ideal. We are located in the middle of Esch/Alzette, Differdange, Kaerjeng and Schifflange which all have either a good bus or train connection but we are often overlooked in the planning process of new connections. Also, the transit traffic generated by the neighboring French border isn't helping. I would say that around 15,000 commuters pass Sanem on a daily basis. "Wéineg Zielverkeier, mei Duerchgangsverkeier".

What is your definition of sustainability?

Sustainability is for me a good management of our resources and energies, not only with the thought in mind that they are running out but also regarding the quality of life of the people and the next generations following. It is sad that people are wasting energy nowadays only because they know it is available to waste, without regarding the consequences this has on our planet. Sustainability is for me a good way to handle the resources regarding the environment, the social aspect of the following generations and the economy.

Sustainability is also trying to reduce the usage of fossil fuels, reducing the mining of fossil fuels, like coal or gas and switching over to renewable energies → cradle-to-cradle

Why does the municipality of Sanem wants to do a SUMP, how did the idea come up do to such a plan?

Sanem is a municipality that only changed things in the past when something went wrong or wasn't working. So punctually there were studies being made but there wasn't a global plan. That's when I was thinking that we can't continue working in that way, we need a complete plan for our mobility situation today and also in the future.

I was looking for a plan where in a first phase a diagnosis of today's situation was made, where lie our strengths and weaknesses, and in a second phase set objectives and action plan which we can follow. This action plan can then be followed up every few years. It is basically a tool to set a structure and a coherent plan for mobility that has to be followed up every few years, and can't be forgotten in the cupboards.

How came the idea to do a SUMP/ to follow the SUMP guidelines?

I'm the mobility consultant of the municipality and during a meeting the national mobility consultant spoke about the SUMP concept. At that point I knew very little about SUMPs and therefore I did a quick internet research about it. I realized that this way of mobility planning could be the right tool for Sanem. At the beginning i didn't realize that normally a SUMP was only applied by really big cities, but after reading the planning process and the table of content of a SUMP I thought that there was nothing speaking against a smaller city like Sanem to also do a SUMP. I know that we can't apply the same measures in Sanem than a big city would apply but I think if the SUMP is tailored to Sanem it can be a successful tool to improve the daily mobility of the inhabitants and the visitors of the municipality.

The demographic of our municipality is very different. There is Belvaux and Soleuvre with have peri-urban characteristics, Ehlerange and Sanem which are both mostly rural with a low density and there is Belval, a fairly new district which aspires to be a urban hub for the south of Luxembourg hosting the university, concert halls and a huge commercial center. The municipality is not a homogeneous space with a constant density but rather a region with satellite villages. Sanem is a big city regarding the areal territory but also a small municipality regarding the population and the density. But in that point, I think our population will be increasing a lot in the following years. At the moment we have 17,000 inhabitants. The municipality aspires to reach a number of 23,000 inhabitants until 2030, but in my opinion we will reach this number already around 2025.

Where do you see the need of a mobility plan for the municipality?

The need of a coherent plan regarding mobility that can be followed over the next 10 to 15 years and gives a direction ahead in which the municipality is steering. I always want to work with a plan on a basis of a structured concept. It is important for them to see the whole picture instead of acting punctually without seeing the consequences of the actions in another place.

Do you think that Luxembourg needs a more structured regulation in terms of mobility planning (e.g. France with the PDU)?

It thinks it would be very dangerous to put a regulation in place regarding mobility planning with how the country is momentarily structured. At the moment it is the Ponts & Chaussées (Luxembourgish road-building administration) that dictates and decides on how mobility should look like. The P&CH is mainly directed to car and road traffic, even if they try to dabble in soft mobility, they mainly regulate the entire road network in the country.

However, I think that it is a good idea to make mobility plans like the SUMP obligatory for regions or municipalities. We are currently working on making mobility plans obligatory for bigger firms and bigger building project that want to settle in our municipality.

What do you think about every municipality in Luxembourg (very small scale) wants to do their own SUMP?

I think it is necessary for every municipality to have a mobility plan but they have to interact and fit to each other in some way or form. I think this won't be an easy process, because of the high number of different stakeholders and political standpoints. Some years ago, they already tried a similar thing with the PAG, and that failed to work out between the different municipalities to pull together in one direction. Speaking out of experience, with Esch/Alzette the collaboration works fine, but on the other hand with Differdange it didn't work at all. In Luxembourg there is a very strong communal autonomy. There are some municipalities exploit this autonomy and others don't use it at all. At the end of the day we have to fit into the national structured planning process with our mobility plan on the basis of the national planning structure. When our SUMP is finished we want to go to the ministry of mobility and the national road administration to present our action plan, and maybe we will act as a role model on how it could work in Luxembourg. There are more and more small-scale municipalities interested in doing SUMPs, so far that the ELTIS start on working on SUMP guidelines for small scale cities.

The main goal of the SUMP should be to sum up the political goals and reach over one legislative period and over the political standpoint.

What results do you expect from the Masterplang Suessem?

I expect to see where the main problems are situated regarding mobility and getting some solutions out of the action plan for these problems. In the action plan i expect having a timeline in what time period the different measures can or will be implemented. After some time the SUMP should also provide a continuous follow up of the progress of the implementation of the various actions.

The document should outlast today's political council and also should outlast myself, so that my successor still can fall back on this document in a number of years.

Where do you see the advantages and the disadvantages of the participatory approach of the SUMP?

The participatory approach could be divided into two categories. There are people who only come to meeting to argue and draw attention to their own problems and then there are some people who are interested in working constructively on improving the mobility situation. From those people you get very interesting information and insider tips. I think the people who are living in the municipality know the best where the problem areas are located, in that sense the exchange between planner and the population is very important.

The exchange with the people after the workshop is also important, to show them the results that occurred from the different encounters and are motivated to read the document and to pursue the development of the mobility planning in the region over the previous years.

Do you see a problem to plan a document in a small scale like Sanem?

No I don't think so, we are working on an action plan with realistic measures that can be implemented over a certain time period.

Do you feel limited in your planning process, in terms of measures you would like to implement but you know you can't because other actors on a superior level are involved?

No, on the contrary, I feel assured that I'm planning things that I can implement later without being dependent on anybody else but me. You have a room where you can work in and if you respect that room with its limits you have your freedom and can do and plan what you want.

Do you think that a SUMP planned by the region PROSUD be more productive than if every municipality does their own plan?

Yes I would find it very helpful but I'm skeptical that it would work, because of the communal autonomy. There is a problem with the high number of stakeholders involved that hinders the cooperation on a regional plan, because everybody could do a plan on their own and nobody forces them to work together. I you don't have to share your success with somebody else why should you?

For example in France, where the municipalities are obligated to work together, in theory it looks fine but in reality it doesn't really work. I think there are regions in France that aren't that important or interesting for the national level, and therefore they only plan out of obligation and don't really do it to work out constructive and productive results for the region.

The problem we have with the municipal autonomy is at the same time a strength regarding France because you don't have to rely on anybody else than yourself and if you need somebody from the national level to take a decision for o<u, in Luxembourg you don't have to wait a long time or have to undergo complicated and long procedures to get in contact with that person. "These are the two sides to the medal".

Do you have anything to add?

I think the SUMP could be a tool to tie international connections, with other cities that are in a similar situation or have the same size in Europe. On that scale we are very behind in Europe and therefore I'm trying with the implementation of the SUMP.

It would be a good idea to implement an overruling plan in a second phase that involves the whole region of the "Minett" on the basis of the SUMP from Sanem.

Interview David Tron

Tell me something about yourself, your education and working career.

Well I studied civil engineering in Lausanne (Switzerland) until 2008. Afterwards I worked for 3 years as an assistant at my university, especially in the transport planning sector. Whereas my studies where mainly civil engineering, I only worked in Transportation afterwards. After the university I started working at the private consulting bureau CITEC in Geneva. In 2016 then I came back to Luxembourg to work here for the ministry of transport and sustainable development.

I work a lot on public transport projects, especially railway-projects, and here in Luxembourg, I'm responsible for all the soft mobility and public transport projects worked out for the country buy the ministry. → Cellule mobilité douce.

Modifications in the code de la route, consulting the municipalities, various cycling projects, but we also do other mobility concept that aren't solely based on soft mobility

What are the biggest, greatest challenges of today's mobility? In Europe and in Luxembourg?

I think there is a huge variety of challenges we have to face today regarding mobility. There are more and more people in Europe living in urban areas, especially in Luxembourg the population is constantly on a rise, so one of the biggest challenges in my opinion is how we use the infrastructures we have at the moment at their maximal capacity. I think the biggest problem doesn't lie in the fact that the cars have to be switched out from a fossil fuel driven

motor into electric cars because the take up the same amount of space. The real challenge is trying to reduce the number of cars because the most important resource in my opinion is space. So for me one challenge is the efficient use of our infrastructures and the space we have at our disposal. Another challenge that is now very specific for Luxembourg is the huge amount of transit traffic it has to generate on a daily basis. Another question is how justifiable it is to keep on moving around with the car out of a sustainable standpoint.

Why is it important to plan mobility in advance?

I think we are in Luxembourg a little behind other European countries, because in Switzerland and in France there is a whole culture of mobility planning in place for good over 30 years now. The problem we have here is that we are trying to solve problem punctually where they occur, without looking at the bigger picture and planning ahead. It often happened that a problem is being solved in one place by building new infrastructure but in fact it only showed us that the problem was shifted but not really resolved.

Especially with big projects like new railways or the tram, that takes 10-15 years from the first planning stages until it is realized, if you don't have a plan what you want to reach with such an infrastructure and why it doesn't make sense.

If you have a mobility plan looking into the future, you can avoid that infrastructure is being build that you don't really need in the future. It can happen that, out of necessity at a point in time an infrastructure is being build, and a little later you realize that you don't need it anymore or the infrastructure's is counterproductive. It is usual in Luxembourg that everywhere where it is possible to build infrastructure, it is the first solution taken even if it isn't necessary. (Example of a bus lane which is built because there is space but not really needed in that place)

What is your definition of sustainability?

What I understand under sustainability is a resourceful handling of all the resources, space, gas, etc. Sustainability for me is a term that reaches far over the field of mobility.

Sustainability in term of mobility is a planning strategy that increases the quality of life without wasting resources, using resources you don't really need. (Less noise, less waste, less air pollution, reaching these goals without changing too much one's habits) Strictly and directly it means for me to steer away from the car and private mobility to emission less and public transport modes.

What is your knowledge on sustainable urban mobility plans?

I have to be honest my knowledge is limited. I roughly know what it is, I know they exist, that they are partly financed by the European commission and that some European countries religiously plan them for their cities, but apart from that I don't know much. I never worked on one, or crossed one in my professional career. That can be due to the fact that Switzerland isn't part of EU, and the French have their own plan with the PDU and many other territorial plans. So the SUMP of Sanem so basically the first one I'm following up on. Based on this interview I read a few things about SUMP but not in the grade of detail where you would say I know much about it.

But basically, I think it is a good tool for countries that don't have an established culture of mobility planning yet, to get a foot in the planning process.

Where do you see the difference between the SUMP and conventional mobility plans/concepts?

I really don't see a difference; a SUMP is basically a best practice recipe on how to do a mobility plan. But this isn't something new, I already learned that 20 years ago at university.

So, it is basically the same thing we are already doing for years, with the only difference that is has a new name and it is co-financed by the European commission. There is only one distinctive thing about the SUMP and that is the fact that there has to be a follow up of the progress. It is also a big document that includes all the transport modes which hasn't been done often in the past. There were cycling plans, or public transport plans, but one plan including everything has rarely been done. Or you don't have a structured action plan afterwards. Also the bottom up approach was rather something theoretical than realistic, but it comes more and more up that the politicians seek the discussion with the population.

I think this could be the big advantage of the SUMP that you have a strict process laid down that you can follow and therefore nobody/nothing gets forgotten.

I'm very curious to see what comes out of the SUMP in Sanem, to see if there are new things coming up, or it being a summary of things we are doing anyway. I'm eager to see if there is something to it, or if it is only a new label and in fact you are doing the same thing as before.

To summarize, I think the most interesting thing about the SUMP is the follow up. If it is done right it is really interesting to see how things evolve over the years and how the applied measures take effect.

What do you think about Sanem being the first municipality in the country doing a SUMP?

I find it interesting and I'm curious to see what the end product of this whole process is. I only wanted to say that it is sad that we as the ministry, so to say the national level, know absolutely nothing about the SUMP. We know that it is being made but, regarding the content or the directing in which it is going we have no idea, nobody included us into the planning process.

Also Sanem is a relatively small municipality. If you are looking at the size scaling of other cities in Europe that are doing a SUMP there are only two municipalities in the whole country who fall in that category, that are Luxembourg City and Esch/Alzette (if you are generous). I think we will see on the example of Sanem it is reasonable to do such a plan for such a small municipality. It is not possible to isolate Sanem and look at t without looking the same time at Differdange and Esch. I would prefer to do a SUMP in the entire region of the ProSud for example, because then it builds a coherent network and every municipality affects the other. You can stop here at the national borders. This plan would ideally also include the border municipalities in France. This region then would include around 150.000 to 200.000 inhabitants, and in my eyes this would make much more sense than this small scale plan. The municipality of Sanem has no nearly power to implement the majority of measures regarding mobility and public transport on their own; they either need the collaboration between the neighboring municipalities, or the national level.

They only have the power to work on measures that are solely on their territory and involve no other stakeholder. → Like the quality of life in the public space.

I'm skeptical that the SUMP is the right tool for the agglomeration of Sanem. I think it's a too small scale, where the municipal actions aren't independent enough so that a SUMP makes sense. To make clear what I mean I give you an example of a cycling network. It doesn't make sense when Sanem has its own cycling network when it ends at the municipal borders. It has to be continued over the territory into the other municipalities to connect and create a coherent network throughout the whole region. It the same thing with mobility plans. In my opinion the main objective of the SUMP is that bigger urban regions have a mobility plan in place that covers all special and mobility planning topics.

Do you think Luxembourg needs a stricter regulation regarding mobility planning (e.g. France with the PDU)?

I think this is hard to answer. I don't think that an obligation to do mobility plans leads to better results, in contrary it leads to alibi studies. Here in Luxembourg the municipal autonomy is very strong in comparison to France and Switzerland. I don't think it is necessary do add a law or a regulation because on a national level the ministry gives a direction, national strategy (MODU 2.0) in which the land should steer in the next years and on that basis the municipalities should plan their concepts.

This is a structure that makes sense that the national level decides on a direction that the municipalities have to follow. Regarding the size of Luxembourg as a country it isn't really necessary to add a regulation.

In Luxembourg we are really fixated on building and infrastructure. We don't recognize concepts as equal measures than to new infrastructure. That's a problem of understanding on the political level but also causes due to the fact that the financial aspect doesn't really matter that much.

What are the different planning processes from an urban space to a rural space?

It is clear that that are two different approaches planning for an urban space and an rural space. In Luxembourg there aren't many regions that you could define as urban. We encounter very different issues than for example a city like Munich. We can only dream about applying measures that work well in cities like Munich only because of the special conditions we have in Luxembourg. It all depends on the density in the area. The only regions I can image having some characteristics of urbanity are Luxembourg City and Esch/Alzette, but that are 2 cities in a whole country. For the most part Luxembourg is constituted of small villages with a low density of single-family houses. The key is to change people's habits. This sounds so easy in theory but in practice this is very difficult and a very lengthy process which has to start at the education of children. From an urban area to a peri-urban area there is a big difference in transit traffic and the usage of cars. In an urban area multimodal mobility can be constructed without the car, in a peri-urban region, multimodality is also very important, but nearly impossible without the car. Multimodality is inevitable in a peri-urban region to create sustainable mobility.

What are the advantages and disadvantages of a participatory approach?

A participatory approach is always important and necessary in my opinion. Basically, it only has advantages. But it surely also can go wrong, if it's done at a bad timing or done wrong. You also have to make the difference in what scale you are doing the participatory approach. On a municipal level it is reasonable to start the participatory approach at the beginning of the SUMP with the current mobility situation analysis. It is an interesting tool to find out what people really want. If they mind the transit traffic so much in their residential areas that they would accept to do a detour themselves to get to their home. A tool that isn't used at all in Luxembourg is to test something for a given time period. Instead of implementing it immediately it could be tested, so people can accustom to it and accept it better afterwards. It is also a tool to save money. You don't need to reconstruct the whole area for a testing phase. If the test was a success then in a second phase infrastructural measures can be taken.

Planner should be brave to test more unconventional things to show the people that it also work in another way.

Interview Fabien Garcia

Tell me something about yourself, your education and working career.

I nearly immediately started working with Transitec after my studies. I'm with Transitec now for 13 years, in the beginning I basically worked here to do mobility plans for bigger companies, and then afterwards I moved over to the planning of PDUs and PLUs. And at the moment I'm mainly working as "chef de projet/directeur d'études" on public transport concepts which I really enjoy.

What are the biggest, greatest challenges of today's mobility? In Europe and in Luxembourg?

I can't tell for the entirety of Europe but the French and the Swiss territory I know really well. Luxembourg is a special case I have to say because you are directly impacted by the daily transit traffic coming from three different countries. But I think this problem as well as other problems of today's mobility is directly connected to the control of urban development and the density. The biggest challenge is not the mobility itself but rather how the territory is developing over time, how people are adapting to it and how it is managed. There is a direct connection between occurring problems in mobility and special planning. There are direct effects influencing both sectors if one is changed.

The second biggest challenge in my opinion is taking better choices in how people are moving, in terms of mobility modes, and further even reduce the need of moving. In big urban cities we can observe that the numbers of individual mobility are stagnating or even going down. I think this is a trend which will continue in that direction. I think we don't wish to have an immobile population nor is it possible but we have to try to get people to a more conscious handling with their mobility to make more sustainable choices.

I think another challenge is to decide on when to build new infrastructure and when to try working with the existing infrastructure and working on a new concept. In the past years we reduced building new infrastructure more and more, but not due to the right reasons but rather out of lack of financing. I think it is important to work not only on creating new mobility offers and transport supply but also work on changing people's habits and therefore shifting and even out the travel demand onto all the transport modes.

Another big defiance is the one of political courage. On a national level in France the politicians are very careful and don't dare to change a lot because they fear the backlash of the population. For example, we recently worked out an Eco tax for cars regarding their co2-emissions which never got realized due to a political choice. The entire very expensive infrastructure and technology of the license plate recognition was set in place and we never got to use it. We also never developed an alternative solution for that so in conclusion the entire work and financing which was flowing into this project.

On a local level I think the choices of the politicians take aren't with sustainability in mind but rather how they get reelected during the next elections. They don't dare to take decisions that are unpopular by the people, which mostly include the reduction and deprivation of individual car traffic.

What is your definition of sustainability?

There is a very classic definition of sustainability I always refer to, that is to guarantee the quality of life of the society on three aspects, the environment, the social and the economy. These three aspects have to function in equilibrium, the social and the environmental aspects can't overpower the economical aspect and vice versa. I think if you define sustainability in that sense it gives you a very accurate representation on how it is in theory understood nowadays. In reality however, I think there is always one of the three aspects that overweighs the others depending on the situation. A very rational person will put the focus on the economy, a very social person on the social aspect and a person that is very nature oriented will but it on the environmental aspects. So, this equilibrium is in reality not that easy to find.

What is your knowledge on sustainable urban mobility plans?

Well in fact I have very little, very limited knowledge on the guidelines of a SUMP. Before I saw your questions and before we were in contact I was never really interested or knew something about SUMPs. I tried to research a little bit about it, but I didn't really get the depth of it, so I would appreciate if you could enlighten me.

In the territory I work, France, Switzerland and North Africa the SUMP isn't used up to this date, and as far as I understood it is "only" a guideline, an alternative working method to conventional mobility concepts to solve mobility problems in urban areas, is that right?

Where do you see the difference between a SUMP and the PDU?

Well as you said, the SUMP is in fact basically the same thing as the PDU, regarding the content, which the difference that the PDUs are obligatory for agglomerations with over 100,000 inhabitants in France, whereas the SUMP isn't embedded into any regulations and can be done out of free will, without any prescriptions nor regulations. In France we are trying at the moment to fusion small agglomerations together to make them disappear so that there are only medium and large-scale regions, so that nearly every part of the French territory is obligated to do/has a mobility plan. I think this is a very good initiative. However, there are already some smaller agglomerations in France that have done a PDU even though they aren't obligated to do one, and that's really good and shows a good will in improving the mobility situation. I think the fact that the PDU is planned in an agglomeration and not only in single city or a single municipality is really a strong point of the PDU in comparison to the SUMP. In France we have a huge number of municipalities and the communal autonomy only goes as far as the communal boarders. Which means that they don't really have a coherence until you but them into an agglomeration.

It is difficult to plan a mobility plan if the actor has no say in the most parts included into the planning process. For example, if you look at Differdange (example he knows) the municipality has no say in the planning of the public transport, because it is planned on a regional or national level, the municipality has no say in planning the state roads in the region, nor the traffic lights on that roads because they are controlled by the national road administration. And so on and so on, for Sanem it's the same case. In that case the municipality itself has no power on deciding what's happening in these cases. So, I think the scale in which we are planning is very important and is a key factor in the success of the mobility plan.

The PDU is a public survey where the population can intervene at any level of the planning process through many different ways. There is also one expert chosen by the state that looks over the whole document and afterwards it has to be approved by all the administrations that are included in the process of making a PDU, from the lowest to the highest level (e.g. environmental associations, the municipalities, the region). All these people are asked to give their opinion on the document, and have to give their ok before the document is published.

Are these points an advantage or a disadvantage for the PDU?

I think they are advantages. The PDU is directly linked to all the other spatial and urban planning documents and can therefore not contradict the lines of these documents. The one thing I would say that is a disadvantage of the PDU is that it takes very long time to finish the whole process, as there are so many stages and stakeholders involved it can take up to 5 years to complete a PDU. I think the fact that the PDU is obligatory is also sometimes a disadvantage as it is done halfhearted and is seen as an alibi document at the end that doesn't fulfill its purpose. This happens very often in fact.

Do you think it is necessary for smaller regions to also do a PDU?

I think in this context there isn't a too small or too big. I think the only thig that is important regarding the size of a region is the adaptation of the action plan to it. The measures have to be adapted to the scale and to the density of the region in which they are planned. I think it is very important to only include measures in your mobility plan that you can actually realize.

Does it make sense in your opinion that Sanem plans a mobility plan on their own without working with the neighboring regions/municipalities of the national level?

To be honest, no I don't think that it makes much sense. I think a SUMP including the whole southern region of Luxembourg, also including the border region of France would make sense. Like from Petange, Rodange to Dudelange. This would make sense in my opinion, because here you are in a coherent territory with comparable mobility situations and all lying in the catchment area of Luxembourg City. I think such a superordinate plan only make sense in the region. If you are going down to the level of the municipality more concrete plans make sense like a cycling plan, a parking management plan, etc.

I think that, due to the fact that very few people have Sanem as a destination, either to work or in their free time.

I think it is clear that it makes much more sense to plan a SUMP in the whole region of the south, in the same time however it is much more difficult in the planning process as a lot more actors are included into the planning process. Here you have different political orientations and different willingness to act which complicates the process enormously.

What are the differences planning for a urban region in comparison to a rural/peri-urban region?

I think the biggest and most relevant difference is the dependency on the car which is constantly present in peri-urban regions. Honestly, in my opinion, the exile of the car in a very dense urban area is for me today completely possible and reasonable. However, in a peri-urban or rural territory there is still a strong reliance on the car. The classic alternatives to the motorized individual car traffic, like for example the soft modes (walking, cycling) or the public transport can't be adapted at all the needs the people have to exclude their car. There is always a strong link in not so densely populated areas between the spatial planning and the mobility offer. It is very import here to try to manage car traffic and to vary between different, newer alternatives to reduce car traffic. This consists in using and seeing the car in different ways, for example car sharing and carpooling make a lot of sense and are promising measures for peri-urban regions. For me this is the main difference in the planning process from an urban to a peri-urban region.

What are the advantages and disadvantages of a participatory approach in planning?

I think it is always a positive addition to include the population into the planning process. But if it isn't done right it can also be a constraint. It is important to recognize the people as experts of the territory but also filter the information they give. Out of experience I can also say that the global interest never equals to the personal interest. In a participatory approach people express their personal interests. The hard work afterwards is to recognize that a certain number of people have the same personal interest and therefore you could derive from this a public interest.

Politicians often realize then that the participatory approach can turn against them, they recognize personal interest of the people and their own and they forget the collective interests of the population. I think these participatory approaches aren't to underestimate and have to be prepared very well. In today's time where we are shifting from an infrastructural way of planning to a more conceptual way of planning it becomes more and more important to include the population and to recognize the social aspects in planning. I think the population to gets more and more conscious about the fact that there aren't unlimited resources and that we have to change their habits to improve the mobility situation in general. Everybody has a re-

sponsibility on how mobility is evaluating in the future, if it is to the better or worse. We always saw mobility as a right. So we have the right to be mobile and we have to be offered a maximum of possibilities to do so and in the end it is me that takes a decision in how I wish to move from one point to the other. I think for the future it is important that this perception changes from mobility being a right to mobility being a duty, a responsibility, meaning we are responsible for the choices we make and what consequences they have in retrospect. Therefore, we should try to take the most sustainable decision regarding our movements.

When we are talking sustainability, I think the majority of the population has no idea what sustainable mobility means, or they don't want to know. in fact on a daily basis we make rather egoistic choices regarding our mobility than we make sustainable ones.

These mobility plans are a tool to make people take more responsibility regarding their mobility and clarifying that there are alternatives.

Do you think Luxembourg needs a stricter regulation regarding **mobility planning (e.g. France and the PDU)?**

I don't think that it is necessary to define a regulation regarding mobility planning in Luxembourg. At the scale of the size of Luxembourg it is necessary that there are guidelines on the national level regarding mobility planning. This has to set a clear structure for the rest of the country on a regional or communal level. I think it would be helpful to maybe force some regions to do mobility strategies on a regular basis. Today people have trouble to reach bus or train stations, there are constant traffic jams, and this in the entire country, even spreading over the land's borders. so the necessity for a top-down approach regarding a nationwide mobility strategy is definitely given. I think there is a too big responsibility to let the municipalities do what they want.

Interview Adrien Stolwijk

What are the biggest, greatest challenges of today's mobility? In Europe and in Luxembourg?

That's very difficult to say. Everybody is talking from the traffic jams and immobility on the roads. is this really the biggest problem of today's mobility? I don't know. I think the biggest problem we have today is that we can fulfill the mobility demand of the people with any transport mode; it is complicated and very exhausting. It is a struggle to find a way to get to work in the morning, same in the evening to get home. I think we have some catching up to do in terms of offering more connections to meet the mobility demand of today's population.

There are a lot of project in the pipeline at the moment that should fulfill this goal. Political decisions have to be taken and there has to be the courage to realize more risky and controversial projects. I think the most planners today steer away from building new infrastructure and only try to solve problems with a new concept. But sometimes this isn't sufficient and it needs new infrastructure. It isn't always very sustainable but if you want to reach your mobility goals it is inevitable to do both.

And then there are the new mobility forms, where nobody really knows yet in what direction we are steering in, so there is a big question mark regarding the development of future mobility planning. Are we on the right path or do we realize in a few years that there is another better way, how knows.

I think it is also very important, for Luxembourg and its flourishing economy that businesses who want to settle in Luxembourg have to do a mobility plan before they are coming to our country. At the moment, the entire traffic in Luxembourg is generated from working traffic, rush hours are induced by the employees etc. The most businesses don't care at all about that, because they don't have to care. They should be forced to plan the mobility of their employees ahead in advance so that more sustainable, ecological and cheap choices than the car can be taken by the employees. I think there is a big potential in improving the traffic situation and solving problems before they occur on the streets.

Why is it important to plan mobility ahead?

I think today's technology makes it possible to know how, why and when people are moving and, on that basis, we can work out mobility plans. It is important to keep in mind that it is very important to predict mobility, if it is for tomorrow, in a week or in several years. I think we know where the weaknesses lie and then invest in projects and infrastructure.

If you look at some examples in Luxembourg where some old projects never have been realized, and are at the moment revised and updated it becomes clear that, if they had been realized, we now would be forced to rebuild some of them because the predictions were wrong. It is difficult to know if the infrastructure you are building is enough, or too much, or whatever for the future.

What is your definition of sustainability?

That's a difficult question because in my opinion is everybody misusing the term of sustainability. I think it is if you are planning with the environment and the human in mind. The impact on the environment should be a factor that is included into the planning process. I don't un-

derstand when projects can't be realized because there are some tiny minor effects on the environment that are taken completely out of context, so to say abused to throw over a project that isn't wanted by some institutions. I think the human should be in the first place, and if a project has to be realized so that the human profits from it, and the benefits are much higher than the risks there shouldn't be a discussion. In that sense the term and the power of sustainability is abused. The situation should always be put into a reasonable perspective where every aspect is analyzed and weighted.

What is your knowledge on sustainable urban mobility plans?

For me a SUMP is a mobility plan, worked out in collaboration with the politicians, the population and the experts. It is a tool that forces the stakeholders of a municipality once to look further than the 5 years of their legislation period. It is again a prognosis into the future but however very interesting to work on innovation and innovation projects. In day to day life we are stuck in realizing "normal" projects and in some way don't have the time left to let the imagination run freely. A SUMP allows the planner to integrate things that don't have to be 100% realistic or 100% feasible. They can ask themselves how they see the ideal image of a city or municipality. For me the SUMP is in some way a guideline, a suggestion of a direction in which the city is steering, in the beginning with a diagnosis of the current situation where they can show what they've already done, be proud or realize what's missing, and on that basis, which the guidelines in mind work out an action plan. It is a tool to expand the horizon of the population, the politicians and also the planning bureaus.

Where do you see the difference between a SUMP and a conventional mobility concept?

Well a SUMP is not a feasibility plan; I don't have to plan it with regard of it having to be realized in a certain number of years. I can plan freely without a time limit and a budget. For example, being car free, this isn't realistic for the city of Sanem but it can be a direction a wish the municipality is striving for.

What were you think when Sanem approached you on collaborating on the first SUMP in Luxembourg?

I'm very happy to be part of a first-time project in Luxembourg. It's a chance for us to be part of their SUMP, and I think there will be a lot of municipalities following the example of Sanem in realizing a SUMP. I think it very impressive that the municipality approached us to do this plan, in fact it should be our job to come up with new innovative planning methods and tools, but in this specific example it shows us that the municipalities also want to be innovative and

on the latest trends regarding mobility. On the European level we aren't up to date, we should have much more knowledge what's happening on a European basis regarding mobility.

Do you think Luxembourg needs a stricter regulation regarding mobility planning (e.g. France and the PDU)?

I don't know. There are some municipalities who do a lot regarding mobility planning, there are others who don't need to, or it doesn't make a lot of sense for them (regarding size or location). I think the fact of making mobility planning obligatory won't motivate the planners of the municipalities more, on contrary if you force them it will become a pro forma act that will be done half-hearted and will in retrospect never be looked at again. It depends on the monetary support they are getting, maybe that's a motivation to do it.

On the other hand, it would be a tool to force municipalities with an important geographic location but don't have any visions regard mobility, it would be a great tool to force them to act in favor of improving their mobility situation.

But in that case the ministry already has an eye on these regions, and has a concept of approaching them, with financial support, without it being obligatory. That's one of the benefits of Luxembourg being such a small country.

So unofficially there is already a national tracking on mobility planning of the communal level. If it is now necessary to do more, I don't know.

At the moment the municipalities have the freedom to plan how they want to plan, because there is no regulation in place, so if the ministry is approaching them on doing a mobility plan, and they are willing to do one, but not under the terms and conditions of the ministry they are free to do so. In some ways this is a benefit, in others a disadvantage of the municipal autonomy.

On a higher, regional level the ministry should have a say in planning and should guide the region but on a municipal level I think it is unnecessary to interfere.

Don't you think it would make more sense to plan a SUMP on a higher level than on the municipal level? Especially here in Luxembourg?

I understand why you are asking this. I think it is necessary because the municipality is motivated and thinks about their own visions for their future and the internal mobility. I think this is a freedom nobody can take you. Ideally the neighboring municipality also does a SUMP and

finds out that their action plan and the one of the neighbors are very similar. It is a coordination act between different stakeholder who is not easy but also not impossible in my opinion.

If they have the same opinion and visions or if they have completely different visions, in both cases it is absolutely necessary to communicate and if this communication is created out of two separate SUMPs so be it. I think everybody should have the freedom to set their own goals without having to consult anybody else.

I think that if it is planned in a bigger scale it can quickly become impersonal and distant to the municipality where it can recognize itself anymore, find their ideas.

A document like the SUMP will show indifferences and different approaches to problems and therefore sets the basis on where to start on the best coherent solution for the intercommunal region.

Where lay the differences in the planning process of Luxembourg in comparison to other European countries?

I think the biggest difference lies within the possibility and the means of realizing projects, especially on the financial basis.

"→ autonomie communale → schrott entsteht → gett op deenen falschen platzen geplangt"

What are the differences of planning for a big urban city than for a smaller rural area?

Yes, for sure there is a big difference in the planning process from an urban to a rural region. In fact, I always say that Luxembourg is nothing other than a big village compared to its neighboring countries. Luxembourg City isn't a real city; in Germany it wouldn't even be called a city. If you put it into perspective it becomes really small.

Luxembourg is really dependent of a car because of the low density. It is also a pity that there is so much daily transit traffic coming from the neighboring countries.

For us it is impossible to get a good schedule for the public transport where you don't have to care about when the next train is coming because the density doesn't allow it. There is a conflict with alternative transport modes than the ones already existing in Luxembourg. It is very expensive (e.g. on demand PT). It isn't only a question of infrastructure or how to schedule and structure a public transport network that assures a good functioning in a rural area but there are so many more things contributing to it. It is much more difficult, nearly impossible to exclude the car. In rural areas the car is a good option for PT, in forms of car-pooling and

car-sharing or in some form of multimodal part of their way. These tools show people that the private car is not the best option but rather sharing the car → mobility as a service.

What are the advantages and disadvantages of a participatory approach in planning?

I only see positive things if it is done right.

The politicians slowly open up to it. And you always get good input during workshop when you are talking to the population. Because they are the experts of the region and they surely know the territory better than us. But the discussion has to be structured. They can't get the impression that this is the way to demand everything from the politicians and put them under pressure if they don't get what they want.

The population should have the chance t express their opinion and dissatisfaction with different situations but in a controlled structured way.

But if it is done right it is an extremely helpful tool for us… Also for the acceptance of a project.

Interview François Houot

Pourrez-vous me faire un petit résumé de votre carrière professionnelle et de vos responsabilités/ votre domaine d'activités chez la communauté de communes du Bassin de Pompey.

Etant en charge de la Direction Infrastructures et Déplacements, j'assure la supervision des services gérant la voirie et les transports sur le territoire de la Communauté de Communes.

Céline PETIT a en charge la gestion du réseau de transport et m'appuie dans les dossiers relevant de la politique de mobilité du Bassin de Pompey.

Quels sont les plus grands défis de la mobilité d'aujourd'hui à votre avis? (en Europe, en France, au Luxembourg?)

Les besoins de mobilité sont en constante progression et le défi est d'y répondre sans saturer nos réseaux d'infrastructures existants pour permettre d'assurer la fluidité des échanges. La création d'infrastructures nouvelles est rendu complexe par le développement urbain de nos régions et pas toujours acceptée au regard des enjeux écologiques. Le trafic local représente souvent une grande part des congestions de nos villes, toutefois il ne faut pas négliger le trafic de transit qui a explosé depuis l'ouverture des barrières douanières et qui continue à croître.

Quelle est votre définition de durabilité?

La durabilité c'est l'inscription dans le temps tout en respectant l'environnement, c'est le fait de pouvoir proposer des solutions de mobilités qui pourront perdurer et se renouveler sans utiliser de ressources non renouvelables, des solutions de mobilités respectueuses de l'environnement.

Quelles sont vos connaissances sur le SUMP (sustainable urban mobility plan)?

Pas vraiment de connaissance, vous êtes la première à me l'évoquer.

Quelles sont les différences fondamentales des principes SUMP et PDU?

Je ne saurais pas répondre compte tenu de ma méconnaissance des SUMP.

Pourquoi est-il nécessaire de faire des plans de mobilité urbains sur le niveau communale/régionale à votre avis?

Il est nécessaire de faire des plans de mobilités sur des niveaux supra communaux pour tenir compte de la réalité des déplacements qui s'affranchit des limites administrative. L'organisation urbaine ne se fait pas forcément à l'échelle d'une ville administrative et il faut considérer les bassins de mobilités pour être au plus près des réalités de déplacements.

Quels sont les avantages et désavantages du principe PDU en France/ de votre PDU?

Le plan de déplacements urbains permet d'assurer une cohérence dans la politique de mobilité d'une collectivité. Il est d'autant plus pertinent si la collectivité maîtrise l'ensemble des compétences en matière de déplacements : aménagement des voiries, gestion des réseaux de transports, création d'infrastructures.

Est-ce que c'est important/nécessaire pour des petites communes/régions périurbaines de faire leur propre PDU?

Il est important de le porter si les enjeux en matière de circulation automobile et de qualité de l'air sont majeurs. La plupart des PDU visent à réduire la place de la voiture et à favoriser les mobilités partagées et propres. Le Bassin de Pompey est situé en proche banlieue de Nancy et rencontre les problématiques des zones urbaines en périphérie des agglomérations.

Est-ce que c'est un avantage d'avoir un cadre réglementé pour les plans de mobilité (comme en France) ou serait-il favorable d'être libre dans l'élaboration d'un plan de mobilité urbain?

Le cadre permet une exhaustivité des thématiques abordées et garantit une cohérence entre les PDU de territoires contigus. Le cadre n'est pas un frein à l'élaboration de propositions multiples.

Quels sont les avantages et désavantages d'élaborer des PDU dans les régions/ EPCI (communautés de communes) à la place du principe du SUMP où chaque ville/commune met en place sa propre politique?

Comme évoqué précédemment, les mobilités du quotidien s'organisent dans un périmètre qui dépasse les limites communales. Dans certains cas, l'échelle est même plus large qu'un EPCI et peut atteindre une aire urbaine (au sens de l'INSEE) voire même une grande partie d'un département. Le PDU a l'avantage de dépasser les limites communales, ne permettant pas de gérer la majeure partie des déplacements, mais dans certains cas, il peut également être contraint par les limites administratives d'une EPCI qui doit gérer de nombreux déplacements avec les territoires voisins.

Quelles sont les différentes approches de conception pour une région urbaine en comparaison avec une région périurbaine/rurale?

La différence porte principalement sur l'effet de masse permettant la mise en place d'un transport collectif performant. Les zones rurales, de plus faible densité, nécessitent de trouver des solutions de mobilités plus souples, pouvant s'adapter à des faibles utilisations. De plus, les distances sont parfois plus longues à couvrir et ne permettent pas toujours un report vers les modes actifs (marche, vélo).

Quels sont, à votre avis, les avantages d'une approche participative de la population dans le procès du PDU?

L'approche participative permet de faire adhérer au projet. La mobilité est l'affaire de tous et les évolutions de comportement nécessitent de bousculer les habitudes. Les usagers/citoyens seront d'autant plus à même d'aller vers le transport collectif et la mobilité partagée s'ils ont participé à l'élaboration des actions du PDU et partagé les enjeux en matière d'environnement et de réduction de la place de la voiture sur l'espace public.

Declaration concerning the Master's Thesis / Bachelor's Thesis

I hereby confirm that the presented thesis work has been done independently and using only the sources and resources as are listed. This thesis has not previously been submitted elsewhere for purposes of assessment.

Munich, March 24th, 2019

Liza Bertinelli