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Sustainable Mobility at station hubs: lessons from Breukelen and Driebergen-Zeist

A comparative case study on the integration of sustainable mobility at the station hubs of Breukelen and Driebergen-Zeist

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Abstract

The increasing pressure on the environment and on the current mobility infrastructure are both pressing Dutch policy makers. This research is analyzing the integration of sustainable mobility in train station hubs. Through the use of the Policy Arrangement Approach the relevant policies can be applied. This approach has been combined with another theory (Strategic Mobility Measures) that makes both theories usable for mobility measures. However, integrating sustainable mobility isn't that easy and not everywhere applied in the same amount. Not all train stations have the same amount of integration of transportation modes and focus on one mode in particular (vehicles, public transport or active mobility).

In this research a comparison is made of the stations of Breukelen and Driebergen-Zeist. Breukelen has a car-centered mentality and is focussed on improving facilities for the car. Driebergen-Zeist, on the other hand, has recently been redeveloped and has shown a diversification of mobility options. The aim of this research is to describe the differences between the cases and how they have resulted in a different view of focus and necessities in and around the station.

Keywords: Sustainable mobility (integration); hub design; station (re)development; transport governance; policy arrangement approach; strategic mobility measures

Preface

During my bachelor degree Spatial Planning my first interest was sparked for mobility topics. By working on different projects during my courses there, I learned that it might be something I can see myself do in the future. With that in mind I found out about a master that was focussed on mobility: Urban and Regional Mobility at the Radboud University. In my first half year of following and completing courses it became more clear to me that this subject has sparked my interest. However, it is still a broad subject. I knew that, but I didn't know what would be my specific interests to research for my thesis. In the beginning of my master thesis I only knew that I wanted to research something with mobility. It is a broad subject and not yet sufficient to become a master thesis. With the help of my supervisor we narrowed mobility down to a station related subject. I wanted to do my research on a topic that was nearby to have some background information. The station of Driebergen-Zeist was the station I saw every day, traveling to my bachelor (UvA) and master (Radboud) university. It was a starting point for my research. From there on I was looking for a comparable case to Driebergen-Zeist with the same physical location close to a bigger city (Utrecht). I knew Breukelen station, but not as a regular visitor. It became clear to me that this station would be the best for a comparison with Driebergen-Zeist, which I will explain in my research. The best way to compare these stations was on their orientation. From there on it became my object of research for half a year until completion.

Furthermore, I would like to thank my supervisor at the Radboud University, Sietske Veenman. All our meetings were very valuable for my process of writing this thesis. Especially in the beginning when I was still struggling to find a topic for my master thesis, you were very helpful. At the beginning you would help me with narrowing my topic down to a concrete researchable subject. Additionally, I would also like to thank my respondents for taking their time to help me with my questions. I couldn't have done this thesis without your help. It also helped that I could ask follow-up questions in case something wasn't clear.

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1. Introduction

In the first chapter an introduction will be given on the focus and cases of this research. The second part of this chapter will state why there is a problem to be found in the field. The research aim will elaborate on what the purpose of this research is. In that part of the chapter the research questions will be connected with the purpose of this research. This chapter concludes with both a scientific and societal relevance. It will explain to what extent this paper challenges or expands the current knowledge on this topic. The relevance for the society and policy makers will also be explained.

1.1 Introduction of Breukelen and Driebergen-Zeist

In recent years, public transport has emerged as a promising alternative to private motorized vehicles, offering a cleaner and more sustainable option for urban mobility. The integration of sustainable transportation modes, including public transport, cycling and walking, has become increasingly important, particularly in connecting train station hubs with the surrounding areas. This integration aims to ensure accessibility for all individuals while promoting environmentally friendly modes of travel (Yang, 2021). By enhancing the accessibility of these hubs, it is believed that usage will increase, leading to a modal shift towards more sustainable transportation options. Figure 1 shows the location of the stations within the province of Utrecht. The stations serve both as an entry point towards Utrecht, but also towards either Amsterdam and Rotterdam (Breukelen station) or Arnhem and Nijmegen (Driebergen-Zeist station). Even though both stations are a node for the surroundings, the developments are different from each other.

The station area of Breukelen is expanding with another park and ride facility next to the station in february 2024 (Provincie Utrecht, 2024). The reasoning for another facility for private vehicles is that Breukelen station as a node is marked mainly as a P+R facility. Building more parking facilities is, just as the redevelopment of Driebergen-Zeist, beneficial for the amount of train users. As a village between two of the biggest cities in the Netherlands (Amsterdam and Utrecht) it has possibilities for train users to live around Breukelen and work in the bigger cities. Here it differs from Driebergen-Zeist, which is more focussed on arriving by bike or bus instead of car. Breukelen has marked car users as their priority target to attract to the station. In 2023 a survey was sent out to the people in the surroundings of the station to participate and give input for new improvements. The goal is to make the station area more liveable and make it more climate proof. The results of this survey are yet to be shared (Van Schie, 2023).

On the other hand, the station of Driebergen-Zeist was completely renovated in 2020. At different governmental levels authorities agreed that this old station was a disaster and couldn't facilitate the area anymore. Its purpose as a station between two peri-urban cities is different from train stations located within the city. People who wanted to cross the street and the railway line would have to wait approximately 20 minutes before they could continue their journey. This was for both the municipalities, provincial level, the ministry of Infrastructure, water management and other organizations the reason to develop a new train station (ProRail, n.d.). This bottleneck station wasn't good at facilitating the bike, car or public transport. In 2020 the new project was finished and due to making a separate bike lane and lowering the road for cars, both these transportation options profited from this station renewal. The redevelopment of the station has benefits for all the users on the road. The accessibility for other road users also increased and the connection with the station hub improved.

There are no accurate results yet of the influence of this redevelopment, because it was finished during the covid-19 pandemic. The pandemic influenced travel behavior, since less people used public transport (Campisi et al., 2020).

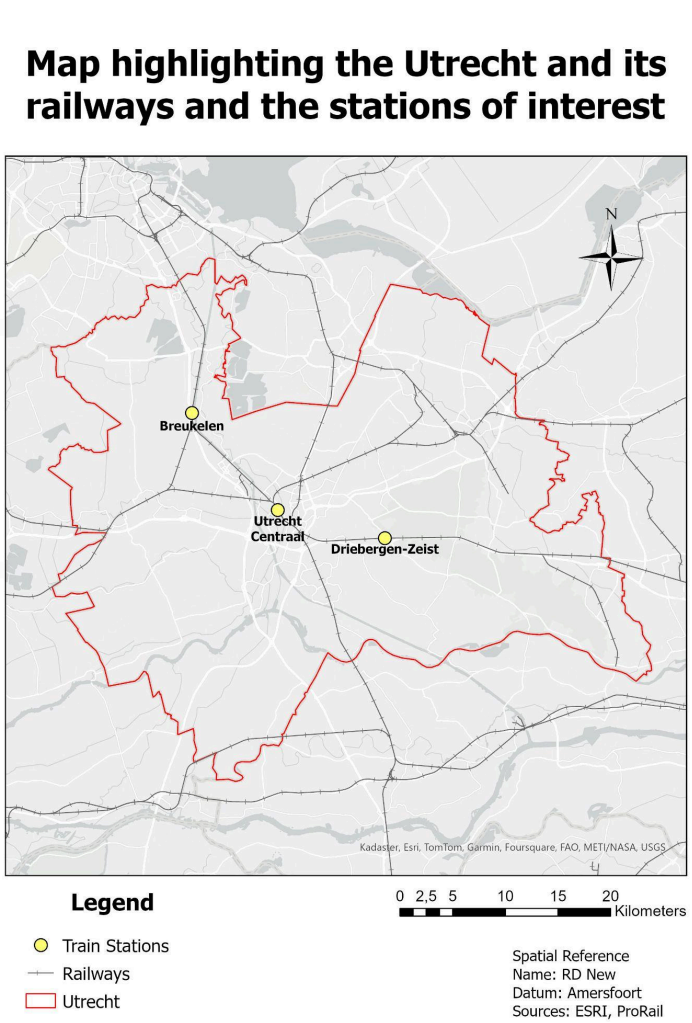

Figure 1: The geographical locations of Breukelen and Driebergen-Zeist (own work)

1.2 Research problem statement

The emergence of public transport as an alternative mode of transportation has led to an increase in train users. This increase is mostly visible in the big cities within the Randstad area. The Randstad is seen as the most important area in the Netherlands with a lot of financial activities (Priemus, 1994). Hirschhorn & Veeneman (2021) state that in the Netherlands efficiency is the main objective of transport governance. This correlates with the place of most of the investments. These investments should encourage people to use the train as their main mode of transportation. However, this research isn't looking at the train as a mode of interest. It looks at the mode that people use before or after their train travel. Using the train instead of personal motorized vehicles is already a step towards a more sustainable future, but this research wants to take it one step further. A lot of station hubs are still designed to have a lot of parking spaces, so people can use the car to get to their closest station to take

the train. The case of Driebergen-Zeist has shown that a new pathway can also be very successful. The redevelopment of this station area has put more focus on sustainable mobility (buses and bikes) to reach the station hub, while also providing space for personal motorized vehicles. As stated before, Breukelen is still serving car interest and neglecting the other modes of transportation. This pathway isn't a radical change towards a more sustainable future wherein sustainable mobility is taking the lead in transportation. There isn't a single approach that works in every case in the Netherlands. However, there are cases that are seen as more resilient and will still be effective in the future. This research will compare two cases that have adopted a different pathway. The research focus will, therefore, be on the differences between the two stations and how they have developed to their current state of sustainable mobility integration.

1.3 Research aim and research questions

The aim of this research is to understand the different outcomes in redevelopment of the station areas of Breukelen and Driebergen-Zeist. A different outcome will have results that impact their service area and possible mobility options. To make a change towards a less car oriented future, the following research question has been used:

How does the interaction of the five dimensions of transport governance and the physical environment influence sustainable mobility integration at the stations of Breukelen and Driebergen-Zeist?

To answer the research question four sub questions have been formulated. At first, both cases will be analyzed to what extent they have integrated sustainable mobility in their developments. This is done by using transport governance and how it affects this integration. Then the transport governance will be compared between Breukelen and Driebergen-Zeist. At last, there will be a focus on the external factor of the physical environment and the context-dependent factors of both cases. These sub-questions will be answered in the results and the conclusion will use this to answer the main research question.

1. *How do the five dimensions of transport governance influence the extent of sustainable mobility integration at Breukelen station?*
2. *How do the five dimensions of transport governance influence the extent of sustainable mobility integration at Driebergen-Zeist station?*
3. *How does the transport governance differ between Breukelen and Driebergen-Zeist?*
4. *What is the influence of the physical environment on the integration of sustainable mobility at the stations of Breukelen and Driebergen-Zeist?*

1.4 Scientific relevance

The integration of sustainable transportation (public transport, cycling and walking) is important to connect the station hub with the surrounding area, so everyone is connected and able to use this hub (Yang, 2021). A modal shift towards more sustainable transportation modes isn't a new subject for researchers. Looking at the benefits of car use on scientific search engines will show only articles that discourage the use of cars and promote more sustainable (and active) mobility. The number of articles that are promoting the shift towards sustainable mobility expose how much of a priority this topic has been for the last decade (Gallo & Marinelli, 2020; Enbel-Yan & Leonard, 2012; Banister, 2008).

Research has been done on the improvement of train station hubs and how to make it as attractive as possible for people to use (Laconte, 2004; Kočárková et al., 2019). Increasing attractiveness of train station hubs is supposed to result in more usage of these hubs. However, the research gap shows that there is a lack of research on train stations integration with sustainable transportation in the Netherlands, especially in peri-urban cities. Living in the city is getting more and more expensive, without a lot of space (Nijskens & Lohuis, 2019). It makes the peri-urban cities more attractive, as they are close to a big city with a lot of transport options (Woltjer, 2014). To accommodate this growth the current transportation options must also be improved, especially public transport and active mobility. This research helps by informing how to cope with this growth with more sustainable mobility. The Netherlands lacks similar research on sustainable transportation integration at station hubs. Therefore, research is necessary on the integration of sustainable mobility and train stations in the Netherlands. Sustainability is, however, a broad concept that can be used in different fields to create a modal shift with innovative methods that are better for the environment (Vos, 2007). This broadness can be overwhelming and a lot can be a part of this overarching concept. However, all the different fields and methods try to contribute to a better future that is more climate resilient.

By bridging the research gap, this research tries to contribute by giving more information on the small steps that can be taken. It hopes to add to the existing literature that is already done on sustainable mobility by expanding it towards integration of sustainable modes (Yuan et al., 2018; Gallo & Marinelli, 2020). An addition to this is the public image of the Netherlands and how they want to radiate their sustainable development. A lot of studies have been conducted on sustainable mobility topics (Kemp & Roitmans, 2004; van der Hoeven, 2017; Farla et al., 2010). These studies agree on the fact that sustainability needs more importance in the policies. One of the policy elements where sustainability is receiving increased attention are the mobility policies (Liu & Dijk, 2022). New inventions ensure that different sustainable mobility options are possible, especially regarding station areas. This research will conduct a comparative case study between two train stations with contrasting priorities in sustainable mobility and car-centric design. One station prioritizes sustainable mobility modes, placing them ahead of car-centric infrastructure, while the other station prioritizes the convenience of car usage over sustainable modes of transportation. This study will delve into the underlying reasons and decision-making processes that led to these diverse priorities. Damidavičius et al. (2020) state that it is vital to understand the factors that influence these priorities. It is crucial for gaining insights in the complex dynamics of sustainable mobility.

1.5 Societal relevance

The integration of sustainable mobility options at train stations is relevant for policy makers at the municipal level. Not only the mobility sector of the municipality is necessary as the course of action is decided by the council. Their actions and plans will result in changes in the built environment that can influence the travel behavior of people. One of the ambitions of the province of Utrecht (2019) is to create a seamlessly integrated network at hubs. However, they mention that there is a priority for both bike storages and P+R facilities. It isn’t mentioned that there should be more priority for sustainable transportation than private motorized vehicles (Provincie Utrecht, 2019). The European Union (2010) released a report in which they stated what the best practices are for train stations. In collaboration with railway authorities from all over Europe a lot of different best practices were explained, but the concepts ‘sustainable’ and ‘mobility’ weren’t mentioned once. If a supra-national organization as the European Union doesn't even pay attention to more integration of sustainable mobility with the station

hubs in their area, others might also ignore it. However, a lot of research has been done to make train stations safer and more pleasant and easy to use for travelers (International Union of Railways, 2019; Giesler, 2019).

Advocating people to use more sustainable mobility is a task for every municipality. One step further is the use of sustainable mobility to get to the station. The bus and bike can replace the car for the first and last mile of daily trips (Stam et al, 2021). People in the Netherlands and especially in the province of Utrecht are using the car often, which will be a vicious cycle where the car is increasingly more prominent as a mode of transportation (Zijlstra et al., 2022; Staat van Utrecht, n.d.). The car has a prominent place as a mode of transportation from A to B, but also as a way to get to the train station. By improving alternatives for the car, people might see that as a new opportunity (Gallo & Marinelli, 2020). Especially, peri-urban cities with good car and public transport connections can find use in this research. The urban cities are already removing cars from the inner cities and the smaller cities have insufficient public transport networks to make it a competitor for the car (Gonçalves et al., 2017).

The improvements that have to be done to make public transport and cycling better alternatives for private vehicles are done by policy makers. Therefore, the main societal relevance of this research is for the policy makers in peri-urban areas. Understanding how different approaches will lead to different results and what the effects of those outcomes are, are relevant for policy makers to give them valuable insights. It can help to evaluate existing policies for both cases that might work, which can then be implemented in various other contexts. The knowledge from Breukelen and Driebergen-Zeist can be a source of information. This knowledge can be used by policy makers in the mobility sector. The policy makers that are interested in this research can use it to extract information and use it to formulate goals or policies that will serve the preferred course of action.

2. Literature review

In this chapter the concepts of transport governance, sustainable mobility and physical environment will be explained first. These concepts are the basis of the conceptual model that will be clarified later in this chapter. Transport governance and sustainable mobility consist of different subconcepts to clarify these concepts. After the concepts are explained, a theoretical framework will be analyzed and adapted to make it applicable for this research. This applicability is done by operationalizing the variables in the conceptual framework.

2.1 Transport governance

All the different projects on infrastructure for transportation require a set of binding rules and a form of how policies are formed. This form of governance is called ‘transport governance’. Transport governance involves coordination and collaboration among governmental bodies, private sector entities, community representatives and other actors to address the complex challenges associated with transportation systems. It includes aspects such as policy development, infrastructure planning, regulatory frameworks, funding mechanisms and public engagement (Rodrigue et al., 2020). Effective governance in the transport sector has advantages, like confidence, low capital costs and stability (Kennedy et al., 2005). Transport projects are often big projects that affect the daily life of many people. There is a bond of trust necessary to keep the investors satisfied (Rodrigue et al., 2020). Rye et al. (2018) researched the governance of public transport in western European countries and concluded that this type of governance is still not effective. In western countries, there are two main objectives for public transport: increasing the amount of public transport and the spatial availability of public transport (Walker, 2008). Limited budgets result in a choice for policy makers. If one of those objectives is promoted, the other will get neglected. However, Hirschhorn and Veeneman (2021) state that only efficiency is an objective within public transport governance. There isn’t enough budget for public transport to both increase efficiency and accessibility. Transport governance, in this research, is measured with five elements based on the frameworks of Van Tatenhove et al. (2000) and Campisi et al. (2020). The frameworks will be the basis for this research and these elements are discourses, actors, rules of the game, resources and the social environment.

2.1.1 Discourse

A discourse is the totality of expressions, opinions and discussions on a topic that results in a meaning of a certain phenomenon. Therefore, the discourse dimension is explained within three relating indicators. These indicators are problem definitions, the belief systems and the approaches. The problem definition states that a clear problem must be recognised by all the actors. A shared definition of the problem can create a coordinated approach to the problem (Leroy & Arts, 2006). The background of the actors aren’t the same and they might have different ideologies and beliefs adopted and integrated in their way of life. These background differences will see the problem in different ways, but might also see differences in the approaches to tackle the problem. The road that leads from the problem to the solution is stated as an important task to solve for the actors (Wiering & Arts, 2006; Leroy & Arts, 2006).

2.1.2 Actors

To understand the changes within policies, the actors involved are important to define. The actor dimension has two components through which it can be analyzed: actor constellations and interaction patterns (Wiering & Arts, 2006). The first perspective indicates the actors that are relevant as stakeholders for the chosen case. Good boundaries are necessary to provide only the relevant stakeholders within the constellation. The second perspective looks at the interaction between the actors. The interaction of the actors can vary and might result in collaboration or opposing views, which correlates with the last perspective. The policies and its changes might be beneficial for multiple groups, where a common goal lies. This can create a coalition between groups to cooperate and work towards the same goal. The same applies to groups that have opposing views and might find themselves as an opposition towards the goals of others (Wiering & Arts, 2006; Leroy & Arts 2006; Liefferink, 2006).

2.1.3 Resources

In the resources dimension, Van Tatenhove et al. (2000) introduce a perspective of resource constellations. This constellation includes all the knowledge, authority and other financial resources that can be used by the actors to influence the outcome. The use of technology and knowledge is essential for new implementations (Nilsson & Persson, 2003). Relevant experts will aid the project and exert influence, which can lead to an imbalance between the different actors. The difference of resources between the actors is explained in their financial capacity and their sufficiency to achieve established goals. The imbalance between the actors can occur at different dimensions of resources. The result will be a power difference between the actors, where some actors can take a leadership role during the process. A lack of leadership can result in a lack of discipline and less coordination within the process (Persson, 2004).

2.1.4 Rules of the game

Rules of the game is a combination of the regulation and legislation of the case. Well-designed regulations allow for adaptability and flexibility in response to changing circumstances or emergencies. Current trends, routines and attitudes towards problems can be turned into laws and regulations. Varying outcomes can give indications on how the policy arrangements are able to change the rules of the game. It is a broad concept, which includes the formal and informal rules that are present for the actors. It also refers to the role of the governmental bodies and how they view certain topics (Liefferink, 2006; Wiering & Arts, 2006).

2.1.5 Social environment

The acceptance of the community of new implementations and ideas is crucial for the outcome of projects. As end-users of the projects the needs of the people are providing insights in how to make the projects work. A behavioral change requires incentives and advocates to promote the new ideas. The government has a role to innovate and promote alternatives for the existing possibilities (Borins, 2014). Loo and Tsoi (2018) explain that a lifestyle transformation is an important element for more sustainable mobility. This lifestyle transformation is summarized in educating people on the concept of sustainability, active mobility and the benefits that come with this. Being more sustainable is

essential for a society and also for individuals. Active mobility, such as cycling and walking, have benefits for one's health and can be a form of exercise.

2.2 Sustainable mobility

The interconnected elements of transport governance influence the extent of sustainable mobility at a station hub. Sustainable mobility is seen as a partial solution to help the environment (Council of the European Union, 2006). According to this council, sustainable mobility aims to meet society's economic, social and environmental needs while minimizing undesirable impacts. This new idea of mobility prioritized greener modes of transportation that produce fewer greenhouse gas emissions. Examples are public transport, cycling and walking (Gallo & Marinelli, 2020). New ideas promote more resilient measures, which take the environment into account as something that must be protected. New transportation systems must integrate the different modes of transportation to increase the overall efficiency and effectiveness of sustainable mobility (Tuskaya, 2009). If a seamless integration of different modes is effectively made, it can compete with the comfort and efficiency of the car. Policies, both encouraging and discouraging for mobility, can further influence the modal shift towards sustainability (Gallo & Marinelli, 2020). The effectiveness of sustainable mobility is very context dependent (Pomykala, 2018). It isn’t an answer for everyone at all times.

Loo and Tsoi (2018) have highlighted five transformations required at different scales and sectors to make sustainable mobility a viable alternative to motorized vehicles (figure 2). The goal to have more sustainable mobility at stations requires changes in four transformations. These transformations include national to individual scales, focusing on city transformation, economic transformation, vehicle transformation, modal-split transformation and lifestyle transformation. The economic transformation will not be addressed in this research, as it drifts away from the research aim. The other four transformations are related to the three goals of Loo and Tsoi (2018). The city and modal-split transformation is related to infrastructure and hub design, the modal-split with the lifestyle transformation belong to the second pillar of public transport and active mobility and lastly the vehicle transformation is part of the improvements of cars. The framework allows for clear distinctions on different scales and different fields. By showing what can or must be done, for all these combinations for a change towards more sustainable mobility, policy makers and even individuals can contribute to this change.

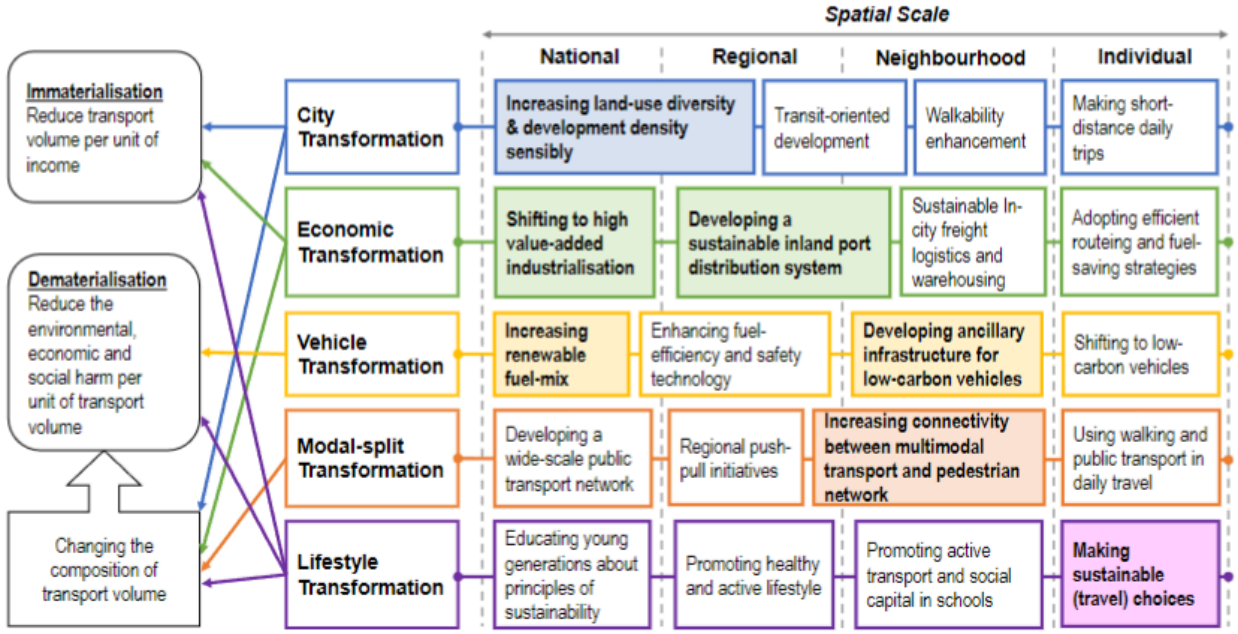

Figure 2: The five transformations (Loo & Tsoi, 2018)

Sustainable mobility at stations is measured by three pillars: infrastructure and hub design, public transport and active mobility and improvements of vehicles (Loo & Tsoi, 2018; Stam et al., 2021; Caroleo et al. 2019; Longo et al., 2018). These pillars are overlapping with the other pillars. They interact not only on their own and changing one of these pillars will result in a change of the other pillars as well. In the end the goal is to reduce the amount of people traveling, the amount of cars used for traveling and how harmful cars are for the environment (Loo & Tsoi, 2018). This is called the Trias Mobilica. A combination of pillar changing will be the most effective way to work on sustainable mobility. All the pillars help the integration of the different types of sustainable mobility.

2.2.1 Infrastructure and hub design

As previously discussed, a hub is the connecting point for multiple transportation modes. It is a central and strategic location designed to serve as a point where people can transfer between different transportation modes (Yang, 2021). The goal of these hubs is to improve the accessibility, convenience and efficiency of transportation. By providing a central point for passengers to transfer between different modes, integration is much more efficient. It has a central bus stop, bike parking and 'kiss & ride' zones, aiming to encourage the use of sustainable and integrated transportation options. However, there is often a park-and-ride facility located next to the station hub as well (Aros-Vera, 2013). The station hub plays a vital role in promoting sustainable mobility and reducing congestion by offering a central point for passengers to connect to different transportation modes (Yang, 2021). However, good integration is necessary between the different modes.

This integration of sustainable mobility is focused on two different elements: organizational design and physical design (Verma & Dhingra, 2006; Hickman et al., 2013). Organizational design is directed at the integration of the different transportation modes with the hub. Planning and coordination on a higher level is necessary to ensure that all the modes are integrated. This mostly plays a role in

integrating the train and bus timetables with each other. So buses arrive and leave around the fixed train times. The efficiency of public transport is enhanced by a good organizational integration, making it more attractive to use. On the other hand, physical design deals with the allocation of physical space to integrate sustainable mobility. This design aspect focuses on facilities that can accommodate sustainable mobility. For example, parking spaces close to the entrance or exit are preferably for electric cars and car-sharing services, ensuring that these are easily accessible. The number and quality of bus stops and bike stalls are also part of this physical design. It can significantly influence the degree of sustainable mobility integration in the transport system (Conticelli et al., 2021). Creating transportation hubs that serve as central points with diverse facilities for different modes is a crucial aspect of sustainable mobility. These hubs are designed to cover a specific area and people must be encouraged to use these hubs (Rijksoverheid, 2023).

2.2.2 Public transport and active mobility

Linked to the first pillar is the use of public transport and active mobility. There are different modes to reach a hub. The first mile that people travel is often the most difficult one to control (Stam et al., 2021). As most of the journey is done by train, the first mile can be any other mode. The infrastructure and hub design mentioned before, allow for these transitions. The combination of these modes is named ‘chain mobility’. Chain-mobility is roughly defined as the journey where different forms of transportation are seamlessly combined to complete a journey from start to finish (Kisgyörgy & Vasvári, 2014). This involves efficiently coordinating various modes of transport, such as bicycles, public transportation, private vehicles and other means, to provide an optimal and sustainable travel experience (Hamersma & de Haas, 2020). This definition is, however, not accepted by other researchers due to the fact that private vehicles are part of the equation. Nello-Deakin and te Brömmelstroet (2021) are strong advocates of removing private vehicles from the daily mobility of people. If private vehicles are still a part of the chain mobility for people it won’t change much. The main issue that is posed, is to get people out of the car and towards more sustainable modes of transportation. Hamersma and de Haas (2020) argue that chain mobility is a promising alternative for private vehicles. It is desired that the biggest part of the chain journey is made by train (Kager et al., 2016; Nello-Deakin and te Brömmelstroet, 2021). By combining different modes of transportation, travelers can choose the fastest and most direct routes, avoiding traffic jams and other delays. It is important that the modes in the chain journey should seamlessly be integrated with each other to create a smooth journey (Hamersma and de Haas, 2020).

Competing with the efficiency and comfort of private vehicles isn’t easy, but integrating modes can make these alternatives more attractive (Tuskaya, 2009; Gallo & Marinelli, 2020). The use of sustainable modes is a personal choice, which can’t be forced by the government. The government can improve facilities and infrastructure, but people have the freedom to choose. Advocating for public transport and active mobility as sustainable and future-proof can influence the decision-making process of people. Also closely related to the need for corresponding infrastructure is the need for sufficient bus lines, which are often passing by. Mixed land-use and high density are key components to be beneficial for these modes. The lack of free space allows very little room for privately owned vehicles and even reduces the need to have a personal vehicle. If all the daily activities are within close range and can be reached easily by bike or bus, the need for privately owned vehicles diminishes (Van & Senior, 2000).

2.2.3 Improvements of vehicles

The car often remains the main mode of transportation for people to travel. The comfort and efficiency that the car offers, is not replaced by the train (Bajracharya, 2016). By improving the car as a sustainable mode the Paris goals can be achieved without banning all the cars. The electrification of vehicles helps to reduce emissions. Electric vehicles are not using fossil fuels and are battery-driven. They do need facilities to charge. The charging points at station hubs positively influence the amount of electric vehicles used to get to the station and the amount of electric vehicles will then positively influence the amount of charging points. This feedback loop of further developments for electric vehicles will increase the use of electric vehicles at stations (Danese et al., 2022). Newer ideas have adopted the idea that car ownership is not really necessary. Shared vehicles are receiving more attention and space in cities and at hubs. The lack of space in cities and more usage of public transport reduces the need for privately owned vehicles. Sometimes people do need a car so they need to have access to one. Shared vehicles allow this group of people to use a car without owning one (Menon et al., 2019). The idea of an electric vehicle and the idea of a shared vehicle are different, but both help sustainable mobility. By improving the vehicles, the use of these vehicles will have less impact on the environment.

2.3 Physical environment

The use of the hub and sustainable mobility is determined by its surroundings, the physical environment. The physical dimension is described by more than differentiating urban and rural areas. It is important as it notes different preferences and offerent mobility options. For example, high density cities often offer additional modes such as a tram or a metro, whereas more rural areas rely on the car and the bus. Other nearby landmarks and hubs are also important for the use of the hub, such as airports and major roads (highways). These landmarks can have an impact on who does and who doesn't use this hub (Campisi et al., 2020). The presence of a highway close to a train station can result in more people using the car as transportation mode. Gallo and Marinelli (2020) state that highways are well connected to cities and make it an efficient way of transportation, at least more efficient than public transport. The use of public transport often causes people to transfer between modes, which decreases the efficiency and comfort of the journey. Even though the goal of public transport in the Netherlands is to improve its efficiency as a competitor to the car, it is still seen as a subordinate mode (Hirschhorn & Veeneman, 2021). Additionally, neighborhoods located close to a station hub can positively influence its use. The distance between the hub and home influences the decision-making process of what mode is most suitable for a journey. If there are industry areas located around the station and the station is further away from neighborhoods, its use will decrease due to longer distances (Campisi et al., 2020).

2.4 Theoretical Frameworks

The policy arrangement approach (figure 3) is a mix of different theories from the Radboud University in the Netherlands (Arts & van Tatenhove, 2004). The theory is based on how policies can be changed or be stable at different times and places. A policy arrangement is explained as "the temporary stabilization of the content and organization of a particular policy domain at a certain policy level or over several policy levels" (Leroy & Arts 2006). This refers to the temporary freezing of the content and structure of a specific policy area. This occurs either at a particular policy level or

across multiple policy levels. During this period, there is a temporary pause in significant changes or modifications to the policies governing a specific domain. The stability can be observed in terms of both the substance of the policies and how they are organized, providing a period of relative consistency and continuity in the policy landscape. This approach, developed by Van Tatenhove et al. (2000), tries to link day-to-day changes in policies to more overarching societal changes (Liefferink, 2006).

This framework is used to understand the context and how the cases and policies have evolved over time. These policy changes didn't occur in isolation. They took place within a broader contextual landscape that includes social, economic and political factors. Therefore, the theoretical framework being used in this study is well-suited to this type of research. It allows for an in-depth exploration of the dynamic context of these policies. This approach ensures that this research takes the complexity of policy into account and its interconnectedness with broader societal trends. It is very dynamic due to the interconnectedness of the four dimensions. This makes it also more suitable for different contexts as policy arrangements aren't happening in a vacuum, but are rather context dependent (Van Tatenhove et al., 2000; Liefferink, 2006).

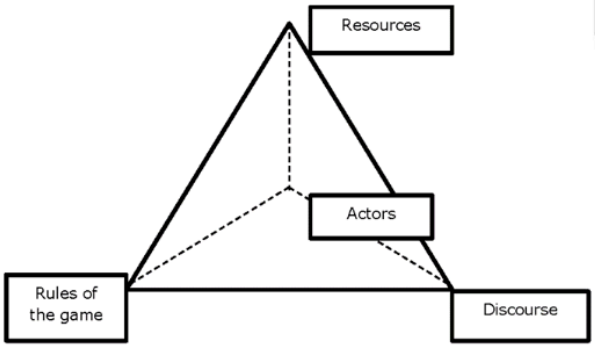

Figure 3: Tetrahedron of the four dimensions of the policy arrangement approach (Van Tatenhove et al., 2000)

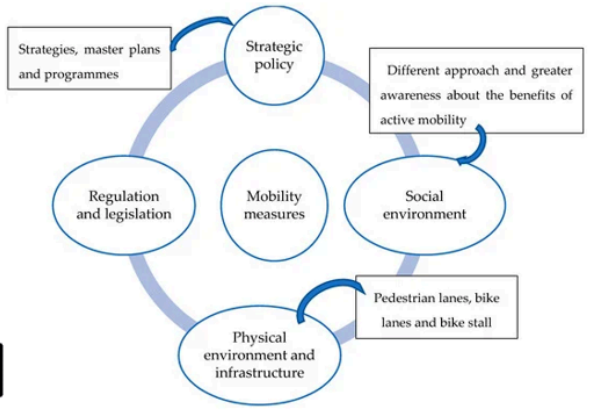

Figure 4: Mobility measures description and possible strategies (Campisi et al., 2020)

The dimensions are already explained as interrelated parts of transport governance. These dimensions are the discourse dimension, the actor dimension, the rules (of the game) dimension and the resources dimension. However, looking at how station hubs operate and have sustainable mobility integrated, there is an additional variable necessary for a framework fitting in this research. The framework, composed by Campisi et al. (2020), will give an additional variable to make the Policy Arrangement Approach usable for this research on sustainable mobility integration. The Strategic Mobility Measures framework, by Campisi et al. (2020), has some overlap with the Policy Arrangement Approach. The 'regulation and legislation' and 'strategic policy' from figure 4 are describing the same elements as the 'rules of the game' from figure 3. Therefore, these two elements aren't taken into account in the conceptual framework. The two variables left are the social environment and the physical environment. The social environment is an addition to transport governance as it describes the actions of how people are educated and advocated to make a change in their mobility behavior. The other necessary addition is the physical environment. Due to the abstractness of the Policy Arrangement Approach the physical environment is not taken into account as part of transport governance. It can vaguely influence some decision-making processes. It is seen as a constant factor

that is not interrelated with the other variables. It was not the goal of Campisi et al. (2020) to make these variables interconnected.

2.5 Conceptual framework

A conceptual framework maps out the relation between the variables used in a research. Because the variables are mapped out and related to other variables a clear objective is shown to understand the research and interrelating dimensions. In this research two theoretical frameworks are chosen and linked to the other to create a conceptual framework (figure 5). The first theoretical framework is the policy arrangement approach by Van Tatenhove et al. (2000). The four dimensions of this framework will be the independent variables. These variables have an effect on the dependent variable 'sustainable mobility'. There is an addition from the framework of Campisi et al. (2020), where the social environment is also part of the independent variables. Other variables from this framework overlap with the framework of Van Tatenhove et al. (2000). These five dimensions form the transport governance that can be applied to both cases. In this relation between independent and dependent variables, there is one moderating variable: physical environment (Campisi et al., 2020). Moderating variables alter the effect that independent variables have on the dependent variable, without a change within transport governance.

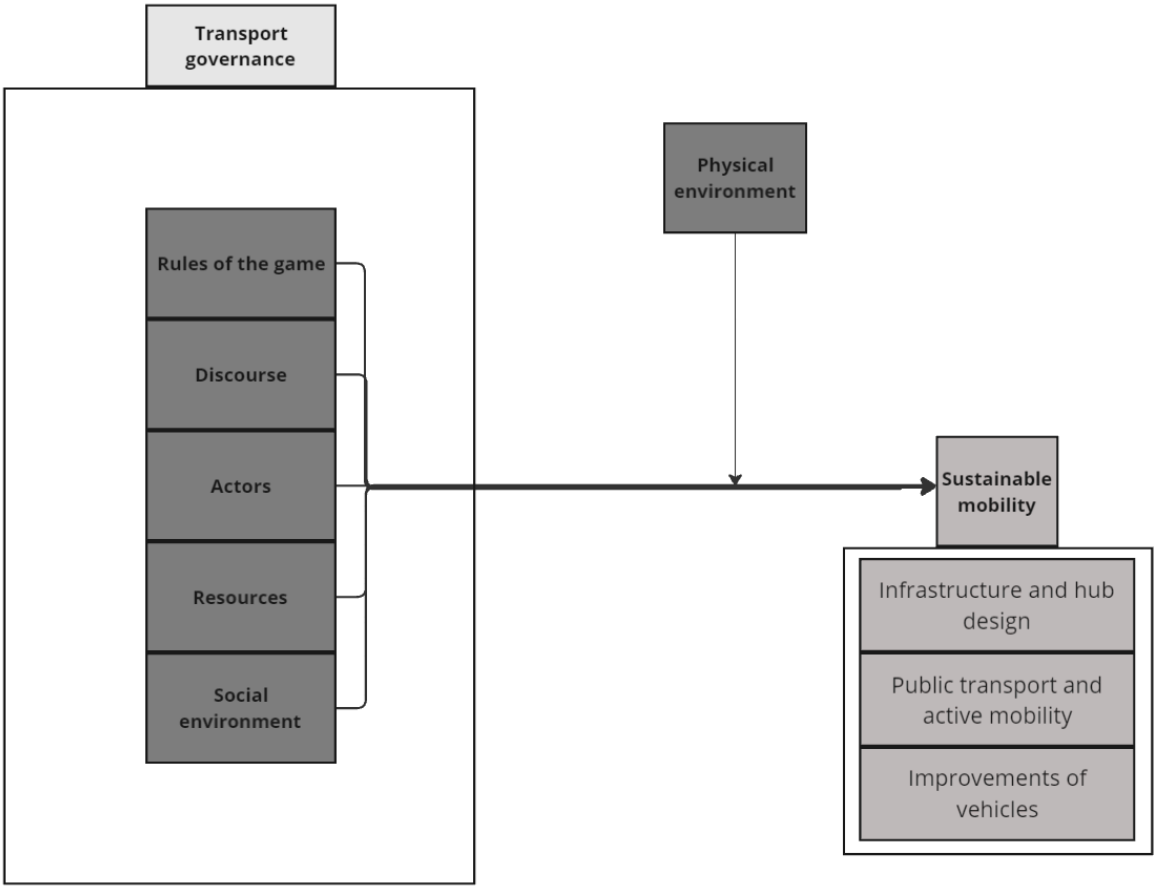

Figure 5: Conceptual framework (Own work)

2.6 Operationalization

The conceptual framework in the chapter above has been operationalized to understand the different variables and how data is going to be gathered on these variables. This is done by making the variables more approachable and measurable. Conducting interviews does not give numeric data, so the researcher must give meaning to the data that is gathered. Through this operationalization table (Table 1) questions can be derived to ask the respondents. Some of the variables are overlapping in what they measure. To make it more applicable, some variables have been combined.

Dimension	Variable	Indicator	Data gathering
Discourse	Problem definition	Knowledge on what the problem is	Semi-structured interviews and policy research
	Belief systems	Ideology, principles, paradigm	Semi-structured interviews and policy research
	Approaches	Solutions for the problem	Semi-structured interviews and policy research
Actors	Actor constellation	The interaction between the key actors (cooperation/opposition)	Semi-structured interviews and policy research
	Interaction pattern	Ideology, principles, paradigm	Semi-structured interviews
Resources	Financial capacity	Subsidies, grants, bonuses	Semi-structured interviews and policy research
	Technological capacity	Technology or experts that can influence the project outcomes	Semi-structured interviews and policy research
Rules of the game	Legislation	Laws, rules, legislation, instructions	Semi-structured interviews and policy research
Social environment	Lifestyle	Awareness, transformation of lifestyle, education	Semi-structured interviews and policy research
Physical environment	Geographical placement	Nearby highways, neighborhoods, landmarks	Semi-structured interviews and policy research
Infrastructure and hub design	Infrastructure	Integration between the general infrastructure and the hub	Semi-structured interviews, policy research and observation
	Hub design	Bus stops, bike parking, kiss & ride, park & ride	Semi-structured interviews, policy research and observation
Public transport and active mobility	Public transport	Possibility for a bus-train journey	Semi-structured interviews, policy research and observations
	Active mobility	Possibility for a bike-train or walk-train journey	Semi-structured interviews, policy research and observation
Improvements of vehicles	Electric vehicles	Availability of charging points	Semi-structured interviews, policy research and observation
	Shared vehicles	Availability of shared mobility options	Semi-structured interviews, policy research and observation

Table 1: Operationalization of the conceptual framework

3. Methodology

The research methodology is an important part of this research, because it keeps the research and researcher aligned with the research objectives and questions. It gives an explanation behind the choices that were made in this research. Firstly, the philosophy of the researcher is assessed and how the data should be collected, analyzed and used. Secondly the strategy of this research will be explained. Thirdly, the method of this research is described. The collected data is divided between observations, policy research and semi-structured interviews. This chapter concludes with the ethics for conducting research.

3.1 Research philosophy

The use of the two cases of Breukelen and Driebergen-Zeist needs a research philosophy to embed the cases in its context. A philosophy is a guiding framework that shapes the approach to conduct research. It influences decision-making about methodology and interpretation based on fundamental ideas about reality and the nature of knowledge (Collis and Hussey, 2014). In this research an interpretivist approach is used. It is based on the fact that reality is profoundly subjective and molded by our individual perceptions. These perceptions allow the respondents in this research to express their own view and points of interests in the cases. The use of interviews in this research also necessitates the need to make this type of data as objective as possible. The use of interpretivism allows for a thorough examination of the cases, which is necessary to understand the influence of transport governance on sustainable mobility integration at Breukelen and Driebergen-Zeist. This is in line with Bryman (2016), who states that this approach is the right fit for qualitative research. However, he does state that it is important to have clear instructions and data management in a research as it is based on personal viewpoints and not on numeric data.

3.2 Research strategy

This research is comparing the cases of the stations of Breukelen and Driebergen-Zeist. Breukelen and Driebergen-Zeist belong to a different category station. Breukelen has the typology of a ‘basis’ station, which serves between 1.000 and 10.000 travelers each day. Driebergen-Zeist is part of the ‘plus’ typology for 10.000 to 25.000 daily travelers (ProRail, 2022). Even though both stations belong to a different category, there is still a comparison to be made. Table 2 shows numeric data on how the stations can be compared. Driebergen-Zeist, even though it is a much bigger station, it is not serving as many people as they can or want. The amount of trains that stop at these stations is very similar, but the difference between these stations are the facilities to get to the station. Table 2 shows a preference for parking spaces for the car in Breukelen, whereas Driebergen-Zeist has diverse possibilities with lots of parking spaces for bikes and a lot of hourly buses. This difference in facilities is of interest for this research, which makes these cases comparable. The stations were respectively built in 1843 and 1844. Breukelen was part of the Amsterdam-Utrecht line, which was extended to Driebergen-Zeist one year later (Stationsweb, n.d.).

	Breukelen	Driebergen-Zeist
Parking spaces (car)	900 (2024)	600 (2023)

Parking spaces (bike)	1400 (2024)	3000 (2023)
Buses per hour	8 in off-peak hours 10 in rush hours	24 in off-peak hours 26 in rush hours
Trains per hour	6 ‘sprinters’ in off-peak hours 8 ‘sprinters’ in rush hours	4 ‘sprinters’ and 4 ‘intercity’s’ in off-peak hours 6 ‘sprinters’ and 4 ‘intercity’s’ in rush hours
Travelers by train (daily)	4789 (2022)	7084 (2022)

Table 2: Characteristics of Breukelen and Driebergen-Zeist (NS, 2022; Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2023; Civil servant Stichtse Vecht, 2024)

Even though the main focus of this research is on comparing Breukelen and Driebergen-Zeist, there is enough attention on the case specifics. Dyer and Wilkins (1991) state that because there are different cases used, the focus will only be on the comparison and not on the specifics of the cases. However, Kaarbo and Beasley (1999) argue that comparative case studies still put a lot of emphasis on the cases before comparing them. Therefore, the results of the cases are separated and seen as case studies and are compared in the conclusion and discussion of this research. A comparative case study design is *‘the systematic comparison of two or more data points (‘cases’) obtained through use of the case study method’* (Kaarbo & Beasley, 1999, p. 372). A comparative case study consists of different case studies that will be compared. A case study is *‘an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context aren’t clearly evident’* (Yin, 2003, p.365). It provides an in-depth understanding without generalization, which aligns with the aim to examine the choices behind the integration of sustainable mobility. Because there is room for both the case specifics and the comparison lessons can be learned. In this case from Driebergen-Zeist, which is seen as more future-proof regarding sustainable mobility integration.

3.3 Research methods

The role of these respondents for either Breukelen or Driebergen-Zeist differs and can give different insights. These cases represent the population of peri-urban train stations, which are close to big cities and have a role in the transportation of work-home people. The city of Utrecht is the interconnecting factor between the two cases. Breukelen and Driebergen-Zeist might not be able to represent the whole population of this type of station hub. The goal is to draw lessons from one case to the other. Therefore, a qualitative manner has been used to conduct this research. Qualitative research aims to generate findings and insights in specific topics. One of the key elements of qualitative research is its inductive view (Bryman, 2016). Every participant in the case study will have a different interpretation of certain elements. As a qualitative researcher these interpretations are important and valuable to understand. Williams (2000) contradicts this statement. He stated that the objects in qualitative research *‘can be seen to be instances of a broader set of recognizable features’* (p. 217). It does give this research some external validity, which is stated as the generalizability of a research. Since the goal is to draw lessons from one case to the other, there is no need for external validity.

Validity also has an internal part, which is focussed on if the research measures what it says it measures, which is looking at the research within its own context. Internal validity assesses to which degree the relations between the different variables aren't random and are supported by a literature claim (Bryman, 2016). By making a literature framework, all the variables have been examined and explained in relation to the others. There is also a conceptual framework where these relations are drawn out to help this validity. In this research all the steps are explained in this methodology chapter, so others can read the choices which are made and its reasoning for those choices. It is all based on literature. Bryman (2016) and Roberts and Priest (2006) state that by doing so, there is more trust and reliability in the research. It is the extent to which a particular method or procedure consistently produces the same results when applied under the same conditions. Reliability is crucial in research because it ensures that the study's findings are trustworthy and not subject to random error.

3.4 Data collection and analysis

As mentioned in the research methods, a qualitative approach is taken to analyze the chosen samples. This analysis will be done by observations, policy research and semi-structured interviews. These three methods of data collection are based on data triangulation. Data triangulation refers to the use of more than one method of gathering data (Hales, 2010). If the data of one method has some flaws, it can be compensated and complemented by the other methods.

3.4.1 Observations

The first type of gathering data is by observing the research objects. In this research the objects are the train station hubs of Breukelen and Driebergen-Zeist. Even though the observations are part of the data collection, it is used to back the data up from the policies and the interviews (Driscoll, 2011). The observation of the stations allows the researcher to understand the use of all the facilities. How people are arriving and leaving the station is noted in this research. No absolute numbers are taken from this type of data collection as the differences during the day may result in different outcomes.

3.4.2 Policy research

Policy research is done to understand how the governmental bodies solve problems related to this research. The policy research will focus on analyzing the relevant policies in this research. These policies aren't only at the local level, but they also transcend the border of their municipality and are policies from the province, the government or the European Union. All these different levels of governance have their own ideas on using sustainable mobility and will try to implement it in their own way, while also taking the policies of higher governmental bodies into account. Table 3 shows the documents that are being used in this research. Chavannes (2022) states that policies from the European level trickle-down to the municipal level. At this level differences can exist in how the higher policy documents are interpreted between Breukelen and Driebergen-Zeist. At the municipal level the policy documents are important as they state the course of action up to the present or to a point in the future (Owen, 2014). Only the policy documents at the municipal level have been coded.

Document title	**Publisher**	**Date of release**	**Level**

Strategy for sustainable and smart mobility	European Commission	2020	Europe
Rail 2050 vision	The European Rail Research Advisory Council	2017	Europe
Station Agenda	Department of infrastructure and environment	2023	National
Development Agenda Future of Public Transport	Department of infrastructure and environment	2021	National
National Future Vision Bicycle	Tour de Force	2022	National
Mobility vision province of Utrecht	Province of Utrecht	2014	Province
Mobility programme 2019-2023	Province of Utrecht	2019	Province
Vision station area Driebergen-Zeist	Municipality Zeist & municipality Utrechtse Heuvelrug	2014	Municipal
Mobility vision	Municipality Zeist	2021	Municipal
Action plan Driebergen-Zeist	Municipality Zeist & municipality Utrechtse Heuvelrug	2023	Municipal
Environmental Strategy Stichtse Vecht: Mobility	Municipality Stichtse Vecht	2022	Municipal
Municipal Traffic and Transportation Plan Stichtse Vecht 2013	Municipality Stichtse Vecht	2013	Municipal

Table 3: Policy documents in this research

3.4.3 Semi-structured interviews

The other form of data collection is through interviewing relevant stakeholders. In both cases of Breukelen and Driebergen-Zeist different stakeholders are selected to conduct an interview. For both cases, respondents with the same role have been asked for an interview to make the comparison between the two cases more objective. Through these interviews valuable insights are gathered to answer the research question and the sub questions. There isn't a hierarchy in interviews and stakeholders are treated equally.

The interviews have a guideline of questions to answer, but due to different answers follow-up questions differ and can cause the interview to go off track. To ensure that all the relevant questions are answered directly or indirectly, an interview guide is used. This is in line with Bryman's (2016) view of semi-structured interviews, where flexibility plays an important role. The comparison between Breukelen and Driebergen-Zeist is harder if the follow-up questions lead to different fields of interest. This is both an opportunity and a threat. Valuable information can be gathered by giving the respondent the freedom to answer how he/she would like. However, this type of interview can often sidetrack from the starting questions because there is a lot of information gathered in a small window

of time. The guide allows the interviewer to go back to these questions and have comparable data (Yin, 2009). In table 3 the list with respondents, their roles and the reasoning for choosing them is given.

Respondent	Role	Reasoning
1.	Civil servant in the mobility department at the municipality of Utrechtse Heuvelrug	The station area of Driebergen-Zeist is located in the municipality of Utrechtse Heuvelrug. A planner who worked on the development of the station area will give valuable insights.
2.	Civil servant in the mobility department at the municipality at Stichtse Vecht	The station area of Breukelen is located in the municipality at Stichtse Vecht. A planner who worked on the development of the station area will give valuable insights.
3.	Expert at ROVER	ROVER protects the interests of all the people in public transport. Their opinion and ideas for a hub design are in the interest of the people.
4.	Expert at Fietsersbond	The Fietsersbond keeps the interests of the bikers as their main interest. Through their efforts bikers have more influence on the actual plans.
5.	Expert at NS	As the owner of the station areas the NS has a powerful role. The experts at the NS that have worked on these cases will be of good use.
6.	Council member of the municipality of Utrechtse Heuvelrug	The council members that were in office during the development know the issues and demands that different parties had regarding the station area.
7.	Council member of the municipality at Stichtse Vecht	The council members that were in office during the development know the issues and demands that different parties had regarding the station area.

Table 3: List of interviewees

3.5 Ethics

Ethics for research

To keep the research ethically sound, five main principles identified by KNAW et al. (2018) within the field of socio-geographical research ethics will be considered throughout the entire study. They advocate for honesty, thoroughness, transparency, independence and responsibility as the five pillars of scientific research.

For the first pillar the researcher has to be honest in the results and the conclusion, which is in line with the internal validity. By transcribing and coding the interviews accurate conclusions can be drawn. It can also be reviewed by others who read the transcripts. The second pillar, thoroughness, is done by constantly documenting the sources for all parts of this research so they can be used again to double-check. It is necessary to be consistent in every aspect of writing this thesis (Thurmond, 2001).

Transparency, the third pillar, demands that the research has to be replicable by other researchers. The first two pillars already form the basis with the transcripts and the documented sources. For qualitative research the concept of transferability grasps the essence better (Tuval-Mashiach, 2021). The base of this research can be replicated in other places as well. It overlaps with the reliability as mentioned in the research methods. Independence, the fourth pillar, assesses whether the researcher prioritizes the best interests of the research. In this study, the researcher alone has been involved in the decision-making. It ensures that no external entity influences or directs the researcher. The fifth and final pillar, responsibility, states the relevance of this topic to research. The scientific and societal relevance in the introduction explain the rationale for this research. In the methodology the research methods are explained.

4. Results

The results chapter starts with background policies on sustainable mobility of the European Union, then the national government, followed by the province of Utrecht for Breukelen and Driebergen-Zeist. Then the first case of Breukelen is discussed, starting with some information on the case and their ambitions. Based on the 5 principles of transport governance and the physical environment the case has been discussed. After the elements of transport governance have been discussed, the three components of sustainable mobility are explained based on the information of the transport governance. It concludes with a summary of the case. The last part follows the same structure as for Breukelen, but then applied to the case of Driebegen-Zeist.

4.1 Overarching policies for Breukelen and Driebergen-Zeist

European level

The European commission (2020) states that mobility, even though it has advantages and serves the public, it also contributes to more pollution and safety risks. As the goal is to evolve towards an emission free society with the new Green Deal, all forms of mobility must be adapted to reach this goal in 2050. The rapid growth of all mobility networks in Europe will provide accessible alternatives to private vehicles, as urbanization is increasing (Europese Commissie, 2020). The train network is the best suitable network to cope with this rapid growth (European Rail Research Advisory Council, 2017; Rijksoverheid, 2023). Comfort, price and efficiency are stated as the most important reasons to choose a mode of transportation. By making these elements more competitive for train use, the use of these modes will also increase.

National level

Tour de Force (2022), a Dutch collaboration between governmental, market and societal parties, makes a case to have more cycling promoting policies. Their goal to increase cycling use finds its results partly at stations. The availability of bike parking has a positive impact on the number of cyclists. It isn't just the total number of stalls that matters; indoor and guarded bicycle parking also encourages more people to cycle to station hubs. Consequently, the government has stated to improve these sustainable mobility facilities as focus points of stations (Rijksoverheid, 2023). However, they mentioned that P+R facilities weren't a part of this list and should not be a point of focus. Even when these facilities are useful for their ability to reduce city congestion and decrease the need for urban parking spots. For medium to long distances the combination of private vehicles and public transport still plays an important role (Rijksoverheid, 2021). While they state the importance of the car in one document (Rijksoverheid, 2021), the central position is given to the bike in another document (Rijksoverheid, 2023).

Province level

For households where both adults work and travel during rush hours, private vehicles offer them the flexibility to combine multiple tasks (Provincie Utrecht, 2014). Public transport can't accommodate this due to its fixed destinations and waiting times. Consequently, private vehicles are more time-efficient for these households, giving them an edge over public transport. Therefore, newer

policies place more importance on integrating trains and local bus networks to create a cohesive network (Provincie Utrecht, 2019; Rijksoverheid, 2023). Both operators should present themselves as a unified entity to avoid unnecessary confusion, which is necessary for Breukelen and Driebergen-Zeist. Improving public transport facilities in the province makes it more efficient, affordable and convenient to use. However, not only public transport facilities are getting improved. Cycling and private vehicles also hold an important part of the total mobility in the province. Therefore, these modes aren't getting neglected and facilities to support these modes are also getting improved. The province states in their programme that facilities for private vehicles at regional nodes must have 'good' parking facilities for private vehicles. For bicycles only 'sufficient' facilities must be present (Provincie Utrecht, 2019). This is in contradiction with their vision, where the chain mobility of cycling and public transport is marked as highly potential for the future and it must be further developed and explored (Provincie Utrecht, 2014).

In the province of Utrecht a hub-and-spoke network connects all the nodes to each other, with Utrecht in the middle. Breukelen and Driebergen-Zeist are both part of this network (figure 6). Utrecht central station serves as a point from where all the other nodes are accessible. However, the nodes are also connected to each other. Good connections with the surroundings, walkable and bikeable distances make these nodes special. Each node has different elements that make it part of this hub-and-spoke network, which is embedded in the local context (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2023).

Figure 6: Travel distances by public transport towards the central station of Utrecht (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2023)

4.2 Case 1: Breukelen

Figure 7: Aerial view of Breukelen station (Provincie Utrecht, 2024)

The Dutch government has stated that Breukelen station is one of the important nodes in the province of Utrecht (Rijksoverheid, 2023). This title of a node ensures that Breukelen is a place where different modes are connected and changing between these modes is possible for all users. The municipality states efforts to promote sustainable mobility in certain parts of the jurisdiction, but in their general vision there is nothing mentioned to reduce private vehicle use to reach the station hub (Gemeente Stichtse Vecht, 2013; Gemeente Stichtse Vecht, 2022). The vision of the municipality Stichtse Vecht (2013) had a lot of interest in the road network, but less interest in the station hub and how to connect it with the surroundings.

However, there are ambitions to make Breukelen station well connected to both Utrecht and Amsterdam. The goal was to have six trains per hour towards Utrecht central station. There are only two other stations between Breukelen and Utrecht central station (Maarssen and Utrecht Zuilen). Both stations serve the same or lower capacity than Breukelen, which makes this goal of six trains per hour too much. Towards Amsterdam the ambition was four trains per hour. This was achieved, but due to covid-19 it was reduced to two trains per hour (Gemeente Stichtse Vecht, 2013; Gemeente Stichtse Vecht, 2022). These ambitions for more trains come from the idea that there will be more train users in the future at Breukelen station. The municipality states that good bus and bike connections to the stations are vital to make this happen. Because Breukelen station is located on the edge of the city surrounded by industry, it is harder to reach for inhabitants of Breukelen. The bridge that crosses the Amsterdam-Rijnkanaal is the fastest way to reach the station for Breukelen, because Breukelen is stretched alongside the Amsterdam-Rijnkanaal and there aren’t a lot of crossings. Due to the car-centered fabric the walking routes are seen as underwhelming. The infrastructure for cycling is seen as sufficient although the parking spaces can be improved. There is a need for more parking

space, which can be indoor and guarded. This might be part of future improvements to cope with future growth and use of the station (Gemeente Stichtse Vecht, 2022).

4.2.1 Discourse

Problem definition

Breukelen is a car-centered municipality, which ensures that there is adequate space for the car. *'We have a policy here of a parking standard of 2.1 per dwelling. So for every home, two parking spaces have to be created. That may feel like 100 years back in the day. It is just an old policy. It's conservative. If you give your residents so much room to do things by car, then you have to have good parking spaces at the station as well'* (Civil servant, Stichtse Vecht). The mentality of being focussed on the car results in a different outcome of the design of the village. These policies are dated, he states, but it is just the standard around Breukelen and it can't change that easily. Offering 2.1 parking spots per dwelling is often more than people need, even in Breukelen, but there is enough space to make this happen. They aren't bound to limited space like Utrecht, where a parking spot is more valuable. *'That is really the mentality thing and I also think that in recent years that difference between cities and these kinds of municipalities has become bigger and bigger. Especially on sustainability and especially how enthusiastically a city like Utrecht tackles it and how cowardly with a few charging stations for some cars we tackle it'* (Civil servant, Stichtse Vecht). He argues that due to the abundance of space and the priority position of the car, sustainable mobility is often seen as optional. Electric vehicles tend to be the most sustainable form of mobility that works in Breukelen. The municipality is willing to help these people by placing charging points to accommodate these vehicles. Utrecht, on the other hand, takes an active stance to promote sustainable mobility. *'We don't focus heavily on cars, but it is a reality'* (Council member, Stichtse Vecht). The council member agrees that there is still a car-centered mentality, but he clarifies that isn't because the municipality is actively promoting the car. It seems to be a result of the past and an attitude towards transportation modes.

It does not help sustainable mobility that the car facilities are better than the public transport facilities. The lack of bus lines that drive regularly around the station makes picking up people by car a better alternative. Especially in the evening there can sometimes be some nuisance and damage to property around the station area. *'Quite a few things happen there that can't quite bear the light of day, so it happens quite often that parents don't let their children and especially female children wait for the bus there, they just pick them up'* (Civil servant, Stichtse Vecht). Therefore, parents often pick their children up from the train instead of letting them wait for the next bus. The distance between the station and Breukelen is relatively low, but due to the Amsterdam-Rijnkanaal a detour is necessary to use the bridge.

In addition, the expert at ROVER states that there is a problem with keeping the buses operating. A bus line must have some capacity at least for it to operate with minimal losses. There are subsidies for the bus operator to run these buses, but without any users it is no use. *'All those bikes require space. It is and always will be individual transportation. Those need parking space. Not on the road, but just for parking. Before you know it, the parking spaces are too small. Buses, on the other hand, when I go by bus I don't claim parking space. I get off and the bus goes on. I don't claim space'* (Expert at ROVER). A bus only parks overnight, but not during the day. Due to the valuable and limited space

that is owned by the station related actors, it is a lot smarter to invest in the bus. The bus lines that connect the other surrounding villages to the station aren't sufficient as a mode of transportation. The number of users of these lines are also quite low, so using more buses on these bus lines would be a financial expense. The province has to decide if the cost coverage rate for this line is sufficient to aid with subsidies. For these villages the car offers the freedom to move, that is something the bus can't do there. Figure 8 shows the share of people that travel to the station area in Breukelen by car. It shows that most of the car travelers are from medium distances of a 15-20 minute drive to the station. So the closest villages of Breukelen and Kockengen have only a small share of the occupancy at the station area. The biggest share comes from the villages Mijdrecht, Wilnis and Vinkeveen with almost one third of the total share of cars. These villages are outside the municipal borders of Stichtse Vecht. However, there are no train stations located closer to them. Breukelen station offers good connections towards either Utrecht, Amsterdam and even Rotterdam. The free parking makes it even better for these travelers to use this station instead of others. The trains will transport more people, which makes it utilized enough to keep the same trains without cutting any out due to a low occupancy.

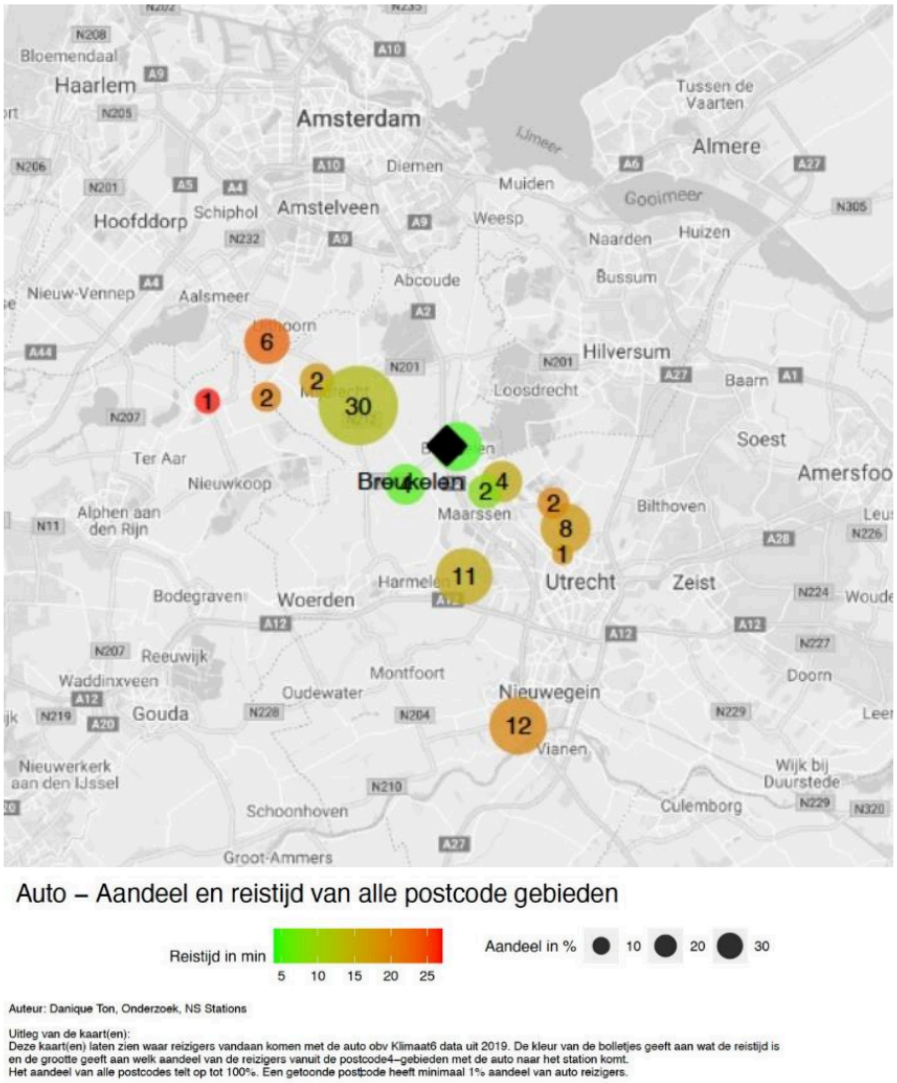

Figure 8: share of users of Breukelen station and their travel time in minutes (Gemeente Stichtse Vecht, 2022)

Figure 9: Mode of travel towards and away from Breukelen station (Gemeente Stichtse Vecht, 2022)

The current situation in Breukelen shows a difference between being the connector for the first mile or the last mile (figure 9). 55% of people who use the station come by car, either as the driver or as a passenger. Which equals to a 45% share of people who use sustainable mobility to arrive. When people use the train to come to Breukelen a different share for every mode is seen. With 34% the share of car users is around ⅓, whereas it was more than ½ as mode to arrive at the station. The majority of people who arrive at Breukelen by train are using sustainable mobility for its last mile. A share of 66% can be allocated to the industry area close to the station. The biggest change is the amount of people that are walking as their last mile compared to their first mile. There is less use in privately owned vehicles (car and bike) and more use of the bus and walking.

Belief system

This car oriented mentality makes the A2 highway next to Breukelen very attractive. Both the civil servant and council member at the municipality agree on this fact. However, the strength in Breukelen doesn't lie with the highway or the station, it lies with the choice they can offer people every day. Having two choices to travel is already better than having the car as the only mode of transportation. The municipality Stichtse Vecht isn't pushing people to use the train or that they use the bus or bike to get to the station. They offer two options and make these options as efficient as possible and the people can decide which suits their journey more. The council member at Stichtse Vecht states that if there are no parking spots available people can just go to the A2 highway next to the station. However, if people see the traffic jams on the A2 they can decide to park their car close to the station and take the train. That is the power of its location. There remains a discussion on how sustainable the car-train journey is, as some people argue that it is less sustainable and others believe it is sustainable. This discussion can suggest that a journey is truly sustainable if a car isn't part of it. It is, however, more sustainable than only using the car. Using the car to arrive at the station is closer towards sustainable mobility. The council member at Stichtse Vecht argues that every effort is valuable and contributes towards the sustainability goals. He knows that it is more sustainable to use the bike or the bus towards the station, but that not everyone is able to do this. There are various reasons why someone might use the car towards the station. For instance, elderly people in villages further away might find it challenging to use sustainable modes of transportation.

Approaches

If people are using sustainable mobility in the municipality, they tend to find it in electric vehicles and bikes. The bus lines aren't used optimally, which makes these bus lines limited. When a bus only drives 2 times per hour past a stop, privately owned vehicles give much more freedom. People use the bike as a mode of transportation as well. The amount of space in the municipality allows people to own cars and bikes and have space to store them. The station also offers 1400 spots for bikes to park, with 120 bike lockers included. Facilities around the station also favor bikes. There is a bike path separate from the road, for safety reasons, which allows people to cycle from Breukelen to the station without any delay. The road system around the station allows bikes to always take priority over the cars. There are also other possible solutions mentioned by the civil servant and the council member. The first one opts to initiate a conversation with a bike-sharing provider. The feasibility of this could be investigated, since it can provide a solution for many commuters in their first and last mile. The second option is to launch a pilot program for a shuttle bus service, which could help transport passengers to and from the station. Especially during rush hours when there is already a lot of traffic on the road. The last possible solution is to collaborate with the local employers to set up a bike system for the employees, if they arrive by train. This would allow their employees to travel to work by train and then complete the last mile of their journey by bike.

The bridge to cross the Amsterdam-Rijnkanaal can be exhausting due to its steepness. This might also be a small barrier that causes people to take other modes of transportation towards the station. This is, however, a given fact that can't be changed. The bridge can't be lowered due to passing cargo ships that require a certain height. An idea that helps with this obstruction is the construction of a cycling bridge (figure 10). The dotted line shows the area that can be covered in a 15 minute walk radius from the station with this bridge. A cycling bridge will ensure that a larger area is covered when walking to Breukelen station. Especially people who live in the North and the central part of Breukelen will see an improvement on their accessibility for walking and cycling. The strategic exploration states that better cycling facilities will make it easier to reach the station by bike compared to the car (Gemeente Stichtse Vecht, 2022). An indoor parking garage is beneficial for the amount of cyclists. Whereas good street lights also help people choose the bike as mode if they have to travel during the evening. This will eventually result in less occupancy of the parking spaces around the station. However, the municipality also states that the amount of spaces for cars can be enhanced to 1500 and still have a high occupancy. More supply of parking spaces makes it more predictable that there is space to park when driving towards the station. The uncertainty now sometimes causes people to use the bike instead as it offers certainty of a place to park the bike. The other uncertainty is that people can also drive to the A2 highway as it is located close to the station. The Amsterdam-Rijnkanaal is a natural barrier for inhabitants of Breukelen to reach the station.

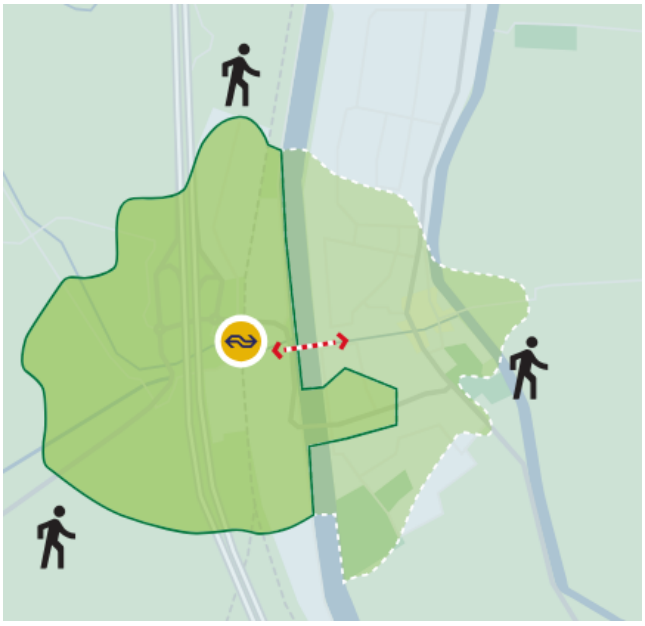

Figure 10: the additional area with a 15 minute walk from the station with a cycling bridge (Gemeente Stichtse Vecht, 2022)

4.2.2 Actors

Actor constellation

At the station area there are multiple actors, each with distinct interests and responsibilities. The main actors, involved in everything, are ProRail, NS and the municipality Stichtse Vecht. ProRail is maintaining the tracks and the stations, NS is the operator of the station buildings and the municipality ensures that the surrounding area is handled. These three actors must collaborate to create a station area that meets the needs of all its users. However, their projects can significantly impact the daily lives of the surrounding citizens. Therefore meetings are hosted to discuss plans with people who are interested to gather input and feedback. A recent example is a survey that was put out by the municipality and the province (Provincie Utrecht, 2024). The goal of this survey was to make the waiting area more pleasant and a better integration between the different modes.

Additionally, there are several other actors at Breukelen station. These include local residents, entrepreneurs, the province, Rijkswaterstaat (the national water authority), the regional water board (waterschap), Syntus (the public transportation company), the Cyclists' Union (Fietsersbond) and ROVER (a regional public transport users' council). These actors might have different concerns and interests regarding the station area. While some of these interests are shared among many parties, others are unique and particularly important to specific groups. Some actors might prioritize accessibility and others might have more interest in efficiency.

The expert at ROVER praises the municipality that they are taking all the relevant stakeholders into account and listen to their views on the project. *'We get involved when it can still have an impact'* (Expert at ROVER). The different parties might have new insights that aren't yet reviewed by the municipality. The get-togethers regarding the station area of Breukelen and the survey gives people a say on the project and makes their insights impactful. The civil servant and the council member at Stichtse Vecht both state that there are no actors, that might be impacted by changes around the

station, are left out. It is their role as municipal employees to listen to the people and not exclude anyone from participating. The importance of participation in new projects and policies is highlighted by the new environmental law (Omgevingswet). The municipality must be the facilitator between the stakeholder groups and bring them together to discuss their ideas.

Interaction patterns

The first point of interaction regarding the station area is what is part of sustainable mobility. What modes of transportation are part of it and what types of chain mobility are sustainable. The discussion on the sustainability of the chain journey of car-train has led to opposing views for the stakeholders, as mentioned before. *'NS, ProRail and the province also say that those people could have come to the station by bus as well. They shouldn't have come to the station by car at all, because we have to discourage parking there a little bit'* (Civil servant, Stichtse Vecht). Whereas the municipality believes that it is sustainable to use the car to drive to the station and from there on use the train, the other stakeholders oppose. The municipality wants to serve the needs of their people and their people require enough parking spots for cars. This quote by the civil servant shows that three of the bigger stakeholders formed a coalition to get more people out of the car. The ongoing debate about what sustainable mobility is, is creating divisions. The limited space available around the station has different groups envisioning various ideal uses for it. Some people advocate for more parking spaces, others for a guarded and indoor bike parking facility.

The second point of interaction is focussing on the balance between the different interests that the actors have. The role of the municipality is to balance the different interests and find a way to satisfy as many needs as possible, without harming other actors. For example, NS and ProRail argue that increasing the availability of shared NS bikes will positively impact the share of sustainable mobility around Breukelen station. Currently, there is no option for guarded and indoor bike parking, which complicates the situation. The absence of such facilities makes it costly to maintain a large fleet of shared NS bikes because they need to be stored in bike lockers. These lockers occupy significant space around the station, limiting the number of shared NS bikes to only eight at Breukelen station. These two actors and others as well argue that it is necessary to improve sustainable mobility facilities around the station so that more people will use these modes. This aligns with the local survey of the municipality and province (Provincie Utrecht, 2024), which stated that the safety and facilities for cyclists aren't sufficient for the future of the station. It is just not a point of priority on the municipal agenda. However, the civil servant argues that it isn't the main goal of the municipality to focus on sustainable mobility. *'This is a pretty right-wing municipality. So the car is still fairly sacred. However, the province has a slightly more left-wing signature'* (Civil servant, Stichtse Vecht). The priority position that the car holds is stronger than the need for sustainable mobility. He also states that, even though the municipality is more in favor of the car, the province is more open to sustainable alternatives.

Rijkswaterstaat, on the other hand, has other interests and wants less cars on the road during rush hours, which causes more traffic flow. The station is located perfectly to capture a share of these cars. The A2 highway to Amsterdam or Utrecht is during rush hours very busy and can cause traffic jams on both sides. If the station of Breukelen is able to reduce the amount of cars that use the highway and instead go to the station, either by car or sustainable mobility, their interests are satisfied. The strategic location of Breukelen station between Amsterdam and Utrecht makes it a prime spot for mode

transfers, allowing commuters to use the train to get to these cities. The policies that are made in Amsterdam and Utrecht to ban the car does boost the amount of public transport users in Breukelen. However, they are only willing to discuss plans if the plans are made by the municipality Stichtse Vecht and if these plans aren't parallel to their ideas and visions.

The third point of interaction is the presence of parking spaces. It is closely related to the first point, but is only focussing on parking for cars. Figure 11 shows that the P+R facilities around the station are during workdays fully occupied. Since the P+R is almost always full, people have a few different options to travel during workdays. The first one is to use the car and go to the station and if there is a parking spot they take the train for the rest of their journey. The second option is that people see or think that there are no available parking spots left and they continue their journey with the car. The presence of the A2 highway closeby makes this an easy alternative for car users. The third option is that people expect that there are no available parking spots left and use other modes of transportation to arrive at the station. There are people who don't take this into account and normally only use the car or other modes, without considering the use of different types of mobility in their journey. The recent addition of 200 parking spots has put the total number of 900 parking spots around the station. It should help people find a place to park their car during workdays.

P+R	Capacity	Occupancy (numbers)		Occupancy (%)	
		Work day	Weekend day	Work day	Weekend day
Breukelen/Abcoude	859	855	-	100%	-
P+R Abcoude	160	152	85	95%	53%
P+R Breukelen	699	703	168	101%	24%

Figure 11: occupancy of Breukelen station (Gemeente Stichtse Vecht, 2022)

4.2.3 Resources

Financial capacity

The long-term parkers at Breukelen who use Schiphol take up a lot of parking spaces. The council member at Stichtse Vecht explains that because cheap airlines offer deals to people to park their car for free and then use their airline, these parking spots are occupied. One of the changes to stop this from happening is paid-parking, he argues. People, traveling to Schiphol, won't leave their car in Breukelen if they have to pay for their parking spot. The question here is how to make it unattractive for long-term parking and attractive for commuters? If the rates are too low, Schiphol users might still use it. However, the rates must not be too high for people who use the train 5 days in a week, who then might decide to take the car as their only mode of transportation. An idea that was brought up by both the civil servant and the council member is to implement a few hours of free parking. This can range from four to eight or nine hours. The commuters who travel daily back and forth to the station by car have a few free hours there before it is paid-parking. Currently, parking spots are often inadequate after 8:30 AM, which causes people to change their mode or chain journey (Provincie Utrecht, 2024). However, this idea is still in development as the number of free hours is not yet decided on. The idea is challenging the car dominance in the municipality. They found enough support for this implementation, so the council did vote in favor of paid-parking.

It is certain that paid-parking will be used on all the parking spots around the station. It does collide with their survey from 2023, where it was revealed that free parking is highly valued, particularly by those traveling by train from rural areas around Breukelen with poor bus connections. There are different opinions regarding the impact of paid-parking. Employees within the municipality believe that paid-parking will only encourage people to continue driving to the A2 highway and complete their entire journey by car. In contrast, NS, ProRail and the province argue that implementing paid-parking will make other modes of transportation more attractive for reaching the station. Since there is no charge for parking bicycles or taking the bus, these options become more financially appealing compared to driving a car to the station.

The introduction of paid-parking around the station of Breukelen could also ensure that car users won't park at the station anymore and drive their entire journey by car, because it wouldn't have the extra cost of parking at the station. If all the old car-train users would do this, it could lead to increased congestion, longer travel times and higher overall costs. If fewer people use the train, it results in lower occupancy rates. Public transport systems rely on passenger volumes as income. Underutilized trains would increase the operational costs. This can lead to either higher ticket prices or less trains on these tracks, which can create a cycle that further discourages public transport use. Due to covid-19 the amount of travelers by train was already reduced and should be back to normal by 2025. To make public transport less expensive, the province is promoting it. If more people use public transport, the costs will be lower and the ticket prices as well. The interests of the province don't solely lie with providing efficient transport, but also in ensuring that it is profitable and sustainable. However, the free space is still used for car related facilities.

Even though the province is promoting public transport, the municipality continues its car oriented journey. *'We can't just build everywhere, because we have no money. But we have plenty of room for housing, so we also have plenty of room for the car. So at least we don't have that spatial need to get the car out'* (Civil servant, Stichtse Vecht). The abundance of space means that there isn't a pressing need to reduce car usage. He also states that sustainable mobility initiatives in the municipality can mostly be found in electric vehicles, not in a modal shift towards other modes of transportation. It often comes with extra costs, which can be a barrier for people to implement. It is also difficult for the municipality to balance the need for sustainable mobility with the financial costs in either infrastructure or transport modes. There are subsidies from the government to implement more sustainable mobility in municipalities. The focus tends to be more on more car related facilities, than sustainable mobility options. An example is the newly built parking garage at the station. As a result, subsidies and financial help are underutilized in this municipality. *'There are also subsidies for sustainable mobility, so there are incentives as a municipality to move in that direction. We are a car municipality, so we don't always want that. Then we let those subsidies go'* (Civil servant, Stichtse Vecht). These subsidies are redirected to larger urban areas, such as Utrecht. Here, the need for sustainable mobility solutions is more urgent due to higher population densities and more congestion. This reallocation of funds underscores the differing priorities and transportation needs between smaller, car-oriented municipalities like Breukelen and larger, sustainability-focused cities like Utrecht.

Technological capacity

The community buses operating in less densely populated areas are facing challenges in maintaining their current operations. One of the government's sustainability goals regarding stations is to transition all buses to zero-emission models by 2030 (Rijksoverheid, 2023). The buses are driven by volunteers, who possess a category B driving license. This is sufficient to operate smaller vehicles (3500 kilograms). Driving licenses are categorized by the weight of the vehicles and heavier buses require different licenses. The expert at ROVER highlights an issue with European regulation. Due to the electrification of the bus fleet the buses become too heavy. The batteries ensure that the overall weight exceeds the limits of the category B license. This situation presents both technological and financial challenges. Volunteers would need different licenses to drive these buses, which can be very expensive. Since these volunteers aren't paid for their work, the costs are often not worth it. This creates a barrier, as many volunteers might be unable or unwilling to pay for an additional license to operate these new buses.

4.2.4 Rules of the game

The expert at ROVER states that local officials at the municipality are tasked with implementing decisions made at the national level. The 2015 Paris Agreement has increased the focus on sustainability overall. Sustainable mobility is a part of this new focus. This focus brings more attention to alternatives of the normalized private vehicles. The municipality can decide what they see as sustainable mobility and where their focus should be. *'Those officials only have an assignment from the government. And if the politicians want it to be 100% electric in a certain year, fine. That's just a precondition'* (Expert at ROVER). To achieve these sustainability goals, the municipality Stichtse Vecht needs the help of the people. Through the mandatory participation process, due to the environmental law (omgevingswet), participation is a precondition. In Breukelen the municipality has organized a get-together and a mobility café, where local officials are present to talk with the citizens about the plans and listen to their input. However, the civil servant at Stichtse Vecht states that the municipality Stichtse Vecht is demand-driven. As the municipality has the car as main mode of transportation, it isn't surprising that the demand doesn't say much on new sustainability goals. It is much more focussed on trivial elements that make the lives of the citizens better. These goals for sustainability must come from higher authorities to make it a precondition.

The attitude of the citizens of Breukelen allows the highway to maintain its prominent position. It gives people a choice to use the car to move in the direction of Utrecht or Amsterdam. However, this efficiency by car poses a threat to sustainable transportation modes. The civil servant at Stichtse Vecht states that one of the key factors that aid the amount of people that use the station in Breukelen are the transport policies of Amsterdam and Utrecht. These cities are increasingly restricting car access to reduce congestion and environmental impact. This results in more commuters at Breukelen station, who otherwise might drive directly to Amsterdam or Utrecht. This causes more public transport passengers and further investments in public transport infrastructure. Because car travel becomes less attractive, other alternatives such as the train gain more priority. It can lead to further investments and more efficient and comfortable journeys by train. However, he also mentions that Utrecht isn't collaborative. Except when policies from Stichtse Vecht have a negative impact on the people in Utrecht. That is when they are willing to collaborate and discuss plans.

4.2.5 Social environment

The expert at ROVER argues that modern e-bikes undermine the original purpose of cycling as a form of active mobility. Cycling was traditionally seen as a healthy activity due to the physical effort. E-bikes help a lot with pedaling, reducing the energy that people have to use to travel. It does make cycling more accessible to people with physical limitations or for long distances. However, the physical benefits from cycling are also diminished. An example in Breukelen is the Breukelerbrug, which connects the side of the station and highway to the village of Breukelen. E-bikes help people to use this bridge. It does show a shift in mentality towards convenience over physical exercise. E-bikes are more beneficial for someone's health and it is better for the environment than a car. In Stichtse Vecht, the standard of using cycling as mode to get to the station isn't very high. The civil servant and the council member acknowledge that Stichtse Vecht isn't known for their sustainable mobility priorities. They do desire more effort from the municipality to promote sustainable mobility. They also know that this shift isn't fully theirs to make. People have the freedom to choose what fits their journey and lifestyle. A shift is necessary towards physical activity as beneficial for someone's health and not to convenience.

4.2.6 Physical environment

The presence of the station and the A2 highway are reasons why people live in or around Breukelen. The expert at ROVER notes that the train can provide an alternative for those who use the car. All the parking spots provide car-centered people with an option to either use the highway or use the car to park it at the station. The civil servant at Stichtse Vecht agrees with the duality of power. *'Breukelen has a sprinter station and an intercity highway connection'* (Civil servant, Stichtse Vecht). He does see that there is more power in the highway than in the station. The railway context shows that a sprinter is a type of train that stops at all the stations on its route. Sprinters are designed to travel shorter distances and have more stops at smaller stations as well. By stating that Breukelen has a sprinter station the civil servant explains that Breukelen is only part of the sprinter network. This makes it easy for people to travel to nearby cities, which is beneficial for daily commuters. However, intercity trains are designed to travel at high-speed and longer distances. The A2 is the most important highway in the Netherlands as it connects Amsterdam with Utrecht and from there to the rest of the country. This gives citizens a very wide range of places they can access in a certain amount of time. The combination of a sprinter station and an intercity highway means that there are different options provided for its users. However, the highway remains often the more efficient option. The highway and the station are located on the other side of the village of Breukelen, connected by a bridge (Breukelerbrug). The barrier of this single bridge close by limits the potential of the station area.

In figure 12 the area is shown that can be reached within 15 minutes from the station. This is also achievable by car and can be faster in some cases, but shows that within 15 minutes the whole village of Breukelen can reach the station. It can even be faster, since it isn't located on the edge of the lines. The smaller neighboring villages are also located within the red area of the 15 minute travel time.

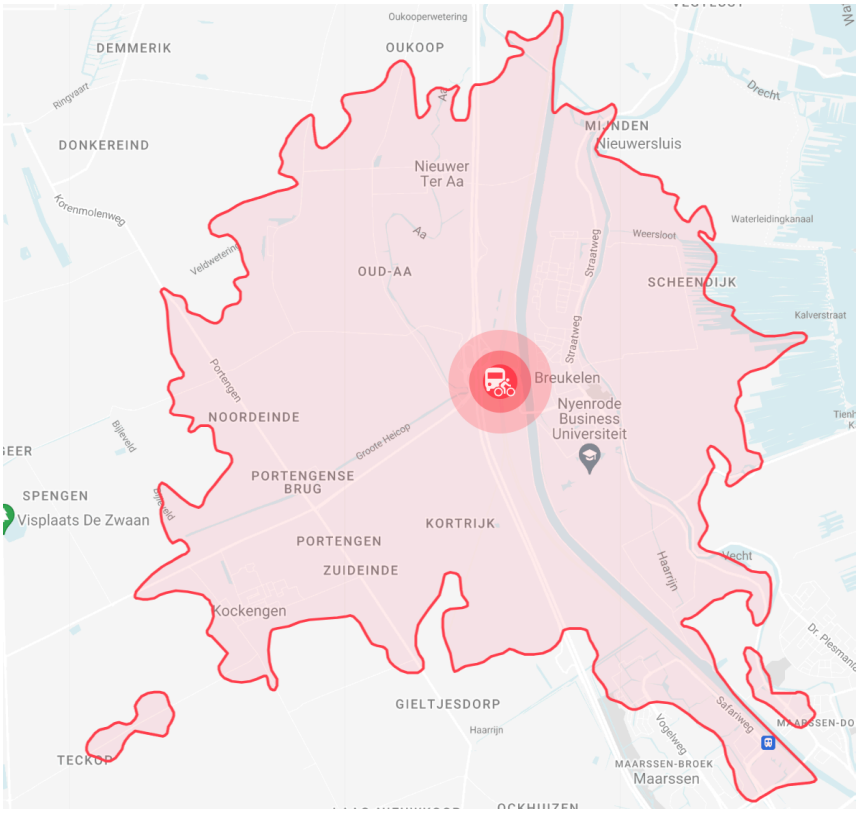

Figure 12: Distance traveled in 15 minutes by either bike or public transport from Breukelen (MapItOut, n.d.)

4.2.7 Influence on sustainable mobility

Influence on infrastructure and hub design

A problem, brought up by the council member at Stichtse Vecht, was the organizational integration of the bus and the train. He notes that it often happens that if people use the bus, they miss the train. There is no clear integration that the bus must arrive in time so people can transfer between these modes. The private modes (car and bike) aren't hindered by this as people are free to leave when they desire. Their obstruction is with the physical integration at the station. The civil servant and the council member note that there is no problem with that as the parking spots for cars and bikes are very close to the station and there are no physical obstructions on the route. It can hinder people that there aren't enough parking spots for cars available during working days so looking for a spot can cost some time. It can also be the deciding factor for car users to use the highway instead of the train station. There are ideas to improve facilities at the station for all modes to make sustainable mobility a better alternative to standard cars. The municipality states that equalizing the modes is the change that might bring sustainable mobility as an alternative. As the ideas are still in their developing phase, there are no concrete plans available.

Influence on public transport and active mobility

Closely related to the first point is the possibility of traveling with public transport and active mobility. Due to the hub design there are integrated facilities for the car, the bus and the bike. The combination of these three modes allows for diverse options. However, there is a hierarchy between

the modes. The car oriented municipality sees a priority position of the car as beneficial for the number of train users as well. It allows them to make car-train journeys if there are enough parking spots available. As a point of discussion on the extent of sustainability of this combination more focus should be on bus-train or bike-train journeys. The civil servant and the council member at Stichtse Vecht state that there is plenty of space to use the car. There are no high density areas or a lot of mixed land-use to necessitate the importance of public transport and active mobility. The components of transport governance have shown that there is not a clear advocate for these modes as a priority mode. They know that there must be more change in this pillar to accomplish a more sustainable society in their municipality. The problem is the lack of interest from the people on these chain journeys.

Influence on improvements of vehicles

As stated before, in the municipality electric vehicles are seen as the solution to tackle sustainable mobility. People don't want a modal shift towards public transport as the main mode of transportation. The civil servant at Stichtse Vecht states that there is already a group that uses electric vehicles or bikes in their daily life and the willingness of the municipality allows them to have these modes. The distances between places allow electric alternatives to replace the normal ones. He also states that only this pillar of sustainable mobility is not enough to tackle the problem, but it is what the people want to change. In their strategic document for the future of the station area it is stated that there is only one shared vehicle present. However, it is not stated that this number should be higher (Gemeente Stichtse Vecht, 2022). According to the civil servant and the council member at the municipality there is no incentive from the people to have these facilities. For them it is not a necessity to implement it if there is nobody that uses it regularly. People in the municipality are ready for a change, but it can't be found in shared mobility yet.

4.2.8 Case study Breukelen summary

For its region, Breukelen is the key node where various modes of transport are integrated to form a seamless journey. Car reduction doesn't appear in the municipal vision, even though the municipality attempted to push for sustainable mobility. Combining facilities is difficult if not impossible as either cars or sustainable mobility will be at the expense of the other (same space and users). The physical location of Breukelen, outside the village, reduces its accessibility. The fastest route to the station involves crossing the Amsterdam-Rijnkanaal via a bridge, since Breukelen is built along the Amsterdam-Rijnkanaal. Three main players (ProRail, NS and the municipality Stichtse Vecht) are responsible for the development and the management of the station. The other actors who often participate are local residents, entrepreneurs, the province, Rijkswaterstaat (national water authority), the regional water board, Syntus (public transportation company), the Cyclists' Union and ROVER (regional public transport users' council). For the municipality it is essential to balance the different interests. For example, increasing the availability of shared NS bikes and improving cycling facilities are ways to promote sustainable mobility. However, due to its car-centered policies and the mentality it isn't that easy. The municipality advocates for a car-train journey, whereas NS and ProRail argue that it is better to go for a bus-train journey. This reduces the usage of cars overall.

A new change around the station is the upcoming paid-parking that will be placed on all the parking spots around the station. There are different opinions on its impact. Some believe that there will be less cars because people will take the bus or bike, others think that people will use their car for the

entire journey and pass the station. The municipality wants people to keep using the station. Therefore, options are considered to have a few hours of free parking each day to balance it. The newly built parking garage was necessary to meet the demand. Especially users from nearby villages like Mijdrecht, Wilnis and Vinkeveen are contributing to the use of the current parking spots. For them Breukelen station is very convenient due to the free parking and the wide range of train connections.

The strategic location of Breukelen between Amsterdam and Utrecht highlights the need for coordination on sustainable mobility measures (Gemeente Stichtse Vecht, 2022). The introduction of paid-parking might push people away from the station, which can lead to an increase in congestion. A decline in train use can result in higher prices and less frequent trains. The province keeps promoting public transport as the solution, to reach the sustainability goals. However, the municipality keeps prioritizing the car due to the abundance of space. It reduces the need for sustainable and innovative initiatives. The proximity of the A2 highway is also influencing the choice-making. It can be seen as both a challenge and an opportunity. The highway is a convenient option, but policies in Amsterdam and Utrecht are restricting the car. This can encourage people to use the train more often.

With a parking standard of 2.1 parking spaces per dwelling, Stichtse Vecht remains a car-centered municipality. Therefore, the highway is such a convenient option as almost everyone owns and uses a car in and around Breukelen. There is no proactive approach to use more sustainable mobility, but rather a choice is offered for people to either use the train or the highway. The current car-centered mentality isn't beneficial for new sustainable initiatives. The municipality does improve all kinds of facilities for either bus, bike or car for its users. For people who use the train there are different modes to arrive at the station. There is some discussion on how sustainable the car-train journey is, but there is an agreement that it is more sustainable than only using the car. For the bike-train journey e-bikes can be very useful as it helps to cross the Breukelerbrug. It does show a mentality that convenience is rated higher than exercise, as the bridge can be challenging to overcome.

4.3 Case 2: Driebergen-Zeist

Figure 13: Aerial view of Driebergen-Zeist station (Arcadis, 2020)

The station area of Driebergen-Zeist is located in between the two municipalities Utrechtse Heuvelrug and Zeist. One of the vocal points in the vision by the municipalities (2014) is that the station serves as a node for people to transfer from one mode to another. The transferability of modes is facilitated by clear information and the low distances between the modes. Within one minute a traveler can reach the train platform from either the bus platforms or the underground bike garage (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2014). In this vision it was shown how the station area would be redeveloped. The first main improvement was the expansion from two to four tracks, which allows faster trains to pass each other. The second one was lowering the road that connects Zeist to the highway (A12). Before this improvement people could be waiting for 20 minutes around the station before they could reach the highway. The third improvement made was a new bus area that is separated from the train station and has clear distinctions and information displayed for its users. The fourth improvement was the new station building with underground and guarded bike garage. The amount of bike stalls was also increased to facilitate around 3000 bikes. The fifth and last main improvement was the new P+R that is located outside the station area and is able to serve 600 private vehicles. All these improvements made Driebergen-Zeist as it is now and how it is able to be part of the top 10 stations in the Netherlands (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2014; Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2023).

The municipality of Zeist (2021) states in their vision that Zeist is already growing in shares of sustainable mobility. However, sustainable mobility is mostly electric cars and shared vehicles in their perspective. For the bus, cycling and walking there are opportunities to make it more efficient. This is differentiated between social and physical elements. For social elements it is stated that employers must convince their employees to use more active mobility or the bus. Most of the commuter flows are less than 15 kilometers away, which allows for good bus connections and active mobility. The infrastructure for cycling and walking is sometimes lacking and not suitable enough to use. Improvements in the physical infrastructure can also contribute to a modal shift towards more sustainable mobility (Gemeente Zeist, 2021). The location in between Zeist and Driebergen results in a different mobility pattern. The amount of people that walk towards the station is very small as it is atleast a 15 minute walk from the closest edges of both villages. Therefore the walking facilities are suboptimal. This leaves more room for the other modes of transportation, such as bike roads and car

roads. In the plans made for the redevelopment, both municipalities agreed on the fact that walking wasn't one of their priority modes. However, the closely located business must be safe and convenient to walk for the train users (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2023).

4.3.1 Discourse

Problem definition

The Paris Agreement in 2015 resulted in a more active approach to reduce carbon emissions. Before this agreement, the plan was stated on how to redevelop Driebergen-Zeist. *'Fortunately, we have freedom to make our own choices. You can, however, make it attractive so that people can make other choices'* (Council member, Utrechtse Heuvelrug). The council member states that because of this change in mentality, sustainable mobility has been given much more attention. As a municipality it is their choice, or in the case of Driebergen-Zeist choices, on how to reduce emissions. The new redeveloped station aligns well with the idea of having more and better public transport connections, more space for cyclists and less attention for polluting vehicles. However, the expert at Fietsersbond notes that even though there are many promises to make the area sustainable, the main mode of transportation in this region remains the car. It isn't a city with limited space. There is space to use the car and between villages it is sometimes necessary to use the car. Even when the cycling facilities are good and the roads connect every part of the region to the main hubs.

The improvements of the bus and bike facilities enhances its competitiveness compared to the car. The P+R and kiss+ride facilities make sure that car users have facilities (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2014). For all users there are facilities provided. The freedom, noted by the council member at Utrechtse Heuvelrug, shows the reason why all facilities are important to provide. However, the P+R is currently under-serving as there aren't enough people who use it. If more houses or workspaces are built around the station, it can benefit the P+R and will be optimally used (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2023). The council member underscores that it is highly important to integrate the different modes with time schedules, which is only applicable for the integration of bus-train journeys. Recently, the expert at Fietsersbond discovered that the bike garage is integrated with the train system. *'The bike garage is operated by the NS, so it is connected to the first train, not the bus. Is it an NS station or a public transport hub'* (Expert at Fietsersbond). The bike garage opens before the first train arrives and closes after the last train leaves (05:45-01:20). However, the first buses depart before the bike garage opens. Cyclists have nowhere to park except some places around the station, where it is prohibited. Because the bike garage is operated by the NS, it is also connected to the train operated by the NS. She argues that Driebergen-Zeist is a node for different modes to connect and transfer between these modes. Except, when it isn't arranged with matching facilities. She believes that there is power in the bike and it should be seen more as the main mode of transportation.

Another problem at Driebergen-Zeist is the timetable of the trains. Each hour, except from rush hours, 4 trains arrive in either direction. Towards Arnhem and Nijmegen these trains arrive at .56, .01, .26 and .31. For Utrecht and Amsterdam the times are .59, .04, .29 and .34. This leaves a gap of 25 minutes with no train in either direction. If people happen to miss their train, the solution is either to wait 25/30 minutes for a new train in the right direction or take the bus. The bus, however, takes the same amount of time to get to Utrecht central or Ede-Wageningen as waiting at Driebergen-Zeist. The

reason that there isn't a more balanced timetable is due to the fact that the NS has to decide between Driebergen-Zeist and Veenendaal de Klomp. The train from Nijmegen in the direction of Amsterdam has a fixed schedule and can't take both of these stations as it will disrupt the whole timetable. Therefore, a decision was made that one train stops at Driebergen-Zeist and the other one stops at Veenendaal de Klomp. Veenendaal has two other stations, but they both are on a different line that only 'sprinter' trains take. Veenendaal de Klomp on the line between Driebergen-Zeist and Ede-Wageningen. If the NS would decide that this station shouldn't be stopped at, it becomes a vacant station. The council member of Utrechtse Heuvelrug believes that the loss of train travelers due to covid-19 has caused this gap of 25 minutes. Before the pandemic there were more trains and there wasn't such a big time gap. As the models state that in 2025 the number of train travelers is back to what it was, it will also cause more need for trains. The only thing the municipalities can do is to make the station as attractive as possible to use. In that case more people will use the station and the need will increase for more trains.

Belief systems

As one the best rewarded stations in the area, Driebergen-Zeist is serving as an example of how a station area can transform. The old station area was congested, unsafe and wasn't serving the amount of people it is now serving. To achieve this the actors have created a plan, where all the needs were combined and taken into account. It is the duty of the municipalities to offer different options to get to the station. The expert at NS agrees on this note. *'Driebergen-Zeist' is the textbook example of a multimodal node where different forms of public transport and chain services come together. In doing so, we give travelers as much choice as possible to make a sustainable journey'* (Expert at NS). It is mostly a transfer to the train, as that is the main purpose of the station. There are a few people who transfer to the different buses as it is also a hub for bus transport. The 26 hourly buses that arrive and depart ensure that the entire region has bus lines connected to this station. Some of the buses are also connected to other stations (Utrecht Central Station, Ede-Wageningen, Rhenen, Veenendaal, Hilversum and Amersfoort Central Station). A lot of surroundings that are either on the same train line or not, are connected by bus. From train station to train station it is faster to travel either directly or via Utrecht Central Station. However, the people in the area that is in the middle between those stations now have a choice in bus options. They can take different buses to arrive at different train lines, which ensures that their mobility options are increased.

In the vision of the municipalities (2014), they declare that sustainable mobility must have a priority position at the station. The facilities for sustainable mobility have a better location than the facilities for private vehicles (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2014). However, the civil servant and the council member at Utrechtse Heuvelrug don't agree with this. There isn't one priority mode right now, they state. On the other hand does the expert at Fietsersbond state that it is the car that has a priority position in this region. The municipality Zeist (2021) does state that their goal is to make all modes equally important. *'The position of the pedestrian, cyclist and public transport traveler becomes as important as that of the car. We invest primarily in infrastructure improvements for pedestrians, cyclists and public transport travelers'* (Gemeente Zeist, 2021). This statement is agreed upon by these respondents. The goal is to have a mobility network that works for all its users and not prioritizing one mode as priority. There is, however, the goal to use more public transport and active mobility. Nobody can be forced to use these modes, it is a choice of preference.

Approaches

The municipality Zeist (2021) states that to increase the amount of sustainable mobility it is vital to connect mobility policies with other policies. If businesses are located in the surroundings, the amount of cyclists and pedestrians will also increase. The need to use private vehicles on a daily basis to get to work is no longer necessary. With the use of the Trias Mobilica Zeist wants to reduce the pollution produced by cars and have an increase in more sustainable modes of transportation. On this note the municipality is also investing more in facilities and infrastructure for walking, cycling and public transport than private vehicles. For the sustainable mobility investments subsidies are received from the province and the government, which aids the municipality in its decision-making process (Gemeente Zeist, 2021). A key element in the policies by the municipalities of Zeist and Utrechtse Heuvelrug (2023) is how the current mobility systems must be protected as a first priority and from there trying to expand to further sustainable developments. It is stated that the bike lanes must be protected. However, no real expansions are planned around the station. The bike lanes around the newly redeveloped station are up to date according to the municipalities of Zeist and Utrechtse Heuvelrug (2023). However, the council member at Utrechtse Heuvelrug states that there are still improvements to be done to make cycling more attractive.

One of the ideas that he poses is a cycle highway between the campus of Wageningen and Utrecht (De Uithof). On this route there are almost no stops to create a smooth journey without interruptions. He also states the roads towards the station must be as efficient as possible. The traffic lights must not cause people to wait minutes before they can cross, road crossings must be absolutely necessary and the safety of the cyclists is very important. An idea to solve these issues at once, is the same as what they did to the station and the road, uneven levels for cars and bikes. By creating either a bicycle tunnel or a small bridge/elevation there is no need to stop at the traffic lights anymore. It will be more safe and people must know that their journey is without risks of getting into an accident. Otherwise other modes of transportation will be more attractive. At the station there is an indoor guarded bike garage that allows people to stall their bikes freely for 24 hours (€1.35 per day after 24 hours). Driebergen-Zeist is also the first station in the Netherlands to have shared e-bikes, provided by the NS. The pilot was successful, because the Utrechtse Heuvelrug is a desired destination for its nature and no other station nearby could host these e-bikes. The intercity-status that Driebergen-Zeist holds is also helping in their sustainable pursuit. This status ensures that the connectivity with either the east of the Netherlands (Arnhem and Nijmegen) and with the west (Amsterdam) is improved by direct trains that travel at high speed and don't stop at every small station. It also means that there is less need to transfer trains as intercity trains only stop at the most relevant stations in their journey. Comfort is one of the components in which the car is ahead of public transport. Transferring between modes is reducing the comfort of that journey. Therefore, less transfers equals more comfort.

4.3.2 Actors

Actor constellation

The four main actors who played a role in the redevelopment of Driebergen-Zeist are the NS, ProRail, the municipality Zeist and the municipality Utrechtse Heuvelrug. The physical location of the station area necessitates cooperation between the two municipalities. The station area is located at the border of each municipality and makes them co-owners of the area. Apart from these four main actors there

are more actors involved. These include the contractor responsible for the construction work, ROVER, Fietsersbond, Veilig Verkeer Nederland (an organization focused on traffic safety), the regional water board, Rijkswaterstaat and the province of Utrecht. Additionally, local landowners, environmental groups, local citizens, local public transport operators and businesses are involved. These were the most active groups now and some also during the planning phase of the redevelopment. The goal was to gain insights into what people thought of the station and listen to the different interest groups. However, the interests can conflict as there is limited space and funds available. The experts at ROVER and Fietsersbond agree that the municipalities were and are very willing to listen to input from other organizations.

Interaction patterns

The limited space available for planning new facilities at Driebergen-Zeist station has led to ongoing discussions about prioritizing facilities. The redesigned station now has several facilities aimed at accommodating all users. This combination ensures the station remains accessible and attractive to users of different transportation modes. However, because the station is situated between two villages, the walking infrastructure has seen minimal changes from its pre-renovation state. The civil servant at Utrechtse Heuvelrug highlights that the concept of redesigning the station area has existed since the previous century. However, the pressure was never enough to actually start this redevelopment. Increasing congestion and safety concerns caused by the road crossing the railway tracks ultimately created enough pressure to start the redevelopment. The main reason was to separate the road and railway tracks to improve traffic flow and safety. All the respondents at Driebergen-Zeist express satisfaction with the current development of the station. There are, however, two points of discussion noted.

A significant point of discussion revolves around the sustainability of the car-train journey, which is the same as in Breukelen. The investments made by the government to create a P+R facility is seen as a very sustainable solution. The civil servant and the council member at Utrechtse Heuvelrug argue that this facility causes people to rethink their journey as car users. There is now an alternative to use the car and for the second part the train. He does state that for the real ‘diehard’ car users this facility isn’t going to change their mind, since they have already decided that they only want to use the car. There are, however, people who are somewhat in between groups and aren’t always making the same chain journey. Sometimes it suits them more to use the train and sometimes the car. It all depends on their preference day-to-day. The goal, stated by NS, is to have as many train kilometers as possible and to reduce the number of kilometers by car. *‘It was taken into account in the creation of a P+R near the station, with the aim of enticing people to travel part of the way by train’* (Expert at NS). The expert at NS and the council member at Utrechtse Heuvelrug state that the presence of the P+R facility helps in that matter, as it gives people a choice. The A12 highway close to the station is also an alternative for people. For car users the choice is either a chain journey or the entire journey by car. The presence of this highway makes it harder for the car-train journey to compete, as it is very compelling to use the highway due to its efficiency and comfort. The expert at NS underscores that the highway isn’t only an issue, but due to the highway the P+R can also attract more people who are passing by with their cars.

The other point of opposite opinions is the preference for bikes or buses as the primary mode of transportation to the station. The expert at Fietsersbond argues that people should use the bike as a

mode of transportation towards the station. On the other hand does the expert at ROVER state that bikes take up too much space and more people should use the bus. He states that it isn't taking up any space, since it isn't a personal vehicle. The limited amount of space around the station shouldn't be used by personal vehicles, at least there should be more focus on buses. The new station area has an indoor parking garage for 3000 bicycles. The expert at Fietsersbond argues that this is both a good and a bad result. *'Back then you could park your bike for nothing. Now you can only do it for 24 hours'* (Expert at Fietsersbond). However, the bike stalls weren't indoor and it was much more chaotic. With the new garage people might not want to have a bicycle purely for traveling to the station and back and stall it there. Especially for younger people the result tends to be that they get picked up by car from the station. That is also an unwanted result from a new bike garage.

4.3.3 Resources

Financial capacity

The municipalities wanted to make the station area a frontrunner in sustainability. However, this ambition comes with significant costs. The goal to reduce emissions with a brand new station that uses a lot of sustainable materials and sustainable mobility ensures their position. The investments done weren't only done by the municipalities. The council member at Utrechtse Heuvelrug states that a large portion of the costs were covered by the government (±50%) and the other part by regional governmental bodies (±50%). There were other investors involved as well, however the 50/50 split is a rough sketch. The expert at NS points out that because of these financial contributions of actors, they can influence the decision-making process. *'In the first place, municipalities can look for government grants or subsidies from other governments. There may be specific plans or projects in area development for which grants can be provided'* (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2014). The P+R facility is an example of these funds. Additionally, investments in sustainable mobility were a priority in this project. It shows a shared commitment to ensure more sustainable mobility in the region. Which also aligns with the overarching sustainability goals. By making Driebergen-Zeist a frontrunner on sustainability, examples can be taken from this station and applied elsewhere. It will be a prime example of how sustainable stations can be in the future.

If the municipalities want to have more buses to ensure that less people take the car entirely or the car to the station, investments must be made. The council member at Utrechtse Heuvelrug adds to this that there are still people who live approximately 10 minutes away from a bus stop. If the municipalities decide that it is worth the financial costs to have extra buses, these people have access to more options. It can either be more buses on the same line or a new/detour line that serves those people better. Of course, there must be knowledge in advance of the willingness of those people to actually use the bus as mode of transportation. The municipalities can run a pilot programme in which they try new lines or detours to see the effect it has on the mobility choices.

Technological capacity

A point of critique for the station is the absence of facilities for electric buses. During the planning phase of the redevelopment, there was no urgency for electric vehicle infrastructure. Therefore, the station lacks these facilities for electric buses nowadays. The goal to electrify the entire bus fleet demands matching facilities at stations to ensure this goal is possible. The electric buses require

charging stations so they can continue their routes throughout the day. Because the daily distances are too long to travel with a charging stop, there is a need to build these stops at hubs. Driebergen-Zeist is a key node, where a charging stop could be placed. It isn't an issue at the time being as there are still a lot of diesel buses active. However, in the future when all buses have to be electric it might become a problem.

There is also an initiative posed by the municipality of Zeist to invest in special traffic lights. *'We look not only at roads but also at technological developments such as traffic lights that give priority to cyclists'* (Gemeente Zeist, 2021). This is not possible at every place around the station. One of the main reasons to redevelop the station area was the traffic jams that were created by the constant barriers for the passing trains. If the traffic lights for the cars were deteriorated, it wouldn't benefit the flow. On the other hand, due to the road and the tracks being on different levels, there wouldn't be any delay. Around the station there are crossings from either Zeist or Driebergen, where cyclists have to cross the road to get to the station. It is a trade-off that the municipalities have to make, in order to decide what has their priority and if it is worth installing.

4.3.4 Rules of the game

The physical location of Driebergen-Zeist needs clear collaboration between the municipality Zeist and Utrechtse Heuvelrug. As co-workers and partly owners, the plans must be discussed together. The council member at Utrechtse Heuvelrug states that at first the councils of both municipalities get together with their own council members. Then a meeting with both councils is organized to discuss all the points. After this both councils return with their own council members and they make a decision. It can happen that both municipalities have a different vote. In that case the municipalities must come together again and discuss, since a majority vote is necessary in both municipalities. He states that it is important to communicate between college and the council in the municipalities. If the communication is clear and the plans are already discussed with the council at first, they are much more willing to accept it. There are also provincial and national interests within these projects. With financial compensation these interests become reality. An example is the new P+R that was financed by governmental funds. For the municipalities it was important that it would fit in with the rest of the area. Therefore, a wooden exterior design was used to make it fit in.

At the preparation phase of the plan, some preconditions were stated which was important to take into account with this project. Sustainability became one of the most important preconditions. The location of the station between green areas, such as the estate of 'De Breul' and the estate 'De Reehorst', which was designed to be as sustainable as possible. The plans tried to fit the new station in with the surroundings, which was important for both municipalities. Both the civil servant and the council member at Utrechtse Heuvelrug agree on the fact that the station area fits in with its surroundings. There is, however, discussion on the presence of the car dealership and a gas station close to the station. According to the civil servant at Utrechtse Heuvelrug, this type of thinking doesn't belong with the new idea of creating a liveable environment around the station for people. This area is perfect for a new group of people, who rely on public transport as their main mode of transportation. Living next to a station has the advantage that there is no need to transfer. However, right behind the station is also the A12 highway. There is still a choice for people to make what is more important. It depends on the target audience that is desired to live there.

In Breukelen, neighboring policies from both Utrecht and Amsterdam influence the use of the station, for Driebergen-Zeist it is only Utrecht. *'In Utrecht, they are going to introduce paid-parking throughout the city. That is a tool to influence car use. This can also influence the transport choices of the inhabitants of our municipality'* (Civil servant, Utrechtse Heuvelrug). In Utrecht the city center is already off limits for certain cars, paid-parking is introduced and there are ideas to make the whole center car-free. All these ideas are contributing to the liveability of the city center and will find other uses for the parking spaces that are now occupied by cars. These policies influence Driebergen-Zeist as paid-parking might keep the car users away from Utrecht. As one of the key nodes around Utrecht, Driebergen-Zeist also serves as a place where people can go to and take the train to the city. The presence of the new P+R and bike garage are facilities that support this claim.

4.3.5 Social environment

The car remains the dominant mode of transportation in both municipalities. People know that climate change is an issue and that we have to look out for what we emit. *'We aren't really encouraging that yet. We are working on a new policy. It should be included in that, but at the moment there is no obstacle to using a normal car'* (Civil servant, Utrechtse Heuvelrug). The civil servant shows the mentality that rules in the municipalities and the surrounding area. For their municipality there are new policies being made. However, he strongly suggests that encouraging people to use public transport and active mobility more as mode of transportation.

Even in the mobility vision posed by the municipality Zeist (2021) it is stated that a lot of the mobility is now done by car. Their destinations are often within a 15 kilometer range. This relatively small area poses possibilities for public transport and cycling as alternatives. Their idea is that employers must convince their employees to use these alternative modes. How this is going to happen isn't mentioned by the municipality. The expert at Fietsersbond underscores that shared NS e-bikes from Driebergen-Zeist are used for small distances. As mentioned before, Driebergen-Zeist is the first station to deploy e-bikes from their NS bike garage. However, the average distance that people use these bikes for is around 8 kilometers. It is a costly alternative to the normal bikes. Employers compensate their employees for their travels, so the costs can be redirected to them. For leisure purposes it is still costly. She states that even though people should cycle more, this isn't the right way. Which agrees with the expert at ROVER his arguments that cycling nowadays is made so easy that people don't even have to pedal.

4.3.6 Physical environment

The differences in distances towards the station require different mobility options for people. The civil servant at Utrechtse Heuvelrug and the expert at NS argue that because people have different needs due to their physical location. It is important to have these needs met in the station area. By improving the facilities for either car and bike parking, the different mobility modes can all use the station as part of their chain journey. The first and last mile is often the most unsustainable part of the journey. If the entire journey is done by car, there wouldn't be a first and last mile. Additionally, there are areas that are underserved by public transport and might find more efficiency and comfort in the car, either as an entire journey or as the first mile to the station. The nearby A12 highway contributes to the share of car users. Before the renovations the entrance to the highway would be blocked by all the passing trains. Nowadays, there is much more traffic flow around the station. The presence can either be

beneficial or not for the number of train users. Traffic jams can make people reconsider their car journey and help convince them to take the train. On the other hand can it also encourage people to take the car if they are in a hurry and there are no traffic jams.

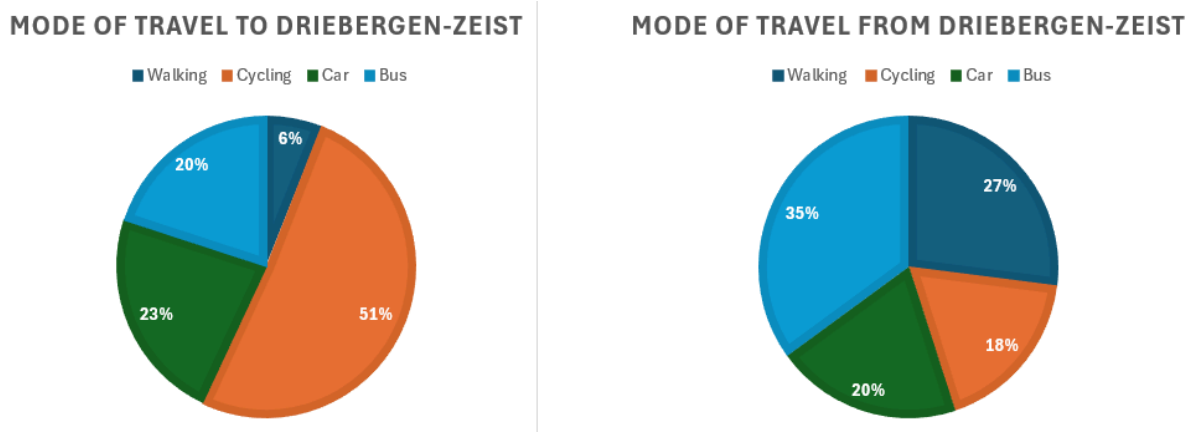

Figure 14: mode of travel towards and away from Driebergen-Zeist station (Gemeente Zeist, 2021)

Figure 14 shows the mode of transportation of travelers that use Driebergen-Zeist in their mobility chain. Noticeable is that more than half the users use the bike as mode to reach the station, with respectively 20% for the bus and 23% for the car. The people who live around Driebergen-Zeist own a bike and using the bike will give them the freedom to move freely when it suits them. Therefore, more than half of the transport towards Driebergen-Zeist is done by bike (Gemeente Zeist, 2021). The people that arrive at Driebergen-Zeist from other destinations see a different balance. The first big change is the share of people that walk as transportation mode from the station. Due to the surrounding office buildings around the station the employees don't necessarily have to live in or around Zeist. The good train connections with the whole country allows them to reach their work at relative ease (Gemeente Zeist, 2021). The bike share is 18%, which is due to the fact that most people don't own a bike since it isn't their hometown closeby. The share of bus users has increased to 35%. The connections with the surrounding cities and villages allows Driebergen-Zeist to play the role of a hub that connects all these places to the station with bus lines. The car use is more or less the same between the two balances.

In the map below (figure 15) the distance is shown that can be reached with a 15 minute travel time either by bike or public transport. The majority of Zeist can reach the station within 15 minutes and Driebergen and Odijk are fully reachable within 15 minutes. The bus lines and cycling connections cover a large area, with a lot of people in it. Bunnik is also mapped within the 15 minute border. However, this is due to its train connection with Driebergen-Zeist.

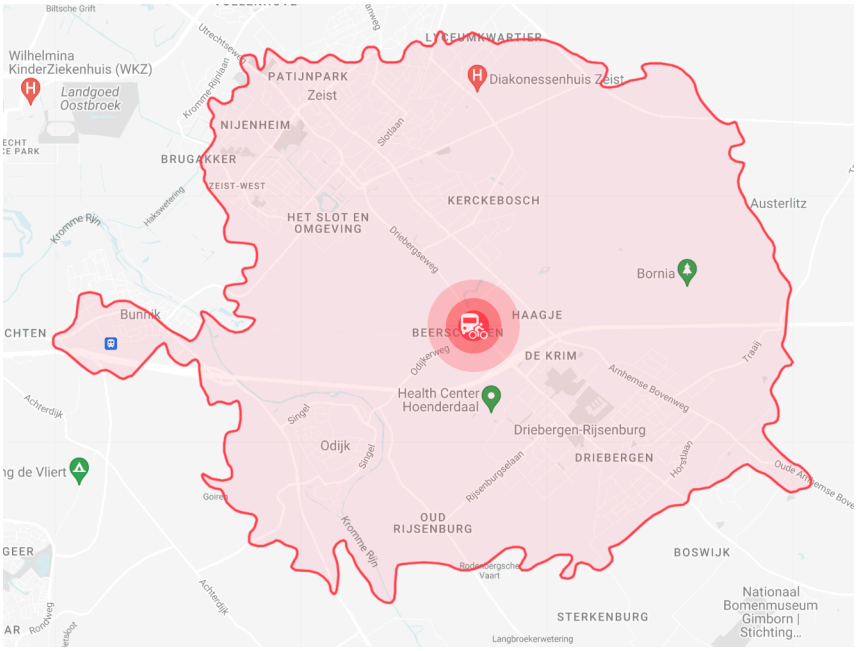

Figure 15: Distance traveled in 15 minutes by either bike or public transport from Driebergen-Zeist (MapItOut, n.d.)

4.3.7 Influence transport governance on sustainable mobility

Influence on infrastructure and hub design

The redevelopment of the station has increased the facilities for all modes. The indoor bike garage has improved the possibility for bike users, the increase in total buses has made it more efficient to use and lowering the road has made car-use also more efficient. Not only as a mode to get to the station, but as a mode to get to the highway. There are no long waiting times to cross the tracks anymore. There are plenty of parking spots for bikes and cars at the station. It was a focus in the redevelopment to have diverse facilities, states the civil servant at Utrechtse Heuvelrug. The location of the station between the two villages of Driebergen and Zeist shows only long straight roads close to the station without many stops. It allows the users of the station to continue their route without many interruptions. The civil servant and the council member at Utrechtse Heuvelrug state that it is their goal to make it as smooth as possible so people are not interrupted a lot as it reduces the efficiency and convenience of their journey.

Influence on public transport and active mobility

The 26 hourly buses at Driebergen-Zeist allow for a lot of people to arrive and leave Driebergen-Zeist around the times that the trains arrive. The problem with this is the short range that trains arrive. The 5-minute window of the trains makes a lot of buses not well fit for the trains. Long waiting times before or after trains arrive at the station are the result of this small window. There is not yet an idea to revert the changes of having only trains at a small interval. The first priority is to have enough train-users as it was before the covid-19 pandemic. Even though the car is still the priority mode around Driebergen-Zeist, public transport and active mobility are rising in popularity. The redeveloped station was partially causing this new change in popularity. The location between villages

highlights that there is no high density and that different modes can be used, which is not limited by a lack of space.

Influence on improvements of vehicles

New solutions like shared mobility and electric vehicles are also on the rise in both municipalities. At the moment that the station was being redeveloped, these solutions weren't as prominent as they are now. The P+R facility now hosts a few shared vehicles and charging points for electric vehicles (Gemeente Zeist & Gemeente Utrechtse Heuvelrug, 2023). A few vehicles are enough to satisfy the needs of the people who use shared vehicles, more are not needed. However, the municipality of Zeist (2021) has stated that shared vehicles are on the rise in their municipality and there should be more focus on how to accommodate them. Electric vehicles are also on the rise. People around Driebergen-Zeist want the comfort of a private vehicle and the freedom to move without fixed timetables. They do want to change their vehicle to electric vehicles, either for the environment or because it is deductible and thus cheaper than conventional cars. The reasoning can differ, but the result is the same. To ensure that this change towards electric vehicles is going smoothly, the municipalities have to place enough charging points. At the P+R there are only a few charging points, which should be higher according to the respondents.

4.3.8 Case study Driebergen-Zeist summary

The station area of Driebergen-Zeist is located on the border of the municipalities of Zeist and Utrechtse Heuvelrug. They emphasized that this station area had a connecting role for the region as a node for different transportation modes. The recent redevelopment consisted of the following improvements: an increase from two to four tracks so trains could pass, the road was lowered to reduce congestion, a new bus area, a new indoor bike garage with room for 3000 bikes and a new P+R facility for 600 private vehicles. They are still aiming to improve facilities for the bus and bike to support more sustainable transportation options. Various actors played a role in the redevelopment, including NS, ProRail, the municipalities of Zeist and Utrechtse Heuvelrug, contractors, ROVER, Fietsersbond, Veilig Verkeer Nederland, the regional water board, Rijkswaterstaat, the province of Utrecht, local landowners, environmental groups, local citizens and businesses, public transport operators and a group representing the elderly.

With the new station faster transfer options are possible, which is essential for the success of sustainable mobility. Fewer transfers leads to greater comfort, which can encourage people to use the bus and station. However, there are areas underserved by public transport in the region. These people need an extra mode of transportation to get to the bus stop, if that is their preferred journey. It is important that the municipality offers an alternative to the car in terms of efficiency, costs and comfort. The 'first and last mile' are often seen as the least sustainable part of the journey as it can require the need for a car. In these areas there is more usage of cars as it offers more efficiency and comfort. Investments in better bus routes and additional facilities might encourage these people to reconsider their mobility behavior.

The redevelopment of Driebergen-Zeist station into a leading sustainable transportation hub involves substantial costs, primarily funded by the government (±50%) and regional authorities (±50%). This shared financial responsibility affects decision-making processes. One of the main investments done

with governmental subsidies is the P+R facility. The collaboration between all the governmental bodies and their interests was an essential part for this project. The different interests were all met in different facilities. The sustainability goals were met and fitting the station in with its nature-historic surroundings was also done.

Even though public transport and cycling are necessary to reach the climate goals, the region remains car-dependent. The accompanying facilities help with this integration, as it allows for smooth transfers from either car, bus or bike. There is, however, a 25-minute gap in the train timetable. This gap is present to either Utrecht or Nijmegen. This poses a challenge for commuters. Privately owned transport modes (car and bike) can be more attractive, due to its freedom. However, the A12 highway is an alternative for the car users as it is often more efficient and comfortable than a journey by train. To capture this share of people, investments were done in the P+R facility. It helps that Driebergen-Zeist has the status of an intercity station, reducing the need for additional transfers. It also allows for either high speed travel further away or nearby stations. The possibilities are wide and makes it more efficient in its use.

5. Conclusion

This research studies the integration of sustainable mobility at the stations of Breukelen and Driebergen-Zeist. The interpretivist philosophy notes that people are different due to their culture, habits and ethics. They are formed by their past and their interactions with others, not everyone is the same. The answers that people give are based on what they see and know. The researcher must find meaning in the answers given and make usable data out of it (Bryman, 2016). Therefore, a strategy was adopted that could compare Breukelen and Driebergen-Zeist in such a way that there is room for respondents to answer the questions based on their background. A comparative case study allows this, as there is a lot of room for context-specific information. The combination of this research philosophy and strategy makes this research more designed to give information on the comparison and not to generalize it to other cases. Through a combination of mainly policy documents and interviews the data was gathered. This data led to answering to following research question:

'How does the interaction of the five dimensions of transport governance and the physical environment influence sustainable mobility integration in the stations of Breukelen and Driebergen-Zeist?'

Breukelen

The design of the station hub Breukelen shows a strong interest in car related facilities. The newly built parking garage ensures the truth of this statement. Within transport governance the biggest influence on the design of the hub are coming from the discourse and the resources. The dominant mentality at Breukelen remains car oriented. Therefore, possible funds to aid more sustainable forms of mobility are often neglected. The limited resources are spent to accommodate more cars. The amount of space and distances makes the car an ideal mode of transportation in this region. A result of this is a lack of proactive thinking for new sustainable mobility solutions and alternatives.

The presence of public transport and active mobility should be more at the station, according to the civil servant and the council member at Stichtse Vecht. It is stated that it would benefit the station to have more efficient alternatives to the car. The actor dimension shows strong advocates for public transport and active mobility. However, some physicalities hinder further use of these modes. The Amsterdam-rijnkanaal is a natural blockade where only one bridge (Breukelerbrug) brings people to the station. All the small villages connected to the station are not used enough to be seen as sufficient for local bus operators. They need investments to keep these lines active as they cost the operators money. The municipality is demand-driven and sustainable mobility is not yet a topic of interest.

The improvement of vehicles is divided between electric and shared vehicles. Whereas shared vehicles are not finding any ground at the station, electric vehicles are a new trend. For buses a precondition is made to have all the buses 100% electric by 2030, which is stated by the rules of the game. The personal use of electric vehicles is mostly influenced by the social environment, with a slight influence of the physical environment as well. People in Breukelen are used to owning a car and the abundance of space allows them to have a car. These electric vehicles are subsidized so owning one has fiscal advantages as well. The civil servant and the council member at Stichtse Vecht note that this share of sustainable mobility has the strongest growth factor at the time, as it allows people to keep a car and still be sustainable.

Driebergen-Zeist

At the redevelopment a lot of resources were used from higher governmental bodies. The investments made all contributed to parts of the new station, not only for parts that include sustainable mobility. The rules of the game stated that the redevelopment must have a sustainable outcome and fit it with the surroundings. Since funds from higher governmental bodies were used, it became a precondition. It became a station where the facilities for the bus and the bike became equal to the car, according to the civil servant and the council member at Utrechtse Heuvelrug. The discourse for a better station that serves all modes of transportation and the availability of the required funds were a combination that resulted in the new Driebergen-Zeist station.

The number of buses that stop at the station has been noted to be very effective by all the municipal employees and the experts, with only a note that mostly the furthest bus stops are used. The increased distance between the bus and the train is not beneficial for smooth and efficient transfers. The actor dimension shows different opinions on what the frontrunner of sustainable mobility should be, the bus or the bike. The opposing views state that both methods are sustainable, but preferences cause them to oppose. The smaller villages have the same issue as at Breukelen station. This physicality has as result that there are more car users from these areas, due to a lack of adequate bus connections. The buses that are now operating can't all be connected to the trains as there is an interval of 2 x 5 minutes every hour in either direction, which makes it not feasible to have all the buses connected to the trains.

The interest in shared vehicles around Driebergen-Zeist has proven to be a bit similar to the case of Breukelen. The difference is that shared vehicles (NS bikes) are used a lot at Driebergen-Zeist. The social environment of Driebergen-Zeist stated the importance of the shared bikes as it helps with the last mile of people. Due to the indoor guarded garage it doesn't take as much space as the lockers at Breukelen. The resource dimension has been effective to improve the fleet of shared bikes. Electric vehicles, on the other hand, are also increasingly used. By stimulating people to change standard vehicles to electric vehicles a bigger share is present. However, the P+R at the station is not growing with the same growth of electric vehicles. With only a few charging points it is not sufficient to cope with this growth.

Concluded

At Driebergen-Zeist the combination of a shared mentality and the presence of necessary funds were the cause of the decision to redevelop the station. It was such a pressing matter to improve the area that it couldn't be delayed any longer. Within the transport governance of Driebergen-Zeist the most notable elements to interact are the discourse and the resources. As one of these dimensions combined are necessary to cause a change. The actor dimension and the social environment are deciding how to implement these changes to make it suitable. Whereas the rules of the game give some preconditions for the projects to work with. It is not something to change, but necessary to implement.

Breukelen is currently in a loop. People don't acknowledge the importance of sustainable mobility as a mode to travel to the station, it is not attractive and efficient enough to use. Therefore, possible funds are not used to improve these modes. In turn it results in more hierarchy of modes, with the car as the main mode of transportation. Sustainable mobility isn't able to compete with the car at the time. Because the car is more efficient and attractive to use, people will continue the cycle and keep using

the car. To make a change this loop must be broken. Either by changing the mentality within the municipality or by investing in sustainable (pilot) programmes.

6. Discussion

The last chapter of this research will start by stating how the findings are linked to the literature review. Then the limitations of this research are explained. By stating two limitations for this research, it might help to provide more context for the findings and make it more credible. After the limitations, three recommendations are made for future research.

6.1 Discussion

Walker (2008) states that limited funds results in a choice-making process. Policy makers must decide what elements are most valuable to implement at a time. In Breukelen the mentality was to maintain the status of the car. The nearby A2 highway makes the car alternative very practical and easy to use. The efficiency gained by car is a reason for the municipality Stichtse Vecht to keep the same pathway of maintaining car use. The interviewees, working at Stichtse Vecht, had a different view on a preferred mentality. Although they knew that the car was and is the focus of the region, they state possibilities that could work in the future. The choice had to be made to either improve car facilities or cycling facilities. The five elements of transport governance, posed by Van Tatenhove et al. (2000) and Campisi et al. (2020), interacted in Breukelen which remains a car oriented municipality. However, these interactions have shown that there are needs to improve the station and the sustainable mobility facilities to get to the station. At this hub it should be possible to transfer easily between modes. The ideal of having a hub that allows these transfers, especially public transport transfers, is that there is an increase of public transport use (Gallo & Marinelli, 2020). The negative elements of public transport, compared to the car, are reduced to make it more attractive. Improving sustainable mobility and decreasing the car benefits are both factors to influence the mobility system. In the Netherlands this is managed by the municipalities, who operate within the frameworks of the higher governmental bodies. The municipality can set their focus on improving sustainable mobility.

The focus of Breukelen is not yet at the level to fully implement a lot of sustainable mobility measures. There are bike and bus facilities, but the infrastructure is underdeveloped. Breukelen and its citizens mainly focus on one element of sustainable mobility, electric vehicles. The physical environment of the municipality can necessitate car ownership and use. If these people use electric vehicles instead of normal vehicles, it is seen as a change in the right direction. The discourse element is highly influential in the pathway that Breukelen has taken. It is an old station so the car focussed infrastructure can be explained by the fact that the car was the dominant mode of transportation at that time. To create effective governance collaboration is necessary. For the station area local parties aren't in favor of sustainable initiatives as it collides with the needs of the citizens that elected them. The transformation table by Loo and Tsoi (2018) shows no activity on the regional and neighborhood scale for either city, modal-split or lifestyle transformations (figure 2). There is no development that is specifically enhancing sustainable mobility. It could be done by improving infrastructure, existing networks or facilities, but the results show that there is a lack of funding for these improvements. The lifestyle part that requires a campaign to promote the benefits of sustainable and active mobility also finds no ground in the municipality Stichtse Vecht. Additionally, people state that the car-train journey is sustainable. It is a personal matter to what extent it is sustainable. The individual lifestyle box states that people should make sustainable travel choices. Resulting in a choice for people to make if they want to be sustainable on that aspect.

In Driebergen Zeist the transformation table by Loo and Tsoi (2018) shows different points of activity (figure 2). While the employees at the municipality Utrechtse Heuvelrug state that there is no active policy that pushes people to use active mobility, the mobility vision of the municipality of Zeist (2021) states that they are actively trying to get people to use buses and bikes. The most important element is using public transport and active mobility in daily life. It is both something that the municipality can back up by enhancing these modes and it is something that can be done on an individual level (Gemeente Zeist, 2021). In correlation with the ideals of the municipality of Zeist (2021) to get more people to use sustainable mobility are the ideals of Yuan et al. (2018) and Conticelli et al. (2021). They agree that more facilities for sustainable mobility, like bus stops, bike stalls, less traffic lights and good infrastructure will increase the use of these modes. The attractiveness of sustainable mobility must be a priority to improve to make a change. For the municipalities and the government as co-investors the project must be worth the costs. For a large project such as this redevelopment the governance had to work to ensure its success (Rodrigue et al., 2020).

These possibilities are only met if the station hub is used by a lot of people. Therefore, all the facilities have seen improvements. Not only for sustainable mobility, but also for car users. The car-train journey must be seen as an alternative for people who only use the car (Yang, 2021). The more opposing stance of Nello-Deakin and te Brömmelstroet (2021) to banish cars finds no ground at this project. The civil servant and the council member agree that for a group a car-train journey is the most sustainable possibility that can happen. It is not wise to discard that group. Therefore, the redevelopment of the station has improved facilities for cars, public transport and active mobility. The transport governance has taken a stagnant stance in sustainable mobility thinking. Now that these modes have corresponding facilities at the station the need for further improvements seems not necessary. According to the municipal employees at Utrechtse Heuvelrug and the experts, the municipalities of Zeist and Utrechtse Heuvelrug remain car oriented. It would be beneficial for sustainable mobility and accessibility if the station hub and its facilities and infrastructure receive more attention. Hamersma and de Haas (2020) and Rijksoverheid (2023) state that at a place like Driebergen-Zeist connections must be made with the region. It is the point where people from the surrounding villages can come and transfer to either Arnhem and Nijmegen or Utrecht and Amsterdam, Driebergen-Zeist offers a wide range of possibilities. These connections ensure that chain journeys are seamlessly integrated, which allows these travelers to be more efficient with their time.

6.2 Limitations

Normally, a few limitations were discovered during this research. By stating the limitations, future researchers might learn from this and find solutions beforehand. The first limitation is regarding the interviews. A comparative case study concerns two or more cases for the researcher to compare. This can be done with different forms of data collection. In this research respondents were interviewed based on their relation with the station area and sustainable mobility. For both cases people were contacted at the same position to create a comparison based on equal experiences. However, there couldn’t be a comparison for all the respondents. The civil servants and council members of Breukelen and Driebergen-Zeist did respond, but there were no responses from the Fietsersbond and the NS in Breukelen. The respondents for the cases didn’t all have the same background, but through the interpretivist approach all the data was usable. It only helps to understand the reasoning behind the arguments given. During the last interviews I kept receiving a lot of the same overlapping data with

other interviews. At that time it was acknowledged that new interviews would not necessarily provide a lot of new data for this research.

The second limitation is on the phase of development of both cases. While Driebergen-Zeist has recently been redeveloped, Breukelen only did a strategic exploration of the station area and how it could be redeveloped. The difference in phases can influence the data. Therefore, the strategic exploration has been seen as a real possibility on how the future of Breukelen can look like. In the methodology of this research the reasoning is stated as to why Breukelen and Driebergen-Zeist are comparable. The stations are comparable in the amount of users and trains, where Driebergen-Zeist is a bit bigger than Breukelen in use. The difference in phases is not just a limitation but also an essential aspect of the study, as it allows for the extraction of lessons and insights from one case to inform the other. If both stations were in the same phase of development, the opportunity for Breukelen to learn from Driebergen-Zeist's experiences would be lost. By examining a station that has already undergone redevelopment alongside one that is still planning its future, this research aims to identify successful strategies, potential pitfalls and best practices that can guide Breukelen in its forthcoming redevelopment efforts.

6.3 Recommendations

As mentioned in the limitations, for directly related future research more cases can be selected to examine. Future researchers should consider using the theoretical framework and method explored in this study for a similar setting. Thus, the context-dependency of this type of research points to the increased value that can be derived from analyzing more cases. By using the theoretical framework, 'Policy Arrangement Approach' and 'Mobility Measures Strategies,' in different contexts, one can understand how mobility policies transform in various circumstances. This approach enables the researchers to look at the policy elements as being in a system so that they understand all the relations that exist. Through the comparison of multiple cases, the authors are able to recognize general trends, differences and similarities in how various municipalities or regions conceive and address mobility issues and opportunities. Specifically, the future research can be devoted to how various cases were able to align policy arrangements with mobility measures. Knowledge of these relations can help to reveal the conditions that promote effective policy implementation and the challenges which slow the process down. Moreover, future research should ideally use other various cases. This would include merging different studies to establish a bigger view of the way in which the mobility policies are affected by the local, regional and national interaction. It would be beneficial for future research to examine how mobility policies change and transform in different cases. It allows the researcher to propose different strategies on how to improve the transport system. It might be taken to an extent that it will generate effective strategies and policies that can be applied suitably to the different contexts of the different municipalities.

Breukelen and Driebergen-Zeist are currently in the process of developing new urban plans for the neighborhoods surrounding the train station. These neighborhoods will be established to increase train usage, but the major highways (A2 for Breukelen and A12 for Driebergen-Zeist) closeby gives the people other means of transportation. Because both of these projects are still at a conceptual level, a discussion of how each mobility culture contributes to the overall layout and use of the neighborhood would be informative. The type of research that could be conducted is how the current transport pattern and use in each of the municipalities influences their development plan. For instance, in

Breukelen itself, there is the influence of A2 highway which could influence the planners to incorporate car oriented elements along with the train oriented facilities. Likewise in Driebergen-Zeist, the A12 may sway the design to enable not only the driver, but the train commuter as well. It could show how local authorities address the requirements of various passengers and what kinds of concessions or improvements result from it. Besides, this comparison could be useful in obtaining information on how to design the integrated and versatile urban environment that fits different transport requirements.

A last point of future recommendations is on the involvement of higher governmental bodies. These bodies mainly worked as funders and expected some conditions to be met by funding projects. A study can be done to draw a contrast which plans are most beneficial for the public interest or for the local region. For example, when describing the situation of the Driebergen-Zeist station, one could investigate the conflicting expectations of the Utrechtse Heuvelrug and Zeist municipalities. This would assist in shedding light on the interaction space between two local governments and their relations with regards to the planning process. They could have helped provide better comprehension of the proportion of the general and specific benefits. This research could also state the types of plans that are more susceptible to be affected by the higher governmental bodies and how this influence occurs. Moreover, it could show how municipalities manage to implement the preconditions determined by the higher levels of governance in the planning phase. This study would advance knowledge in how different levels of government influence the planning process with the hope of achieving a balanced development planning process.

As stated in the societal relevance, this research is meant to inform policy makers on the relevance of integrated sustainable mobility at the local train stations. Especially for policy makers in the province of Utrecht this study finds its relevance. The goal is to create an integrated network between all the hubs, which is only possible if the modes of transportation are integrated at these hubs.

8. Literature

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9. Appendices

Appendix 1: interview guide

There are three types of interviews conducted in this research:

-The first type is with an expert on the development of the station area of Driebergen-Zeist. Most of the data will be used to form a base for this case.

-The second type is with an expert on the development of the station area of Breukelen. Most of the data will be used to form a base for this case.

-The third type is with an expert who has knowledge on both the station areas of Driebergen-Zeist and Breukelen and will provide data for both cases.

The questions will be changed for the different types of interviews to make them applicable for the knowledge of the respondent and make them less general. This is mostly done by specifying the case and research area for the question. The guide is also something to use to get back on track if the interview is not following these guidelines. The questions are not asked one by one in this order.

Start
-Short introduction on the research conducted
-All details and information will be anonymous, so interviewees are mentioned as respondent #1, #2, etc.
-Permission to record the interview to be able to use the data at a later moment

Introduction of respondent
-Where do you work?
-What is your daily job?
-How does it relate to the station area?

Actor
-What are the actors that play a role in the development of station areas?
-Are there different actors when the integration of sustainable mobility in the station development is taken into account?
-Are there a lot of coalitions when sustainable mobility is integrated?
-Are there a lot of conflicts when sustainable mobility is integrated?

Resources
-Are there differences in power between the actors?
-If yes, who holds more power and how is this visible/measurable?
-Is there a difference in knowledge and financial resources between the actors?
-How is this visible?
-To what extent does a difference in knowledge and financial resources contribute to different power relations?

Rules of the game
-What regulations on the municipal level have an influence on the development of station areas?

-What regulations on the municipal level have an influence on the integration of sustainable mobility?
-Are there other regulations that influence the integration of sustainable mobility?
-Which governmental level has the highest preferences in favor or against sustainable mobility integration?

Discourse
-What are the objectives regarding the integration of sustainable mobility?
-Are these objectives shared by actors?
-Is the problem statement shared by the different actors or are there different views on why and how sustainable mobility can contribute?
-What are the problems that are holding the integration of sustainable mobility back?
-Are these problems relevant or leading for all actors or only for a specific group of actors?
-What ideologies are leading in the station development? (Profitable, efficiency, accessibility)

Social environment
-Are people advised to use more sustainable mobility?
-Are people made aware of the benefits of sustainable mobility?

Physical environment
-Does the presence of highways closeby affect the use of sustainable mobility?
-Does the location of the station affect the consideration of the station hub and sustainable mobility?
-Does the distance between the station hub and the destination (home, work) influence the use of sustainable mobility?

General questions
-What is the biggest trade-off to integrate sustainable mobility and to what extent?
-Is using the car to a station hub seen as a win or is it more radical to use sustainable mobility to travel to a station hub?