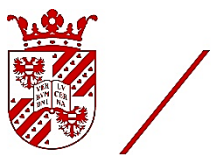


Between Modes and Levels

A Research on the Governance for the Implementation of Intermodality in Declining Peri-Urban Areas



**university of
 groningen**

faculty of spatial sciences

Master's Thesis Environmental and Infrastructure Planning

Author: Tobias Deelstra (S3198014)

Supervisor: Prof. dr. Jos Arts

05-08-2021

Faculty of Spatial Sciences

University of Groningen

Colophon

| | |
|------------------|---|
| Master's Thesis: | MSc. Environmental and Infrastructure Planning |
| Theme: | Governance and Accessibility |
| Title: | Between Modes and Levels |
| Subtitle: | A Research on the Governance for the Implementation of Intermodality in Declining Peri-Urban Areas |
| Description: | This research elaborates on understanding on how multi-level governance can be used for implementing intermodality policy in declining peri-urban areas to improve accessibility. |
| Place: | Groningen, The Netherlands |
| Date: | 05-08-2021 |
| Status: | Final version |
| Author: | T. (Tobias) Deelstra |
| Student number: | S3198014 |
| Contact: | t.deelstra@student.rug.nl t.deelstra@live.nl |
| University: | University Groningen / Rijksuniversiteit Groningen |
| Faculty: | Spatial Sciences Landleven 1 9747 AD Groningen |
| Supervisor: | Prof. dr. E.J.M.M. (Jos) Arts |
| Second reader: | Prof. dr. ir. T. (Taede) Tillema |
| Cover: | P+R Hoogkerk, at the interface of the urban and peri-urban areas (by Miranda Drenth, 2019) |

Preface

Dear reader,

Before you lies my master thesis on the governance for implementation of intermodality in declining peri-urban areas. This thesis marks the end of my time as a student in Groningen. The five years that I have studied on the RUG in Groningen have been an absolute joy, where I have dived into the intriguing field of spatial planning, made new friends and memories, and started my first steps towards a professional career.

During my bachelor Spatial Planning and Design, I got the first grasp on how concepts like mobility, accessibility and governance work and relate. In my master Environmental and Infrastructure Planning I tended to focus again on these concepts wherever possible, of which – in the end – this thesis is the ultimate final result. The deeper exploration on these concepts in different contexts that this thesis has provided me with, has given me the insight that there are still enough challenges ahead. Personally, I hope to contribute to solutions within the field of mobility in the future.

During these five years of exploration in Groningen, I have had much support from my parents, brother and sister. Mom, dad, Iris and Wouter thanks for being a listening ear all these years and showing sincere interest in what I was doing in Groningen. I also want to thank my friends in the city of Groningen and Friesland for their good social drinks, discussions and perspectives. A special thanks for the gentlemen with whom I have explored several craft beers the last few years. After long days of studying, it was a welcome distraction to relax and have discussions about anything with all of you. I also want to thank the colleagues of SAC Groningen, with whom I already have had a great experience on what planning practice looks like. It offered me the opportunity to develop myself professionally during my studies.

In the process of writing this thesis I specifically want to thank my supervisor Jos Arts. With his enthusiasm, expertise and useful remarks during our numerous thesis meetings, Jos has given me the support and guidance I needed during – the sometimes difficult – research process. I also want to thank my second reader Taede Tillema for helping out in the last stage of this thesis. I also want to express my gratitude to Ferry van Kann, Ōnne Kask, Robin Neef and Tibor Rongen, for being available to discuss and review my research in various stages. Lastly, I want to thank all the interviewees that have cooperated in this study. Without them, this thesis would not have been possible.

Where my study time in Groningen now has come to an end, this thesis report now begins. I hope you enjoy reading this thesis and hope it has useful insights for both academia and practice.

Tobias Deelstra

Groningen, August 2021

Abstract

On the one hand, urban areas increasingly start improving their *environmental sustainability* by reprioritising active transport modes and public transport over car use. Dense urban areas have increasingly limited space for cars within their boundaries and also see the environmental pollution and nuisance in cities as undesirable. On the other hand, various rural areas in the Netherlands suffer from population decline, resulting in the removal or reduction of (public transport) services since these are not viable anymore. This process further increases car dependency in these areas and leads to transport poverty for people that do not have access to a car. This reduction of (transport) services due to population decline challenges the *socio-economic sustainability* in these declining areas.

These different rural and urban contexts are not independent of each other. Since mobility does not limit itself by jurisdictional boundaries, mobility operates in and between these urban and rural areas. This links the (declining) rural area to the urban area, making the rural areas in western countries often have peri-urban characteristics. A peri-urban area (*'ommeland'* in Dutch) consists of the municipalities and towns that surround a city and is considered part of the city's sphere of influence in functional sense. This functional interdependence between peri-urban areas and the urban core has created regional housing, job and mobility markets. When looked at the (functional) mobility market, the peri-urban areas are part of the Daily Urban System (DUS) of the urban core, which consists of the passenger transport flows towards the urban core from its surroundings and v.v. The declining and car dependent peri-urban areas thus are functionally interdependent to the growing urban core that increasingly reprioritises active and public transport modes. Intermodality: the use of multiple transport modes in one trip, offers opportunities to connect these different functionally dependent transport networks and improve both socioeconomic and environmental sustainability. Yet, since implementation of intermodality in DUSs tries to improve the mobility that is not limit itself by jurisdictional boundaries, implementation involves a governance with multiple levels, actor groups and policy sectors. By doing a literature study followed by semi-structured interviews and document analysis in a qualitative comparative case study, this study *aims to develop an understanding on how multi-level governance is used for implementing intermodality policy in declining peri-urban areas to improve accessibility.*

In this study, it was found that the implementation of intermodality is predominantly done by governments on local and regional levels. Implementations are mostly taking place in the transport network, often centred around intermodal hub developments. For these hub developments often one particular transport mode is chosen to form a basis for the spokes and mobility. This choice often finds a clear parallel with the control the initiating government level has on a certain modality. The governance level initiating the implementation of intermodality therefore is deciding in what type of intermodal transport system is developed. Besides transport networks, land-use is also contributing to accessibility and is therefore also to be considered. This component does however get less attention in implementation compared to the transport component and is often considered in later development phases of intermodality. Moreover, it was also found that the land-use system is less controlled by governments – often initiating implementation of intermodality – but see more influence of market parties and citizens. As a result, the more top-down and government-led implementation of intermodality in peri-urban areas can be improved by consideration of actors in the land-use system as well. An integrative vision – considering both transport and land-use components of intermodal accessibility – and multi-level governance approach might therefore improve the interaction between different transport modes and between land-use and transport, further improving the sustainability in both urban and peri-urban areas. This might also link policies between the different governance levels and the modes these control. In the end, this integration might put intermodality in a position where multiple levels and actors use it to come to more effective sustainable mobility in peri-urban areas.

Table of Contents

| | |
|--|----|
| Colophon..... | 2 |
| Preface..... | 3 |
| Abstract..... | 4 |
| List of Figures and Tables..... | 8 |
| List of Abbreviations..... | 9 |
| 1. Introduction..... | 10 |
| 1.1. A city with a declining peri-urban area | 10 |
| 1.2. The growing and liveable central city | 11 |
| 1.3. Intermodal travel..... | 12 |
| 1.4. The multi-level context..... | 13 |
| 1.5. Problem definition and research aim..... | 13 |
| 1.6. Research question..... | 14 |
| 1.7. Scientific relevance | 14 |
| 1.8. Societal relevance..... | 16 |
| 1.9. Readers' guide..... | 16 |
| 2. Theoretical Framework..... | 17 |
| 2.1. Intermodality..... | 17 |
| 2.1.1. Defining intermodality | 17 |
| 2.1.2. Multimodality, unimodality, intramodality and chain mobility..... | 18 |
| 2.2. Peri-urban areas | 19 |
| 2.2.1. The urban-rural dichotomy..... | 19 |
| 2.2.2. Defining peri-urban areas..... | 20 |
| 2.2.3. Peri-urban areas in Dutch spatial planning | 21 |
| 2.3. Rural and peri-urban sustainable mobility | 22 |
| 2.4. Accessibility..... | 23 |
| 2.4.1. Defining accessibility..... | 23 |
| 2.4.2. Land Use Transport Interaction (LUTI)..... | 24 |
| 2.4.3. The intermodal transport system..... | 27 |
| 2.5. Multi-level governance..... | 29 |
| 2.5.1. Defining governance..... | 29 |
| 2.5.2. Defining multi-level governance | 31 |
| 2.6. Resumé and conceptual model..... | 33 |
| 3. Methodology | 35 |
| 3.1. Research design..... | 35 |

| | |
|---|----|
| 3.2. Literature study..... | 36 |
| 3.3. Case selection..... | 37 |
| 3.4. Policy document analysis..... | 38 |
| 3.5. Semi-structured interviews..... | 39 |
| 3.6. Ethical considerations | 40 |
| 4. Results Groningen case..... | 41 |
| 4.1. Introduction | 41 |
| 4.2. Implementation of intermodality | 42 |
| 4.2.1. Transport policy and developments..... | 42 |
| 4.2.2. Land-use policy and developments..... | 46 |
| 4.3. Governance..... | 48 |
| 4.3.1. National level | 48 |
| 4.3.2. Provincial level | 49 |
| 4.3.3. Municipal level | 51 |
| 4.3.4. Market parties..... | 52 |
| 4.3.5. Citizens | 54 |
| 4.4. Analysis..... | 55 |
| 5. Results Noord-Holland case..... | 57 |
| 5.1. Introduction | 57 |
| 5.2. Implementation of intermodality | 58 |
| 5.2.1. Transport policy and developments..... | 58 |
| 5.2.2. Land-use policy and developments..... | 61 |
| 5.3. Governance..... | 63 |
| 5.3.1. National level | 63 |
| 5.3.2. Provincial level | 64 |
| 5.3.3. Municipal level | 65 |
| 5.3.4. Market parties..... | 66 |
| 5.3.5. Citizens | 68 |
| 5.4. Analysis..... | 69 |
| 6. Analysis and Discussion..... | 71 |
| 6.1. Analysis..... | 71 |
| 6.1.1. The transport system..... | 71 |
| 6.1.2. The land-use system..... | 72 |
| 6.1.3. Multi-level governance | 73 |
| 6.2. Discussion | 75 |
| 6.2.1. Peri-urban context..... | 75 |

| | |
|--|-----|
| 6.2.2. Sustainable mobility and LUTI-cycle | 75 |
| 6.2.3. Multi-level governance | 77 |
| 7. Conclusion | 78 |
| 7.1. Sub questions | 78 |
| 7.2. Overall research question..... | 80 |
| 7.3. Recommendations for planning practice | 80 |
| 7.4. Suggestions for further research | 81 |
| 7.5. Reflection..... | 82 |
| Literature | 84 |
| Appendices..... | 95 |
| Appendix 1..... | 95 |
| Appendix 2..... | 97 |
| Appendix 3..... | 99 |
| Appendix 4..... | 100 |

List of Figures and Tables

| | |
|--|-----|
| Figure 1: Abolished bus stop in Sint Willebrord by Marcel van den Berg (2020). | 10 |
| Figure 2: Areas in the Netherlands with population decline (blue) or expected population decline (light blue) (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019)..... | 10 |
| Figure 3: Grote Markt in Groningen in the late 1960's by SERC (2015) | 11 |
| Figure 4: The role of intermodality in both the urban and peri-urban context (by author, partly based on Witte et al., 2021)..... | 15 |
| Figure 5: Positioning of all the concepts in relation to each other, with an example to illustrate each concept (author)..... | 19 |
| Figure 7: The land-use transport interaction cycle by Bertolini (2012)..... | 25 |
| Figure 8: The node-place model by Bertolini (1999)..... | 26 |
| Figure 9: The governance network of actor groups in planning based on Sayal (2005) in Buitelaar & Sorel (2010) (author)..... | 30 |
| Figure 10: The governance network of actor groups in (public) transport systems based on Van Nes & Bovy (2004) (author)..... | 30 |
| Figure 11: Characteristics of formal and informal interactions in (multi-level) governance networks adapted from Innes et al. (2007) and Morand (1995) (author)..... | 31 |
| Figure 12: Conceptual model (author) | 34 |
| Figure 13: Research design consisting of the different methods used and the sub questions these try to answer (author)..... | 36 |
| Figure 14: The case area in the case of Groningen..... | 41 |
| Figure 15: the basic bus network for Groningen and Drenthe. The blue lines (Qlink/Qliner) are fixed for 20 years, and the red connections are fixed for 10 years. The white dots represent the hub locations. (Provincie Groningen, 2019)..... | 44 |
| Figure 16: The case area in the case of the Kop of Noord-Holland..... | 57 |
| Figure 17: A design of a Mobipunt (Advier, 2020) | 59 |
| | |
| Table 1: Framework for case study research by Yin (2014)..... | 36 |
| Table 2: A swot-analysis of the case of Groningen (author)..... | 55 |
| Table 3: A swot-analysis of the case of Noord-Holland (author)..... | 69 |
| Table 4: Documents studied for the (policy) document analysis and used for the secondary data analysis..... | 95 |
| Table 5: List of interviewees..... | 99 |
| Table 6: Codebook..... | 100 |

List of Abbreviations

| | |
|----------------|---|
| ANWB | Algemene Nederlandse Wielrijders Bond (Royal Dutch Touring Club) |
| BV | Besloten Vennootschap (Limited Company) |
| BZK | Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (Dutch Ministry of the Interior and Kingdom relations) |
| CBS | Centraal Bureau voor de Statistiek (Dutch Bureau of Statistics) |
| CRA | College van Rijksadviseurs (Dutch Board of Government Advisors) |
| DKW | De Kop Werkt! |
| DUS | Daily Urban System |
| EC | European Commission |
| e.g. | exempligratia = for example |
| EU | European Union |
| FUA | Functional Urban Area |
| I&W | Ministerie van Infrastructuur & Waterstaat (Dutch Ministry of Infrastructure and Water management) |
| i.e. | id est = that is/namely |
| KIM | Kennisinstituut Mobiliteitsbeleid (Dutch Institute for Transport Policy Analysis) |
| Ltd. | Limited company |
| MLG | Multi-Level Governance |
| MRA | Metropoolregio Amsterdam (Metropolitan Region of Amsterdam) |
| MRDH | Metropoolregio Rotterdam-Den Haag (Metropolitan Region of Rotterdam and The Hague) |
| NOVI | Nationale Omgevingsvisie (National vision of the spatial environment) |
| NS | Nederlandse spoorwegen (Dutch Railways) |
| OECD | Organisation for Economic Cooperation and Development |
| OV | Openbaar Vervoer (Public Transport) |
| P+R | Park and Ride |
| PBL | Planbureau voor de Leefomgeving (Dutch Environmental assessment Agency) |
| RGA | Regio Groningen Assen |
| RWS | Rijkswaterstaat (executive agency of the Dutch Ministry of Infrastructure and Water Management) |
| RLI | Raad voor de Leefomgeving en Infrastructuur (Dutch Council for the Environment and Infrastructure) |
| TOD | Transit Oriented Development |
| wmo | Wet maatschappelijke mndersteuning (Dutch societal support law) |

1. Introduction

1.1. A city with a declining peri-urban area

The region surrounding the city of Groningen is confronted with population decline and is expected to continue doing so in the future (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (BZK), 2019). The process of rural decline in the hinterland of Groningen is a trend that can be recognised in more regions in the Netherlands. Young and/or higher-educated people increasingly choose the ‘growing’ city for their home due to studies or work, which leaves behind a relatively large group of elder and/or lower-educated people in these areas (Haartsen & Venhorst, 2010).

Population decline leads to removal and reduction of services in these areas (Haartsen & Venhorst, 2010). Lower population density makes services such as hospitals, schools, and public transport less economically viable, which causes the relative distance to these activities to increase (Pot et al., 2019). Consequently, declining areas experience problems such as transport poverty, which is created by the interface of transport disadvantages and social disadvantages (Lucas, 2012). Transport disadvantages can occur when one has for instance not the possession of a car and/or public transport is poor. Examples of social disadvantages are low skills, low income and/or poor housing. These two combined create transport poverty, which shortly stated, means that people have inaccessibility to activities and hence experience social exclusion (Lucas, 2012).

This problem is also linked to the concept of transport justice. In his book “Transport Justice: Designing fair transportation systems” Karel Martens (2017) argues that society has the right on accessibility, which gives governments the “obligation to provide sufficient accessibility to all under most circumstances” (p.216). Traditional transport planning focusses primarily on solving (road) congestion, whilst from the perspective of transport justice and the right to accessibility, focus should be more on improving accessibility for people that have the least accessibility: often people with no access to a car (Martens, 2017).

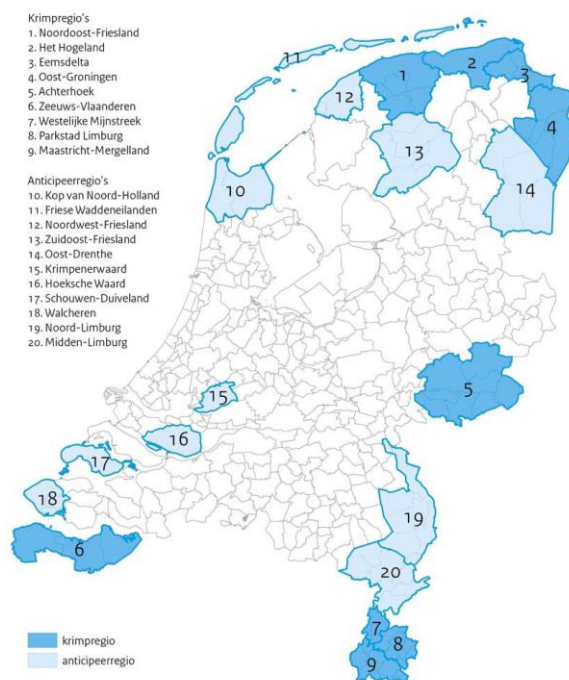


Figure 2: Areas in the Netherlands with population decline (blue) or expected population decline (light blue) (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019).
Figure 1: Abolished bus stop in Sint Willebrord by Marcel van den Berg (2020).

However, a declining rural area is not always to be seen separately from the city, since rural areas in western countries often have functional peri-urban characteristics. A peri-urban area ('*ommeland*' in Dutch) consists of the municipalities and towns that surround a city and is considered part of the city's sphere of influence in a geographical and functional sense (Hornis & Van Eck, 2008). When looked at the (functional) mobility market, the peri-urban areas are part of the Daily Urban System (DUS, or Functional Urban Area – FUA) of the central city, which consists of the passenger transport flows towards the urban core from its surroundings and vice versa (Hornis & Van Eck, 2008). This makes the peri-urban area an integral part for the (personal) mobility system and the accessibility of a city, since together they form it (Bertolini & Le Clercq, 2003).

To sum up, due to population decline, people living in declining peri-urban areas increasingly become car dependent for their personal transport needs (Smith et al., 2012). In order to access activities (in cities) and services, the car sometimes is the only serious option, since public transport is increasingly absent and active modes of transport are not always an option because of long distances (Bertolini & Le Clercq, 2003; Molin et al., 2016). This service reduction results in a reduction of *socio-economic sustainability*, thereby reducing liveability in declining peri-urban areas (Haartsen & Venhorst, 2010).

1.2. The growing and liveable central city

When one zooms in to the declining peri-urban area in the province of Groningen, one can recognise that a city such as Groningen has another type of problem related to its growth. In the 1960's and 1970's the city centre of Groningen was like many cities in the post-war period at the time: a city with population decline and its streets increasingly taken over by the car. In 1977 the traffic circulation plan was introduced and changed the city's car-oriented nature towards a focus on the active transportation modes, such as cycling and walking. The central city centre was deemed an unsuitable place for the car, which forced private cars to park in parking garages on the city centre's edges. Over the decades that followed, Groningen started to experience population growth again, resulting in more pressure from cars on the city's regional and local road network. The rise in car use resulted in more environmental pollution, space usage and nuisance. In the city centre however, the priority for active modes remained.



Figure 3: Grote Markt in Groningen in the late 1960's by SERC (2015)

The quest for reduction of car use does not stop on the city centre's edge nowadays. The last few decades, Groningen has developed multiple park and ride (P+R) facilities in the outskirts of the city. These P+Rs are locations where a transfer between the private car and a collective mode of transport is facilitated (CROW, 2005). Some locations nowadays also offer opportunities for shared mobility (e.g., shared bicycle systems, shared cars) and other transport services that intersect these locations, creating intermodal hubs (Hamersma & De Haas, 2020).

In 2017 alone, two new P+R facilities were opened near Groningen's city limits (Groningen Bereikbaar, 2017). Groningen facilitates these locations in order to reduce car use by people visiting the city from peri-urban areas, thereby improving the *environmental sustainability* of the urban environment and improving liveability. On the one hand, with the P+R policy, the city focusses on travellers that live in the (declining) peri-urban areas. On the other hand, P+R-locations might also serve urban citizens travelling towards declining peri-urban areas. With the (declining) peri-urban areas increasingly becoming places for city residents to recreate and undertake leisure activities (Rauws & De Roo, 2011), the P+R concept might make these "hinterland activities" more accessible for city residents.

1.3. Intermodal travel

The growing city and its declining peri-urban area creates a context that consists of more than just the contradiction between population growth – resulting in *declining environmental sustainability* – and population decline – resulting in *declining socio-economic sustainability*. This contradiction also causes multiple differences in the transport system. It is the declining peri-urban area where the car remains (sometimes increasingly) a necessity (Smith et al., 2012, Steenbekkers & Vermeij, 2013), whilst the growing city is steering on a less prominent role for the car within its borders (e.g., Gemeente Amsterdam, 2013; Gemeente Groningen, 2018). It is the growing city where public transport services are doing well on factors like frequency, network density and viability, whilst the declining peri-urban area is experiencing a decline in all three factors (Steenbekkers & Vermeij, 2013). It is the declining peri-urban area where cycling limits itself relatively more as a leisure activity (Steenbekkers & Vermeij, 2013), whilst density in the growing city makes cycling a serious transportation mode for commute (Gemeente Amsterdam, 2013, KiM, 2019). Clearly, the transport system – and thereby mobility – in declining peri-urban areas differs from that of urban areas (Bertolini & Le Clercq, 2003).

There are possibilities to overcome this difference and make the transport systems in both areas connect to each other, thereby also contributing to a solution for the different sustainability challenges in both areas. Take for example the development of P+R-locations in the outskirts of Groningen, where a transfer from car to public transport is enabled. The P+R offers opportunities for intermodality: the use of multiple transport modes in one trip from A to B (Hamersma & De Haas, 2020; Jones, et al., 2000) which in this case connects the car-dependent peri-urban region with the carless city.

Dacko & Sparltholz (2014) see the concept of intermodality as a solution to reduce congestion and stimulate sustainable transportation in the urban core, thereby improving urban environmental sustainability. In both planning practice and academia, urban intermodality is recognised as a concept that can enable environmental sustainability and accessibility – contributing to socio-economic sustainability – by combining individual flexibility of private transport modes (such as car, bicycle, and walking) and economies of scale of collective transport (such as bus, tram, metro, and train) (Bertolini & Le Clercq, 2003; Kuijpers et al., 2010). As argued earlier however, the city's DUS makes the peri-urban area also an integral part of the city's mobility system. This means that the peri-urban area interacts with the city via the transport system – and the mobility it enables – and therefore intermodality here might also play a role in achieving a more sustainable and accessible city (Bertolini & Le Clercq, 2003). Moreover, in the declining peri-urban area itself, intermodality has also potential

to improve accessibility for people without a car, and therefore can improve socio-economic sustainability (Witte et al., 2021). In declining peri-urban areas intermodality can enable people access to activities via intermodal hubs, by using multiple transport modes (car, bus/train, (e-)bicycle) (Hamersma & De Haas, 2020). Combining multiple transport modes in one trip might improve carless accessibility in declining peri-urban areas – resulting in better socio-economic sustainability. In addition, intermodality might in some cases create an alternative for the unimodal car use in peri-urban areas – resulting in better environmental sustainability (Hamersma & De Haas, 2020).

In light of these effects intermodality might bring to both areas, one might ask if governments consider intermodality as a concept to improve socio-economic and environmental sustainability? Research by Bertolini & Le Clercq (2003) and Oostendorp et al. (2019), indicates that governments might be considering this, at least in the urban context. However, less is known about the (policy) implementation and potential of intermodality in declining peri-urban areas. One of the few authors addressing this are Hamersma & De Haas (2020) who indicate that intermodal hub concepts in (declining) peri-urban areas are developed to maintain (public) transport in these areas.

1.4. The multi-level context

As the previous sections have stated, intermodality is a concept that potentially improves accessibility – resulting in improvement of socio-economic sustainability – and environmental sustainability in the growing city and its declining peri-urban areas, thereby improving the *liveability* in both areas. To reach this improvement, implementation of intermodality in urban and declining peri-urban areas is needed. For this (policy) implementation, however, collaboration between various actors and levels is essential.

Since the peri-urban area and the DUS of a city are not limited to jurisdictional boundaries (Bertolini, 2009; Janssen-Jansen & Woltjer, 2010; Tordoir et al., 2015), intermodality is implemented in a complex context. On multiple levels, various actors and policy sectors need a degree of collaboration to make implementation of policy on intermodality successful (Hamersma & De Haas, 2020; Hornis & Van Eck, 2008; Tordoir et al., 2015). This requires municipal, provincial, and national governments, market parties, and citizens to work together (Hamersma & De Haas, 2020). Multi-level governance (MLG) is therefore expected to be essential in coping with complex interregional challenges (Tordoir et al., 2015) such as implementation of intermodality.

1.5. Problem definition and research aim

Over the last decades, studies have shown substantial interest in researching the concept of intermodality and its effects, potential, and conditions (e.g., Dacko & Spalteholz, 2014; Gebhardt et al., 2017; Goletz et al., 2020; Van Nes & Bovy, 2004; Oostendorp et al., 2019; Schultz et al., 2020). Planning practice is familiar with the concept and increasingly tries to improve the conditions that are needed for intermodal accessibility. The general consensus is that intermodality can contribute to both environmental and socio-economic sustainability by combining different transport modes in one trip.

The context of peri-urban areas as part of a city's DUS, makes that – to implement intermodality – a relatively large region is to be considered. This area does not limit itself to one jurisdiction, but involves multiple governance levels instead, making a collaboration between levels and actors needed. Yet, there is not much known about how this multi-level governance is used to implement intermodality.

This study aims to develop an understanding on how multi-level governance is used for implementing intermodality policy in declining peri-urban areas to improve accessibility. The focus hereby is on a peri-urban context that experiences population decline in the Netherlands. The declining peri-urban context has seen limited attention in research on the topic of intermodality. Striking, since problems

such as declining accessibility – and as a result declining socio-economic sustainability –characterize declining peri-urban areas. The decline in liveability these problems cause, provide urgency to understand implementation of intermodality in this context. Based on expert judgement two peri-urban areas with different multi-level governance mixes were selected: Groningen (interprovincial governance) and the northern part of Noord-Holland (intermunicipal governance). These declining peri-urban areas are used to develop an understanding on the aim. This study focusses solely on the implementation of passenger intermodality to solve accessibility and sustainability issues, since passenger mobility is more related to experienced liveability than logistical mobility.

1.6. Research question

From the research aim and the context discussed in the earlier sections, the following overall research question can be discerned: ***How can multi-level governance be used in the implementation of intermodality in declining peri-urban areas?***

The following sub questions are used to find an answer to the overall question:

1. *How can intermodality and (multi-level) governance on accessibility in a peri-urban context be conceptualised?*
2. *How is intermodality in declining peri-urban areas in the Netherlands implemented and how do land-use and transport policies in these areas relate to intermodality?*
3. *What governance approach is used in implementation of intermodality in peri-urban areas?*
4. *How can implementation of intermodality in declining peri-urban areas be improved by using multi-level governance arrangements?*

Question 1 is theoretical and used to describe and define the concepts that are used in this thesis. The answer to question 1 provides input for empirical questions 2 and 3. The theoretical concepts of question 1 are operationalised so that they can be used as basis for a policy document analysis and interviews. The answers to questions 2 and 3 give an understanding of how current implementation of intermodality in declining peri-urban areas is done and offer the opportunity to compare current practices with theory in the fourth question. Question 4 is more application-oriented, and it provides arrangements to apply and improve implementation of intermodality in declining peri-urban areas.

1.7. Scientific relevance

Intermodality is linked to the research topic of mobility, which has been extensively researched the last few decades (Oostendorp et al., 2019). In this research topic, intermodality is in general defined as the use of multiple different transport modes in one trip from A to B (Hamersma & De Haas, 2020).

On the one hand, intermodality as a concept is often scientifically contextualised in urban areas, since congestion, pollution, and lack of space in urban cores increasingly limit accessibility and environmental sustainability of urban centres, especially by cars (Giuffrè et al., 2012; McKinnon et al., 2009; Nieuwenhuijsen & Khreis, 2016). Intermodality is thereby seen as concept that might improve environmental sustainability in urban areas, and therewith fits in the sustainable mobility paradigm by Banister (2008). Sustainable mobility has an important role to play in the development of more sustainable urban regions (Banister, 2008; Goldman & Gorham, 2006), resulting in a growing call for a transition towards reprioritisation of active and collective transport modes over car use (Bertolini, 2020; Holden et al., 2019). Still, Holden et al. (2019) state that there is a “need to find sustainable mobility narratives and make actors — government, firms and the public — believe in them.” (p.10). Intermodality can be seen as contributor to (environmental) sustainable mobility urban areas, since aims to reduce of car use and can trigger a shift to active and public transport (Oostendorp et al., 2019).

Yet, with urban growth due to (sub)urbanization (EC, 2020; UN, 2018), DUSs are increasing in size, making peri-urban areas more dependent on access to the city for services and activities (Antrop, 2000; 2004) – particularly in areas with population decline and reduction of services. This dependence means that this regional accessibility has become intertwined with economic, environmental, and social goals of urban regions and their governments (Straatemeier, 2008).

On the other hand, accessibility in declining peri-urban areas is challenged by reduction of public transport services, limiting accessibility for non-car users, thereby putting pressure on socio-economic sustainability (Haartsen & Venhorst, 2010; Smith et al, 2012). Changing the travel behaviour of car users – to sustain a public transport network – thus far had limited success (Spickermann et al., 2014). Public transport can often not be seen as sole alternative for individualized motor transport, due to lacking flexibility, longer travel time and lower perceived quality (Grotenhuis et al., 2007; Molin et al., 2016). Furthermore, in peri-urban car environments, active transport modes are not seen as full alternative either, since distances are relatively long, which prevents a reprioritisation from happening (Molin et al., 2016). Intermodality could in this context however also be recognised as a solution, providing the opportunity of using multiple transport modes in one trip to keep activities from and in peri-urban areas accessible (Hamersma & De Haas, 2020; Witte et al., 2021).

In the end, this means that intermodality has potential to improve sustainability in both urban areas (primarily environmentally) and peri-urban areas (primarily socio-economically) (Witte et al., 2021; see figure 4). Hereby it improves liveability in both areas, thereby also connecting the different urban and peri-urban transport systems to each other (Bertolini & Le Clercq, 2003; see also section 1.3.).

Although intermodality – as a central concept within passenger mobility – is related to extensively researched theories and transitions regarding accessibility and sustainable mobility, research on (implementation of) passenger intermodality itself is limited – specifically on declining peri-urban areas. Oostendorp et al. (2019) state that intermodality as a concept is well-known in practice but has seen limited empirical and theoretical research. Furthermore, Schulz et al. (2020) state that there is sparse knowledge on the institutional logics of actors involved with intermodality and that more research on collaboration between actors implementing intermodality in different contexts is needed.

This study elaborates on these identified knowledge gaps, which indicate an urgency to better understand implementation of intermodality from a governance perspective. Moreover, the (declining) peri-urban context has seen limited attention in intermodality research. Striking, since problems such as declining accessibility – and as a result declining socio-economic sustainability – provide urgency to gain an understanding on implementation of intermodality in this context.

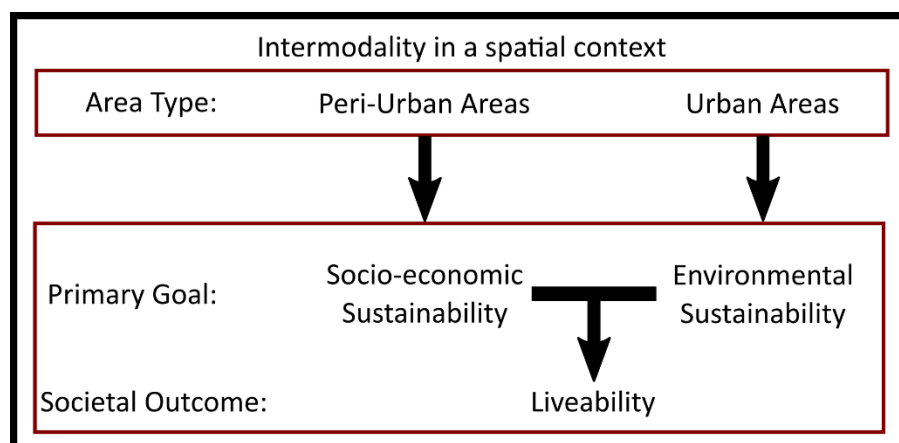


Figure 4: The role of intermodality in both the urban and peri-urban context (by author, partly based on Witte et al., 2021).

Since the peri-urban context is institutionally complex because it covers multiple spatial scales (Hamersma & De Haas, 2020; Hornis & Van Eck, 2008; Tordoir et al., 2015), multi-level governance is expected to be relevant in the implementation of intermodality in this context (Bertolini, 2009).

Multi-level governance (MLG) is a central concept used in this study. On the one hand, MLG is used empirically: to gain an insight in the governance used for implementation of policy measures (Piattoni, 2010), such as intermodality. This provides an understanding on how governance in complex regional contexts such as the declining peri-urban areas is structured. It also contributes to the understanding of how governance is used in implementing intermodal policies. On the other hand, MLG can be used in a normative sense: where it can be used to give suggestions of improvement (Piattoni, 2010), contributing to sub question 4. Lastly, on European and national levels much MLG is researched, whilst the knowledge on governance in lower levels of government gets less attention (Monstadt, 2007). This study focusses – by looking into the local and regional levels of governance – on lower MLG-levels, since these cover DUSs of (declining) peri-urban areas (Hornis & van Eck, 2008).

1.8. Societal relevance

Mobility has environmental and socio-economic impacts, in both urban and peri-urban areas, making a more sustainable mobility an important theme within policies (Goletz et al., 2020). Worldwide, intermodality might create more sustainable mobility and therefore can be linked to UN Sustainable Development Goal #11: resilient, inclusive, and sustainable cities (UN, 2015). Furthermore, European programmes such as SUMP (Sustainable Urban Mobility Plans) see intermodality as an important concept to develop more sustainable, accessible, and liveable urban regions (Eltis, 2019). The understanding on how intermodality is implemented in practice in declining peri-urban areas – where declining accessibility of activities puts pressure on the socio-economic sustainability – therefore is relevant for planners and policy makers. Specifically, for areas suffering from population decline, this study provides useful insights that might maintain liveability of these areas. In addition, the normative perspective of MLG in this study provides suggestions for implementation of intermodality improvement in declining peri-urban areas. Barriers, success factors and conditions found in the study can provide the opportunity to create governance arrangements that may improve implementation of intermodality. This might lead to suggestions for new governance arrangements that can be applied by planning practice in the studied cases and wider: in a (declining) peri-urban context. Lastly the study contributes to the understanding on implementation of intermodality policies in a peri-urban context. This insight provides planners with an understanding on how changes in MLG for implementation of intermodality might result in an increase in both environmental and socio-economic sustainability in urban and peri-urban areas.

1.9. Readers' guide

This first chapter has demarcated the topic that is researched, has elaborated on the declining peri-urban and multi-level context, and has introduced the research aim and questions. Chapter 2 further elaborates, defines, and conceptualises important theories and concepts and serves as the theoretical framework of this thesis. Here, the first sub question is answered, and a conceptual model is provided. In chapter 3 the methodology of this thesis is substantiated. Chapters 4 and 5 discuss the results of the two cases studied and provide answers for the second and third sub questions. In Chapter 6 consists of the analysis of the cases and a discussion based on the theoretical concepts and findings in chapter 2. Lastly, chapter 7 comes to a conclusion and recommendations for planning are presented, and suggestions for future research are given. This chapter ultimately provides an answer for the fourth question and also provides an answer for the overall research question. Lastly, the used literature sources and appendices can be found.

2. Theoretical Framework

The purpose of this chapter is to understand the various concepts that are relevant within the study topic and to use these to create the theoretical base of this study. The chapter outlines the concepts that form the conceptual model of this thesis. This chapter addresses sub question 1: “How can intermodality and (multi-level) governance on accessibility in a peri-urban context be conceptualised?” Of these relevant concepts, first intermodality (2.1.) and peri-urban areas (2.2) are defined, then concepts relating to the implementation of intermodality are discussed: sustainable mobility (2.3.) and accessibility (2.4.), followed by the conceptualization of multi-level governance (2.5.). The chapter ends with the answer on the first sub question and the conceptual model (2.6.).

2.1. Intermodality

2.1.1. Defining intermodality

The concept of intermodality finds its origin in logistics literature, where interest in intermodality started to increase during the containerization of freight transport in the 1950s (Crainic & Kim, 2007; Levinson, 2006). Intermodality has provided freight transport with a contribution to a more efficient intermodal freight transport chain (Muller, 1995). This intermodal freight transport has seen considerable attention in scientific literature the last half-century, which has provided first definitions for the concept (Crainic & Kim, 2007; Willing et al., 2017). An example of such definition is given by McKinsey et al. (1989) in Jones et al. (2000) that state that intermodality is “the shipment of containerized cargo using more than one mode” (p.347). This definition includes the characteristic of intermodality that multiple different transport modes are used. It does however not concern passenger transport and not a specification of the shipment that takes place. A more recent definition of intermodality provided by the UN/ECE (2001) is “a system of transport whereby two or more modes of transport are used to transport the same loading unit or truck in an integrated manner, without loading or unloading, in a [door to door] transport chain” (p.17). This definition shows that intermodality in freight transport has a different meaning than in passenger transport. Intermodality in freight transport is regarded as a special form of multimodality, where the goods transported are not changed of transport unit (e.g., a container) when transferred from transport mode (Willing et al., 2017). This means that definitions on intermodality in freight transport literature provide the major characteristics for intermodality (the use of multiple modes, transfers of modes, movement from a to b in one trip), but are not yet sufficient, since the focus of this study is on passenger intermodality.

In their article “*Developing a Standard Definition of Intermodal Transportation*” Jones et al. (2000) combine aspects of various original definitions of intermodality found in freight transport literature, to provide a standard definition of intermodality that also covers the passenger transport context of intermodality. They state that intermodal transport can be defined as: “the shipment of cargo and the movement of people involving more than one mode of transportation during a single, seamless journey.” (Jones et al., 2000, p.349). This definition is broader and covers passenger as well as freight intermodality. There remains a need further refine this definition, since intermodal freight transport uses other definitions for modes (often only four: water, air, rail, and road), and has minor different characteristics than intermodal passenger transport (SteadieSeifi, 2014; Willing et al., 2017). The definition for intermodality used in this study is provided by an EU-study on passenger intermodality by Müller et al. (2004): “Passenger intermodality is a policy and planning principle that aims to provide a passenger using different modes of transport in a combined trip chain with a seamless journey.” (p.6). This definition specifically considers intermodality in the passenger mobility context, which is the focus of this study.

2.1.2. Multimodality, unimodality, intramodality and chain mobility

Intermodality is closely related to multiple concepts that are sometimes used as synonym for the concept. In the next section the concepts multimodality, unimodality, intramodality and chain mobility are discussed, to distinguish these from intermodality and provide separate definition for them.

Multimodality is regularly confused with intermodality. The European Commission uses in documents for combined transportation the terms intermodal, multimodal and co-modal interchangeably (EC, 2013; 2017; Givoni & Banister, 2010), which indicates the confusion between the use of both terms in the Dutch context as well. Although some (Dutch) literature uses term multimodality to express the definition of intermodality (Bockstael-Blok, 2001; Bos et al. 2001; Dacko & Spalteholz, 2014; Krygsman & Dijst, 2001), most topic-related literature makes a distinction between intermodality and multimodality (e.g., Goletz et al., 2020; Molin et al., 2015; Olvera et al., 2015; Oostendorp et al., 2019; Willing et al, 2017). Multimodality is often seen as the use of more than one transport mode within a given period of time (Heinen & Mattioli, 2019; Molin et al, 2015). This is the definition used in this study. Some literature uses the more specific multimodality definition by Nobis (2007), stating that “any person who uses more than one mode of transportation within 1 week is classified as multimodal” (p.36). Intermodality therefore can be identified as a subset of multimodality, which means that all intermodal trips are multimodal, but that all multimodal trips are not necessarily intermodal.

Unimodality can be regarded as the opposite term for intermodality. Unimodality has not one clear definition in literature. Heinen & Mattioli (2019) define unimodality as “the use of only one mode over the time frame” (p.1112). The time frame used can vary from one mode in one trip or one mode in one week (Hamersma & De Haas, 2020; Heinen & Mattioli, 2019). This means that unimodality is the opposite term for multimodality as well. Unimodality is often seen as environmentally harmful, since a unimodal trip is associated with a car trip. This assumption is not necessarily true, since unimodal active trips are more sustainable than most intermodal trips (Hamersma & de Haas, 2020). In this study unimodality is defined as the sole use of one transport mode of transport in one trip. Hereby, it has to stated that, besides a walking trip, there are no 100% unimodal trips, since with all unimodal movements an extent of walking is involved. For example, when one has to walk towards car or bicycle in order to use it. Based on this, nearly all trips would be intermodal, which is undesirable and not the type of trips that this study focusses on. That is why – based on the chosen methodology of Hamersma & De Haas (2020), Olvera et al., (2015) and the Dutch Institute for Transport Policy Analysis (KiM; 2019) – walking trips shorter than 10 minutes or 1 kilometre are not seen as separate modal trip. This means that a car trip to a work location with its parking lot at 500 metres from its entrance is unimodal, but a car trip to a P+R where one transfers to a shared bike (*OV-fiets*) to cover the last 2 kilometres is intermodal.

Intramodality, like unimodality, can also be seen as an opposite term for intermodality. Where intermodality combines two or more different transport modes in a single trip, intramodality combines two or more of the same transport modes in one trip (Van Nes, 2002). A trip whereby one travels by bus and has to transfer between to busses in order to reach the destination, is an example of an intramodal trip. These types of transfers happen mostly during public transport or carpool trips, and are considered a subset of unimodal travel, since the transport mode does not change during the transfer (Van Nes, 2002). However, it is possible to have an intermodal trip with intramodal transfers (Hamersma & De Haas, 2020). For example, a trip that starts with cycling more than a kilometre to a train station where a first train is taken and – in that journey – one has to transfer to another train. In this example the intramodality has become a subset of an intermodal trip. This study sees these types of intramodal trips as intermodality, provided that there is at least one other mode used in the trip.

Chain mobility is the mobility that is facilitated by means of a combination of transportation modes in one trip (CROW, 2020; Rietveld, 2002; Walle & Steenberghen, 2006). Both intermodality and intramodality contribute to chain mobility since both terms include one or more transfers in a trip. The term chain mobility (*ketenmobiliteit* in Dutch) is relatively popular in usage in the Netherlands and Belgium, but elsewhere the term is also known as customized mobility or integrated mobility (Kemp & Rotmans, 2004; Walle & Steenberghen, 2006). Intermodality can thus be regarded as a concept that creates a transport chain (of different types of transport modes) in one trip, resulting in chain mobility as output. Although the term is limited used internationally, Hamersma & De Haas (2020) define chain mobility and chain transportation in their report the same way as intermodality: “as a trip from A to B involving the use of at least two transport modes.” (p.55). In this study, chain mobility is seen as a collective term for the mobility that is generated by intermodality and/or intramodality (see figure 5).

To sum up, intermodality finds itself in a field where the concept is used with various definitions. A clear divide is identified between the usage of intermodality in freight transport literature and passenger transport literature. This study uses the definition by Müller et al. (2004): “*Passenger intermodality* is a policy and planning principle that aims to provide a passenger using different modes of transport in a combined trip chain with a seamless journey.” (p.6), since it covers the basic principles of intermodality and places it in a policy (implementation) perspective, which fits the aim and focus of this study. Although the concepts of multimodality, unimodality, intramodality and chain mobility all have their link to intermodality (figure 5), they also have minor differences in their definitions compared to intermodality, as discussed before. This study focusses primarily on intermodality.

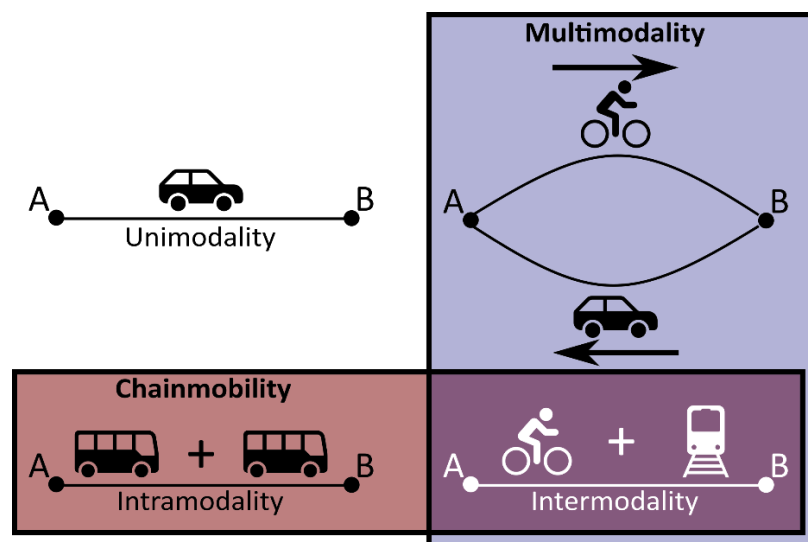


Figure 5: Positioning of all the concepts in relation to each other, with an example to illustrate each concept (author).

2.2. Peri-urban areas

2.2.1. The urban-rural dichotomy

Historically, rural and urban areas were always recognised as separate geographical areas with their own characteristics (Antrop, 2000). The rural area existing of nature and agriculture having a low population density and few services (Lerner & Eakin, 2011). The urban area with a population living densely together and being primarily build-up (Schaeffer et al., 2013). In rural areas, the population in the Middle Ages up until the mid-20th century was mostly occupied in agriculture, whilst the relatively smaller urban population had non-agricultural occupations (Schraeffler et al., 2013). This dichotomy in terms of occupation, function, and physical location, became common in policies and – later – planning for these contrasting areas (Hornis & Van Eck, 2008; Simon, 2008). Also, social science has for long

relied on the contrast between rural and urban. Simon (2008) argues that reason for this urban-rural dichotomy “was the idea that urban and rural areas were characterized by very different land-use patterns and human behaviours and that the boundaries between these spaces and places were easily discernible and clear-cut” (p.168).

Until the mid-twentieth century, recognising the rural area as agricultural and natural reflected the reality (Schaefter et al., 2013), whilst after that, mobility increased, allowing for a more fragmented rural area in terms of land-use and occupation, fuelled by suburbanisation processes (Narain, 2017). This has made the urban-rural dichotomy – from the mid-20th century onwards – vague, since borders between areas have become broader and landscapes with both urban and rural morphologies emerged (Tacoli, 2003). This development has made scientists observe that the traditional dichotomy between urban and rural has outlived its usefulness and is inadequate today (Ilanquinta & Drescher, 2000; Schaeffer et al., 2013; Tacoli, 2003).

One of the explanations for the depletion of the strict divide between urban and rural areas is found in increased mobility patterns (Antrop, 2004). Since technological advancements in transport enable more people and goods to move further in a shorter amount of time, people are not forced to live in the city to visit every-day activities or work there. This increase in mobility, for one, has created a stronger functional interaction between rural and urban areas that goes beyond production for the city and/or urbanisation processes: mobility-, jobs- and housing markets between the two areas have become interwoven (Gutierrez & García-Palomares, 2007; Hornis & Van Eck, 2007). Today, the rural and urban areas can however not be seen as equals. The city is still the important economic, political, and cultural node for the region (Hornis & Van Eck, 2008). This transforms the (former) rural area into a peri-urban area that is functionally subordinate to the city, showing similarities with principles of Christaller’s ‘Central Place Theory’ (Gonçalves et al., 2017a; Hornis & Van Eck, 2008).

2.2.2. Defining peri-urban areas

Functionally and morphologically, the merge of urban and rural areas has created peri-urban areas. The peri-urban area (in Dutch: *ommeland*) is defined in various ways, due to the interest in the phenomenon from various disciplines (Gonçalves et al., 2017a; 2017b; Hornis & Van Eck, 2008; Ilanquinta & Drescher, 2000). This means that, there is not one general definition for peri-urban areas other than the OECD-definition stating that a peri-urban area is the intermediate between the predominantly urban area and the predominantly rural area (Brezzi et al., 2011). In literature, population density is often used to define if an area is rural or peri-urban, which makes that peri-urban areas are sometimes equated with ‘suburban areas’ on the ‘urban fringe’ (Caruso, 2001; Simon, 2008). These environments are however not seen as the same thing in most relevant literature, since suburban areas and urban fringes are often based on being part of the build-up (urban) area (Caruso, 2001), whilst peri-urban areas have a more mixed morphology with more diverse land-uses (Simon, 2008). When looked at measures resulting from morphological characteristics, such as population density or distance (20-30km. is often used) to major towns (50,000 pop.), peri-urban areas might be discerned from more rural ones. However, these measures are context-dependent. When the distance to major towns is applied to the Netherlands, one can argue that the Netherlands has no ‘real countryside’ or rural areas and thus is totally peri-urban or urban of character, which does not necessarily reflect the reality (Caruso, 2001). The spatial planning policies and as a result the compactness of built-up areas in the Netherlands, make that the morphological characteristics of rural areas are harder to apply in the Dutch context, meaning that the functional relations are more useful for defining peri-urban areas (Caruso, 2001). Thus, for the topic and perspective of this study, a more functional definition of peri-urban areas from a mobility-perspective is preferable.

Although functional definitions of peri-urban areas are for many broad perspectives fuzzy and ill-defined, – since they involve both rural and urban characteristics that are expressed across large areas – for mobility there is a more specific consensus on the definition (Gonçalves et al., 2017a). Gonçalves et al. (2017a) state that there “is a consensus that these [peri-urban] areas are dependent on the services and facilities of the main urban centres and because of this dependency and their distance from urban centres, mobility/means of transport have to be developed in order to satisfy the needs of the populations.” (p.645). This consensus defines the role of mobility and accessibility in the peri-urban areas and finds a parallel with the DUS-concept. When operationalised, the percentage of people movement to work in the urban core or to travel to activities in an urban core outside their own local jurisdictions, is often used to determine if that area is peri-urban (Hornis & van Eck, 2007; 2008; Van der Laan, 1998; Williams et al., 2012). In light of this – although a universal definition of the concept is lacking – peri-urban areas are in this study defined as “primarily morphologically rural areas that have a substantive functional connection with an urban core, in terms of dependency on work or (daily) activities.” This definition fits to the mobility perspective this study takes on intermodality and also incorporates the social-economic sustainability aspect of the access to (regional) services. Although the urban-rural dichotomy and peri-urban areas are defined and discussed, there is a need to elaborate on the place of these concepts in Dutch spatial planning policies over the years.

2.2.3. Peri-urban areas in Dutch spatial planning

As said earlier, the DUS started to cover larger areas in the mid-20th century thereby creating peri-urban areas and depleting the strict division between urban and rural areas. The process of this depletion fuelled by suburbanisation was in the Netherlands characterized by the concept of ‘bundled deconcentration’ (in Dutch: ‘gebundelde deconcentratie’) also known as clustered suburbanisation or concentrated deconcentration (Van der Cammen et al., 2012; Caruso, 2001). Bundled deconcentration involved the idea of spreading housing needs in central cities over larger city regions (stadsgewesten) and appoint ‘new towns’ to prevent uncontrolled suburbanisation (i.e., sprawl) (Van der Cammen et al., 2012; Caruso, 2001; Levine & Van Weesep, 1988). These ‘new towns’ – located at some distance from the city in the city region – expanded the city’s DUS significantly and served the city with labour and a solution for the (sub)urbanisation problems. The city region was clearly designed to solve urban problems such as urbanisation and housing shortages (Hornis & Van Eck, 2008).

Although city regions had a specific focus on the peri-urban and DUS, in Dutch policy making there is a clear distinction between urban and rural planning. The urban-rural dichotomy has still dominance over the spatial organisation of the Netherlands (Vander Cammen et al., 2012). Whereas the dynamics of the peri-urban area in between has seen limited interest in planning policy (Hornis & Van Eck, 2007; Simon, 2008), which is remarkable since more than 38% of the population lives in peri-urban environments (Broitman & Koomen, 2015).

The focus of the Dutch national government today seems to be on higher transport networks between cities and not necessarily on the traditional city regions (the urban core and the DUS/peri-urban area it serves) (Hornis & Van Eck, 2007). The provincial and municipal levels of government nowadays need to collaborate in city regions in order to cover the specific peri-urban area (Hornis & Van Eck, 2007). This collaboration is always multi-level, since the peri-urban area does not necessarily limit itself to the jurisdictional boundaries (Allen, 2003; Tordoir et al., 2015). This multi-level structure will be further discussed in section 2.5, where multi-level governance is elaborated on.

To sum up and to come to the core characteristics of peri-urban contexts, it is important to recognise that peri-urban areas have resulted from the removal of a clear line between the rural and urban, due to improved mobility combined with (sub)urbanisation. Morphologically, peri-urban areas are hard to define. Functionally however, can peri-urban areas in a Dutch context be best recognised as areas that

are part of the DUS of an urban core, without a clear jurisdiction. This means that peri-urban areas have significant dependence of the urban node in terms of employment, but also for their services (education, healthcare, commerce, culture, etc.). As a result, a geographical distinction based on the functional relation between urban and peri-urban areas can be made based on this socio-economic dependency. Lastly, it is expected that the peri-urban area as a concept has limited recognition from (Dutch) governments and policy, often making a strict distinction between rural and urban policies. It is indicated that there is limited attention on the peri-urban relation between rural and urban areas.

2.3. Rural and peri-urban sustainable mobility

Sustainable mobility is a concept widely used and acknowledged in the academic world. The article of Banister (2008) named “The sustainable mobility paradigm” focusses on a more sustainable mobility in cities by using mixed uses and a shift and priority for active and collective transport modes to achieve a reduction of car use. The application of the paradigm in the urban region is relevant for this study, since intermodality offers support for the creation of (environmentally) sustainable transportation from the peri-urban area towards the city (Oostendorp et al., 2019). However, more relevant for this thesis and less discussed in literature, is the idea of more sustainable mobility peri-urban (rural) areas. Sustainable mobility – besides potential for improvement of environmental sustainability – particularly contributes to the improvement of socio-economic sustainability in these areas (Witte et al., 2021)

Sustainable mobility in the urban area focusses on combinations between transportation and land-use planning, which also remain part of the solution for more sustainable mobility in rural areas (Hickman et al., 2013), due to lower density of services. Distances are longer, which make that the alternatives for the car have to be created by public transport for the most part of journeys (Shergold & Parkhurst, 2010). Slowman & Hendy (2008) state however that “Patterns of movement in rural communities are often too dispersed to be handled efficiently by conventional public transport and, as a result, these kinds of transport tend to require high subsidies to remain in operation.”. They propose rural taxi services as part of the public transport mix as a solution to this problem (Slowman & Hendy, 2008).

Besides options such as car sharing, there seems to be limited academic literature on how sustainable mobility in rural or peri-urban areas might look like. Santos et al. (2010) state that, due to low population density and the resulting larger distances to services, public transport has limited feasibility in most peri-urban and rural cases. Cycling and walking are merely alternatives for short and local car journeys (Santos et al., 2010). With that knowledge, a major contributor to overcome these difficulties in peri-urban areas lies in the combination and integration of different transport policies in these areas (May et al., 2006). Policy integration can – among other measures – be found in intermodal planning since the transfer between two or modes has to be synergized (May et al., 2006). Intermodality therefore can be seen as an example of integration of policy (fields) and a contribution to environmentally sustainable mobility (Hamersma & De Haas, 2020; Oostendorp et al., 2019), since it promotes a (partial) modal shift and reduction of car use (Banister, 2008; Simon, 2008). For rural areas, this synergizing of transport modes can be constituted in intermodal hubs, where multiple transport modes interact and transfers between modes are facilitated (Hamersma & De Haas, 2020; Kwantes et al., 2019). It is these hubs where socio-economic sustainability might be improved as well, since transfer locations offer opportunities to make services accessible by multiple transport modes, improving user potential of the intermodal as well (Hamers et al., 2014; Krygsman & Dijst, 2001; Witte et al., 2021; see also 2.4.2.). Intermodality can from this perspective also be used to increase public transport use (Stelling, 2011; Zijlstra et al., 2014; Witte et al., 2021).

For the Dutch context, it is useful to discuss the role of cycling in mobility and the possible role it can have in rural intermodality. A quarter of all trips is done by bicycle in the Netherlands and the average

trip length on a bicycle 3,5 kilometres (KiM, 2019). This gives cycling a promising role in creating sustainable trips towards or from hubs in peri-urban areas, since these areas consist of relative compact settlements (compared internationally) and profound cycling infrastructure (Rietveld & Daniel, 2004). Expertise on 'cycle and ride' trips is in place, since on stations these transfers happen regularly already (Givoni & Rietveld, 2007). The rise of e-bike-use further improves the potential for intermodality, since longer distances can be covered (Hamersma & De Haas, 2020; KiM, 2019). From the peri-urban and rural context, cycling (or walking) constitutes a good alternative for the car on the shorter trips towards or from intermodal hubs. On longer distances to or from hubs, the car remains however often the sole option. There are however opportunities to transfer to a good public transport link on hubs, which is comparable to P+R-concept (Hamersma & De Haas, 2020; Kwantes et al., 2019).

To sum up, due to low population density and relatively large distances, public transport is not able to sustain a dense network in peri-urban and rural areas, resulting in higher car dependency, thereby making improvement of sustainable mobility more challenging in these areas compared to urban areas. With policy integration and – more specific in this thesis – intermodality, however, it is recognised that a partial modal shift is possible. With intermodal hubs, there are possibilities to make the trips in peri-urban and rural areas partially more environmentally sustainable, whilst also giving opportunities for better socio-economic sustainability. In the Dutch context, the bicycle also offers the potential to create sustainable travel towards or from hubs, as long as the distance remains limited.

2.4. Accessibility

2.4.1. Defining accessibility

When one hears the word accessibility in the media or society, it often involves the lack of it, due to traffic jams, overcrowded public transport, or 'missing (transport) links' in and around urban regions (Martens, 2017). The solution to improve this lack of accessibility in the past, was by using traffic and transport models resulting in predicted travel demands – eventually met by infrastructure provision (Busscher et al., 2015; Owens, 1995; Tillema, 2019). Today, the view on accessibility is more integrated, with increasing consideration for other aspects related to infrastructure, such as land-use or focus on other transport modes (Arts et al., 2016; Banister, 2008; Busscher et al., 2015; Straatemeier, 2019; Tillema, 2019). Since intermodality uses different transport modes in one trip, accessibility of these different transport modes is essential for provision of intermodal transport. Transfer locations, destinations, and origins of trips have to be accessible by two or more transport modes, indicating the need of accessibility in order to create intermodality. To enable access, transport system design is of importance. But, also land-use planning concepts such as transit oriented development, the compact city concept and bundled deconcentration contribute to the nearness and thereby to the accessibility of (transfer) locations (Caruso, 2001; Hamers et al., 2014; Straatemeier, 2019). Accessibility can also be a result of intermodality, since new transfers between different transport networks provide and/or improve accessibility as well (e.g., P+Rs providing access to a city centre by combining car and public transport). In this section, definitions and components of accessibility are discussed.

Accessibility is a broader concept than transportation or mobility. Where mobility is identifying the distance one can travel in a certain time, accessibility also incorporates the access to activities in a certain amount of time. Many definitions of accessibility exist, of which "the potential of opportunities for interaction" (p.73) by Hansen (1959), is one of the earliest. Over the years, this definition has been further developed. Burns & Golob (1976) specified the definition to: "the ease with which any land-use activity can be reached from a location using a particular transport system" (p.175), making it applicable on the transport system. This definition combines the land-use and transport systems that form accessibility. It considers however one particular transport system, making it rather insufficient for this thesis, which focusses on two or more transport modes.

A more recent conceptualisation of accessibility is given by Geurs & Van Wee (2004), who define accessibility as: “the extent to which land-use and transport systems enable (groups of) individuals to reach activities or destinations by means of a (*combination of*) transport mode(s)” (p.128). This study uses this definition as well, since the definition clearly incorporates combinations of different transport modes, making it also applicable on intermodal accessibility. Furthermore, based on their definition, Geurs & Van Wee (2004) distinguish four different types of components of accessibility:

1. *The land-use component*: which considers the amount, quality, and spatial distribution of supply (destinations: shops, jobs, education, etc.) and demand (origins: housing) of locations.
2. *The transportation component*: which is a disutility for individuals to cover distance between origin and destination using one or more transportation mode(s) (including travel time).
3. *The temporal component*: the availability of opportunities to visit destinations or origins at different times of the day.
4. *The individual component*: the needs, abilities, and opportunities of individuals to reach transport.

Not all components have relevance for this study. Temporal and individual components are more influenced by personal behaviour and context, which is harder to be influenced by policies on a higher geographical scale like intermodal policy (Dijst et al., 2013; Geurs & Van Wee., 2013). Although actors in MLG may try to directly influence or the individual component, the component depends – besides accessibility – on individual choice, which is influenced many other policy sectors related to economic, educational, and social factors (Geurs & Van Wee, 2013). This makes the individual component less relevant for the scope of this study. The temporal component has also limited relevance since this study focuses on implementing intermodal accessibility (in declining peri-urban areas) on a higher level than the individual/personal level the temporal dimension mostly influences (Geurs & Van Wee, 2013). Therefore, it is assumed that on the individual level people have time available to travel to work and leisure activities. For clarification: *travel time* – in a sense of disutility – is seen as travel cost and part of the transport component of (intermodal) accessibility (Geurs & Van Wee, 2004). So, (general) time needed to travel from A to B is typified as a resistance factor in the transport system (Tillema, 2007).

The land-use and transport components – and the interaction between these – are more relevant for the implementation of intermodality and the governance involved with it. Accessibility can be improved via policy within these two components: transport policy and land-use policy (Bertolini, 2012). By transport and/or land-use policy, intermodal accessibility can be influenced strongest by governments (Bertolini, 2012, Wegener & Fürst, 1999). Since intermodality relies on the access to hubs (Gorter et al., 2000), which thus can be influenced by land-use- and transport-related policy measures. Since this study focusses on intermodality – a concept that needs accessibility provided by multiple transport systems to be successful – both transport system as well as land-use system deserve some extra elaboration. The next two subsections zoom in on both systems and the relation to accessibility.

2.4.2. Land Use Transport Interaction (LUTI)

Traditionally, transport networks are often seen as networks that have be efficient (Martens, 2017). However, the role of these networks for people to access opportunities such as jobs, housing, and leisure activities, is often neglected (Straatemeier, 2008). In addition to the transport system itself, the locations of these activities are important. To understand this relationship the Land Use Transport Interaction (LUTI) by (originally) Wegener & Fürst (1999) is used.

The LUTI-cycle by Bertolini (2012), based on Wegener & Fürst (1999) is shown in figure 7. One can start anywhere on the cycle, but in general the relations are explained by Wegener & Fürst (1999) and Bertolini (2012) as follows:

1. *Land use*: is the distribution of land uses (e.g., residential, industrial, commercial), which enable activities (e.g., living, working, shopping) to take place.
2. *Activities*: are the distribution of activities which require the use of the transport system to make trips between locations of these activities.
3. *Transport system*: is the distribution of infrastructure, just like the model of Geurs & Van Wee (2004) and is required to create spatial interactions that can be measured by accessibility.
4. *Accessibility*: is created by the transport system and determines the location of land-uses, and thereby makes the relationship between the concepts cyclical.

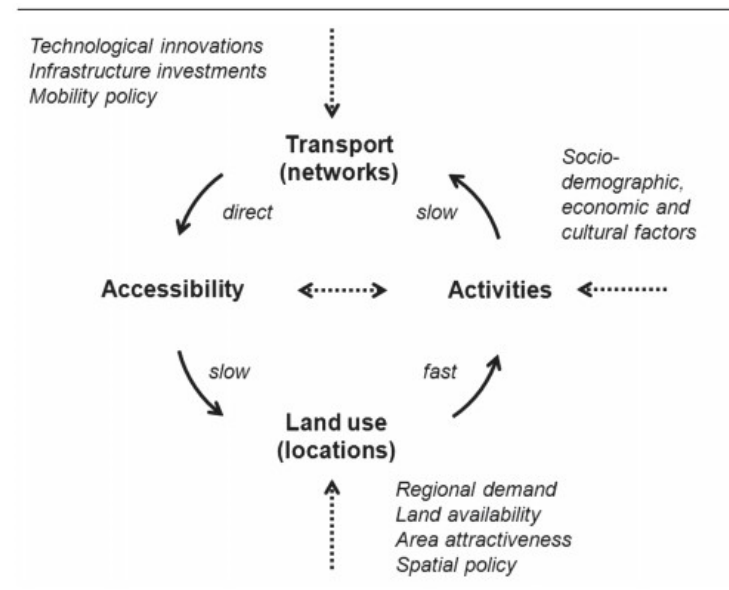


Figure 6: The land-use transport interaction cycle by Bertolini (2012).

Not all relations happen in figure 7 at the same pace. The relations from transport system to accessibility and from land-use to activities happen quickly on a short term, whilst the development of transport systems based on activities and land use based on accessibility happens on a longer term and slower pace (Bertolini, 2009; 2012). Furthermore, within the LUTI-cycle, activities and accessibility influence each other. Activities often seek accessible locations, but these same activities create the need for accessibility via transport networks (Bertolini, 2012).

Despite increasing efforts to better integrate land-use and transport, traditional transport planning on an efficient (road) transport system providing accessibility is far from gone (Martens, 2017). Often based on economic costs caused by congestion, the relatively accessible regions (e.g., the Randstad, cities) are made more accessible, primarily by car or train (Martens, 2017). Other (public or active) transport modes or regions with less economic significance – and have as a result often a lower accessibility levels to begin with – receive limited attention (Martens, 2017; Tillema, 2019). The (national) policy on accessibility improvements remains rather limited to urbanized areas (Hornis & Van Eck, 2007; Martens, 2017; Tillema, 2019) and is often digested from (N)MCA-reports (market and capacity analysis) based on economic indicators. As a result, attention is mostly on accessibility *between* and *in* urban cores, since these are economically essential and see growing population, whilst limited attention is given on accessibility in rural areas, peri-urban areas, or urban regions (Hornis & Van Eck, 2007). To add to this challenge, land-use policies are expected to be determined locally on a municipal level, whilst transport policies are often created (inter)regionally on a more provincial/national level. This gives difficulties in integration and underlines the need for an MLG-perspective (see section 2.5.).

Nonetheless, (interaction between) land-use and transport systems influence(s) accessibility and therefore one or both systems can be changed to improve accessibility (Bertolini, 2012; Tillema, 2007). However, for declining peri-urban areas, land-use developments are sparser and possibly less interesting for citizens and (as a result) market (Hilbers et al., 2011). This expectation means it is expected that land-use, together with the longer term change it inherits, might have less potential for improvement of accessibility in declining peri-urban areas (Hilbers et al., 2011). The transport system sees less influence of market and citizens, indicating more opportunities for government steering. Therefore, the transport system is expected to be more useful to improve accessibility in a declining peri-urban context and is further discussed in subsection 2.4.3. The next paragraphs further discuss

the possible role land-use should have, to make (intermodal) accessibility more effective (in the longer term) (Bertolini, 2009; Straatemeier, 2008).

For example – if citizens and market show potential – by planning new land-uses in peri-urban areas within distances from hubs that can be covered by active modes, so that intermodal trips towards destinations by other modes than the car are enabled in peri-urban areas (Bertolini & Le Clercq, 2003; Stelling, 2011). After all, a shorter distance from an intermodal hub, means less access time (Hamersma & De Haas, 2020) indicating higher user potential (Krygsman & Dijst, 2001). This land-use development – with intermodal transport systems – contributes to solving the depriving socio-economic sustainability, tackling Martens’ (2017) transport injustice and Lucas’ (2012) transport poverty.

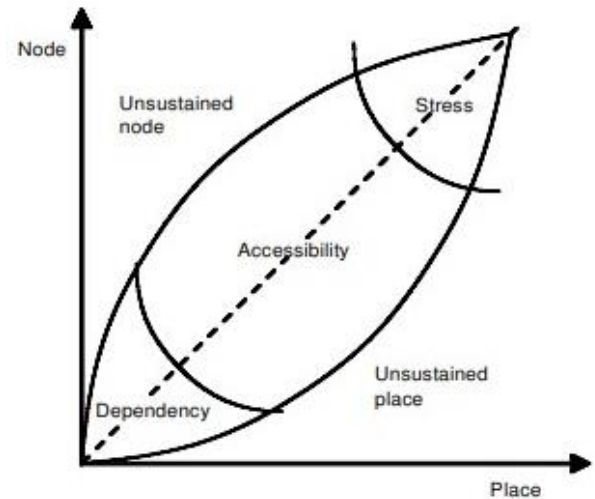


Figure 7: The node-place model by Bertolini (1999)

Consideration of land-use policies is thus important when intermodal accessibility is to be achieved, since intermodal hubs have more user potential if these are near services/activities (Krygsman & Dijst, 2001). Influence on intermodal accessibility by land-use takes might take a relatively long time compared to the transport system, which directly influences accessibility (Bertolini, 2012; Wegener & Fürst, 1999), it is important for intermodal hubs to be both a ‘place’ and a ‘node’ to create user potential. Bertolini (1999), in his node-place model (figure 8), concludes that ‘place’ (activities in catchment/service areas of public transport stops/hubs) and ‘node’ (connection/accessibility of public transport stops/hubs in transport networks) should be balanced in order to create a balance between transport and land-use dimension. In this way, unfeasible places/nodes (where one of the dimensions is prevailing over the other, see figure 8) can be prevented (Bertolini, 1999). For the land-use dimension near hubs in declining peri-urban areas this specifically means that activities resulting from services (‘places’) should be nearby and dimensioned on the hub and the spokes leading to it. This then creates (intermodal) accessibility or dependency (in areas with limited density) and helps prevent unfeasible hubs from occurring and travellers use it (Bertolini, 1999; Chorus & Bertolini, 2011). Van den Boomen & Venhoeven (2012) give an example of this need for ‘place’ by referring to the introduction of local medical practices for basic medical needs in areas suffering from population decline, due to the previous closure of a regional hospital. By locating these smaller practices near public transport stops in the region, these locations slowly become anchor points for other services as well (Van den Boomen & Venhoeven, 2012).

Although the example of Van den Boomen & Venhoeven (2012) shows the influence of clustering services around public transport stops/hubs (also known as transit-oriented development – TOD), for these services to locate there, accessibility via the spokes is also needed. These spokes are often physical infrastructures (roads, rail, cycling paths, etc) and enable movement of people from one hub/location to another. In public transport – which is essential for most intermodal trips – special importance has to be given to the non-physical public transport lines that use some of these physical infrastructures. Public transport lines are therefore be seen as a non-physical component of spokes.

To better understand the hubs and spokes, it is useful to look into the transport system component of (intermodal) accessibility. This is done in the next section, where various factors that affect the efficiency of an intermodal transport system are defined as well.

2.4.3. The intermodal transport system

Specifically, for the transportation system, there are a few factors that determine how efficient and effective, and as a result of that, how promising intermodal trips are in achieving intermodal accessibility. Before the factors are discussed, it is useful to take notice that a (public) transport network exists in principle of three different parties/actor types (Van Nes & Bovy, 2004):

1. *Travellers*: a group that is best served by networks where the travel costs are minimized.
2. *Operators*: a group that is inclined to maximise profits and cost-effectiveness.
3. *Authorities*: a group that is striving for minimizing perceived travel costs or maximum cost-effectiveness, this actor can steer the interests of the other actors to some extent via governance structures.

These actor types and their different roles form the basis for the governance system that tries to implement intermodality and is further discussed in section 2.5. In this section, each actor has a role and interest in one or multiple of the factors of a public transport system. Van Nes & Bovy (2004) argue in their research that public transport network design provides the factors necessary for intermodal trip making, since most intermodal trips (except for park + bike solutions) involve the transfer towards and/or from public transport. To add to that, the choice to travel intermodally is made to a large degree on the basis of the relative costs (e.g., time, financial expenses, comfort (transfers, frequency, waiting time)) of using (different) transport modes (Qian & Zhang, 2011). When this given fact is scaled up towards a higher (aggregated) level, this means that: the more limited the cost of travel, the higher the effectiveness and efficiency of the transport networks (Van Nes & Bovy, 2004), and therefore the larger the chance of a successful intermodal transport system (Pitsiava-Latinopoulou & Iordanopoulos, 2012). For implementation of intermodality as a policy measure, it is relevant to go by these factors to specify the possible elements in a transport system that have the possibility to improve the operation of such transport system and thereby also the accessibility to activities the transport system provides. In the situation of an intermodal transport system, Van Nes & Bovy (2004) determine four factors that contribute to the success of the interests one or more actors have:

1. *(Space) accessibility*: a factor that is connected to the land-use of a certain service/catchment area. The time needed to access a station or bus stop is seen as a cost for the travellers using the transport system. The location of a stop thus determines the (space) accessibility. For intermodality this means that the location where multiple transport systems interact, is also experiencing this factor. For instance, the distance that has to be covered by bicycle from residences to get to a station is seen as cost that need to be kept under certain thresholds.
2. *Time accessibility*: a factor that determines the waiting time for travellers, which is identified as a cost. The waiting time can be improved by heightening the frequency of transit, which improves the conditions for travellers, but has network costs as a result on the side of the operator.
3. *Design speed*: a factor that determines the travel time one has on the transport network. For intermodal networks this means that the spokes before and after transfers are affected by this factor. If the design speed is high, the costs for travellers are lower. Take for example a measure such as a bus lane reducing the change of getting stuck in traffic with public transport, or the upgrade of a bus line with a train service.
4. *Network density*: a factor that determines the spacing between spokes and the spacing between stops on the lines on the network. The network density is often expressed in lines or stations per unit of surface. It is assumed that the higher the network density is, the more developed a network is and the higher its respective costs are (Xie & Levinston, 2009).

In the end, the various factors for intermodal transport systems and the relations they have result in the total perceived cost for both the operator and the traveller. If the costs for the travellers are too

high, they will choose an alternative mode to travel with or cancel travel, resulting in higher cost for the operator. If the costs are too high for the operator, fares might go up, stops might be removed or lines might be cancelled, resulting in higher cost for the traveller. Van Nes & Bovy (2004) call this causal cycle a *bi-level optimisation problem*, where network design and travel behaviour influence each other. This cycle is hard to influence, specifically the individual transport choice of someone, since this is dependent on many factors that lay outside transport/land-use planning (Geurs & Van Wee, 2013; Van Nes & Bovy, 2004). However, authorities might steer this problem somewhat by supporting one or both actor types for example by means of subsidies, service concessions and infrastructure investments.

Although identified are from a network design perspective, the factors by Van Nes & Bovy (2004) clearly show distinguishable stages in intermodality: access/egress stage (space accessibility), transfer stage (time accessibility) and line-haul stage (design speed), that are in each intermodal trip (Krygsman, 2004). However, a unimodal trip with a car has, compared to intermodal transport, the advantage of a high (space) accessibility, with often little to none access and/or egress time, and no transfers in between (Krygsman, 2004). The car is also provided with higher network density, since the road network has a diffuse network with multiple alternatives between routes, whereas the public transport network is formed as a hub-and-spoke network with limited coverage (Van den Boomen & Venhoeven, 2012). This difference is fundamental between the two networks (car and public transport), with the road network much more robust than that of the public transport, which is vulnerable when something happens at an important node (Van den Boomen & Venhoeven, 2012; Derrible & Kennedy, 2010). This makes the transport system for cars in most peri-urban areas the most efficient (Krygsman, 2004).

To sum up, the concept of accessibility involves more than just mobility or transportation, because it also includes the land-use and the activities that result from it. Accessibility is composed of four components: individual, temporal, land-use, and transport. The former two are mostly connected to personal transport behaviour, which is in its turn affected by many other societal factors. The latter two are more relevant on the scale on which policy is implemented and as a result have more relevance for implementation of intermodality. This section has tried to link accessibility concept to intermodality and peri-urban context. It is important to consider that intermodality needs accessibility in order to provide access to origins and destinations by multiple transport modes. But, by combining these different modes, intermodality also creates intermodal accessibility to areas and places. This twofold nature can also be identified in the LUTI-cycle which has shown the need for a focus on both land-use (long term) and transport (shorter term) systems, since both influence each other, resulting in a step-by-step influence on (intermodal) accessibility. To improve the transport system for intermodal trips, a focus on transfer experience seems specifically relevant, besides improvement of access/egress times and network speeds. Land-use planning can also contribute on intermodal accessibility by enabling nearness to hubs in (declining) peri-urban areas, but on a longer term. Lastly, this section has shown that accessibility policies, measures and improvements are mainly addressing urban areas and the networks between these areas, resulting in limited attention on accessibility in rural areas and peri-urban areas (DUS). In addition, for both the land-use and the transport component, the declining peri-urban context gives improvement of accessibility an extra challenge, since density is becoming lower. Integration and combination of transport modes, but also integrating land-use and transport policies seem a solution that might provide (intermodal) accessibility to declining peri-urban areas. However, both policies operate generally on different levels (national, regional, local, etc.), with transport policy serving a regional level and land-use policy serving a more local-municipal level. This expected difference, combined with the characteristics of DUS – which are not limited to jurisdictional boundaries – indicates the need to look at multi-level governance, which is done in the next section.

2.5. Multi-level governance

2.5.1. Defining governance

To understand governance, it is useful to first define government. Governments in nation states have been around for centuries and contemporary exist of a bureaucratic system fitting their government type. The government operates primarily in the executive branch, where it implements and enforces the laws made by the legislative branch. Government thus can be “characterized by its ability to make decisions and its capacity to enforce them.” (Stoker, 1998, p.17). A government therefore is the traditional way of governing via a hierarchical order and limited amounts of stakeholders, which makes this type of decision-making a top-down approach (Hajer & Wagenaar, 2003). The sole execution by the government has shown its shortcomings in decision-making in the mid-1900s and has uncovered the dependence of governments on other actors (market and citizens) (Innes & Booher, 2003).

Therefore, since the 1980s, multiple academic authors argued and described a shift towards more open, flexible, and market-oriented governments in western countries (Hajer & Wagenaar, 2003; Kooiman et al., 2008; Osborne, 1993). The term used for this more open type of government is called governance (Osborne, 1993; Peters & Pierre, 1998; Stoker, 1998). Although the concept of governance is defined in a variety of ways, the general agreement is that governance is “the development of governing styles in which boundaries between and within public and private sectors have become blurred” (Stoker, 1998, p. 17). Governance thus goes beyond the traditional government structure and implies that “a change in the meaning of government, referring to a new process of governing; or a changed condition of ordered rule; or the new method by which society is governed” (Rhodes, 1996, p. 652-653). The idea of governance is that by “lessening the governing role of the state” (Kooiman et al., 2008, p. 2), the power of governing is shared with market, citizens, and government (Innes & Booher, 2003; Peters & Pierre, 1998). In planning –which implementation of intermodality is part of– governance is conceptualized this way, with planning giving the “appropriate role of the state, market forces, and citizens in influencing social outcomes” (Sayal, 2005, p.XXI in Buitelaar & Sorel, 2010).

Over the years, governance has seen increasing attention and use. Hajer & Wagenaar (2003) argued that shift from government to governance “illustrates a widespread dissatisfaction with the limited reach of ‘set solutions’ to thorny political issues imposed through top-down government intervention” (p. 2). This renewed form of government shaped the situation where terms such as:

“‘governance’, ‘institutional capacity’, ‘networks’, ‘complexity’, ‘trust’, ‘deliberation’ and ‘interdependence’ dominate the debate, while terms like ‘the state’, ‘government’, ‘power’ and ‘authority’, ‘loyalty’, ‘sovereignty’, ‘participation’ and ‘interest groups’ have lost their grip on the analytical imagination.” (Hajer & Wagenaar, 2003, p. 1).

Since governance has received so much attention, the concept has various uses and forms. Rhodes (1996; 2000) sees that most governance approaches have the following common characteristics:

1. *Interdependence between organisations*, thereby also covering non-state actors, creating vague boundaries between private, public, and voluntary organisations.
2. *Continuing interactions between network members*, due to negotiations & exchange of resources.
3. *Game-like interactions*, created by the trust and kept regulated by the rules of the game agreed by the network participants.
4. *A significant degree of autonomy from the state*, since networks need to be self-organising, although the networks can be steered by the government imperfectly if needed.

These characteristics by Rhodes (1996) are based on multiple governance forms and are the fundamentals of what he calls “self-organizing, interorganisational networks” (p. 660) of governance.

Combined with the *actor groups* defined by Sayal (2005) in Buitelaar & Sorel (2010), this results in the general governance network of actor groups in (land-use) planning, shown in figure 9. A specified version of the governance network based on the actor groups in (public) transport systems identified by Van Nes and Bovy (2004) in subsection 2.4.3., is shown in figure 10.

Besides this network governance conceptualisation of governance (Rhodes 2000), there is also the conception of institutional governance, which explores the governance concept from the perspective of institutions, distinguishing between governing (organisation) structures such as: market-based, network-based and hierarchy-based (Meuleman, 2008; Rhodes, 1996). The different structures can be found in multiple organisations. For the topic of this study however, network governance (figures 9 and 10) – which focusses primarily on relations and task-division between actors and organisations – is more relevant for implementation of intermodality in peri-urban areas, since multiple levels of governance are involved (Allen, 2003; Hornis & Van Eck, 2007; 2008; Tordoir et al., 2015).

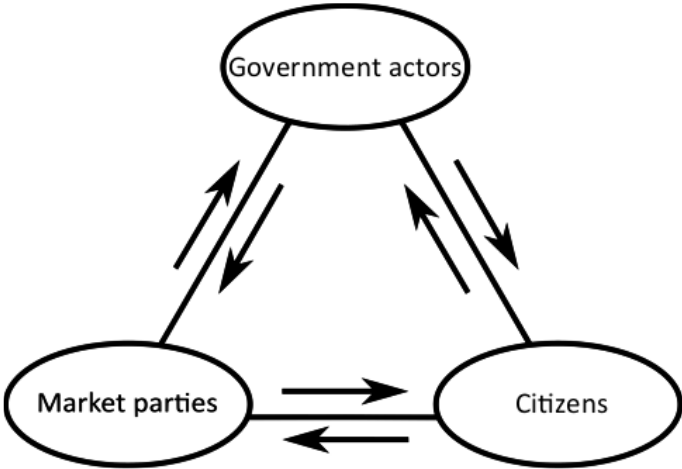


Figure 8: The governance network of actor groups in planning based on Sayal (2005) in Buitelaar & Sorel (2010) (author).

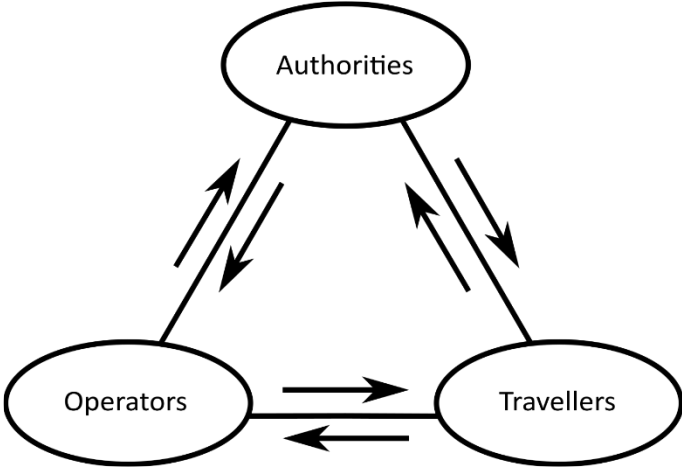


Figure 9: The governance network of actor groups in (public) transport systems based on Van Nes & Bovy (2004) (author).

Before discussing this multi-level (vertical) perspective, it is important to recognise that planning also includes horizontal interaction between various actors, sometimes scattered across departments or policy sectors (Klijn, 2008). A clear example of this can be seen in the LUTI-cycle discussed in subsection 2.4.2, where the need for consideration of and interaction between transport planning and land-use planning is argued (Bertolini, 2012). For implementation of intermodality, other policy sectors possibly

relevant are environmental or economic policies and their respective actors. This horizontal interaction between actors/policy creates governance on one level, distributing various *tasks and responsibilities* (Rhodes, 1996). This can be established by both formal and informal *relations*, such as public-private partnerships (Brinkerhoff & Brinkerhoff, 2011), stakeholder involvement (Edelenbos & Klijn, 2006) or collaborative approaches with citizens (Healey, 1996). To implement intermodality in peri-urban areas, these relations are necessary for horizontal interaction between actor(s) (groups). The next subsection focusses on vertical interactions in multi-level governance, and then further addresses these relations.

2.5.2. Defining multi-level governance

Multi-level governance (MLG) finds its origin in the European context, where Marks, Hooghe, & Blank (1996) argue that MLG might work to enable supranational steering of the state-centred national governments that would soon be part of the European union. Marks (1993) first defined multi-level governance as: “a system of continuous negotiation among nested governments at several territorial tiers” (p. 392). One sees this description links to the governance definition by Rhodes (1996), where he states that governance has continuous processes and that negotiation in these is needed. What is however distinctive in comparison with the definition by Rhodes (1996), is the notion of multiple levels. The definition of Rhodes (1996) seems to aim specifically for horizontal interaction between stakeholders on a certain level, whilst MLG also adds a vertical interaction to the governance (Hooghe & Marks, 2003). For this study, the vertical multi-level perspective is to be included since peri-urban areas – and the DUS(s) these are related to – are not limited to jurisdictional boundaries and do not have formal regional tier (Allen, 2003; Bertolini, 2009; Hornis & Van Eck, 2008, Tordoir, 2015).

For example, when looking at multiple government *levels*, the Netherlands has in this regard a formal three-tier structure, existing of the national, provincial, and municipal level (Bertolini, 2009), which has been in place since the composition of the constitution in 1848 (Buitelaar et al., 2007). (Officially, a technical, fourth tier exists: water boards, but these have their power limited to water management and therefore less relevance for the topic of this study). Over time, the relatively formal supra-national level of the EU has been added, but a formal regional gap still seems to exist (Buitelaar et al., 2007; Janssen-Jansen & Woltjer, 2010). As discussed in subsection 2.2.3, informal concepts or collaborations such as city regions (stadsgewesten) on regional levels, have not seen fundamental successes for peri-urban planning (Hornis & Van Eck, 2007). This is not to say that informal concepts or collaborations have no chance to work (see e.g., Innes et al., 2007). The alternatives for this informal regional level seem limited, since a strong formal government tier on the regional level – serving the peri-urban area – seems not to be expected soon (Bertolini, 2009; Buitelaar et al., 2007).

The disquisition on the government levels above, has introduced notions of formality and informality of levels and institutions. As institutions and their rules can be formal or informal (Alexander, 2005; Helmke & Levitsky, 2004), so can relations between levels and/or actor(s) (groups) in MLG – resulting in formal and informal networks/interactions (Healey, 2007; Innes et al., 2007). Innes et al. (2007)

| Formalistic interaction orders | Informalistic interaction orders |
|---------------------------------------|---|
| Ratification of authority | Free flow of information |
| Routinization of interaction | Creativity |
| Social and emotional detachment | Familiarity and affective involvement |
| Procedural fairness | Relative chaos |
| Status differentiation | Status leveling |

Figure 10: Characteristics of formal and informal interactions in (multi-level) governance networks adapted from Innes et al. (2007) and Morand (1995) (author).

make – based on Morand (1995) – a distinction between formalistic and informalistic interaction, which planners can come across as relations in governance networks (figure 11). Formalistic interaction consists of hierarchic structures operating in a procedural and rational way (Innes et al., 2007). Informalistic interactions, on the other hand, compare better with a network structure which “includes actions and communications that are neither prescribed nor proscribed by any rules” (Innes et al., 2007, p.198). Although both interaction types are extremes, they are relevant to understand and distinguish governance *relations* between various actor groups and/or levels. A formal relation with contracts or covenants consisting of rules and laws constraining human interaction may for example lead to other outcomes than an informal relation without ratification and a more explorative nature.

When these interactions happen in governance networks covering multiple levels, it results in two *MLG-types*. Hooghe & Marks (2003) distinguish between: types I and II, more generally; a top-down and a bottom-up approach. Type I MLG (‘top-down’) has:

1. *General-purpose jurisdictions*: the power to decide on policies is dispersed across jurisdictions, which means that smaller packages of policies are done by individual governments.
2. *Nonintersecting memberships*: since memberships are territorial, goals are fulfilled within the territorial jurisdictions, which means that there is no need to cross (jurisdictional) boundaries.
3. *Jurisdictions at a limited number of levels*: often no more than three or four jurisdictional levels are involved, for instance, municipal, provincial, and national government levels.
4. *Systemwide architecture*: based on the *trias politicas* of De Montesquieu (1989), the jurisdictional structure is on every level is structured same way, but with different responsibilities.

Whilst type II MLG (‘bottom-up’) is quite the contrary, so argue Hooghe & Marks (2003), since it has:

1. *Task-specific jurisdictions*: a more governance-based system where, based on the task at hand, people are confronted with specific public service industries that operate based on what is needed for their overarching goal.
2. *Intersecting memberships*: borders of jurisdictions are crossed and government levels and actors on the same level interact with each other, which means that jurisdictions will (partly) overlap.
3. *Many jurisdictional levels*: public goods are managed on the levels they fit based on the characteristics of the public good, so that its provision has fewest costs and most benefits.
4. *Flexible design*: the design of the jurisdictional structure may change because of interaction with external forces such as citizen preferences, which operate in a pragmatic and collaborative way instead of the traditional systemic way.

Both MLG-types have their own flaws and benefits and in most cases elements of type I MLG can be found in type II MLG approaches and vice versa (Hooghe & Marks, 2003). For implementation of intermodality in peri-urban areas both types can and will be used to some extent.

To sum up, the concept of intermodality and the accessibility that it tries to provide requires the use of the horizontal dimension of governance, since the LUTI-cycle and various actors in intermodality (see figures 7, 9 & 10) require it. Governance networks existing of government actors, market parties and citizens with various tasks and responsibilities form the interdependence needed for implementation of intermodality. However, the lack of a formal regional level for the peri-urban context and the DUSs forming peri-urban relations limited to jurisdictional boundaries, requires a vertical dimension to be added. Lastly, this need for vertical and horizontal governance interactions, has as result that a multi-level governance perspective on implementation of intermodality in declining peri-urban areas is required. The MLG-perspective provides a framework from which the various actor groups, tasks and responsibilities, levels, relations, and MLG-types, can be analysed and discussed.

2.6. Resumé and conceptual model

This chapter has theorised on the concepts of intermodality, accessibility and (multi-level) governance and has described the context of sustainable mobility and peri-urbanity these are operating in to get and answer on the first sub question: *How can intermodality and (multi-level) governance on accessibility in a peri-urban context be conceptualised?*

First, it has identified that the general definition of passenger intermodality used in this study is “a policy and planning principle that aims to provide a passenger using different modes of transport in a combined trip chain with a seamless journey.” (Müller et al., 2004, p.6). Since, due to low population density and relatively long distances, public transport alone is not able to sustain a dense network in peri-urban and rural areas, resulting in more car-dependency, this concept of intermodality is expected to contribute to – primarily socio-economic – sustainable mobility in rural and peri-urban areas. It is therefore expected to be a main argument for governments to implement intermodality in these areas.

Since the focus of this study is on implementation of intermodality in these declining peri-urban areas, the existing understanding of peri-urban areas was elaborated on. This section has found that the conceptualization and boundaries of peri-urban areas are unclear, but that for transport systems the peri-urban area draws a parallel with areas serving and urban core in a DUS. Because of the vagueness of the conceptualisation of peri-urban areas and (national) focus on flows between urban centres, peri-urban areas have received limited attention in policies. This observation – in addition to the fact that peri-urban areas cover multiple jurisdictional boundaries – has created the urgency to look at the (multi-level) governance needed for the implementation of intermodality.

Governance has proven to be of growing importance in implementation of land-use and transportation planning. Horizontal governance interactions mainly cover the relations and collaboration between government, market, and citizens, but can also be applied on the integration of various policy sectors. For this study, this policy sector integration is primarily of importance between transportation planning and land-use planning, since these policy sectors have both the ability to influence accessibility by means of policy measures (see next paragraph). The vertical governance interaction focusses on the different levels on which decision-making takes place. For the Netherlands this traditionally happens primarily on the municipal, provincial, and national level, but in practice other levels can be infinite – being for instance based on DUS, public transport concession areas, regional partnerships/collaborations, or other thematic scales. It is because of the level of the DUS/peri-urban areas – being located between the jurisdictional municipal and provincial levels – that this vertical dimension of governance has become a necessity for the implementation of intermodality. So, multiple jurisdictions are included in DUS and peri-urban areas and – as a result of that – multiple actor groups, levels and policy sectors are expected to be needed for implementation of intermodality. In other words, MLG is expected to be central for implementation of intermodality in peri-urban areas.

To undertake this implementation, MLG-actor groups and collaborations can influence the level of accessibility and therewith intermodality by means of transport policies (hub- and spoke-oriented policies) and land-use policies (spatial and flanking policies). Subsequently, these policies influence respectively the transport network and the land-use system, which in their turn influence – via the LUTI-cycle – the level of accessibility of (peri-urban) areas. In the end, this level of accessibility also enables the degree to which intermodality is possible. Specifically for hubs that enable the transfers needed for intermodality, this need for attention on both transport and land-use is shown in the node-place model. This node-place model argues that hubs facilitating intermodal transfers should be developed on location that are both a node (intersection of transport lines/networks) and a place (having services and activities in its catchment/service area). Based on the influence of both land-use

and transport components, it is expected that both are relevant and used in policy for the implementation of intermodality in declining peri-urban areas/contexts.

The aforementioned concepts, contexts and relations have created the conceptual model (figure 12).

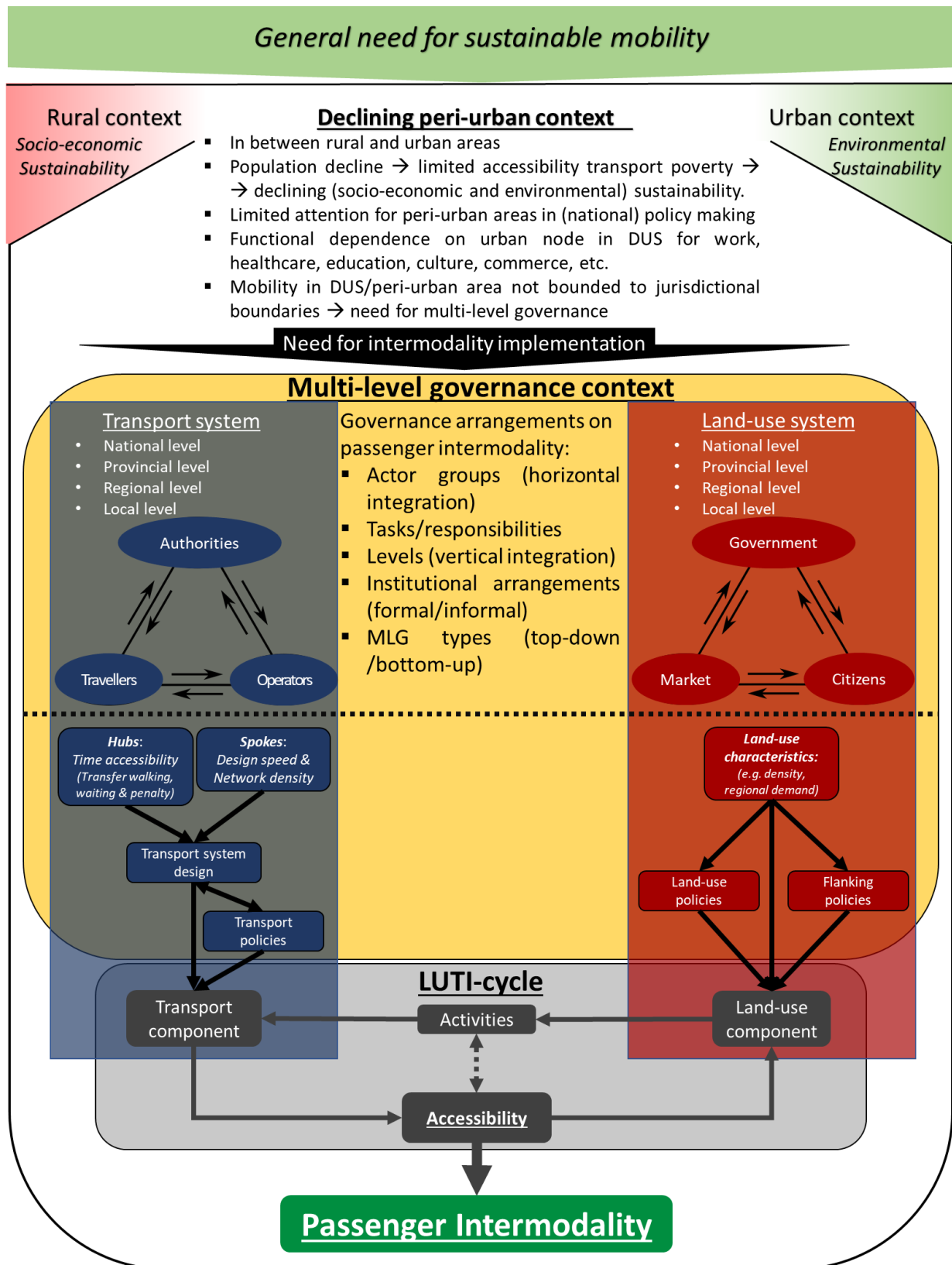


Figure 11: Conceptual model (author)

3. Methodology

The purpose of this chapter is to discuss the different methods used in the execution of this study and operationalize the conceptual model presented in the previous chapter. The operationalization creates the basis for the empirical research questions that are answered in chapter 4. First, section 3.1. discusses the research design which explains the argumentation behind the different methods chosen. Section 3.2. discusses the execution of the literature study in chapter 2. Section 3.3. defines the case selection. Section 3.4. discusses the framework used for the policy document analysis. Section 3.5. discusses the qualitative data collection done by means of semi-structured interviews. Lastly, section 3.6. elaborates on the ethical considerations concerning the data-collection.

3.1. Research design

The research design of this study consists of a theoretical component and an empirical component. The theoretical component consists of a literature review on the concepts central to the problem statement that this study addresses. The literature review in chapter 2 conceptualised and theorised on concepts such as intermodality, peri-urban areas, (sustainable) mobility, accessibility, and (multi-level) governance. All these concepts can be deduced to the problem statement and the research aim and questions that result from that statement. A literature review on these central concepts was conducted first, in order to gain understanding on the academic knowledge that was already available on the topic (Van Wee & Bannister, 2016). This knowledge gave an answer to the first sub question and provided a basis to operationalise the knowledge for researching the empirical component of this study. Furthermore, the literature review allowed the positioning of this research in the academic literature, which meant the value of this research could be added to the current academic knowledge base afterwards (Van Wee & Bannister, 2016).

The empirical component was conducted by a comparative case study research on two cases. Case study research is a methodology that is used to get a detailed understanding based on various sources of one or more examples in a class of phenomena (Baxter & Jack, 2008; Taylor, 2016). This study used a qualitative case study approach with two extreme cases to find the answers to the empirical sub questions 2 and 3. A qualitative case study is “an approach to research that facilitates exploration of a phenomenon within its context using a variety of data sources” (Baxter & Jack, 2008, p.544). In this study, implementation of intermodality can be seen as an example operating in complex contexts like (multi-level) governance and declining peri-urban areas. This made a qualitative case study a suitable method to use for gaining an understanding of intermodality (‘the example’) in these contexts.

Furthermore, Yin (2003) states that case study approaches are suitable when, “(a) the focus of the study is to answer “how” and “why” questions; (b) you cannot manipulate the behaviour of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context.” (Baxter & Jack, 2008, p.545). When one applies these terms to the research questions and the context this study operates in, a case study approach seemed again a fitting approach to understand how multi-level governance could be used for implementing intermodality policy in a declining peri-urban context to improve accessibility.

With case study research fitting the nature of the research questions, aim and context, the framework for case study was based on the five key principles for case studies by Yin (2014):

| | |
|---|--|
| 1. Triangulation from multiple sources of evidence | This research used multiple (qualitative) sources in the comparable case study research. Mixed methods were used to analyse the cases: by means of policy document analysis and semi-structural interviews. |
| 2. Maintaining a chain of evidence | First, careful literature review provided definitions, existing relations between concepts, and a conceptual model. The two cases were analysed by textual policy document analysis and semi-structured interviews. The results from these methods were analysed and discussed based on the conceptual framework. With the logical and chronological order described above, a conclusion where the theories and the conceptual model were linked to the results from the case study, was made. Based on this, suggestions for follow-up research and recommendations were given. |
| 3. Keeping a case study database | The results of the case study were stored on a (password secured) computer and on the Google Drive of a RUG account, where it could be kept as a database per case, linking results from different sources within the case. The same database principle was followed in the coding process on ATLAS.ti 8., where per case studied, a separate document group maintained to find interrelations between sources. |
| 4. Review of gathered data by key informants | After semi-structured interviews were conducted, the interview was transcribed. If requested by the participants, the transcripts could be reviewed. Moreover, academic supervisors had access to the transcripts. A focus group long was an option, but in the end, did not fit the time frame. |
| 5. Analytical strategy | To have viable results, data from semi-structured interviews and policy documents was coded. Codes were based on literature review and conceptual model (deductive) and emerging data-patterns (inductive). |

Table 1: Framework for case study research by Yin (2014)

Different methods were used in this research: literature research, secondary qualitative data analysis (via a quickscan, to come to a case selection), policy document analysis and semi-structured interviews, which are discussed in detail later in this chapter (figure 13). After this, the cases are analysed and compared. To allow analytical generalisation of case study research in the conclusion, the analytical strategy was followed to compare results with the findings in chapters 1 and 2 (Yin, 2014).

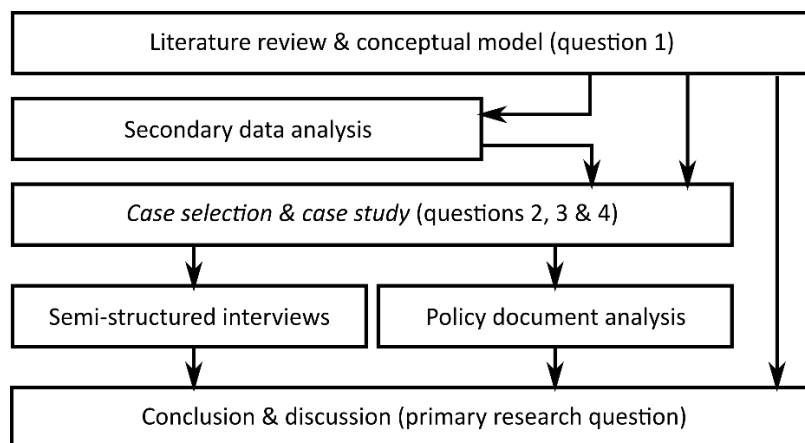


Figure 12: Research design consisting of the different methods used and the sub questions these try to answer (author).

3.2. Literature study

In the chapter 2 a literature study was used to understand central concepts in this study by means of theories and definitions. Eventually this literature study was the basis for the conceptual model presented in section 2.6. The literature study was conducted with idea of getting the most recent

insights in how the concepts relevant for this study were to be seen. In most instances, the literature used was from the 2000s, preferably the 2010s. However, there were some instances where older literature was used. In these instances, this was justified because the older definitions or theories were used or cited in recent articles or books. This indicated that the theory was still relevant in academic literature today. In total, some 100+ predominantly academic sources were cited, consisting of mostly articles from academic journals. Nevertheless, in some instances other (semi-)academic sources such as: book chapters, PhD-theses, inaugural speeches, congress papers, and reports were used as well.

To find these academic sources, three different search engines were used: Google Scholar, Scopus, and SmartCat (by the University of Groningen). The search terms – that are related to the research questions posed in chapter 1 – that have been used in these engines were among others: ‘multimodality’, ‘intermodality’, ‘ketenmobiliteit’, ‘urban-rural dichotomy’, ‘peri-urban’, ‘accessibility’, ‘land-use transport interaction’, ‘governance’, ‘institutions’, ‘multi-level governance’, and ‘institutional design’. Based on these terms, articles were selected, and other secondary terms were searched based on these: ‘multimodal passenger transport’, ‘intermodal passenger transport’, ‘chain mobility’, ‘daily urban system’, ‘rural sustainable mobility’, ‘intermodal hub’, ‘transport system design’, ‘intermodal transfer’, and ‘informal institutions’.

Furthermore, scientific articles also were collected by ‘snowballing’ scientific references and citations from articles found with these search terms. Both forward snowballing: looking at sources that have cited the found article, as well as backward snowballing: looking at references used in the found article, were used. The snowballing has led to the usage of 90 articles originating from more than 50 different scientific journals, in particular (among others): Transport Policy (9 times), Journal of Transport Geography (4 times), Land Use Policy (4 times), Transportation Research Part A: Policy and Practice (4 times), and Transportation (3 times).

3.3. Case selection

In order to use the case study research method to answer the sub questions (2, 3, and 4) on intermodality in declining peri-urban areas in the Netherlands, two cases were selected for this study. Since this study used a qualitative case study approach with two extreme cases to find the answers to the empirical sub questions 2 and 3, this case study design can be identified as embedded (the units of analysis consisted of multiple government levels, other market parties and citizens) and comparative. Based on the two MLG-types found in literature (see Hooghe & Marks, 2003), two extreme cases were selected. These cases were thought to be both leaning to one of the two governance types identified here: top-down and bottom-up. Important to stress is that both types were expected to be identified in both cases, since there is no absolute governance mix where one type is solely apparent. Based on a quickscan of the secondary qualitative data (see for data appendix 1) different factors in peri-urban cases were identified, resulting in the selection process below.

Within the Netherlands there are multiple areas that are experiencing population decline or are projected to do so in the future (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019; see figure 2). Most of these areas have all three characteristics: rural, peri-urban, and urban. The mix of these differs, however. Declining peri-urban areas that are serving a multitude of larger DUSs (and also smaller ones) and therefore are harder to analyse, were seen as not preferable for this study, since these areas require more extensive (document) analysis, which does not fit within the time frame of this study. This meant that the declining peri-urban areas in the Randstad (and southern Limburg) were not preferable to serve as case (Hornis & Van Eck, 2008).

Before selecting two cases out of the options left, consideration was given to the physical characteristics of the remaining areas. More specific, the presence of large water features or nation

borders have effects on the cost of transport and thereby on the shape of DUSs, often restricting these. Clear examples of this in the remaining peri-urban areas were found in Zeeland and the Frisian Waddeneilanden, where water creates a permanent barrier for travel. This barrier was also identified to a lesser extent for the Hoeksche Waard and the Krimpenerwaard since these areas have limited bridge connections. The national border with Germany also affects travel in the Achterhoek and northern and middle parts of Limburg, which made the DUS of these areas less representative. Core cities like Venlo (northern Limburg) or Doetinchem (Achterhoek), were located closely to the German border, which possibly extends its DUS into Germany, which made these rather 'international' cases not suitable for this study. The same held true for the border with Belgium in Zeeuws-Vlaanderen.

These selection criteria led to three options to choose two cases from: the Kop of Noord-Holland (multiple cores: Alkmaar and to some extent Hoorn and Amsterdam), Fryslân (core: Leeuwarden) and Groningen/Drenthe (core: Groningen). The case of Groningen/Drenthe seemed comparable with Fryslân – both provinces experiencing province-wide stagnation or decline of population – whilst the case of the Kop of Noord-Holland it was the only part of the province of Noord-Holland experiencing these problems. Also, the fact that the Kop of Noord-Holland had multiple cores stood out against the others. This made that comparison of the cases of Groningen and the northern part of Noord-Holland was expected to be more interesting since the cases were expected to be more different. Lastly, it was expected that the Kop of Noord-Holland was using a more top-down type of governance, whilst Groningen/Drenthe was doing implementation bottom-up. In the end, this expected distinction directly resulted in selecting Groningen and Noord-Holland as cases.

3.4. Policy document analysis

In order to understand how intermodality was characterized in both cases, a policy document analysis was conducted. Document analysis is a qualitative data collection method that systematically reviews and evaluates text-written documents (Bowen, 2009). The aim of this analysis in this study was to get an understanding on the characterization of intermodality in declining peri-urban areas and how policy documents related to implementation of intermodality. Furthermore, the document analysis could also be useful and validating in the understanding on how governance was used in this implementation. The policy document analysis for both cases was relevant for the case study research that this study is involved with, since documents are expected to introduce a more objective viewpoint and background to understand the cases studied (Bowen, 2009). This characteristic of document analysis research is also useful in conducting the semi-structured interviews, where the objective insights give background knowledge and might be helpful to identify and relativize more subjective statements made by respondents (Yanow, 2006). This method, together with the conducted literature study earlier, added to the triangulation principle central to case study research (Yin, 2014).

Based on the conditions set above, documents were selected from these three source types: government policy documents, reports from knowledge institutes advising the government(s), and visions and policies of relevant market/operator parties and citizens/travellers organisations (e.g., NS, Arriva, Qbuzz, Fietsersbond, ANWB). A first list of documents was composed by using Google and search engines on the online resources of the respective governments and organisations. The selection of organisations searched was based on:

1. the jurisdictions where the cases are part of (provincial and municipal governments)
2. other relevant and known regional government institutes/collaborations operating in the field of mobility and strategic spatial planning (e.g., Prorail, Rijkswaterstaat, De Kop Werkt, Regio Groningen Assen, OV-bureau Groningen Drenthe)

3. PBL, CBS, KiM, CRA and RLI, which are national thinktanks on population decline and/or mobility. These sources were also used in the process of making a case selection and are represented as “secondary data analysis” in figure 13.
4. relevant (national or regional) market parties and interest groups (NS, Arriva, Qbuzz, Fietsersbond, ANWB).

From searches on websites of the four groups listed, policy documents regarding ‘mobility’, ‘ketenmobiliteit’, ‘accessibility’, and ‘population decline’ were selected for further observation. Based on this further observation, respective documents were selected (see also appendix 1). This selection was further expanded by means of snowballing: when in relevant pieces of the respective document studied another (policy) document was referred to, that (policy) document was further observed and was – when deemed relevant – selected too. Lastly, some documents were also selected by input of interviewee respondents. In order to be selected, the (policy) document had to:

1. be primarily about accessibility, mobility, population decline or ketenmobiliteit, and/or;
2. be of high importance for the national/regional government, and/or;
3. be as recently published as possible (preferably within the last five years).

Since the results are divided in two chapters – covering each one of the cases – it was chosen to describe the results of the national policy documents in the ‘national level’-subsection (4.3.1. and 5.3.1.) of each of the chapters. This was regarded as suitable since the national policy documents were found to contain limited information on intermodality in general.

3.5. Semi-structured interviews

As state earlier, a major part of the empirical data in this study was gathered by means of semi-structured interviews. Longhurst (2016) states that this qualitative method is suitable within case study research since it contributes to the triangulation principle within case study research (Yin, 2014). The semi-structured nature of the interview allows for more freedom of both the interviewer and the interviewee compared to a structured interview (Longhurst, 2016). This creates an environment in which the topic at hand can be steered by means of the questions posed by the interviewer, but it also has the capability of switching between questions based on the answers (Longhurst, 2016). These characteristics allow the interview to take place in a conversation-like manner, with room for follow-up questions, deeper exploration, and explanation during the interview (Gill et al., 2008). In light of these arguments, semi-structured interviews were considered as suitable qualitative method within the case study research conducted.

During the semi-structured interviews respondents were asked to answer questions about their experiences, the organisation they worked for and other relevant insights they had on the topic of this study. Since the semi-structured interviews were specifically used to answer sub questions 3 and 4, a focus within the questions asked was on the way governance and collaboration between parties to implement intermodal accessibility is used. For sub question 2, some questions are asked about the way the transport system and land-use system are used and how they interact. The interview framework generally used for the interviews is shown in appendix 2. The interviews were held in Dutch.

Respondents were selected in a comparable way as the documents in the document analysis. For each case different government jurisdictions such as provinces, municipalities, regional collaborations /institutes, played a role in implementation of intermodality. Of these organisations, professionals operating in the field of mobility (or sometimes more specific: intermodality) were selected and contacted by e-mail. This e-mail contained a short introduction of the research and an invitation for the conduction of an online semi-structured interview. During the interview respondents were asked

if they knew other relevant persons for interviews. By means of this ‘snowballing’, more respondents were contacted and asked if an interview could be conducted. The interviewing and selection of interviewees was finished when interviewees started repeating things that already were said by other interviewees or if the sub questions could be answered with confidence (based on at least 7 interviews per case). Also, some generic interviews – with professionals not connected to one of the two cases – were held, to gain a perspective on the governance and Dutch context to interpret results.

The list of interviewees is shown in appendix 3. In total 19 professionals were interviewed: 2 generic interviews, 9 interviews regarding the case of Groningen, and 8 interviews regarding the case of the Kop of Noord-Holland. These interviewees are referred to with a ‘#’, followed by the number stated in the table of appendix 3.

All interviews were recorded and were transcribed afterwards. Respondents had the opportunity to read the transcripts afterwards. The transcripts then were analysed and coded in ATLAS.ti 8. The code tree in the coding process consisted of both inductive and deductive codes. The inductive codes were gathered from the conceptual model presented in chapter 2. The deductive codes were gathered from the answers in the interviews themselves. The code tree used for the analysis of the interview transcripts is shown in appendix 4. The transcripts can be requested at the author.

3.6. Ethical considerations

Every research faces ethical considerations, and so did this research. Although this study was not written as part of an internship, the researcher did introduce himself to a number of the interviewees of the hub programme in Groningen beforehand. During a meeting of this programme team the research goals and introduction were explained and a heads up for upcoming interviews was given to the team. Although the introduction of the research was short – only involving an introduction of the topic and phenomenon researched – these interviewees might have a little advantage in information beforehand compared to interviewees that did not attend the meeting. The attendance of the researcher and introduction of the research in the meeting, was done to make interviewees aware of the urgency of the research, which in the end improved communication and the planning of interviews.

Furthermore, due the COVID-19 pandemic all interviews had to be done via online video call software. This meant that non-verbal or informal elements in the interview technique were limited compared to physical interviews. However, due to the health situation in the Netherlands in the interview period between December 2020 and February 2021 physical interviewing was not an option.

In the e-mail correspondence and at the start of each interview, consent for recording, transcription and data storage was asked to every individual interviewee. All interviewees accepted the terms, and two interviewees indicated the wish to read the transcripts afterwards. In the end, these interviewees had no comments, which meant that all interview data gathered, was also used for the results of this study. Still, a limitation to this interview data is the fact that only professionals (of primarily government institutions) were interviewed. This had no negative influence on answering the interview questions, since the scope of this study was based on this interviewee selection. However, for a broader understanding and a stronger answer to the questions, (more) interviewees from other occupations could have been invited. This would increase perspectives from other non-professional actors in the governance involved with the implementation of intermodality, such as citizens, politicians, or employers. This might have left out external perspectives on the cases, limiting the full view on implementation of intermodality and the governance involved with it. The time frame for this thesis limited the option to do more interviews however.

4. Results Groningen case

The results of the case studies are discussed in two chapters. This chapter discusses the results of the Groningen case. Based on answers of nine interviewees and the analysis of eight relevant policy documents (for details: see chapter 3), the chapter is divided in three sections: an introduction, a section about the implementation of intermodality with a focus on developments in LUTI-principles and policies, and a section discussing the governance that is needed for this implementation. Chapter 5 discusses the other case of Noord-Holland. Interviewee are referred with a '#' followed by the respective number in the interviewee overview table in appendix 3.

4.1. Introduction

Groningen is a city located in the province of Groningen. The city serves the area around it, which is also part of the province of Drenthe, forming the first case in this study. Regions north and (south)east of the city are currently facing population decline. This process is expected for the rest of the North Netherlands in the future. The peri-urban area linked with the city of Groningen as 'growing' core is shown in figure 14.

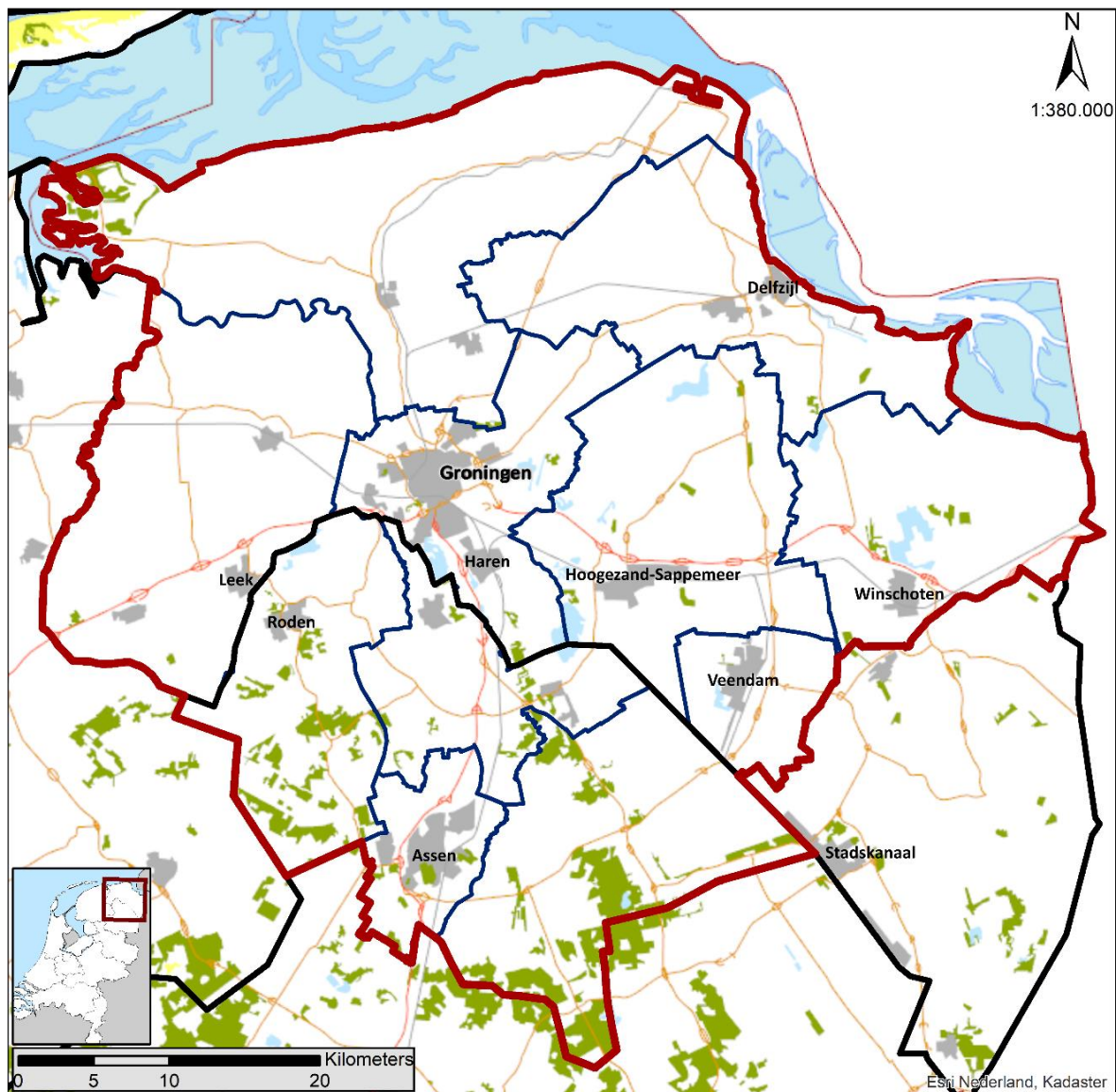


Figure 13: The case area in the case of Groningen.

Besides the city of Groningen – which is the major regional (service) centre and is expected to continue growing in the future – other regional centres are Delfzijl-Appingedam, Hogeveen-Sappemeer, Veendam, Assen (to an extent), Roden and Leek. Most of the area exists of agriculture or nature. The economic core is the city of Groningen, where the university, hospitals, government institutions and the business sector are located. The harbours of the Eemshaven and Delfzijl, tourism in the North of Drenthe and gas extraction east of the city are also major economic activities. The gas extraction is due to earthquakes expected to be reduced in the future. In the end, this leaves Groningen with a substantial DUS for (daily) mobility, which is seen as one of the largest in the Netherlands.

In this case the provincial governments are working together in the hub programme, where intermodality is facilitated through intermodal hubs (Provincie Drenthe, 2018; Provincie Groningen, 2019). Other organisations involved in this development are the OV-Bureau and Publiek Vervoer, that are rather unique organisations in the Netherlands (Provincie Groningen 2020a; 2020b; #18). The OV-Bureau is responsible for the bus concession management and bus network development of the concession Groningen Drenthe, which is unique, since most since most provinces do this themselves or let public transport operators do it. Publiek Vervoer is an organisation set up by all municipalities in Groningen and Drenthe and manages the supportive transport (wmo- and scholar transportation) in the region (Provincie Groningen 2020a; 2019; #4). Qbuzz is the bus operator in the area. Arriva operates most rail connections to the north and east of the city, whilst NS operates the rail connection to the south (#6; #8).

4.2. Implementation of intermodality

As stated before, in Groningen and Drenthe, the implementation of intermodality is placed in a government-led hub programme formed by the provinces, OV-Bureau, Publiek Vervoer and the municipality of Groningen. Although there are more organisations involved with the implementation of hubs and intermodality in the region, this programme is taking the lead in coordinating, facilitating, and initiating a transport system that is able to carry intermodal movements. Interviewee #1 explained that “new transport policy prescribes the development of intermodality. We want to start with that development on the hubs.”

4.2.1. Transport policy and developments

Differences between urban and peri-urban areas

The difference in mobility characteristics between urban and peri-urban areas were seen in the transport system in the case of Groningen (gemeente Groningen, 2019; provincie Groningen 2020a). In their policies the provinces focused on public transport, and it was described as the fundament necessary for the development of intermodality (provincie Drenthe, 2018; provincie Groningen, 2019; #1; #2; #3; #5; #8). Specifically, for the city, (combinations with) walking and cycling were seen as preferable (gemeente Groningen, 2019; #2; #5). However, in the areas surrounding the city the car still was an important mode, and was in many places seen as inevitable (#1; #3; #5; #7). This view is illustrated by the view of interviewee #7, who stated that:

“The mobility debate [with the province and other municipalities] concentrates around walking, cycling and public transport, which are most prevalent in the city of Groningen. One feels in the Westerkwartier as if the province has limited attention for the car. Whilst this mode is essential for the accessibility of our rural area.”

Interviewee #5 of the province explained and partially confirmed the view of interviewee #7. The car was not perceived as the ‘wrong mode’ to use (#5). “It is just that we [the province of Groningen] have as policy walking first, cycling second, and public transport and the car on third and fourth place,

since this [policy] contributes to the goals of a healthy and sustainable society.” Interviewee #5 could however imagine that people want to travel by car, which was not to be seen as a ‘bad’ thing (#5).

Although the feeling of interviewee #7 might be recognised by many, the situation described by interviewee #5 was the policy of the province and municipality of Groningen (Gemeente Groningen, 2019; Provincie Groningen, 2020a). Interviewee #2 and the policy of gemeente Groningen (2019) stressed that “it is necessary to choose for space-efficient and sustainable forms of mobility” (p.14), meaning fewer cars. The difference in views between interviewees #5 & #7 reflects the different views by both levels and environments, since interviewee #7 represented a relative rural and car-dependent municipality, whilst interviewee #5 represented the province, including various environments.

However, regarding the implementation of Park and Rides (P+Rs), both the province and the municipalities were on the same page. The general idea behind this lay on the interface of both policies: P+Rs should facilitate parking on the edge of the city (#2, #5) or closer to home (#1), where one could transfer to another mode into the city. Interviewee #7 enthusiastically elaborated on this, by sharing that the P+R-locations were successful and helped attract more people in the public transport, something that was preferable for a more sustainable transport system.

Sustainability and liveability as goals

The ranking of modes in the earlier quotation of interviewee #5 shows clearly one of the goals that were involved with the mobility and accessibility policies by the provinces: sustainable mobility (provincie Drenthe, 2018; provincie Groningen, 2020a; 2020b; 2019). This was by most interviewees described as reducing the use of cars to create a more sustainable transport system (#1; #2; #4; #5; #6), in some cases referring to the climate agreement of Paris (#1; #6). In line with this, intermodality was recognised a possible way to (partially) reduce the negative impacts caused by mobility (#1), whilst also improving the liveability in the city (#2). In specific, flanking policies such as paid parking, car-free environments and walk- and bicycle-stimulating design were used in the city to achieve this (#2, #5).

The other goal for which intermodality – specifically hubs – was used, was improvement of liveability and inclusiveness (#1; #5; provincie Drenthe, 2018; provincie Groningen, 2020a; 2020b; 2019). Interviewee #1 stated that “anyone should be able to travel anywhere. That should be the basis [...] Mobility is good, but it is just a means. Only with that, you will not succeed.” Therefore, the focus of hubs was not solely on the current transport network, but also on the access of public services and supportive transport (#1; #5). Combining the hubs with public services is discussed in the subsection about land-use, since this links less to transportation.

Public transport as basis

Within transport policy, public transport was stressed as important element in both of the underlying goals named for intermodality (#1; #2; #3; #5 among others). Besides the observation that the share of zero-emission busses had been increased the last decade and would continue to do so in the concession area (#6; #8), public transport was also seen as cornerstone in achieving accessibility and socio-economic sustainability by the hub programme (#1; provincie Drenthe, 2018; provincie Groningen, 2019). All interviewees recognised the problem of population decline and the pressure it put on public transport. Interviewee #5 stated that “the hubs have as their function to contribute to the goal of keeping the rural areas liveable and public services accessible”.

To do this sustainably, the initial approach of the provinces and the OV-Bureau primarily targeted itself around the creation of a stable bus network (#1; #2; #3; #5; #6; #8). In 2016 this network became policy, and two years later, hubs were deduced from this public transport network (#5; #8; provincie Drenthe, 2018; provincie Groningen, 2019). Figure 15 shows this basic network and the hub locations (provincie Drenthe, 2018). Interviewee #5 explained the importance of the network as follows:

“In the network are nowadays also the hubs incorporated, where public transport connects to other modes. Public transport was however the first principle for that. Because, when your backbone [of public transport] is not functioning well, your hubs also function less effectively”

This approach is not totally new, since for the city of Groningen P+R-locations were previously planned along busy (public transport) spokes and corridors (CROW, 2005; gemeente Groningen, 2019). Interviewee #2 recognised this parallel: “The P+R-locations were already important intermodal transfer locations, but the hubs are becoming that nowadays as well”.

With the network in figure 15 as basis, interviewee #8 explained that many hub locations were based on their location in the network, such as stations and regional bus stations: “So we moved away from a relatively dense public transport network [...] towards a more dispersed network, with higher quality, frequency, and hubs that better connect the network to other modes”. In regions where major nodes in the public transport network were non-existent (Pekela, Siddeburen), hubs and their connecting bus lines had yet some flexibility in determination of location and routing (#8).

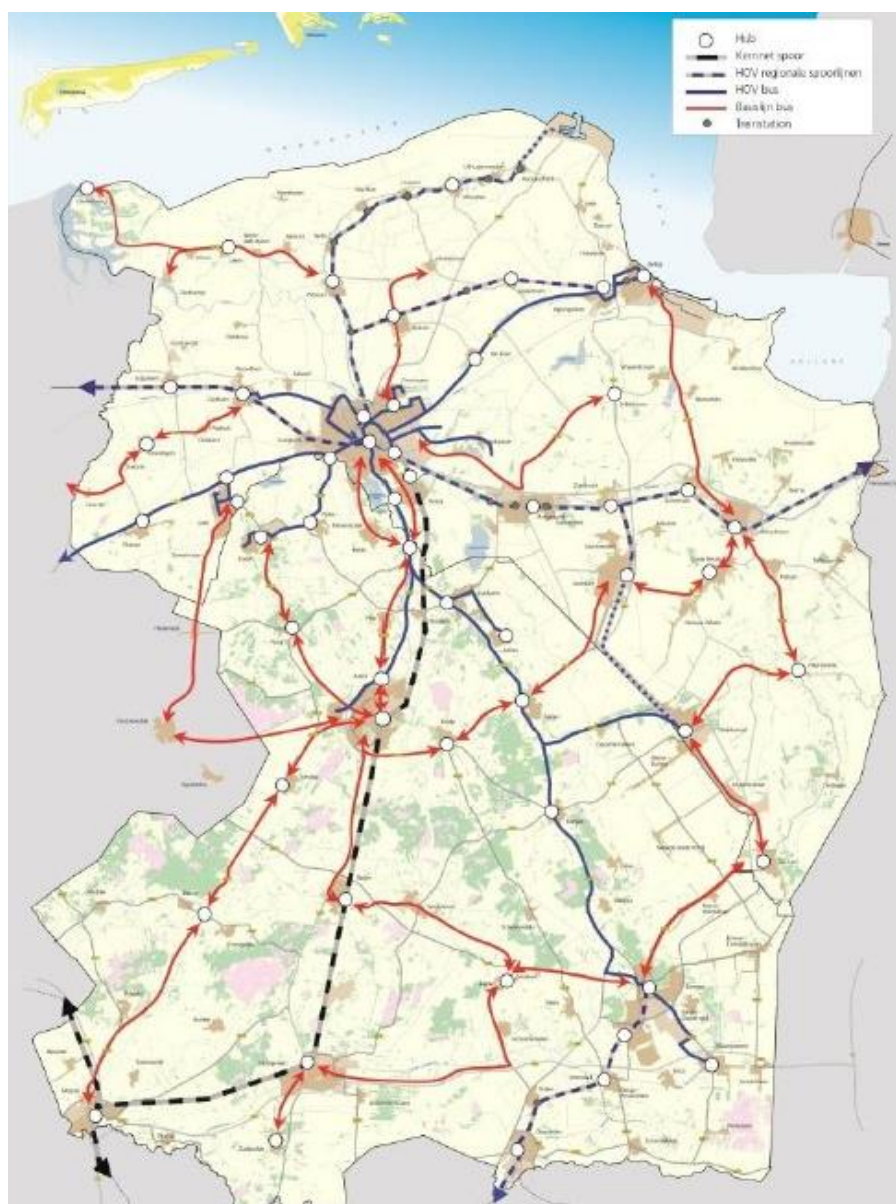


Figure 14: the basic bus network for Groningen and Drenthe. The blue lines (Qlink/Qliner) are fixed for 20 years, and the red connections are fixed for 10 years. The white dots represent the hub locations. (Provincie Groningen, 2019).

Stretching as tool

The dispersed public transport network in Groningen and Drenthe could partly be attributed to the stretching of bus lines (#2; #8). Stretching lines meant that the bus lines were rerouted over more primary roads and/or reduced in the number of stops it had in towns – thickening the transport flows (gemeente Groningen, 2019; provincie Groningen, 2016). Results from this process indicated that – in the Groningen case – buses became faster and more comfortable, and therefore attracted more users, which made the public transport system more efficient – and thereby more viable and stable (#1; #2; #8; CBS/O&S Groningen, 2018). Initially, locals often resisted removal of bus stops caused by stretching (#2; #8). Nevertheless, “there is a substantial list of places where first the bus line crossed village but nowadays not anymore. The complaints have died out in most cases and ridership has exploded.” (#8).

Stretching therefore specifically helped improve the spokes in the intermodal transport network, since public transport spokes became more attractive for people that travelled by hub (CBS/O&S Groningen, 2018). This also generated a reduced bus driving time, which potentially reduced cost for the operator. To further improve the reliability of stretched lines, infrastructure of public transport spokes was improved (gemeente Groningen, 2019). Interviewee #2 gave as example of this, the various separate bus lines between the P+Rs (near the city) and the city centre. With the renewal of the main station and travel time monitoring, there might be other routes expected to be upgraded in the future (#2).

Lastly, spokes for the cycling infrastructure were upgraded to become part of a regional, stretched cycling network (provincie Groningen, 2016). Specifically for the longer distances, the province – together with municipalities – developed new cycling routes for commuters (#5; #7; provincie Groningen, 2016). Interviewee #7 of the municipality of Westerkwartier indicated that these might increase unimodal cycling trips and might also contribute to intermodality. In Westerkwartier, a newly developed cycling route connected two hubs: P+R Hoogkerk and P+R Midwolde (#7). The municipality was looking for possibilities to connect communities nearby to the newly developed cycle route as well, so that it facilitated cycling movements from the communities towards hubs (#7). The province of Groningen (2016) had a specific policy document for improvement of bike transfer in trips on hubs.

Using supportive transport

Stretching lines has inevitably led to longer distances towards hubs, still, every hub was found within a distance of 10 kilometres from an individual’s destination or origin, often closer (#1; #2; provincie Groningen, 2016). Besides improving cycling spokes, there was another way the hub programme tried to improve the access to and egress from the hubs over this distance. As alternative for the bicycle, a small-scale demand-based transport mode – the hub-taxi – was introduced as solution for facilitating access and egress transport towards and from the hub (#4; #5; #7; #8). Interviewee #4 from the Publiek Vervoer brought up that the taxi could be used freely – also for people without an indication – for a standard fare. The hub-taxi would be bringing passengers from the hub towards their destination or from their origin towards the hub (#4; #5; #8). This service was to make using the hub more attractive for travellers living far from a public transport hub (#5), whilst the concept also hoped to reduce usage of general supportive transport (#4; #7; #8). Interviewee #4 (Publiek Vervoer) described that it was part of its activities to: “Reduce the number of supportive transport users and bring them more social inclusiveness by letting them travel by public transport (sometimes combined with hub-taxi) instead.”

This development was expected to increase public transport use by people eligible to wmo, whilst reducing the cost of supportive transport for municipalities (#4, #8). Hoping that in general, by creating this intermodal travel option, supportive and public transport became more efficient. Something that was supported by the interviewees from the municipalities itself (#2; #4; #7) and the provincial environmental vision, that stated that action was undertaken to develop “the hub as a transfer location between supportive transport and public transport.” (provincie Groningen, 2019, p 108).

4.2.2. Land-use policy and developments

Combining hub developments and local public services

The second goal for implementation of intermodality – improving liveability – also links up with the (developments in) land-use policies, which had broadened the scope of the hub programme the last few years (#1; #5; #9). Although the hub programme started as a programme in mobility, nowadays “hubs start to be development themselves more as socio-economic nodes for the region” (#9; provincie Groningen, 2019). Public services were increasingly convinced to locate around the hub, sometimes in a multifunctional fashion (#1; #5; provincie Groningen, 2020b; 2019). For example, the library in Roden, which served also as a waiting area and information kiosk of the bus stop nearby:

“The library [...] was already planning a kind of waiting room, whilst the municipality was planning the same on their own parcel. After setting up a conversation with the municipality, the library and us [the province of Drenthe], these functions were combined. There is not just one library. [...] It becomes a broader story.” (Interviewee #1)

In the example above, the hub location was integrated and combined with other public services near its fixed location. Creating these kinds of integrated solutions is mentioned in policy documents of the provinces and by interviewees as one of the key characteristics of the hubs developed in the hub programme. (provincie Drenthe, 2018; provincie Groningen, 2019). When the hub location was rather fixed (stations or cross points of transit lines) the kind of integration with local services (as done in Roden) was sought (#1; #8), making these services intermodally accessible. Another example of integration of services on (fixed) intermodal hubs, was done by creating these. The programme team tried to introduce food entrepreneurs (see subsection 4.3.2.) and parcel lockers on hubs (#9). In these parcel lockers, people could pick up the parcels they ordered from these saves (#5) and “enthusiasm from local entrepreneurs, makes that they also want to participate in the pilot” (#9).

In sparsely populated areas – where major nodes in the public transport network were non-existent (Pekela, Siddeburen) – the hub location was more flexible, and integration was done differently (#5, #8). Here, land-use developments, citizen initiatives and relocation of public services could have an effect on the hub location (#1; #5; #8). This meant that on a smaller scale, changes in the initial selection of hub locations could be made over time. Interviewee #8 gave an example of this:

“In Siddeburen we initially planned the hub near the village, but after a conversation with the municipality and the redevelopment within the village, with a multifunctional centre (including a primary school, doctor, etc.), we chose to move the hub there.”

In the small village of Zweelo, hub development to create intermodal accessibility took a next step, since citizens created a hub on their own initiative (#5). Furthermore, the chain of libraries: Biblionet was, after the success in Roden, thinking of integrating more of their locations with other hubs and bus stops, (#1). According to interviewees #5 & #9, these bottom-up developments were supported by the hub programme as far as possible (#5; #9).

Locating regional public services near hubs

Locally, local and/or regional services were tried to be integrated in hubs, whilst on a higher scale, it was tried to locate regional public services – attracting quite some mobility – such as high schools or hospitals ‘at least’ near hubs. Then, these regional public services could be reached with multiple transport modes – creating intermodal accessibility. Interviewees #1 & #5 explained that in a school relocation in Borger, the school chose its location near the hub. Other examples in Winschoten and Hoogkerk showed the same (#3, #8). This was also found in the provincial policy of Groningen (2019), where clustered regional services near hubs were described as a next step in the hub programme.

Interviewee #1 indicated that although these public services were easier to stimulate in their development near hubs than activities private parties or land-use developments, the boards of the organisations – such as schools – still had quite a say in location choices. Meaning that sometimes public services anyway ended up in places that were hardly intermodally accessible (#1). An example of this – named by interviewees #3, #5 & #8 – was the regional hospital (opened in 2016) in Scheemda, located at 2 kilometres from the hub on the station. As interviewee #3 of the municipality stated:

“The choice of the hospital location was primarily the task of the province [of Groningen]. In my opinion, there was little attention for the accessibility by public transport. Maybe none. Anyhow, it was no issue during that stage. Other elements played a role.”

Interviewee #8 from the OV-Bureau added:

“Currently, [the hospital] is located in the periphery of the bus network. If the location had been near the Winschoten or Zuidbroek station, one would have had a just as car-accessible location as now, but with better public transport. That has not happened. [...] I think due to clumsiness in coordination.”

All interviewees did however stress that in many cases the analysis on accessibility by public transport – or other transport modes – was done right, but that sometimes other interests were effective for location choices. Interviewee #8 explained that these other interests could also come from other transport modes, resulting in limited access for other modes. In Groningen, the location of a regional education cluster was primarily based on accessibility by means of bicycle, which made sense from the urban characteristics and young audience (#8; provincie Groningen, 2016).

Steering land-use developments by certainty

Besides the location of (public) services, steering of land-use developments was tried. Many of the basic bus lines (see figure 15) were routed for at least 15 years (Provincie Drenthe, 2018; Provincie Groningen, 2019). This offered certainty for land-use developments that were harder to steer, such as business areas and residential developments (#1, #5, #7). Interviewee #1 stated that in theory the certainty should have an effect, but that in practice some developments still ended up in places that were not intermodally accessible. Interviewees #3 & #5 indicated the same, by concluding that autonomic market parties, such as developers, were somewhat harder to steer in their location choice. An exception was the growing city of Groningen, where intertwining public transport with land-use was done for some time (#2; Gemeente Groningen, 2019). Interviewee #1 added to this that the presence of public services was often a prerequisite before private parties developed. According to interviewee #1, most developments around hubs north of Zwolle were led by (semi-)governmental services that located there initially, and after some time other businesses and developments followed.

An employer approach, where the provincial organisation of ‘Groningen Bereikbaar’ tried to stimulate employers to let their employees travel in a different, more sustainable manner (via P+Rs, e-bikes, or public transport), was a flanking policy used for making companies intermodally accessible (#2, #5).

However, making as much modes as possible available from the start of the land-use development was also experienced as a way to improve travel by multiple modes and public transport. An example of interviewee #7 showed intermodal travel behaviour could be stimulated in residential districts:

“When we planned a residential district in Leek, we agreed with the OV-Bureau that there should be a bus line in the start of the development [...] That meant that when the first houses were realised, people were confronted with the bus, [...] Many people from the district now take the bus to work.”

In the city of Groningen, where more TODs took place, municipal policy wanted TODs to continue, by stating that: “The best form of transport policy is land-use policy” (Gemeente Groningen, 2019, p.38).

4.3. Governance

As one could read in the previous section, many actors have a variety of roles and tasks, that they together bring into action to achieve a transport system that can be travelled intermodally. In the hub programme, the two provinces, the OV-Bureau and the Publiek Vervoer are the main actors. These actors are however not the only ones since other initiatives and organisations help in achieving intermodal accessibility. Based on different levels described in chapter 2 and the findings in the interviews, the actors are discussed per governance level, whereafter the role of the market and citizens in the governance is described.

4.3.1. National level

Ministerial investments

The national government was described as an actor with limited importance by most interviewees. Interviewee #5 stated that most of the investments made by the provinces and municipalities were indirectly issued by the national government, specifically in the National Plan Groningen Programme, which specifically focused on improving liveability of the province of Groningen. Sometimes, the subsidies were more direct, as interviewees #5, #6 & #7 described in the case of implementing extra bicycle parking or charging stations.

Gathering Information and knowledge

Furthermore, the national government also was interested in the hub programme and all the developments it brought about in the region (#1; #5; #9; provincie Groningen, 2020a). The programme team tried to get on the radar of the national government, specifically the Ministry of Infrastructure and Water Management (I&W), since this might have improved chances for subsidies from the national government. The national government played a minor role in the vision for public transport, which linked to intermodality: the OV Toekomstbeeld 2040 (#2; #6), where it tried to make sure that information was shared on a national level (#1; #8). Peri-urban and rural areas were discussed in the OV Toekomstbeeld, but these areas were not that much related to intermodality explicitly (Ministerie van Infrastructuur & Milieu, 2016). Generally, a future with an increasing combination of private and collective modes, which would be in the peri-urban and rural areas more tailor-made and demand-based, was indicated (CROW, 2018; Ministerie van Infrastructuur & Milieu, 2016). Other content in the OV-Toekomstbeeld focused primarily on strengthening intermodal travel on interurban connections.

The Hague's bureaucracy

On the other hand, was the national government, with its siloed structure of ministries, seen as an actor that was working in a bureaucratic way (#1; #8). Interviewee #1 stated that this made it quite hard to fit the integrated view of the hub programme in the scopes that the ministry of infrastructure and water management issues. This made getting financial support from the national government hard, since the hub programme had evolved into broader programme, with a focus on more than just mobility hubs (#5). Interviewee #1 stated that it was hard to get financial support for the integration of the hub and library in Roden. The ministry of I&W directed the programme team to the ministry of Education for subsidies, since the plan involved a library (#1). That ministry heard the plan and directed the team back to the ministry of I&W since they did do mobility hubs (#1). In the end, the team went to the ministry of the interior, which understood the issue, but told integrated projects were hard to subsidize (#1). This view is recognized by other interviewees (#2; #5; #8; #9). Interviewee #8 pointed out that the problem might be harder since when asked if the national government should have a more explicit role in the implementation of hubs, the response of interviewee #8 was:

“Please don’t. [...] The national government is well-trained in trailing the trends and taking notice of these trends, but very bad in making a policy on it.”

4.3.2. Provincial level

Interprovincial collaboration

The provinces played, with the OV-Bureau, an important role in the implementation of intermodality around Groningen (provincie Drenthe, 2018; provincie Groningen, 2020b, 2019). Provincial mobility policy stated that the provinces had to be frontrunners in accessibility (provincie Groningen, 2020b). Both interviewees of the provinces, as well as other members of the programme team, indicated that the collaboration between the provinces worked out smoothly (#1, #5). Collaboration between the provinces was sought in the hub programme, where on the major ideas, the provinces agreed and worked together on them, whilst also leaving each other some freedom in the implementation (#1). Drenthe was for instance using a different policy for placing water taps on hubs than Groningen (#1).

OV-bureau as manager and developer of public transport

A reason for this effective provincial collaboration was the OV-Bureau, which managed and developed the public transport concession area fully covering both provinces (#5). Together with the municipality of Groningen, the provinces owned the OV-Bureau and had deputies serving in the organisational board (#1; #5). Many interviewees indicated that the OV-Bureau was part of the successful implementation of hubs and that it was desirable that it – as government agency – had a say in the bus network (#1; #3; #5; #8; #9). It also underlined that both provinces and the municipality of Groningen via the OV-Bureau indirectly possessed the role public transport concession manager and developer, since the OV-Bureau was also responsible for bus network development and financial risk (#8; #9).

Most interviewees saw both provinces as the driving and initiating force behind the hub programme (#1; #2; #5; #7; #8; #9). There were however some interviewees that saw the OV-Bureau as the central and initiating party (#3; #4; #7). Interviewee #3 of the municipality of Oldambt saw the hub programme and its organisation for instance as “a clone of the OV-Bureau”.

Initiating and coordinating hub development

Interviewee #5 of the province of Groningen stated that the primary tasks of the provinces lay in supporting (financially), connecting parties, and initiating necessary actions to create the right conditions for the implementation of the hub programme. Interviewee #1 gave as an example that the province of Drenthe was planning on placing shared cars on some of the hubs in the province where no market party wanted to facilitate, or no citizen initiative was shown. The province filled up these gaps, whilst also supporting or connecting to the parties that were able to facilitate shared cars (#1).

This intermediary role was also taken up by the hub programme, whose task it was to connect (local) parties and municipalities to the hub concept (#9) Interviewee #9 told that food trucks were to be introduced on hubs, where food/drinks could be bought by travellers passing through. The province saw this as a chance to meet with some entrepreneurs and the OV-Bureau, to find a suitable slot for the entrepreneur to stand there based on travel data, and to let them as a pilot sell there (#9). To make things easy, interviewee #9 made sure the right municipal permits were requested and marketing was done (#9). Interviewee #9 stated about these pilots that: “That’s how we want to try things out.”

The comment of interviewee #9 was recognised by many other interviewees as a success of the hub programme (#1; #2; #5; #8). Interviewee #8 described the spirit as “the will to make things happen”, whilst interviewee #2 added to that spirit that success was not necessarily a certainty, and that there was room for error in the implementation. The thriving force in this was the hub team, since they wanted to make sure that interests and organisations were aligned, and these organisations were doing what they wanted them to achieve a successful implementation of the hubs (#7; #8; #9). In order to get things done, interviewees #1, #4, #7 & #8 stated that having well-developed networks of contacts was a plus that contributed to the effectiveness of implementation.

Although the province itself developed hubs that were on provincial roads, in most cases, collaboration with other parties was necessary. In both instances, provinces hoped to foster municipal collaboration and a more integrated view on issues and solutions (#1; #2; #5; #9). The case of the Roden library discussed in section 4.2.2. was seen by interviewee #1 as a perfect example of what provincial facilitation and coordination could bring municipalities: an integrated view on things. It was this integrated view the hub programme increasingly embraced and tried to propagate (#5; #9), since it was noticed by interviewees that many people within municipalities and other government agencies were mostly focused on own projects and responsibilities (#1; #4; #5; #7; #8; #9). However, interviewee #5 brought in that it took some time and effort – internally and externally – to achieve this integrated way of working. The hub programme had recently also broadened its scope to more than mobility (#5).

Seeking municipal support

In another light stated interviewee #1 that regional mobility was too substantial to handle for most municipalities, whilst it was too small to handle by the national government. This resulted in intermodality being a task left to the provinces (#1), whilst the province would still need the support and collaboration of municipalities in most instances (#2; provincie Groningen, 2020a). This made political and administrative collaboration between the two governance levels essential, which could sometimes be a barrier according to some interviewees (#1; #8; #9). One of the instances wherein this barrier became clear, was when the members of the hub programme tried to steer and influence land-use and transport decisions made by municipal governments (#1; #8; #9). Interviewee #1 gave the example of a municipality where a transportation alderman did not give its support to the hub programme, but that the sustainability alderman was rather positive. Showing that that “sometimes is also the role of the province: being flexible in the perspective you take to achieve things” (#1).

Institutional fragmentation

Interviewee #8 did point out that this municipal coordination was necessary because of the fragmented nature of the field of actors:

“That we just do it and show that things are possible, is a positive thing. Deputies and aldermen love that. But in order to take the next step, one has to adjust and discuss constantly with many other organisations in the field. In the end, that limits the effectiveness of the programme.”

The critique on the fragmentation by interviewee #8 was not shared by others in the Groningen case, but this stance contrasted with interviewee #18, who in a generic interview stated that:

“Operating from the traditional three governmental levels by Thorbecke is hard since they are institutionalized. Task-oriented organisations such as the OV-Bureau in Groningen and Drenthe, show a separation of the sluggishness and bureaucracy in the original three levels. [...] They are relative effective organisations. I am a fan of that.”

Both interviewees agree that there are serious advantages in making the task-oriented organisations work, since they enabled a more hands-on approach on the implementation of intermodality and hubs. However, since deputies saw that this works, multiple organisations in the same policy sector were set up, leading to risks of institutional fragmentation (#8) or illegitimizing the democratic system (#18). Despite the fragmented institutional landscape sketched by interviewee #8, most interviewees stated that the goals that were set by organisations and governments in the collaboration, overlapped with hub programme goals (#3; #4; #5; #6; #7; #8; #9). This made collaboration in itself possible, and only left discussion about other relevant choices and agreements in the process (#6; #7). It was this discussion in a multilevel setting (with market, governments, and citizens) that the provincial policy was finding desirable (provincie Groningen, 2020a) and/or necessary (provincie Groningen, 2020b).

4.3.3. Municipal level

Intermediary and developer

Compared to organisations on the regional/provincial level, municipalities have a limited coordinating and initiating role in the implementation of intermodality. However, municipalities did have an important role to fulfil as developer and provider of local knowledge (#2; #3; #7). As the governance level closest to the citizens, municipalities were often the intermediaries between the citizens and the relevant governmental organisation or level (#7), and were therefore the bearer of useful, local information in the implementation of hubs (#2). Interviewee #7 described the role as municipality as:

“... being an intermediary to many other organisations and agencies. Receiving complaints from citizens and make sure that they reach the responsible organisation where they belong. [...] But that role also leaves such room to convey bottom-up initiatives to other government organisations.”

Besides this task of retrieving initiatives and complaints, municipalities were also receiving responsibilities from the provinces, OV-Bureau, and other regional governmental agencies, primarily affecting their role of road owner (#3; #7; #8). Since municipalities were often the road owner on the location of the hubs, they were responsible for making development on or around hubs possible (#3). This also meant that for infrastructure construction, public space, and the needed legislation, the responsibility was often with the municipalities, also for land-use developments and zoning plans (#1). Interviewee #3 gave as an example the development of bus infrastructure, where the municipality had for instance to pay for the development of new bus stops if the OV-bureau planned a new bus line, since the OV-Bureau “only gets budget primarily for bus scheduling and exploitation”. Interviewee #3 added to that that “budgetary walls” between these organisations should be removed, “to get a grip on the monetary flows for these operational changes.”

Municipal funding problems

The problem interviewee #3 outlines in the previous quote, clearly shows the responsibility for development municipalities have. It also indicates that a municipality had to bear these costs whilst it did not always have the means to pay for it. Interviewee #2 added that there might have been willingness in a municipality to work with the hub programme on the improvement of intermodality, the ability was also necessary. However, to quote interviewee #2 “this ability often parallels with the finances”. In general municipalities did not have enough finances to cover the investments needed (#5; #7; #9). Although it was by most interviewees described as hard barrier, co-financing was used as way to divide cost between municipality, provinces, and other national subsidies (#5; #7; #9). The provincial cycling policy stated for instance that the province was to support peri-urban municipalities with investments for cycling infrastructure improvement (provincie Groningen, 2016). Interviewee #7 of the municipality Westerkwartier explained that this might be still difficult, since even if a municipality had to retrieve 20-25% of the money for the investment, it could be a challenge on the municipal budget.

The hard financial situation indicated in the quote above was acknowledged by most interviewees, and was sometimes seen as a clear barrier in achieving the most effective or needed hub-investments (#5, #8). Interviewee #8 gave as reason that a “province never wants to become the ATM of municipalities”, and therefore co-financing was used. Still, “it can be that a less urgent or desirable project succeeds instead of more urgent one, since the other municipality did not get necessary finances covered” (#8).

Other municipal interests

As shown in subsection 4.3.2., political support (democratic legitimization) in municipalities was a barrier, since not all municipalities saw the urgency of the implementation of hubs and had the democratic legitimacy within their territorial jurisdictions (#1; #2; #9), therefore having the power over intermodal hubs development as well. On the other hand, in light of the funding problems

municipalities had, municipalities might not have had all the necessary means for hubs, and as a result had responsibilities and interests different than hubs (#2; #5; #7; #8). Municipal interviewees #2, #3 & #7 all indicated that they sometimes felt a lack of imagination by other governance levels. Whilst the expectations for hubs by higher levels were sometimes not specific, the municipalities were expected to develop and improve hubs. (#2; #7). Interviewee #2 admits that expectations were sometimes unclear or unrealistic. “There was a proposal for a kiosk on the P+R Hoogkerk, where the municipality should also contribute €100,000. - per year. Yeah, good luck with that” (#2). From a hub-perspective “the kiosk is a good idea, however, there are also other interests at stake for a municipality” (#2).

Regional municipal collaboration

Municipalities worked together in the regional collaboration of the Groningen-Assen region (RGA) (CBS/O&S Groningen, 2018). This organisation included as members the municipalities of Assen, Groningen and other municipalities that were seen as part of the central (peri-)urban region (#2; CBS/O&S Groningen, 2018). The provinces of Drenthe and Groningen were also involved in the collaboration, and primarily facilitated the collaboration (#2). RGA covered multiple themes that were important for the region, of which accessibility was one, “since it does not limit itself to the municipal borders” (#7). To improve intermodal accessibility, municipalities worked for instance together by realizing improvements on public transport spokes near the city. Interviewee #2 stated that regional collaborations, like the separate bus lane between the P+R in Hoogkerk and the main station (see also subsection 4.2.1.), used a regional fund where the relevant municipalities contributed to: “The principle has always been that we work together regionally, also for accessibility. Simply since you can’t do it alone.” (#2). Interviewee #7 added to this that there were other projects related to regional accessibility that were also taken up by RGA investments, such as the P+R-sites and regional cycling routes, but also projects in regional spatial planning for housing and work. RGA partly supported these regional projects with some subsidies, whilst it also aligned the policies of the various municipalities to some extent (#2; #7).

4.3.4. Market parties

Operators as mobility providers

Since the hub programme has its focus on public transport, operators play a significant role in implementation of intermodality. Most interviewees indicated however that the role of operators was primarily in the capacity as executor driving buses and/or trains, and that the influence of operators on the schedules or network development was limited (#3, #5, #7). In particular for the bus network, since the OV-Bureau was primarily responsible for this task (#8). Interviewee #8 stressed however that decisions were often taken in good communication and alignment of the operator: Qbuzz.

Since operators were closest to the public transport users and drive the routes, they contributed important observations for service improvement that sometimes led to changes in infrastructure or schedules (#3). Interviewee #3 did however experience that in most cases the focus of the operator was on driving the schedule punctually and the quantity of people using their service, and less on this quality. Interviewee #8 stressed however that from the OV-Bureau-perspective, operators “build on the product experience as much as we [OV-bureau] do, so we try to celebrate successes together”. It was just that the government had a somewhat bigger role than elsewhere in the Netherlands (#3; #8).

Since the OV-Bureau was able to steer Qbuzz to some extent, the implementation of intermodality (and more bus usage due to/with that) was a priority in the organisation (#1; #5; #8; #9). For Arriva and NS this was different, since they operated under a concession directly issued by the province and national government, respectively (provincie Groningen, 2019). Interviewee #6 of NS stated that NS did support the hub-idea, since NS “recognises that the train product becomes less interesting to use,

if the first and last mile are jammed". Therefore, interviewee #2 was appointed as mobility developer, so that "the train remains a backbone, but becomes better interwoven with other modalities" (#2).

This perspective on the transport system, had other operators as well (#6; #19). Interviewee #19 from the mobility alliance – an organisation of operators and transport lobby groups – explained that these organisations agreed on the same, general goal: interweave modalities. It was however that every organisation had its own interest to have that goal (#19). Interviewee #6 added to that – in its experience – competition between operators was not won or lost on the quality, but in the connections with other trains, busses or other modes. "An improved transfer benefits both operators (and travellers)" (#6). Interviewees #8 & #19 had the same experience, and #19 concluded:

"There is really 'the awareness' that it is about complementarity on different movements. We all realise that there is not one silver bullet that solves the problem. We have to complement each other, because the problem is simply too big to solve for one operator or organisation"

Operators as land-owners

Another key position operators NS and ProRail had, was landownership (#1; #6). Interviewee #1 gave as an example the NS, which owns nearly all Dutch station buildings and some ground positions, even if Arriva operated the line. ProRail owned the rail infrastructure and most bicycle storage facilities (#6). These ground positions gave the NS and ProRail a relatively powerful position in the development of the hubs near stations, since they were (partly) owner of most station locations. On the strategic level, both organisations supported the goal by the governments of improving intermodal travel in the form of hubs (#5; #6). Though interviewee #5 gave away that in practice this development could be bureaucratic, with stiff processes and sometimes legal difficulties, which resulted in a barrier in the development of the programme (#5; #9) – specifically for the tailor-made approach the hub programme strived to use (#9). Interviewee #9 gave as an example the placement of bicycle storage facilities on stations, where users and respective capacities were calculated and then placed by ProRail. Not all the stations had however the same travellers groups, so the hub programme wanted to base the parking design on that (#9). Yet, Interviewee #9 stated that this implementation was difficult since "ProRail has just one type of bicycle storage. They do not think further than the capacity numbers"

ProRail was not interviewed for this study, but interviewee #6 of NS recognised some of the statements made by #5 & #9. "We often get the distinction that NS is a big company from far away. [...] We might have said more arrogantly 'no' to some things in the past, explaining that feeling". On the other hand, Interviewee #6 now stated that most governments and relevant organisations appreciate the improvement in how NS was developing itself with regional managers nowadays. The past attitude was however not totally gone and not totally unavoidable (#6), since Interviewee #6 concluded that: "Because our behaviour in the past, I expect bottlenecks in the collaboration earlier from our side than on the side of a municipality."

Using local entrepreneurs for local services

As discussed in subsection 4.3.2., the hub programme tried to involve (food truck) entrepreneurs primarily on the hubs itself (#1; #5; #9). Another example of this was the parcel locker pilot that had been introduced on a few peri-urban hubs in Drenthe as part of the EU-project: SURFLOGH (#9; Interreg North Sea Region, 2021). Interviewee #9 stated that enthusiasm was growing under local entrepreneur associations, recognising it as a nice initiative. Interviewee #9 stated that, besides a sustainable way of parcel delivery on the hub as a central node for the region, the hub programme also aimed to show to entrepreneurs "That the hub can also be an opportunity, not a competitor."

Modest growth of shared mobility facilitators

Although the programme in Groningen does not focus much on shared mobility, there were some developments. In the city of Groningen, market parties had recently introduced shared scooters (#1). Outside the city making profits was deemed harder, which was shown by the idea of provincie Drenthe to set up shared cars by themselves on multiple hubs (#1; see also 4.3.2). The recent introduction commercially-owned shared e-bikes on the hub location near Hoogkerk by Deelfiets Nederland, was seen as a pilot by interviewee #2. The same hub location also has the availability of the OV-fiets, owned by NS. Some other stations had these shared bikes as well if the NS operated on the station (#6).

4.3.5. Citizens

Gathering local input via participation

Most interviewees indicated that there is room for ideas of citizens and travellers on hubs (#1; #5; #9). Still, it was important to stress that nearly all of the actions of the hub programme were initiated, facilitated, and coordinated by governments (#9). The reason for this given by interviewee #1 was that it was hard to get people involved with the hub project at the right time. Interviewee #5 added that the extent in which people were interested to bring in their ideas, depended on the location. “On P+Rs near the edge of the city [...] are more opportunities for bottom-up discussions with entrepreneurs and logically a limited role for local residents. It depends on the level you work on.” (#5).

Nevertheless, interviewees #1, #5 & #9 specifically stated that participation was for most hub projects an addition since the programme wished to work bottom-up via tailor-made approaches and processes for each of the hubs (#5). An example of getting input for this, was the usage of old emergency telephones, where users of the hub could leave suggestions and opinions regarding the hub (#1; #5). The OV-Bureau did also (bus) surveys, resulting in feedback from users of public transport stops (#3).

Interviewee #1 stated that in some cases the municipalities were given the responsibility for the participation since this governance layer was more approachable. Interviewee #7 agreed by sharing that most people just called the municipality if something in their neighbourhood was bothering them or changing. In reverse, municipalities also had frequent contact with community associations “to collect problems and urgent topics” (#7). That information was then shared within forums consisting of other governmental agencies, to work together with citizens towards solutions (#7; #9).

Citizen initiatives in hub development

Although the citizen initiatives in Siddeburen and Zweeloo were named earlier, interviewees did not stress the regular occurrence of these initiatives (#9). It was intended to create exploitation of electric shared cars by community-based energy co-operations (producing local sustainable energy) (#1). Something comparable was done in Loppersum, where locals had that idea themselves (#5).

As stated earlier, some citizens in the village of Zweeloo were starting to create their own hub (#5). Interviewee #5 explained that these bottom-up initiatives could be quite a challenge because of the nature of institutional debate on policy:

“We have to help them with that. [...] It is an important group with potential, the citizens, but it depends on the policy theme in which their initiative takes place. Policies are [...] abstract, and that makes the conversation hard until the moment it becomes more real.”

4.4. Analysis

This section analyses the previous described results in an interrelated way. To give an overview of the major results, table 2 gives an overview from the perceived characteristics of the Groningen case. The section uses this overview to describe the analysis.

| | |
|--|---|
| <p>Strengths</p> <ul style="list-style-type: none"> - Stretching - Park & Rides - Basic bus network - Strategic hub programme - OV-Bureau - Regio Groningen-Assen | <p>Weaknesses</p> <ul style="list-style-type: none"> - Shared mobility sees limited focus (yet) - Democratic legitimization in municipalities - Municipal finances - Silo's (operators and municipalities) |
| <p>Opportunities</p> <ul style="list-style-type: none"> - Services on intermodal accessible places - Land-use steering near hubs - Integrated, broader scope hub programme - Publiek Vervoer - Room for error and experimentation - Local entrepreneurs on hubs | <p>Threats</p> <ul style="list-style-type: none"> - Institutional fragmentation - Other municipal challenges - Integrated nature limiting national subsidies - Bureaucratic nature of operators |

Table 2: A swot-analysis of the case of Groningen (author).

Intermodality in the case of Groningen is primarily coordinated and initiated by the provinces. This level is involved with public transport concession management, which also explains why the backbone of the hub programme is public transport connections. Because of the *OV-Bureau* as a relative powerful governmental actor on this level, public transport development can be more controlled by the provinces and municipality of Groningen than elsewhere in the Netherlands. This active role in public transport development has given room to *controlled stretching* and experiments during the concession. The active provinces and *OV-Bureau* have therefore created a *hub programme* that is relatively effective, since the development of most transport modes can be steered by these organisations. Over the years, a *basic public transport network*, *Park and Ride-locations*, and now the strategic hub programme – that builds on experiences of the previous two – are concepts that are the result of this government-led coalition. In this coalition the municipal collaboration in *RGA* also adds to this effectiveness since its collective fund offers opportunities to finance intermunicipal projects.

A collective financial fund is however not used in the implementation of the hub programme. Even though the provinces contribute to development of hubs and take over some municipal cost for hub development, *municipalities have difficulties to finance* their part. This makes investments sometimes ineffective, since not all municipalities in areas where intermodality development is urgent can get their budgets right, resulting sometimes in developments not getting the money necessary – in the end cancelling the project. The lack of money brought up by the municipalities has multiple causes, with one of these being the variety of *other (budgetary) challenges municipalities experience* in the area. Regional intermodality might therefore sometimes have limited importance for municipalities compared to running expenses on social welfare or existing public services. Some municipalities are coping with *lacking support for investments in intermodality internally or politically as part of the democratic legitimization*, creating a barrier for implementation of intermodality. Sometimes this – combined with the financial inability – can lead to municipal barriers for implementation, limiting the coalition's effectiveness. Another barrier limiting this effectiveness are *siloed municipal departments or operators*. The programme tries to cope with this by creating broad project teams for every hub, by letting municipal departments or operators work together to *create integrated intermodal hubs*.

These broader project teams are the result of the *broader scope the hub programme* has gained over time. Provincial policies reflect this broader perspective and stress that integrated solutions and multi-

level collaboration with other governments, market parties and citizens is needed. The hub programme works from these principles of integration and multiple levels, and tries to convey these to other parties as well. Some examples have shown that locations of regional services are related to the intermodal transport network, with mixed successes. Still, on a longer horizon, development as *intermodal hubs as socio-economic hubs with services, dimensioned land-use developments, and local entrepreneurs nearby*, is seen as a new and integrated goal for the hub programme. The first step in this process, is the future integration of the *Publiek Vervoer* services with the hub locations. This combination is to make the transport system more effective (creating intermodal trips between *Publiek Vervoer* and public transport) and efficient (more income for public transport, less cost for *Publiek Vervoer*). This combination is also an example of the *experimental nature of the hub programme*. This has been enabled by the government-led coalition, which is pioneering in (rural) hub development in the Netherlands, and continuously looks to what works in practice and what does not.

This experimental stance does have as a drawback that investments are not always successful and sometimes cover too many fields due to their integrated nature. Since the programme has this focus, *the siloed departmental structures in The Hague might be a barrier for subsidies*, possibly limiting the effectiveness. Another development that not only limits the effectiveness but also the democratic principle, is the existence of many 'quangos' (quasi-governmental organisations), causing *institutional fragmentation*. This leaves the hub programme with more stakeholders and subsidy competitors aiming for the same overall goal. This is already seen in a practical sense, with the *bureaucratic nature of all the different operators* that have to be involved with intermodal developments. Examples of NS and ProRail show that these parties agree on the goal in general, but sometimes limit the opportunities possible on hubs. For instance, by limiting the types of bicycle storages or working with detailed legal procedures from these operators' role as landowner.

5. Results Noord-Holland case

This chapter discusses the results of the Kop of Noord-Holland case. Like the previous chapter of the Groningen case, after the instruction of the case, a section about the implementation of intermodality with a focus on developments in LUTI-principles and policies follows. Thereafter, a section discussing the governance that lies behind this implementation follows. The results are based on eight relevant policy documents and answers of 8 interviewees.

5.1. Introduction

The northern part of the province of Noord-Holland is one of the cases studied in this study. Also known as the 'Kop' (Head) of North Holland, the area north of Alkmaar and Hoorn is anticipated to suffer from population decline in the future. The peri-urban area in this case is shown in figure 16.

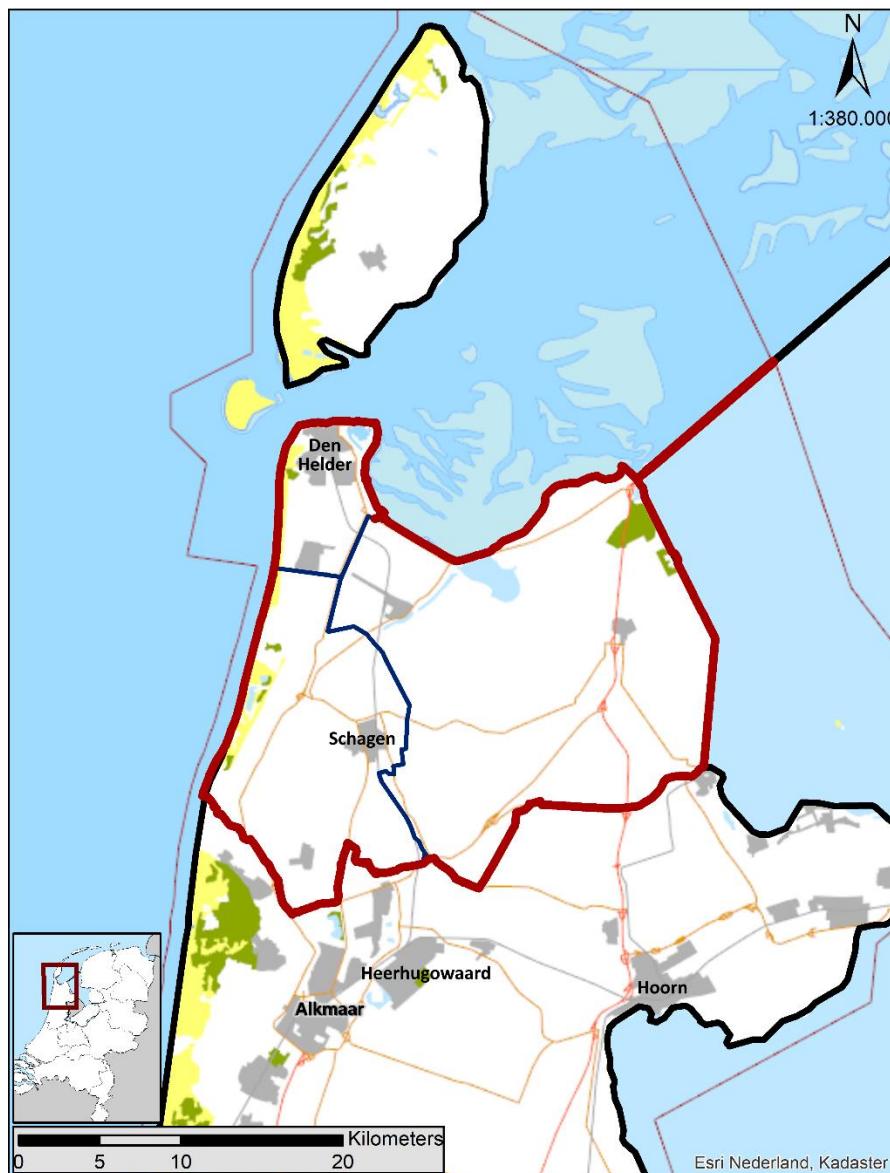


Figure 15: The case area in the case of the Kop of Noord-Holland

The Kop of North Holland mainly exists of agricultural land, which give the landscape an open character. Major economic activities are clustered around the harbour of Den Helder, Schagen, the tourism industry on the North Sea coast and greenhouse and datacentre development in the south-

eastern part. Den Helder (41,000 inhabitants) and Schagen (19,000 inhabitants) house most regional services and have (together with Anna Paulowna) a train connection towards Alkmaar, Zaandam, and Amsterdam. Schagen, Den Helder, and Hollands Kroon are the municipalities in the region. DUSs of Alkmaar, Hoorn and to some extent Amsterdam are served by the region.

In this case, municipalities are working together on the implementation of intermodality in the regional collaborative programme called: De Kop Werkt! (Movares, 2020). This programme focusses on various regional themes such as housing, employment, and accessibility (Movares, 2020). Within the theme of accessibility, the implementation of 'Mobipunten' (Mobipoints) is a project that tries to improve accessibility by the creation of intermodal transfer points throughout the Kop, with a focus on shared mobility (Advier, 2020). The Mobipunten are initiated and implemented by Advier and the municipalities of Schagen, Den Helder and Hollands Kroon (Advier, 2020). Besides the Mobipunten, the province of Noord-Holland is also working on a programme on public transport node development. The focus in this programme is however not on the north of the province yet (provincie Noord-Holland & Flevoland, 2019), but might however be interesting in the future for the Kop, so it is discussed shortly in this study. The programme works together with NS, the sole train operator in the area, and ProRail. Connexion is the bus operator in the area, serving under a concession issued by the province.

5.2. Implementation of intermodality

As stated above intermodality in the case in the Kop of Noord-Holland is primarily undertaken by the municipalities on local and regional scale with the Mobipunten project, where shared mobility and other facilities are developed on intermodal hubs. The province has a limited role in this project but is responsible for bus concession management and its own programme. The Mobipunten are initiated and implemented by the municipalities as part of a regional collaborative programme: De Kop Werkt! Together with Advier consultancy the project is executed and has reached the early implementation phase, "expected to grow towards the ambition of 40 Mobipunten in the Kop in the near future" (#15).

5.2.1. Transport policy and developments

Facilitating shared mobility via Mobipunten

Mobipunten were hubs developed and initiated by De Kop Werkt! (DKW) and Advier and located mostly at bus stops and stations (#10; #11; #12; #14; #15; Advier, 2020). Besides a bus and/or train connection, a Mobipunt also offers a form of shared mobility, often being shared bicycles and/or shared cars (#11; #15; Advier, 2020). The basis for this network of Mobipunten was in most cases the availability of public transport and in some cases a purchaser of shared mobility (#10; #11; #15). Although officially the availability of public transport is not a necessity, it was highly desirable (#15). Interviewee #15 described a Mobipunt as follows, thereby addressing its connection to intermodality:

"The basis of the Mobipunt is about mobility. We want to make it easier to travel for inhabitants of the area. There has to be a connection with public transport in 90-95% percent of the cases, where people can convert towards a (shared) bike. Shared cars are harder.

Mobipunten were not limited to the Kop, since the concept was part of the European programme SHARE NORTH, with comparable implementation in (among others) Norway, Belgium, Germany and Sweden (#11; Advier, 2020). The Mobipunten concept was in the Netherlands and Belgium introduced by Advier consultancy, which was involved with stakeholder relations and execution of the Mobipunten in the Kop (#11; #15; Advier, 2020). The European programme behind the project was specifically meant to facilitate knowledge sharing and possible policy transfer (#11). The Mobipunten in the rural Kop contribute to this goal, since most Mobipunt concepts were implemented in urban regions, contributing knowledge from a new context (#11). Interviewee #11 explained that there were

other problems at stake for regions like the Kop since “the Kop is more focused on maintaining liveability and service accessibility [...] whilst in cities play other, more space-related issues”.



Figure 16: A design of a Mobipunt (Advier, 2020)

The project resulted from the reduction of bus connections in the sparsely populated region, which potentially deprived the accessibility/socio-economic sustainability – and therewith the liveability of the area (#11; #15; Advier, 2020). Further bus line reduction in the area was expected by most interviewees, since most lines could not be made exploitable because of limited use (#12). Therefore, Mobipunten were seen as the alternative to fill up the gaps (of egress and access transport) that the reduction of public transport (would) cause (in the future) (#11; #13; #14; Movares, 2020). Stretching and thereby thickening the lines was in consideration but was not expected to be a solution for the decline of public transport use (#10; #11; #15; provincie Noord-Holland, 2019; provincie Noord-Holland & Flevoland, 2019). The provincial mobility policy stated that “for less profitable lines there has to be searched for alternative, new forms of public transport” (provincie Noord-Holland, 2019, p.9). This policy was based on the national OV-toekomstbeeld 2040, which stated small-scale demand-based transport should be considered for areas with declining public transport (Ministerie van Infrastructuur & Milieu, 2016). Interviewee #11 explained shared mobility as the key alternative chosen in the Kop:

“An alderman politically wants to avoid a reduction of public transport at all costs, certainly when badly communicated or argued. [...] However, shared mobility could be a viable alternative. [...] One sees that it is interesting for thinner lines to replace these with small-scale transport than the traditional bus.”

Provincial public transport nodes in station areas

The provincial programme involved with the implementation of intermodality had its focus on ‘public transport nodes’ throughout the province, specifically stations (#12; #13; #14). Interviewee #11 stated however that the province supported the idea of Mobipunten, was held updated, and possibly wanted to expand the concept further over the province (which has not yet been mentioned by others).

The provincial plan for public transport nodes used the rail network as backbone and focused on all train stations and four major bus stations in the province (#13; provincie Noord-Holland & Flevoland, 2019). The idea for these hubs started in 2010, in an execution plan to upgrade all station areas in the province (#13) and connected to the provincial (mobility) policy goals of (environmental and socio-economic) sustainability improvement (provincie Noord-Holland, 2019). The programme had an integrated focus on both the transport network and the surroundings of the station with TOD (#13; provincie Noord-Holland, 2013). The transport network perspective within the programme focused on creating storage capacity for bikes and station accessibility improvement for other transport modes (#13). Interviewee #13 explained the programme aims for “intermodal accessibility [...] by improving first and last miles to stations”. These connections were often municipal responsibility, but the province might be able to offer advise (#13).

The provincial policies and programme specifically focused on the LUTI-cycle – by considering both land-use and transport systems – but did not consider the Kop in their implementation (#13; #14). Interviewee #14 stated that the province has not an active focus on the stations in the Kop but tried encouraging municipalities in developing better station areas themselves. Interviewee #13 explained that this lack of active involvement by the province in the stations in the Kop was because of the absence of a ‘rail development corridor’, whilst other busier areas in the province were. This was also seen in the provincial policy documents (provincie Noord-Holland, 2013; provincie Noord-Holland & Flevoland, 2019), and caused by a priority list that was agreed upon by the province, since interviewee #13 explained that “the area north of Heerhugowaard is not yet seen as a priority in our provincial public transit fund, [...] so for us there is not yet urgency to take action in the Kop from the programme”

The lack of policy/vision for the northern part of Noord-Holland was also recognised and mentioned by interviewees #12 & #14. The province had based its policy on the national OV-Toekomstbeeld 2040, from which a regional OV-Toekomstbeeld was created, indicating a focus on more demand-based and shared mobility (#12; #13). This indication showed that the province had formed not a specific vision about development of the station nodes in the Kop. Combined with limited number of new housing developments compared to the rest of the province, provincial attention had shifted more to the southern part of the province in the public transport nodes programme (#12; #13; #14; #16). Interviewee #12 proposed that in the near future, this view on intermodality in the province should reach beyond own provincial programmes:

“A focus on the stops in the region, is lacking. The Mobipunten are now developed separate from what we do as province. It would be nice if we, as a province, would also get a vision on that.”

Demand-based transport as local transport service

Based on the current provincial policy, the north of the province should conform itself to the idea of shared mobility and small-scale demand-based transportation (#12; #13; provincie Noord-Holland & Flevoland, 2019). Besides shared mobility – being part of the Mobipunten project – there were also other examples for demand-based transportation in the Kop.

Interviewee #12 gave as an example the flex busses are operated by Connexxion. These busses were not driving regularly but could be requested by inhabitants of the smaller villages they serve (#12; #13; #16). The service then drove a scheduled route and connected to one or more stops where a transfer to the regular public transport could be made (#12; #13). Interviewee #16 of the municipality of Hollands Kroon stated that this type of transportation “is more focused on the demand [...] instead of driving empty busses. This makes the service tailor-made.”

Another initiative fully operated by volunteers, were local transport organisations (#12; #16). These were individual organisations, operating separately from the concession or public transport schedules,

ran by volunteers (#12). Although there were multiple of these organisations providing this service in various parts of the province, in the municipality of Hollands Kroon, Belbus Noordkop was offered. As interviewee #12 explained, the Belbus facilitated the transport between villages for inhabitants that lived there. These busses could only be used by inhabitants of the municipality of Hollands Kroon, but it facilitated the connecting factor in the transport system that the municipality was looking for (#12).

Furthermore, an example of demand-driven public transport referred to by many interviewees was the bus line serving the business site of Agriport (#11; #12; #14; #15; #16). Here, DKW, Connexion and the province had rerouted the bus line connecting Hoorn and Medemblik on the request of some companies on the new Agriport business site in between (#11, #14, #15). This change had been sustained by assurances from the companies that employees would use the bus for commute, and also a Mobipunt with shared bikes was created (#14). Based on this prospective of demand, the operator had the financial means to alter the line and to add some stops and drive time to it (#14). The changed route was in this case sustained by the changed demand, as interviewee #14 explained that Connexion bus subscriptions bought by companies were used to finance the cost of the extra minutes driving time. The province itself had no extra budget to add stops in a running concession (#14).

Interregional cycle and rail connection

Most interviewees regarded the rail-connection as an important transportation corridor, which connected the Kop to the rest of the country (#10; #12; #13; #14). Interviewee #10 stated that there was a debate on what to do with the rail connection. “On the one hand we want a quick and frequent connection to the Amsterdam area, with as few stops as possible. [...] On the other hand, we might also want some extra stations and a higher frequency of trains between Alkmaar and Den Helder.” (#10). A research had been performed to look for the possibilities for a light rail concept between Den Helder and Alkmaar (#10; #12; #15). Interviewee #12 said about the light rail idea that this gave opportunities to use and create a better regional intermodal transport system since busses got a better connection with the train. Also, extra stops could improve access to nearby villages for a longer term (#12).

Furthermore, it was said in the coalition agreement of the province, that a research had to be performed on the doubling of the rail connection between Den Helder and Schagen (#12; #14; provincie Noord-Holland & Flevoland, 2019). There was a wish for this in the region, since with the doubling of the tracks, frequencies could be heightened (#14). Interviewee #14 stated however that on current lay-out, 4 trains an hour is possible already. This made that some interviewees had doubts on the idea:

“I think immediately: for whom?” (#13), *“I don’t see the doubling happening.”* (#14).

Where investments in rail infrastructure are not always regarded as a necessity, investments in cycling infrastructure are. Interviewees saw positive trends in cycling and agreed with proposed investments for a regional cycling network (#10; #12; #14; #15; #16; #17). These (inter)regional cycling connections were initiated and primarily subsidized by the province (#14; #15). DKW had added alternative connections in the Kop, to connect these with other modes, to increase bike accessibility and improve intermodality (#15; gemeente Hollands Kroon, 2016; Movares, 2020). Interviewee #15 explained: “To increase the cycling accessibility, we can then connect a new network to the Mobipunten, which can connect that to the public transport stops. In that way, we intend to melt different modes together.”

5.2.2. Land-use policy and developments

Decline or not decline

Although the ministry of BZK had identified the area of the Kop as an anticipation area, with a foresight of population decline in the near future, some of the interviewees stated that the region had difficulties

in accepting this projection (#10; #14; #17). Primarily the aldermen of municipalities were named as persons that hoped to change the forecasts of decline and agreed on any land-use developments that might change the projection (#10; #14). The policy document of gemeente Hollands Kroon (2016) stated “Not decline, but growth is the future of Hollands Kroon.” (p. 23). Interviewee #10 of the municipality recognised this expectation and added that “specifically aldermen and deputies, want to turn around the decline and leave the anticipation region for what it is. But you just cannot steer that. You cannot ask people to stay or live somewhere.”

Nevertheless, there might also be hope, since interviewee #13 stated that in Hoorn and Alkmaar the demand for housing near Amsterdam was having an effect on housing demand. Interviewee #16 did indicate that this growth was happening already in the municipality of Hollands Kroon:

“I think that Hollands Kroon does that experience that much population decline. I read in the paper that our municipality has welcomed 750 new inhabitants this year, so in that light we do not see decline per se. There are already few people living here [...] so I believe that it can decline not any further”

The (ir)relevance of hub developments

In subsection 5.2.1. the public transport node programme of the province has been discussed, primarily from the transport network perspective. The other factor in the provincial programme was the integration of station nodes with land-uses nearby: transit-oriented developments (TOD) (#12; #13; provincie Noord-Holland, 2013), aiming to let people live and work closer to the stations in the province (#12; #14). Interviewee #13 explained that most developments were led by municipalities, which were more involved with land-use planning than a province. The province did try to steer these developments in municipalities with score points that municipalities gained on provincial subsidies if developments were planned near the public transport nodes (#13). So that municipalities got, together with the arguments for sustainable mobility and space-efficiency, incentivized to plan developments in an integrated fashion near public transport (#13). However, as said in section 5.1., most provincial developments were done in the busier, southern part of the province and not in the Kop (#14).

Potentially locating public services such as schools or health facilities near public transport stops were recognized by some of interviewees (#10; #11; #14; #15; #17). There was however often not a clear policy for it from the interviewees’ organisations (#10; #11; #14; #15; #16). The policy of gemeente Hollands Kroon (2016) and report of Movares (2020) both stated that services should be clustered in major towns, but did not state anything on the inclusion with mobility or public transport. Interviewee #17 stressed that this idea of locating public services near public transport was of importance, but specific strategies were not given. Interviewee #15 added that clustering near Mobipunten was not yet actively done, and that for the current state of the Mobipunten project, this was yet “a step too far” for the development phase the project was in.

Community-based services as improvement for local liveability

Interviewees involved with the Mobipunten project stated the importance of communities in realizing a more liveable Kop (#10; #11; #15). Interviewee #11 explained that with the public transport reduction in the region it was undoable to create a transport system where all people without car ownership had a public transport connection near their origin to reach their destinations. There needed to be an alternative for this, but a sole focus on (shared) mobility was not a solution for the whole problem of transport poverty and liveability (#11; #15). Interviewee #11 proposed to also look from the Mobipunt perspective to: “the alternative that is available in the community, where people come together and share things with each other. Not only transport, but also other services and products”. Interviewee #11 believed that there might be a success if the local “liveability component can be loaded into the solution that a mobipunt can bring to communities” As example, interviewee #11 gave:

“A practitioner that visits a village once every week, bringing the supply to the demand [...] or a farmer selling local produce. That makes these villages liveable in future for everyone in the longer term”

Interviewee #11 also added to this that there were ideas to develop the idea of these local services into a small counter near the Mobipunt, where these different local services could be located multifunctionally. The idea behind this – making the mobipunten more part of a wider liveability component for the community – was also made concrete by interviewee #15, who depicted that “there are many other aspects to the Mobipunten than just mobility or transport”. These aspects could be for instance a selling point for local produce, parcel lockers, or a local book exchange (#15). Interviewee #15 predicted that:

“A Mobipunt can grow towards much more than just a ‘zuil’ with a bus. Within this year we [...] want to have five Mobipunten+ realised, with a small counter on it. [...] Powered by and for the community.”

5.3. Governance

In the Kop of Noord-Holland case, other actors than in the Groningen case, have a variety of roles and tasks. Together they create a transport system that can be travelled intermodally. In the previous section two major programmes on implementation of intermodality were discussed: the Mobipunten project as part the DKW programme that is primarily initiated by Advier consultancy and the municipalities, and the public transport node programme initiated by the province and NS. These four actors are however not the sole ones since other initiatives run by other parts of the province, citizens or market parties are also of importance. Based on different levels described in chapter 2 and the findings in the interviews, the actors are discussed per governance level, whereafter the role of the market and citizens in the governance is described.

5.3.1. National level

Priorities of the ministry

Just like the Groningen case, the national government played a minimal role in the implementation of intermodality in the Kop (#12; #13; #14; #15) “The collaboration in the Kop is more with the municipality and the province, than with the national level” (#13). The instance that the national government was mentioned in the interviews by some interviewees, was when they named the OV-toekomstbeeld 2040 (Ministerie van Infrastructuur & Milieu, 2016) as a fundament for their own and/or provincial policy (#12; #13; #14; #16). Interviewee #17 added that two major focusses of the national government – based on the OV-Toekomstbeeld – were the regional cycling connections that connected different regions and the bicycle parking on stations. On these two priorities, municipalities were often (partly) offered financial means and knowledge from the national government (#17). The rest of the OV-Toekomstbeeld contents focused on (inter)urban relations, making them less relevant.

Rijkswaterstaat as road owner and national hinge

Although the national government’s involvement in implementation of intermodality was limited, it had still a role as road owner. The government agency Rijkswaterstaat, national road owner, was part of the working group on accessibility in DKW since they owned some of the road connections in the Kop: the N9 and N99 (#10; #14; #15). Interviewee #14 stated that by adding Rijkswaterstaat to the group, it was hoped to position the Kop better within the national government, to show what regional problems were, and to gain investments (#14). Yet, Rijkswaterstaat was only involved in traffic safety (#14).

5.3.2. Provincial level

Informing and investing

The province had various roles in the implementation of intermodality in the case of Noord-Holland. Firstly, the role of the province in the Mobipunten project was limited (#11; #14; #15). Indirectly the province subsidized the project by paying 50% of the budget given to the whole programme of DKW, but specific involvement with implementation of the Mobipunten was absent (#10; #14; #15). The province saw the Mobipunten as municipal affair (#11; #13; #14). Interviewee #10 stated however that the province was following the project, since they found the idea interesting. The province was seen as actor gathering information for possible implementation elsewhere, interviewee #10 explained. The goal of Mobipunten served the province and its policy supported the Mobipunten (#10; Provincie Noord-Holland, 2019). But according to interviewee #10 the province “is not involved with realisation and set up. [...] They are less interested in the deeper function of the project. There, municipalities take the absolute active role. That is logical.”

The province was however the initiator, coordinator, and facilitator of its own public transport node programme (#12; #13; #14). Here, the province was directly involved with the formation of station areas and the long-term design of the train network, together with NS (#13). However, as stated in subsection 5.2.1., this programme had currently a limited priority for the Kop (#13), resulting in a limited direct provincial role for implementation of intermodality in the Kop (#12; #13). This lack of vision on intermodality for the Kop (see subsection 5.2.1) was seen as a barrier in implementation and collaboration by the provincial interviewees (#12; #13; #14). The province was however a little more active with the implementation of cycling routes through the Kop as infrastructure owner (#14; #15). Provincial interviewee #14 as regional manager of the Kop explained:

“When it is our infrastructure or cycling routes, where we have specific subsidies for, we are involved. [...] We also realise these newly build cycling routes ourselves. We are more active in this position”

Provincial bus concession management

Indirectly, however, the province had a lot of influence on the implementation of intermodality, since it was financing and determining, together with the operator Connexxion, how the busses in the region were deployed (gemeente Schagen, 2011; provincie Noord-Holland, 2019). This was essential for the success of the Mobipunten project, since the connection between shared mobility and public transport was deemed essential on most hub locations. Interviewee #15 described both roles in this comment:

“The province has absolutely subsidizing role. With the Mobipunten themselves they are not involved, [however], to make the rerouting on Agriport possible, the province has absolutely committed itself as concession issuer and negotiated with Connexxion about it.”

The province was in this case thus the concession issuer and Connexxion the concession owner (#12). Development of the public transport network was done in collaboration with Connexxion, where both parties had limited options to alter from the agreed upon concession (#12). With a trend of public transport reduction interviewee #12 explained that for the rural areas, this posed the province for a problem, “since lower frequent lines with low usage, make it hard to keep lines cost-effective and keep the schedule up”. Although the aim of the province as concession issuer was to keep the province accessible for everyone, everywhere, it was harder to cut the cost in urban areas where accessibility was already good, since most money was made there (#12). This according to interviewee #12 made that “it is less likely that the province cuts urban lines to reduce cost there instead of the rural lines”

The quote of interviewee #12 earlier shows the problem that has resulted in public transport decline in the Kop. Connexxion was a market party, so the focus was also on cost-efficiency in the concession

(#12), which would make a further reduction in the future thinkable, certainly with the effects of the COVID-19 pandemic on the use of public transport (#11; #15). Mobipunten might therefore become more important, and interviewee #12 stated that the initiative was communicated as a suggestion towards Connexion. It was this communicating and intermediary role between municipality (wishes) and operator that the province actively tried to maintain. Interviewee #12 gave as an example:

“As issuer we appreciate it when the concession owner takes on these initiatives. [...] Connexion had for example already indicated in the concession that they wanted some pilots with shared bikes [...] which might now also be possible collaboration with the Mobipunten.”

Lack of coordination

Interviewees #12, #13, #14, #16 stated however that the coordination by the province in general might be done better in the future and identified it as a current barrier. This barrier links up with the lack of a vision of the province (see subsection 5.2.1) on and possible institutional fragmentation (see subsection 4.3.2). Interviewee #16 proposed:

The coordination is something I miss a little now. There are so many groups and meetings. [...] It would be nice if there is one institute that has the lead. The province is perfect for that role, I think.”

5.3.3. Municipal level

De Kop Werkt! as regional municipal collaboration

Central in the development, initiation, and facilitation of the Mobipunten was the municipal collaboration of De Kop Werkt! (DKW). The municipalities of Schagen, Den Helder, Hollands Kroon and Texel had formed this collaboration in order to work together on the regional challenges in the Kop (#10). Texel does not participate in the Mobipunten project, so when in this study DKW is mentioned, the municipal collaboration between first three municipalities is meant.

In general, there was a programme manager, leading the whole DKW programme (#10). On the topic of accessibility DKW worked in an official working group with officials from participating municipalities, Rijkswaterstaat and the province (#10; #15). The working group primarily executed the development of projects, such as Mobipunten. For the Mobipunten, Advier specifically had the role to build relations with companies and other stakeholders, whilst each municipality participated most with citizens. This working group was led by an external project leader, reporting to the one of the municipality's aldermen with as responsibility accessibility (#10). The respective alderman was part of a group of aldermen, a representative of the ministry and the deputy, that formed the decision-making steering group of the collaboration (#10). In the end, the municipal councils had the last say in the bigger decisions (#10).

DKW had a collaboration covenant between the participating municipalities and province (#10). Of the budget for the programme 50% was raised by the province and the rest by the municipalities (#10; #15). This collective fund – also meant for the Mobipunten – was by many interviewees seen as a success, since one did not need the approval by every municipality for every expense (#10; #14; #15), “which gives the collaboration on accessibility a good degree of effectiveness.” (#15).

The municipalities and Advier had the task to implement the Mobipunten on chosen locations (#17). Interviewee #17 stated that the municipality often was landowner which made implementation easy. Selecting the Mobipunt locations was in the development phase done by DKW in coordination with the province, Advier, Rijkswaterstaat and Connexion (#11; #15). Interviewee #11 explained that in later phases of the project, this was to be done differently (see also subsection 5.3.4.): “In the beginning we started top-down, [...] [but] eventually locations are planned and financed more bottom-up”

Political barriers in developments

Since DKW was a collaboration between various actors, there were some clashes between interests (#10; #15). The parties in the collaboration had the right to veto decisions and propositions (#10). “We have once run into a situation in which one party is against something. And in other instances that a municipality wants something, but the rest will not. Then, unfortunately, the proposition is not executed.” (#10). Interviewee #15 added to this that although the collective fund was a success, the political discussions were a part of that. Interviewee #10 recognised the difficulties between the different interests on different levels: “actors in the collaboration and collective fund have to discuss things with each other. Thereafter the propositions reach the steering group for accessibility, where it can be the case that the provincial deputy sees things differently than the aldermen”. The challenge was then to find a middle ground that everyone could live with (#10).

Financial difficulties and municipal silos

Like the case of Groningen, municipal interviewees (#16; #17) both stressed that there were some financial barriers in the implementation of the intermodality measures and that it took some effort to overcome these. Interviewee #14 of the province stated that many municipalities tried to lure at the province for subsidies.

Furthermore, interviewees #11, #12 & #16 stated that there were more possibilities for integration of their mobility related fields with other fields in the municipalities. Interviewee #16 stated that the tasks in its function were fragmented, “it is not always known what another colleague does do”.

5.3.4. Market parties

Profit-oriented operators and legal procedures

Due to the equally divided influence between provincial concession issuer and the operator that owned the concession, concession operating costs were often focused upon (#13). This also held true for the province, resulting in public transport reduction and making that less people used it (#10). Interviewee #10 of DKW and the municipality Schagen stated that in its opinion, the concession was focused on ridership: “If Connexxion sees that the usage of a bus between a few of our villages shrinks at a certain moment, they just terminate a line. Without communication to us.”. Interviewee #12, working concession manager for the province explained how these reductions occur:

“The interest of Connexxion is mainly in keeping the concession as attractive as possible to make sure that they do not lose money on it. That is their primary goal. It might sound unpleasant, but I think that making profit is the interest of every commercial operator.”

Still, in the Kop Connexxion had an important role in how intermodality via bus could be implemented (#12). Interviewee #10 stated that municipalities had a hard time steering or influencing Connexxion, since they served under a provincial concession. Interviewee #12 stated however that collaboration with the Mobipunten by Connexxion might be logical, since it made sense to integrate marketing and bike pilots of both. A policy report of Advier (2020) stated the same and added that “Connexxion sees added value in the Mobipunten” (p. 9). However, interviewee #12 stressed that “it is hard to take new steps, since it is an area with few income”.

For the rail operator, NS, the bureaucracy barrier that was identified earlier in the other case, also is found in Noord-Holland (#11; #13; #16). Interviewee #11 stated that NS eventually reacted enthusiastic on the Mobipunten concept. They had sent NS an invitation to come over and talk about the possibility of collaboration on various fields (#11). “The e-mail was not replied” (#11), which made that the NS was seen as a difficult stakeholder by interviewee #11.

In the provincial public transport programme, the NS and ProRail played a more important role, since the rail programme was partly initiated by them (#13). “That means that [the province] also tries to involve them from the beginning, since that is also what they like” (#13) Communication was therefore not deemed a problem for the province as it seemed. However, interviewee #13 recognised some legal difficulties in the execution of some of the developments in the programme:

“I see a barrier when I want to make a collaboration- or intention agreement. Then it becomes difficult with ProRail and NS, which sometimes leads to delays. The rail owner and operators then become very legal and detailed. [...] Legal advice seems to have quite some influence in the organisations”

Privatising the Mobipunten

The expectation for the future of the Mobipunten would be worked on by the project group of the Mobipunten (#10; #11; #14; #15). The idea of DKW and Advier was that Mobipunten could eventually be placed in a BV (private limited company), largely independent from DKW and the governments (#11; #15). Here the current municipalities could be shareholders, and the function of exploitation and development of the concept could be done largely independent from the government (#11; #15). Interviewee #11 explained that the rationale behind the idea was the fact that DKW was a temporary vehicle, because a municipal collaboration could end. Mobipunten, after implementation, would be a continuous vehicle wherein “exploitation, innovation, and policy are of importance” (#11). Interviewee #11 argued that these tasks should not be dependent on Advier or DKW but should be clustered structurally in a BV.

The idea was to first develop a well-established Mobipunten network with DKW (#11; #15), cover the pre-investments, and make the concept attractive for market parties (#11). After that, the BV would take care of the concept, with the idea to have an operational side with a director, separated from a board existing of municipal politicians (#11; #15), innovative parties and a degree of entrepreneurship (#11). Now, fundamentals for the idea were shaped, as interviewee #11 stated on the future perspective:

“So, in the end, the website, account management, physical placement and maintenance will have to remain subsidized. But the shared mobility should generate revenue for the market party responsible for it. From that revenue, new investments can be done. For now, it is getting the set up and exploitation model right.”

Execution of hub development by a consultancy

Advier consultancy had an important role in the development of Mobipunten in the Kop (#11; #15). Advier was hired by DKW to do the execution of the Mobipunten (#10), and since Advier did this as part of the SHARE NORTH programme of the EU, they got some European subsidy for this execution as well (#15). Their task was to take up the stakeholder management near the hubs, close off contracts with other companies for the Mobipunten, and connect with their network of companies (#11; #15).

Interviewee #11 linked the tasks of Advier to the creation of the Mobipunten BV in the future. Advier did the stakeholder management to better bring the municipalities in contact with “interested commercial parties for shared mobility and possibly Mobipunten” (#11). And if the ‘swing’ is once there, the trend “would be expected positive”, also for the possible BV (#11).

Using companies to create demand for intermodality

Since the Mobipunten were primarily offering shared bikes or shared cars, some shared mobility facilitators were involved in the project with the prime responsibility of exploitation (#11; Advier, 2020). Since the region was not densely populated, it was hard for market parties to build a business case in the Kop on their own (#11; #15; Advier, 2020). This was why the Mobipunten project took away some of the constant cost for facilitators, by doing the stakeholder- and account management,

promotion and participation (#11). In the end, the expectation was that the behavioural change in the population would increase usage and reduce the need for assistance by the project team, interviewee #11 stated, “the cars will pay for themselves”. Interviewee #15 agreed with #11 and added that the role of DKW was in this instance to build up the concept, and to let the market take it over as soon as possible: “If it does work for the market, we will sell or exploit the concept” (#11)

There were however also multiple local companies involved in taking or maintaining these shared vehicles near their location and therewith sustaining demand (#15). Interviewee #11 gave the example of Avia, a local petrol station that had placed a few shared cars on their property and had bought kilometres on these cars for their employees – so that they could use the cars to get there. On the other side, the cars were part of the Mobipunt nearby, “which might improve sales or trailer rental for Avia as well. It has two sides” (#11).

Avia should be the example for many larger companies in the future of Mobipunten (#11; #15). An example of a larger company that contributed to the development of a Mobipunt and improvement of public transport, was Microsoft on Agriport (#11; #14; #15). In continuation of subsection 5.2.1., Microsoft was one of the companies that made public transport towards Agriport possible by buying bus subscriptions as employer – making rerouting for Connexion and a Mobipunt viable (#14; #15).

5.3.5. Citizens

Voluntary-operated transport providing local accessibility

Many of the interviewees stated that one of the characteristics of the Kop was the large number of (societal) organisations involved in executing (access or egress) transport (#12; #14; #16). Interviewee #13 told that the demand-based flex buses discussed in subsection 5.2.1 were driven by volunteers after they had had a short training by the operator. “In that way, the province is able to serve an area where it is impossible to drive a regular bus” (#13). Interviewee #12 agreed that it was advantageous to have large group of volunteers providing the transport in areas where this was too costly with traditional public transport. Yet, interviewee #12 stressed that dependence on “mostly elderly” volunteers, meant that there was a risk that initiatives might become less viable because of the declining and aging population.

Bottom-up implementation via participation

Much of the contact with citizens for the implementation of the Mobipunten was done by the municipalities (#10). However, to stimulate the usage of the newly Mobipunten, there were events planned to introduce the local community to the new hubs (#11; #15). Due to COVID-19 these were cancelled however, which had also resulted in minimal usage of shared cars in local communities (#15).

On the long term, there would be more room for citizen initiatives for Mobipunten (#11). For example, if a community would want a Mobipunt in combination with some other developments happening, then that should be an option aiming for (#11). Where implementation of the Mobipunten now happened on a top-down basis, in the future this should become a more bottom-up development (#11). As interviewee #11 ended:

“The preferable way is the bottom-up way. There are some initiatives on some places, which we try to combine with the possibility of a Mobipunt. The first 12 Mobipunten are placed top-down. It has to be a sound governance mix in the intermodality. Preferably bottom-up, but that is hard in the beginning.”

5.4. Analysis

This section analyses the previous described results in an interrelated way. To give an overview of the major results, table 3 gives an overview from the perceived characteristics in the case of the Kop. The section uses this overview to describe the analysis.

| | |
|--|--|
| <p>Strengths</p> <ul style="list-style-type: none"> - Shared mobility - Municipal score points on TOD for provincial subsidies - Regional municipal collaboration (DKW) - Collective fund - Market-based approach (Mobipunten BV) - Voluntary transport | <p>Weaknesses</p> <ul style="list-style-type: none"> - Structural reduction of public transport - Not always planning for decline - Limited effort to integrate public services and intermodal transport (yet) - Limited provincial initiating/coordinating role in implementation of intermodality |
| <p>Opportunities</p> <ul style="list-style-type: none"> - Provincial station node programme in Kop - Light rail plans - Cycling connections - Trial and error (Mobipunten+) - Bottom-up developments | <p>Threats</p> <ul style="list-style-type: none"> - Further reduction of public transport - Institutional fragmentation - Municipal silos - The power of market parties |

Table 3: A swot-analysis of the case of Noord-Holland (author)

In the Kop of Noord-Holland, the major implementation of intermodality is done by connecting shared mobility to other (public) transport modes. By introducing these semi-private vehicles near bus stops and stations, car-less users of public transport can – without extra waiting time – still reach their destination or origin in the peri-urban region. This approach can be logically explained by the fact that implementation of it is done by the three municipalities in DKW. They have recognised the regional decline of public transport and the resulting declining liveability and accessibility of this, as a regional challenge. Since municipalities do not have the responsibility for the public transport concession, the focus is laid on the alternative small-scale and demand-based transport mode that can be facilitated by the municipality to fill the gaps that public transport reduction has left: *shared mobility*. As an alternative for the shared mobility, the region has numerous *voluntary transport initiatives by operator or citizen organisations*, facilitating forms of access- and egress transport. This makes the contribution of demand-based transportation in the Kop significant. Implementation of new Mobipunten, further improving the possibilities for demand-based transport by means of shared mobility is partly done by Advier, which as market party keeps commercial ties with other companies and stakeholders in the region. This also reflects the *market-based approach* DKW takes on the development of Mobipunten in the future, with the possible creation of *Mobipunten BV*. Currently, however, *DKW and its municipalities are implementing the Mobipunten themselves, via a collective fund* which reduces the need to get approval of each municipality for investments in the hubs in the region. The province has financed 50% of the DKW-budget, and with that also 50% of the Mobipunten project. The province is however not involved with the Mobipunten project, since it has its own programme on hubs, which implements and transforms all stations to integrated public transport nodes, with a focus on both intermodal transport network and land-use development. The latter is however not a provincial responsibility, so the province tries to influence municipalities by introducing them to *score more points for subsidies in return for locating new housing and business developments close to public transport nodes*.

However, because the province has this own policy programme stretching over the whole province, *the province has no other vision on implementation of intermodality in the province*. With the busier Amsterdam region in the south having the most stations, the north only gets four stations wherein the province nowadays sees no urgency for intermodal hub development. In the end, there is thus no

provincial involvement in implementation of intermodality in the Kop. This is striking, since over the last few years the structural reduction of public transport in the region has made intermodal travel more difficult, with the regional (intermunicipal) liveability under pressure. *The decline of the public transport network* can be explained by limited public transport usage and high car ownership. Population decline in the future is expected to worsen this trend, but the possibility of this looming *challenge of decline is not recognised by governments*, specifically aldermen, in the region yet. Population decline is expected to turn in to growth, based on the demand of Amsterdam. This expectation might also explain why there is *no specific policy to keep services accessible intermodally*, whilst public transport has and has been underused for years.

Due to its intermodal and integrated view, *the provincial public transport node programme might provide an opportunity to share knowledge and take up other possible developments* in the area such as the *light rail plans* and *new cycle connections*. The provincial programme is based on LUTI and aims for intermodal accessibility. This is something that is relevant in the Kop, where the limitedly used public transport lines might be better sustained if new developments or public services are to be planned close to stops. These developments also fit in the nature of the Mobipunten project, *which is (to be) based on more bottom-up and trial and error*, compared to the more top-down and planned provincial programme. It can be these two different perspectives that together might create interesting, integrated combinations in locations of transportation, services, and land-use developments along the (light)rail- and cycling corridors. Therefore, however, improvement of the collaboration between province and municipalities/DKW is necessary

The success of the Mobipunten mainly depends on the public transport that serves them. Since the province is not involved with the Mobipunten and the operators are not part of the project (team) either, *a change or reduction of the public transport system is a threat* to the project. The municipalities have no power on the concession and are therefore dependent on the goodwill of the province and operator. This also shows *the power market parties (such as operators)* have on the project. Shared mobility subscriptions have to be sold to market parties to make a good business case. This now goes well, but it is to be seen if these market parties will use shared mobility in the future. Usage of the concept might also stagnate if there is not an interregional vision on intermodality and shared mobility concepts, *fragmenting into different transport systems and initiatives*. This provincial lack of coordination has led to municipalities developing concepts themselves, such as the Mobipunten. It is in these municipalities that officials state that they expect a more coordinating role of a province, since from within *municipal siloed organisations*, it is harder to make an integrated plan for the whole region and its connection other regions.

6. Analysis and Discussion

This chapter analyses the results presented in chapters 4 and 5 and connects these to the theories discussed in chapter 2. First, based on the conceptual model (see figure 12), the transport system, land-use system, and MLG are compared and analysed for both cases. Thereafter, these components are discussed with the theories on the LUTI-cycle, MLG and peri-urban context outlined in chapter 2.

6.1. Analysis

6.1.1. The transport system

In both cases the implementation of intermodality is centred around hub development. Hubs are locations specifically designed to facilitate a transfer between different modalities, therefore directly contributing to intermodality. Other key implementations that contribute to intermodal accessibility include for example: realisation of improved spokes for different modalities (e.g., for public transport or cycling), usage of supportive transport, demand-based transport services and alignment of (public) transport systems on spatial developments. Although these developments are important in themselves, most are related to the hub development projects (“Hubs” in Groningen, “Mobipunten” in Noord-Holland), which makes the hubs the central implementation used to improve intermodality. Still, a hub is strongly dependent on the spoke developments in various networks. More similarities between the two cases can be seen in the development of regional cycling connections and bicycle parking at stations. These two developments contribute to the improvement of (new) spokes towards the hubs (regional cycling connections) and the hubs itself (bicycle parking at stations). Both cases are investing in these developments and see opportunities to improve hubs with this.

Differences between the cases are identified in the reasons behind hub development. Groningen has decided on a stretched and stable public transport network for the next decade. Stretching in this area has indicated more usage of public transport in the past. This (supply-based) public transport network is used as basis for implementation of intermodality by means of hubs. With these hubs, accessibility for people without cars in low-density peri-urban areas should be safeguarded or even improved, aiming to improve the liveability of the area. The reduction of cars in the urban core – the city of Groningen – is also to be achieved by the hubs, since people are invited to park on P+Rs near the city and travel the last mile with bus or bike. Lastly, hubs are also to contribute to the reduction of supportive transport cost, by letting ‘people entitled to wmo’ travel from a hub with public transport combined with a hub-taxi. In the Kop, the prime reason to implement Mobipunten is however to fill up the accessibility gaps caused by the (increasingly) reduced public transport network. The hub here connects areas that have no public transport with the public transport that is left. The area limitedly focusses on improving of safeguarding public transport, but focusses instead on shared mobility facilitation on Mobipunten, providing the region with demand-based transportation to reach destinations. Shared mobility is depicted here as the alternative for public transport in the area. So, whilst Groningen uses hubs to connect and transfer people from spokes served by private modes, supportive transport or hub-taxi to the stretched public transport network, the Kop uses hubs as transfer locations to shared mobility spokes in areas where public transport is (in the future) not viable anymore.

Another major difference between the cases can be seen in the transport system design in relation to the DUS it serves. Whilst in the Kop a single train connection is handling both regional and interregional connections, train connections in Groningen suggest to be more regional and limitedly interrelate with other DUSs. For the case of the Kop, the railroad is of importance for transport inside the area, but also for transport towards the growing urban region in the south (Amsterdam and Alkmaar). In the fight

against population decline, this rail connection is depicted as a possible way to make the Kop attractive for more population growth. In Groningen – although its DUS is relatively isolated from other major DUS – there is a comparable NS-rail connection towards the Zwolle and the Randstad. There are however also a few other regional rail connections operated by Arriva from the central urban core. These regional trains play a central role in the DUS of Groningen but have limited connections to other DUS or areas outside the DUS. The relative isolation of the rather large DUS of Groningen can be suggested as an explanation for this and might also explain the implementation of (more) long-distance express bus-routes in the area compared to the Kop. The cases also differ in how local demand-based transport is organised on these public transport systems and spokes. Groningen has set up a separate organisation, Publiek Vervoer, that is – besides its task of supporting municipalities with supportive transport – to exploit a hub-taxi, taking people from their origin or destination to the hub. In the Kop, this type of organisation is absent. Voluntary transport and the FlexBus (informally) fulfil a comparable function for citizens in the area. The Flexbus in the Kop is similar to neighbourhood busses driven in the case of Groningen, since both are part of the concession and supported by operators.

Lastly, a difference in P+R policy can be seen. Groningen specifically focusses on P+R-locations surrounding the city, since it wants its urban area as car-free as possible. Whilst, although the Kop indicates that it has one of the highest rates of car use, P+R-locations in the area itself are limited. This difference might be explained by the fact that an urban core as large as Groningen – high-density and historic centre – is not part of the Kop, with Alkmaar and Amsterdam being located outside the area.

6.1.2. The land-use system

Similarities between both cases can be seen in the difficulty to govern land-use developments to improve intermodal accessibility. Firstly, it is indicated that the land-use market is more dominated by decisions of organisations, market parties and citizens individually and is therefore less government-initiated. Secondly, the population decline and/or stagnation create conditions in which land-use developments are limited in peri-urban areas. In urban areas this problem is less evident. Lastly, there are also other factors than accessibility that play a role in the location choice of land-use developments (e.g., safety, land prices, necessary investments, emergency routing (for ambulances)). These three realities make it in both cases harder to steer land-use developments towards locations where they are intermodally accessible for governments – in practice often locations close to hub developments.

Both cases nevertheless try steering land-uses – and specifically – services to a certain extent in their implementation of intermodality. The provinces in the Groningen case are actively trying to locate services near hubs. Goals for the hub programme are broadening, resulting in increasing focus on making the intermodal hubs shift towards socio-economic hubs for the peri-urban area as well. The provinces, with support of municipalities, actively try to combine local services nearby the hub location with the hub development to make hubs more multifunctional. On a more regional scale, services like hospitals or schools are convinced to (re-)locate near hubs so that these locations become intermodally accessible. It is this land-use component of the LUTI-cycle that sees increasingly attention in the case of Groningen but is also depicted as complex and high effort with sometimes limited rewards. In the Kop, active steering of land-use developments is limited. In the rest of the province however, the provincial public transport node programme actively tries to steer land-use developments by subsidies for municipalities if developments are located close to nodes. Still, this provincial programme is not active in the Kop, which makes this type of steering limited. Municipalities in the Kop have a limited focus on locating or realizing their Mobipunten close to (local) services (yet). This might be explained by a scope limited to (shared) mobility provision in this early hub-development stage (compared to Groningen). However, first signs of a change towards a broader scope might be identified in municipal policy – that states that services are to be clustered in major towns – and the Mobipunt-plus concept.

In both cases it is suggested that services are easier to steer than residential or business area developments because of the influence of market parties. For the case of Groningen, it is also important to stress that the provinces and its OV-Bureau are the initiators of the hub programme, whilst most land-use policies and locations are the responsibility of the municipalities. This makes the provincial influence on this limited. Yet, provinces have more influence on the transport component, since they have a responsibility on infrastructure and public transport network development. In the Kop – where the hub development is primarily done by the municipalities – this influence is to some extent the other way around. Still, when it comes to increasing public transport use and intermodal travel, both cases choose the employer approach as ‘easier’ alternative for steering land-use. In short this means that by selling public transport-, P+R-, or shared mobility subscriptions to employers for their employees, the governments and operators improve public transport and intermodal travel towards that location in return. In the end, one sees that both cases choose to develop the transport component here instead of the ‘harder to influence’ land-use component. Therefore, it is in general with flanking policies like these – and for instance paid-parking in urban cores – governments try to dimension the transport system on the land-use system.

6.1.3. Multi-level governance

The major similarity in the governance of both cases is that the national government is until now limitedly involved in the implementation of intermodality. In the specific instances of bicycle parking at stations and regional cycling networks, the national level serves a role of investor, but in the hub programmes and -projects of both cases there is minimal national investment. In national visions (e.g., NOVI, OV-Toekomstbeeld 2040) there is limited attention for intermodality in peri-urban areas, since most national policies focus on (inter)urban connections (see subsection 2.2.3.). The case of the Kop does however fit into the model that the national government foresees for rural areas: considering small-scale demand-based transport for areas with declining public transport. The peri-urban context in the case of Groningen proves however that rural areas do not necessarily have declining public transport since stretching lines can improve usage. Although there are national subsidies for hub developments, these remain hard to achieve for the increasingly integrated projects the Groningen hub programme is implementing. Departmental structures prevent coordination between ministries (e.g., I&W and Education), resulting in subsidies that are not eligible for integrated hub solutions, since these are solely meant for mobility hubs (see also 4.3.1.) The national government can therefore be considered relatively visionless and non-cooperative on intermodality in peri-urban areas.

In the lower (regional and local) levels of governance, there are major differences between both cases. The reason for the two different implementations of hubs can be explained by the governance levels initiating the development of hubs. In Groningen, the province – also in charge of public transport concessions and developments (via the OV-Bureau) – is the initiator, resulting in a central role for the public transport system in implementation of intermodality. In the Kop, municipalities have the major initiating role, whilst provincial role in the Kop and Mobipunten programme is limited. This makes that the public transport network is an unchangeable given for the initiating municipalities, resulting in a focus on foreseeable alternatives for this (declining) network: shared mobility. With this, municipalities in the Kop have control over a demand-based transportation system and thereby directly improve the intermodal accessibility in the area. This situation is comparable with the power provinces have over the public transport via the OV-Bureau in the Groningen case, except that the three municipalities in the Kop have chosen a smaller-scale and demand-based transport system they (fully) control. Another major difference in the cases are the relations between operators and provinces. In the case of the Kop, this relation is – like most Dutch concession areas – balanced and formally divided between operator (concession owner) and province (concession issuer), which has as a result that the focus is on the financial viability of the concession. The operator gets a sum of money to operate agreed-upon

bus lines for eight to ten years, with one or multiple reviews of the bus network in this period. Public transport usage in the Kop was/is declining, raising costs on these lines, therefore making these more unprofitable than other lines in the (larger) concession area. The responsibility for the development of this network is shared between province and operator as well, which has – in combination with the focus on financial viability by both parties – led to a public transport network reduction. In Groningen, the bus network development is to a large extent controlled by the OV-Bureau, which is owned by the provinces and the municipality of Groningen. As a result of this, financial risk related to the bus network development are not the responsibility of the operator. The operator is still responsible for execution of an agreed-upon bus service level. The OV-Bureau-structure has given the provinces room to make decisions in the network and build the intermodal hub programme on the relatively stable bus network this government-controlled institution provides. This structure also explains why the Groningen hub programme sees public transport – specifically busses – as the backbone of their hub network.

Municipalities have in both cases a comparable responsibility to develop intermodal hubs, since hubs are often on municipal grounds. In the Groningen case, the initiating provinces help municipalities with covering the investment cost needed for the hub, if municipalities also pay a share. A barrier in this, are the operators (often ProRail and/or NS) that own assets and land surrounding the hub locations on stations. These parties prove to be rather legal-minded and commercial, delaying hub developments. The scope these operators have – set by its shareholder: the national government – is often limited to rail/station development, -maintenance, and -facilities, making investments for the sake of other modalities a challenge. Although there are few stations in case of the Kop, this legal bureaucratic process is recognised by interviewees in that area as well. Other hubs are often developed on municipal grounds as well. In comparison with Groningen however, the municipalities in the Kop are – besides the parties realizing the Mobipunten – also the initiating party in the Mobipunten project. The participating municipalities have their own collective fund for the project (of which half was paid by the province), making investments in Mobipunten relatively easy since budgets are agreed upon.

A similarity between both cases is the expectation that the hub programmes primarily providing intermodality are to become separated from their current initiators. Still, the chosen structure for this differs between both cases. In the Kop this idea is most specific: making Mobipunten *a separate BV (Ltd.)* so that shared mobility set up on the Mobipunten can be exploited, maintained, and innovated by an effective and continuous vehicle – separate from the temporary vehicle that currently develops Mobipunten: DKW and Advier. Alternatively, in the Groningen hub programme – with the increasingly integrated view on its hub development – ideas are heard to make the hub programme *a separate organisation of or within the provinces*. In this way, the programme is detached from its original mobility perspective, hoping to further develop the hubs as socio-economic(ally sustainable) hubs.

Lastly, both cases indicate that the limited participatory processes are primarily taken up by the municipalities. Citizens have a limited role in the implementation of intermodality in both cases. Yet, there is increasingly room for self-organisation and citizens initiatives such as: local hub development in communities, voluntary and informal transport services, and local energy corporations willing to provide (electric) shared mobility. It is these examples that show the potential role for citizens in the implementation of intermodality – certainly on a more local scale. Governments recognize this, support and leave room for these bottom-up developments, but remain – because of the legislative power (e.g., land- and infrastructure ownership, policy making, connectivity with other institutions/organisations) – the major implementor of intermodality in peri-urban areas. This rather top-down positioned governance underlines however – in both cases – the importance of taking up challenges together with market and citizens to improve intermodal accessibility in peri-urban areas.

6.2. Discussion

6.2.1. Peri-urban context

In the Dutch government policy context, many peri-urban areas are seen as rural areas (Caruso, 2001), creating a functional sense of the urban-rural dichotomy, comparable with the conclusion Van der Cammen et al. (2012) make on this dichotomy in Dutch spatial planning policy. The results show this dichotomy in policies for instance in the priority for active modes the city of Groningen gives in its mobility policy confirming the reprioritisation indicated by Bertolini (2020) and Holden et al. (2019) in subsection 1.3. Rural municipalities focus more on public transport- and car-accessibility. This difference can be (partly) explained by the different morphological land-use characteristics the two area types have, resulting in high population density in urban areas, and a lower density in rural areas.

The areas regarded in the results as (morphologically) rural areas are in fact peri-urban areas in a functional sense, since these remain interdependent on one or multiple urban core(s) as part of a DUS (Hornis & Van Eck, 2007; 2008). This peri-urban interdependence on urban core is recognised in the results. Examples of these results are spoke improvements in the peri-urban areas studied – examples being: regional cycling paths, stretching, and shared mobility – connecting both areas to each other. This shows that provincial and municipal policy does give attention to peri-urban dynamics, thereby rather disagreeing with conclusion of Hornis & Van Eck (2007) and Simon (2008) Still, the results do prove that it is difficult to define what peri-urban exactly comprises of, confirming the discussion found in literature (e.g., Gonçalves et al., 2017a; 2017b; Hornis & Van Eck, 2008; Iaquinta & Drescher, 2000).

It is the difference between peri-urban/rural and urban transport policies that has created two transportation networks which intermodality tries to connect in order to improve both socio-economic sustainability in the rural/peri-urban area as well as to improve environmental sustainability in the urban area. It therefore is not necessarily recognised that governments have limited attention for peri-urban dynamics in policies – which is contrary to what Hornis & Van Eck (2007) and Simon (2008) indicate –, but it is however often mistakenly regarded from an outdated urban-rural dichotomy. Still, notions made by Hornis & Van Eck (2007) on the absence of national government policy on these rural/peri-urban mobility dynamics and on the multi-level collaboration between province and municipality to implement policies in peri-urban areas, can also be recognised in this study.

6.2.2. Sustainable mobility and LUTI-cycle

Based on the distinction made between rural and urban areas in the results, the different challenges for sustainability run parallel with this distinction. Environmental sustainability is limitedly discussed in the results chapters because it was limitedly brought up by the interviewees. One can however recognise from the results that the environmentally sustainable mobility primarily sees attention in urban areas in order to reduce environmental/spatial pressure of car use, coinciding with the picture drawn in by Bannister (2008) and Oostendorp et al. (2019) in section 2.3. Environmentally sustainable mobility is also recognised in the peri-urban area in the form of electric busses or electric shared mobility. Characteristics like longer distances to services and low population density causing a more prominent role for public transport as alternative for the car – identified by Shergold & Parkhurst (2010) – can be specifically seen in the case of Groningen. Introducing rural taxi services as part of the public transport network – identified by Slowman & Hendy (2008) – is also done in both cases. Whereby in Groningen these taxi services are used to increase public transport use from hubs, confirming Stelling (2011) and Zijlstra et al. (2014) that state intermodality can be used to increase public transport use.

However, the primary challenge in peri-urban areas is socio-economic sustainability improvement. Hubs are – like Hamersma & De Haas (2020) conclude – central in implementation of intermodality

and improvement socio-economic sustainability in peri-urban areas. Still, in literature and results, socio-economic sustainability is often related to as accessibility, which can be seen as concept directly influencing the degree of socio-economic sustainability in peri-urban areas. When looked at the components of accessibility – besides the transport component – the focus on this remains limited in comparison. The results of this study confirm that the individual and temporal component named by Geurs & Van Wee (2004) in subsection 4.1.1. play a minor role in the implementation of intermodality in peri-urban areas since influence on these via policies is hard and limited due to other individual behaviours (Dijst et al., 2013). Yet, transport and land-use components are used in implementation, by – as shown in the results – steering land-use and improving and realising hubs and spokes.

Based on the LUTI-cycle by Wegener & Fürst (1999), it can be concluded that of these two components, the transport system is used for most implementation of intermodal accessibility (see also subsection 6.2.3.). The transport system is government-led and has a direct effect on the intermodal accessibility – confirming figure 7 by Bertolini (2012). Land-use developments are identified in interviews as slowly following on the developments in the transport network, sometimes locating near hubs years after the hub was realised, further confirming the relations drawn by Bertolini (2012). It confirms the expectation that the long-term process of intermodal accessibility development via the land-use system is difficult, possibly because of limited government control on this system (Hilbers et al., 2011).

The node-place model by Bertolini (1999) is also involved with these two LUTI-components (see figure 8). The hub developments – together with improvement of connecting spokes – used by many governments to implement intermodality, are recognised in the model since both place (land-use) and node (transport) are considered to make a hub feasible. There are however differences between development phases when these dimensions are used. Most intermodal hub developments are started from a focus on the (public) transport network, planning the hub locations (the ‘nodes’) based on their location in this network. In later development phases, the ‘place’ dimension generally gets more attention. Sometimes, this place dimension influences the nodal dimension, resulting in relocation of intermodal hubs (e.g., Siddeburen). The balance between the place and nodal dimensions argued for by Bertolini (1999) and Chorus & Bertolini (2011) seems in practice dependent on location and development phase. In both cases, though, the nodal dimension prevails over the place dimension in most cases – making most starting hubs ‘unfeasible. However, this dominance is followed up later phases by increased attention for the place dimension – improving ‘feasibility’ of the hub. In the case of hub development near stations, operators are often land/asset-owner, making both dimensions more difficult develop.

It is these operators that also have a major role in the design of the intermodal transportation network, since public transport is often fulfilling one part of an intermodal trip (Van Ness & Bovy, 2004). To improve the intermodal transport network, governments, operators and – in the end – travellers use all four factors described by Van Ness & Bovy (2004) to implement intermodality. ‘Space accessibility’ and ‘design speed’ are – based on the results – perceived as most useful to improve intermodal access. Space accessibility is primarily used in the location choice for an intermodal hub near services or land-uses – or developing these close to the hub (TOD). Specifically for the Groningen case, stretching is used to increase the design speed of bus lines. In another way, in the Kop design speed is increased with interregional cycling spoke development. Both measures improve intermodal accessibility, since travel costs are reduced. Due to stretching however, Groningen sees a significant rise of users of the intermodal network and is thereby also able to increase frequency of buslines, further improving ‘time accessibility’ resulting in reduced travel costs. This then might lead to a positive effect on the network, which helps to overcome the bi-level optimisation problem named by Bovy and Ness (2004), since authorities, operators, and travellers all profit. This can be partly explained by government control (via

the OV-Bureau) on public transport development in Groningen. The bi-level optimisation problem can however be identified in the Kop, where interests of the operator are clashing with traveller's cost – without too much interference of authorities – resulting in declining profits and public transport use.

6.2.3. Multi-level governance

As seen in the previous subsections, there are differences in the MLG in both cases. When looked at the 'actor groups' defined by Sayal, 2005 in Buitelaar & Sorel, 2010, government stands out most in the implementation of intermodality. This fact makes that – certainly in the 'task/ responsibility' to develop transport networks (spokes and hubs) – the implementation of intermodality has more similarities with the government definition by Stoker (1998), since its development is "characterized by [the government's] ability to make decisions and its capacity to enforce them." (Stoker, 1998, p.17). An exception is the development of shared mobility and public transport, where more market forces are recognised – specifically in the Kop – since execution of these transport services is often a task/responsibility by market parties. The differentiation of actor groups is larger in the land-use system, where market forces and citizens have significantly more influence on developments, due to private ownership and investments. This leads to a governance where actor groups – including governments – need to have continuing interactions with each other, have some autonomy from the state and are interdependent (fitting the characteristics of Rhodes (1996; 2000)), due to a balanced distribution of tasks/responsibilities and therefore: influence and control.

Horizontal interaction between actor groups is therefore in the developments in the transport system – except for shared mobility and public transport – limited, whilst this interaction is more common in land-use planning – due to its differentiation of actor groups. When looked at the government actor group, horizontal interaction between policy sectors is hard due to the departmental structure of governments. The same difficulty in horizontal interaction can also be seen in the departments within some of the operators, making (integrated) development of hubs near stations difficult. One exemption of this lack of internal horizontal interaction is the provincial level, since results of both cases show that provinces actively try to bring various policy sectors together in integrated programmes – for example, the hub programme of Groningen and Drenthe or public transport node programme of Noord-Holland.

In vertical interaction between 'levels', the provincial level is often important since the integrated provincial way of working is tried to be conveyed to the local level. In implementation, the local level often physically develops intermodality/hubs, whilst the national level is mostly absent. The 'relations' between actor groups and levels, results are mixed. Spoke development on all levels is often formalised since infrastructure is government-owned. Public transport networks are often managed by a formal relation between market parties and government with clear authority ratification. Contrarily, internally in government-led hub developments, creativity and exploration are often needed, because of limited experience and novelty, making the implementation rather informalistic (based on Innes et al., 2007).

Based on the *interactions* between *actor groups* and how the *relations* are formalized, the implementation of intermodality in peri-urban areas is predominantly mixed: top-down with support for bottom-up initiatives. Most principles of the top-down MLG-characteristics by Hooghe & Marks (2003) apply. certainly, when looked at the transport network development – which is mostly used for implementation of intermodality – there is often worked with 'general-purpose jurisdictions' and a 'general systemwide architecture' based on the tree-tiered government levels. Exemptions of this are however regional collaborations set up by these government levels, such as RGA or DKW. Also, by involving market and citizens' initiatives, more 'flexible designs' (see subsection 2.5.2) are increasingly used, making the governance more bottom-up. Still, these bottom-up developments are part of the current, government-led and initiated top-down implementation of intermodality in peri-urban areas.

7. Conclusion

This chapter answers the sub- and overall research questions (see section 1.6) on basis of the findings of the study. First, the sub questions are answered, then the overall research question is answered, followed by recommendations, suggestions for further research, and a reflection on the process.

7.1. Sub questions

1. How can intermodality and (multi-level) governance on accessibility in a peri-urban context be conceptualised?

On basis of the literature review in chapter 2, intermodality can be best conceptualised as a policy principle that aims to provide a passenger using different modes of transport in a combined trip chain with a seamless journey. This policy principle results from a general (policy) aim to improve – both environmental, but specifically, socio-economic – sustainability. Intermodality can contribute to both this accessibility improvement in peri-urban areas as well as environmental sustainability in urban areas. Peri-urban areas can, from the mobility perspective, be defined as areas sharing rural and urban characteristics and a strong functional connection to the urban core. In this context, intermodality is to contribute to the improvement of accessibility of trips in and between peri-urban area and urban core by better connecting different transport systems to each other. Since accessibility – which intermodality tries to improve – has a transport and a land-use component, consideration of both components in an integrated planning is important. To achieve this integrated intermodal policy, multi-level governance is needed, to bring different areas, often having their own and multiple jurisdictions, together since mobility in the urban core and its surroundings does not limit itself to these boundaries. In this MLG, vertical and horizontal integration, relations, tasks and actors are of importance.

2. How is intermodality in declining peri-urban areas in the Netherlands implemented and how do land-use and transport policies in these areas relate to intermodality?

Based on the results in chapters 4 and 5, intermodality in declining peri-urban areas is predominantly found to be implemented by developing intermodal hubs. In planning practice – such as in the cases of Groningen and the Kop – most of these developments are done in an experimental manner (trial-and-error), without detailed policy documents, frameworks, or scope, because of the topic's relative novelty. In this study two implementation types were found. Firstly, stretching public transport with regional intermodal hubs, where public transport spokes are improved in speed ('design speed') and frequency ('time accessibility') but the number of stops is reduced, which makes connection with private transport modes and hub-taxi a necessity (see chapter 4). Secondly, public transport reduction and as a result shared mobility, where implementation of intermodal hubs with shared mobility fills up accessibility gaps the reduced public transport network leaves (see chapter 5). Both approaches increasingly explore on locating services near hubs, thereby actively maintaining the socio-economic sustainability (liveability) in peri-urban areas (e.g., socio-economic hubs in Groningen, Mobipunt-plus). The land-use component remains however harder to control by the initiating governments than the (predominantly) government-controlled transport component. Land-use developments see influence from decisions by individual market parties, citizens, and organisations, which affect and can limit government initiatives in this component. Also, locational factors, policies and, other interests than implementation of intermodality influence decisions – making the land-use component develop slower than the transport component. Lastly, lower dynamics of activities in the peri-urban areas make the transport component a more preferable policy sector to focus on. These factors make that – despite policies aiming for integration – integrated policies on intermodality are often lacking, resulting in most implementation of intermodality happening via the transport network in declining peri-urban areas.

3. What governance approach is used in implementation of intermodality in peri-urban areas?

Municipal and provincial governments predominantly implement Intermodality, and often do that in an informal, explorative implementation process, with few formal internal interactions (limited internal accountability). Externally, interactions are more formal between other actor(s) (groups) such as operators or other market parties. Municipalities are predominantly responsible for the physical realisation of hubs and most of the spokes (such as access roads, cycling paths). However, since most travel happens between different municipalities, a more regional, facilitating, and strategic role is taken up by the provincial level and/or an intermunicipal collaboration. This level higher up is often also responsible for subsidizing developments on municipal grounds because municipal budgets often cannot solely bear the investment costs. Involvement of the provincial level is also of importance because of the responsibility this level has for public transport concession – an essential part of most intermodal journeys. The provincial level tries to steer – via its subsidizing role – other actor groups and levels to come to more integrative solutions in the implementation of intermodality. The national level plays (until now) a limited role in such cases as Groningen and the Kop, but is increasingly studying relevant projects all over the country for best practices. However, some certain developments, such as bicycle parking at stations or regional cycling connections, do receive specific national subsidies. The market is primarily taking up the role as transport operator – which is formally ratified with (provincial) governments – but has also influence on public transport network development (via its operations) and on land use near stations (via its landownership) – thereby indirectly influencing implementation of intermodality. Shared mobility facilitation is also increasingly taken up by market parties but remains a difficult business case in peri-urban areas without strong government interference and subsidies. Citizens play a minor role in most cases since implementation is planned by governments. Still, governments support voluntary transport initiatives or local hub developments with the means necessary and depict larger bottom-up movements – taken up by local communities – in the future.

4. How can implementation of intermodality in declining peri-urban areas be improved by using multi-level governance arrangements?

This study shows that the implementation of intermodality in declining peri-urban areas is often initiated by one level of government. As a result, the modalities focused on, depend on the governance level that initiates the implementation of intermodality. As a result, different levels are working on different transport modes separately, making the creation of intermodal transport system difficult. This can be improved if the different levels start working from an integrated vision on intermodality in the DUS that covers the multiple jurisdictions. An overall vision on this topic – including and integrating policies of government levels and organisations – is currently in cases such as Groningen and the Kop lacking or unclear. Creating such an endorsed multi-level vision might for instance connect municipal, market, or citizen developments on shared mobility to provincial public transport developments, enhancing implementation of intermodality as collaborative multi-level process. Further consideration of the land-use component of intermodal accessibility might also be achieved if collaboration between organisations, citizens, market parties, municipalities and provinces can be grounded in such integrated vision. Financial tools, such as provincial subsidy score points for land-use developments by market parties or municipalities and collective funds – financed by multiple levels/parties – for hub development, might effectively reduce financial and political barriers between actors and (their) levels. National government may play a role in guidance for these governance structures and integrated developments. Lastly, implementation of intermodality can be made more effective if independent, stable institutions – with multiple (government) levels as shareholders – take up these integrated intermodal developments in peri-urban areas. There are however risks for democratic legitimization and institutional fragmentation that can be caused by setting up such separate institutions ('quangos').

7.2. Overall research question

Based on the answers on sub questions, the overall research question can be answered: ***How can multi-level governance be used in the implementation of intermodality in declining peri-urban areas?***

To make the implementation of intermodality more integrated by considering both the land-use and transport components of the LUTI-cycle equally, a shared vision and collaboration between governments, markets and citizens on multiple levels and policy sectors is a necessity. This study shows that intermodality in peri-urban areas is primarily implemented by means of hubs, often initiated by one government level. Intermodality in many of these developments has a focus on one /few type(s) of modality, depending on the control the respective level has on this modality. In order to achieve the integration with other modalities, collaboration and policy integration with other governance levels is needed. In other words: the implementation of intermodality is unavoidably multi-level. Besides confirming the fact that the accessibility intermodality provides is not limited to jurisdictional boundaries and levels and therefore is multi-level (see sections 1.7 and 2.6), this study has found that the need for multi-level implementation of intermodality is also caused by the responsibilities and influence different levels have on the various modalities. This can be for instance seen in the fact that municipalities own most cycling infrastructure, whilst provinces and market parties are responsible for bus services. Besides this necessary integration of multiple responsibilities and policies in the government-led transport component of intermodal accessibility, the land-use component – dominated significantly by market parties, (semi-government) organisations, and citizen (behaviour) – is to be integrated as well. This underlines the need for a governance where government levels specifically include market and citizens in implementation. With the inclusion of market and citizens – and the control they have – land-use developments might be steered to improve intermodal accessibility further improving the socio-economic conditions in declining peri-urban areas. Eventually, this might bring also balance to the current predominant focus on the transport network (focussing on nodes instead of places) that implementation of intermodality has in the initial development phases.

7.3. Recommendations for planning practice

Based on the answer on sub question 4, general and case specific recommendations on the governance for the implementation of intermodality in declining peri-urban areas can be made. In general, the governance for implementation of intermodality in peri-urban areas might be further enhanced by:

1. *Integrated intermodal vision.* In order to create sustainable intermodality, intermodal policies incorporating both the land-use system as well as the transport network should be introduced. More attention on the land-use system – specifically placement of public services – may improve socio-economic sustainability, by more horizontal interaction between policy sectors, broadening the (sustainability) goals intermodality can support.
2. *Shared vision on intermodality between levels.* Besides horizontal integration, vertical integration between levels of governance can contribute to a better implementation of intermodality. Different levels of government and operators control different transport modes, making a shared vision between levels inevitable for an interconnected intermodal transport network.
3. *Separated institutions on implementation of intermodality.* To attract more actors in the implementation of intermodality, institutions largely independent from the traditional government tiers might improve the effectiveness of the implementation of intermodality. Such institutions where different levels, actor groups and policy sectors might integrate and interact, thereby may also improve the connection to market and citizens, and may potentially provide a better influence on the land-use system. However, a point of concern for these quango's is democratic justification.

For the Groningen case the governance on the implementation of intermodality might be further enhanced by:

4. *Collective fund for implementation of intermodality.* To reduce the financial difficulties of the municipal level and remove budgetary silos between policy sectors, a collective fund funded by provinces and municipalities might improve effectiveness of implementation of intermodality. Implementation then becomes less dependent on municipal or sectoral budgets per project.
5. *Provincial subsidies with score point system.* Provincial steering on land-use developments towards intermodally accessible places, might be improved by issuing subsidies for these developments to municipalities. By using a scoring system (like Noord-Holland does) incorporating the intermodal access of land-use development, land-use can be steered and implementation of intermodality improved.
6. *Involvement of shared mobility (facilitators).* Involvement of more shared mobility – facilitated by market parties via subsidies – in the hub programme and its resulting intermodality, might further improve opportunities to travel intermodally to and – especially – from hubs. This can overcome the accessibility gaps that are possibly left by the other demand-based collective transport modes.

For the case of the Kop the governance on the implementation of intermodality might be further enhanced by:

7. *Connection between different transport modes.* Concepts relating to intermodality are relatively fragmented in the area, with different levels of governments having their own (hub) developments focused on a specific mode as basis. Integration of these different developments and modes these use as basis, might improve the intermodal network since modes and levels are better connected.
8. *Inclusion of public services in scope.* A broader perspective on the inclusion of the land-use system – specifically inclusion of public service locations – in developing intermodality might contribute to improvement of socio-economic sustainability. What might also be of help to achieve this, is the recognition that population decline (in the future) makes alignment of public services more urgent than depicted in the current situation.
9. *Stable basic transport network.* In order to create a transport component where one can travel intermodally via hubs/Mobipunten, a stable and certain public transport network is of importance. Closer collaboration between DKW, Connexion and the province might herein create a basic network that is maintained on the longer term, giving other land-use and (intermodal) transport projects a more certain transport system to work/connect with.

7.4. Suggestions for further research

The results of this study suggest some opportunities for further research about both the governance component and transport network component. Regarding the governance component, the implications of the introduction of largely independent, effective institutions for participative and democratic planning processes in implementation of intermodality is a relevant topic for follow-up research. Some interviewees indicated that this process of creating ‘quango’s’ (quasi-governmental organisations) that are largely independent from the formal three-tiered democratic institutions in the Netherlands (the ‘house of Thorbecke’) may improve the implementation of intermodality. However, it was also indicated that they are putting pressure on democratic principles of planning, making a study based on for instance power relations between actors by Forester (1982) or democratic principles by Flyvbjerg (1998) relevant further research. Such in-depth further research might also relate to earlier discussions on the role a currently lacking regional government tier in the Netherlands potentially may have. The lack of this level, identified by Buitelaar et al. (2007), might be giving room for these quango’s on (inter)regional levels – therefore relating to the DUS- and peri-urban concepts.

Another topic relevant for possible follow-up research discussed in this study is the relation between different modalities in the transport network in relation to sustainable mobility. Intermodality brings different transport networks together whereby this study found that most of the implementation of intermodality in peri-urban areas is aimed at improvement of socio-economic sustainability. In urban areas environmental sustainability seems, based on the results of this study and literature, more a predominant aim (e.g., Witte et al., 2021). Still, developments in society indicate the need for rural and peri-urban areas to improve environmental sustainability as well (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2020). And the other way around, socio-economic sustainability is also important for urban areas (accessibility and liveability of vulnerable neighbourhoods). Therefore, a relevant topic for follow-up research might be an explorative study about the potential of intermodality for improvement of environmental sustainability in peri-urban areas or, alternatively, improvement of socio-economic sustainability in urban areas. For the environmental sustainability problem in peri-urban areas, results from this study indicate that intermodality has potential. Although literature on the topic of (environmental) sustainable mobility seems divided on the ability of intermodality to solve this, due to a higher share of car-use in trips (Hamersma & De Haas, 2020). A possible study focusing on intermodality in relation to the competition between transport modes in intermodal trips – and therefore differences in travel behaviour (e.g., reduction of car use) it might bring about – can be a relevant addition to the academic discussion and societal relevance on this topic of environmental sustainability in peri-urban areas.

7.5. Reflection

In the theoretical framework I brought together different academic concepts that were not commonly combined. The combination of these different concepts (sustainable mobility, MLG, LUTI) used in different contexts (peri-urbanity, governance, policy-making), made my conceptual model somewhat 'rich' – or just messy. The conceptual model did, however, shed light on how the different contexts and concepts related to each other, which helped operationalise the theoretical concepts in the case selection and interview guide – specifically theories on accessibility, governance, and the LUTI-cycle. Still, the theoretical framework might be unbalanced in its level of detail on some concepts. However, the quite elaborate literature study helped to answer the first sub question, fulfilling the theoretical component of the research design.

The research design I used for this thesis turned out to be a good and fitting design in general. The theoretical component (literature review), via the conceptual model, contributed to an operationalised interview guide for the empirical component (interviews and document analysis). Initially, a quantitative component was to be part of this thesis, however, during the process this did not fit the more governance-based approach I took, since I started focusing on more qualitative components such as policy, relations and actors. Still, in the qualitative case study approach this research has taken, I have used mixed methods. I used a policy document analysis and interviews to gather data from various sources. Moreover, for the case selection I used other, more secondary qualitative data – different reports from knowledge institutes and governments – to come to a case selection. This makes the differentiation of the qualitative sources satisfactory. Nevertheless, my research could have been stronger by including (also) a quantitative component to answer the empirical component as well, for instance by looking into quantitative accessibility or intermodality databases. Moreover, my research has studied two cases, which makes gathered data a rather limited sample. More cases in different contexts could have been studied to strengthen my thesis' results. Lastly, the expected difference in MLG-types on which I based the case selection, was limitedly identified between the selected cases – both were top-down.

Within the qualitative sources I used, the number of interviews is deemed satisfactory for the scope of a master's thesis, since for every case more than 7 interviews were held with relevant professionals. Considering the time frame of the research and the nature of the sub questions, the perspective given by the – in total 19 – interviewees is deemed sufficient. As discussed in the ethical considerations in section 3.6., interviews were held in the time of the COVID-19 pandemic, removing the face-to-face interview as option, which meant that interviews were held online. This did only limitedly influence the quality of the interviews. However, a shortcoming regarding this, was that additional (informal and/or non-verbal) information might have been missed due to this situation. Moreover, only professionals working in the field of accessibility and intermodality were interviewed. This has left out perspectives of other policy sectors and actors in the MLG, such as ProRail, companies, public services, or citizen (organisations). The interviewees could also have been interviewed on multiple occasions – for instance via a focus group – so that more could be concluded more confidently about the process of implementation of intermodality. However, considering the time frame of this research, this was not a viable option.

Overall, the data and literature found, provided enough insights to answer the research questions posed and contributed to the research aims, and also provided new insights. The topic researched was complex. Yet, the topic also sees increasing interest in both policy making and academic science – particularly intermodality and accessibility (e.g., RWS, 2020; Kask, 2021; Witte et al., 2021). This has made that there might be new insights in policy making and academic science that were only limited/not considered in this thesis, due to their emergence during the execution of this research. Therefore, the contribution of this research lies primarily bringing these concepts in combination with the multi-level governance and peri-urban/DUS perspectives, as was the expectation. In the end, integration between modes and levels might put intermodality concept in a new perspective where consideration of multiple levels and actor groups and peri-urban relations might create solutions for a more sustainable mobility.

Literature

- Advier (2020). *Mobipunten in de Kop van Noord-Holland – Praktijkpaper*. s.l.: Advier
- Allen, A. (2003). Environmental planning and management of the peri-urban interface: perspectives on an emerging field. *Environment and urbanization*, 15(1), 135-148.
- Antrop, M. (2000). Changing patterns in the urbanized countryside of western Europe. *Landscape Ecology*, 15(3), 257–270.
- Antrop, M. (2004). Landscape change and the urbanization process in Europe. *Landscape and urban planning*, 67(1-4), 9-26.
- Alexander, E. R. (2005). Institutional transformation and planning: From institutionalization theory to institutional design. *Planning theory*, 4(3), 209-223.
- Arts, J., Hanekamp, T., Linssen, R., & Snippe, J. (2016). Benchmarking integrated infrastructure planning across Europe – moving forward to vital infrastructure networks and urban regions. *Transportation Research Procedia*, 14, 303-312.
- Banister, D. (2008). The sustainable mobility paradigm. *Transport policy*, 15(2), 73-80.
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The qualitative report*, 13(4), 544-559.
- Berg, M van den. (2020). *De plek in Sint Willebrord waar voorheen een bushalte was*. Retrieved on 04-07-2021 from: <http://marcelvandenbergh.com/categorie/category/1/verdwenen-bushalte-1-jpg?q=willebrord&page=1>.
- Bertolini, L. (1999). Spatial development patterns and public transport: the application of an analytical model in the Netherlands. *Planning Practice and Research*, 14(2), 199-210.
- Bertolini, L. (2009). *De planologie van mobiliteit* (Vol. 331). Amsterdam: Amsterdam University.
- Bertolini, L. (2012). Integrating mobility and urban development agendas: a manifesto. *disP-The Planning Review*, 48(1), 16-26.
- Bertolini, L. (2020). From “streets for traffic” to “streets for people”: can street experiments transform urban mobility?. *Transport Reviews*, 1-20.
- Bertolini, L., & Clercq, F. Le (2003). Urban development without more mobility by car? Lessons from Amsterdam, a multimodal urban region. *Environment and planning A*, 35(4), 575-589.
- Bockstael-Blok, W. (2001). *Chains and Networks in Multimodal Passenger Transport*. PhD Thesis, Delft: Delft University of Technology.
- Brezzi, M., Dijkstra, L., & Ruiz, V. (2011). *OECD extended regional typology: the economic performance of remote rural regions*. Retrieved on 24-08-2020 from: <https://doi.org/10.1787/5kg6z83tw7f4-en>.
- Broitman, D., & Koomen, E. (2015). Regional diversity in residential development: a decade of urban and peri-urban housing dynamics in The Netherlands. *Letters in Spatial and Resource Sciences*, 8(3), 201-217.
- Boomen, T. van den & Venhoeven, T. (2012). *De mobiele stad: over de wisselwerking van stad, spoor en snelweg*. Rotterdam: nai010 uitgevers.

- Bos, E., M. Bijlsma, J. Salverda & I. Veling (2001). *Multimodaal Personenvervoer; literatuurstudie*. TT01-09. Veenendaal: Traffic Test BV.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*, 9(2), 27-40.
- Brinkerhoff, D. W., & Brinkerhoff, J. M. (2011). Public–private partnerships: Perspectives on purposes, publicness, and good governance. *Public administration and development*, 31(1), 2-14.
- Buitelaar, E., Lagendijk, A., & Jacobs, W. (2007). A theory of institutional change: illustrated by Dutch city-provinces and Dutch land policy. *Environment and Planning A*, 39(4), 891-908.
- Buitelaar, E., & Sorel, N. (2010). Between the rule of law and the quest for control: Legal certainty in the Dutch planning system. *Land Use Policy*, 27(3), 983-989.
- Burns, L. D., & Golob, T. F. (1976). The role of accessibility in basic transportation choice behavior. *Transportation*, 5(2), 175-198.
- Busscher, T., Tillema, T., & Arts, J. (2015). In search of sustainable road infrastructure planning: How can we build on historical policy shifts?. *Transport Policy*, 42, 42-51.
- Cammen, H. van der, Klerk, L. de, Dekker, G., Witsen, P. P., & O'Loughlin, M. (2012). *The selfmade land: culture and evolution of urban and regional planning in the Netherlands*. First edition. Houten: Spectrum.
- Caruso, G. (2001). *Periurbanisation, the situation in Europe: A bibliographical note and survey of studies in the Netherlands, Belgium, Great Britain, Germany, Italy and the Nordic Countries*. Dijon: Délégation à l'Aménagement du Territoire et à l'Action Régionale (DATAR), Ministère de l'Aménagement du Territoire et de l'Environnement.
- CBS/O&S Groningen (2018). *Mobiliteitsmonitor Regio Groningen-Assen 2017*. Den Haag: Centraal Bureau voor de Statistiek.
- Chorus, P., & Bertolini, L. (2011). An application of the node place model to explore the spatial development dynamics of station areas in Tokyo. *Journal of transport and land use*, 4(1), 45-58.
- College van Rijksadviseurs (2012). *Over stad, spoor en snelweg. Advies over multimodale knooppunten van infrastructuur en ruimtelijke inrichting*. Rotterdam: NAI010.
- Crainic, T. G., & Kim, K. H. (2007). Intermodal transportation. *Handbooks in operations research and management science*, 14, 467-537.
- CROW (2005). *Aan de slag met P+R-beleid*. CRW070/Byr/1902. Deventer: CROW.
- CROW (2018). *Vitaal Platteland! – Samen de kracht van het platteland benutten*. K-D062. Ede: CROW.
- CROW (2020). *Thema Ketenmobiliteit*. Retrieved on 16-08-2020 from: <https://www.crow.nl/themas/mobiliteit/ketenmobiliteit>.
- Dacko, S. G., & Spalteholz, C. (2014). Upgrading the city: Enabling intermodal travel behaviour. *Technological Forecasting and Social Change*, 89, 222-235.
- Derrible, S., & Kennedy, C. (2010). Characterizing metro networks: state, form, and structure. *Transportation*, 37(2), 275-297.

Dijst, M., Rietveld, P., & Steg, L. (2013). Individual needs, opportunities and travel behaviour: a multidisciplinary perspective based on psychology, economics and geography. In Wee, B. van, Annema, J. A., & Banister, D. (Eds.). *The transport system and transport policy: an introduction* (pp. 19-47). Cheltenham, UK/Northampton, MA, US: Edward Elgar Publishing.

Drenth, M. (2019). *P+R Hoogkerk*. Retrieved on 09-07-2021 from: <https://mirandadrenth.media/>.

Edelenbos, J., & Klijn, E. H. (2006). Managing stakeholder involvement in decision making: A comparative analysis of six interactive processes in the Netherlands. *Journal of public administration research and theory*, 16(3), 417-446.

Eltis (2019). *Guidelines for developing and implementing a sustainable urban mobility plan*. Retrieved on 05-07-2021 from: https://www.eltis.org/sites/default/files/sump_guidelines_2019_interactive_document_1.pdf.

European Commission (2013). *Multimodal personal mobility*. Retrieved on 22-08-2020 from: <https://eu-smartcities.eu/sites/default/files/2017-10/Multimodal%20personal%20mobility%20january.pdf>.

European Commission (2017). *Analysis of the EU Combined Transport - Final Report*. FV355/2012/MOVE/D1/ETU. Luxembourg: European Commission.

European Commission (2020). *Developments and Forecasts on Continuing Urbanisation*. Retrieved on 20-06-2020 from: https://ec.europa.eu/knowledge4policy/foresight/topic/continuing-urbanisation/developments-and-forecasts-on-continuing-urbanisation_en#:~:text=Europe's%20level%20of%20urbanization%20is,than%20in%20the%20developed%20ones.

Flyvbjerg, B. (1998). *Rationality and power: Democracy in practice*. Chicago: University of Chicago press.

Forester, J. (1982). Planning in the Face of Power. *Journal of the American planning association*, 48(1), 67-80.

Gebhardt, L., Krajzewicz, D., & Oostendorp, R. (2017). Intermodality—key to a more efficient urban transport system?. *Proceedings of the 2017 eceee summer study*, 759-769.

Gemeente Alkmaar (2017). *Visie Mobiliteit en Bereikbaarheid 2017-2027*. Alkmaar: Gemeente Alkmaar.

Gemeente Amsterdam (2013). *Amsterdam Aantrekkelijk Bereikbaar*. Amsterdam: Gemeente Amsterdam.

Gemeente Den Helder (2011). *Visie infrastructuur Den Helder 2025*. Den Helder: Gemeente Den Helder.

Gemeente Groningen (2018). *Omgevingsvisie 'The Next City': de Groningse leefkwaliteit voorop*. Groningen: Gemeente Groningen.

Gemeente Groningen (2019). *Visie op het Gronings OV 2040*. Groningen: Provincie Groningen.

Gemeente Hollands Kroon (2016). *Omgevingsvisie Hollands Kroon - "Ruimte voor Elkaar"*. Anna Paulowna: Gemeente Hollands Kroon.

Gemeente Oldambt (2017). *Omgevingsvisie*. Winschoten: Gemeente Oldambt.

- Gemeente Schagen (2011). *De visie en de missie van de gemeente HSZ*. Schagen: Gemeente Schagen.
- Geurs, K. T., & Wee, B. van (2004). Accessibility evaluation of land-use and transport strategies: review and research directions. *Journal of Transport geography*, 12(2), 127-140.
- Geurs, K. T. & Wee, B. van (2013). Accessibility: perspectives, measures and applications. In Wee, B. van, Annema, J. A., & Banister, D. (Eds.). *The transport system and transport policy: an introduction* (pp. 207-226). Cheltenham, UK/Northampton, MA, US: Edward Elgar Publishing.
- Gill, P., Stewart, K., Treasure, E. & Chadwick, B. (2008). Methods of data collection in qualitative research: interviews and focus groups. *British Dental Journal*, 204(6), 291-295.
- Givoni, M. and Banister, D. (2010) *Integrated transport: from policy to practice*. Hoboken: Taylor & Francis.
- Givoni, M., & Rietveld, P. (2007). The access journey to the railway station and its role in passengers' satisfaction with rail travel. *Transport Policy*, 14(5), 357-365.
- Giuffrè, T., Siniscalchi, S. M., & Tesoriere, G. (2012). A novel architecture of parking management for smart cities. *Procedia-Social and Behavioral Sciences*, 53, 16-28.
- Goldman, T., & Gorham, R. (2006). Sustainable urban transport: Four innovative directions. *Technology in society*, 28(1-2), 261-273.
- Goletz, M., Haustein, S., Wolking, C., & l'Hostis, A. (2020). Intermodality in European metropolises: The current state of the art, and the results of an expert survey covering Berlin, Copenhagen, Hamburg and Paris. *Transport Policy*, 94, 109-122.
- Gonçalves, J., Gomes, M., & Ezequiel, S. (2017a). Defining mobility patterns in peri-urban areas: A contribution for spatial and transport planning policy. *Case studies on transport policy*, 5(4), 643-655.
- Gonçalves, J., Gomes, M. C., Ezequiel, S., Moreira, F., & Loupa-Ramos, I. (2017b). Differentiating peri-urban areas: A transdisciplinary approach towards a typology. *Land Use Policy*, 63, 331-341.
- Gorter, C., Nijkamp, P., & Vork, R. (2000). Analysis of travellers' satisfaction with transport chains. *Transportation planning and technology*, 23(3), 237-258.
- Groningen Bereikbaar (2017). *P+R Meerstad op 14 oktober klaar voor gebruik*. Retrieved on 05-07-2020 from: <https://www.groningenbereikbaar.nl/nieuws/pr-meerstad-op-14-oktober-klaar-voor-gebruik>.
- Grotenhuis, J. W., Wiegmans, B. W., & Rietveld, P. (2007). The desired quality of integrated multimodal travel information in public transport: Customer needs for time and effort savings. *Transport Policy*, 14(1), 27-38.
- Gutierrez, J., & García-Palomares, J. C. (2007). New spatial patterns of mobility within the metropolitan area of Madrid: towards more complex and dispersed flow networks. *Journal of transport geography*, 15(1), 18-30.
- Haartsen, T., & Venhorst, V. (2010). Planning for decline: anticipating on population decline in the Netherlands. *Tijdschrift voor economische en sociale geografie*, 101(2), 218-227.
- Hamers D., Snellen, D., Breedijk, M., Hilbers, H., Nabielek, K. & Tennekes, J. (2014). *Kiezen én delen: Strategieën voor een betere afstemming tussen verstedelijking en infrastructuur*. Den Haag: Planbureau voor de Leefomgeving (PBL).

- Hamersma, M. & Haas, M. de. (2020). *Kenmerken van 'veelbelovende' ketens: Inzichten voor het stimuleren van ketenmobiliteit in Nederland*. Den Haag: Kennisinstituut voor Mobiliteitsbeleid (KiM).
- Hansen, W. G. (1959). How accessibility shapes land use. *Journal of the American Institute of planners*, 25(2), 73-76.
- Hajer, M. A., & Wagenaar, H. (2003). Introduction. In M. A. Hajer, & H. Wagenaar, (Eds.). *Deliberative policy analysis: understanding governance in the network society*. (pp. 1-30). Cambridge: Cambridge University Press.
- Healey, P. (1996). The communicative turn in planning theory and its implications for spatial strategy formation. *Environment and Planning B: Planning and design*, 23(2), 217-234.
- Healey, P. (2007). *Urban complexity and spatial strategies: Towards a relational planning for our times*. Milton, UK/New York, NY, USA: Routledge.
- Heinen, E., & Mattioli, G. (2019). Does a high level of multimodality mean less car use? An exploration of multimodality trends in England. *Transportation*, 46(4), 1093-1126.
- Helmke, G., & Levitsky, S. (2004). Informal institutions and comparative politics: A research agenda. *Perspectives on politics*, 2(4), 725-740.
- Hickman, R., Hall, P., & Banister, D. (2013). Planning more for sustainable mobility. *Journal of Transport Geography*, 33, 210-219.
- Hilbers, H., Snellen, D., Daalhuizen, F., De Jong, A., Ritsema van Eck, J., & Zondag, B. (2011). *Nederland in 2040: een land van regio's. Ruimtelijke Verkenning 2011*. Den Haag: Planbureau voor de Leefomgeving.
- Holden, E., Gilpin, G., & Banister, D. (2019). Sustainable mobility at thirty. *Sustainability*, 11(7), 1965.
- Hooghe, L., & Marks, G. (2003). Unraveling the central state, but how? Types of multi-level governance. *American political science review*, 233-243.
- Hornis, W. & Eck J. R. van. (2007). *Het Nieuwe Ommeland; Veranderingen in Stad-land-relaties*. Rotterdam: NAI/Den Haag: Ruimtelijk Planbureau.
- Hornis, W., & Eck, J. R. van. (2008). A Typology of Peri-urban Areas in the Netherlands. *Tijdschrift voor economische en sociale geografie*, 99(5), 619-628.
- Iaquina, D. L., & Drescher, A. W. (2000). Defining the peri-urban: rural-urban linkages and institutional connections. *Land reform*, 2, 8-27.
- Innes, J. E., & Booher, D. (2003). Collaborative policymaking: Governance through dialogue. In M. Hajer & H. Wagenaar (Eds.), *Deliberative Policy Analysis: Understanding Governance in the Network Society* (pp. 33-59). Cambridge: Cambridge University Press.
- Innes, J. E., Connick, S., & Booher, D. (2007). Informality as a planning strategy: Collaborative water management in the CALFED Bay-Delta Program. *Journal of the American Planning Association*, 73(2), 195-210.
- Interreg North Sea Region (2021). *SURFLOGH*. Retrieved on 30-06-2021 from: <https://northsearegion.eu/surflogh/>.

- Janssen-Jansen, L. B., & Woltjer, J. (2010). British discretion in Dutch planning: Establishing a comparative perspective for regional planning and local development in the Netherlands and the United Kingdom. *Land Use Policy*, 27(3), 906-916.
- Jones, W. B., Cassady, C. R., & Bowden Jr, R. O. (2000). Developing a standard definition of intermodal transportation. *Transport Law Journal*, 27, 345-352.
- Kask, Ö. (2021). *Hub programme Groningen and Drenthe - State of hubs, governance, and future outlook*. Groningen: University of Groningen.
- Kennisinstituut Mobiliteitsbeleid (KiM) (2019). *Mobiliteitsbeeld 2019*. Den Haag: Ministerie van Infrastructuur en Waterstaat.
- Kemp, R., & Rotmans, J. (2004). Managing the transition to sustainable mobility. In B. Elzen, F. W. Geels, & K. Green (Eds.). *System innovation and the transition to sustainability: theory, evidence and policy* (pp. 137-167). Cheltenham, UK: Edward Elgar Publishing.
- Klijn, E. H. (2008). Governance and governance networks in Europe: An assessment of ten years of research on the theme. *Public management review*, 10(4), 505-525.
- Kooiman, J., Bavinck, M., Chuenpagdee, R., Mahon, R., & Pullin, R. (2008). Interactive governance and governability: an introduction. *The journal of transdisciplinary environmental studies*, 7(1), 1-11.
- Krygsman, S. (2004). *Activity and travel choice(s) in multimodal public transport systems*. PhD thesis, Utrecht: Utrecht University.
- Krygsman, S., & Dijst, M. (2001). Multimodal trips in the Netherlands: microlevel individual attributes and residential context. *Transportation Research Record*, 1753(1), 11-19.
- Kuijpers, C., Noy, M., Buck, P., Ongering, L., Bertolini, L., Tordoir, P., ... Venhoeven, T. (2010). *Stedelijke ontwikkeling en mobiliteit: 8 handvatten voor de ontwikkeling van spoorzones tot knooppunten*. Den Haag: Ministerie van VROM, Ministerie van V&W, NS, ProRail.
- Kwantes, C., Juffermans, N. & Scheltes, A. (2019). HUB's: van hippe hype-fase naar duurzame mobiliteitstransitie. Paper presented at Colloquium Vervoersplanologisch Speurwerk, Leuven, Belgium.
- Laan, L. van der (1998). Changing urban systems: an empirical analysis at two spatial levels. *Regional studies*, 32(3), 235-247.
- Lerner, A. M., & Eakin, H. (2011). An obsolete dichotomy? Rethinking the rural–urban interface in terms of food security and production in the global south. *The Geographical Journal*, 177(4), 311-320.
- Levine, M. A., & Weesep, J. V. (1988). The changing nature of Dutch urban planning. *Journal of the American Planning Association*, 54(3), 315-323.
- Levinson, M. (2006). Container shipping and the decline of New York, 1955–1975. *Business History Review*, 80(1), 49-80.
- Longhurst, R. (2016). Semi-structured Interviews and Focus Groups. In Clifford, N., Cope, M., Gillespie, T., & French, S. (Eds.). *Key methods in geography* (pp.581-595). London, UK: Sage publications.
- Lucas, K. (2012). Transport and social exclusion: Where are we now?. *Transport policy*, 20, 105-113.
- Marks, G. (1993). Structural policy and multilevel governance in the EC. *The Maastricht debates and beyond*, 392.

- Marks, G., Hooghe, L., & Blank, K. (1996). European integration from the 1980s: State-centric v. multi-level governance. *JCMS: Journal of Common Market Studies*, 34(3), 341-378.
- Martens, K. (2017). *Transport justice: Designing fair transportation systems*. First edition. Milton, UK/ New York, NY, USA: Routledge.
- May, A. D., Kelly, C., & Shepherd, S. (2006). The principles of integration in urban transport strategies. *Transport policy*, 13(4), 319-327.
- McKinnon, A., Edwards, J., Piecyk, M., & Palmer, A. (2009). Traffic congestion, reliability and logistical performance: a multi-sectoral assessment. *International Journal of Logistics: Research and Applications*, 12(5), 331-345.
- Meuleman, L. (2008). *Public management and the metagovernance of hierarchies, networks and markets: The feasibility of designing and managing governance style combinations*. Heidelberg: Springer Science & Business Media.
- Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (2019). *Krimpgebieden en anticipeergebieden*. Retrieved on 28-07-2020 from: <https://www.rijksoverheid.nl/onderwerpen/bevolkingsdaling/krimpgebieden-en-anticipeergebieden>.
- Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (2020). *Nationale Omgevingsvisie – Duurzaam perspectief voor onze leefomgeving*. Den Haag: Ministerie van Binnenlandse Zaken en Koninkrijksrelaties.
- Ministerie van Infrastructuur & Milieu (2016). *Overstappen naar 2040 – Flexibel en slim OV*. Den Haag: Ministerie van Infrastructuur & Milieu.
- Molin, E., Mokhtarian, P., & Kroesen, M. (2016). Multimodal travel groups and attitudes: A latent class cluster analysis of Dutch travelers. *Transportation Research Part A: Policy and Practice*, 83, 14-29.
- Monstadt, J. (2007). Urban governance and the transition of energy systems: Institutional change and shifting energy and climate policies in Berlin. *International Journal of Urban and Regional Research*, 31(2), 326-343.
- Montesquieu, C. De (1989). *Montesquieu: The spirit of the laws*. Cambridge: Cambridge University Press.
- Morand, D. A. (1995). The role of behavioral formality and informality in the enactment of bureaucratic versus organic organisations. *Academy of Management Review*, 20(4), 831-872.
- Movares (2020). *De Kop Werkt!* s.l.: Movares.
- Muller, G. (1995). *Intermodal Freight Transportation* (3rd ed.). Westport, CT: Eno Transportation Foundation.
- Müller, G., Riley, P., Asperges, T., & Puig-Pey, P. (2004). *Towards passenger intermodality in the EU, recommendations for advancing passenger intermodality in the EU (Report 3)*. Dortmund: European Commission.
- Narain, V. (2017). Taken for a ride? Mainstreaming periurban transport with urban expansion policies. *Land Use Policy*, 64, 145-152.
- Nes, R. van (2002). *Design of multimodal transport networks: A hierarchical approach*. PhD thesis, Delft: Delft University of Technology.

- Nes, R. van, & Bovy, P. H. (2004). Multimodal traveling and its impact on urban transit network design. *Journal of advanced transportation*, 38(3), 225-241.
- Nieuwenhuijsen, M. J., & Khreis, H. (2016). Car free cities: Pathway to healthy urban living. *Environment international*, 94, 251-262.
- Nobis, C. (2007). Multimodality: facets and causes of sustainable mobility behavior. *Transportation Research Record*, 2010(1), 35-44.
- O'Leary, Z. (2014). *The Essential Guide to Doing your Research Project*. 2nd Edition. Thousand Oaks, CA: SAGE Publications, Inc.
- Olvera, L. D., Guézéré, A., Plat, D., & Pochet, P. (2015). Improvising intermodality and multimodality. Empirical findings for Lomé, Togo. *Case Studies on Transport Policy*, 3(4), 459-467.
- Oostendorp, R., Krajzewicz, D., Gebhardt, L., & Heinrichs, D. (2019). Intermodal mobility in cities and its contribution to accessibility. *Applied Mobilities*, 4(2), 183-199.
- Osborne, D. (1993). Reinventing government. *Public Productivity & Management Review*, 16(4), 349–356.
- Owens, S. (1995). From 'predict and provide' to 'predict and prevent'? Pricing and planning in transport policy. *Transport policy*, 2(1), 43-49.
- Peters, B. G., & Pierre, J. (1998). Governance without government? Rethinking public administration. *Journal of public administration research and theory*, 8(2), 223-243.
- Piattoni, S. (2010). *The theory of multi-level governance: conceptual, empirical, and normative challenges*. Oxford: Oxford University Press.
- Pitsiava-Latinopoulou, M., & Iordanopoulos, P. (2012). Intermodal passengers terminals: Design standards for better level of service. *Procedia-Social and Behavioral Sciences*, 48, 3297-3306.
- Pot, F., Tillema, T., & Jorritsma, P. (2019). *Wegen naar mobiliteitsarmoede in perifere rurale gebieden*. Paper presented at Colloquium Vervoersplanologisch Speurwerk, Leuven, Belgium.
- Provincie Drenthe (2018). *Omgevingsvisie 2018*. Assen: Provincie Drenthe.
- Provincie Groningen (2016). *Verbinden met de Fiets – Fietsstrategie 2016-2025*. Groningen: Provincie Groningen.
- Provincie Groningen (2019). *Geconsolideerde Omgevingsvisie februari 2019*. Groningen: Provincie Groningen.
- Provincie Groningen (2020a). *Startnotitie Programma Mobiliteit Provincie Groningen*. Groningen: Provincie Groningen.
- Provincie Groningen (2020b). *Thematisch Programmaplan – Nationaal Programma Groningen*. Groningen: Provincie Groningen.
- Provincie Noord-Holland (2013). *Maak Plaats! – Werken aan knooppuntontwikkeling in Noord-Holland*. Haarlem: Provincie Noord-Holland.
- Provincie Noord-Holland (2019). *Agenda Mobiliteit – Discussienota*. Haarlem: Provincie Noord-Holland.

- Provincie Noord-Holland & Provincie Flevoland (2019). *Regionaal OV Toekomstbeeld 2040 Noord-Holland & Flevoland: Kansrijke Noodzaak*. Haarlem: Provincie Noord-Holland.
- Qian, Z. S., & Zhang, H. M. (2011). Modeling multi-modal morning commute in a one-to-one corridor network. *Transportation Research Part C: Emerging Technologies*, 19(2), 254-269.
- Raad voor de Leefomgeving en Infrastructuur (2009). *Kansen voor een krimpend platteland – Advies over de gevolgen van bevolkingsdaling voor het platteland*. Utrecht: Raad voor de Leefomgeving en Infrastructuur.
- Rauws, W. S., & de Roo, G. (2011). Exploring transitions in the peri-urban area. *Planning Theory & Practice*, 12(2), 269-284.
- Rhodes, R. A. W. (1996). The new governance: governing without government. *Political studies*, 44(4), 652-667.
- Rhodes, R. A. W. (2000). Governance and Public Administration. In J. Pierre, (Ed.). *Debating governance: Authority, steering, and democracy*. Oxford: Oxford University Press.
- Rietveld, P. (2002). Multimodaliteit, knooppunten en complementariteit; Grenzen aan de concurrentie. Amsterdam: Vrije Universiteit.
- Rietveld, P., & Daniel, V. (2004). Determinants of bicycle use: do municipal policies matter?. *Transportation Research Part A: Policy and Practice*, 38(7), 531-550.
- Rijkswaterstaat (2020). *De multimodale hub en Rijkswaterstaat : een verkenning naar de link tussen het hoofdwegennet en duurzame stedelijke mobiliteit*. Utrecht: Rijkswaterstaat.
- Santos, G., Behrendt, H., & Teytelboym, A. (2010). Part II: Policy instruments for sustainable road transport. *Research in transportation economics*, 28(1), 46-91.
- Schaeffer, P. V., Kahsai, M. S., & Jackson, R. W. (2013). Beyond the rural–urban dichotomy: Essay in honor of Professor AM Isserman. *International Regional Science Review*, 36(1), 81-96.
- Schulz, T., Böhm, M., Gewalt, H., Celik, Z., & Krcmar, H. (2020). The Negative Effects of Institutional Logic Multiplicity on Service Platforms in Intermodal Mobility Ecosystems. *Business & Information Systems Engineering: The International Journal of Wirtschaftsinformatik*, 1-17.
- SERC (2015). *Groningen – Grote markt*. Retrieved on 04-07-2021 from: <http://fotos.serc.nl/groningen/groningen/groningen-24516/>.
- Simon, D. (2008). Urban environments: issues on the peri-urban fringe. *Annual review of environment and resources*, 33, 167-185.
- Sloman, L., & Hendy, P. (2008). *A new approach to rural public transport*. London: Commission for Integrated Transport (CfIT).
- Smith, N., Hirsch, D., & Davis, A. (2012). Accessibility and capability: the minimum transport needs and costs of rural households. *Journal of Transport Geography*, 21, 93-101.
- Spickermann, A., Grienitz, V., & Heiko, A. (2014). Heading towards a multimodal city of the future?: Multi-stakeholder scenarios for urban mobility. *Technological Forecasting and Social Change*, 89, 201-221.
- SteadieSeifi, M., Dellaert, N. P., Nuijten, W., Woensel, T. van, & Raoufi, R. (2014). Multimodal freight transportation planning: A literature review. *European journal of operational research*, 233(1), 1-15.

- Steenbekkers, A., & Vermeij, L. (2013). *De dorpenmonitor. Ontwikkelingen in de leefsituatie van dorpsbewoners*. Den Haag: Sociaal en Cultureel Planbureau.
- Stelling, C. (2011). Parkeren op afstand in stad en land. *AGORA Magazine*, 27(1), 7-10.
- Stoker, G. (1998). Governance as theory: five propositions. *International social science journal*, 50(155), 17-28.
- Straatemeier, T. (2008). How to plan for regional accessibility?. *Transport policy*, 15(2), 127-137.
- Straatemeier, T. (2019). *Joint Accessibility Design: A framework to improve integrated transport and land use strategy making*. PhD thesis, Amsterdam: University of Amsterdam.
- Stuurgroep Toekomstbeeld OV (2019). *Bus, Tram, Metro-netwerk Toekomstbeeld OV – Uitwerking voor de middellange termijn*. Eindhoven: GoudappelCoffeng.
- Tacoli, C. (2003). The links between urban and rural development. *Environment and Urbanization*, 15, 3-12.
- Taylor, L. (2016). Case Study Methodology. In Clifford, N., Cope, M., Gillespie, T., & French, S. (Eds.). *Key methods in geography* (pp.581-595). London, UK: Sage publications.
- Tordoir, P. P., Poorthuis, A., & Renooy, P. H. (2015). *De veranderende geografie van Nederland: de opgaven op mesoniveau*. Amsterdam: Regioplan.
- Tillema T. (2007). Tillema, T. (2007). *Road pricing: a transport geographical perspective. Geographical accessibility and short and long-term behavioural effects*. PhD thesis, Utrecht: Utrecht University.
- Tillema, T. (2019). *Ruimte voor bereikbaarheid: van stad tot ommeland*. Groningen: University of Groningen.
- United Nations (UN) (2015). *Transforming our world: the 2030 Agenda for Sustainable Development*. s.l.: United Nations General Assembly.
- United Nations (UN) (2018). *World Urbanization Prospects: The 2018 Revision*. s.l.: United Nations.
- United Nations / Economic Commission for Europe (UN/ECE) (2001). *Terminology on Combined Transport*. New York & Geneva: United Nations.
- Verwest, F., & van Dam, F. (2010). *Van bestrijden naar begeleiden: demografische krimp in Nederland: Beleidsstrategieën voor huidige en toekomstige krimpregio's*. Den Haag: Planbureau voor de leefomgeving.
- Walle, S. V., & Steenberghen, T. (2006). Space and time related determinants of public transport use in trip chains. *Transportation Research Part A: Policy and Practice*, 40(2), 151-162.
- Wee, B. van., & Banister, D. (2016). How to write a literature review paper?. *Transport Reviews*, 36(2), 278-288.
- Wegener, M. & Fürst, F. (1999). *Land-Use Transport Interaction: State of the Art*. Dortmund: Institut für Raumplanung Universität Dortmund.
- Williams, A. M., Foord, J., & Mooney, J. (2012). Human mobility in functional urban regions: understanding the diversity of mobilities. *International Review of Sociology*, 22(2), 191-209.

- Willing, C., Brandt, T., & Neumann, D. (2017). Intermodal mobility. *Business & Information Systems Engineering*, 59(3), 173-179.
- Witte, J. J., Alonso-González, M., & Rongen, T. (2021). *Verkenning van het concept mobiliteitshub*. Den Haag: Kennisinstituut voor Mobiliteitsbeleid (KiM).
- Xie, F., & Levinson, D. (2009). Topological evolution of surface transportation networks. *Computers, Environment and Urban Systems*, 33(3), 211-223.
- Yanow, D. (2006). Qualitative-interpretive methods in policy research. In F. Fischer, G. Miller, & M. Sidney (Eds.), *Handbook of public policy analysis* (pp. 405-415). Taylor & Francis.
- Yin, R.K. (2003). *Case Study Research: Design and Methods*. London, UK/ Thousand Oaks, CA, USA: Sage Publications.
- Yin, R. K. (2014). *Case Study Research: Design and methods*. London, UK/Thousand Oaks, CA, USA: Sage publications.
- Zijlstra, T., Vanoutrive, T., & Verhetsel, A. (2014). *De effectiviteit van park + ride*. D/2014/11.528/3 Antwerpen: Steunpunt Goederen- en personenvervoer.

Appendices

Appendix 1

Documents studied for the document analysis and used for the secondary data analysis:

| National policy documents | | | |
|---|--|-------------|--|
| Document title | Organisation/Authors | Year | Focus/document type |
| Kenmerken van veelbelovende ketens | KiM; Hamersma & De Haas, (2020) | 2020 | Research report on intermodality |
| Nationale Omgevingsvisie – Duurzaam perspectief voor onze leefomgeving | Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (2020) | 2020 | National policy document on spatial development |
| Bus, Tram, Metronetwerk – Toekomstbeeld OV | Stuurgroep Toekomstbeeld OV & Goudappel Coffeng (2019) | 2019 | Consultant report on public transport |
| Kiezen of Delen | PBL; Hamers et al. (2014) | 2014 | Research report on hubs |
| Van bestrijden naar begeleiden: demografische krimp in Nederland | PBL: Verwest & Van Dam (2010) | 2010 | Research report on areas with population decline |
| Over stad, spoor en snelweg. Advies over multimodale knooppunten van infrastructuur en ruimtelijke inrichting | CRA; College van Rijksadviseurs (2012) | 2012 | Advice on intermodal accessibility |
| Kansen voor een krimpend platteland | RLI; Raad voor de Leefomgeving en Infrastructuur (2009) | 2009 | Advice on areas with population decline. |
| Vitaal Platteland! | CROW (2018) | 2018 | Research report on rural governance |
| Overstappen naar 2040 | Ministerie van Infrastructuur & Milieu (2016), the 12 Dutch provinces, MRA, MRDH, NS & ProRail | 2016 | National policy document on public transport |
| Regional policy documents (case Kop of Noord-Holland) | | | |
| De Kop Werkt! – Bereikbaarheid | Movares (2020) | 2020 | Consultant report on accessibility |
| De visie en missie van de gemeente HSZ | Gemeente Schagen (2011) | 2011 | Vision document of the municipality of Schagen |
| Visie infrastructuur Den Helder 2025 | Gemeente Den Helder (2011) | 2011 | Infrastructure policy document |
| Kansrijke Noodzaak – schaa sprong naar het mobiliteitssysteem van de toekomst | Provincie Noord-Holland & Provincie Flevoland (2019) | 2019 | Regional policy document on public transport |

| | | | |
|--|--------------------------------|------|---|
| Omgevingsvisie Hollands Kroon | Gemeente Hollands Kroon (2016) | 2016 | Municipal spatial planning policy document |
| Mobipunten in de Kop van Noord-Holland | Advier (2020) | 2020 | Consultant report on hub-strategy and accessibility |
| Agenda Mobiliteit | Provincie Noord-Holland (2019) | 2019 | Regional policy document on mobility |
| Visie Mobiliteit en Bereikbaarheid – Alkmaar bereikt | Gemeente Alkmaar (2017) | 2017 | Municipal mobility policy document |
| Maak Plaats! | Provincie Noord-Holland (2013) | 2013 | Provincial public transport policy document |
| <u>Regional policy documents (case surroundings of Groningen)</u> | | | |
| Startnotitie Programma Mobiliteit Provincie Groningen | Provincie Groningen (2020a) | 2020 | Regional policy document on mobility |
| Thematisch Programmaplan - Nationaal Programma Groningen | Provincie Groningen (2020b) | 2020 | Regional policy document |
| Mobiliteitsmonitor Regio Groningen-Assen 2017 | CBS/O&S Groningen (2018) | 2018 | Research report on mobility |
| Visie op het Gronings OV | Gemeente Groningen (2019) | 2019 | Municipal mobility policy document |
| Verbinden met de Fiets | Provincie Groningen (2016) | 2016 | Regional policy document on cycling |
| Omgevingsvisie Provincie Groningen 2016-2020 | Provincie Groningen (2019) | 2019 | Provincial spatial planning policy document |
| Omgevingsvisie 2018 | Provincie Drenthe (2018) | 2018 | Provincial spatial planning policy document |
| Omgevingsvisie | Gemeente Oldambt (2017) | 2017 | Municipal spatial planning policy document |

Table 4: Documents studied for the (policy) document analysis and used for the secondary data analysis.

Appendix 2

Interview guide

In order to answer questions 2 (partly), 3, and 4 (partly).

1. *How is intermodality in declining peri-urban areas in the Netherlands characterized and how do land-use and transport policies in these regions relate to intermodality?*
2. *How is governance used in implementation of intermodality in peri-urban areas?*
3. *How can implementation of intermodality in declining peri-urban areas be improved by using multi-level governance arrangements?*

Inleiding

Dank dat u openstaat voor dit interview voor mijn masterthesis. Allereerst de vraag of er bezwaar tegen heeft dat het interview wordt opgenomen? Heeft u afspraken aansluitend aan deze afspraak, omwille van tijd?

Mijn onderzoek gaat over multimodaliteit en ketenmobiliteit in peri-urbane krimpgebieden. Over het onderzoek zal ik nu het een en ander mondeling toelichten:

- Probleemstelling (groeiende stad vs. krimpend platteland → effecten op mobiliteitskeuzes, auto-afhankelijkheid en leefbaarheid.
- Multimodaliteit (meerdere vervoerswijzen in een rit van a naar b) in krimpgebieden kan zowel bereikbaarheid als duurzaamheid positief beïnvloeden. → Clusteren van vervoer, beter dan unimodale autoritten. → Voorkomen van vervoersarmoede en vergroten van vervoersgelijkheid.
- Implementatie ervan wordt echter bemoeilijkt doordat mobiliteit zich niet houdt aan de grenzen van gemeenten en provincies. Hiervoor is dus (strategische) samenwerking over meerdere bestuurlijke lagen, sectoren en gebieden benodigd.
- Dat brengt me bij de onderzoeksvraag van dit onderzoek: **How can multi-level governance be used in the implementation of intermodality in declining peri-urban areas?** (oftewel, hoe kan meerlaagse bestuurlijke samenwerking (multi-level governance) bijdragen aan de beleidsimplementatie van ketenmobiliteit in krimpende peri-urbane gebieden?).

Heeft u nog vragen of op-/aanmerkingen naar aanleiding van deze introductie?

Het interview bestaat uit 3 blokken: Vervoerssysteem, ruimtelijke ordening en multi-level governance.

- Zou u uzelf en de organisatie waar u voor werkt kort kunnen introduceren? Wat is uw rol?
- Bent u ook bekend met bevolkingskrimpproblematiek (of stagnatie)? Zo ja, heeft u hiervan eventuele voorbeelden? Ook gerelateerd aan mobiliteit of planologie?

Vervoerssysteem

- Binnen mijn onderzoek is ketenmobiliteit van belang. Hoe zou u het begrip ketenmobiliteit? Beschrijven? Welke componenten heeft het begrip volgens u? Hubs? Spokes?
- Welke (f)actoren spelen hierbij een rol? Welke modaliteiten?
- (Op welke manier) is uw organisatie betrokken bij het mogelijk maken van ketenmobiliteit?
- Hoe zou ketenmobiliteit een rol kunnen spelen in het verbeteren van bereikbaarheid in krimpgebieden? Wat kan er gedaan worden met de hubs? En wat met de spokes? Wie speelt daarin een rol? (Waarom?) Wat is de rol een de centrale stad/steden hierin?

Ruimtelijke ordening

- Daarnaast speelt ruimtelijke ordening een rol binnen het creëren van bereikbaarheid. Op welke manier is ruimtelijke ordening van belang in het implementeren van ketenmobiliteit?
- Welke (f)actoren spelen hierbij een rol? Waarom?
- Is uw organisatie betrokken bij het mogelijk maken van ketenmobiliteit door middel van ruimtelijke ordening? Zo ja, hoe en waarmee?
- Hoe zou ruimtelijk beleid een rol kunnen spelen in het verbeteren van ketenmobiliteit in krimpgebieden? Locatiekeuzes? Bestemmingsplan? Flankerend beleid?
- Wat is waarde van ketenmobiliteit in krimpgebieden met aanvullend ruimtelijk beleid?

Multi-level governance

- Aanpassingen in het vervoerssysteem en de ruimtelijke ordening spelen dus een rol bij implementatie van ketenmobiliteit. Deze verschillende beleidsterreinen behoeven echter samenwerking. Op welke manier is deze samenwerking vormgegeven om ketenmobiliteit te implementeren?
- Binnen welke beleidsterreinen vindt deze samenwerking plaats? Op welke manier? In het vervoerssysteem? Ruimtelijke ordening? Of beide/anders?
- Wat is de rol van uw organisatie in die samenwerking?
- Met welke andere partijen? Markt? Bewonersorganisaties? Overheden?
- Welke taken hebben deze partijen? En hoe zijn deze taken vastgelegd?
- Hoe is de relatie van uw organisatie met andere partijen?
- Op welke manier zijn deze relaties ontstaan? Op welke manier zijn deze relaties en taken vastgelegd?
- Welke partij heeft volgens u de regie? Waarom?
- Op welke manier speelt afhankelijkheid een rol in de samenwerking?
- Wat is de rol van de overheid in deze samenwerking? Nationaal? Provinciaal? Gemeentelijk?
- Wat ziet u als het doel?
- Welke voorwaarden ziet u voor deze samenwerking? Welke barrières? En waarin is de samenwerking succesvol? Wat zijn verbeterpunten?
- ***Wat zijn specifiek de voordelen/nadelen van de samenwerking bij de implementatie van ketenmodaliteit in krimpgebieden?***
- ***Op welke manier is de relatie met de centrale stad van belang bij de implementatie van ketenmobiliteit in krimpgebieden? Heeft u daar ook voorbeelden bij?***
- ***Op welke manier is de samenwerking met marktpartijen, bewoners en overheden van belang voor de implementatie van ketenmobiliteit in krimpgebieden? Waarom is gekozen voor samenwerking? En Wat voor nadelen/voordelen zijn er?***
- Hoe ziet u de toekomstige ontwikkeling van de samenwerking voor u?

Afsluiting

Dank voor het interview. Heeft u nog iets om toe te voegen?

Bent u geïnteresseerd in het ontvangen van de eindversie?

Heeft u nog suggesties voor andere informatie/partijen/personen waarmee ik dit interview af zou kunnen nemen?

Bedanken voor interview

Ethische verantwoording -> er wordt zorgvuldig omgegaan met de data, welke gebruikt zal worden in de thesis zonder uw naam. De opname van het interview wordt getranscribeerd.

Appendix 3

List of interviewees:

| | | |
|-----|--------------------------------------|---|
| | Case of Groningen | <i>9 interviewees</i> |
| #1 | Province of Drenthe | Project manager mobility |
| #2 | Municipality of Groningen | Policy maker public transport |
| #3 | Municipality of Oldambt | Policy maker mobility |
| #4 | Publiek Vervoer | Project and contract manager |
| #5 | Province of Groningen | Project manager mobility |
| #6 | Nederlandse Spoorwegen | Mobility developer |
| #7 | Municipality of Westerkwartier | Policy maker mobility |
| #8 | OV-Bureau Groningen Drenthe | Manager network development |
| #9 | Reis via hub | Advisor/policy maker hubs |
| | | |
| | Case of Kop North Holland | <i>8 interviewees</i> |
| #10 | Municipality of Schagen/De Kop Werkt | Policy maker mobility |
| #11 | Advier/De Kop Werkt | Advisor (shared) mobility |
| #12 | Province of Noord-Holland | Policy maker hubs |
| #13 | Province of Noord-Holland | Concession manager |
| #14 | Province of Noord-Holland | Policy maker mobility/regional manager De Kop |
| #15 | De Kop Werkt | Manager mobility and accessibility |
| #16 | Municipality of Hollands Kroon | Policy maker mobility |
| #17 | Municipality of Den Helder | Policy maker mobility |
| | | |
| | General expert interviews | <i>2 interviewees</i> |
| #18 | GoudappelCoffeng | Hub/public transport consultant |
| #19 | Mobility alliance/ANWB | Director (public relations) |

Table 5: List of interviewees.

Appendix 4

Codebook used for coding the interviews

| Code | Code Group(s) | Description | Number |
|---------------------------------|------------------------------|---|---------------|
| Trial and error | Successes | Implementing the intermodality in an experimental/trial-and-error way of working. Often limited official (policy) documents or extensive debate before implementing. Learning by doing | 9 |
| A good network | Successes | Actors know each other, which leads to good communication, often resulting in better (integrated) solutions in implementation of intermodality | 13 |
| Bureaucracy | Barriers | Bureaucratic processes limiting the effectiveness of the implementation of intermodality. Examples are risk-mitigation, bad communication, or informational difficulties within organisations, leading to delays in implementations | 10 |
| Citizens' initiative | Citizens/Travellers | Project related to the implementation of intermodality set up by (local) citizens | 13 |
| Collective financial fund | Successes | Fund for implementation of intermodality, set up by multiple actors. Often one sum of money to implement multiple (separate) projects/hubs | 16 |
| Companies | Market parties | Market parties that want to be accessible by means of one or multiple transport modes OR want to create commercial activities close to intermodal hubs | 11 |
| Consultancies | Market parties | Consultancies helping with the implementation of intermodality | 7 |
| Demand-based transport services | Transport | Collective transport services that do not have a schedule to operate on, but base their operation on the demand at a certain moment | 14 |
| Employer approach | Market parties; Successes | Approach where the employers are approached by operator/governments to let their employees travel more sustainably towards work. In return, public transport discounts are given to the employee or intermodality developments are planned to make the company location better accessible | 9 |
| European project/programme | National government | European programmes are involved with the implementation of intermodality or a programme/project related to it | 6 |
| Finances | Barriers | Financial budgets for implementation are hard to establish between actors | 23 |

| | | | |
|-----------------------------|-----------------------------|--|----|
| Flanking policies | Land-use | Policies that do not involve physical developments, but indirectly change the way spaces are used. e.g., paid-parking, tailor-made solutions in communities | 13 |
| Hubs | Transport | Locations where intermodal transfers are being facilitated by connecting the spokes of multiple modes to each other | 66 |
| Lack of imagination /vision | Barriers | The implementation of intermodality is lacking a general vision, policy or plan that is agreed upon by relevant actors | 10 |
| Land-use characteristics | Conditions | Condition that is the result of economic, demographic, and spatial trends | 32 |
| Land-use policy | Land-use | Policies that determine where functions and uses are planned. These can be steering or restrictive | 28 |
| Limitedly promoted | Barriers | Implementation is limited known under actors | 2 |
| Liveability | Conditions | Also known as socio-economic sustainability. Nearness of (public) services | 17 |
| MaaS | Transport | Mobility as a Service, related to the implementation of intermodality when actors want to increase/propagate intermodal travel via personal travel advice on apps/websites | 5 |
| Multifunctionality | Land-use | The principle that one building/place has multiple functions to fulfil, for instance a hub combined with local services nearby | 7 |
| Municipal coordinator | Municipal government | Municipality/municipalities coordinating the implementation of intermodality | 5 |
| Municipal developer | Municipal government | Municipality developing the physical implementation of intermodality (hubs) | 27 |
| <i>Municipal government</i> | <i>Municipal government</i> | <i>Municipal code in combination with related successes or barriers</i> | 29 |
| Municipal initiator | Municipal government | Municipality/municipalities initiating the implementation of intermodality | 7 |
| Municipal investor | Municipal government | Municipality/municipalities investing in the implementation of intermodality | 7 |
| Municipal legislator | Municipal government | Municipality responsible for the legislative/spatial planning process via the land-use plan/zoning laws | 6 |
| Municipal road owner | Municipal government | Municipality developing – as road- and/or landowner – the physical implementation of intermodality (spokes) | 9 |
| <i>National government</i> | <i>National government</i> | <i>National code in combination with related successes or barriers</i> | 7 |
| National informant | National government | National government having the role of gathering information on | 5 |

| | | | |
|--|-----------------------|---|----|
| | | implementation of intermodality by other levels/actors | |
| National investor | National government | National government investing in the implementation of intermodality or related measures | 7 |
| NGO/Societal institutions | Citizens/Travellers | NGO's and/or (local or regional) societal institutions operating, creating or implementing possibilities for intermodality | 2 |
| Operators | Market parties | Market parties facilitating and operating forms of collective transport | 38 |
| Participation | Citizens/Travellers | Participation of citizens in government-initiated projects/hubs | 9 |
| Political support/power | Barriers | Political/official/internal support or power is lacking, leading to a barrier in implementation of intermodality | 22 |
| Provincial concessor | Provincial government | Province(s) in the role of public transport concession issuer. Responsible together with operators for the public transport in the area | 21 |
| Provincial coordinator | Provincial government | Province(s) coordinating the implementation of intermodality | 17 |
| Provincial facilitator /connector | Provincial government | Province(s) facilitating collaboration between other parties and levels on the implementation of intermodality | 15 |
| Provincial informantor | Provincial government | Province(s) having the role of gathering information on implementation of intermodality by other levels/actors | 7 |
| Provincial initiator | Provincial government | Province(s) initiating the implementation of intermodality | 17 |
| Provincial investor | Provincial government | Province(s) investing in the implementation of intermodality | 17 |
| Provincial road owner | Provincial government | Province(s) developing – as road- and/ or landowner – the physical implementation of intermodality (spokes) | 2 |
| Public services | Land-use | Accessibility of public services because of the location | 26 |
| Public transport | Transport | Collective form of transportation based on a schedule | 69 |
| Public transport concession area (OV-bureau) | Regional government | Management on the public transport concession area. Often also relating to the public transport network development, indirectly shaping the opportunities for (implementation of) intermodality. Organisations like the OV-Bureau have this role in Groningen | 32 |
| Reduction of public transport | Transport | Trend where public transportation is reduced or removed in a certain area due to low usage and/or frequency | 11 |

| | | | | |
|------------------------------|------------|--|---|----|
| Regional collaboration | municipal | Regional government Municipal government | Collaboration on the regional level between the municipal and provincial levels. Municipalities work together on the implementation of intermodality | 37 |
| Regional collaboration | provincial | Provincial government Regional government | Collaboration on the interregional level between the provincial and national levels. Provinces work together on the implementation of intermodality | 14 |
| Same (societal) goal | | Successes | Actors, levels, or policy sectors having the same goal on the implementation of intermodality, therewith creating an easier collaboration between them and improving the effectiveness of the implementation. | 24 |
| Separate institution on hubs | (broad) | Regional government | (Ideas for) a regional institution for hub/intermodality development in a certain region, separated from the initial initiators of the development. Can be commercial or government-led | 16 |
| Shared mobility | | Transport | Mobility provided by means of private transport modes that are shared with others. | 28 |
| Shared facilitator | mobility | Market parties | Market parties facilitating shared forms of private transport | 13 |
| Silos | | Barriers | Physical or informational barriers between different departments, persons, organisations, levels, or actors. Often typified by a focus on own project, scope, or responsibility, limiting integration and communication | 22 |
| Spokes | | Transport | Improvement of spokes leading to the improvement of accessibility (of hubs). Often improvements in infrastructure, frequency or speed-related measures. Often implemented solely per mode | 40 |
| Stretching | | Transport | The process of rerouting public transport lines over major roads and removing stops to make public transport move faster over its spokes | 9 |
| Supportive transport | | Transport | Transport meant for people with an indication, bringing them from A to B | 17 |
| Sustainability | | Conditions | Also known as environmental sustainability. Environmental impact is reduced as much as possible | 8 |
| Transport policy | | Transport | Policy relating to one or more transport modes, steering developments/implementation of intermodality | 48 |
| Transport system design | | Transport | The design of the transport system that decides how transport is used in the different modal networks | 34 |

Table 6: Codebook.