Mobility hubs and chances for behavioural change

A qualitative study on intermodal travel behaviour in rural areas in Groningen and Drenthe, the Netherlands

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Abstract

In the European Union, there is a need to reduce CO_2 emissions caused by the transport sector. Consequently, there is increasing attention for intermodal passenger transport via mobility hubs to reduce unsustainable car-use. The intermodal mobility hub is proposed in rural areas to increase the attractivity and accessibility of the public transport system. Based on thirteen structured in-depth interviews with rural dwellers in Groningen and Drenthe, the Netherlands, and an online expert workshop, involving policymakers from national and decentralised institutions, this study aims to deeper understand which behavioural factors influence travel behaviour via a hub in rural areas of intermodal and potential intermodal travellers and uncover which behavioural change interventions can induce intermodal travel behaviour in rural areas in the Netherlands. The COM-B model and BWC framework have been adopted to examine internal and external behavioural factors to a person, as well as reasoned and unreasoned behaviour. The results of this study demonstrate that behavioural change interventions concentrating on psychological capability, physical opportunity, and reflective and automatic motivation can stimulate intermodal travel behaviour via hubs in rural areas in the Netherlands. Several behavioural change interventions are proposed to policymakers to stimulate intermodal travel behaviour via hubs.

1. Introduction

During the Paris climate summit in 2015, the European Union (EU) agreed to work towards a CO_2 neutral union. Currently, the EU aims to reduce their CO_2 emissions by 40% in 2030 compared to the level of emissions in 1990 (European Parliament, 2021). However from 1990 till 2019, the greenhouse emissions from the European transport sector have increased by 33,5%. Passenger cars are the largest contributor of CO_2 emissions within the European transport sector (European Parliament, 2023). To counter the increase of transport related CO_2 emissions, the European Commission proposed a set of guidelines to develop the Trans-European Transport Network (TEN-T), including the development of multimodal passenger hubs, or mobility hubs (European Commission, 2021).

The mobility hub concept has received increasing attention in transport literature (Geurs & Münzel, 2022). It is a physical place, which facilitates intermodal transport by a seamless transfer between different modes of transportation (Anderson et al., 2017; Storme et al., 2021; Witte et al., 2021). Intermodality is defined as a journey that consists of two or more means of transport (Nobis, 2007). Several regions in Europe have implemented a mobility hub network in urban areas (e.g. Utrecht, Bremen and Vienna) as well as rural areas (e.g. Flanders, Groningen-Drenthe, and Karlsruhe) (Kask, 2021; Rongen et al., 2022). A mobility hub can be a major train station connecting urban centres, as well as a local bus station which connects a village to the nearby city. The transfer at a hub from a first- or last-mile mobility mode or between two public transport modes is seamless to optimise the intermodal journey for the passenger (Storme et al., 2021). Shared mobility services can be available at a mobility hub (Geurs & Münzel, 2022).

In rural areas, the mobility hub is proposed as a transport planning instrument to increase the attractivity and accessibility of the public transport system (Bell, 2019; Frank et al., 2021). Many European regions are experiencing difficulty with providing adequate public transport services in rural areas. A low demand for travel in rural areas due to a low population density makes operating public transport services according to the mobility needs of rural dwellers economically unfeasible for transport operators. The current rural depopulation and ageing of rural populations strengthen this problem (Mounce et al., 2020). Demand responsive transport (DRT) has been implemented in some European rural regions to mitigate the decline of public transport services (Mounce et al., 2020). The implementation of shared mobility services has also been suggested as an alternative to public transport services in rural areas (Mounce et al., 2020; Poltimäe et al., 2022). A mobility hub can connect these new mobility services to the existing public transportation system to enable intermodal mobility in rural areas (Frank et al., 2021).

In the Netherlands, mobility hubs in rural areas are proposed to bring together transport modes and provide a rapid connection between rural and urban areas (Ministry of Infrastructure and Water Management, 2021). Previous quantitative and qualitative studies on intermodality have established a comprehensive set of factors influencing intermodal travel behaviour, such as operation hours of public transport services (Berg & Ihlström, 2019; Pot et al., 2021), the proximity of public transport stops to the users' home (Berg & Ihlström, 2019), the attitude towards public transport (Hamersma & de Haas, 2021), and car-ownership (Hine et al., 2012; Pot et al., 2020). However, the behavioural factors that influence intermodal travel behaviour via a hub in rural areas has not been examined yet. Therefore, the aim of this study is to deeper understand which behavioural factors influence travel behaviour via a hub in rural areas of intermodal and potential intermodal travellers and uncover which behavioural change interventions can induce intermodal travel behaviour in rural areas in the Netherlands. This results in the following research questions: 1) Which behavioural factors are influencing travel behaviour of intermodal and potential intermodal travellers via hubs in rural areas in the Netherlands? and; 2) Which behavioural change interventions can stimulate intermodal travel behaviour via hubs in rural areas in the Netherlands? The Behavioural Change Wheel (BWC) by Michie et al. (2011) is adopted as a framework to answer the research questions. Data for this study were collected using qualitative methods, including thirteen in-depth structured interviews with intermodal and potential intermodal travellers and an expert workshop with policymakers from national and decentralised institutions.

In the Netherlands, Groningen and Drenthe are the first provinces to adopt a mobility hub network connecting rural and urban areas. 57 hubs have been realised, together with DRT service the 'hubtaxi', to provide transport to inaccessible places by public transport (Kask, 2021). In the future, the provinces aim to further develop the hubs conceiving an accessible and inclusive hub-network

(Provincie Drenthe, 2022). Rural areas in Groningen and Drenthe are selected as a case for this study. The establishment of mobility hubs and a DRT service in the provinces provides an opportunity to examine travel behaviour of intermodal and potential intermodal travellers via hubs in rural areas.

The remainder of this article is structured as follows. Section 2 outlines the COM-B model and BWC framework. Section 3 provides an overview of the adopted methods and analysis of this study, as well as the respondent characteristics. Following, section 4 presents the findings. Finally, in section 5 the most important results and recommendations are discussed, including the strengths and limitations of this research.

2. Theoretical Framework

The behavioural COM-B model designed by Michie et al. (2011) considers internal and external factors influencing behaviour of an individual, as well as reasoned and unreasoned behaviour. The COM-B model consists of Capability, Opportunity and Motivation that together influence Behaviour (Figure 1). The model is part of the larger Behavioural Change Wheel (BWC) designed by Michie et al. (2011) to offer one comprehensive behavioural framework to researchers and policymakers including factors that are influencing human behaviour and accompanying behavioural change interventions. Firstly, the COM-B model is explained with regard to behavioural factors influencing intermodal travel behaviour via hubs according to previous studies. Secondly, the behavioural change interventions from the BWC are outlined.
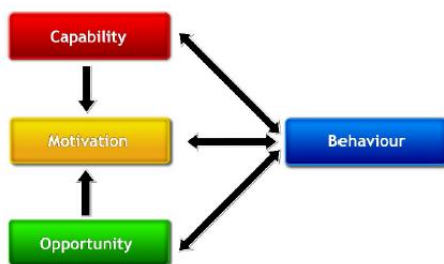

Figure 1 COM-B model by Michie et al. (2011)

2.1 Capability

Capability is defined in the COM-B model as the individual's physiological and physical capacity to engage an activity. These processes are internal to a person. Physical capability involves the physical functioning of a person. Psychological capability is understood as the individual's capacity to engage in the necessary thought processes to engage in an activity (Michie et al., 2011).

When considering previous literature, a study on intermodal travel behaviour in the Netherlands revealed that those that are not in possession of a drivers' licence are more likely to engage in intermodal travel behaviour, while those that are able to drive are more likely to engage in unimodal car-use (Hamersma, & de Haas, 2021). Hence, the inability to drive a car, increases the likelihood of intermodal travel behaviour. A qualitative study on perceived transport poverty in Zeeland, the Netherlands, showed that older adults who are unable to drive rely on their social network to drive them to activities (Pot et al., 2020). Furthermore, the study by Pot et al. (2020) revealed that the complexity of planning and booking a public transport trip appeared a reason for rural inhabitants to restrain from public transport (Pot et al., 2020). This was especially difficult for older adults and those experiencing trouble with navigating through digital services (Coutinho et al., 2020; Pot et al., 2020).

2.2 Opportunity

According to Michie et al. (2011), opportunity concerns all external factors to an individual that make behaviour possible. Physical opportunities are provided by the environment and available resources, and social opportunities are provided by culture, e.g. the way we think about things. In previous studies, elements of physical opportunities influencing intermodal travel behaviour have been regularly discussed. Physical opportunities are first outlined, followed by social opportunities.

In their study on intermodal travel behaviour in rural Sweden, Berg and Ihlström (2019) applied Hägerstrands' (1970) time-geography theory to examine intermodal travel behaviour in rural areas.

Time geography recognises human movement is restricted by temporal and spatial constraints (Miller, 2017). Firstly, time geography defines capability constraints, which involve physical capabilities and available resources. These constraints are adopted according to the COM-B model (i.e. physical capabilities are a capability, and available resources an opportunity). Secondly, time geography considers coupling constraints, which limit individuals through shared activities with others, such as work or school. This means that the ability to engage in activities is restricted by when, where and for how long individuals have to engage in other social activities. Thirdly, authority constraints define whether individuals are legally able to conduct an activity. For example, after the closing hour of the supermarket, it is not possible to go shopping (Miller, 2017).

Correspondingly, Berg and Ihlström (2019) found that the geographical distance between the home and the nearest public transport stop in rural areas discourages inhabitants to travel by public transport. Furthermore, they found that public transport schedules often not align with the travel needs of rural inhabitants to engage in daily activities as school and work (Berg & Ihlström, 2019). Hine et al. (2012) also found that unavailable bus services during evening hours in rural areas were negatively reviewed. Moreover, Pot et al. (2020) found that respondents living in rural areas in the province of Zeeland considered moving due to unavailable bus services during evening hours. Hence, coupling and authority constraints are relevant to consider when examining intermodal travel behaviour in rural areas.

When considering available resources, Hamersma and de Haas (2021) found that those with no access to a car are more likely to engage in intermodal travel behaviour than those with access to a car and living in rural areas. Similarly, Hine et al. (2012) found that in rural Northern Ireland non-car owning individuals are travelling more by public transport. Furthermore, the study by Klein (2017) on bus ridership between cities in the North of the United States, revealed that the price of a bus ticket was the most important reason to book a ticket. Reimbursements of travel expenses appeared to influence individuals decision-making (Klein, 2017). Ramos et al. (2019) found that the perception of costs of public transport differed among inhabitants of Lisbon (Portugal). While some emphasised that public transport was less expensive than travelling by car, others indicated the opposite, which resulted in different behaviour among both groups. Besides costs, the perceived comfort of a public transport journey was important. Ramos et al. (2019) found that lack of space in public transport services was negatively experienced, while Berg and Ihlström (2019) found that in rural areas the possibility to work in the bus was perceived as positive.

Additionally, studies have shown that the spatial design influences intermodal travel behaviour. Firstly, Berg and Ihlström (2019) identified safety concerns among rural inhabitants in Sweden about the routes towards a public transport stop. In their study, respondents expressed that the routes towards a public transport stop were unsafe for pedestrians, and especially for children, as there was insufficient street lighting and the route was along a motorway. Furthermore, the design of mobility hubs influences intermodal travel behaviour. Berg and Ihlström (2019) found that bus stops needed to have streetlights, a roof, a safe place to wait, a weather-proof design, and a safe parking place available for cars and bicycles. This corresponds to the study on hubs in rural Austria by Bell (2019), who found that hubs in rural areas need to be safe, have weather-proof shelters, have barrier-free transfer options and have information facilities. Moreover, a study on intermodal travel behaviour in an urban area in the Netherlands (Utrecht) revealed that intermodal travellers in urban areas prefer to start their public transport journey at a station with safe and available bicycle parking facilities, rather than choosing the nearest station (van Kuijk et al., 2022). Hence, safe and available bicycle parking facilities appears an important feature at a hub for intermodal travellers in the Netherlands.

In addition to the abovementioned physical opportunities, social opportunities appeared to be relevant when considering intermodal travel behaviour in rural areas. Pot et al. (2020) found that unfriendly behaviour by the bus driver and/or customer services was experienced negatively by rural inhabitants, and resulted in aversion to public transport. In general, personal contact with the bus driver was perceived as a positive part of public transport (Pot et al., 2020). With regard to the social norm, Berg and Ihlström (2019) and Pot et al. (2020) concluded that people living in rural areas perceive having a car and travelling by car as the local social norm.

2.3 Motivation

The third and last factor influencing behaviour according to the COM-B model concerns motivation, which involves the brain processes that energise and direct behaviour. Two processes are

distinguished: reflective- and automatic processes. The former involves conscious thought processes or making evaluations and plans. While the latter involves emotions and impulses that arise from associative learning and/or innate dispositions (Michie et al., 2011).

As mentioned before, motivation is influenced by capability and opportunity (Figure 1). For example, whether people perceive the route towards the public transport as safe (Berg and Ihlström, 2019) or whether people believe buying a public transport ticket as complex (Pot et al., 2020). Perceptions and beliefs about a certain mode of transport together shape the attitude of an individual towards this mode of transport (Van Acker et al., 2010). Perceptions, as well as intentions, self-identity, evaluations and goals are conscious thought processes defined as reflective motivation (West & Michie, 2020).

From the study of Hamersma and de Haas (2021), it appeared that individuals with a positive attitude towards public transport are more likely to engage in intermodal travel behaviour, while unimodal car-users have a more negative attitude towards public transport services. In their study on attitudes of multimodal travellers in the Netherlands, Molin et al. (2016) found that often more frequent use of a transport mode is related to more positive attitudes towards that mode of transport. However, this conclusion did not apply to every group of transport users, as public transport users had an average attitude towards public transport and below average attitudes towards cycling, while 40% of this group used the bicycle as an access mode (Molin et al., 2016). Regarding car-use, Olde Kalter et al. (2020) found that a shift of a positive towards a more negative attitude towards car-use and ownership, does not necessarily result in more or less car-use.

When considering automatic motivation processes, Steg and Kalf (2000) outlined that travel behaviour is strongly habitual in their study on car-use in the Netherlands. When individuals are used to a certain routine, including a certain mode of transport, they are not likely to change to another mode of transport. Alternatives for the habituated mode of transport are not considered, while these alternatives might be better suitable to personal values, schedules or budgets (Steg & Kalf, 2000). Hence, previous behaviour is a strong predictor of future behaviour. According to Thøgersen (2006) providing an experience of public transport to car users might be a way to change behaviour. Others have suggested to focus on life changing events, such as household composition, moving or a new job, to alter habits (Scheiner et al., 2016; Janke et al., 2021).

2.4 Behavioural Change Interventions

According to Michie et al. (2011), effective behavioural change interventions to achieve a certain behaviour can be designed after an analysis of the relevant behavioural factors (capability, opportunity and motivation) an individual or a group of people need to achieve the aimed behaviour. Behaviour change interventions are defined as 'coordinated sets of activities designed to change specific behaviour patterns' (Michie et al., 2011, p. 2). Within the BWC, the factors influencing behaviour, or the COM-B model, involve the inner circle. On the outer two rings intervention functions and policy categories are outlined by Michie et al. (2011). Intervention functions include strategies to alter specific factors determining behaviour. For example, increasing knowledge or understanding through education, and creating an expectation of reward through incentivization (Michie et al., 2011). On the most outer ring, relevant policy categories are connected to the intervention functions by Michi et al. (2011) to enable policymakers to implement effective policies to achieve a certain behaviour. Policy categories include, for example, fiscal measures to reduce or increase financial costs for a certain behaviour, and environmental or social planning to design a favourable environment for a certain behaviour. The three layers of the BWC explained above interact with each other. The grey boxes in the tables below demonstrate which behavioural factors are connected to which intervention function (Table 1) and which policy categories correspond to which intervention function (Table 2). Corresponding to the BWC, the conceptual model of this study is outlined in Figure 2 including the factors influencing intermodal travel behaviour via hubs presented in the previous paragraphs.

Table 1 Links between the behavioural factors presented in the COM-B model and the intervention functions (Michie et al., 2011)

	Education	Persuasion	Incentivisation	Coercion	Training	Restriction	Social/ environmental structuring	Modelling	Enablement
Capability physical					X				X
Capability psychological	X				X				X
Motivation reflective	X	X	X	X					
Motivation automatic		X	X	X	X		X	X	X
Opportunity physical						X	X		X
Opportunity Social						X	X		X

Table 2 Links between policy categories and intervention functions (Michie et al., 2011)

	Education	Persuasion	Incentivisation	Coercion	Training	Restriction	Social/ environmental structuring	Modelling	Enablement
Communication/ marketing	X	X	X	X	X			X	
Guidelines	X	X	X	X	X	X	X		X
Fiscal			X	X	X		X		X
Regulation	X	X	X	X	X	X	X		X
Legislation	X	X	X	X	X	X	X		X
Environmental/ social planning							X		X
Service provision	X	X	X	X	X				X

Capability

Physical capability:
- The ability to drive a car

Psychological capability:
- Mental capacity to plan an intermodal journey
- The ability to navigate digital devices and process digital information
- The ability to buy a public transport ticket

Opportunity

Physical opportunity:
- Parking spaces
- Spatial design hub
- Financial resources
- Material resources
- Price of public transport services
- Travel reimbursements
- Road infrastructure
- Geographical distance from home to nearest hub
- Coupling constraints
- Authority constraints

Social opportunity:
- Social interactions
- Local social norms

Motivation

Reflective motivation:
- Perceptions
- Believes
- Evaluation
- Intentions

Automatic motivation:
- Emotions
- Habits
- Impulses

Travel behaviour in rural areas

Intervention functions

Education	Coercion	Modelling
Persuasion	Restriction	Enablement
Incentivization	Environmental restructuring	

Policy categories

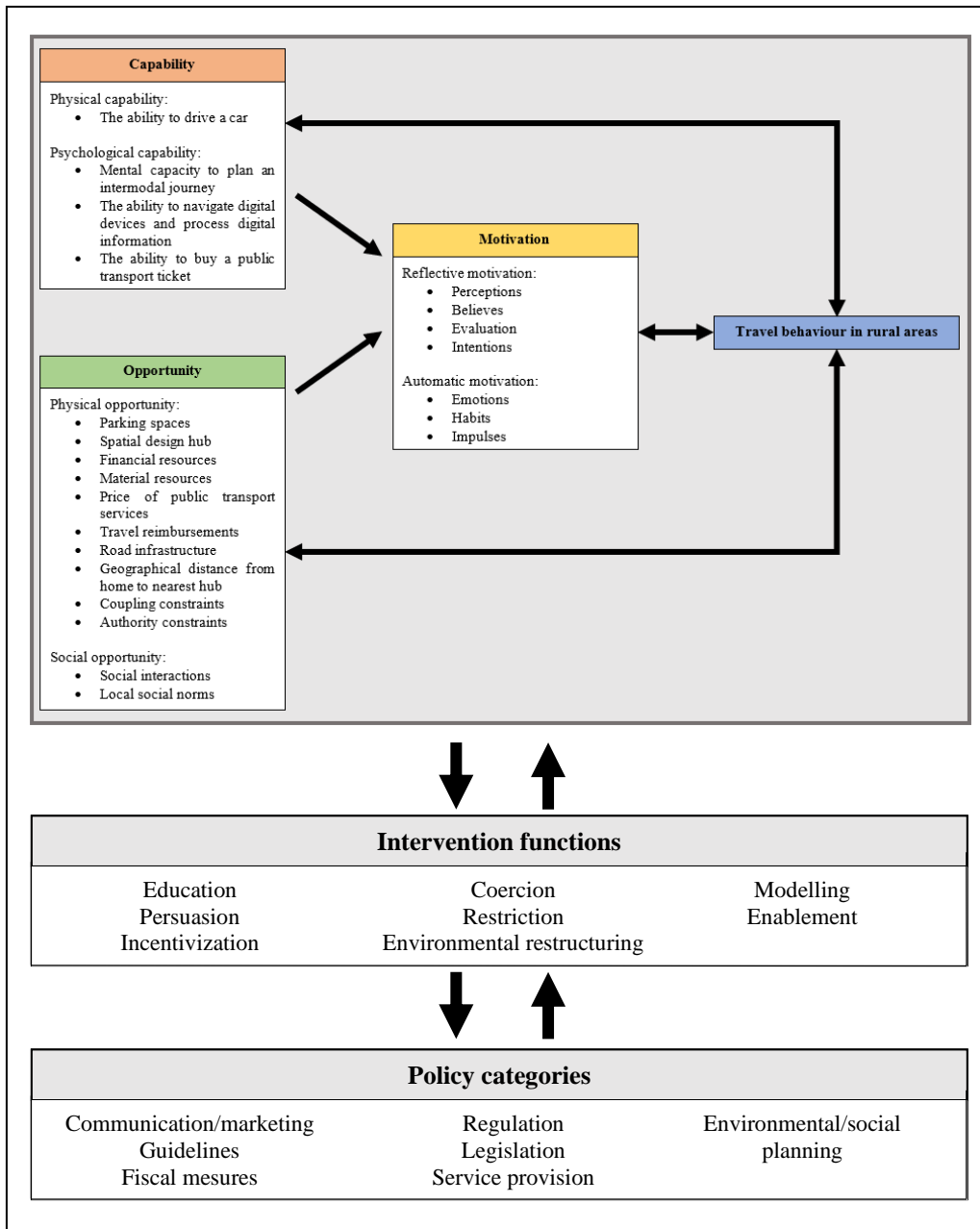| Communication/marketing | Regulation | Environmental/social |
| Guidelines | Legislation | planning |
| Fiscal mesures | Service provision | |

Figure 2 Conceptual model based on Michie's et al (2011) COM-B model and BWC framework

3. Methods

3.1 Case study

The provinces of Groningen and Drenthe were selected as a case for this study, because of their rural character and the implementation of a mobility hub programme. Groningen and Drenthe are located in the North of the Netherlands. The provinces have respectively 590 170 and 497 743 inhabitants (CBS, May 2022). These are relatively small numbers for the Netherlands; only the provinces Zeeland and Flevoland have less inhabitants. The city of Groningen (234 950) is the largest centre of both provinces (CBS, 2023). Next are Emmen (107 856) and Assen (68 979), both located in Drenthe (ibid.). Outside of these larger cities, there are large and small rural villages. The cities are connected with other parts of the Netherlands through an intercity train connection from the city of Zwolle (Overijssel) to Assen and Groningen. Regional trains connect some smaller villages in Groningen and Drenthe to cities as Groningen, Leeuwarden and Zwolle. Other villages are dependent on bus connections for public transportation. For some regions in Groningen and Drenthe, it is impossible to reach services, as a hospital, general practitioner or school, within 45 minutes by public transport. The bicycle and car offer better alternatives to access services in rural areas in Groningen and Drenthe (Bastiaanssen, & Breedijk, 2022).

In order to improve public transport connections the Public Transport Organisation Groningen and Drenthe (OV-Bureau Groningen Drenthe) realised the hub programme in 2018. After the implementation of the law for transport of people (Wet Personenvervoer 2000), the OV-Bureau Groningen Drenthe was established by the provinces, as the provinces became financially responsible for providing regional public transport (Kask, 2021). The hub programme aimed to generate more cost-efficient and accessible public transport in the provinces (ibid.). The hub programme has been implemented through a bottom-up structure with the aim to enable travelling for everyone to their desired destination with their preferred mode. Innovations and improvements were implemented without clear policy structures or preparatory research. In total 57 hubs in Groningen (34) and Drenthe (23) were realised on existing train- and bus stations (ibid.). These hubs were assigned for further development such as, providing WiFi, water taps, bicycle lockers, parcel lockers, electric charging stations and shared bicycles and/or cars (Kask, 2021; Reisviahub, 2023). In the future, the province of Drenthe aims to connect amenities to hubs, such as a library, and proving accurate and accessible travel information, to establish inclusive mobility hubs (Provincie Drenthe, 2022).

Together with the launch of the hub programme, the hubtaxi was introduced in Groningen and Drenthe, as a demand response transport service providing door-to-door or door-to-hub transport to those experiencing trouble accessing a hub. The hubtaxi needs the be reserved at least two hours in advance by telephone to ensure the transfer at the hub to a public transport service. There is a range of half an hour prior to the reserved, in which the hubtaxi can arrive at the house (Publiek Vervoer Groningen Drenthe, n.d.). Currently, the price per kilometre of the hubtaxi is according to public transport tariff when the hubtaxi is used as a first or last-mile mode from or to the hub. This is a promotional rate, which might be discontinued in the future (Publiek Vervoer Groningen Drenthe, n.d.).

3.2 Qualitative research methods

In this research, qualitative methods have been adopted to achieve a deeper understanding of the behavioural factors affecting intermodal travel behaviour in rural areas in Groningen and Drenthe. In-depth interviews were conducted with fourteen inhabitants of rural areas across the selected provinces. As one couple participated together during one interview, the collected data contained thirteen interviews in total. The data collection period took place from the beginning of May 2023 till the end of June 2023. The interviews lasted between 22 minutes and 80 minutes with an average of 53 minutes per interview. The first interviews were conducted face-to-face, located either at the home of the respondent or at a suggested place by the respondent, for example an office or restaurant. In total, seven interviews were held face-to-face and six interviews were held online during a video call. Ethical considerations were made prior to, during and after data collection, including an informed consent form (appendix 1), a reflection on the positionality of the researcher, as a white female student, and transparency about the involved institutions (University of Groningen and Ministry of Infrastructure and Water Management).

The interviews were guided through a structured topic list according to the COM-B model. There was room to deviate from the topic list and ask further questions. However, the structured sequence of topics was followed throughout all interviews. Two topic lists were designed, one for intermodal travellers and one for potential intermodal travellers. Both topic lists started with general questions on mobility patterns and available means of transportation to the respondent. These were followed by more specific questions on the current travel behaviour of the respondent. Subsequently, the researcher explained what the hub programme of Groningen and Drenthe entails and how hubs have been implemented. The experience with hubs was discussed with intermodal travellers, while the possibility to travel via a hub was explored with potential users. At last, all respondents were asked to give their opinion on hubs. The complete topic list can be found in appendix 2.

The interviews were recorded on a secured mobile phone and manually transcribed. The transcripts were analysed using Atlas.ti 23. A deductive, as well as an inductive coding strategy was adopted to perform a thematic analysis to identify recurring or outstanding capabilities, opportunities and motivations. Deductive codes were derived from the COM-B model, including capabilities (physical and psychological), opportunities (physical and social), and motivation (automatic and reflective), and the literature on intermodal travel behaviour. Inductive codes were constructed from the data. The complete code tree can be found in appendix 3.

After the analysis, an exploratory expert workshop was arranged to assess possible behavioural change interventions. The workshop was organised by the researcher together with the Ministry of Infrastructure and Water Management. In total, six experts were present from the Ministry of Infrastructure and Water Management, the province of Drenthe, the municipality of Groningen, OV-Bureau, Transport Region Groningen-Assen and Publiek Vervoer. Four interventions combining different intervention functions from the BWC were derived from the results by the researcher and presented to the experts. The experts were asked to explain which interventions they thought were impactful and achievable. These questions initiated a discussion among the experts about their perspectives on possible successful behavioural change interventions based on their expertise and the results from the in-depth interviews with inhabitants. The expert workshop was located in an online environment and lasted approximately one and a half hours. No recordings were made during the workshop. Based on the notes taken by a note-taker, the expert workshop produced a set of behavioural change interventions.

3.3 Sample

The sample contained fourteen inhabitants from rural areas of the province of Groningen and Drenthe. The respondents were between the age of 35 and 75, which means that two population groups were included: employed and (newly) retired. These groups were selected as they are permanent inhabitants of rural areas. Young adults were excluded from this study as they experience more changes in their life, such as moving or having a first job, which influences travel behaviour. Different sampling strategies were applied to select respondents. Criterion sampling was adopted as only respondents from rural areas were selected between the 35 and 75 years old. Furthermore, a maximum variation sampling strategy was performed as both car users and public transport users were selected to obtain behavioural insights from both groups. Umbrella organisations of village interest associations, municipalities and contacts from the researchers network were approached to connect with possible respondents. Through these initial contacts the researcher received contact details of those willing to participate. Furthermore, snowball sampling was adopted by asking respondents to invite others to participate.

For the expert workshop, policymakers from national and decentralised organisations were invited. The Ministry of Infrastructure and Water Management was involved in the workshop as lessons can be learned from this study on the implementation of mobility hubs in other rural areas in the Netherlands. Besides, the Ministry contributes financially to public transport and makes legislation such as the Wet Personenvervoer 2000. Policymakers from decentralised organisations working on public transport and mobility in Groningen and Drenthe were invited to the workshop, as they are responsible for regional public transport.

3.4 Respondent characteristics

The respondent characteristics are presented in Table 3. Respondents' names have been anonymised through the use of pseudonyms. Mr. Jans and Mrs. de Graaf are a couple and participated together during one interview, as they both applied to participate. Also important to mention is that Mr. van Luin has a wheelchair due to a physical disability.

As can be seen in Table 3, most respondents are between the 35 and 45 years old (5) or 65 years or older (5). Only one respondent is between the age of 45 and 55. Three respondents are between the 55 and 65 years old. Most of the respondents are employed (8). The other respondents are retired (5). Five respondents live within 10 minutes walking from a hub, while eight respondents live further than 10 minutes walking from a hub. According to Hamersma and de Haas (2021), in general, people are willing to walk up to 1 km, which is approximately 10 minutes, to a train station. The last column of Table 3 presents the most frequently used modes of transportation. Half of the respondents only travelled by car or active modes (walking or cycling). Two respondents are only travelling by public transport or active modes. A group of respondents regularly shifted between the car and public transport: five respondents are travelling mostly by car and sometimes by public transport, while two participants are travelling mostly by public transport and sometimes by car (Table 3). All respondents are living in villages in Groningen and Drenthe. Four respondents live in Drenthe and 10 respondents live in Groningen (Figure 3).

Table 3: Respondent characteristics

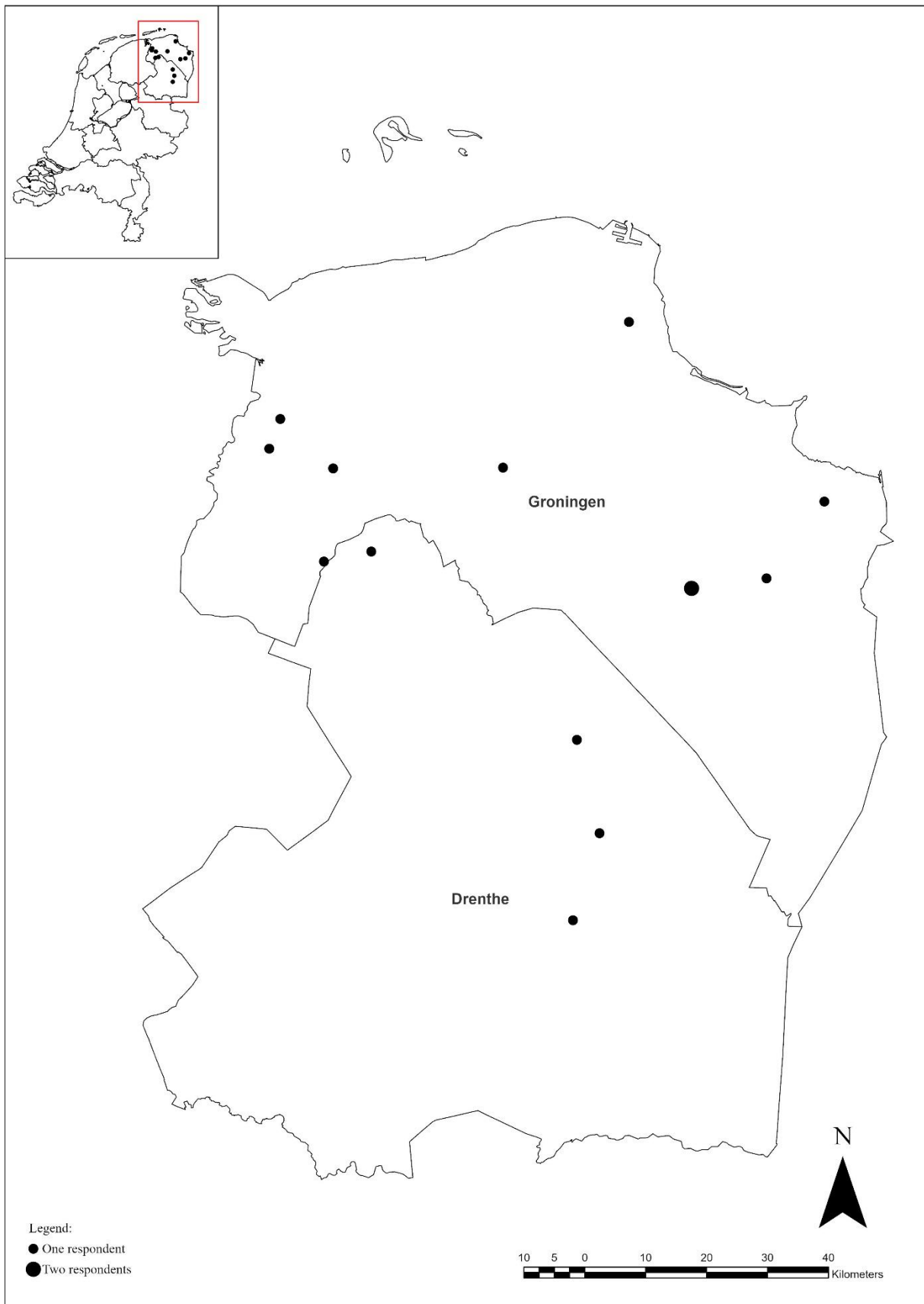| Pseudonym	Age	Occupation	Proximity to a hub (10 minutes walking)	Modes of transportation
Mr. de Groot	65 years old or older	Retired	Further than 10 minutes walking	Only car (or active modes)
Mr. van Luin	65 years old or older	Retired	Within 10 minutes walking	Only public transport
Mrs. van Veen	35 till 45 years old	Employed	Within 10 minutes walking	Mostly car, sometimes public transport
Mrs. Akkerhuis	65 years old or older	Employed	Further than 10 minutes walking	Only public transport
Mr. Vriezema	55 till 65 years old	Retired	Further than 10 minutes walking	Only car (or active modes)
Mrs. Meijer	65 years old or older	Retired	Further than 10 minutes walking	Only car (or active modes)
Mrs. Visser	65 years old or older	Retired	Further than 10 minutes walking	Only car (or active modes)
Mr. Jans	35 till 45 years old	Employed	Further than 10 minutes walking	Only car (or active modes)
Mrs. de Graaf	35 till 45 years old	Employed	Further than 10 minutes walking	Mostly car, sometimes public transport
Mr. Boer	35 till 45 years old	Employed	Within 10 minutes walking	Mostly public transport, sometimes car
Mr. Bron	55 till 65 years old	Employed	Further than 10 minutes walking	Mostly car, sometimes public transport
Mr. Vink	55 till 65 years old	Employed	Within 10 minutes walking	Mostly car, sometimes public transport
Mrs. Mulder	35 till 45 years old	Employed	Further than 10 minutes walking	Mostly public transport, sometimes car
Mrs. Groen	45 till 55 years old	Employed	Within 10 minutes walking	Mostly car, sometimes public transport

Figure 3 Spatial distribution of respondents

4. Results

The aim of this study is to deeper understand which behavioural factors influence intermodal behaviour via hubs in rural areas in the Netherlands, and uncover which behavioural interventions can induce intermodal travel behaviour in rural areas. Firstly, the results of the qualitative analysis of the in-depth interviews are presented using the COM-B structure. Secondly, the four interventions presented during the expert workshop are outlined, as well as the suggested interventions by the experts.

4.1 Capability

The behavioural factor capability consists of someone's physical capability and psychological capability. Physical capability involves someone's physical abilities to engage in a certain behaviour. From the interviews, it appeared that the ability to drive is an important factor influencing intermodal travel behaviour. Mr. van Luin can no longer drive a car due to his disability, and Mrs. Akkerhuis had no driver's licence, which forced them to engage in intermodal travel behaviour for their daily movements. For other respondents, physical constraints were no issue.

Psychological capability appeared to be an important behavioural factor. The interviews revealed that having an understanding of the public transport network and system encourages respondents to engage in intermodal travel behaviour. Respondents made a trade-off between what they know or believe about a mode of transport when they are making travel decisions. This appeared to be strongly related to previous experience and willingness to understand the public transport system.

First of all, only Mr. van Luin and Mrs. Akkerhuis had full knowledge of the hub-programme. The majority of the respondents did not know the hub concept. They could make estimation of what a hub entailed, but had never seen the hub-logo or heard about it. Some respondents knew about the hub concept, but did not know about all the possibilities available on a hub. The feeling that they missed something that they should have known made respondents feel uncomfortable and irritated. When talking further with respondents about hubs, it appeared that the feeling of not having all the information to make a trade-off between the car and public transport, discouraged respondents to engage in intermodal travel behaviour. This can include information on travel time, travel costs or shared mobility services. Mrs. de Graaf, who is working and has children, explained how she makes a trade-off between the car and public transport based on travel costs when visiting the city with her son:

"*When I go to [city B] with [name son] you have Arriva trains instead of NS trains. You have to buy a ticket, and the ticket machine doesn't indicate the possibility of a railrunner [child discount], even though there is one. So I just pay full price for [name son] to go to [city C]. And that's something like 7 euro there and 7 euro back. And that's quite a lot. Of course, then the car is just really more cost effective. Also because, I heard from someone that apparently, I can buy a railrunner for [name son] through the NS site, so he just travels for 2.50 euros. And that is not indicated. And so then public transport also seems more expensive than it actually is.*" Mrs. de Graaf

Similarly, having knowledge on how you can save time and money by engaging in intermodal travel behaviour, encouraged respondents to engage in intermodal travel behaviour. Mr. Vink, who usually travels by car, explained that he and his partner take the bus for leisure trips:

"*It's actually cheaper too and especially if you calculate from P+R [village A]. For 6 euros up and down to the city and no parking fees and so on. That's obviously very cheap.*" Mr. Vink

So knowledge is important to be able to make a trade-off between means of transport.

In addition to having knowledge, having the mental capacity to understand how the public transport system works is important. Some respondents, both intermodal and potential intermodal travellers, indicated that it is too much effort for them to figure out how shared-bicycle services work or to plan an intermodal journey, while others are more willing to figure this out. Respondents who had previously used public transport experienced less trouble with planning an intermodal journey than those with no or little previous experience.

Additionally, some respondents indicated that travelling by car was mentally stressful. Especially traffic, and parking and navigating in the city were reasons for respondents to engage in intermodal travel behaviour when visiting a city for occasional trips. For Mr. Boer, who mostly travels by public transport this was a reason to go by train to work:

"What also has an impact is that I can relax more on the way to work and back. I can still do something and I don't have to concentrate on driving home in the busy commute, then you want to get home as soon as possible which is stressful. On the train, I find that's nicer to just shut everything off from the day." Mr. Boer

Hence, the physical capability to drive a car or not largely determined travel behaviour, but also whether respondents perceived travelling by public transport or the car as a mentally stressful. Furthermore, having all the information to make a trade-off between an intermodal journey or the car emerged as an important factor for respondents to feel informed in their travel decisions.

4.2 Opportunity

Both physical and social opportunity were relevant when discussing travel behaviour with respondents. First, the physical opportunities involving an intermodal journey from A to B are outlined, followed by physical interventions involving available resources and spatial design. Social opportunities are discussed in the last paragraph of this section.

4.2.1 Physical opportunity: journey from A to B

First of all, the operation hours of public transport services determined travel opportunities. Respondents indicated that, especially during evening hours, public transport services are unavailable or run less frequently. Secondly, whether the nearest public transport stop could be easily reached from the home of the respondent influenced travel decisions. Respondents living far away from hubs and/or bus stops indicated that, even if they wanted to, public transport is no obvious mode of transport to them. Mr. de Groot, who is living further than 10 minutes walking from a hub, explained:

"But in the situation where we are now, that you are at least 5 kilometres away from a bus stop to begin with. Surely it gets a bit more complicated. . . . But if I could get on a bus there [village] that goes directly to the city, if I didn't have to make the whole suburban journey first, I would [...] absolutely do it more often yes." Mr. de Groot

Mr. de Groot explained that the first bus stop is too far away from his home, which does not make it an option for him to engage in intermodal travel behaviour.

The quote by Mr. de Groot also indicates that in vehicle time is important, which is associated with destination accessibility. When respondents had to make a large detour when travelling by public transport, an intermodal journey was not considered as an alternative to the car. Besides, the amount of transfers and transfer time were important for respondents to consider an intermodal journey or not, as well as the distance from the egress stop or station to the destination. Mrs. Groen, who is living close to a hub, once went by bus to work as her daughter borrowed her car. The quote from Mrs. Groen, who is living close to a hub, illustrates why destination accessibility and the last-mile discouraged her to go by public transport to work:

"By car, it takes me 25 minutes to get to work. Well, I think it took us at least an hour and 15 minutes, and well had to walk quite a bit. Because we didn't want to wait for that transfer. Then we said, well, let's walk, but that was quite a long walk, because we walked for at least 20 minutes." Mrs. Groen

So, for Mrs. Groen to complete the last-mile to work she either had to wait a long time for another bus or walk 20 minutes, while the complete journey only takes 25 minutes by car.

Furthermore, as exemplified by the quote of Mrs. Groen, the personal situation of the respondents influenced the availability of a car, as well as the available travel time. Employed respondents with children and/or a partner indicated that the time influences travel decisions. Some

respondents indicated that work-work traffic to meetings influenced their travel behaviour, as explained by Mrs. van Veen, who is living close to a hub:

"And we go to students very often. We have to go to places spread all over the north. So [Village A], [Village B], well you can't think of anything or we'll get there. Only you don't get there by public transport. Then you have to travel far too long, and it takes me far too much working time to get to a student. So yes, in that respect, I do rely a bit on the car." Mrs. van Veen

So having work meetings discouraged Mrs. van Veen to travel by public transport. For households with children, the household schedule was important when deciding for a mode of transport. Children had to go to school, and needed to be picked up from day care. Also after work activities of respondents, their children and/or partners determined the time schedule in which travelling had to take place. As explained by Mr. Jans, this can be quite a puzzle:

"And now we combine it in the morning with the children's breakfast and one takes [name of son] to school and the other takes [name of daughter] to day care and then to work. So it's often practical as well. We now have it all arranged so that everyone gets to work on time." Mr. Jans

As Mr. Jans indicated, family households build their own daily patterns. Contrary to employed respondents, retired respondents perceived that they had more time to make a journey compared to their working days. This change of perception did, however, not result in a shift towards intermodal travel behaviour. Retired respondents rather chose for an active mode of transport or a more scenic car journey than public transport.

4.2.1 Physical opportunity: available resources and built environment

Besides the geographical and temporal factors of an intermodal journey from A to B, physical opportunity involves the material and financial resources available to a respondent as well as the built environment. All respondents that mostly travel by car were in possession of two or more cars. Some of these respondents explained that the insurances and taxes they have to pay to own a car, made it more expensive to travel by public transport once in a while. Respondents that mostly travel by public transport had either one car within the household or no car at all. Additionally, Mr. Bron and Mrs. Mulder explained that the availability of shared cars at work enabled them to go by public transport to work. Furthermore, travel reimbursements influenced travel behaviour. For example, Mr. Vink, who lives close to a hub, could receive a reimbursement for public transport, but chose not to:

"When I would go by train to work instead of car, then I would have to figure out how to change the travel reimbursement. Probably I would have to declare differently or something. But then again, that would be complicated." Mr. Vink

So Mr. Vink perceived changing the travel reimbursements as complicated. Respondents that received standard compensation for public transport from their employers, chose more easily for a trip by public transport, than respondents that did not receive standard reimbursement for public transport.

When considering the built environment, respondents indicated that available parking at work enabled them to commute by car. High parking costs in urban areas discouraged respondents to travel by car to a city. When considering the spatial design of the hubs, respondents expressed the need for safe car and bicycle parking, information facilities, a little shop, a toilet, shared-bicycles, weather-proof shelters, and streetlights or staff to increase safety. Especially respondents living far away from a hub favoured car parking at a hub, as they need to travel a large distance to access a hub. One respondent was more critical on car parking spaces, as he said that parking spaces take up a lot of space in his village, which could also be used for green space or a playground. Some respondents would like better information facilities on a hub. Mrs. Mulder, who travels by train to work, explained:

"I have to be very honest, I don't know how it works, an OV-fiets [shared bicycle]. If on the station there is an OV-fiets and a description on how it works in a nutshell, or with a QR code like that, and I could do that in a few steps, it would be easier." Mrs. Mulder

Some respondents indicated that they would like more information on the cheapest and fasted route through an application. One respondent emphasised the importance of social interaction on a hub, especially for smaller villages where hardly any facilities are left.

4.2.3 Social opportunity

It appeared that travelling by public transport was not perceived by any respondent as the prevailing social norm in his or her village. All respondents indicated that having one or two cars was the prevailing social norm. In villages with a hub connected to nearby cities, travelling by train or bus to one of these cities was experienced as more normal by respondents living there. Correspondingly, these respondents engaged in intermodal travel behaviour when they (occasionally) visited one of these nearby cities.

Furthermore, the interviews revealed that behaviour of others can encourage intermodal travel behaviour. As indicated by Mrs. de Graaf in the capability section, she learned from someone how to obtain a children's discount ticket for the train. All respondents knew someone who regularly travelled by an intermodal manner. For example, Mrs. Visser, who is living far away from a hub, learned about the hubtaxi from a neighbour who is regularly travelling by hubtaxi:

"And I said to the neighbour this morning I also want to try that with the hub taxi. I'm going to do that one day. And then I'll go to Groningen and I'll let them take me all the way here. Because I understood that you have to allow for a margin that they can come fifteen minutes earlier or fifteen minutes later. So for me it doesn't matter, I have all the time now anyway" Mrs. Visser

Hence, social interactions and behaviour of others influences the behaviour of respondents in this study.

4.3 Motivation

When closely reading through the previous sections, it becomes clear that how respondents perceived the capabilities and opportunities available to them influenced travel behaviour. Besides, the interviews revealed that the perception of the car influenced intermodal travel behaviour. Some respondents felt connected to their car and enjoyed travelling by car. Mr. Jans, who is mostly travelling by car, explained that the car equals relaxation for him:

"*And what I also like about riding alone. Some pretty heavy things happen at [work]. Then I find it really nice to go home for, well, 20 minutes to half an hour just by myself with music or something like that, but just in my little bubble. Then I also notice that I can let go of the stress of work or a serious incident before I come home.*" Mr. Jans

Others perceived the car as a necessity to travel to places, but did not enjoy travelling by car. They preferred to engage in intermodal travel behaviour (in certain circumstances). Some respondents explained that when they had to travel a large distance they usually went by train. Some respondents preferred to go to the city by public transport rather than by car. Mrs. van Veen, who mostly travels by car, explained why she preferred the train in certain circumstances:

"*If I travel a large distance, I prefer to take public transport yes. . . if you have to concentrate in the car for a long time, I don't like that. Then I prefer to read a book for example in the train or something. And I think if you travel to the West of the country or to North Brabant, then you are much more likely to have traffic jams. So ultimately if you go by train, it will take you about the same amount of time.*" Mrs. van Veen

The quote indicated that Mrs. van Veen perceived the train as more comfortable than the car when travelling to other parts of the Netherlands. Respondents who perceived public transport as comfortable and preferable expressed intentions to travel via a hub. Only Mr. Vriezema and Mrs. Meijer expressed that they would never be convinced to travel via a hub. Some respondents positively perceived a journey by public transport and expressed a strong intention to engage in intermodal travel behaviour, while they

had no or little previous experience with travelling by public transport. For respondents, who did not already travel by public transport, something needed to change to achieve the intention to travel via a hub, such as a hub closer by home or more frequent connections. Intermodal travellers expressed a strong personal motivation to engage in intermodal travel behaviour. For Mrs. Mulder, who lives further than 10 minutes walking from a hub and does not receive a public transport reimbursement, travelling environmental friendly was the most important reason for her to go by train to work:

"*[From] the environmental [milieu] point of view, I think it's nonsense actually to go by car. I do it sometimes out of convenience of course, but generally I take the bike or train for that reason.*" Mrs. Mulder

Mr. van Luin explained why he believed it is important to go by public transport rather than by wheelchair taxi:

"*I think what can be done in a normal manner, should be done a normal manner. And that is travelling by public transport in this case. The possibility is there to make use of it, so do it!*" Mr van Luin

The quotes of Mr. van Luin and Mrs. Mulder revealed a strong intrinsic motivation to travel by public transport.

When regarding automatic motivation, respondents in both the intermodal travellers and the unimodal car-users group tended to adhere to their travel patterns. Car-users explained that having a car automatically leads to using a car, as respondents were already paying to own a car and the car is perceived as an easy accessible and flexible mean of transport. Mr. Vink, who is living close to a hub, explained:

"*In part it might also be habit, because humans are creatures of habit and so am I. I think of myself as slightly less of a creature of habit than a lot of other people, but of course I am also a creature of habit. So and yes if you stick to that habit so going to work by car then you don't have to think.*" Mr. Vink

As explained by Mr. Vink, it is convenient to adhere to travel habits, as these are automatic processes. Hence, reflective, as well as automatic brain processes are influencing travel behaviour of the respondents.

4.4 Behavioural Change Interventions

The previous paragraphs have shown that respondents lack capabilities, opportunities and motivation to achieve intermodal travel behaviour via a hub. During the expert workshop, four interventions derived from the interviews were discussed based on impact and feasibility. The experts added four interventions to achieve intermodal travel behaviour via hubs. The Table (4) below presents the interventions discussed during the workshop, as well as the connected intervention functions and behavioural factors, as outlined in the theoretical framework (see Table 1 and 2). The first four interventions in Table 4 are the established interventions by the researcher.

The first intervention involved expanding of the public transport network. As outlined in the section 'Physical opportunity: journey from A to B', some respondents were willing to travel by public transport, but were unable due to geographical distance from a public transport stop to their home or destination, and/or the destinations they can reach from the departure station. The experts agreed that expanding the public transport network would be an impactful intervention, but also a challenging intervention as financial means are scarce.

Secondly, it was presented to the experts to increase information facilities at the hubs. As explained in the paragraph 'Capability', respondents that had a car available to them, made a trade-off between the car and public transport. Respondents expressed a clear need to have more information facilities at the hub, for example, about how and where to rent shared bicycles, existing discounts, how and where to buy a ticket, where to find the toilet, and/or where to buy a ticket for the P+R bus. The expert from the province of Drenthe explained that they want to have a staff member at the hubs to answer questions, and to serve people who are less able to read or use digital devices. However, in

general, the experts thought it was more impactful to attract potential travellers to a hub rather than providing more information on a hub.

The third intervention involved a hub action day. Similar to the previous intervention, this intervention can inform people about a hub. In addition, as revealed in the paragraph 'Motivation', travelling by car is habit for some respondents. In order to break with this habit, it is suggested to implement a discount on the hub action day for travelling by public transport. This discount can attract people to visit the hub and let them experience an intermodal journey. Furthermore, hosts and buddies can support visitors at the hub and accompany travellers that are insecure about travelling by public transport. Hosts can also hand out information brochures. The experts did not think this intervention would have a major impact on travel behaviour compared to other interventions, but they agreed that it was important to attract more potential travellers to the hubs.

The last intervention involved increasing work-to-work shared car-use. As explained in the paragraph 'Physical opportunity: journey from A to B', the availability of shared cars at work enabled respondents to travel to work by public transport. Other respondents explained that the need to travel to work appointments made them dependent on the car. Hence, a shared car system at work could enable employees to intermodal commute. The expert from the municipality of Groningen favoured this intervention due to the estimated impact, but from his experience it appeared complicated to implement this intervention since companies have ongoing contracts for their lease cars.

Table 4 Behavioural change interventions discussed during the expert workshop and the linking COM-B factors, intervention functions and policy categories

Behavioural change interventions	COM-B factors	Intervention functions	Policy categories
Expanding public transport network	Physical opportunity	Social/environmental structuring	Environmental planning
Increase information facilities on hubs	Psychological capability	Enablement Education	Guidelines
Hub action day	Automatic and reflective motivation Psychological capability	Education Incentivization	Communication/ marketing Service provision
Work-to-work shared cars	Physical opportunity	Enablement	Service provision
Parking policy	Physical opportunity	Restriction	Regulation
Beneficial public transport travel reimbursements	Reflective motivation	Incentivization	Fiscal measures
Improving road signs	Psychological capability	Enablement	Guidelines
Public transport ambassadors	Automatic motivation	Modelling	Communication/ marketing

Furthermore, the expert from the Transport Region Groningen-Assen indicated the importance of flanking policies. He mentioned that it is important to discourage car-use, by increasing parking costs and decreasing parking spaces. The expert also suggested to involve employers in mobility policies. Travel reimbursements, as well as decreasing parking spaces at work proofed to be an impactful incentive to change travel behaviour of employees in his experience. It was emphasised that a national fiscal measure to make public transport reimbursements more fiscally attractive for employers than car reimbursement was expected to be introduced soon. Furthermore, the experts agreed that attracting potential travellers to the hub was important. The expert from the municipality of Groningen expressed that they are planning to improve road signs to P+R hubs. The expert from the province of Drenthe explained that they want to increase involvement public transport ambassadors to promote travelling via a hub.

5. Discussion and conclusion

In this study, it is shown that COM-B related behavioural factors influence travel behaviour of respondents living in rural Groningen and Drenthe. For *capability*, the physical ability to drive a car and the psychological ability to plan an intermodal journey via a hub influenced intermodal travel behaviour of the respondents, which supports the findings of Pot et al. (2021) and Hamersma and de Haas (2021). When regarding *opportunity*, this study confirms the findings of Berg and Ihlström (2019) that coupling and authority constraints influence intermodal travel behaviour in rural areas, including operation hours, first- and last-mile distance and connectivity, destination accessibility and activities. Consistent with the literature, this study found that safe car and bicycle parking, frequent connections, facilities as a toilet or shop, information facilities, shared bicycles and streetlights were favoured at a hub (Bell, 2019; Berg and Ihlström, 2019). Furthermore, having a car was perceived as the social norm, while travelling by public transport was considered as less common in rural areas in the Netherlands (Berg & Ihlström, 2019; Pot et al., 2021).

Adding to the literature on intermodal travel behaviour in rural areas, this study demonstrates that a persons' *motivation* to engage in intermodal travel behaviour via a hub is relevant. Perceptions on capabilities and opportunities to engage in intermodal travel behaviour, but also the perception on public transport in general, differed greatly between respondents. These perceptions also differed between daily trips and occasional trips. Some potential intermodal travellers favoured intermodality for leisure or long trips, while they perceived intermodality as too much effort or uncomfortable for their daily trips. Remarkably, potential intermodal travellers who expressed the intention to engage in intermodal travel behaviour and/or had a positive perception on public transport did not necessarily have experience with public transport. The differences in perceptions on intermodal travel behaviour are largely explained by whether respondents perceive the car as instrumental, enjoyable or environmentally harmful. Besides, this study found that intermodal travellers have a strong intrinsic motivation to travel intermodally. Furthermore, Both intermodal travellers and potential intermodal travellers experienced daily movements as automatic or habitual behaviour.

In addition, the expert workshop resulted in a set of behavioural change interventions combining different intervention functions. The experts estimated that all discussed interventions can stimulate intermodal travel behaviour. Expanding the public transport network and work-to-work shared cars appeared difficult to achieve, while more active engagement of public transport ambassadors and organising a hub-action day was assessed as feasible. When considering the effectiveness of the interventions, expanding the public transport network, parking policy, beneficial public transport reimbursements and work-to-work shared cars were estimated as impactful interventions by the experts.

Hence, although travel behaviour is influenced by many factors, these behavioural change interventions suggest that there is a chance to achieve intermodal travel behaviour via a hub. Only two respondents expressed unwillingness to the target behaviour. It is advised to policymakers to increase knowledge about hubs and the facilities provided at a hub, expand the public transport network, involve employers in mobility policies, and restrict car-use. These interventions target physical opportunity, psychological capability and reflective and automatic motivation, which appeared to be important from the in-depth interviews. While these interventions are estimated to stimulate intermodal travel behaviour, the costs, i.e. financial and governmental, and benefits of the interventions need to be considered prior to implementing an intervention. In addition, it is recommended to policymakers to consider the effect of the interventions on the social norm within a community, village or workplace. Although having a car was perceived as the social norm, behaviour of others appeared to be a catalyst of behavioural change. This mechanism can be used by policymakers to stimulate intermodal travel behaviour in rural areas.

The in-depth interviews together with the expert workshop appeared an appropriate method to deeper understand behavioural factors influencing intermodal travel behaviour and establish potential behavioural change interventions to stimulate intermodal travel behaviour. The thirteen structured interviews built a rich data set due to the duration of the interviews and the carefully designed topic list. Although a diverse group of respondents was selected for this study based on the criteria age between 35 and 75 and living in rural areas, the sample did not represent the rural Dutch population. The purpose of this research was not to achieve a representative sample, but rather to provide an understanding of existent behaviours of inhabitants living in rural areas. The expert workshop substantiated the findings

from the in-depth interviews. Although only six experts were present during the workshop, they represented various national and decentralised institutions, which contributes to the value of the workshop.

Hence, this study has shown qualitative research methods can uncover underlying behavioural factors of travel behaviour to stimulate intermodal travel behaviour (Hamersma & de Haas, 2021). For this purpose, the COM-B model and behavioural change wheel appeared to be suitable schemes. For future quantitative research, it is recommended to examine across different population groups how rural dwellers in the Netherlands make a trade-off between the car and an intermodal journey using the COM-B model, to establish targeted behavioural change interventions. For future qualitative research, it is recommended to further delimit the selection of respondents. It is recommended to focus on rural dwellers living in proximity of a hub to further understand why proximity to a hub does not always result in intermodal travel behaviour. Besides, a similar qualitative study to stimulate intermodal travel behaviour in sub-urban areas might be relevant, as sub-urban areas in the Netherlands are characterised by high lease car ownership and are usually designed for car-mobility (Zijlstra et al., 2022). Lastly, it is recommended to researchers and policymakers to conduct an experimental research. One or more recommended behavioural change interventions can be implemented as a pilot in a rural area in Groningen and Drenthe to evaluate whether these interventions stimulate intermodal travel behaviour.

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Appendix 1. Informed consent form

Heel erg bedankt voor uw deelname aan dit onderzoek. Het interview zal ongeveer een uur duren.

Ik ben Marlene van Doorne, en ik voer dit onderzoek uit als afstudeerscriptie voor de onderzoeksmaster ruimtelijke wetenschappen. Als onderdeel van mijn afstudeerscriptie loop ik stage bij het Ministerie van Infrastructuur en Waterstaat. Het doel van dit onderzoek is om beter te begrijpen welke keuzes inwoners van plattelandsgebieden maken wanneer zij zich verplaatsen voor hun dagelijkse activiteiten, zoals naar het werk of op familiebezoek. Er zijn verschillende factoren die de keuze voor een vervoersmiddel (bijvoorbeeld de auto of fiets) beïnvloeden. Ik wil beter begrijpen welke factoren voor u, en andere deelnemers aan dit onderzoek, belangrijk zijn. Als u meer wilt weten over het onderzoek en mijn relatie tot de Rijksuniversiteit Groningen of het Ministerie van Infrastructuur en Waterstaat, verwijs ik u graag door naar mijn begeleider Taede Tillema (t.tillema@rug.nl).

Ik wil u er graag van bewust maken dat er een geluidsopname wordt gemaakt van dit gesprek. Ik gebruik deze opname voor het verwerken van het gesprek tot een resultaat. Hiervoor maak ik een transcript van de opname. Zowel de opname, als het transcript worden niet gedeeld met anderen binnen of buiten de deelnemende organisaties. Bovendien worden de opname en het transcript zorgvuldig bewaard en opgeslagen op een beveiligde computer.

Vink het vakje aan als u akkoord gaat:
- ☐ Ik ben het er mee eens dat er een pseudoniem gebruikt wordt
  Niet noodzakelijk: ik kies graag zelf mijn pseudoniem: _____
- ☐ Ik ga ermee akkoord dat er een geluidsopname van het interview wordt gemaakt
- ☐ Ik ga ermee akkoord dat de onderzoeker de verkregen informatie gebruikt voor het afstudeeronderzoek
- ☐ Ik begrijp dat ik me op elk moment kan terugtrekken uit het onderzoek zonder een reden te hoeven geven.
- ☐ Ik heb de informatie over het onderzoeksdoel en -proces gelezen en begrepen.
- ☐ Ik heb de mogelijkheid om vragen te stellen.
- ☐ Ik neem vrijwillig deel aan dit interview.
- ☐ Ik ben me bewust van mijn rechten als deelnemer aan dit onderzoek.

Ik hoop dat dit duidelijk is. Als u verder nog vragen heeft, voelt u zich vrij om ze aan mij te stellen of later een email te sturen.

Heel erg bedankt voor uw deelname aan het onderzoek en voor uw inzichten en antwoorden.

Marlene van Doorne (marlene.van.doorne@minienw.nl)

Date: Handtekening:

Appendix 2. Topic list

Topic list potential intermodal travellers
Small-talk
Introductie (5 min)
Ik ben bezig met mijn scriptie voor de onderzoeksmaster ruimtelijke wetenschappen aan de Rijksuniversiteit Groningen. Als onderdeel van mijn scriptie loop ik stage bij het ministerie van Infrastructuur en Waterstaat. Zij hebben een ondersteunende rol, dit is een onafhankelijk onderzoek. Ik heb geen auto en reis vaak met het openbaar vervoer. *Dan fiets ik naar het station, pak ik vanaf daar de trein, en later weer de bus vanaf het station om mijn bestemming te bereiken [neem de reis die ik heb gemaakt om respondent te bereiken als voorbeeld].* Het doel van dit gesprek is om de keuzes beter te begrijpen die u, en anderen, maken wanneer zij zich verplaatsen. - Dit gesprek duurt ongeveer 60 minuten - Ik wil je uitnodigen om vrijuit te spreken in dit gesprek, omdat ik graag wil weten hoe het écht zit. - Deelname is overigens volledig vrijwillig, en er zijn geen goede of foute antwoorden. - Ik voer meerdere gesprekken. Om de antwoorden te verwerken wordt dit interview opgenomen. De opnames en transcripten worden niet gedeeld met anderen of binnen betrokken organisaties. Verder worden de transcripten en resultaten geanonimiseerd om uw privacy te bewaren. *Voorafgaand tekenen informed consent form*
Kennismaken en introductie onderwerp (10 min)
Zou u me wat meer over uzelf kunnen vertellen? • Waar woont u? • Wat is uw leeftijd? Zou u me wat kunnen vertellen over uw dagelijkse activiteiten waarvoor u het huis uitgaat? • Welke reis legt u regelmatig af? • Met welk vervoersmiddel reist u? Zou u me kunnen vertellen welke vervoersmiddelen u tot uw beschikking heeft? • Welke vervoersmiddelen heeft u in privé bezit? • In hoeverre heeft u een reizigersabonnement, zoals een ov-daluren kaart? • In hoeverre krijgt u een vergoeding voor de kosten die u maakt voor uw reis naar [*invullen*]? In hoeverre kunt u uw gewenste bestemmingen bereiken? Welk cijfer zou u de bereikbaarheid van uw gewenste bestemmingen geven? Wat is de reden dat u dit cijfer geeft? • Hoe moeilijk of makkelijk vindt u het om een reis [*invullen*] af te leggen? • In hoeverre zijn er momenten waarop u zich beperkt voelt in het reizen naar een gewenste bestemming? • Wat is de reden daarvoor? • In hoeverre ervaart u moeilijkheden wanneer u een reis plant naar bijvoorbeeld [*invullen*]? *Doorvragen* • Zijn er belangrijke dingen waar u rekening mee houdt voordat u op pad gaat? • Wat is daar de reden voor?
Huidige reisgedrag in kaart brengen *unimodaal autogebruik* (10 min)
Laten we inzoomen op de *laatste/belangrijkste* [*situatie gebonden*] reis die u gemaakt heeft. Zou je dat voor de geest kunnen halen? Kunt u me vertellen wat de reden/aanleiding was voor de reis? - Met welk vervoersmiddel(en) reisde u? Op welke manier bent u daar gekomen? - Vanaf waar vertrok u en waar ging u naartoe? - Kunt u voor mij nagaan welke keuzes u maakt tijdens deze reis naar [*invullen*]? - Wijkt u ook weleens af van uw routine? (zoals onderweg naar de supermarkt)

- Wat is daar de reden voor?

Waarom koos u ervoor om deze reis met de auto af te leggen?
- In hoeverre overweegt u wel eens andere vervoersmiddelen om deze reis af te leggen?
- In hoeverre is het realistisch dat u deze reis met een ander vervoersmiddel aflegt?
- Wanneer maakt u de keuze om met de auto te reizen? Wanneer kiest u voor een ander vervoersmiddel?

Wat waren de voor- of nadelen van deze reis of de auto?

<u>Toets:</u>
- In hoeverre speelt de afstand die u moet afleggen een rol bij het kiezen voor de auto of een ander vervoersmiddel?
- In hoeverre heeft uw directe omgeving invloed op uw keuze voor een bepaald vervoersmiddel?
- In hoeverre houdt u rekening met uw omgeving wanneer u [invullen] reis aflegt?
- Hoe normaal is het in uw omgeving/dorp om een auto in bezit te hebben?
- Hoe normaal is het in uw omgeving/dorp om met het openbaar vervoer te reizen?
- Zou u voor mij kunnen omschrijven welke vervoersmiddelen anderen in je omgeving [*gezin, vrienden/familie, collega's*] gebruiken? Hoe verplaatsen zij zich voor hun dagelijkse activiteiten?

Attitudes en percepties

Zoals u zo net beschreef reist u regelmatig met de auto naar [*invullen*]

Wat vindt u van reizen met de auto? (*algemeen*)

In hoeverre zou u liever met een ander vervoersmiddel reizen naar [*invullen*]?
- Wat is de reden daarvoor?
- Welke omstandigheden zouden moeten veranderen zodat u met uw gewenste vervoersmiddel zou kunnen reizen?
- Zou u voor mij kunnen beschrijven hoe deze hypothetische situatie eruit zien?

Zoals u net beschreef reist uw [*sociaal contact*] regelmatig met [*vervoersmiddel*] naar [*bestemming*].

Hoe kijkt u er tegen aan dat uw x met vervoersmiddel x reist?
- In hoeverre zou u in zijn/haar situatie ook met [*invullen*] reizen?
- Wat is de reden daarvoor?
- Wat zou u anders doen dan [*invullen*]?
- Wat is de reden daarvoor?
- Hoe zou u deze reis/situatie beoordelen ten opzichte van uw reis naar bestemming [*invullen*]?

Reacties op doelgedrag (20 min)

Ik zou het graag met u willen hebben over hubs. In de provincies Groningen en Drenthe zijn er een paar jaar geleden zogenoemde hubs aangelegd. Dit zijn bestaande bus en treinstations die een knooppunt vormen van openbaar vervoer in de regio. Dit om te garanderen dat iedereen zich kan verplaatsten naar zijn of haar gewenste bestemming en met het gewenste vervoersmiddel.
- **Kent u deze hubs of heeft u ze wel eens gezien?**

Hubs worden aangeduid met dit plaatje [*Afbeelding 1*]. Voorbeelden van hubs zijn de hub bij Hoogkerk nabij Groningen [*Afbeelding 2*], waar reizigers over kunnen stappen op verschillende buslijnen of naar de privé auto of deelfiets. En hub Gieten [*Afbeelding 3*], waar reizigers kunnen overstappen op busverbindingen tussen Assen, Groningen en Emmen en tussen aangelegen dorpen.

- **Wat zijn de eerste associaties, beelden of gedachtes die er bij je op komen als je denkt aan hubs?**

> *Meer informatie bieden waar nodig*
> - Naast een overstappunt naar het openbaar vervoer bieden hubs faciliteiten voor het parkeren van fietsen en soms de auto.
> - Sommige hubs bieden ook laadpunten aan voor elektrische auto's
> - Ook zijn is er soms deelvervoer aanwezig op een hub, zoals een deelfiets of deelauto. Het plan is dat dit in de toekomst verder wordt uitgebreid.
> - *Informatie over de hub taxi?*
> - Andere aanwezige activiteiten op een hub zijn bijvoorbeeld een cafetaria of plek om eten of drinken te kopen. Ook is er soms een bibliotheek of buurtcentrum naast de hub. Sommige hubs bieden een pakketkluis. Hier worden pakketjes geleverd door de bezorger en veilig opgeslagen totdat de eigenaar het pakketje komt ophalen

Nu u meer informatie heeft over hubs…

Zou u me kunnen vertellen in hoeverre heeft u wel eens gebruik gemaakt van een van deze hubs?
- Zou u voor mij uw ervaring met hubs kunnen beschrijven?
- Wat vond u van deze reis?
- Hoe ervaarde u de overstap naar de hub?
  - Met welk vervoermiddel bereikte u de hub? Wat was de reden om met dit vervoersmiddel naar de hub te gaan?
  - Gaat u ook wel eens met een ander vervoersmiddel naar de hub? Wat is de reden daarvoor?
  - Met welk vervoersmiddel verliet u de hub om uw bestemming te bereiken? Wat was de reden om met dit vervoersmiddel de hub te verlaten?
  - Verlaat u ook wel eens met een ander vervoersmiddel de hub? Wat is de reden daarvoor?
- Had u een overstap tijdens uw reis naar een andere bus/trein?
  - Hoe ervaarde u de overstap?
- Met welk cijfer zou u deze reis beoordelen? Wat is de reden daarvoor?
- In hoeverre ervaarde u moeilijkheden of beperkingen tijdens de reis?
  - In hoeverre ervaarde u moeilijkheden of beperkingen voorafgaand aan de reis? (*planning*)

Kunt u mij vertellen wat de voordelen (zouden kunnen) zijn van gebruik van hubs?
En wat zouden in uw ogen nadelen (kunnen zijn) bij het gebruik van hubs?
- Wat is de reden daarvoor?

Hoe realistisch of onrealistisch is het dat u op dit moment voor uw reis naar [*invullen*] de hub zou gebruiken?
- Kunt u voor mij inschatten hoeveel tijd het u zou kosten om via een hub of met het openbaar vervoer te reizen naar uw bestemming?
- Wat zou u moeten veranderen om wel via een hub te reizen naar uw bestemming?
- Hoe zou in uw ogen het hub-programma moeten veranderen zodat u naar uw bestemming kunt reizen via een hub? U mag hierin out of the box denken
- In hoeverre denkt u dat in deze situatie met de hub zou reizen naar uw bestemming?

Ik zou graag een situatie voor u willen schetsen waarin u geen gebruik meer kan maken van de auto. Ik hoop natuurlijk niet dat dit echt gebeurt, maar ik zou graag meer te weten willen komen over de stappen die u zou doorlopen, stel u zou in een dergelijke situatie terecht komen.
STEL: u heeft uw sleutelbeen gebroken waardoor u 6 weken niet mag auto rijden. Je hebt een afspraak in het voor u nabij gelegen ziekenhuis voor een controle. Deze afspraak is om 14:00 's middags. Hoe zou je in dit geval naar het ziekenhuis reizen voor uw afspraak?

- Welke afwegingen maakt u om deze reis te realiseren?
- **Wat als…? [*doorvragen afhankelijk van het antwoord dat de respondent geeft*]**
STEL: uw wilt met uw gebroken sleutelbeen naar uw [*werk, familie etc. invullen*]. Hoe zou u uw reis in dit geval aanpakken?
    - Welke afwegingen maakt u om deze reis te realiseren?
    - **Wat als…? [*doorvragen afhankelijk van het antwoord dat de respondent geeft*]**
STEL: [*schets een situatie op basis van de situatie van de respondent*] 1) er komt een hub naast uw werk; 2) belangrijke bestemming komt dichterbij; 3) er komt een hub in het dorp; 4) er is een deelauto beschikbaar op de nabijgelegen hub;
    - Welke afwegingen maakt u om deze reis te realiseren?
    - **Wat als…? [*doorvragen afhankelijk van het antwoord dat de respondent geeft*]**

Ondersteuning bij doelgedrag

Ik zou nog graag uw mening vragen over hubs. Het gaat er hierbij om wat voor jou belangrijk is, er is geen goed of fout antwoord [*vragen stellen die niet al eerder beantwoord zijn*].
 	
Wat is er volgens u nodig om vaker via hubs te reizen?
    - In hoeverre mist u dingen, die het voor u mogelijk zouden maken om via een hub te reizen?
    - Welke voorzieningen moeten er bij een hub te vinden zijn zodat u er gebruik van gaat maken?
    - Wat zou jou / anderen over de streep halen om de hub te gebruiken?
 	
Wanneer heeft een hub voor u toegevoegde waarde?
    - Hoe zou de ideale hub er volgens jou uitzien?

Tot slot / afsluiting
- Zijn er nog dingen die we gemist hebben tijdens het gesprek die je nog wilt meegeven? Heel erg bedankt voor uw deelname aan het onderzoek. Ik wil u bedanken voor de antwoorden en inzichten die u gegeven heeft. Ik ga deze samen met de andere interviews verwerken voor mijn master scriptie. Verder wil ik u erop wijzen dat u zich ook na dit gesprek kan terugtrekken van het onderzoek, tot het moment dat ik mijn resultaten uitgewerkt heb. Als u geïnteresseerd bent kan ik u mijn belangrijkste resultaten opsturen. Als u nog vragen heeft over dit gesprek of over mijn onderzoek kunt u mij bereiken via [*email*].

Topic list intermodal travellers
Small-talk
Introductie (5 min)

Ik ben bezig met mijn scriptie voor de onderzoeksmaster ruimtelijke wetenschappen aan de Rijksuniversiteit Groningen. Als onderdeel van mijn scriptie loop ik stage bij het Ministerie van Infrastructuur en Waterstaat. Zij hebben een ondersteunende rol, dit is een onafhankelijk onderzoek. Ik heb geen auto en reis vaak met het openbaar vervoer. *Dan fiets ik naar het station, pak ik vanaf daar de trein, en later weer de bus vanaf het station om mijn bestemming te bereiken [neem de reis die ik heb gemaakt om respondent te bereiken als voorbeeld].* Het doel van dit gesprek is om de keuzes beter te begrijpen die u, en anderen, maken wanneer zij zich verplaatsen.
 	
    - Dit gesprek duurt ongeveer 60 minuten
    - Ik wil je uitnodigen om vrijuit te spreken in dit gesprek, omdat ik graag wil weten hoe het zit.
    - Deelname is overigens volledig vrijwillig, en er zijn geen goede of foute antwoorden.
    - Ik voer meerdere gesprekken. Om de antwoorden te verwerken wordt dit interview opgenomen. De opnames en transcripten worden niet gedeeld met anderen of binnen betrokken organisaties. Verder worden de transcripten en resultaten geanonimiseerd om uw privacy te bewaren.
 	
Voorafgaand tekenen informed consent form

Kennismaken en introductie onderwerp (10 min)

Zou u me wat meer over uzelf kunnen vertellen?
- Waar woont u?
- Wat is uw leeftijd?

Zou u me wat kunnen vertellen over uw dagelijkse activiteiten waarvoor u het huis uitgaat?
- Welke reis legt u regelmatig af?
- Met welk vervoersmiddel reist u?

Zou u me kunnen vertellen welke vervoersmiddelen u tot uw beschikking heeft?
- Welke vervoersmiddelen heeft u in privé bezit?
- In hoeverre heeft u een reizigersabonnement, zoals een ov-daluren kaart?
- In hoeverre krijgt u een vergoeding voor de kosten die u maakt voor uw reis naar [*invullen*]?

In hoeverre kunt u uw gewenste bestemmingen bereiken? Welk cijfer zou u de bereikbaarheid van uw gewenste bestemmingen geven? Wat is de reden dat u dit cijfer geeft?
- Hoe moeilijk of makkelijk vindt u het om een reis [*invullen*] af te leggen?
- In hoeverre zijn er momenten waarop u zich beperkt voelt in het reizen naar een gewenste bestemming?
- Wat is de reden daarvoor?
- In hoeverre ervaart u moeilijkheden wanneer u een reis plant naar bijvoorbeeld [*invullen*]? *Doorvragen*
- Zijn er belangrijke dingen waar u rekening mee houdt voordat u op pad gaat?
- Wat is daar de reden voor?

Huidige reisgedrag in kaart brengen *intermodaal* (10 min)

Laten we inzoomen op de *laatste/belangrijkste* [*situatie gebonden*] reis die u gemaakt heeft met het openbaar vervoer. Zou je dat voor de geest kunnen halen?

Kunt u me vertellen wat de reden/aanleiding was voor de reis?
- Met welk vervoersmiddel(en) reisde u? Op welke manier bent u daar gekomen?
- Vanaf waar vertrok u en waar ging u naartoe?
- Kunt u voor mij nagaan welke keuzes u maakt tijdens deze reis naar [*invullen*]?
- Wijkt u ook weleens af van uw routine? (zoals onderweg naar de supermarkt)
- Wat is daar de reden voor?

Waarom koos u ervoor om deze reis met het openbaar vervoer af te leggen?
- In hoeverre overweegt u wel eens andere vervoersmiddelen om deze reis af te leggen?
- In hoeverre is het realistisch dat u deze reis met een ander vervoersmiddel aflegt?
- Wanneer maakt u de keuze om met het openbaar vervoer te reizen? Wanneer kiest u voor een ander vervoersmiddel?
- Wat waren de voor- of nadelen van deze reis of het openbaar vervoer?

Toets:
- In hoeverre speelt de afstand die u moet afleggen een rol bij het kiezen voor het openbaar vervoer of een ander vervoersmiddel?
- In hoeverre heeft uw directe omgeving invloed op uw keuze voor een bepaald vervoersmiddel?
- In hoeverre houdt u rekening met uw omgeving wanneer u [invullen] reis aflegt?
- Hoe normaal is het in uw omgeving/dorp om een auto in bezit te hebben?
- Hoe normaal is het in uw omgeving/dorp om met het openbaar vervoer te reizen?
- Zou u voor mij kunnen omschrijven welke vervoersmiddelen anderen in je omgeving [*gezin, vrienden/familie, collega's*] gebruiken? Hoe verplaatsen zij zich voor hun dagelijkse activiteiten?

Attitudes en percepties

Zoals u zo net beschreef reist u regelmatig met het openbaar vervoer naar [*invullen*]

Wat vindt u van reizen met het openbaar vervoer? (*algemeen*)

In hoeverre zou u liever met een ander vervoersmiddel reizen naar [*invullen*]?
- Wat is de reden daarvoor?
- Welke omstandigheden zouden moeten veranderen zodat u met uw gewenste vervoersmiddel zou kunnen reizen?
- Zou u voor mij kunnen beschrijven hoe deze hypothetische situatie eruit zien?

Zoals u net beschreef reist uw [*sociaal contact*] regelmatig met [*vervoersmiddel*] naar [*bestemming*].

Hoe kijkt u er tegen aan dat uw x met vervoersmiddel x reist?
- In hoeverre zou u in zijn/haar situatie ook met [*invullen*] reizen?
- Wat is de reden daarvoor?
- Wat zou u anders doen dan [*invullen*]?
- Wat is de reden daarvoor?
- Hoe zou u deze reis/situatie beoordelen ten opzichte van uw reis naar bestemming [*invullen*]?

KNIP in het interview (*alleen voor autogebruikers?*) Reacties op doelgedrag (15 min)

Ik zou het graag met u willen hebben over hubs. In de provincies Groningen en Drenthe zijn er een paar jaar geleden zogenoemde hubs aangelegd. Dit zijn bestaande bus en treinstations die een knooppunt vormen van openbaar vervoer in de regio. Dit om te garanderen dat iedereen zich kan verplaatsten naar zijn of haar gewenste bestemming en met het gewenste vervoersmiddel.
- **Kent u deze hubs of heeft u ze wel eens gezien?**

Hubs worden aangeduid met dit plaatje [*Afbeelding 1*]. Voorbeelden van hubs zijn de hub bij Hoogkerk nabij Groningen [*Afbeelding 2*], waar reizigers over kunnen stappen op verschillende buslijnen of naar de privé auto of deelfiets. En hub Gieten [*Afbeelding 3*], waar reizigers kunnen overstappen op busverbindingen tussen Assen, Groningen en Emmen en tussen aangelegen dorpen.
- **Wat zijn de eerste associaties, beelden of gedachtes die er bij je op komen als je denkt aan hubs?**

> *Meer informatie bieden waar nodig*
> - Naast een overstappunt naar het openbaar vervoer bieden hubs faciliteiten voor het parkeren van fietsen en soms de auto.
> - Sommige hubs bieden ook laadpunten aan voor elektrische auto's
> - Ook zijn is er soms deelvervoer aanwezig op een hub, zoals een deelfiets of deelauto. Het plan is dat dit in de toekomst verder wordt uitgebreid.
> - *Informatie over de hub taxi?*
> - Andere aanwezige activiteiten op een hub zijn bijvoorbeeld een cafetaria of plek om eten of drinken te kopen. Ook is er soms een bibliotheek of buurtcentrum naast de hub. Sommige hubs bieden een pakketkluis. Hier worden pakketjes geleverd door de bezorger en veilig opgeslagen totdat de eigenaar het pakketje komt ophalen

Nu u meer informatie heeft over hubs…

Zou u me kunnen vertellen in hoeverre heeft u wel eens gebruik gemaakt van een van deze hubs?
- Zou u voor mij uw ervaring met hubs kunnen beschrijven?
- Wat vond u van deze reis?
- Hoe ervaarde u de overstap naar de hub?
    - Met welk vervoermiddel bereikte u de hub? Wat was de reden om met dit vervoersmiddel naar de hub te gaan?
    - Gaat u ook wel eens met een ander vervoersmiddel naar de hub? Wat is de reden daarvoor?
    - Met welk vervoersmiddel verliet u de hub om uw bestemming te bereiken? Wat was de reden om met dit vervoersmiddel de hub te verlaten?

- o Verlaat u ook wel eens met een ander vervoersmiddel de hub? Wat is de reden daarvoor?
- Had u een overstap tijdens uw reis naar een andere bus/trein?
    - o Hoe ervaarde u de overstap?
- Met welk cijfer zou u deze reis beoordelen? Wat is de reden daarvoor?
- In hoeverre ervaarde u moeilijkheden of beperkingen tijdens de reis?
    - o In hoeverre ervaarde u moeilijkheden of beperkingen voorafgaand aan de reis? (*planning*)

Kunt u mij vertellen wat de voordelen (zouden kunnen) zijn van gebruik van hubs?
En wat zouden in uw ogen nadelen (kunnen zijn) bij het gebruik van hubs?
- Wat is de reden daarvoor?

Hoe realistisch of onrealistisch is het dat u op dit moment voor uw reis naar [*invullen*] de hub zou gebruiken?
- Kunt u voor mij inschatten hoeveel tijd het u zou kosten om via een hub of met het openbaar vervoer te reizen naar uw bestemming?
- Wat zou u moeten veranderen om wel via een hub te reizen naar uw bestemming?
- Hoe zou in uw ogen het hub-programma moeten veranderen zodat u naar uw bestemming kunt reizen via een hub? U mag hierin out of the box denken
- In hoeverre denkt u dat in deze situatie met de hub zou reizen naar uw bestemming?

Ik zou graag een situatie voor u willen schetsen waarin u geen gebruik meer kan maken van de auto. Ik hoop natuurlijk niet dat dit echt gebeurt, maar ik zou graag meer te weten willen komen over de stappen die u zou doorlopen, stel u zou in een dergelijke situatie terecht komen.
STEL: u heeft uw sleutelbeen gebroken waardoor u 6 weken niet mag auto rijden. Je hebt een afspraak in het voor u nabij gelegen ziekenhuis voor een controle. Deze afspraak is om 14:00 's middags. Hoe zou je in dit geval naar het ziekenhuis reizen voor uw afspraak?
- Welke afwegingen maakt u om deze reis te realiseren?
- **Wat als…? [*doorvragen afhankelijk van het antwoord dat de respondent geeft*]**
STEL: uw wilt met uw gebroken sleutelbeen naar uw [*werk, familie etc. invullen*]. Hoe zou u uw reis in dit geval aanpakken?
- Welke afwegingen maakt u om deze reis te realiseren?
- **Wat als…? [*doorvragen afhankelijk van het antwoord dat de respondent geeft*]**
STEL: [*schets een situatie op basis van de situatie van de respondent*] 1) er komt een hub naast uw werk; 2) belangrijke bestemming komt dichterbij; 3) er komt een hub in het dorp; 4) er is een deelauto beschikbaar op de nabijgelegen hub;
- Welke afwegingen maakt u om deze reis te realiseren?
- **Wat als…? [*doorvragen afhankelijk van het antwoord dat de respondent geeft*]**

Ondersteuning bij doelgedrag

Ik zou nog graag uw mening vragen over hubs. Het gaat er hierbij om wat voor jou belangrijk is, er is geen goed of fout antwoord [*vragen stellen die niet al eerder beantwoord zijn*].

Wat is er volgens u nodig om vaker via hubs te reizen?
- In hoeverre mist u dingen, die het voor u mogelijk zouden maken om via een hub te reizen?
- Welke voorzieningen moeten er bij een hub te vinden zijn zodat u er gebruik van gaat maken?
- Wat zou jou / anderen over de streep halen om de hub te gebruiken?

Wanneer heeft een hub voor u toegevoegde waarde?
- Hoe zou de ideale hub er volgens jou uitzien?

Tot slot / afsluiting
- Zijn er nog dingen die we gemist hebben tijdens het gesprek die je nog wilt meegeven?

Heel erg bedankt voor uw deelname aan het onderzoek. Ik wil u bedanken voor de antwoorden en inzichten die u gegeven heeft. Ik ga deze samen met de andere interviews verwerken voor mijn master

scriptie. Verder wil ik u erop wijzen dat u zich ook na dit gesprek kan terugtrekken van het onderzoek, tot het moment dat ik mijn resultaten uitgewerkt heb. Als u geïnteresseerd bent kan ik u mijn belangrijkste resultaten opsturen. Als u nog vragen heeft over dit gesprek of over mijn onderzoek kunt u mij bereiken via [*email*].

Interview afbeelding 1

Interview afbeelding 2

Interview afbeelding 3

Appendix 3. Code tree